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Description of a Daily Simulation Model For the Area 4 (Skeena) Commercial Gillnet Fishery

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ABSTRACT

Cox-Rogers, S. 1994. Description of a daily simulation model for the Area 4 (Skeena River) commercial gillnet fishery. Can. Manuscr. Rep. Fish. Aquat. Sci. 2256: iv + 46 p.

This report describes a daily simulation model for the Area 4 (Skeena River) commercial gillnet fishery. The model evaluates the effects of various gillnet fishing patterns on the catch and escapement of sockeye, steelhead (including sub-stocks), early-run coho, chinook, and pink salmon migrating through four sub-areas of Area 4. For any fishing pattern, the model predicts the daily sockeye harvest rate associated with the fishing effort, and applies this rate to the abundance of salmon to calculate catch. The model uses sockeye harvest rate and effort relationships obtained from run-reconstructions of Area 4 fishery data for the years 1985-1991. The daily abundance of each species entering Area 4 depends upon the run sizes and run-timings used in the model. A return of 2.3 million fish to Area 4 is used as the expected sockeye run size. Run sizes for other species can be specified, or represented as proportions, for harvest rate calculations. The daily proportions of sockeye entering the fishery are derived from average reconstructed run-timing curves for the base-period years 1985-1991. The run-timings for other species are summarized from a combination of test fishery and tagging data, and are represented in the model as normal distributions. The model is spread-sheet based, and evaluates any combination of fish abundance and gillnet fishing pattern, including the use of gillnet weedlines and catch and release for steelhead. Changes in harvest rate are measured about the pattern for the 1985-1991 period.

RÉSUMÉ

Dans ce rapport, on décrit un modèle de simulation quotidienne de la pêche commerciale au filet maillant dans le secteur 4 (Skeena River). Le modèle en question permit d'évaluer les effets de divers modes de pèche au filet maillant sur les captures et sur l'échappée; il s'utilise pour le saumon rouge, la truite arc-en-ciel anadrome (y compris les sous-stocks), le saumon coho a remonte hâtive, le saumon quinnat et le saumon rose en migration dans quatre sous-unités du secteur 4. Quel que soit le mode d'exploitation, le modèle permet de prévoir le taux de capture quotidien de saumon rouge correspondant a l'effort de pèche et, par l'application du taux obtenu aux effectifs, de calculer les prises. Le modèle fait intervenir des relations entre le taux de capture et l'effort de pèche, déterminées par reconstruction des remontes dans le secteur 4 a partir de données recueillies de 1985 a 1991. La valeur quotidienne des effectifs de chaque espèce pénétrant dans le secteur 4 dépende de la taille et de la chronologie de la remonte utilisées dans le modèle. Pour le saumon rouge, l'effectif escompte de remonte utilise dans le modèle est un retour de 2.3 millions de poissons dans le secteur 4. Pour calculer le taux de capture des autres espèces,

on peut utiliser des valeurs d'effectif de remonte déterminées ou des proportions. Dans le cas du saumon rouge, la proportion quotidienne pénétrant dans la zone de pèche est déterminée d'après des courbes chronologiques des remontes moyennes reconstituées pour la période de base (1985-1991). Pour les autres espèces, la chronologie de la remonte est établie sous une forme condensée a partir d'un ensemble de données conjuguant les résultats de pêches exploratoires et d'études de marquage et représentée sous forme distributions normales dans le modèle. Le modèle est un tableau de ventilation et permet d'évaluer toutes les combinaisons possibles d'effectifs et de modes d'exploitation au filet maillant, y compris le filet maillant modifie de type "weedlines" ainsi que la capture avec remise a l'eau pour la truite arc-en-ciel anadrome. Les variations du taux de capture sont mesurées par rapport a la courbe de la période de base (1985-1991).

INTRODUCTION

The Skeena River, in northern British Columbia, supports an important commercial fishery for sockeye and pink salmon each July and August. The fishery takes place in statistical Area 4, adjacent to the river mouth. Although management of the Area 4 fishery has evolved considerably since the late 1800's (see Sprout and Kadowaki 1987), the incidental catch of non-target species in Area 4, such as steelhead, coho and chinook salmon, remains a concern. Overlaps in run-timing among the various salmon stocks prevent harvesting of single stocks in Area 4, while diverse stock productivities preclude the application of a single harvest rate that would provide the maximum sustained yield for all stocks (Sprout and Kadowaki 1987). Recent management of the fishery has been characterized by attempts to reduce harvest rates on incidental species. Fishing opportunities are now restricted in early August to protect early-run coho. As well, in 1991, DFO committed to reducing Area 4 steelhead harvest rates by 50% within three years. Unfortunately, reliable catch and escapement data for Skeena River coho and steelhead do not exist, and so direct evaluation of Area 4 harvest rates, for these species, is difficult.

In the absence of reliable catch and escapement data for Skeena River steelhead, Ward et al. (1993) developed a computer model of the Area 4 fishery to estimate steelhead harvest rates indirectly. Their approach used weekly harvest rates for sockeye, adjusted for differences in run-timing, as a surrogate for steelhead and other co-migrating species. Ward et al's. (1993) model was a useful first step in understanding the dynamics of the Area 4 fishery; however, the weekly time step in the model was found to be insufficient for pre-season planning purposes. Daily resolution of the Area 4 fishery, on a sub-area basis, is required to assess harvest rate changes attributable to specific management actions.

This report describes a daily simulation model for the Area 4 commercial gillnet fishery. The model was jointly developed by the Department of Fisheries and Oceans and the British Columbia Ministry of Environment, Lands, and Parks, as a tool for evaluating Area 4 management options. The model is spread-sheet based, and evaluates the effects of various gillnet fishing patterns on the catch and escapement of sockeye, steelhead (including sub-stocks), early-run coho, chinook, and pink salmon migrating through four sub-areas of Area 4. The model allows managers to explore alternate fishing regimes before fishing actually takes place, and provides an objective framework for pre-season planning. As an example of model use, various simulations of the Area 4 fishery are presented.

METHODS

General Description of the Area 4 Model

The structure of the Area 4 model is similar to the "gauntlet" fishery models described by Gilhousen (1992) and Starr and Hilborn (1988). Fish are assumed to pass through a series of sequential fisheries before escaping to spawn. The catch of fish in each sequential fishery is regulated by varying the number of boats present, and by varying the days when fishing occurs.

The Area 4 model uses the following inputs to simulate the fishery:

a) total incoming abundance of sockeye, coho, steelhead, chinook, and pink salmon.
b) run-timing curves for sockeye, coho, steelhead, chinook, and pink salmon.
c) daily fishing effort (# of boats).
d) a schedule of expected changes in daily harvest rate attributable to gillnet "weedlines", and steelhead catch and release..

The model treats Area 4 as four sequential fisheries: Outside, Sound, Smith, and River/Gap/Slough (Figure 1). All fish are assumed to move through each sub-area prior to passing into the Skeena River. The runs entering the fishery are partitioned into daily migration blocks. Each migration block represents a proportion of the run-timing curve for each species. The migration blocks are moved sequentially through each sub-area using a daily time-step. Sockeye tagging studies show that sockeye take between two and five days to move through Area 4 (Takagi and Smith 1973), with four days being the best point estimate (Smith and Jordan 1973). Currently, the model is configured with a four day migration rate for all species, although the number of days each migration block spends in each sub-area can be modified if required.

The basic calculation in the model is the estimate of sub-area catch and escapement, where the catch depends upon the gillnet fishing pattern (ie. the dates fished and the effort present). For any fishing pattern, the model first predicts the daily sockeye harvest rate associated with the daily fishing effort in each sub-area, and then applies this rate to the daily proportion of fish present in each sub-area to calculate daily catch and escapement.

The relationships for predicting daily harvest rate from fishing effort were obtained from historical Area 4 sockeye run-reconstructions. The daily effort in each sub-area can be entered manually into the model, or predicted from regressions relating historical Area 4 effort to date. If specified, changes in harvest rate, attributable to using gillnet weedlines, and catch and release for steelhead, are incorporated into the daily harvest rate calculations.

The abundance of fish entering Area 4 depends upon the run sizes and run-timings used in the model. The run-timing curve for sockeye is derived from the historical run-reconstructions. The run-timing curves for other species are summarized from a combination of test fishery CPUE and tagging data, and are represented in the model as normal distributions with specified peak dates and standard deviations.

A 25% exploitation rate is applied to the abundance of each species before the start of calculations. This rate represents estimates of Skeena River sockeye exploitation in S. E. Alaska, and Canadian Areas 1, 3 and 5.

The major assumptions of the model are:

a) fish pass through each sub-area as a uniform band.
b) migration is constant in speed and direction.
c) fishing gear is spread uniformly over the migration path within each sub-area
d) gear efficiency remains stable during the allowed fishing time while each unit removes fish that another unit could have caught (eg. gear competition occurs).
e) an exponential limit adequately describes the relationship between daily harvest rate and fishing effort in each sub-area:

1) $h = 1 - e^{-qE}$

where C is catch, N is abundance, h is the harvest rate (C/N), q is an estimate of the catchability coefficient, E is effort, and e is the base of natural logarithms (Hilborn and Walters 1992).

f) daily harvest rates calculated for sockeye apply to all co-migrating species.

Data Sources

The model was configured using data obtained from the Operations Branch of the Department of Fisheries and Oceans in Prince Rupert. The primary sources of data were Area 4 sockeye catch and effort records by sub-area from 1985-1991, and Tyee test fishery catch per effort (CPUE) records, by species, from 1985-1991. The schedule of weedline impacts used in the model was summarized from studies conducted by Lewensky (1992). The years 1985-1991 were selected as the "base-period" for the model because a) these years represent recent management of the Area 4 fishery, and b) the data were complete for run-reconstruction by sub-area.

The Area 4 sockeye catch data used to configure the model represented fishery officer hail estimates collected inseason. To calibrate the inseason hails against actual sales slip catch records, the inseason hails were first converted to proportions of the seasonal total for each year, and then multiplied by the annual sales slip figure. Sockeye escapement past the Tyee test fishery was generated using Tyee test fishery CPUE expanded to daily escapement. Daily (i) sockeye escapement (E_i) was estimated by dividing daily sockeye CPUE in the test fishery by annual estimates of test fishery catchability (q). Annual sockeye catchability in the test fishery was obtained from post-season calibrations using actual escapement estimates from the Babine River counting fence (Cox-Rogers and Jantz 1993).

2) $E_i = CPUE_i / q$

The Area 4 effort data used to configure the model represented gillnet (95%) and purse seine vessels (5%) counted during fishery officer surveys and overflights. Purse seine effort, where present in the data base, was converted to gillnet equivalents using a 1985-1991 sockeye conversion ratio of approximately 4:1 (eg. seine CPUE : gillnet CPUE).

Model Configuration

The model was configured in three steps: A) run-reconstruction of historical sockeye returns to Area 4, B) defining species run-timing, and C) simulating the fishery.

A) Sockeye Run Reconstruction

The sockeye run-reconstructions used to configure the model followed the methodology of Starr and Hilborn (1988). The reconstructions established daily sockeye abundance and harvest rates in each sub-area of Area 4 for the 1985-1991 base-period, and established run-timing curves for sockeye entering the fishery. The basic relationships used in the reconstructions were:

$$(3) \quad \begin{aligned} N_{ij} &= C_{ij} + E_{ij} \\ h_{ij} &= C_{ij} / N_{ij} \end{aligned}$$

where N_i was daily abundance in sub-area j, C_i was daily catch, E_i was daily escapement, and h_i was the daily harvest rate.

The reconstructions also configured data relating Area 4 fishing effort to date. Linear regressions relating fishing effort and date were calculated for a) average 1985-1991 total Area 4 effort against date and b) average 1985-1991 sub-area proportions of Area 4 effort against date. Average weekly effort was evaluated at the mid-point of each Julian week to account for differences in fishery start dates attributable to calender variation among years.

B) Species Run-timing

The run-timing curves used to configure the model were derived from a variety of sources. For sockeye, the 50% cumulative proportion (catch + escapement) dates were calculated from the run-reconstructions, and aligned with the average 1985-1991 50% cumulative proportion date. The daily proportions were then averaged across all years and smoothed to remove daily variability.

For early-run coho, chinook, and pink salmon, run-timing was estimated using 1985-1991 test fishery CPUE. The 50% cumulative CPUE dates were calculated for each year, and aligned to the average 1985-1991 50% cumulative CPUE dates. The daily CPUE's were then averaged across all years, and expressed as daily proportions. The daily proportions were smoothed to remove variability caused by low or zero CPUE values in some years. Normal distributions were applied to the smoothed daily proportions, using the mean 50% peak dates for each species and a common standard deviation, for all species, of 12.5 days. Finally, the normal distributions were moved back four days to approximate run-timing into the fishery.

Steelhead run-timing was estimated from a review of available information (Ward et al. 1993), and from a run-reconstruction of 1985-1991 test fishery CPUE "entering" the fishery by:

4) $N_{ij} = E_{ij} / (1-h_{ij})$

where N_i was reconstructed daily CPUE in sub-area j, E_i was daily escapement (CPUE), and h_i was reconstructed daily sockeye harvest rate. The 50% cumulative proportion dates were calculated from the run-reconstructions, and aligned with the average 1985-1991 50% cumulative proportion date. The daily proportions were then averaged across all years and smoothed to remove daily variability. A normal distribution was applied to the smoothed daily proportions, using the mean 50% peak date, and a standard deviation of 12.5 days. Normal distributions were also used to represent steelhead sub-stock timing in the model. The peak dates and standard deviations (11.0 days) for steelhead sub-stocks were obtained from Ward et al. (1993).

C) Fishery Simulation

The objective of the fishery simulations was to 1) establish the average 1985-1991 base-period fishing pattern and harvest rates for all species, and 2) modify the base-period fishing pattern to show the effects of alternate management options. The fishery simulations were configured using the following inputs:

a) incoming Area 4 abundance by species
b) incoming Area 4 run-timing by species
c) daily Area 4 fishing pattern by date (ie. area and effort) and pattern of weed-line use
d) schedule of weedline and steelhead catch and release impacts

For the simulations, inputs a, b, and d were held constant while input c was varied. Changes in harvest rate were measured relative to the pattern for the 1985-1991 base-period. For simulation purposes, a run size of 2.3 million was used as the "expected" run entering Area 4. Run sizes for steelhead, coho, chinook, and pink salmon were set at one, due to uncertainty in the expected run sizes for these species.

The calculations used in the fishery simulations were simply a rearrangement of equation (3), and followed the forward-construction methodology described by Starr and Hilborn (1988):

$$5)\quad \begin{aligned} C_{ij} &= h_{ij}N_{ij} \\ E_{ij} &= N_{ij} - C_{ij} \end{aligned}$$

where C_i was daily catch in sub-area j, h_i was the daily harvest rate from equation (1), N_i was daily abundance, and E_i was daily escapement.

The performance of the base-period model was also tested under stochastic conditions, using Monte Carlo simulation (Crystal Ball 1991, Decisioneering Inc.). Two calculations in the model can be expected to be sensitive to stochastic variation: a) the sub-area daily harvest rates calculated from equation (1), and b), the daily proportions of each species entering the fishery, as determined from their run-timing curves. Although the prediction of effort by sub-area is also subject to variability, the objective of the Monte Carlo simulation was to find the most likely base-period harvest rates when effort was held constant.

The Monte Carlo simulation was configured by specifying probability distributions for (a) and (b) above, and running the model for 20,000 trials to find the probability distributions of the Area 4 harvest rates for all species. For the sub-area daily harvest rates, triangular probability distributions were defined about the point estimates for the base-period simulation, using, as maximum and minimum values, the harvest rates calculated when the 95% confidence limits for q were placed into equation (1). For the run-timings, triangular probability distributions were specified about the peak day of entry in Area 4 for each species, with one week (seven days) on either side of the peak used to specify the minimum and maximum values. To be consistent with other species, a normal run-timing curve was defined for sockeye, using a peak day of entry into Area 4 of July 21, and a standard deviation of 12.5 days. The standard deviation of the run-timing curves for each species was not altered for the Monte Carlo simulation, to examine the impacts of early versus late peak timing, rather than protracted versus compressed run duration.

Adjustments to daily harvest rates: Gillnet weedlines and steelhead catch and release

When specified as model options, gillnet weedline and steelhead catch and release impacts were directly applied to the daily harvest rates calculated from equation 1. Weedlines are gillnets suspended below the water surface, so that fish near the surface can swim over the net without being caught. For surface oriented species, such as steelhead (Ruggerone et al. 1990), using weedlines in Area 4 is expected to reduce steelhead harvest rates considerably (Lewensky 1992). Catch and release of live steelhead from gillnets is another method of reducing steelhead harvest rates. Catch and release of live steelhead was first proposed by the North Coast Advisory Board in 1992. Steelhead surviving captures are placed in holding tanks, revived, and later released into areas where recapture is reduced. For the fishery simulations, weedline and catch and release impacts were modelled as expected percentage reductions in daily harvest rate.

RESULTS

A) Sockeye Run Reconstruction

The results of the sockeye run-reconstructions for 1985-1991 are presented in Appendix 1. The reconstructed sockeye harvest rates are highest in the River/Gap/Slough, and lowest in the Sound and Outside. Average effort in Area 4 peaks in the third to fourth weeks of July (Figure 2), corresponding to the general timing of the fishery on sockeye. Relative effort also increases noticeably in the River/Gap/Slough as the season progresses, and decreases in the other sub-areas (Figure 3). This probably reflects of the fleet's tendency to "follow" the sockeye and pink runs into the river as the season progresses, and the departure of much of the fleet after early August, leaving mostly river-gillnets in the fishery.

Figure 4 shows the relationship between daily sockeye harvest rate and daily effort in each sub-area for 1985-1991. Although the fitted curves indicate a progressive increase in daily harvest rate with effort, there is considerable variability in the raw data when more than one or two hundred boats are fishing. Figure 5 summarizes the modelled daily harvest rate versus effort relationship among the sub-areas. For any level of fishing effort, daily harvest rates are highest in the River/Gap/Slough, and lowest in the Sound and Outside. This suggests differential catchability among areas, with sockeye becoming more vulnerable to capture as they approach the river mouth. Increasing sockeye vulnerability toward the river mouth may be related to the funnelling effect of the Skeena River estuary, where fish are concentrated by shallower water and restricted topography.

B) Species Run-timing

The average 1985-1991 run-timings for each species are shown in Figure 6. For sockeye and steelhead, the 50% peak dates of entry into the fishery were estimated to be thirteen days apart (July 21 and August 3 respectively, Table 1), the same as reported by Ward et al. (1993). For early-run coho, and pink salmon, the 50% peak dates of entry were August 6 and 7 respectively. The 50% peak date of entry for chinook was July 1.

Figure 7 compares the annual reconstructed run-timings generated for steelhead and sockeye, expressed as cumulative proportions. Unlike sockeye, the steelhead reconstructions show considerable annual variation. Some of this variation appears due to the nature of test fishery CPUE data for steelhead. Many daily CPUE values for steelhead are consecutively low or zero. This creates "holes" in the reconstructions calculated using equation 4. As well, some variation may be due to annual variability in stock-specific steelhead abundance. Because of these sources of variability, a normal curve (Figure 8) is considered a better approximation of run-timing for steelhead. The same concerns apply to the timing curves generated for early-run coho, chinook, and, to a lesser extent, pink salmon. Actual catch and escapement data is needed to further refine the run-timings for steelhead, coho, chinook and pink salmon used in the model.

C) Fishery Simulation

- 1985-1991 Base-Period Harvest Rates: point estimates

The result of the 1985-1991 base-period simulation is presented in Table 2. The base-period simulation used a 1985-1991 fishing pattern calculated as follows:

Julian Week	Week Ending	Average Days Fished	1985-1991 Actual Mean Effort (1st day)	1985-1991 Model Effort (1st day)
26	June 25 - July 01	0	0	0
27	July 02 - July 08	1	413	438
28	July 09 - July 15	2	466	546
29	July 16 - July 22	2	679	653
30	July 23 - July 29	4	709	761
31	July 30 - Aug 05	3	608	623
32	Aug 06 - Aug 12	3	494	485
33	Aug 13 - Aug 19	3	341	347
34	Aug 20 - Aug 26	3	220	210
35	Aug 27 - Sept 02	1	88	72

		22		

From table 2, the point estimate Area 4 harvest rates, for the base-period, were 40.6% for sockeye, 36.3% for steelhead, 34.8% for coho, 33.7% for pinks, and 20.4% for chinook. The base-period harvest rates on steelhead sub-stocks were 42.3% for early-run (eg. Morice), 36.5% for middle-run (eg. Babine), and 30.5% for late-run (eg. Kispiox). The simulated sockeye harvest rate of 40.6% compares with the actual average 1985-1991 sockeye harvest of 41.2%, and the actual unweighted average sockeye harvest rate of 39.2% (Table 3).

- 1985-1991 Base-Period Harvest Rates: Monte Carlo estimates

The results of the Monte Carlo simulation are shown in Figures 9, 10, and 11. After 20,000 trials, the most probable (modal) Area 4 harvest rates, for the base-period, were calculated to be 42.3% for sockeye, 35.5% for steelhead, 34.9% for coho, 33.3% for pinks, and 20.2% for chinook. The modal base-period harvest rates on steelhead sub-stocks were 42.6% for early-run (eg. Morice), 37.8% for middle-run (eg. Babine), and 30.4% for late-run (eg. Kispiox).

These results are similar to the point estimates generated from a single model run. However, unlike the point estimate simulation, the Monte Carlo simulation describes the certainty about the modal estimates. For example, the 90% certainty ranges for the base-period were harvest rates were: sockeye (38.7% - 42.4%), steelhead (30.2% - 39.0%), coho (29.0% - 39.3%), pinks (27.8% - 38.5%), chinook (14.5% - 26.7%), early-run steelhead (39.4% - 42.7%), middle-run steelhead (30.8% - 40.7%), and late-run steelhead (23.9% - 36.2%). Based on these results, the sensitivity of the model is considered to be well within the ranges required for management purposes.

