COMMERCIAL SALMON ALLOCATION

Introduction

The allocation of salmon amongst each of the salmon fleets has always been a contentious enterprise. There is a broad diversity of views on every element of salmon allocation. The cultural, social, and economic features of this species are important, not only to harvesters and primary users but of the general public across Canada.

The allocation of salmon among commercial licence harvesters is a significant component of ongoing management processes as well as attempting to identify and evaluate management options for the future. The following document is a summary of the development of the Allocation Policy and the annual process to define allocation targets.

The development of an Allocation Policy is founded on the principle that Pacific salmon belong to the people of Canada as a common property resource and must be sustainably managed by government for the benefit of present and future generations. This includes meeting of conservation objectives to not only sustain the stock but also allow for reasonable rebuilding from low levels. As well a policy focused on salmon allocation must also reflect First Nations priority access for food, social and ceremonial needs as well as international Treaties Canada is committed to. Once these parameters are addressed, social priorities come into play and it is here the diversity of views is the greatest. In developing the Allocation Policy, a wide range of views were considered over a number of years.

History

Throughout the middle portion of the last century, salmon harvesters had the utmost of flexibility with the ability to change gear types and fish throughout the coast. However with the introduction of licence limitation in the late 1960's the Department was increasingly challenged to make allocation policies that could be supported by the majority of the fleet, management decisions that were seen to be fair and provide a benchmark to evaluate allocation decisions. The introduction of Area Licencing in 1996 further added to the necessity of having a clear allocation framework.

In early 1996, Dr. A. May was asked to provide recommendations to the Minister on an intersectoral Allocation Policy Framework including initial shares and identify a process to allow adjustments in shares. In recommendations dealing with commercial sharing arrangements, Dr. May recommended the years 1991 – 1994 as the base for salmon allocation purposes (there were significant departures in 1995 (and 1996 when he was writing the report) and going to previous years would only serve to reopen historical grievances). He also recommended that a tribunal be established to make recommendations regarding commercial allocation decisions.

In 1997 and again in 1998 Steven Kelleher was asked to provide advice on commercial sharing arrangements for the salmon fishery for the upcoming 4 year period. In his first series of recommendations which are summarized in a letter to the Minister dated April 30, 1997, Mr. Kelleher provided advice on coastal sharing which was to be based on sockeye equivalents comprised of all salmon species for four year periods, specific troll recommendations based on the "Troll Consensus", equitable sharing (to the extent possible) between fleets of the same gear type, "Catch-up – Make Up" provisions for Fraser sockeye, and variances/adjustments resulting from differences in forecasted and actual catches. Following submission of this letter, Mr. Kelleher was asked to continue to work with the commercial industry to develop a long term plan for the period 1998 – 2001. Using the previous report as a starting point, Mr. Kelleher consulted broadly and submitted his report prior to the start of the 1998 season. Mr. Kelleher made 23 recommendations across a broad spectrum of issues that influence allocation including coast wide sharing, northern access to Fraser sockeye, Area G fishing in Areas 11 and 111, area reselection, buybacks and implementation of new selective fisheries.

At the same time (starting in October, 1998), Mr. S. Toy was asked to consult with stakeholders on the implementation of Dr. May's recommendations. Based on feedback regarding commercial allocation, Mr. Toy recommended the establishment of initial allocations based on catches from 1991 to 1994 and the accounting framework of sockeye equivalents. Mr. Toy also supported consultation processes regarding allocation recommended by Dr. May that included an "Allocation Board" that was separate from government.

These reports were considered in the development of the Allocation Policy that was released in 1999. The Allocation Policy was comprehensive in that it provided information regarding the priority of conservation and First Nations and the priority of Chinook and coho directed fisheries for the recreational fishery. For commercial salmon, it confirmed the approach of using sockeye equivalents as the currency for determining shares, provided for a sharing arrangement and confirmed that Fraser sockeye would not be available to northern fleets.

The sharing arrangement target for the commercial fleet is 40% seine, 38% gillnet and 22% troll as measured in sockeye equivalents.

The basis for sockeye equivalents was based on the recommendation to use relative catch per licence proportions for the 1991 – 1994 period. Those proportions were 68.1% seine, 12.7% gillnet and 19.2% troll. The current target allocations (40 – 38 – 22 for seine, gillnet and troll respectively) is the result of gear transfers that have taken place since 1994 and applying the "sockeye equivalent by fleet" approach.