Interestingly, for both sockeye and early run steelhead, the harvest rate probability distributions are positively skewed, with relatively "tight" 90% certainty ranges. For other species, the harvest rate probability distributions are more symmetric, and have wider 90% certainty ranges. This is likely due to the interaction between the fishing pattern, the daily harvest rates produced by the fishing pattern, and the run-timing for each species. Daily harvest rates, which are maintained at their highest levels when effort peaks later in July, appear to offset the effects of variable peak run-timing for both sockeye and early steelhead, thus resulting in Area 4 harvest rates exhibiting tighter certainty ranges. For other species, the interaction between daily harvest rates and run-timing is more variable, thus resulting in Area 4 harvest rates exhibiting wider certainty ranges.

-1994 Pre-Season Fishery Simulations

The results of several point estimate simulations, for the 1994 fishing season, are shown in Table 4. The simulation runs are presented as examples of what different fishery objectives might produce, and are not intended as recommendations for specific management options.

The simulations were configured by altering the fishing pattern (specific dates fished) to achieve the stated objectives. The simulations summarize a range of potential management options from status quo (#2) to consideration of early-timed steelhead impacts (#9). The schedule of 1.2m weedline impacts (60-mesh standard nets) used in the simulations is presented in Table 5. Comments regarding these simulation runs are as follows:

1) Base Case

The actual Area 4 sockeye harvest rate over the base-period was approximately 40% (eg. (39.2% to 41.2%, depending on the weighting method used). The steelhead harvest rate is estimated to be 36%. A 50% reduction would result in a steelhead harvest rate of 18%.

2) Recent Management
-plus steelhead catch and release

This model run shows the expected benefits from the steelhead catch and release program, and the coho conservation plan of recent years (two days per week in early August).
The steelhead and sockeye harvest rates are both reduced by 4%.

3) Recent Management
-plus steelhead catch and release, plus weedlines in all areas

This model run is similar to #2, with the addition of 1.2 m weedlines in all areas. The additional impact of weedlines reduces the steelhead harvest rate to 20%, close to the 18% target. Sockeye harvest rate is reduced to 31%, equivalent to a catch reduction of 212,000 sockeye.

4) 50% steelhead harvest rate reduction
-plus steelhead catch and release, plus weedlines in all areas
-fishing pattern moved earlier to increase sockeye catch
-fishing time increased to account for reduced sockeye catch with weedlines

This version is similar to #3 with the fishing pattern altered to reduce the steelhead harvest rate to the 18% target, while improving the sockeye harvest rate to within 2% of the base case.

5) 50% steelhead harvest rate reduction
-plus steelhead catch and release, plus weedlines in outside areas only
-fishing pattern moved earlier to increase sockeye catch
-fishing time increased to account for reduced sockeye catch with weedlines

This version is similar to #3 and #4 except weedlines are only used in outside fisheries. The steelhead 50% reduction is achieved, while the sockeye harvest rate is improved to slightly above the base case.

6) 50% steelhead harvest rate reduction
-plus steelhead catch and release, plus weedlines in all areas
-fishing pattern moved earlier to increase sockeye catch
-differential impact on river fishers
-fishing time increased to account for reduced sockeye catch with weedlines

This version is similar to #3 and #4 except river fisheries are reduced while maintaining outside fisheries. The steelhead reduction is within the target range, while the sockeye harvest rate is similar to the base case.

7) 50% steelhead harvest rate reduction
-plus steelhead catch and release, plus weedlines in all areas
-fishing pattern adjusted to maximize sockeye catch
-August fisheries 'eliminated'.
-fishing time increased to account for reduced sockeye catch with weedlines

This run 'maximizes' sockeye catch by switching effort from the August fishery to the July sockeye period. The sockeye harvest is increased by 5% over the base-period, however this incremental catch is at the expense of the August fishery and reduces the benefits to early steelhead runs.

8) 50% steelhead harvest rate reduction
-plus steelhead catch and release, no weedlines

Here, the model run shows the fishing pattern required to achieve the 50% steelhead harvest rate reduction if weedlines are not part of the package. As expected, the required reduction in fishing time is significant, especially in August. Maximum harvest rate reduction for coho is shown by this fishing pattern.

9) 50% early steelhead harvest rate reduction
-plus steelhead catch and release, plus weedlines in all areas
-fishing time increased to account for reduced sockeye catch with weedlines

This version reduced the harvest rate on early steelhead to 50%. Achieving this objective requires a major reduction in sockeye harvest since the timing of the early steelhead stocks more closely overlaps with sockeye.

From table 4, several general aspects of the simulation runs are apparent. First, the modeled Area 4 harvest rates depend on when fishing occurs in relation to the run-timing curves for each species. For sockeye, maximum harvest rates occur when fishing effort is high during mid to late July. For steelhead, minimum harvest rates occur when effort is low from late July through mid-August, and/or when weedlines are used. For coho and pinks, minimum harvest rates occur when effort is low from early to mid-August.

Second, sub-stock Area 4 harvest rates on steelhead are only reduced when fishing effort is low in relation to their run-timing. For "early" timed steelhead stocks (late July), harvest rates are only reduced when late July effort is reduced, or when weedlines are specified during periods of high sockeye directed effort. The simulations clearly identify a fundamental dilemma for the Area 4 fishery: harvest rates for steelhead can be changed for all stocks in aggregate, but not equally for all sub-stocks at once. This idea applies to all species.

Comments on Weedline Impacts and Catch and Release for Steelhead

In waters outside the River/Gap/Slough, 1.2m weedlines are expected to reduce harvest rates on all species, but with a much greater reduction for steelhead because of their surface orientation. In the River/Gap/Slough, weedlines are expected to reduce harvest rates on all species except coho (Table 5). It should be stressed, however, that the data in Table 5 were generated under test fishing conditions. The actual impacts of fishing weedlines in Area 4 are not known, and need to be evaluated. Currently, uncertainty exists regarding the impacts of using weedlines under full fleet conditions. To reflect this uncertainty, the weedline impacts used in the model were arbitrarily reduced by approximately 30%. Further assessment of the theoretical and actual impacts of fishing weedlines in Area 4 is required.

The reduction in Area 4 harvest rates attributable to catch and release depends upon the number of boats participating (compliance), the mortality rate upon landing, and the probability of recapture after release. Preliminary assessment suggests that compliance rates are currently low, while the mortality rate upon landing is high (70%). As such, the current benefits of catch and release are probably quite low. In the model, catch and release benefits are modeled as a 5% reduction in the daily harvest rate. Major improvements in compliance and landing mortality would be required for catch and release to further reduce steelhead harvest rates in Area 4.

CONCLUSIONS

This report describes a daily simulation model for the Area 4 commercial gillnet fishery. The model evaluates the effects of various gillnet fishing patterns on the catch and escapement of sockeye, steelhead (including sub-stocks), early-run coho, chinook, and pink salmon migrating through four sub-areas of Area 4. The model is a useful tool for evaluating alternate management options for the Area 4 fishery. The model also provides managers with an objective and consistent framework for pre-season planning. Caution, however, should be used in relying on the harvest rate calculations for designing fisheries without some form of in-season evaluation program in place. The model generates "average" expected impacts for the Area 4 fishery, and in-season run-timing, run sizes, effort patterns, and migration rates can differ from the pre-season predictions generated by the model. As such, the model simulations should only be used to guide the in-season management process.

For sockeye, the model does well in predicting the average impacts of fishing in Area 4. Reconstructed sockeye timing into Area 4 varies little from year to year, and using effort to predict daily sockeye harvest rate results in average sub-area catches and escapements that agree relatively well with actual data. For other species, the model predictions are currently the best available, and will eventually need to be calibrated against actual catch and escapement data to assess their accuracy.

RECOMMENDATIONS

1) The model can be used for Area 4 management purposes subject to a continuation of work directed at refining run-timing, catchability, and sensitivity of the model to stochastic variation and violation in assumptions.

2) Stock specific data for all species are needed to further refine the run-timings used in the model. Specifically, Area 4 catch and escapement monitoring programs for these species should be developed, as well as stock identification techniques for stock-specific evaluation of run-timing.

3) Studies should be implemented to examine the theoretical and empirical impacts of fishing gillnets with weedlines in Area 4. Specifically, the use of weedlines in a full fleet situation should b evaluated.

ACKNOWLEDGMENTS

The assistance of Dr. Art Tautz (B.C. Ministry of Environment, Lands, and Parks), and Dave Peacock (Department of Fisheries and Oceans) in developing the Area 4 model is greatly appreciated. The comments of PSARC (Pacific Stock Assessment Review Committee) reviewers Paul Ryall (Department of Fisheries and Oceans) and Dr. Russ Frith (LGL Environmental Consultants) were especially valuable and helped to improve the paper considerably. Thanks to Dr. Marc Labelle (B.C. Ministry of Environment, Lands, and Parks) for assisting with the Monte Carlo simulations. This paper has been formally reviewed and approved by PSARC and the Pacific Region of the Department of Fisheries and Oceans.

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SPECIES	AREA 4 (1) 50% PEAK DATE	NORMAL CURVE STANDARD DEVIATION
CHINOOK	JULY 1	12.5
SOCKEYE	JULY 21	N/A
STEELHEAD	AUGUST 3	12.5
-early run	JULY 27	11.0
-middle run	AUGUST 5	11.0
-late run	AUGUST 9	11.0
COHO (early)	AUGUST 6	12.5
PINK (even)	AUGUST 7	12.5
PINK (odd)	AUGUST 1	12.5

(1) ENTERING FISHERY

Table 1. Average 1985-1991 peak 50% dates for salmon entering Area 4, as calculated for use in the model.

TABLE 1	allSx	Coho	Chin	Pink	Chum	MorS	KisS	BulS	ZymS	SusS	BabS	OthS	AllS
Incoming Run	3200000	1.000	1.000	1.000	0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Oth. Fis. Cat.	800000	0.250	0.250	0.250	0	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
Area 4 Run (ac)	2400000	0.750	0.750	0.750	0	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
Area 4 Run (mo)	2397978	0.750	0.745	0.749	0	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
Oth. Fis. Cat.													
catch	800000	0.250	0.250	0.250	0	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
esc	2397978	0.750	0.745	0.749	0	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
h.r	0.25	0.250	0.251	0.250	0.00	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
OUTSIDE													
catch	203027	0.053	0.028	0.051	0	0.066	0.045	0.055	0.066	0.066	0.055	0.053	0.055
esc	2194951	0.697	0.716	0.699	0	0.684	0.705	0.695	0.684	0.684	0.695	0.697	0.695
h.r	0.08	0.070	0.038	0.068	0.00	0.088	0.060	0.074	0.088	0.088	0.074	0.071	0.074
SOUND													
catch	154343	0.038	0.025	0.036	0	0.049	0.032	0.040	0.049	0.049	0.040	0.038	0.040
esc	2040608	0.659	0.691	0.662	0	0.635	0.673	0.655	0.635	0.635	0.655	0.658	0.655
h.r	0.07	0.054	0.035	0.052	0.00	0.072	0.045	0.057	0.072	0.072	0.057	0.055	0.058
SMITH													
catch	206532	0.045	0.040	0.043	0	0.062	0.037	0.048	0.062	0.062	0.048	0.045	0.049
esc	1834076	0.614	0.651	0.620	0	0.573	0.636	0.607	0.573	0.573	0.607	0.613	0.606
h.r	0.10	0.068	0.058	0.064	0.00	0.098	0.054	0.073	0.098	0.098	0.073	0.069	0.074
R/G/S													
catch	410102	0.126	0.059	0.123	0	0.140	0.115	0.131	0.140	0.140	0.131	0.128	0.128
esc	1423974	0.489	0.593	0.497	0	0.433	0.521	0.476	0.433	0.433	0.476	0.484	0.478
h.r	0.22	0.205	0.090	0.198	0.00	0.244	0.181	0.216	0.244	0.244	0.216	0.210	0.211
All Area 4													
catch	974004	0.261	0.152	0.252	0	0.317	0.229	0.274	0.317	0.317	0.274	0.266	0.272
esc	1423974	0.489	0.593	0.497	0	0.433	0.521	0.476	0.433	0.433	0.476	0.484	0.478
Area 4 H.R.	0.406	0.348	0.204	0.337	0.000	0.423	0.305	0.365	0.423	0.423	0.365	0.354	0.363
AREA 4 Exploit.	0.304	0.261	0.152	0.252	0.000	0.317	0.229	0.274	0.317	0.317	0.274	0.266	0.272
TOTAL EXPLOIT.	0.555	0.511	0.403	0.503	0.000	0.567	0.479	0.524	0.567	0.567	0.524	0.516	0.522

Table 2. Predicted average Area 4 harvest rates for sockeye, early-run coho, chinook, pink, and steelhead salmon for the base-period years 1985-1991.

	ACTUAL 1991	ACTUAL 1990	ACTUAL 1989	ACTUAL 1988	ACTUAL 1987	ACTUAL 1986	ACTUAL 1985	ACTUAL 85-91 AVG	MODEL 85-91 AVG
Incoming Run	3088471	2577331	2509299	4044396	2619753	1726081	5850501	3202262	3200000
Oth. Fis. Cat.	772118	644333	627325	1011099	654938	431520	1462625	800565	800000
Area 4 Run (ac)	2316353	1932998	1881974	3033297	1964815	1294561	4387876	2401696	2397978
Oth. Fis. Cat.									
catch	772118	644333	627325	1011099	654938	431520	1462625	800565	800000
esc	2316353	1932998	1881974	3033297	1964815	1294561	4387876	2401696	2397978
h.r	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.250	0.250
OUTSIDE									
catch	208887	150102	114352	192835	93038	64863	530149	193461	203027
esc	2107466	1782896	1767622	2840462	1871777	1229698	3857727	2208235	2194951
h.r	0.090	0.078	0.061	0.064	0.047	0.050	0.121	0.081	0.085
SOUND									
catch	133976	99380	89517	213921	96886	94727	493054	174494	154343
esc	1973490	1683516	1678105	2626541	1774891	1134971	3364673	2033741	2040608
h.r	0.064	0.056	0.051	0.075	0.052	0.077	0.128	0.079	0.070
SMITH									
catch	267147	259757	144248	399473	126284	113784	374501	240742	206532
esc	1706343	1423759	1533857	2227068	1648607	1021187	2990172	1792999	1834076
h.r	0.135	0.154	0.086	0.152	0.071	0.100	0.111	0.118	0.101
R/G/S									
catch	352539	318771	274398	706867	200466	177076	635996	380873	410102
esc	1353804	1104988	1259459	1520201	1448141	844111	2354176	1412126	1423974
h.r	0.207	0.224	0.179	0.317	0.122	0.173	0.213	0.212	0.224
All Area 4									
catch	962549	828010	622515	1513096	516674	450450	2033700	989571	974004
esc	1353804	1104988	1259459	1520201	1448141	844111	2354176	1412126	1423974
TOTAL	2316353	1932998	1881974	3033297	1964815	1294561	4387876	2401696	2397978
Area 4 H.R.	0.416	0.428	0.331	0.499	0.263	0.348	0.463	0.412	0.406
Area 4 H.R. (1)	-	-	-	-	-	-	-	0.393	-
AREA 4 Exploit.	0.312	0.321	0.248	0.374	0.197	0.261	0.348	0.309	0.304
TOTAL EXPLOIT.	0.562	0.571	0.498	0.624	0.447	0.511	0.598	0.559	0.554

Area 4 H.R. (1) = unweighted

Table 3. Comparison of actual average 1985-1991 sockeye catch, escapement, and harvest rate in Area 4 with the results obtained for the base-period simulation.

RUN	DESCRIPTION	SUB-AREAS	WEEKLY FISHING PATTERN JULY	WEEKLY FISHING PATTERN AUGUST	STLHD H.RATE	EARLY STLHD H.RATE	SOCK. H.RATE	PINK H.RATE	EARLY COHO H.RATE	SOCKEYE CATCH	SOCKEYE ESCAPE	FISHING WEEKS	FISHING DAYS
1	BASE 1985-91	Outside (1) River	0 1 2 2 4 0 1 2 2 4	3 3 3 3 1 3 3 3 3 1	36.3%	42.4%	40.0%	33.7%	34.8%	927,704	1,370,358	9	22
2	Recent management Coho + C&R	Outside (1) River	0 1 2 2 4 0 1 2 2 4	3 2 2 3 1 3 2 2 3 1	31.7%	39.0%	36.7%	30.0%	31.1%	843,766	1,454,296	9	20
3	Recent management Coho + C&R + weed(all)	Outside (1) River	0 1 2 2 4 0 1 2 2 4	3 2 2 3 1 3 2 2 3 1	20.3%	25.0%	31.4%	25.6%	30.4%	722,383	1,575,679	9	20
4	50% steelhead H.R Red. C&R + weed(all) consider fishing pattern consider sockeye catch	Outside (1) River	1 2 5 4 2 1 2 5 4 2	2 2 1 1 0 2 2 1 1 0	17.2%	25.0%	38.7%	20.5%	24.7%	888,769	1,409,293	9	20
5	50% steelhead H.R Red. C&R + weed(out only) consider fishing pattern consider sockeye catch	Outside (1) River	1 2 5 4 3 1 2 5 4 3	1 1 1 1 0 1 1 1 1 0	18.7%	29.0%	42.0%	19.5%	21.3%	965,567	1,332,495	9	19
6	50% steelhead H.R Red. C&R + weed(all) reduce river fishing pattern consider sockeye catch	Outside (1) River	1 2 5 5 3 1 2 5 4 2	2 2 2 1 0 1 1 1 0 0	17.4%	26.0%	41.3%	21.7%	25.4%	949,388	1,348,674	9	23
7	50% steelhead H.R Red. C&R + weed(all) maximize sockeye catch	Outside (1) River	1 3 6 5 4 1 3 6 5 4	3 0 0 0 0 3 0 0 0 0	18.8%	31.0%	46.2%	20.5%	24.7%	1,061,882	1,236,180	9	22
8	50% steelhead H.R Red. C&R maximize sockeye catch No weedlines	Outside (1) River	1 2 4 3 2 1 2 4 3 2	2 0 0 0 0 2 0 0 0 0	18.8%	31.0%	37.3%	15.6%	16.9%	858,060	1,440,002	9	14
9	50% early stlhd. H.R Red. C&R + weed(all) consider fishing pattern consider sockeye catch	Outside (1) River	1 2 3 2 2 1 2 3 2 2	2 2 2 1 0 2 2 2 1 0	14.7%	19.0%	28.2%	18.3%	22.1%	648,722	1,649,340	9	17

1) eg. Outside, Sound, and Smith

Table 4. The results of various simulation runs showing the effects of alternative fishing patterns on Area 4 harvest rates for steelhead, sockeye, pink, and coho. Changes in harvest rate are compared to pattern for the 1985-1991 base period. The weekly fishing pattern represents the number of days fished within each statistical week. The weedline impacts used in the simulations represent data for 1.2m 60-mesh standard nets.

AREA	YEAR TESTED	TYPE OF WEEDLINE	NET TYPE	TESTED LOCATION	% CHANGE STLHD.(1)	% CHANGE SOCK. (1)	% CHANGE PINK(1)	% CHANGE COHO(1)	% CHANGE CHINOOK(1)
4	1991	1.20 METER	60 MESH-STD	MARINE	-76%	-29%	-30%	-23%	N/A
4	1991	0.80 METER	60 MESH-STD	MARINE	-45%	-22%	-15%	-11%	N/A
4	1991	0.40 METER	60 MESH-STD	MARINE	-40%	-16%	-12%	-21%	N/A
4	1991	1.20 METER	60 MESH-STD	RIVER	-39%	-28%	-24%	6%	N/A
4	1992	1.20 METER	60 MESH-STD	MARINE	-65%	-13%	-24%	-17%	N/A
4	91-92 AVG	1.20 METER	60 MESH-STD	MARINE	-70%	-21%	-27%	-20%	N/A
4	1992	NONE	60 MESH-MONO	MARINE	-46%	0%	63%	7%	N/A
4	1992	1.20 METER	60 MESH-MONO	MARINE	-69%	17%	92%	-4%	N/A
4	1992	NONE	90 MESH-MONO	MARINE	-35%	50%	122%	58%	N/A
4	1992	1.20 METER	90 MESH-MONO	MARINE	-73%	25%	54%	31%	N/A

(1) CHANGES IN CATCH RELATIVE TO 60-MESH STD NET

Table 5. The expected change in catch for weedlines fished in Area 4. The data represent the percent change in catch, by species, compared to standard 60-mesh nets. (Source. Lewensky 1992).

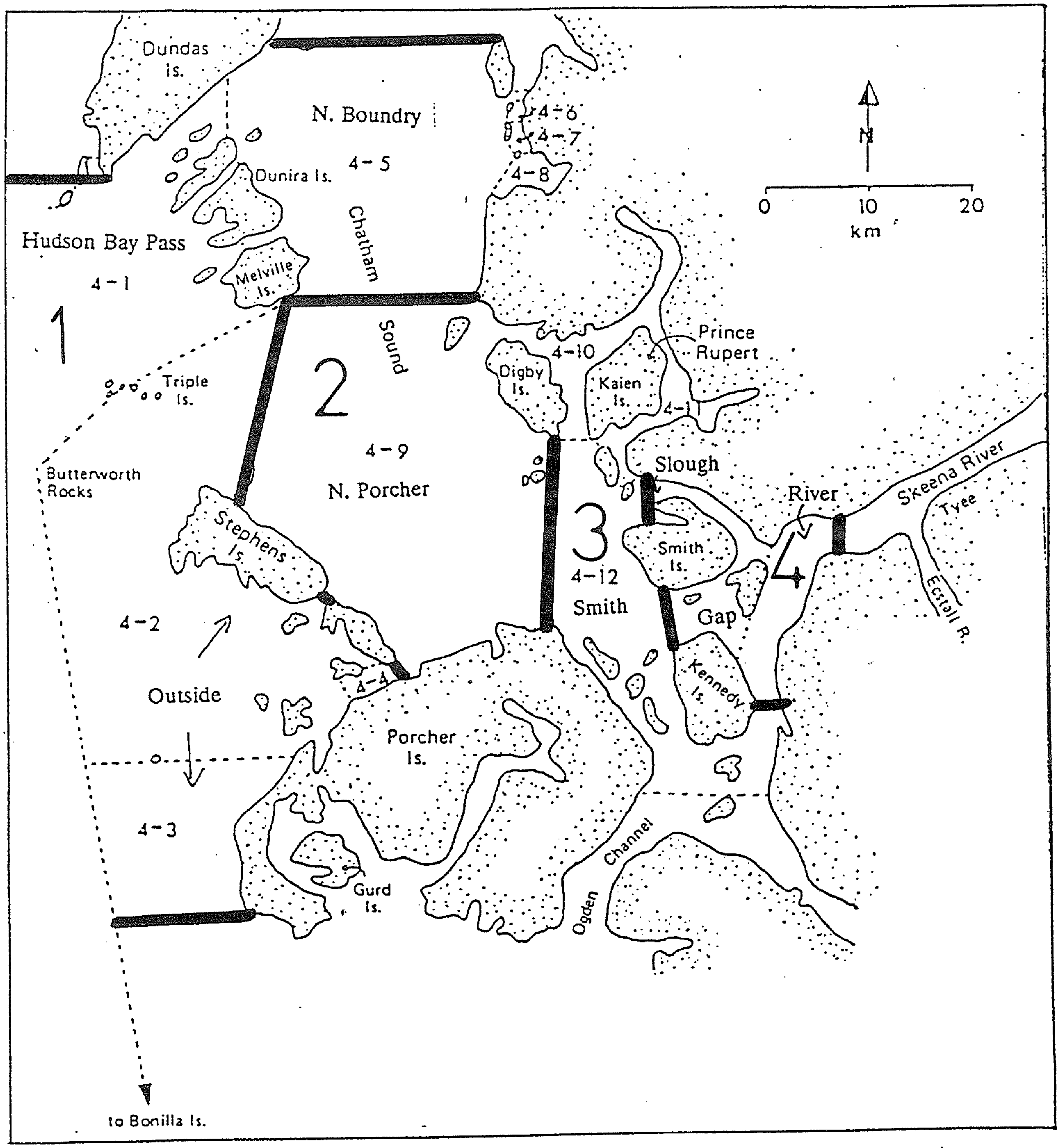
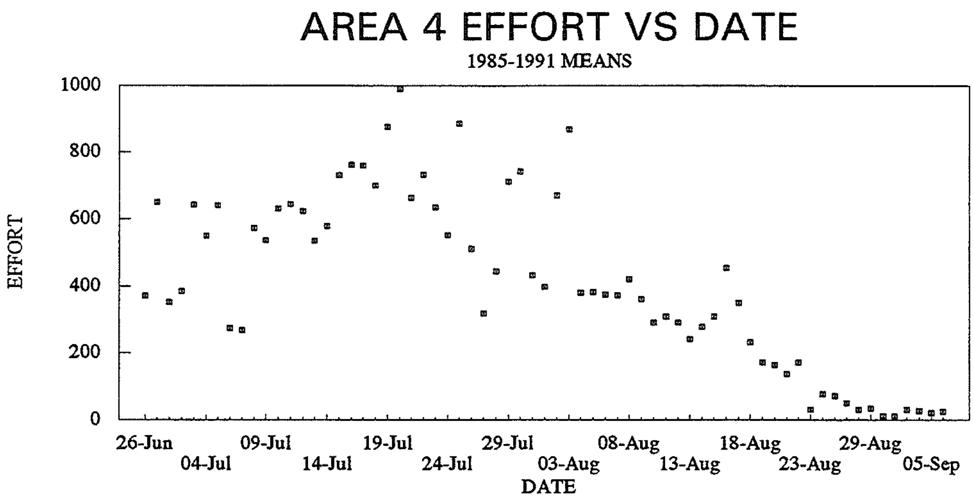


Figure 1. Map of statistical Area 4 at the mouth of the Skeena River, showing the four sub-areas used in the model : (1) Outside(4-1, 4-2, 4-3, 4-4, 4-5), (2) Sound (4-9), (3) Smith (4-12), and (4) River/Gap/Slough (4-13, 4-14, 4-15).



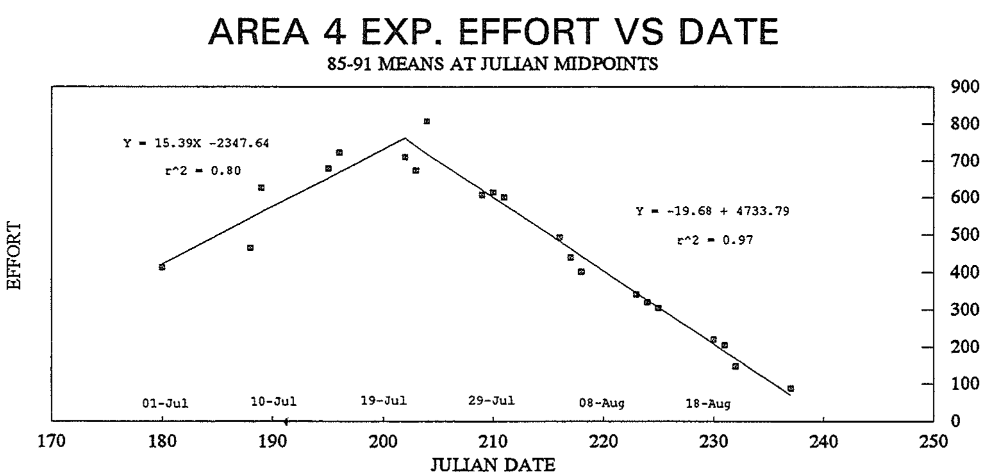


Figure 2. Average 1985-1991 total Area 4 by date. The first graph shows the actual mean effort calculated by date from 1985-1991. The second graph shows the means aligned to the mid-point of each Julian calender week to account for differences in fishery start dates attributable to calender variation among years.

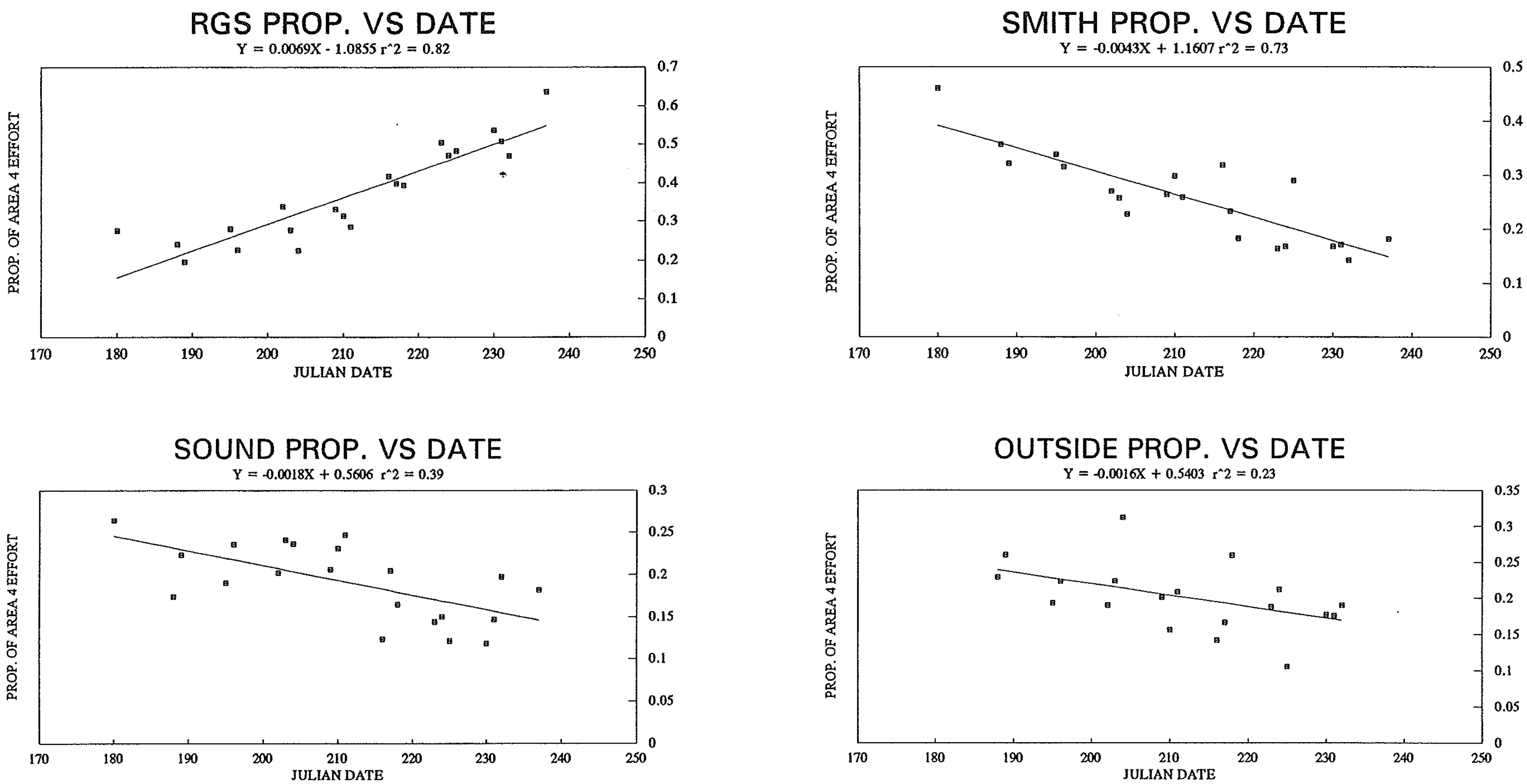


Figure 3. Average 1985-1991 sub-area proportions of total Area 4 effort by date.

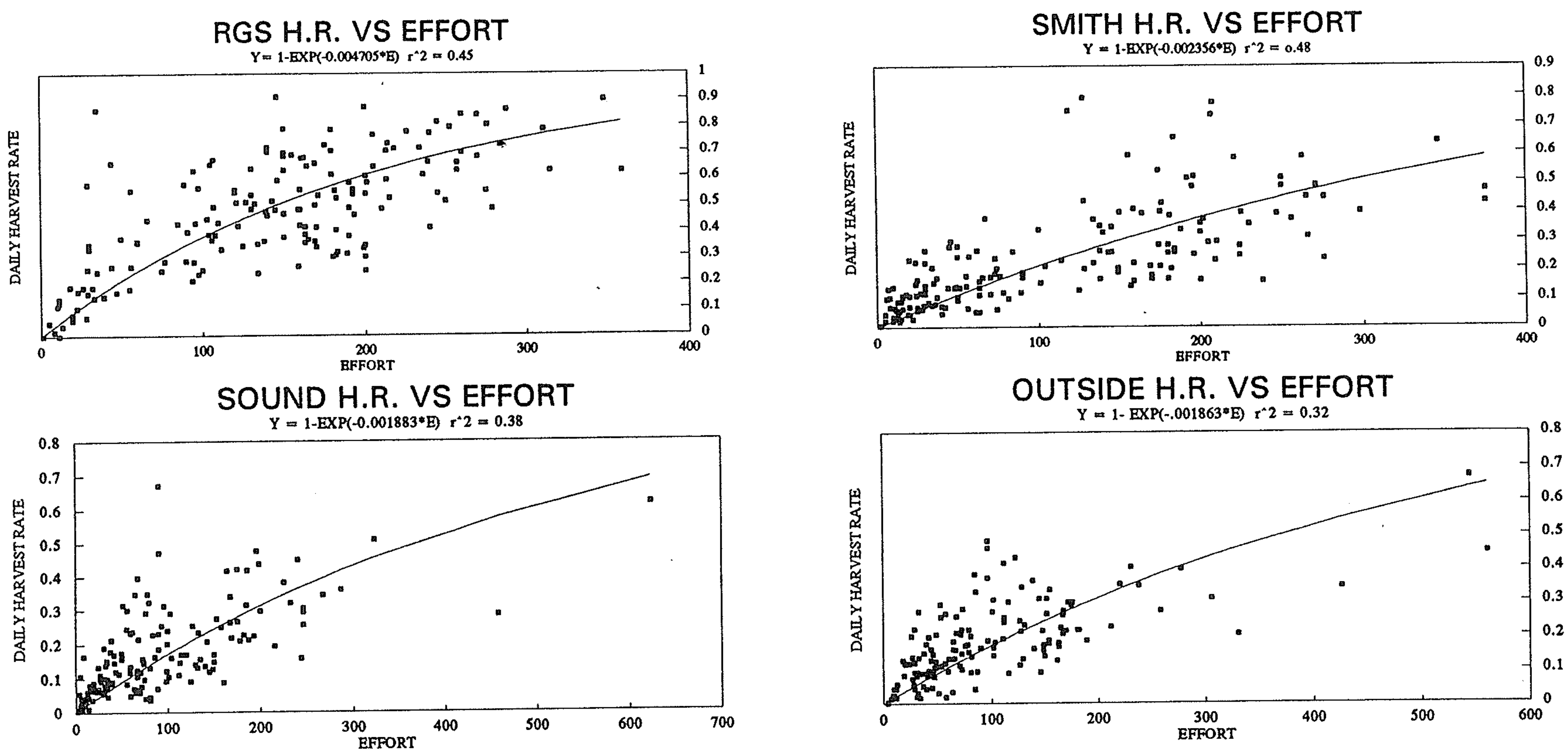


Figure 4. The relation between daily sockeye harvest rate and daily effort in each sub-area of Area 4 from 1985-1991.

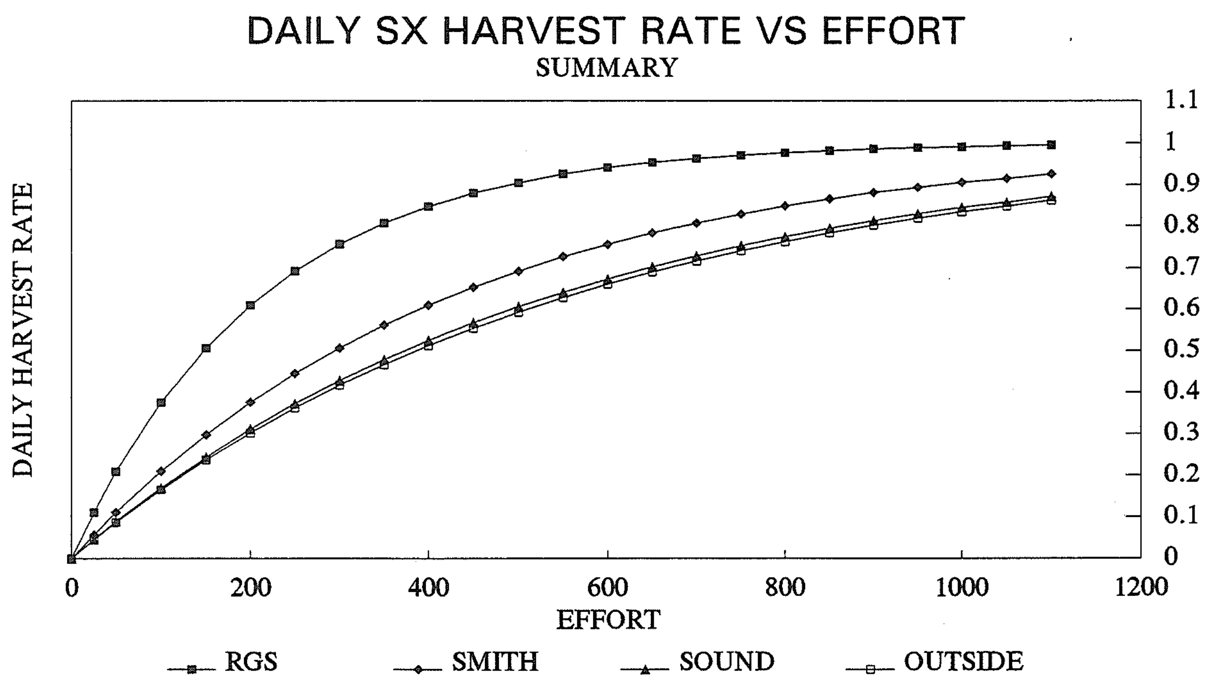


Figure 5. Summary of figure 4, showing the relationship between daily sockeye harvest rate and daily effort in each sub-area of Area 4 from 1985-1991.

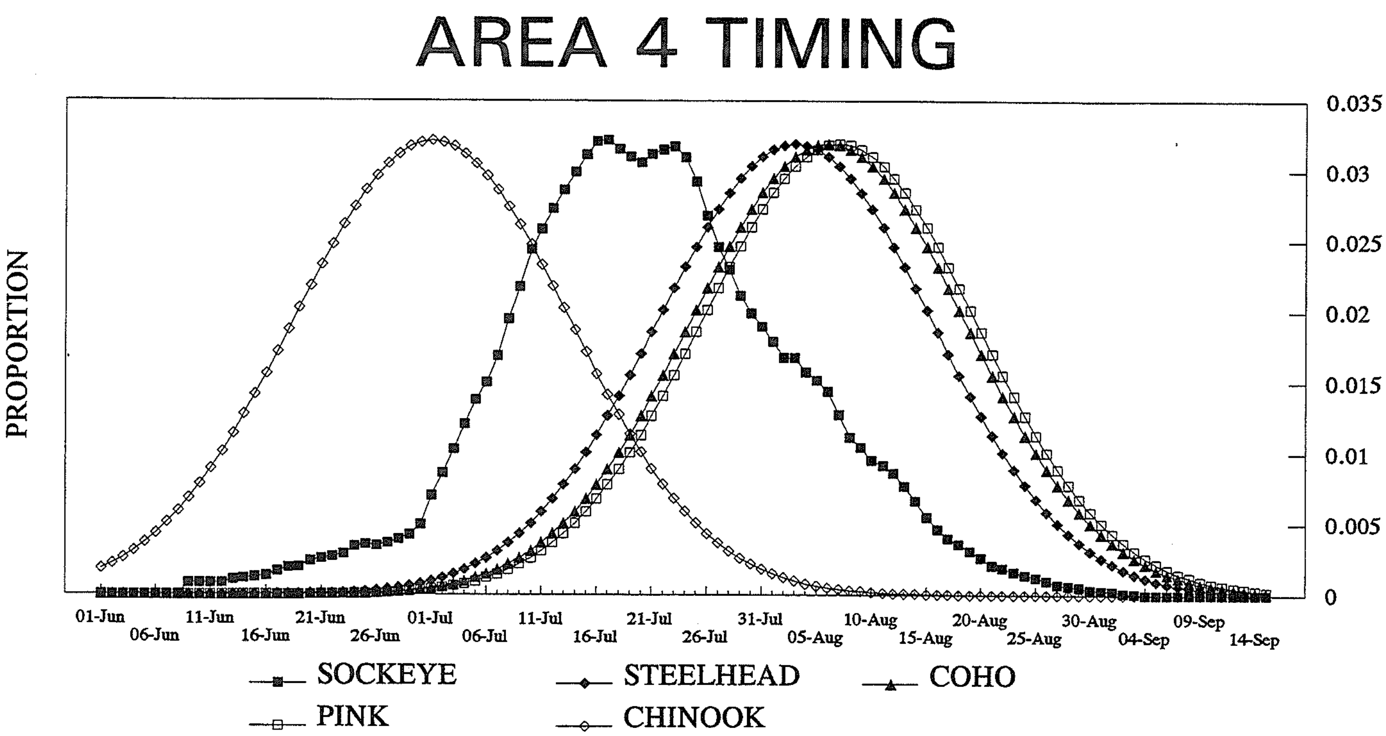
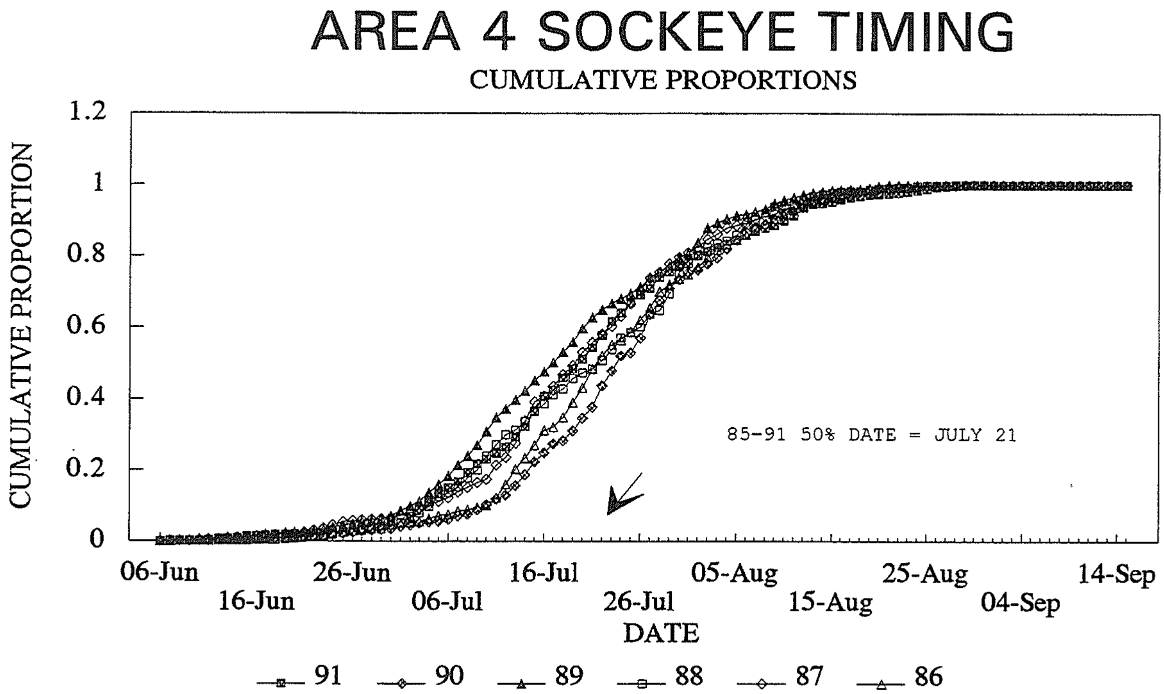


Figure 6. Average 1985-1991 run timing for chinook, sockeye, steelhead, coho, and pink salmon entering Area 4.