Target allocations are not fixed entitlements to the resource and are subject to change over time as a result of conservation issues, changes in management approaches or other issues including some fleets becoming more selective than others.

Calculating Sockeye Equivalents

Annually DFO collects a range of information to derive sockeye equivalents. Catch information is derived from sales slip information (for catch in pieces and weight) and managers estimates and inserted onto the Fishery Operation System database. Where there is insufficient information from Sales Slips due to low catches and improperly completed Sales Slips, standard weights are used. And finally to derive value, DFO contracts an economist to interview fish buyers to determine prices paid to fishermen. The information is captured in a spreadsheet from which sockeye equivalents are calculated.

Sockeye equivalent calculations

$$\text{Sockeye Equivalent} = \frac{\text{Price /fish}}{\text{Price/sockeye}}$$

$$\text{Price/fish} = \frac{\text{Landed value by species}}{\text{Total Catch by species (pieces)}}$$

The objective of using sockeye equivalents is to develop a "common currency" across all species with which to evaluate the returns to harvesters. Sockeye has been selected because of it's ability to be harvested by all fleets and its desirability. Each sockeye caught by a fleet is given a value of "1", other species worth 3 times the average value of sockeye is given a value of "3" while other species worth half that of a sockeye would be given a value of "0.5". So in the example of Chinook having a value of "3" and pink salmon having a value of "0.5", a harvest of 10 sockeye, 3 Chinook and 20 pinks would be valued at "29" (10 + (3 X 3) + (20 X 0.5)).

Annual Process

The annual process consists of 2 parts; the post season review and developing a preseason plan. After collecting the information (See Annex 1 – Instructions for 2007) from the previous year (catch and value), sockeye equivalents by area and by fleet are calculated (See Annex 2 – Annual Sockeye Equivalent Calculations). These are summed and compared to projections developed pre-season. There are no adjustments made where post season values are different from either the target allocation or the allocation estimated in pre-season exercises.

For the second part of the exercise (development of the preseason plan), Area Chiefs of Resource Management provide estimates of forecast catches by area and by gear. Applying the sockeye equivalent values derived from information collected in the previous year to these forecasted catches results in a notional sharing arrangement between all the fleets. In consultation with representatives of the fleet, changes to gear shares are made to achieve the target catch allocation levels. For example if the proposed catches by gear licence area shows the troll fleet exceeding the target level of 22% and the seines are less than the target level of 40%, adjustments are often made (reducing the troll catch of one species in one area and increasing the seine share).

The Allocation Model – Issues

The approach has been revised since the inception of the Allocation Policy. The approach of using sockeye equivalents on a coast wide basis works well if all fleets have access to all fisheries for that gear type. On the Pacific Coast, area licencing restricts fleet movement; the result is that the current allocation framework is "blind" to intra fleet variation (two troll fleets (Area F and G) can have access to good abundances of high value chinook which in some years can consume the entire target share for troll leaving one troll fleet (Area H) with no access to fish – fortunately net fleets have agreed to voluntarily reduce their share so the one troll fleet has access to some fish). In other cases it is very difficult to modify long standing local sharing arrangements in order to balance out allocations to achieve coastal sharing objectives.

For many years, the Allocation Policy was based on one Sockeye Equivalent valuation provided for each species of salmon. This assumes similar weight and valuation for each species regardless of where that fish was harvested. However there is a large discrepancy in size (and value) of Chinook between southern areas and northern areas. The effect then was that a small southern troll caught Chinook was valued the same as a large northern troll caught Chinook. In order to address this, the model has been modified to derive a sockeye equivalent from catches in northern areas and southern areas separately. The caveat to this however is that the value for sockeye is still derived from coast wide data.

Another issue is that related to increased values. Many fleets have worked to improve the value of their catch by improved quality and directed marketing. These increased values are incorporated into the sockeye equivalent calculations in effect penalizing fleets who have taken steps to catch more fish (by using selective fishing measures) or increase the value of their catch and rewarding those fleets who have stayed with status quo approaches.

Review of 2006 and Preseason Planning for 2007

As in past years, DFO staff provided catch estimates and the Catch Data Unit provided updated tables using information solicited from the pricing survey. Table 1 is a summary of that information.