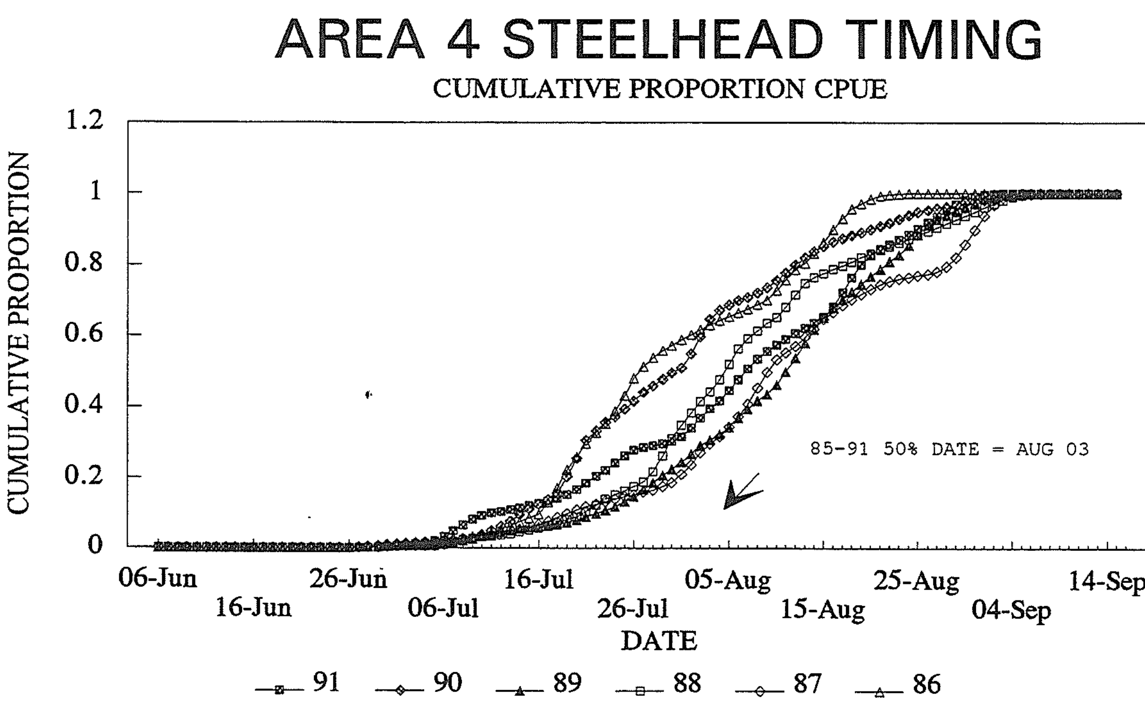


Figure 7. 1986-1991 sockeye and steelhead run timing into Area 4, expressed as cumulative daily proportions.

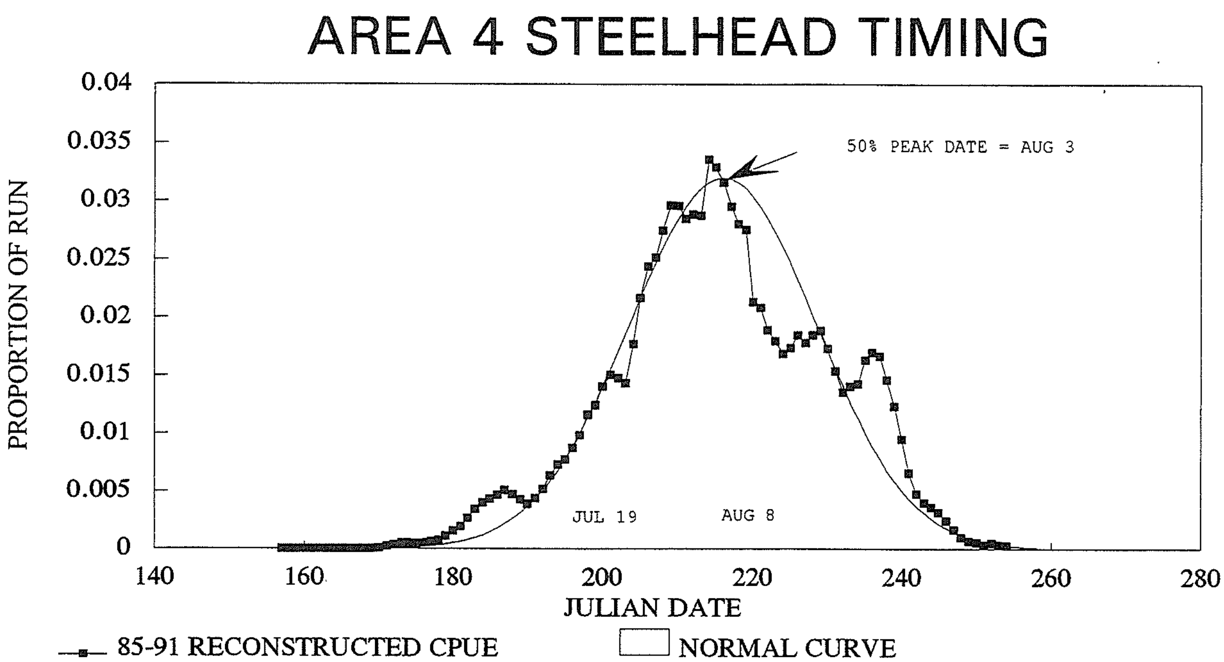


Figure 8. Average 1985-1991 steelhead run timing into Area 4, showing the smoothed proportion CPUE curve, and the normal curve used in the model to represent steelhead run timing.

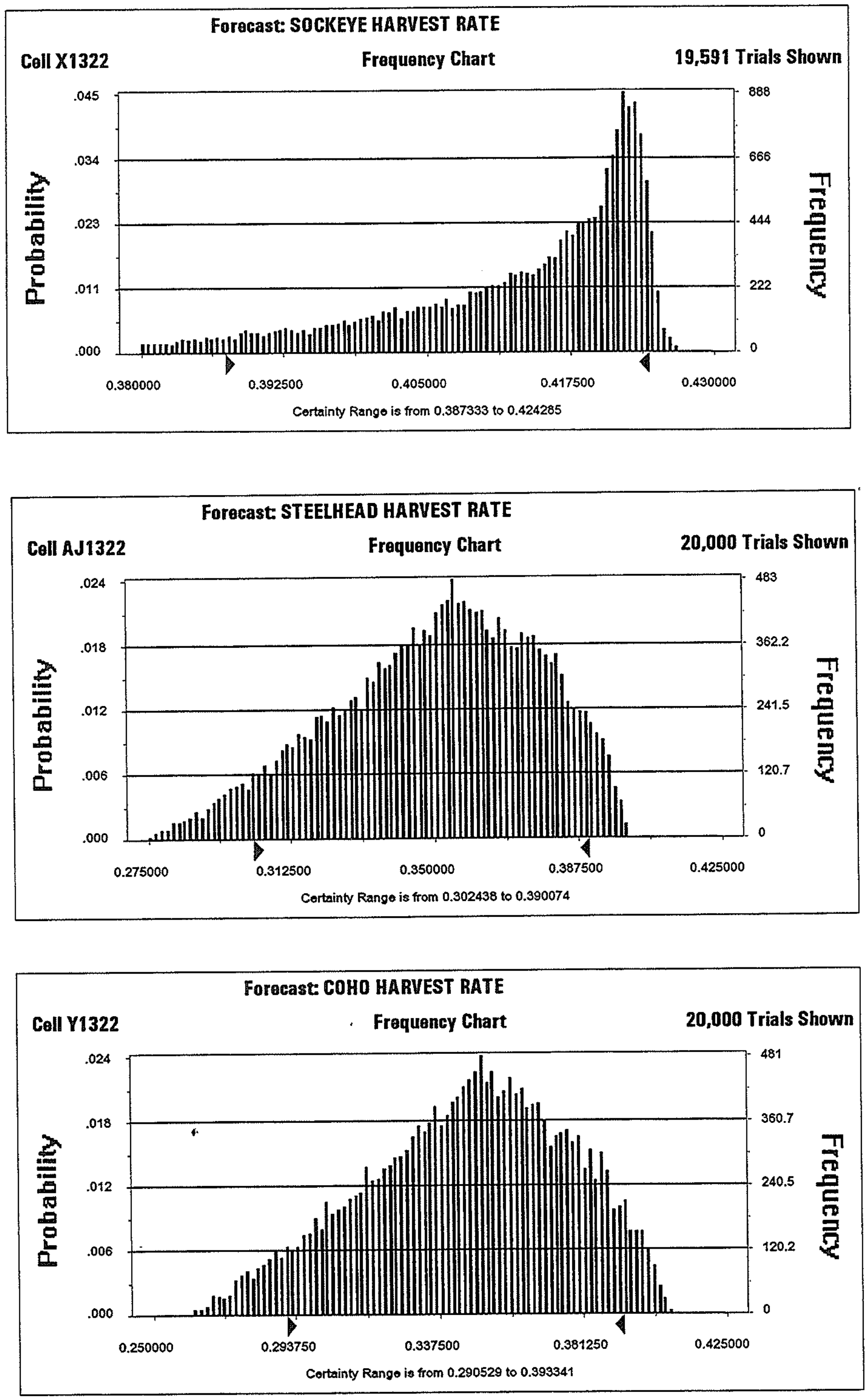
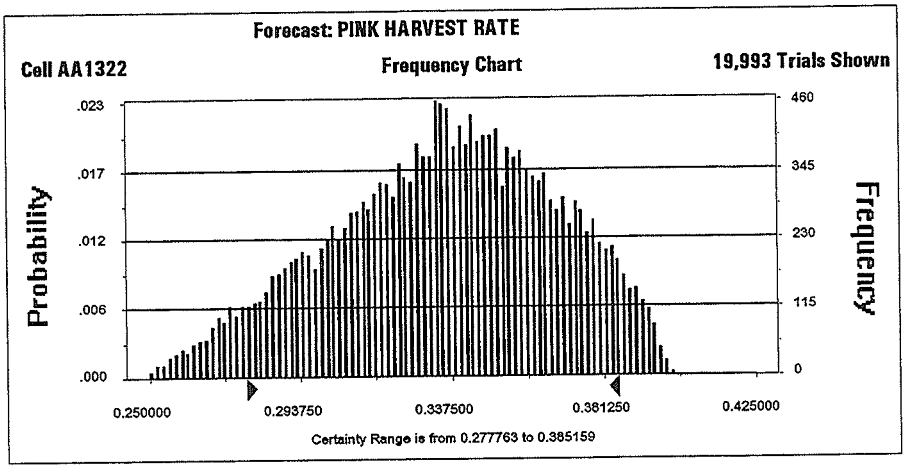
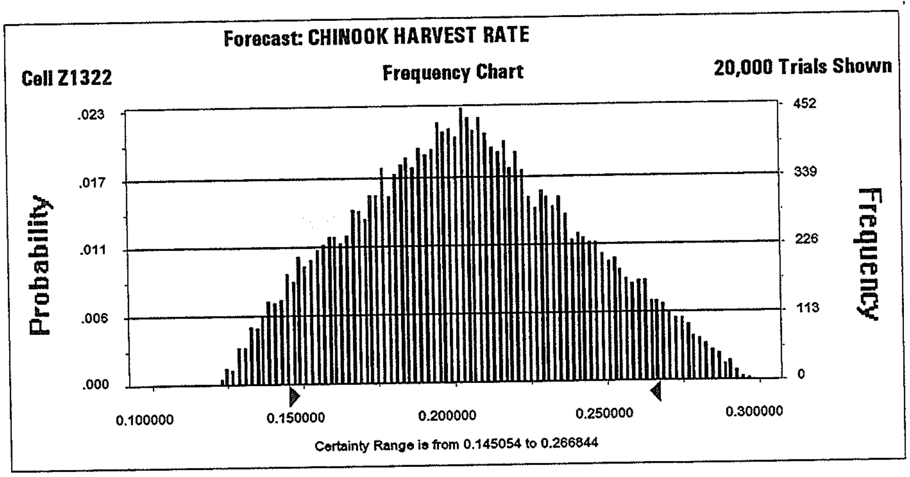


Figure 9. Probability distributions for 1985-1991 base-period Area 4 harvest rates for sockeye, steelhead, and coho, as obtained from Monte Carlo simulation.





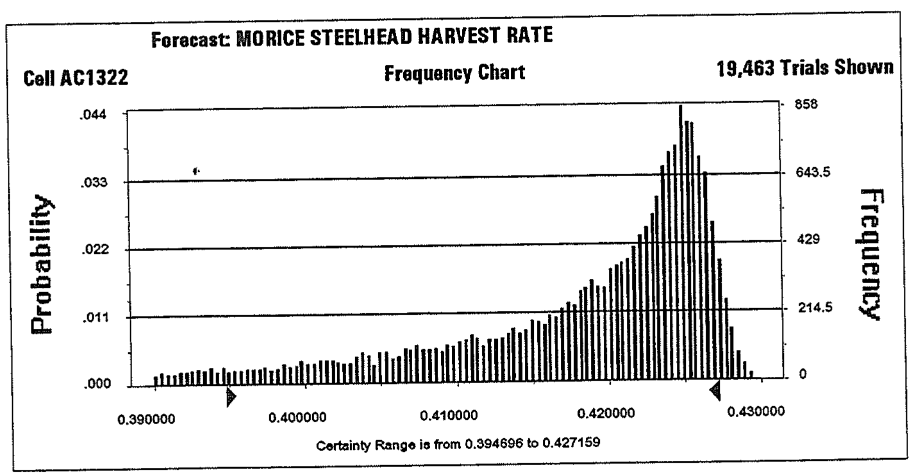
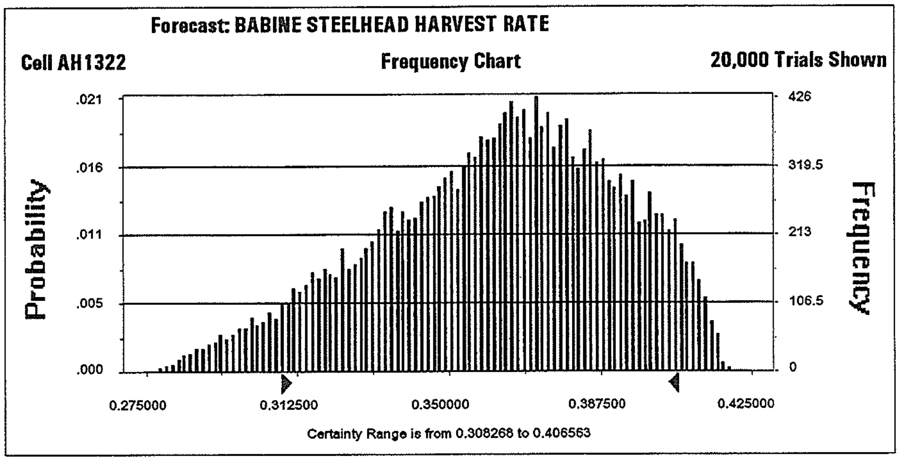


Figure 10. Probability distributions for 1985-1991 base-period Area 4 harvest rates for pinks, chinook, and early-run steelhead (Morice) as obtained from Monte Carlo simulation.



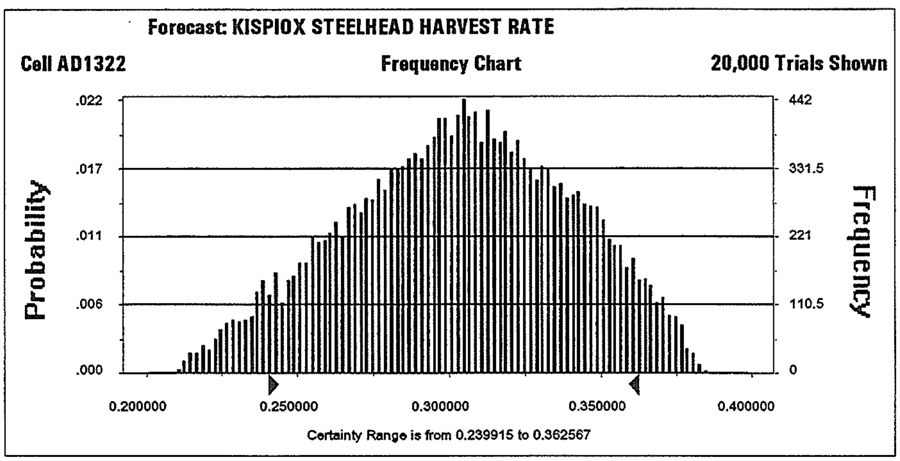


Figure 11. Probability distributions for 1985-1991 base-period Area 4 harvest rates for middle-run (Babine) and late-run (Kispiox) steelhead as obtained from Monte Carlo simulation.

APPENDIX 1. 1985-1991 Area 4 sockeye run-reconstruction through four sub-areas of Area 4 (see Figure 1).

1985 AREA 4 RECONSTRUCTION
24-Oct

DATE	ACTUAL ESC	EFFORT R/G/S	HAIL CATCH	SALES CATCH	R/G/S RUN	DAILY H.R.	EFFORT SMITH	HAIL CATCH	SALES CATCH	SMITH RUN	DAILY H.R.	EFFORT SOUND	HAIL CATCH	SALES CATCH	SOUND RUN	DAILY H.R.	EFFORT OUTSIDE	HAIL CATCH	SALES CATCH	OUTSIDE RUN	DAILY H.R.	YEARLY TOTAL SALES CATCH
06-Jun JN6				0	0	0.00			0	0	0.00			0	0	0.00			0	0	0.00	
07-Jun JN7				0	0	0.00			0	0	0.00			0	0	0.00			0	1188	0.00	
08-Jun JN8				0	0	0.00			0	0	0.00			0	1188	0.00			0	1250	0.00	
09-Jun JN9				0	0	0.00			0	1188	0.00			0	1250	0.00			0	4581	0.00	
10-Jun JN10				0	1188	0.00			0	1250	0.00			0	4581	0.00			0	1956	0.00	
11-Jun JN11	1188			0	1250	0.00			0	4581	0.00			0	1956	0.00			0	4161	0.00	
12-Jun JN12	1250			0	4581	0.00			0	1956	0.00			0	4161	0.00			0	3599	0.00	
13-Jun JN13	4581			0	1956	0.00			0	4161	0.00			0	3599	0.00			0	6099	0.00	
14-Jun JN14	1956			0	4161	0.00			0	3599	0.00			0	6099	0.00			0	6340	0.00	
15-Jun JN15	4161			0	3599	0.00			0	6099	0.00			0	6340	0.00			0	10573	0.00	
16-Jun JN16	3599			0	6099	0.00			0	6340	0.00			0	10573	0.00			0	1250	0.00	
17-Jun JN17	6099			0	6340	0.00			0	10573	0.00			0	1250	0.00			0	3652	0.00	
18-Jun JN18	6340			0	10573	0.00			0	1250	0.00			0	3652	0.00			0	2572	0.00	
19-Jun JN19	10573			0	1250	0.00			0	3652	0.00			0	2572	0.00			0	14930	0.00	
20-Jun JN20	1250			0	3652	0.00			0	2572	0.00			0	14930	0.00			0	17261	0.00	
21-Jun JN21	3652			0	2572	0.00			0	14930	0.00			0	17261	0.00			0	22342	0.00	
22-Jun JN22	2572			0	14930	0.00			0	17261	0.00			0	22342	0.00			0	23208	0.00	
23-Jun JN23	14930			0	17261	0.00			0	22342	0.00			0	23208	0.00			0	12269	0.00	
24-Jun JN24	17261			0	22342	0.00			0	23208	0.00			0	12269	0.00			0	24985	0.00	
25-Jun JN25	22342			0	23208	0.00			0	12269	0.00			0	24985	0.00			0	14341	0.00	
26-Jun JN26	23208			0	12269	0.00			0	24985	0.00			0	14341	0.00			0	11091	0.00	
27-Jun JN27	12269			0	24985	0.00			0	14341	0.00			0	11091	0.00			0	6447	0.00	
28-Jun JN28	24985			0	14341	0.00			0	11091	0.00			0	6447	0.00			0	2019	0.00	
29-Jun JN29	14341			0	11091	0.00			0	6447	0.00			0	2019	0.00			0	19207	0.00	
30-Jun JN30	11091			0	6447	0.00			0	2019	0.00			0	19207	0.00			0	18344	0.00	
01-Jul J1	6447	35	1890	1742	2019	0.86	128	16490	15200	19207	0.79	91	9373	8640	18344	0.47	97	10082	9293	19299	0.48	34875
02-Jul J2	277	44	2860	2636	4007	0.66	119	7854	7239	9704	0.75	91	7280	6710	10005	0.67	97	8206	7564	20467	0.37	24150
03-Jul J3	1371			0	2465	0.00			0	3295	0.00			0	12903	0.00			0	7420	0.00	
04-Jul J4	2465			0	3295	0.00			0	12903	0.00			0	7420	0.00			0	18993	0.00	
05-Jul J5	3295			0	12903	0.00			0	7420	0.00			0	18993	0.00			0	16059	0.00	
06-Jul J6	12903			0	7420	0.00			0	18993	0.00			0	16059	0.00			0	111467	0.00	
07-Jul J7	7420			0	18993	0.00			0	16059	0.00			0	111467	0.00			0	97914	0.00	
08-Jul J8	18993	44	4576	4218	16059	0.26	250	58500	53923	111467	0.48	153	29223	26937	97914	0.28	148	20648	19032	88988	0.21	104110
09-Jul J9	11841	55	11055	10190	57544	0.18	250	39250	36179	70978	0.51	158	18960	17477	69956	0.25	163	14775	13619	76064	0.18	77465
10-Jul J10	47354			0	34799	0.00			0	52479	0.00			0	62445	0.00			0	69544	0.00	
11-Jul J11	34799			0	52479	0.00			0	62445	0.00			0	69544	0.00			0	67220	0.00	
12-Jul J12	52479			0	62445	0.00			0	69544	0.00			0	67220	0.00			0	135542	0.00	
13-Jul J13	62445			0	69544	0.00			0	67220	0.00			0	135542	0.00			0	116776	0.00	
14-Jul J14	69544	159	34980	32243	67220	0.48	200	23600	21754	135542	0.16	246	32472	29931	116776	0.26	165	25078	23116	103375	0.22	107044
15-Jul J15	34977	159	32277	29752	113788	0.26	138	15456	14247	86844	0.16	246	25584	23582	80259	0.29	165	19150	17652	79593	0.22	85233
16-Jul J16	84036			0	72598	0.00			0	56676	0.00			0	61941	0.00			0	148894	0.00	
17-Jul J17	72598			0	56676	0.00			0	61941	0.00			0	148894	0.00			0	159989	0.00	
18-Jul J18	56676	134	23450	21615	61941	0.35	224	44800	41295	148894	0.28	178	36312	33471	159989	0.21	140	22110	20380	126747	0.16	116762
19-Jul J19	40326	134	27413	25268	107599	0.23	224	33600	30971	126518	0.24	169	25350	23367	106367	0.22	150	23286	21464	153784	0.14	101070
20-Jul J20	82331			0	95547	0.00			0	83001	0.00			0	132320	0.00			0	94592	0.00	
21-Jul J21	95547			0	83001	0.00			0	132320	0.00			0	94592	0.00			0	116225	0.00	
22-Jul J22	83001	257	94319	86940	132320	0.66	200	33400	30787	94592	0.33	226	48123	44358	116225	0.38	238	52728	48603	140657	0.35	210687
23-Jul J23	45380	257	43433	40035	63805	0.63	180	19800	18251	71867	0.25	246	30482	28097	92054	0.31	258	31570	29100	106927	0.27	115483
24-Jul J24	23771	193	26634	24550	53616	0.46	81	6723	6197	63957	0.10	267	29160	26879	77827	0.35	330	42097	38803	191141	0.20	96429
25-Jul J25	29066	180	18720	17255	57760	0.30	61	2805	2586	50948	0.05	458	47070	43387	152337	0.28	561	74610	68773	153774	0.45	132001
26-Jul J26	40505			0	48363	0.00			0	108950	0.00			0	85001	0.00			0	112667	0.00	
27-Jul J27	48363			0	108950	0.00			0	85001	0.00			0	112667	0.00			0	73599	0.00	
28-Jul J28	108950			0	85001	0.00			0	112667	0.00			0	73599	0.00			0	129546	0.00	
29-Jul J29	85001	218	87200	80378	112667	0.71	143	20401	18805	73599	0.26	199	61546	56731	129546	0.44	277	61870	57029	144401	0.39	212943
30-Jul J30	32289	200	32000	29496	54794	0.54	138	20700	19081	72816	0.26	323	48491	44697	87372	0.51	181	24237	22341	103401	0.22	115615
31-Jul J31	25298	150	21900	20187	53735	0.38	100	15500	14287	42674	0.33	287	31685	29206	81060	0.36	231	31477	29014	72341	0.40	92694
01-Aug A1	33548			0	28387	0.00			0	51854	0.00			0	43326	0.00			0	37653	0.00	
02-Aug A2	28387			0	51854	0.00			0	43326	0.00			0	37653	0.00			0	66642	0.00	
03-Aug A3	51854			0	43326	0.00			0	37653	0.00			0	66642	0.00			0	67609	0.00	
04-Aug A4	43326	190	23750	21892	37653	0.58	149	13410	12361	66642	0.19	64	5120	4719	67609	0.07	97	12175	11223	60556	0.19	50195
05-Aug A5	15761	163	22657	20884	54281	0.38	63	3528	3252	62889	0.05	70	3182	2933	49334	0.06	101	18180	16758	61868	0.27	43827
06-Aug A6	33397	163	22820	21035	59637	0.35	63	5544	5110	46401	0.11	60	2400	2212	45110	0.05	111	14322	13202	68985	0.19	41559
07-Aug A7	38603			0	41290	0.00			0	42898	0.00			0	55783	0.00			0	34209	0.00	
08-Aug A8	41290			0	42898	0.00			0	55783	0.00			0	34209	0.00			0	76038	0.00	
09-Aug A9	42898			0	55783	0.00			0	34209	0.00			0	76038	0.00			0	97854	0.00	
10-Aug A10	55783			0	34209	0.00			0	76038	0.00			0	97854	0.00			0	62260	0.00	
11-Aug A11	34209	190	40090	36953	76038	0.49	40	4900	4517	97854	0.05	84	15429	14222	62260	0.23	116	19052	17561	58764	0.30	73253
12-Aug A12	39085	170	34000	31340	93338	0.34	50	4850	4471	48038	0.09	59	5310	4895	41202	0.12	131	19295	17785	76621	0.23	58490
13-Aug A13	61998			0	43568	0.00			0	36308	0.00			0	58836	0.00			0	38137	0.00	
14-Aug A14	43568			0	36308	0.00			0	58836	0.00			0	38137	0.00			0	47469	0.00	
15-Aug A15	36308	182	26390	30788	58836	0.52	63	4414	5150	38137	0.14	73	6427	7498	47469	0.16	102	7278	8491	27756	0.31	51927
16-Aug A16	28048	182	14378	13253	32988	0.40	40	3160	2913	39971	0.07	103	6088	5612	19265	0.29	154	9940	9162	49304	0.19	30940
17-Aug A17	19734			0	37058	0.00			0	13653	0.00			0	40141	0.00			0	26481	0.00	
18-Aug A18	37058			0	13653	0.00			0	40141	0.00			0	26481	0.00			0	23192	0.00	
19-Aug A19	13653	112	14224	13111	40141	0.33	29	2137	1970	26481	0.07	35	2511	2315	23192	0.10	49	4409	4064	19992	0.20	21460
20-Aug A20	27030	110	11440	10545	24511	0.43	30	2918	2690	20877	0.13	38	3104	2861	15928	0.18	42	3440	3171	16184	0.20	19267