Table 1. Catch and Price Information from 2006

Landed Value ($000)	Seine		Gillnet			Troll		
Species	A	B	C	D	E	F	G	H
Chinook	$ -	$ 54.63	$ 838.97	$ 556.27	$ 157.09	$ 8,254.25	$ 3,393.68	$ -
Sockeye	$ 1,865.46	$ 12,649.78	$ 6,281.88	$ 3,130.56	$ 4,219.32	$ 334.86	$ 682.49	$ 2,729.70
Coho	$ 10.39	$ 2.52	$ 61.13	$ 15.77	$ -	$ 1,830.32	$ 46.78	$ -
Pink	$ 273.22	$ 7.20	$ 139.56	$ 9.37	$ 0.03	$ 70.49	$ 0.04	$ 1.37
Chum	$ 923.43	$ 3,676.39	$ 2,188.63	$ 1,331.88	$ 1,303.90	$ 0.20	$ 74.15	$ 368.65
Total	$ 3,072.49	$ 16,390.53	$ 9,510.16	$ 5,043.85	$ 5,680.33	$ 10,490.11	$ 4,197.14	$ 3,099.72
Catch (tonnes, round)								
Chinook	0.00	11.59	148.10	114.25	36.43	1019.38	404.03	0.00
Sockeye	579.57	3925.68	2112.03	1046.53	1421.74	57.52	156.66	601.44
Coho	6.13	1.53	20.28	5.19	0.00	415.73	10.18	0.00
Pink	729.02	19.21	568.79	36.10	0.11	69.34	0.04	1.76
Chum	805.35	3206.92	2363.34	1438.43	1407.80	0.13	27.64	260.51
	2120.06	7164.93	5212.54	2640.50	2866.08	1562.09	598.55	863.71
Landed Price ($/kg.)								
Chinook		$ 4.71	$ 5.66	$ 4.87	$ 4.31	$ 8.10	$ 8.40	
Sockeye	$ 3.22	$ 3.22	$ 2.97	$ 2.99	$ 2.97	$ 5.82	$ 4.36	$ 4.54
Coho	$ 1.70	$ 1.65	$ 3.01	$ 3.04		$ 4.40	$ 4.59	
Pink	$ 0.37	$ 0.37	$ 0.25	$ 0.26	$ 0.25	$ 1.02	$ 1.00	$ 0.78
Chum	$ 1.15	$ 1.15	$ 0.93	$ 0.93	$ 0.93	$ 1.57	$ 2.68	$ 1.42
Landed Price ($/lb.)								
Chinook		$ 2.14	$ 2.57	$ 2.21	$ 1.96	$ 3.67	$ 3.81	
Sockeye	$ 1.46	$ 1.46	$ 1.35	$ 1.36	$ 1.35	$ 2.64	$ 1.98	$ 2.06
Coho	$ 0.77	$ 0.75	$ 1.37	$ 1.38		$ 2.00	$ 2.08	
Pink	$ 0.17	$ 0.17	$ 0.11	$ 0.12	$ 0.11	$ 0.46	$ 0.45	$ 0.35
Chum	$ 0.52	$ 0.52	$ 0.42	$ 0.42	$ 0.42	$ 0.71	$ 1.22	$ 0.64
Average Weight (kg./piece)								
Chinook	0.00	5.69	8.56	7.80	8.60	8.05	5.11	0.00
Sockeye	2.12	2.40	2.30	2.57	2.53	2.69	2.72	2.71
Coho	3.65	4.08	4.24	3.79	0.00	4.24	4.33	0.00
Pink	1.79	1.59	2.00	1.92	1.69	2.38	2.42	2.09
Chum	4.96	4.54	5.81	4.79	4.56	4.28	3.98	4.56
	- from CCSS							
Catch (pieces, 000's)								
Chinook	0.00	2.04	17.30	14.65	4.24	126.63	79.10	0.00
Sockeye	273.56	1,636.79	917.47	407.75	560.90	21.40	57.69	221.89
Coho	1.68	0.37	4.78	1.37	0.00	98.02	2.35	0.00
Pink	406.24	12.10	285.10	18.83	0.06	29.11	0.01	0.84
Chum	162.30	706.98	406.95	300.56	308.77	0.03	6.94	57.15
Landed Price ($/piece)								
Chinook	0.00	26.82	48.48	37.96	37.08	65.18	42.90	0.00
Sockeye	6.82	7.73	6.85	7.68	7.52	15.65	11.83	12.30
Coho	6.18	6.75	12.78	11.50	0.00	18.67	19.91	0.00
Pink	0.67	0.59	0.49	0.50	0.42	2.42	2.42	1.63
Chum	5.69	5.20	5.38	4.43	4.22	6.71	10.69	6.45
Sockeye Equivalents								
Chinook	0.00	3.47	7.08	4.94	4.93	4.17	3.63	0.00
Sockeye	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Coho	0.91	0.87	1.87	1.50	0.00	1.19	1.68	0.00
Pink	0.10	0.08	0.07	0.06	0.06	0.15	0.20	0.13
Chum	0.83	0.67	0.79	0.58	0.56	0.43	0.90	0.52