21-Aug A21	13966	100	4900	4516	18188	0.25	20	1000	922	13067	0.07	35	1217	1122	13013	0.09	35	1763	1625	18322	0.09	8185
22-Aug A22	13671	85	5610	5171	12145	0.43	11	375	346	11892	0.03	35	1297	1196	16697	0.07	35	1435	1323	14985	0.09	8035
23-Aug A23	6974			0	11546	0.00			0	15502	0.00			0	13662	0.00			0	16627	0.00	
24-Aug A24	11546			0	15502	0.00			0	13662	0.00			0	16627	0.00			0	10358	0.00	
25-Aug A25	15502			0	13662	0.00			0	16627	0.00			0	10358	0.00			0	6760	0.00	
26-Aug A26	13662			0	16627	0.00			0	10358	0.00			0	6760	0.00			0	12180	0.00	
27-Aug A27	16627			0	10358	0.00			0	6760	0.00			0	12180	0.00			0	0	0.00	
28-Aug A28	10358			0	6760	0.00			0	12180	0.00			0	0	0.00			0	0	0.00	
29-Aug A29	6760			0	12180	0.00			0	0	0.00			0	0	0.00			0	0	0.00	
30-Aug A30	12180			0	0	0.00			0	0	0.00			0	0	0.00			0	0	0.00	
31-Aug A31	0			0	0	0.00			0	0	0.00			0	0	0.00			0	0	0.00	
01-Sep S1	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
02-Sep S2	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
03-Sep S3	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
04-Sep S4	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
05-Sep S5	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
06-Sep S6	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
07-Sep S7	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
08-Sep S8	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
09-Sep S9	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
10-Sep S10	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
11-Sep S11				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
12-Sep S12				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
13-Sep S13				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
14-Sep S14				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
15-Sep S15				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
TOTAL	2354177	3866	682966	635996	2990172	0.213	2994	405115	374501	3364673	0.111	3994	533196	493054	3857727	0.128	4173	573213	530149	4387876	0.121	2033699
AREA 4 H.R.						0.145					0.085					0.112					0.121	0.463

1986 AREA 4 RECONSTRUCTION
24-Oct

DATE	ACTUAL ESC	EFFORT R/G/S	HAIL CATCH	SALES CATCH	R/G/S RUN	DAILY H.R.	EFFORT SMITH	HAIL CATCH	SALES CATCH	SMITH RUN	DAILY H.R.	EFFORT SOUND	HAIL CATCH	SALES CATCH	SOUND RUN	DAILY H.R.	EFFORT OUTSIDE	HAIL CATCH	SALES CATCH	OUTSIDE RUN	DAILY H.R.	YEARLY TOTAL SALES CATCH
06-Jun JN6	0			0	0	0.00			0	0	0.00			0	0	0.00			0	0	0.00	
07-Jun JN7	0			0	0	0.00			0	0	0.00			0	0	0.00			0	207	0.00	
08-Jun JN8	0			0	0	0.00			0	0	0.00			0	207	0.00			0	937	0.00	
09-Jun JN9	0			0	0	0.00			0	207	0.00			0	937	0.00			0	708	0.00	
10-Jun JN10	0			0	207	0.00			0	937	0.00			0	708	0.00			0	480	0.00	
11-Jun JN11	207			0	937	0.00			0	708	0.00			0	480	0.00			0	468	0.00	
12-Jun JN12	937			0	708	0.00			0	480	0.00			0	468	0.00			0	457	0.00	
13-Jun JN13	708			0	480	0.00			0	468	0.00			0	457	0.00			0	251	0.00	
14-Jun JN14	480			0	468	0.00			0	457	0.00			0	251	0.00			0	450	0.00	
15-Jun JN15	468			0	457	0.00			0	251	0.00			0	450	0.00			0	708	0.00	
16-Jun JN16	457			0	251	0.00			0	450	0.00			0	708	0.00			0	812	0.00	
17-Jun JN17	251			0	450	0.00			0	708	0.00			0	812	0.00			0	915	0.00	
18-Jun JN18	450			0	708	0.00			0	812	0.00			0	915	0.00			0	362	0.00	
19-Jun JN19	708			0	812	0.00			0	915	0.00			0	362	0.00			0	1520	0.00	
20-Jun JN20	812			0	915	0.00			0	362	0.00			0	1520	0.00			0	2678	0.00	
21-Jun JN21	915			0	362	0.00			0	1520	0.00			0	2678	0.00			0	3290	0.00	
22-Jun JN22	362			0	1520	0.00			0	2678	0.00			0	3290	0.00			0	5578	0.00	
23-Jun JN23	1520			0	2678	0.00			0	3290	0.00			0	5578	0.00			0	3888	0.00	
24-Jun JN24	2678			0	3290	0.00			0	5578	0.00			0	3888	0.00			0	5356	0.00	
25-Jun JN25	3290			0	5578	0.00			0	3888	0.00			0	5356	0.00			0	3180	0.00	
26-Jun JN26	5578			0	3888	0.00			0	5356	0.00			0	3180	0.00			0	5504	0.00	
27-Jun JN27	3888			0	5356	0.00			0	3180	0.00			0	5504	0.00			0	8337	0.00	
28-Jun JN28	5356			0	3180	0.00			0	5504	0.00			0	8337	0.00			0	9569	0.00	
29-Jun JN29	3180			0	5504	0.00			0	8337	0.00			0	9569	0.00			0	4427	0.00	
30-Jun JN30	5504			0	8337	0.00			0	9569	0.00			0	4427	0.00			0	900	0.00	
01-Jul J1	8337			0	9569	0.00			0	4427	0.00			0	900	0.00			0	3268	0.00	
02-Jul J2	9569			0	4427	0.00			0	900	0.00			0	3268	0.00			0	4574	0.00	
03-Jul J3	4427			0	900	0.00			0	3268	0.00			0	4574	0.00			0	3150	0.00	
04-Jul J4	900			0	3268	0.00			0	4574	0.00			0	3150	0.00			0	8185	0.00	
05-Jul J5	3268			0	4574	0.00			0	3150	0.00			0	8185	0.00			0	11976	0.00	
06-Jul J6	4574			0	3150	0.00			0	8185	0.00			0	11976	0.00			0	5965	0.00	
07-Jul J7	3150	66	3894	3611	8185	0.44	67	4824	4473	11976	0.37	39	1365	1266	5965	0.21	97	5267	4884	10646	0.46	14233
08-Jul J8	4574			0	7503	0.00			0	4700	0.00			0	5762	0.00			0	6522	0.00	
09-Jul J9	7503			0	4700	0.00			0	5762	0.00			0	6522	0.00			0	8182	0.00	
10-Jul J10	4700			0	5762	0.00			0	6522	0.00			0	8182	0.00			0	7238	0.00	
11-Jul J11	5762			0	6522	0.00			0	8182	0.00			0	7238	0.00			0	28152	0.00	
12-Jul J12	6522			0	8182	0.00			0	7238	0.00			0	28152	0.00			0	49145	0.00	
13-Jul J13	8182			0	7238	0.00			0	28152	0.00			0	49145	0.00			0	55329	0.00	
14-Jul J14	7238	140	21840	20251	28152	0.72	90	9900	9180	49145	0.19	56	5040	4673	55329	0.08	102	7222	6696	40745	0.16	40800
15-Jul J15	7902			0	39965	0.00			0	50655	0.00			0	34048	0.00			0	46199	0.00	
16-Jul J16	39965			0	50655	0.00			0	34048	0.00			0	46199	0.00			0	54204	0.00	
17-Jul J17	50655			0	34048	0.00			0	46199	0.00			0	54204	0.00			0	11871	0.00	
18-Jul J18	34048			0	46199	0.00			0	54204	0.00			0	11871	0.00			0	34884	0.00	
19-Jul J19	46199			0	54204	0.00			0	11871	0.00			0	34884	0.00			0	54196	0.00	
20-Jul J20	54204			0	11871	0.00			0	34884	0.00			0	54196	0.00			0	54111	0.00	
21-Jul J21	11871	200	32800	30413	34884	0.87	174	31320	29041	54196	0.54	127	14859	13778	54111	0.25	47	5640	5230	66531	0.08	78461
22-Jul J22	4471	160	15075	13978	25155	0.56	134	16080	14910	40333	0.37	175	17675	16389	61302	0.27	54	6048	5608	50666	0.11	50885
23-Jul J23	11177	160	13120	12165	25423	0.48	150	19125	17733	44913	0.39	175	20475	18985	45058	0.42	81	8504	7885	39550	0.20	56769
24-Jul J24	13258			0	27180	0.00			0	26073	0.00			0	31665	0.00			0	15183	0.00	
25-Jul J25	27180			0	26073	0.00			0	31665	0.00			0	15183	0.00			0	32270	0.00	
26-Jul J26	26073			0	31665	0.00			0	15183	0.00			0	32270	0.00			0	42341	0.00	
27-Jul J27	31665			0	15183	0.00			0	32270	0.00			0	42341	0.00			0	42747	0.00	
28-Jul J28	15183	179	27387	25394	32270	0.79	138	15870	14715	42341	0.35	164	19229	17830	42747	0.42	168	17330	16069	58918	0.27	74008
29-Jul J29	6876	179	18258	16899	27626	0.61	128	11648	10781	24917	0.43	142	9620	8904	42849	0.21	139	10735	9936	27488	0.36	46520
30-Jul J30	10727			0	14136	0.00			0	33945	0.00			0	17552	0.00			0	20370	0.00	
31-Jul J31	14136			0	33945	0.00			0	17552	0.00			0	20370	0.00			0	14556	0.00	
01-Aug A1	33945			0	17552	0.00			0	20370	0.00			0	14556	0.00			0	25985	0.00	
02-Aug A2	17552			0	20370	0.00			0	14556	0.00			0	25985	0.00			0	35483	0.00	
03-Aug A3	20370			0	14556	0.00			0	25985	0.00			0	35483	0.00			0	29570	0.00	
04-Aug A4	14556	182	8554	7931	25985	0.31	89	4539	4209	35483	0.12	71	3795	3519	29570	0.12	71	2414	2238	20041	0.11	17897
05-Aug A5	18053			0	31274	0.00			0	26051	0.00			0	17802	0.00			0	13295	0.00	
06-Aug A6	31274			0	26051	0.00			0	17802	0.00			0	13295	0.00			0	19544	0.00	
07-Aug A7	26051			0	17802	0.00			0	13295	0.00			0	19544	0.00			0	27334	0.00	
08-Aug A8	17802			0	13295	0.00			0	19544	0.00			0	27334	0.00			0	12844	0.00	
09-Aug A9	13295			0	19544	0.00			0	27334	0.00			0	12844	0.00			0	15979	0.00	
10-Aug A10	19544			0	27334	0.00			0	12844	0.00			0	15979	0.00			0	16284	0.00	
11-Aug A11	27334	130	8784	8145	12844	0.63	42	1190	1103	15979	0.07	22	1114	1033	16284	0.06	45	894	829	17629	0.05	11110
12-Aug A12	4700	122	6710	6222	14876	0.42	32	1408	1306	15251	0.09	40	1430	1430	16800	0.09	37	888	823	16067	0.05	9677
13-Aug A13	8654	140	6860	6361	13945	0.46	25	970	899	15370	0.06	40	1498	1389	15243	0.09	29	557	516	11685	0.04	9166
14-Aug A14	7584	140	10920	10125	14471	0.70	25	850	788	13854	0.06	40	1033	958	11169	0.09	29	1145	1062	8801	0.12	12933
15-Aug A15	4345			0	13066	0.00			0	10211	0.00			0	7739	0.00			0	9938	0.00	
16-Aug A16	13066			0	10211	0.00			0	7739	0.00			0	9938	0.00			0	11096	0.00	
17-Aug A17	10211			0	7739	0.00			0	9938	0.00			0	11096	0.00			0	5988	0.00	
18-Aug A18	7739	107	7169	6647	9938	0.67	30	1710	1586	11096	0.14	34	985	913	5988	0.15	29	894	829	8978	0.09	9975
19-Aug A19	3290	107	5029	4663	9510	0.49	30	1440	1335	5075	0.26	32	896	831	8149	0.10	31	580	538	5788	0.09	7367
20-Aug A20	4847	105	2625	2434	3740	0.65	30	900	835	7319	0.11	60	1320	1224	5250	0.23	40	776	720	8169	0.09	5212

21-Aug A21	1306	90	1980	1836	6484	0.28	30	960	890	4026	0.22	69	1732	1606	7449	0.22	54	1078	1000	3921	0.25	5332
22-Aug A22	4648			0	3136	0.00			0	5843	0.00			0	2922	0.00			0	0	0.00	
23-Aug A23	3136			0	5843	0.00			0	2922	0.00			0	0	0.00			0	0	0.00	
24-Aug A24	5843			0	2922	0.00			0	0	0.00			0	0	0.00			0	0	0.00	
25-Aug A25	2922			0	0	0.00			0	0	0.00			0	0	0.00			0	0	0.00	
26-Aug A26	0			0	0	0.00			0	0	0.00			0	0	0.00			0	0	0.00	
27-Aug A27	0			0	0	0.00			0	0	0.00			0	0	0.00			0	0	0.00	
28-Aug A28	0			0	0	0.00			0	0	0.00			0	0	0.00			0	0	0.00	
29-Aug A29	0			0	0	0.00			0	0	0.00			0	0	0.00			0	0	0.00	
30-Aug A30	0			0	0	0.00			0	0	0.00			0	0	0.00			0	0	0.00	
31-Aug A31	0			0	0	0.00			0	0	0.00			0	0	0.00			0	0	0.00	
01-Sep S1	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
02-Sep S2	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
03-Sep S3	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
04-Sep S4	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
05-Sep S5	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
06-Sep S6	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
07-Sep S7	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
08-Sep S8	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
09-Sep S9	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
10-Sep S10	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
11-Sep S11				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
12-Sep S12				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
13-Sep S13				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
14-Sep S14				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
15-Sep S15				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
TOTAL	844112	2207	191003	177076	1021189	0.173	1214	122734	113784	1134971	0.100	1286	102066	94727	1229698	0.077	1052	69972	64863	1294561	0.050	450345
AREA 4 H.R.						0.137					0.088					0.073					0.050	0.348