Unfortunately there were two errors in the information that was presented to the CSAB Allocation group in April 2007. One related to the calculation of sockeye equivalents and the other was related to the way in which the sockeye equivalent calculation was done to derive the sockeye equivalents for north coast and south coast. While the second error was discovered at the meeting and was corrected, the first was not and the flawed results were used to undertake planning.

To more precisely describe the errors, the sockeye equivalent calculation was incorrect because the sockeye equivalent outlined for each licence area in Table 1 was calculated for each area separately. For example, the sockeye equivalents for salmon harvested by Area A was calculated based on comparing the landed price of sockeye by Area A with the landed price for other salmon species for Area A; the sockeye equivalents for salmon harvested by Area F was calculated based on comparing the landed price of sockeye for Area F with the landed price for other salmon species by Area F and so on for each licence area. This is incorrect; there should have been one price per sockeye for all

licence areas based on the total value of sockeye for all licence areas divided by the total number of sockeye caught by all licence areas.

The second error (which was corrected at the meeting) was the calculation of sockeye equivalents for north and south separately. To determine the sockeye equivalent for the north and south for each species, an average of each of the sockeye equivalents for any one species for licence areas fishing in one area was used. For example, to determine the sockeye equivalent for coho for the north, the average of the sockeye equivalent for coho for Area A, Area C and Area F was calculated. This was felt to be inappropriate because one high or low value with no or low catch could inappropriately skew the result; a more appropriate approach would be weight the average based on catch (the greater the catch of a given species by any one area, the greater the weighting of the sockeye equivalent for that species for that particular licence area).

Table 2 is the corrected information. Figure 1 shows a comparison of the sharing arrangement results of the meeting (using incorrect information) and the sharing arrangements when the revised information is used.

Recommendations for 2008

No Change to current approach (focus on coast wide sharing arrangements (40-38-22) and try for equal sharing between the southern gillnet and troll fleets)

Except for correction to calculations, and unless there is unanimous support for a different approach, there should be no material change to the Allocation Sharing arrangements for 2008. As well, it is unlikely there will be a recommendation to materially change the licence regime for 2008.

Review of approach with CSAB

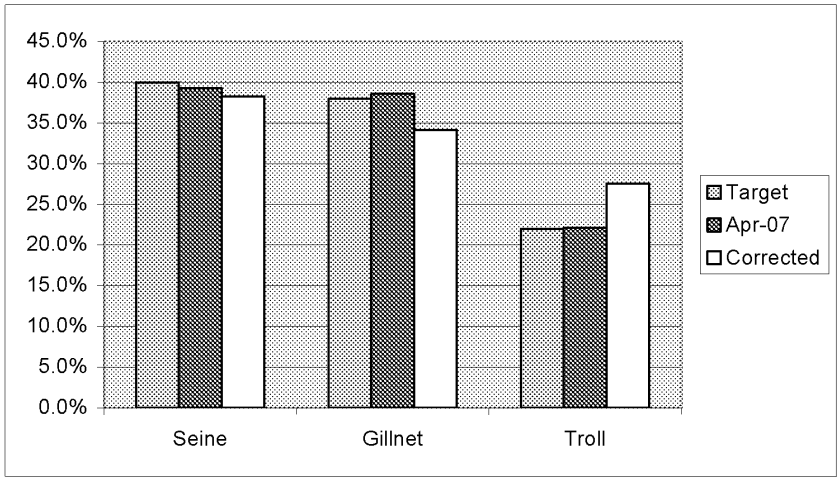
It is felt the revised calculations should be presented to the CSAB in January or February so the approach is understood. Final information will not be available because the pricing survey cannot be completed until March so information related to bonuses can be incorporated. As a result, an April meeting will still be required to finalize the results.

Table 2. Catch and Price Information and Corrected Sockeye Equivalents for 2006

Landed Value ($000)	Seine			Gillnet			Troll	
Species	A	B	C	D	E	F	G	H
Chinook	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sockeye	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Coho	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Pink	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Chum	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Catch (tonnes, round)								
Chinook	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sockeye	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coho	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pink	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landed Price ($/kg.)								
Chinook								
Sockeye								
Coho								
Pink								
Chum								
Landed Price ($/lb.)								
Chinook								
Sockeye								
Coho								
Pink								
Chum								
Average Weight (kg./piece)								
Chinook	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sockeye	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coho	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pink	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chum	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	- from CCSS							
Catch (pieces, 000's)								
Chinook	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sockeye	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coho	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pink	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landed Price ($/piece)								
Chinook	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sockeye	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Coho	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pink	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sockeye Equivalents								
Chinook	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Sockeye	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Coho	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Pink	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Chum	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Weighted SE								
Chinook	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Sockeye								
Coho	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Pink	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Chum	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

	North	South
Chinook	**#DIV/0!**	**#DIV/0!**
Sockeye	**1.00**	**1.00**
Coho	**#DIV/0!**	**#DIV/0!**
Pink	**#DIV/0!**	**#DIV/0!**
Chum	**#DIV/0!**	**#DIV/0!**

Figure 1. Comparison of Commercial Salmon Sharing arrangements determined in April 2007 and October, 2007



Conclusion

The allocation of the commercial salmon TAC comprised of 5 species and 3 fleets over a total of 8 licence areas is very complex. Due to the variance of views, making changes to the policy is difficult. Changes in management approaches will be implemented in the near future; any change to the Allocation Policy should be co-ordinated with changes in management approaches.

Appendix 1 - Annual Process to complete the 2007 Actual Allocations File

1) Have an account created in FOS if you do not have one already. The person to contact is Bruce Patten.
2) Once your FOS has been set up:

- To run Preliminary Harvest Information report and Salmon Allocation report:
- Click on Run Reports
- Click on Customized Reports
- Click on Resource Management Reports
- Click on RHQ Ops Centre
  Preliminary harvest information output source data or
  Salmon Allocation output source data
  Steps: Pick year
  1) Submit
  2) Download
  3) Copy into spreadsheet called Preliminary Harvest Information or Salmon Allocation - into worksheet called source data (from Bruce Patten)
  4) View toolbars - select pivot table
  5) Highlight data and click on ! refresh (on pivot table)
  6) Run pivot table wizard, click back and check range - update to last row if necessary

  Note: Double click on cells in spreadsheet to see drill down
  Note: To see what estimates are missing go to back to RHQ Ops Centre and click on List Openings Without Manager's Estimates.

- Commercial Openings Without Managers Estimates
  Run Reports/Customized Reports/Resource Management Reports/RHQ Ops Centre/Openings Without Managers Estimates

3) The Comparison sheet will need to be updated – info must be entered from the Target Allocations Worksheet and compared to the Actual Catch report from the Manager's Estimation on FOS.
4) The Sockeye Equivalents and # of Licence must be updated (once they have been established and verified – see next page) on the Summary spreadsheet of the 2007 Allocation Projected vs Actual excel file.
5) Once these numbers have been updated, the remaining spreadsheets should automatically update.

Annual Process to complete the 2008 Projected Allocations File

1) Email the Area Chiefs for the 2008 potential harvest numbers by the licence areas in Table 1 (only column 5 needs to be completed, the rest of the table updates automatically.

2) Email Laurie Biagini at the Regional Data Unit to request Gord Gislason's report on the Salmon Prices 2007.

3) Confirm with Laurie on when the information from the report will be inputted into the catch stats database.

4) Once the information has been inputted into the database, request a data run to get all the landed values, by gear (GN, SN, TR), by fishing area (i.e. a,b,c,d,e,f,g,h) by species for 2007. The data run should also provide:

   - All harvest data
   - Total landed weight (round)
   - Total landed value ($)
   - Average weight
   - Total piece count

   - Also request the landing period (i.e. time caught) and statistical area.

5) Once this data has been received, merge it into the "Data" worksheet of the "SXEquiv2008PreseasonPlanning" Excel file.
6) Once the Sockeye Equivalents and Land Price have been established for both North and South Coast, enter those amounts into the "LV & SE Data" worksheet of the "2008 Target Allocations QuasiNorthSouth" Excel file. As well, landed catch, value etc for each of the licence areas will have to be imported into the "SH.+ LV+SE_SUM" worksheet of the same file.
7) The Data Text spreadsheet of the excel file should also be updated with the correct number of licences in each area (verify with the Licencing Unit).
8) The remaining calculations on all the spreadsheets of the excel file should automatically update.