1987 AREA 4 RECONSTRUCTION
24-Oct

DATE	ACTUAL ESC	EFFORT R/G/S	HAIL CATCH	SALES CATCH	R/G/S RUN	DAILY H.R.	EFFORT SMITH	HAIL CATCH	SALES CATCH	SMITH RUN	DAILY H.R.	EFFORT SOUND	HAIL CATCH	SALES CATCH	SOUND RUN	DAILY H.R.	EFFORT OUTSIDE	HAIL CATCH	SALES CATCH	OUTSIDE RUN	DAILY H.R.	YEARLY TOTAL SALES CATCH
06-Jun JN6	0			0	0	0.00			0	0	0.00			0	0	0.00			0	389	0.00	
07-Jun JN7	0			0	0	0.00			0	0	0.00			0	389	0.00			0	1367	0.00	
08-Jun JN8	0			0	0	0.00			0	389	0.00			0	1367	0.00			0	953	0.00	
09-Jun JN9	0			0	389	0.00			0	1367	0.00			0	953	0.00			0	539	0.00	
10-Jun JN10	389			0	1367	0.00			0	953	0.00			0	539	0.00			0	2357	0.00	
11-Jun JN11	1367			0	953	0.00			0	539	0.00			0	2357	0.00			0	2307	0.00	
12-Jun JN12	953			0	539	0.00			0	2357	0.00			0	2307	0.00			0	2257	0.00	
13-Jun JN13	539			0	2357	0.00			0	2307	0.00			0	2257	0.00			0	5141	0.00	
14-Jun JN14	2357			0	2307	0.00			0	2257	0.00			0	5141	0.00			0	3862	0.00	
15-Jun JN15	2307			0	2257	0.00			0	5141	0.00			0	3862	0.00			0	4163	0.00	
16-Jun JN16	2257			0	5141	0.00			0	3862	0.00			0	4163	0.00			0	2959	0.00	
17-Jun JN17	5141			0	3862	0.00			0	4163	0.00			0	2959	0.00			0	4100	0.00	
18-Jun JN18	3862			0	4163	0.00			0	2959	0.00			0	4100	0.00			0	3035	0.00	
19-Jun JN19	4163			0	2959	0.00			0	4100	0.00			0	3035	0.00			0	4627	0.00	
20-Jun JN20	2959			0	4100	0.00			0	3035	0.00			0	4627	0.00			0	1367	0.00	
21-Jun JN21	4100			0	3035	0.00			0	4627	0.00			0	1367	0.00			0	7963	0.00	
22-Jun JN22	3035			0	4627	0.00			0	1367	0.00			0	7963	0.00			0	10909	0.00	
23-Jun JN23	4627			0	1367	0.00			0	7963	0.00			0	10909	0.00			0	13442	0.00	
24-Jun JN24	1367			0	7963	0.00			0	10909	0.00			0	13442	0.00			0	16527	0.00	
25-Jun JN25	7963			0	10909	0.00			0	13442	0.00			0	16527	0.00			0	18195	0.00	
26-Jun JN26	10909			0	13442	0.00			0	16527	0.00			0	18195	0.00			0	7148	0.00	
27-Jun JN27	13442			0	16527	0.00			0	18195	0.00			0	7148	0.00			0	2320	0.00	
28-Jun JN28	16527			0	18195	0.00			0	7148	0.00			0	2320	0.00			0	3135	0.00	
29-Jun JN29	18195			0	7148	0.00			0	2320	0.00			0	3135	0.00			0	4351	0.00	
30-Jun JN30	7148			0	2320	0.00			0	3135	0.00			0	4351	0.00			0	8477	0.00	
01-Jul J1	2320			0	3135	0.00			0	4351	0.00			0	8477	0.00			0	9906	0.00	
02-Jul J2	3135			0	4351	0.00			0	8477	0.00			0	9906	0.00			0	12590	0.00	
03-Jul J3	4351			0	8477	0.00			0	9906	0.00			0	12590	0.00			0	22748	0.00	
04-Jul J4	8477			0	9906	0.00			0	12590	0.00			0	22748	0.00			0	23427	0.00	
05-Jul J5	9906			0	12590	0.00			0	22748	0.00			0	23427	0.00			0	20110	0.00	
06-Jul J6	12590	91	8736	8967	22748	0.39	62	6014	6173	23427	0.26	50	3100	3182	20110	0.16	72	3948	4052	19852	0.20	22374
07-Jul J7	13781			0	17254	0.00			0	16928	0.00			0	15800	0.00			0	32527	0.00	
08-Jul J8	17254			0	16928	0.00			0	15800	0.00			0	32527	0.00			0	25643	0.00	
09-Jul J9	16928			0	15800	0.00			0	32527	0.00			0	25643	0.00			0	27449	0.00	
10-Jul J10	15800			0	32527	0.00			0	25643	0.00			0	27449	0.00			0	17591	0.00	
11-Jul J11	32527			0	25643	0.00			0	27449	0.00			0	17591	0.00			0	78196	0.00	
12-Jul J12	25643			0	27449	0.00			0	17591	0.00			0	78196	0.00			0	44669	0.00	
13-Jul J13	27449	47	2820	2894	17591	0.16	221	44200	45368	78196	0.58	80	14138	14511	44669	0.32	76	12853	13193	77583	0.17	75966
14-Jul J14	14696			0	32828	0.00			0	30157	0.00			0	64390	0.00			0	122975	0.00	
15-Jul J15	32828			0	30157	0.00			0	64390	0.00			0	122975	0.00			0	103501	0.00	
16-Jul J16	30157			0	64390	0.00			0	122975	0.00			0	103501	0.00			0	31625	0.00	
17-Jul J17	64390			0	122975	0.00			0	103501	0.00			0	31625	0.00			0	53649	0.00	
18-Jul J18	122975			0	103501	0.00			0	31625	0.00			0	53649	0.00			0	62609	0.00	
19-Jul J19	103501			0	31625	0.00			0	53649	0.00			0	62609	0.00			0	50567	0.00	
20-Jul J20	31625	181	28800	29561	53649	0.55	202	22624	23221	62609	0.37	196	23469	24089	50567	0.48	176	21898	22476	75512	0.30	99347
21-Jul J21	24088	163	15871	16290	39388	0.41	140	8400	8622	26478	0.33	193	11600	11906	53036	0.22	182	11244	11541	53473	0.22	48359
22-Jul J22	23098			0	17856	0.00			0	41129	0.00			0	41932	0.00			0	44641	0.00	
23-Jul J23	17856			0	41129	0.00			0	41932	0.00			0	44641	0.00			0	42007	0.00	
24-Jul J24	41129			0	41932	0.00			0	44641	0.00			0	42007	0.00			0	58432	0.00	
25-Jul J25	41932			0	44641	0.00			0	42007	0.00			0	58432	0.00			0	66130	0.00	
26-Jul J26	44641			0	42007	0.00			0	58432	0.00			0	66130	0.00			0	74871	0.00	
27-Jul J27	42007	192	30528	31334	58432	0.54	128	12800	13138	66130	0.20	115	12435	12763	74871	0.17	87	6233	6398	68405	0.09	63633
28-Jul J28	27098			0	52992	0.00			0	62108	0.00			0	62008	0.00			0	32038	0.00	
29-Jul J29	52992			0	62108	0.00			0	62008	0.00			0	32038	0.00			0	46221	0.00	
30-Jul J30	62108			0	62008	0.00			0	32038	0.00			0	46221	0.00			0	35442	0.00	
31-Jul J31	62008			0	32038	0.00			0	46221	0.00			0	35442	0.00			0	24877	0.00	
01-Aug A1	32038			0	46221	0.00			0	35442	0.00			0	24877	0.00			0	33718	0.00	
02-Aug A2	46221	234	28548	25360	35442	0.72	73	5110	4539	24877	0.18	90	8803	7820	33718	0.23	78	7830	6956	40111	0.17	44675
03-Aug A3	10082	213	11715	12024	20338	0.59	57	6156	6319	25898	0.24	90	6030	6189	33155	0.19	66	3933	4037	30500	0.13	28569
04-Aug A4	8314	213	13419	13773	19579	0.70	55	3685	3782	26966	0.14	67	3216	3301	26463	0.12	65	5655	5804	31766	0.18	26661
05-Aug A5	5806	190	8550	8776	23184	0.38	70	3850	3952	23162	0.17	67	2680	2751	25961	0.11	73	2894	2970	13654	0.22	18449
06-Aug A6	14408			0	19210	0.00			0	23211	0.00			0	10684	0.00			0	15404	0.00	
07-Aug A7	19210			0	23211	0.00			0	10684	0.00			0	15404	0.00			0	20145	0.00	
08-Aug A8	23211			0	10684	0.00			0	15404	0.00			0	20145	0.00			0	15672	0.00	
09-Aug A9	10684	179	10561	10840	15404	0.70	37	2035	2089	20145	0.10	47	1739	1785	15672	0.11	68	3494	3586	13976	0.26	18300
10-Aug A10	4564	155	10540	12438	18056	0.69	50	2850	3363	13887	0.24	6	216	255	10390	0.02	82	2091	2468	18021	0.14	18524
11-Aug A11	5618	150	7050	7201	10524	0.68	45	2745	2804	10135	0.28	11	670	684	15553	0.04	49	3890	3973	31970	0.12	14662
12-Aug A12	3323	150	4980	5112	7331	0.70	50	1500	1540	14869	0.10	51	4480	4598	27997	0.16	46	1790	1837	19568	0.09	13087
13-Aug A13	2219			0	13329	0.00			0	23399	0.00			0	17731	0.00			0	3461	0.00	
14-Aug A14	13329			0	23399	0.00			0	17731	0.00			0	3461	0.00			0	13680	0.00	
15-Aug A15	23399			0	17731	0.00			0	3461	0.00			0	13680	0.00			0	6691	0.00	
16-Aug A16	17731			0	3461	0.00			0	13680	0.00			0	6691	0.00			0	6502	0.00	
17-Aug A17	3461	175	9675	9930	13680	0.73	44	880	903	6691	0.14	57	1900	1950	6502	0.30	74	2432	2496	8954	0.28	15280
18-Aug A18	3749	121	2853	2928	5787	0.51	20	200	205	4552	0.05	42	1072	1100	6458	0.17	57	1218	1250	10580	0.12	5484
19-Aug A19	2859	108	1620	1663	4346	0.38	15	150	154	5358	0.03			0	9329	0.00			0	10207	0.00	1817
20-Aug A20	2683			0	5204	0.00			0	9329	0.00			0	10207	0.00			0	5963	0.00	

21-Aug A21	5204			0	9329	0.00			0	10207	0.00			0	5963	0.00			0	3092	0.00	
22-Aug A22	9329			0	10207	0.00			0	5963	0.00			0	3092	0.00			0	4138	0.00	
23-Aug A23	10207			0	5963	0.00			0	3092	0.00			0	4138	0.00			0	1129	0.00	
24-Aug A24	5963	103	1339	1374	3092	0.44	22	110	113	4138	0.03			0	1129	0.00			0	1141	0.00	1487
25-Aug A25	1718			0	4025	0.00			0	1129	0.00			0	1141	0.00			0	1680	0.00	
26-Aug A26	4025			0	1129	0.00			0	1141	0.00			0	1680	0.00			0	3423	0.00	
27-Aug A27	1129			0	1141	0.00			0	1680	0.00			0	3423	0.00			0	2805	0.00	
28-Aug A28	1141			0	1680	0.00			0	3423	0.00			0	2805	0.00			0	2186	0.00	
29-Aug A29	1680			0	3423	0.00			0	2805	0.00			0	2186	0.00			0	1567	0.00	
30-Aug A30	3423			0	2805	0.00			0	2186	0.00			0	1567	0.00			0	1175	0.00	
31-Aug A31	2805			0	2186	0.00			0	1567	0.00			0	1175	0.00			0	782	0.00	
01-Sep S1	2186			0	1567	0.00			0	1175	0.00			0	782	0.00			0		0.00	
02-Sep S2	1567			0	1175	0.00			0	782	0.00			0	389	0.00			0		0.00	
03-Sep S3	1175			0	782	0.00			0	389	0.00			0	364	0.00			0		0.00	
04-Sep S4	782			0	389	0.00			0	364	0.00			0	0	0.00			0		0.00	
05-Sep S5	389			0	364	0.00			0	0	0.00			0	0	0.00			0		0.00	
06-Sep S6	364			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
07-Sep S7	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
08-Sep S8	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
09-Sep S9	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
10-Sep S10	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
11-Sep S11				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
12-Sep S12				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
13-Sep S13				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
14-Sep S14				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
15-Sep S15				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
TOTAL	1448893	2665	197605	200466	1649359	0.122	1291	123309	126284	1775644	0.071	1161	95548	96886	1872529	0.052	1252	91403	93038	1964815	0.047	516674
AREA 4 H.R.						0.102					0.064					0.049					0.047	0.263

1988 AREA 4 RECONSTRUCTION
24-Oct

DATE	ACTUAL ESC	EFFORT R/G/S	HAIL CATCH	SALES CATCH	R/G/S RUN	DAILY H.R.	EFFORT SMITH	HAIL CATCH	SALES CATCH	SMITH RUN	DAILY H.R.	EFFORT SOUND	HAIL CATCH	SALES CATCH	SOUND RUN	DAILY H.R.	EFFORT OUTSIDE	HAIL CATCH	SALES CATCH	OUTSIDE RUN	DAILY H.R.	YEARLY TOTAL SALES CATCH
06-Jun JN6				0	0	0.00			0	851	0.00			0	558	0.00			0	265	0.00	
07-Jun JN7				0	851	0.00			0	558	0.00			0	265	0.00			0	247	0.00	
08-Jun JN8	851			0	558	0.00			0	265	0.00			0	247	0.00			0	265	0.00	
09-Jun JN9	558			0	265	0.00			0	247	0.00			0	265	0.00			0	1674	0.00	
10-Jun JN10	265			0	247	0.00			0	265	0.00			0	1674	0.00			0	1290	0.00	
11-Jun JN11	247			0	265	0.00			0	1674	0.00			0	1290	0.00			0	2131	0.00	
12-Jun JN12	265			0	1674	0.00			0	1290	0.00			0	2131	0.00			0	2899	0.00	
13-Jun JN13	1674			0	1290	0.00			0	2131	0.00			0	2899	0.00			0	1290	0.00	
14-Jun JN14	1290			0	2131	0.00			0	2899	0.00			0	1290	0.00			0	1253	0.00	
15-Jun JN15	2131			0	2899	0.00			0	1290	0.00			0	1253	0.00			0	1957	0.00	
16-Jun JN16	2899			0	1290	0.00			0	1253	0.00			0	1957	0.00			0	3045	0.00	
17-Jun JN17	1290			0	1253	0.00			0	1957	0.00			0	3045	0.00			0	3951	0.00	
18-Jun JN18	1253			0	1957	0.00			0	3045	0.00			0	3951	0.00			0	3393	0.00	
19-Jun JN19	1957			0	3045	0.00			0	3951	0.00			0	3393	0.00			0	1994	0.00	
20-Jun JN20	3045			0	3951	0.00			0	3393	0.00			0	1994	0.00			0	6255	0.00	
21-Jun JN21	3951			0	3393	0.00			0	1994	0.00			0	6255	0.00			0	5012	0.00	
22-Jun JN22	3393			0	1994	0.00			0	6255	0.00			0	5012	0.00			0	3100	0.00	
23-Jun JN23	1994			0	6255	0.00			0	5012	0.00			0	3100	0.00			0	4253	0.00	
24-Jun JN24	6255			0	5012	0.00			0	3100	0.00			0	4253	0.00			0	7632	0.00	
25-Jun JN25	5012			0	3100	0.00			0	4253	0.00			0	7632	0.00			0	17390	0.00	
26-Jun JN26	3100			0	4253	0.00			0	7632	0.00			0	17390	0.00			0	13280	0.00	
27-Jun JN27	4253	120	4496	4221	7632	0.55	263	10818	10156	17390	0.58	200	4200	3943	13280	0.30	67	1661	1559	9909	0.16	19879
28-Jun JN28	3411			0	7234	0.00			0	9337	0.00			0	8350	0.00			0	16544	0.00	
29-Jun JN29	7234			0	9337	0.00			0	8350	0.00			0	16544	0.00			0	13590	0.00	
30-Jun JN30	9337			0	8350	0.00			0	16544	0.00			0	13590	0.00			0	13471	0.00	
01-Jul J1	8350			0	16544	0.00			0	13590	0.00			0	13471	0.00			0	24640	0.00	
02-Jul J2	16544			0	13590	0.00			0	13471	0.00			0	24640	0.00			0	31380	0.00	
03-Jul J3	13590			0	13471	0.00			0	24640	0.00			0	31380	0.00			0	49077	0.00	
04-Jul J4	13471	162	17820	16729	24640	0.68	196	17248	16192	31380	0.52	75	5100	4788	49077	0.10	116	4996	4690	52495	0.09	42399
05-Jul J5	7911	130	7800	7322	15188	0.48	210	13860	13012	44289	0.29	215	9860	9256	47804	0.19	85	3910	3671	87918	0.04	33261
06-Jul J6	7865			0	31277	0.00			0	38548	0.00			0	84248	0.00			0	33847	0.00	
07-Jul J7	31277			0	38548	0.00			0	84248	0.00			0	33847	0.00			0	48915	0.00	
08-Jul J8	38548			0	84248	0.00			0	33847	0.00			0	48915	0.00			0	74894	0.00	
09-Jul J9	84248			0	33847	0.00			0	48915	0.00			0	74894	0.00			0	70207	0.00	
10-Jul J10	33847	214	41944	35837	48915	0.73	205	25420	21719	74894	0.29	100	19774	16895	70207	0.24	146	13001	11108	119648	0.09	85559
11-Jul J11	13078	192	31392	29470	53175	0.55	145	19575	18377	53312	0.34	149	14602	13708	108540	0.13	149	16301	15303	98033	0.16	76858
12-Jul J12	23705	205	28495	26751	34936	0.77	170	16660	15640	94832	0.16	140	12035	11298	82729	0.14	130	11845	11120	84733	0.13	64809
13-Jul J13	8185	200	20800	19526	79191	0.25	170	13430	12608	71431	0.18	130	11020	10345	73613	0.14	145	12405	11645	37701	0.31	54125
14-Jul J14	59665			0	58823	0.00			0	63268	0.00			0	26055	0.00			0	75308	0.00	
15-Jul J15	58823			0	63268	0.00			0	26055	0.00			0	75308	0.00			0	85220	0.00	
16-Jul J16	63268			0	26055	0.00			0	75308	0.00			0	85220	0.00			0	59858	0.00	
17-Jul J17	26055	348	72036	67626	75308	0.90	230	32200	30229	85220	0.35	185	20095	18865	59858	0.32	149	14014	13156	76444	0.17	129876
18-Jul J18	7682	284	42600	39992	54991	0.73	175	17325	16264	40994	0.40	182	15288	14352	63288	0.23	220	20398	19149	54571	0.35	89758
19-Jul J19	14999	240	23520	19086	24729	0.77	175	12600	10225	48936	0.21	233	13992	11355	35422	0.32	426	37384	30337	88252	0.34	71003
20-Jul J20	5643	240	24240	15811	38711	0.41	195	17745	11574	24067	0.48	244	13960	9106	57915	0.16	545	50215	32753	48813	0.67	69244
21-Jul J21	22900			0	12493	0.00			0	48809	0.00			0	16059	0.00			0	33392	0.00	
22-Jul J22	12493			0	48809	0.00			0	16059	0.00			0	33392	0.00			0	68606	0.00	
23-Jul J23	48809			0	16059	0.00			0	33392	0.00			0	68606	0.00			0	92157	0.00	
24-Jul J24	16059	201	20703	19436	33392	0.58	125	9125	8566	68606	0.12	81	3483	3270	92157	0.04	34	1727	1621	97825	0.02	32893
25-Jul J25	13956	226	49810	46761	60040	0.78	174	26779	25140	88888	0.28	81	4593	4312	96203	0.04	31	999	938	46510	0.02	77150
26-Jul J26	13279	236	41442	38955	63748	0.61	184	25061	23557	91892	0.26	60	2316	2177	45572	0.05	32	1640	1542	48641	0.03	66230
27-Jul J27	24793			0	68335	0.00			0	43395	0.00			0	47099	0.00			0	113422	0.00	
28-Jul J28	68335			0	43395	0.00			0	47099	0.00			0	113422	0.00			0	31771	0.00	
29-Jul J29	43395			0	47099	0.00			0	113422	0.00			0	31771	0.00			0	141724	0.00	
30-Jul J30	47099			0	113422	0.00			0	31771	0.00			0	141724	0.00			0	178839	0.00	
31-Jul J31	113422			0	31771	0.00			0	141724	0.00			0	178839	0.00			0	73211	0.00	
01-Aug A1	31771	260	127400	119601	141724	0.84	346	121446	114011	178839	0.64	60	10560	9914	73211	0.14	73	8207	7705	77644	0.10	251230
02-Aug A2	22123	260	56420	45101	64827	0.70	265	35245	28174	63297	0.45	241	39379	31479	69939	0.45	102	10100	8074	57176	0.14	112827
03-Aug A3	19727	200	22600	11995	35123	0.34	180	11880	6305	38460	0.16	623	57348	30436	49102	0.62	306	19539	10370	33636	0.31	59106
04-Aug A4	23129			0	32155	0.00			0	18666	0.00			0	23266	0.00			0	20815	0.00	
05-Aug A5	32155			0	18666	0.00			0	23266	0.00			0	20815	0.00			0	50314	0.00	
06-Aug A6	18666			0	23266	0.00			0	20815	0.00			0	50314	0.00			0	89335	0.00	
07-Aug A7	23266			0	20815	0.00			0	50314	0.00			0	89335	0.00			0	36735	0.00	
08-Aug A8	20815	311	42109	39531	50314	0.79	74	5846	5488	89335	0.06	66	2288	2148	36735	0.06	64	2208	2073	61566	0.03	49240
09-Aug A9	10782	315	55755	52341	83847	0.62	70	4130	3877	34588	0.11	76	2584	2426	59493	0.04	51	1800	1690	53160	0.03	60334
10-Aug A10	31506			0	30710	0.00			0	57068	0.00			0	51471	0.00			0	14861	0.00	
11-Aug A11	30710			0	57068	0.00			0	51471	0.00			0	14861	0.00			0	7371	0.00	
12-Aug A12	57068			0	51471	0.00			0	14861	0.00			0	7371	0.00			0	35697	0.00	
13-Aug A13	51471			0	14861	0.00			0	7371	0.00			0	35697	0.00			0	28913	0.00	
14-Aug A14	14861			0	7371	0.00			0	35697	0.00			0	28913	0.00			0	18038	0.00	
15-Aug A15	7371	270	31975	30018	35697	0.84	76	5323	4997	28913	0.17	28	1758	1650	18038	0.09	65	2356	2212	13932	0.16	38877
16-Aug A16	5679	270	17312	16252	23916	0.68	101	2629	2468	16387	0.15	44	1506	1414	11721	0.12	40	2041	1916	10961	0.17	22050
17-Aug A17	7664			0	13919	0.00			0	10307	0.00			0	9045	0.00			0	4289	0.00	
18-Aug A18	13919			0	10307	0.00			0	9045	0.00			0	4289	0.00			0	2789	0.00	
19-Aug A19	10307			0	9045	0.00			0	4289	0.00			0	2789	0.00			0	7442	0.00	
20-Aug A20	9045			0	4289	0.00			0	2789	0.00			0	7442	0.00			0	11676	0.00	

21-Aug A21	4289			0	2789	0.00			0	7442	0.00			0	11676	0.00			0	4124	0.00	
22-Aug A22	2789	200	4800	4506	7442	0.61	34	952	894	11676	0.08	31	837	786	4124	0.19	40	216	203	4675	0.04	6388
23-Aug A23	2936			0	10782	0.00			0	3338	0.00			0	4472	0.00			0	2826	0.00	
24-Aug A24	10782			0	3338	0.00			0	4472	0.00			0	2826	0.00			0	8679	0.00	
25-Aug A25	3338			0	4472	0.00			0	2826	0.00			0	8679	0.00			0	3631	0.00	
26-Aug A26	4472			0	2826	0.00			0	8679	0.00			0	3631	0.00			0	2863	0.00	
27-Aug A27	2826			0	8679	0.00			0	3631	0.00			0	2863	0.00			0	2844	0.00	
28-Aug A28	8679			0	3631	0.00			0	2863	0.00			0	2844	0.00			0	1582	0.00	
29-Aug A29	3631			0	2863	0.00			0	2844	0.00			0	1582	0.00			0	558	0.00	
30-Aug A30	2863			0	2844	0.00			0	1582	0.00			0	558	0.00			0	274	0.00	
31-Aug A31	2844			0	1582	0.00			0	558	0.00			0	274	0.00			0	750	0.00	
01-Sep S1	1582			0	558	0.00			0	274	0.00			0	750	0.00			0		0.00	
02-Sep S2	558			0	274	0.00			0	750	0.00			0	1225	0.00			0		0.00	
03-Sep S3	274			0	750	0.00			0	1225	0.00			0	1107	0.00			0		0.00	
04-Sep S4	750			0	1225	0.00			0	1107	0.00			0	1344	0.00			0		0.00	
05-Sep S5	1225			0	1107	0.00			0	1344	0.00			0	1610	0.00			0		0.00	
06-Sep S6	1107			0	1344	0.00			0	1610	0.00			0	1701	0.00			0		0.00	
07-Sep S7	1344			0	1610	0.00			0	1701	0.00			0	0	0.00			0		0.00	
08-Sep S8	1610			0	1701	0.00			0	0	0.00			0	0	0.00			0		0.00	
09-Sep S9	1701			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
10-Sep S10				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
11-Sep S11				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
12-Sep S12				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
13-Sep S13				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
14-Sep S14				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
15-Sep S15				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
TOTAL	1528597	5084	785469	706867	2235464	0.316	3763	445297	399473	2634937	0.152	3243	266578	213921	2848008	0.075	3016	236963	192835	3033297	0.064	1513096
AREA 4 H.R.						0.232					0.131					0.070					0.063	0.497

1989 AREA 4 RECONSTRUCTION
24-Oct

DATE	ACTUAL ESC	EFFORT R/G/S	HAIL CATCH	SALES CATCH	R/G/S RUN	DAILY H.R.
06-Jun JN6	0			0	0	0.00
07-Jun JN7	0			0	0	0.00
08-Jun JN8	0			0	915	0.00
09-Jun JN9	915			0	610	0.00
10-Jun JN10	610			0	1476	0.00
11-Jun JN11	1476			0	1791	0.00
12-Jun JN12	1791			0	1112	0.00
13-Jun JN13	1112			0	6802	0.00
14-Jun JN14	6802			0	2097	0.00
15-Jun JN15	2097			0	2343	0.00
16-Jun JN16	2343			0	3593	0.00
17-Jun JN17	3593			0	1191	0.00
18-Jun JN18	1191			0	4626	0.00
19-Jun JN19	4626			0	4892	0.00
20-Jun JN20	4892			0	4597	0.00
21-Jun JN21	4597			0	3022	0.00
22-Jun JN22	3022			0	4026	0.00
23-Jun JN23	4026			0	5679	0.00
24-Jun JN24	5679			0	1831	0.00
25-Jun JN25	1831			0	3868	0.00
26-Jun JN26	3868	171	4326	4527	8503	0.53
27-Jun JN27	3977			0	10759	0.00
28-Jun JN28	10759			0	3888	0.00
29-Jun JN29	3888			0	9312	0.00
30-Jun JN30	9312			0	10286	0.00
01-Jul J1	10286			0	8672	0.00
02-Jul J2	8672			0	8652	0.00
03-Jul J3	8652	215	8256	8639	16563	0.52
04-Jul J4	7924			0	21556	0.00
05-Jul J5	21556			0	13465	0.00
06-Jul J6	13465			0	19539	0.00
07-Jul J7	19539			0	49235	0.00
08-Jul J8	49235			0	42168	0.00
09-Jul J9	42168			0	46942	0.00
10-Jul J10	46942	253	43091	45092	56756	0.79
11-Jul J11	11664	210	12266	12836	26695	0.48
12-Jul J12	13859	200	11054	11567	38774	0.30
13-Jul J13	27206			0	35416	0.00
14-Jul J14	35416			0	53360	0.00
15-Jul J15	53360			0	36400	0.00
16-Jul J16	36400	359	27797	29088	46757	0.62
17-Jul J17	17668	160	9347	9781	23296	0.42
18-Jul J18	13515	170	13207	13868	33711	0.41
19-Jul J19	19844			0	18604	0.00
20-Jul J20	18604			0	32669	0.00
21-Jul J21	32669			0	46735	0.00
22-Jul J22	46735			0	54068	0.00
23-Jul J23	54068	104	25860	27061	70420	0.38
24-Jul J24	43359	60	15091	15792	44121	0.36
25-Jul J25	28329			0	28811	0.00
26-Jul J26	28811			0	22551	0.00
27-Jul J27	22551	39	3189	3337	22630	0.15
28-Jul J28	19293	29	3939	4122	25797	0.16
29-Jul J29	21675			0	28949	0.00
30-Jul J30	28949			0	42759	0.00
31-Jul J31	42759	23	4528	4739	28136	0.17
01-Aug A1	23397	22	2979	3118	30009	0.10
02-Aug A2	26891			0	39195	0.00
03-Aug A3	39195			0	20375	0.00
04-Aug A4	20375	143	27545	28824	56217	0.51
05-Aug A5	27393	138	23021	24090	67065	0.36
06-Aug A6	42975			0	19568	0.00
07-Aug A7	19568			0	14322	0.00
08-Aug A8	14322	127	6880	7199	14148	0.51
09-Aug A9	6949	95	3623	3792	6046	0.63
10-Aug A10	2254	98	3874	4054	7233	0.56
11-Aug A11	3179			0	11064	0.00
12-Aug A12	11064			0	20346	0.00
13-Aug A13	20346			0	18968	0.00
14-Aug A14	18968	132	5689	5953	11878	0.50
15-Aug A15	5926	96	4480	4689	10969	0.43
16-Aug A16	6280			0	8691	0.00
17-Aug A17	8691			0	4577	0.00
18-Aug A18	4577			0	3829	0.00
19-Aug A19	3829			0	4803	0.00
20-Aug A20	4803			0	915	0.00

DATE	EFFORT SMITH	HAIL CATCH	SALES CATCH	SMITH RUN	DAILY H.R.
06-Jun JN6			0	0	0.00
07-Jun JN7			0	915	0.00
08-Jun JN8			0	610	0.00
09-Jun JN9			0	1476	0.00
10-Jun JN10			0	1791	0.00
11-Jun JN11			0	1112	0.00
12-Jun JN12			0	6802	0.00
13-Jun JN13			0	2097	0.00
14-Jun JN14			0	2343	0.00
15-Jun JN15			0	3593	0.00
16-Jun JN16			0	1191	0.00
17-Jun JN17			0	4626	0.00
18-Jun JN18			0	4892	0.00
19-Jun JN19			0	4597	0.00
20-Jun JN20			0	3022	0.00
21-Jun JN21			0	4026	0.00
22-Jun JN22			0	5679	0.00
23-Jun JN23			0	1831	0.00
24-Jun JN24			0	3868	0.00
25-Jun JN25			0	8503	0.00
26-Jun JN26	65	2106	2204	12962	0.17
27-Jun JN27			0	3888	0.00
28-Jun JN28			0	9312	0.00
29-Jun JN29			0	10286	0.00
30-Jun JN30			0	8672	0.00
01-Jul J1			0	8652	0.00
02-Jul J2			0	16563	0.00
03-Jul J3	169	5425	5677	27233	0.21
04-Jul J4			0	13465	0.00
05-Jul J5			0	19539	0.00
06-Jul J6			0	49235	0.00
07-Jul J7			0	42168	0.00
08-Jul J8			0	46942	0.00
09-Jul J9			0	56756	0.00
10-Jul J10	176	18871	19747	46442	0.43
11-Jul J11	159	10440	10925	49699	0.22
12-Jul J12	159	6325	6619	42034	0.16
13-Jul J13			0	53360	0.00
14-Jul J14			0	36400	0.00
15-Jul J15			0	46757	0.00
16-Jul J16	192	23292	24374	47670	0.51
17-Jul J17	134	9017	9436	43147	0.22
18-Jul J18	164	11403	11973	30577	0.39
19-Jul J19			0	32669	0.00
20-Jul J20			0	46735	0.00
21-Jul J21			0	54068	0.00
22-Jul J22			0	70420	0.00
23-Jul J23	84	14764	15450	59570	0.26
24-Jul J24	63	5114	5352	34162	0.16
25-Jul J25			0	22551	0.00
26-Jul J26			0	22630	0.00
27-Jul J27	14	1505	1575	27372	0.06
28-Jul J28	13	1144	1197	30146	0.04
29-Jul J29			0	42759	0.00
30-Jul J30			0	28136	0.00
31-Jul J31	19	1305	1366	31375	0.04
01-Aug A1	10	835	874	40069	0.02
02-Aug A2			0	20375	0.00
03-Aug A3			0	56217	0.00
04-Aug A4	78	8532	8928	75994	0.12
05-Aug A5	73	5793	6062	25630	0.24
06-Aug A6			0	14322	0.00
07-Aug A7			0	14148	0.00
08-Aug A8	50	2231	2334	8380	0.28
09-Aug A9	46	2895	3030	10263	0.30
10-Aug A10	49	1691	1770	12833	0.14
11-Aug A11			0	20346	0.00
12-Aug A12			0	18968	0.00
13-Aug A13			0	11878	0.00
14-Aug A14	27	1372	1436	12404	0.12
15-Aug A15	37	1672	1750	10441	0.17
16-Aug A16			0	4577	0.00
17-Aug A17			0	3829	0.00
18-Aug A18	56	315	330	5133	0.06
19-Aug A19	20	263	275	1190	0.23
20-Aug A20	16	268	280	2611	0.11

DATE	EFFORT SOUND	HAIL CATCH	SALES CATCH	SOUND RUN	DAILY H.R.
06-Jun JN6			0	915	0.00
07-Jun JN7			0	610	0.00
08-Jun JN8			0	1476	0.00
09-Jun JN9			0	1791	0.00
10-Jun JN10			0	1112	0.00
11-Jun JN11			0	6802	0.00
12-Jun JN12			0	2097	0.00
13-Jun JN13			0	2343	0.00
14-Jun JN14			0	3593	0.00
15-Jun JN15			0	1191	0.00
16-Jun JN16			0	4626	0.00
17-Jun JN17			0	4892	0.00
18-Jun JN18			0	4597	0.00
19-Jun JN19			0	3022	0.00
20-Jun JN20			0	4026	0.00
21-Jun JN21			0	5679	0.00
22-Jun JN22			0	1831	0.00
23-Jun JN23			0	3868	0.00
24-Jun JN24			0	8503	0.00
25-Jun JN25			0	12962	0.00
26-Jun JN26	68	2448	2562	6450	0.40
27-Jun JN27			0	9312	0.00
28-Jun JN28			0	10286	0.00
29-Jun JN29			0	8672	0.00
30-Jun JN30			0	8652	0.00
01-Jul J1			0	16563	0.00
02-Jul J2			0	27233	0.00
03-Jul J3	186	9226	9655	23120	0.42
04-Jul J4			0	19539	0.00
05-Jul J5			0	49235	0.00
06-Jul J6			0	42168	0.00
07-Jul J7			0	46942	0.00
08-Jul J8			0	56756	0.00
09-Jul J9			0	46442	0.00
10-Jul J10	104	9166	9592	59290	0.16
11-Jul J11	74	6846	7164	49198	0.15
12-Jul J12	72	4246	4443	57803	0.08
13-Jul J13			0	36400	0.00
14-Jul J14			0	46757	0.00
15-Jul J15			0	47670	0.00
16-Jul J16	187	11184	11704	54851	0.21
17-Jul J17	135	5397	5648	36225	0.16
18-Jul J18	68	2214	2325	34994	0.07
19-Jul J19			0	46735	0.00
20-Jul J20			0	54068	0.00
21-Jul J21			0	70420	0.00
22-Jul J22			0	59570	0.00
23-Jul J23	42	5627	5888	40051	0.15
24-Jul J24	35	3740	3914	26464	0.15
25-Jul J25			0	22630	0.00
26-Jul J26			0	27372	0.00
27-Jul J27	33	4632	4847	34993	0.14
28-Jul J28	31	2429	2542	45300	0.06
29-Jul J29			0	28136	0.00
30-Jul J30			0	31375	0.00
31-Jul J31	18	1453	1521	41590	0.04
01-Aug A1	13	1260	1319	21694	0.06
02-Aug A2			0	56217	0.00
03-Aug A3			0	75994	0.00
04-Aug A4	27	1638	1714	27344	0.06
05-Aug A5	25	2125	2224	16545	0.13
06-Aug A6			0	14148	0.00
07-Aug A7			0	8380	0.00
08-Aug A8	27	1074	1124	11387	0.10
09-Aug A9	27	1538	1610	14443	0.11
10-Aug A10	100	4896	5124	25469	0.20
11-Aug A11			0	18968	0.00
12-Aug A12			0	11878	0.00
13-Aug A13			0	12404	0.00
14-Aug A14	32	851	890	11332	0.08
15-Aug A15	52	2006	2099	6676	0.31
16-Aug A16	77	1519	1590	5419	0.29
17-Aug A17			0	5133	0.00
18-Aug A18			0	1190	0.00
19-Aug A19			0	2611	0.00
20-Aug A20			0	3390	0.00

DATE	EFFORT OUTSIDE	HAIL CATCH	SALES CATCH	OUTSIDE RUN	DAILY H.R.	YEARLY TOTAL SALES CATCH
06-Jun JN6			0	610	0.00	
07-Jun JN7			0	1476	0.00	
08-Jun JN8			0	1791	0.00	
09-Jun JN9			0	1112	0.00	
10-Jun JN10			0	6802	0.00	
11-Jun JN11			0	2097	0.00	
12-Jun JN12			0	2343	0.00	
13-Jun JN13			0	3593	0.00	
14-Jun JN14			0	1191	0.00	
15-Jun JN15			0	4626	0.00	
16-Jun JN16			0	4892	0.00	
17-Jun JN17			0	4597	0.00	
18-Jun JN18			0	3022	0.00	
19-Jun JN19			0	4026	0.00	
20-Jun JN20			0	5679	0.00	
21-Jun JN21			0	1831	0.00	
22-Jun JN22			0	3868	0.00	
23-Jun JN23			0	8503	0.00	
24-Jun JN24			0	12962	0.00	
25-Jun JN25			0	6450	0.00	
26-Jun JN26	46	1523	1594	10905	0.15	10886
27-Jun JN27			0	10286	0.00	
28-Jun JN28			0	8672	0.00	
29-Jun JN29			0	8652	0.00	
30-Jun JN30			0	16563	0.00	
01-Jul J1			0	27233	0.00	
02-Jul J2			0	23120	0.00	
03-Jul J3	73	3207	3356	22895	0.15	27327
04-Jul J4			0	49235	0.00	
05-Jul J5			0	42168	0.00	
06-Jul J6			0	46942	0.00	
07-Jul J7			0	56756	0.00	
08-Jul J8			0	46442	0.00	
09-Jul J9			0	59290	0.00	
10-Jul J10	172	19873	20796	69994	0.30	95227
11-Jul J11	212	16069	16815	74618	0.23	47740
12-Jul J12	170	9461	9900	46300	0.21	32530
13-Jul J13			0	46757	0.00	
14-Jul J14			0	47670	0.00	
15-Jul J15			0	54851	0.00	
16-Jul J16	128	9362	9797	46022	0.21	74963
17-Jul J17	167	11760	12307	47301	0.26	37172
18-Jul J18	163	8946	9393	56129	0.17	37559
19-Jul J19			0	54068	0.00	
20-Jul J20			0	70420	0.00	
21-Jul J21			0	59570	0.00	
22-Jul J22			0	40051	0.00	
23-Jul J23	29	7069	7397	33862	0.22	55796
24-Jul J24	19	1927	2017	24646	0.08	27074
25-Jul J25			0	27372	0.00	
26-Jul J26			0	34993	0.00	
27-Jul J27	27	3396	3554	48854	0.07	13313
28-Jul J28	20	3610	3778	31914	0.12	11639
29-Jul J29			0	31375	0.00	
30-Jul J30			0	41590	0.00	
31-Jul J31	10	927	970	22664	0.04	8595
01-Aug A1	9	1374	1438	57655	0.02	6748
02-Aug A2			0	75994	0.00	
03-Aug A3			0	27344	0.00	
04-Aug A4	33	2471	2586	19131	0.14	42052
05-Aug A5	27	2128	2227	16375	0.14	34603
06-Aug A6			0	8380	0.00	
07-Aug A7			0	11387	0.00	
08-Aug A8	41	1241	1299	15741	0.08	11956
09-Aug A9	31	2146	2246	27715	0.08	10677
10-Aug A10	43	1630	1706	20673	0.08	12653
11-Aug A11			0	11878	0.00	
12-Aug A12			0	12404	0.00	
13-Aug A13			0	11332	0.00	
14-Aug A14	24	842	881	7558	0.12	9160
15-Aug A15	12	240	251	5670	0.04	8789
16-Aug A16			0	5133	0.00	1590
17-Aug A17			0	1190	0.00	
18-Aug A18			0	2611	0.00	330
19-Aug A19			0	3390	0.00	275
20-Aug A20			0	2631	0.00	280

21-Aug A21	915	33	318	333	2331	0.14	24	355	371	3390	0.11	3	20	21	2631	0.01	7	43	45	3433	0.01	770
22-Aug A22	1998	26	524	548	3019	0.18	11	165	173	2610	0.07			0	3388	0.00			0	4340	0.00	721
23-Aug A23	2471	18	429	449	2437	0.18	13	278	291	3388	0.09			0	4340	0.00			0	2028	0.00	740
24-Aug A24	1988	19	232	243	3097	0.08	12	244	255	4340	0.06			0	2028	0.00			0	1122	0.00	498
25-Aug A25	2855			0	4085	0.00			0	2028	0.00			0	1122	0.00			0	718	0.00	
26-Aug A26	4085			0	2028	0.00			0	1122	0.00			0	718	0.00			0	789	0.00	
27-Aug A27	2028			0	1122	0.00			0	718	0.00			0	789	0.00			0	1009	0.00	
28-Aug A28	1122	29	394	412	718	0.57	16	78	82	789	0.10			0	1009	0.00			0	1772	0.00	494
29-Aug A29	305	30	234	245	708	0.35	18	108	113	1009	0.11			0	1772	0.00			0	915	0.00	358
30-Aug A30	463			0	896	0.00			0	1772	0.00			0	915	0.00			0	0	0.00	
31-Aug A31	896			0	1772	0.00			0	915	0.00			0	0	0.00			0	0	0.00	
01-Sep S1	1772			0	915	0.00			0	0	0.00			0	0	0.00			0		0.00	
02-Sep S2	915			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
03-Sep S3	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
04-Sep S4	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
05-Sep S5	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
06-Sep S6	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
07-Sep S7	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
08-Sep S8	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
09-Sep S9	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
10-Sep S10	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
11-Sep S11	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
12-Sep S12	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
13-Sep S13	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
14-Sep S14	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
15-Sep S15	0			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
TOTAL	1260374	2999	262173	274398	1534772	0.179	1967	137806	144248	1679020	0.086	1435	85535	89517	1768537	0.051	1463	109245	114352	1881974	0.061	622515
AREA 4 H.R.						0.146					0.077					0.048					0.061	0.331

1990 AREA 4 RECONSTRUCTION
24-Oct

DATE	ACTUAL ESC	EFFORT R/G/S	HAIL CATCH	SALES CATCH	R/G/S RUN	DAILY H.R.	EFFORT SMITH	HAIL CATCH	SALES CATCH	SMITH RUN	DAILY H.R.	EFFORT SOUND	HAIL CATCH	SALES CATCH	SOUND RUN	DAILY H.R.	EFFORT OUTSIDE	HAIL CATCH	SALES CATCH	OUTSIDE RUN	DAILY H.R.	YEARLY TOTAL SALES CATCH
06-Jun JN6				0	0	0.00			0	0	0.00			0	0	0.00			0	0	0.00	
07-Jun JN7				0	0	0.00			0	0	0.00			0	0	0.00			0	1324	0.00	
08-Jun JN8				0	0	0.00			0	0	0.00			0	1324	0.00			0	448	0.00	
09-Jun JN9				0	0	0.00			0	1324	0.00			0	448	0.00			0	453	0.00	
10-Jun JN10				0	1324	0.00			0	448	0.00			0	453	0.00			0	458	0.00	
11-Jun JN11	1324			0	448	0.00			0	453	0.00			0	458	0.00			0	1207	0.00	
12-Jun JN12	448			0	453	0.00			0	458	0.00			0	1207	0.00			0	1519	0.00	
13-Jun JN13	453			0	458	0.00			0	1207	0.00			0	1519	0.00			0	1159	0.00	
14-Jun JN14	458			0	1207	0.00			0	1519	0.00			0	1159	0.00			0	1295	0.00	
15-Jun JN15	1207			0	1519	0.00			0	1159	0.00			0	1295	0.00			0	2707	0.00	
16-Jun JN16	1519			0	1159	0.00			0	1295	0.00			0	2707	0.00			0	3972	0.00	
17-Jun JN17	1159			0	1295	0.00			0	2707	0.00			0	3972	0.00			0	915	0.00	
18-Jun JN18	1295			0	2707	0.00			0	3972	0.00			0	915	0.00			0	604	0.00	
19-Jun JN19	2707			0	3972	0.00			0	915	0.00			0	604	0.00			0	2278	0.00	
20-Jun JN20	3972			0	915	0.00			0	604	0.00			0	2278	0.00			0	1694	0.00	
21-Jun JN21	915			0	604	0.00			0	2278	0.00			0	1694	0.00			0	1821	0.00	
22-Jun JN22	604			0	2278	0.00			0	1694	0.00			0	1821	0.00			0	3145	0.00	
23-Jun JN23	2278			0	1694	0.00			0	1821	0.00			0	3145	0.00			0	4320	0.00	
24-Jun JN24	1694			0	1821	0.00			0	3145	0.00			0	4320	0.00			0	9241	0.00	
25-Jun JN25	1821			0	3145	0.00			0	4320	0.00			0	9241	0.00			0	2844	0.00	
26-Jun JN26	3145	89	2362	2490	4320	0.58	181	3354	3535	9241	0.38	78	943	994	2844	0.35	44	1018	1073	8434	0.13	8092
27-Jun JN27	1830			0	5706	0.00			0	1850	0.00			0	7361	0.00			0	6338	0.00	
28-Jun JN28	5706			0	1850	0.00			0	7361	0.00			0	6338	0.00			0	1275	0.00	
29-Jun JN29	1850			0	7361	0.00			0	6338	0.00			0	1275	0.00			0	3419	0.00	
30-Jun JN30	7361			0	6338	0.00			0	1275	0.00			0	3419	0.00			0	6805	0.00	
01-Jul J1	6338			0	1275	0.00			0	3419	0.00			0	6805	0.00			0	10775	0.00	
02-Jul J2	1275	146	2958	3117	3419	0.91	184	4212	4439	6805	0.65	36	948	999	10775	0.09	86	2268	2390	7278	0.33	10946
03-Jul J3	302			0	2366	0.00			0	9775	0.00			0	4888	0.00			0	11294	0.00	
04-Jul J4	2366			0	9775	0.00			0	4888	0.00			0	11294	0.00			0	7575	0.00	
05-Jul J5	9775			0	4888	0.00			0	11294	0.00			0	7575	0.00			0	3155	0.00	
06-Jul J6	4888			0	11294	0.00			0	7575	0.00			0	3155	0.00			0	11451	0.00	
07-Jul J7	11294			0	7575	0.00			0	3155	0.00			0	11451	0.00			0	16396	0.00	
08-Jul J8	7575			0	3155	0.00			0	11451	0.00			0	16396	0.00			0	11007	0.00	
09-Jul J9	3155	169	3899	4110	11451	0.36	156	9182	9678	16396	0.59	50	1824	1923	11007	0.17	81	2045	2156	23595	0.09	17866
10-Jul J10	7341			0	6718	0.00			0	9084	0.00			0	21440	0.00			0	29716	0.00	
11-Jul J11	6718			0	9084	0.00			0	21440	0.00			0	29716	0.00			0	30504	0.00	
12-Jul J12	9084			0	21440	0.00			0	29716	0.00			0	30504	0.00			0	20417	0.00	
13-Jul J13	21440			0	29716	0.00			0	30504	0.00			0	20417	0.00			0	52290	0.00	
14-Jul J14	29716			0	30504	0.00			0	20417	0.00			0	52290	0.00			0	59232	0.00	
15-Jul J15	30504			0	20417	0.00			0	52290	0.00			0	59232	0.00			0	70118	0.00	
16-Jul J16	20417	279	23874	25164	52290	0.48	196	13953	14707	59232	0.25	89	4670	4922	70118	0.07	112	11485	12105	47605	0.25	56898
17-Jul J17	27126			0	44525	0.00			0	65196	0.00			0	35499	0.00			0	51769	0.00	
18-Jul J18	44525			0	65196	0.00			0	35499	0.00			0	51769	0.00			0	17234	0.00	
19-Jul J19	65196			0	35499	0.00			0	51769	0.00			0	17234	0.00			0	49968	0.00	
20-Jul J20	35499			0	51769	0.00			0	17234	0.00			0	49968	0.00			0	72387	0.00	
21-Jul J21	51769			0	17234	0.00			0	49968	0.00			0	72387	0.00			0	59872	0.00	
22-Jul J22	17234	276	24564	40231	49968	0.81	208	34237	56074	72387	0.77	62	8717	14277	59872	0.24	152	21188	34702	112746	0.31	145284
23-Jul J23	9737	150	10710	11289	16313	0.69	271	21003	22138	45595	0.49	125	6753	7118	78044	0.09	152	20497	21605	81416	0.27	62149
24-Jul J24	5024	75	5470	5766	23457	0.25	298	26692	28134	70926	0.40	150	9672	10195	59812	0.17	175	21839	23019	79530	0.29	67114
25-Jul J25	17691			0	42792	0.00			0	49617	0.00			0	56511	0.00			0	18275	0.00	
26-Jul J26	42792			0	49617	0.00			0	56511	0.00			0	18275	0.00			0	80099	0.00	
27-Jul J27	49617			0	56511	0.00			0	18275	0.00			0	80099	0.00			0	129743	0.00	
28-Jul J28	56511			0	18275	0.00			0	80099	0.00			0	129743	0.00			0	73033	0.00	
29-Jul J29	18275	245	38933	65338	80099	0.82	375	33188	55697	129743	0.43	168	11516	19326	73033	0.26	79	6049	10152	67160	0.15	150513
30-Jul J30	14761	245	37855	39901	74047	0.54	375	24008	25305	53707	0.47	168	18420	19415	57008	0.34	79	10079	10624	48800	0.22	95245
31-Jul J31	34146			0	28401	0.00			0	37593	0.00			0	38177	0.00			0	34759	0.00	
01-Aug A1	28401			0	37593	0.00			0	38177	0.00			0	34759	0.00			0	18149	0.00	
02-Aug A2	37593			0	38177	0.00			0	34759	0.00			0	18149	0.00			0	29971	0.00	
03-Aug A3	38177			0	34759	0.00			0	18149	0.00			0	29971	0.00			0	31936	0.00	
04-Aug A4	34759			0	18149	0.00			0	29971	0.00			0	31936	0.00			0	50023	0.00	
05-Aug A5	18149	288	24517	25842	29971	0.86	159	12289	12953	31936	0.41	81	6210	6546	50023	0.13	68	9337	9842	47421	0.21	55183
06-Aug A6	4128	169	11793	12430	18983	0.65	149	8261	8707	43478	0.20	86	5855	6171	37580	0.16	91	6114	6444	39686	0.16	33753
07-Aug A7	6553	150	15243	16066	34770	0.46	90	5033	5305	31408	0.17	75	3105	3273	33242	0.10	58	6847	7217	27352	0.26	31861
08-Aug A8	18704			0	26104	0.00			0	29969	0.00			0	20135	0.00			0	18120	0.00	
09-Aug A9	26104			0	29969	0.00			0	20135	0.00			0	18120	0.00			0	27641	0.00	
10-Aug A10	29969			0	20135	0.00			0	18120	0.00			0	27641	0.00			0	31575	0.00	
11-Aug A11	20135			0	18120	0.00			0	27641	0.00			0	31575	0.00			0	27105	0.00	
12-Aug A12	18120	146	15444	16279	27641	0.59	51	4048	4267	31575	0.14	14	1113	1173	27105	0.04	44	3502	3691	23151	0.16	25410
13-Aug A13	11362	164	16735	17640	27308	0.65	28	1511	1593	25932	0.06	14	830	875	19459	0.04	26	1940	2045	10271	0.20	22152
14-Aug A14	9668	150	14510	15294	24339	0.63	36	1396	1471	18584	0.08	20	678	715	8226	0.09	18	1554	1638	12882	0.13	19118
15-Aug A15	9045	120	8837	9314	17113	0.54	20	762	803	7512	0.11	16	696	734	11244	0.07	21	616	649	5586	0.12	11500
16-Aug A16	7799			0	6708	0.00	24	1473	1553	10511	0.15			0	4936	0.00			0	9111	0.00	1553
17-Aug A17	6708			0	8958	0.00			0	4936	0.00			0	9111	0.00			0	5679	0.00	
18-Aug A18	8958			0	4936	0.00			0	9111	0.00			0	5679	0.00			0	7783	0.00	
19-Aug A19	4936	56	2261	2383	9111	0.26	24	1202	1267	5679	0.22	4	57	60	7783	0.01	13	419	442	7967	0.06	4152
20-Aug A20	6728	35	1008	1062	4412	0.24	15	650	685	7723	0.09	10	149	157	7525	0.02	12	118	124	7102	0.02	2029

21-Aug A21	3349	32	1218	1284	7038	0.18	14	142	150	7368	0.02	7	112	118	6978	0.02	10	175	184	7516	0.02	1736
22-Aug A22	5754	29	1722	1815	7219	0.25	10	227	239	6860	0.03			0	7332	0.00			0	7409	0.00	2054
23-Aug A23	5404			0	6621	0.00			0	7332	0.00			0	7409	0.00			0	828	0.00	
24-Aug A24	6621			0	7332	0.00			0	7409	0.00			0	828	0.00			0	3023	0.00	
25-Aug A25	7332			0	7409	0.00			0	828	0.00			0	3023	0.00			0	6588	0.00	
26-Aug A26	7409			0	828	0.00			0	3023	0.00			0	6588	0.00			0	2752	0.00	
27-Aug A27	828	30	947	998	3023	0.33	13	203	214	6588	0.03			0	2752	0.00			0	1830	0.00	1212
28-Aug A28	2025	13	219	231	6375	0.04	5	60	63	2752	0.02			0	1830	0.00			0	4441	0.00	294
29-Aug A29	6144	10	258	304	2689	0.11	6	153	180	1830	0.10	2	19	22	4441	0.01			0	982	0.00	506
30-Aug A30	2385	5	78	82	1650	0.05	2	22	23	4419	0.01	4	53	56	982	0.06			0	1243	0.00	161
31-Aug A31	1568	1	4	4	4395	0.00	5	38	40	926	0.04	5	24	25	1243	0.02			0	1000	0.00	70
01-Sep S1	4391			0	886	0.00			0	1217	0.00			0	1000	0.00			0		0.00	
02-Sep S2	886			0	1217	0.00			0	1000	0.00			0	1804	0.00			0		0.00	
03-Sep S3	1217	11	118	124	1000	0.12	8	118	124	1804	0.07	11	87	92	2657	0.03			0		0.00	340
04-Sep S4	876	11	102	108	1680	0.00	8	248	261	2566	0.10	9	111	117	703	0.17			0		0.00	486
05-Sep S5	1572	8	34	36	2304	0.02	7	73	77	586	0.13	6	22	23	553	0.04			0		0.00	136
06-Sep S6	2269	11	67	71	509	0.14	10	69	73	530	0.14	5	52	55	512	0.11			0		0.00	198
07-Sep S7	458			0	458	0.00			0	458	0.00			0	0	0.00			0		0.00	
08-Sep S8	458			0	458	0.00			0	0	0.00			0	0	0.00			0		0.00	
09-Sep S9	458			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
10-Sep S10				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
11-Sep S11				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
12-Sep S12				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
13-Sep S13				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
14-Sep S14				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
15-Sep S15				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
TOTAL	1111217	3113	265740	318771	1429988	0.223	2928	207807	259757	1689746	0.154	1295	82636	99380	1789126	0.056	1321	127090	150102	1932998	0.078	828011
AREA 4 H.R.						0.164					0.134					0.051					0.077	0.427

1991 AREA 4 RECONSTRUCTION
24-Oct

DATE	ACTUAL ESC	EFFORT R/G/S	HAIL CATCH	SALES CATCH	R/G/S RUN	DAILY H.R.	EFFORT SMITH	HAIL CATCH	SALES CATCH	SMITH RUN	DAILY H.R.	EFFORT SOUND	HAIL CATCH	SALES CATCH	SOUND RUN	DAILY H.R.	EFFORT OUTSIDE	HAIL CATCH	SALES CATCH	OUTSIDE RUN	DAILY H.R.	YEARLY TOTAL SALES CATCH
06-Jun JN6	0			0	0	0.00			0	0	0.00			0	0	0.00			0	667	0.00	
07-Jun JN7	0			0	0	0.00			0	0	0.00			0	667	0.00			0	1323	0.00	
08-Jun JN8	0			0	0	0.00			0	667	0.00			0	1323	0.00			0	656	0.00	
09-Jun JN9	0			0	667	0.00			0	1323	0.00			0	656	0.00			0	962	0.00	
10-Jun JN10	667			0	1323	0.00			0	656	0.00			0	962	0.00			0	1946	0.00	
11-Jun JN11	1323			0	656	0.00			0	962	0.00			0	1946	0.00			0	2963	0.00	
12-Jun JN12	656			0	962	0.00			0	1946	0.00			0	2963	0.00			0	6505	0.00	
13-Jun JN13	962			0	1946	0.00			0	2963	0.00			0	6505	0.00			0	2055	0.00	
14-Jun JN14	1946			0	2963	0.00			0	6505	0.00			0	2055	0.00			0	4723	0.00	
15-Jun JN15	2963			0	6505	0.00			0	2055	0.00			0	4723	0.00			0	8790	0.00	
16-Jun JN16	6505			0	2055	0.00			0	4723	0.00			0	8790	0.00			0	3017	0.00	
17-Jun JN17	2055			0	4723	0.00			0	8790	0.00			0	3017	0.00			0	3291	0.00	
18-Jun JN18	4723			0	8790	0.00			0	3017	0.00			0	3291	0.00			0	3422	0.00	
19-Jun JN19	8790			0	3017	0.00			0	3291	0.00			0	3422	0.00			0	1724	0.00	
20-Jun JN20	3017			0	3291	0.00			0	3422	0.00			0	1724	0.00			0	3028	0.00	
21-Jun JN21	3291			0	3422	0.00			0	1724	0.00			0	3028	0.00			0	1399	0.00	
22-Jun JN22	3422			0	1724	0.00			0	3028	0.00			0	1399	0.00			0	2711	0.00	
23-Jun JN23	1724			0	3028	0.00			0	1399	0.00			0	2711	0.00			0	3520	0.00	
24-Jun JN24	3028			0	1399	0.00			0	2711	0.00			0	3520	0.00			0	3662	0.00	
25-Jun JN25	1399			0	2711	0.00			0	3520	0.00			0	3662	0.00			0	3619	0.00	
26-Jun JN26	2711			0	3520	0.00			0	3662	0.00			0	3619	0.00			0	4056	0.00	
27-Jun JN27	3520			0	3662	0.00			0	3619	0.00			0	4056	0.00			0	3050	0.00	
28-Jun JN28	3662			0	3619	0.00			0	4056	0.00			0	3050	0.00			0	7106	0.00	
29-Jun JN29	3619			0	4056	0.00			0	3050	0.00			0	7106	0.00			0	3064	0.00	
30-Jun JN30	4056			0	3050	0.00			0	7106	0.00			0	3064	0.00			0	26721	0.00	
01-Jul J1	3050			0	7106	0.00			0	3064	0.00			0	26721	0.00			0	12411	0.00	
02-Jul J2	7106	56	1898	1686	3064	0.55	207	22006	19549	26721	0.73	30	840	746	12411	0.06	58	995	884	47206	0.02	22865
03-Jul J3	1378			0	7172	0.00			0	11665	0.00			0	46322	0.00			0	36789	0.00	
04-Jul J4	7172			0	11665	0.00			0	46322	0.00			0	36789	0.00			0	53057	0.00	
05-Jul J5	11665			0	46322	0.00			0	36789	0.00			0	53057	0.00			0	56068	0.00	
06-Jul J6	46322			0	36789	0.00			0	53057	0.00			0	56068	0.00			0	39380	0.00	
07-Jul J7	36789			0	53057	0.00			0	56068	0.00			0	39380	0.00			0	41015	0.00	
08-Jul J8	53057	139	29715	26397	56068	0.47	256	16420	14586	39380	0.37	94	11802	10484	41015	0.26	61	8511	7561	57712	0.13	59028
09-Jul J9	29671	98	6459	5738	24794	0.23	188	11523	10236	30531	0.34	113	8306	7378	50151	0.15	127	15765	14004	57438	0.24	37356
10-Jul J10	19056	95	6367	5656	20295	0.28	182	9580	8510	42773	0.20	120	8342	7410	43433	0.17	123	15925	14147	32787	0.43	35723
11-Jul J11	14639			0	34263	0.00			0	36023	0.00			0	18640	0.00			0	35367	0.00	
12-Jul J12	34263			0	36023	0.00			0	18640	0.00			0	35367	0.00			0	41637	0.00	
13-Jul J13	36023			0	18640	0.00			0	35367	0.00			0	41637	0.00			0	67243	0.00	
14-Jul J14	18640			0	35367	0.00			0	41637	0.00			0	67243	0.00			0	68297	0.00	
15-Jul J15	35367	189	14553	12928	41637	0.31	276	33661	29902	67243	0.44	99	9327	8286	68297	0.12	189	20721	18407	99766	0.18	69523
16-Jul J16	28709	169	20817	18492	37340	0.50	266	21065	18713	60011	0.31	150	13542	12030	81359	0.15	162	13805	12263	97218	0.13	61498
17-Jul J17	18848	183	14726	13082	41299	0.32	276	18257	16218	69329	0.23	160	8290	7364	84954	0.09	155	14349	12747	38013	0.34	49411
18-Jul J18	28217			0	53111	0.00			0	77590	0.00			0	25266	0.00			0	78705	0.00	
19-Jul J19	53111			0	77590	0.00			0	25266	0.00			0	78705	0.00			0	57073	0.00	
20-Jul J20	77590			0	25266	0.00			0	78705	0.00			0	57073	0.00			0	62799	0.00	
21-Jul J21	25266	275	48626	43196	78705	0.55	225	25191	22378	57073	0.39	133	16645	14786	62799	0.24	129	29135	25882	75480	0.34	106242
22-Jul J22	35509	250	19943	17716	34695	0.51	238	8442	7499	48013	0.16	145	6627	5887	49599	0.12	154	15870	14098	79763	0.18	45200
23-Jul J23	16979	239	30112	26749	40513	0.66	209	11292	10031	43712	0.23	132	9676	8596	65665	0.13	127	11526	10239	90835	0.11	55615
24-Jul J24	13764	199	12611	11203	33681	0.33	157	8973	7971	57070	0.14	112	10080	8954	80596	0.11	104	11364	10095	55947	0.18	38223
25-Jul J25	22478			0	49099	0.00			0	71642	0.00			0	45852	0.00			0	66770	0.00	
26-Jul J26	49099			0	71642	0.00			0	45852	0.00			0	66770	0.00			0	48940	0.00	
27-Jul J27	71642			0	45852	0.00			0	66770	0.00			0	48940	0.00			0	44144	0.00	
28-Jul J28	45852	205	48370	42969	66770	0.64	114	12629	11219	48940	0.23	101	5188	4609	44144	0.10	167	16309	14488	70622	0.21	73284
29-Jul J29	23801	145	20261	17999	37722	0.48	200	15950	14169	39536	0.36	98	5789	5143	56134	0.09	112	10676	9484	39466	0.24	46794
30-Jul J30	19723	130	15289	13582	25367	0.54	180	16168	14363	50991	0.28	96	10586	9404	29982	0.31	112	12962	11515	27821	0.41	48863
31-Jul J31	11785	165	15068	13385	36628	0.37	145	5997	5327	20578	0.26	65	6393	5679	16306	0.35	85	11051	9817	25757	0.38	34209
01-Aug A1	23243			0	15251	0.00			0	10627	0.00			0	15940	0.00			0	45099	0.00	
02-Aug A2	15251			0	10627	0.00			0	15940	0.00			0	45099	0.00			0	30290	0.00	
03-Aug A3	10627			0	15940	0.00			0	45099	0.00			0	30290	0.00			0	24903	0.00	
04-Aug A4	15940	161	34264	30438	45099	0.67	48	4615	4100	30290	0.14	35	2143	1904	24903	0.08	60	2462	2187	22804	0.10	38628
05-Aug A5	14661	150	22764	20713	26190	0.79	30	2992	2722	22999	0.12	25	1595	1451	20617	0.07	49	2697	2454	22955	0.11	27341
06-Aug A6	5477	125	7774	6906	20277	0.34	35	3274	2908	19165	0.15	28	2242	1992	20501	0.10	42	4330	3846	39820	0.10	15652
07-Aug A7	13371			0	16257	0.00			0	18509	0.00			0	35974	0.00			0	20664	0.00	
08-Aug A8	16257			0	18509	0.00	184	10848	9637	35974	0.27			0	20664	0.00			0	19482	0.00	9637
09-Aug A9	18509			0	26337	0.00	104	4851	4309	20664	0.21			0	19482	0.00			0	16527	0.00	4309
10-Aug A10	26337			0	16355	0.00			0	19482	0.00			0	16527	0.00			0	29704	0.00	
11-Aug A11	16355			0	19482	0.00			0	16527	0.00			0	29704	0.00			0	31747	0.00	
12-Aug A12	19482	106	8168	5999	16527	0.36	55	7103	5217	29704	0.18	56	10604	7788	31747	0.25	48	7771	5708	53461	0.11	24712
13-Aug A13	10528	94	5696	5060	24487	0.21	74	5396	4794	23959	0.20	35	2545	2261	47754	0.05	53	7007	6225	21356	0.29	18339
14-Aug A14	19427			0	19165	0.00	247	19903	17680	45493	0.39			0	15131	0.00			0	7500	0.00	17680
15-Aug A15	19165			0	27813	0.00			0	15131	0.00			0	7500	0.00			0	6002	0.00	
16-Aug A16	27813			0	15131	0.00			0	7500	0.00			0	6002	0.00			0	18459	0.00	
17-Aug A17	15131			0	7500	0.00			0	6002	0.00			0	18459	0.00			0	10523	0.00	
18-Aug A18	7500			0	6002	0.00			0	18459	0.00			0	10523	0.00			0	11330	0.00	
19-Aug A19	6002	77	5669	5187	18459	0.28	34	2354	2154	10523	0.20	19	973	890	11330	0.08	38	1038	950	6387	0.15	9180
20-Aug A20	13272	60	3239	2969	8370	0.35	30	1324	1214	10440	0.12	16	483	443	5437	0.08	33	1772	1624	5998	0.27	6249

21-Aug A21	5401	50	3852	3422	9227	0.37	25	909	807	4994	0.16	15	395	351	4374	0.08	28	259	230	4122	0.06	4810
22-Aug A22	5805			0	4187	0.00			0	4023	0.00			0	3892	0.00			0	3509	0.00	
23-Aug A23	4187			0	4023	0.00			0	3892	0.00			0	3509	0.00			0	9567	0.00	
24-Aug A24	4023			0	3892	0.00			0	3509	0.00			0	9567	0.00			0	7019	0.00	
25-Aug A25	3892			0	3509	0.00			0	9567	0.00			0	7019	0.00			0	7182	0.00	
26-Aug A26	3509	28	763	678	9567	0.07	25	545	484	7019	0.07	14	84	75	7182	0.01	4	26	23	12585	0.00	1260
27-Aug A27	8889	19	440	391	6535	0.06	16	506	450	7108	0.06	7	74	66	12562	0.01	4	13	12	7129	0.00	918
28-Aug A28	6144			0	6658	0.00			0	12496	0.00			0	7117	0.00			0	2055	0.00	
29-Aug A29	6658			0	12496	0.00			0	7117	0.00			0	2055	0.00			0	4646	0.00	
30-Aug A30	12496			0	7117	0.00			0	2055	0.00			0	4646	0.00			0	2515	0.00	
31-Aug A31	7117			0	2055	0.00			0	4646	0.00			0	2515	0.00			0	1509	0.00	
01-Sep S1	2055			0	4646	0.00			0	2515	0.00			0	1509	0.00			0		0.00	
02-Sep S2	4646			0	2515	0.00			0	1509	0.00			0	0	0.00			0		0.00	
03-Sep S3	2515			0	1509	0.00			0	0	0.00			0	0	0.00			0		0.00	
04-Sep S4	1509			0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
05-Sep S5				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
06-Sep S6				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
07-Sep S7				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
08-Sep S8				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
09-Sep S9				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
10-Sep S10				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
11-Sep S11				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
12-Sep S12				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
13-Sep S13				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
14-Sep S14				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
15-Sep S15				0	0	0.00			0	0	0.00			0	0	0.00			0		0.00	
TOTAL	1353804	3407	397444	352539	1706343	0.207	4026	301774	267147	1973490	0.135	1898	152571	133976	2107466	0.064	2224	236339	208887	2316353	0.090	962549
AREA 4 H.R.						0.152					0.115					0.058					0.090	0.416