

# ECOTRUST CANADA REPORT FOR 2012 AREA 3 & 4 SEINE AND GILLNET BIOLOGICAL SAMPLING AND CATCH MONITORING PROGRAM

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June 15<sup>th</sup>, 2012 to August 31<sup>st</sup> 2012

Submitted January 2013  
v.2 revised January 17<sup>th</sup> 2013

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## Contents

List of Tables .....	3
Introduction & Purpose .....	4
Season Overview .....	4
Our Approach.....	5
Catch Monitoring.....	5
Biological Sampling.....	5
Compliance Monitoring.....	6
Results.....	6
Catch Monitoring & Biological Sampling.....	6
Compliance Assessments.....	9
Gillnet Compliance Assessments.....	10
Seine Compliance Assessments.....	11
Discussion & Recommendations .....	12
Training, staff and capacity.....	12
Data forms and protocols .....	13
Partnership with Environment Canada .....	14
Ongoing Program Delivery, Supplies & Communications .....	14
Appendix 1: Conditions of non-retention species upon release.....	17

## List of Tables

Table 1: Summary of biological sampling activities conducted, by date, subarea and gear type .....	6
Table 2: Species encountered on all sets monitored .....	7
Table 3: Species composition on all sets monitored .....	7
Table 4: Condition of non-retained species upon release.....	8
Table 5: Number of vessels sampled and sockeye samples collected, by opening and gear type .....	8
Table 6: Number of vessels sampled and chum samples collected, by opening and gear type .....	9
Table 7: Compliance observed during gillnet fisheries, per set .....	10
Table 8: Observed status of revival boxes on gillnet vessels.....	10
Table 9: compliance observed during seine fisheries, per set .....	11
Table 10: observed status of revival boxes on seine vessels, per vessel .....	11
Table 11: Condition of coho upon release.....	17
Table 12: Condition of chum upon release .....	17
Table 13: Condition of small chinook upon release .....	18
Table 14: Condition of large chinook upon release.....	18
Table 15: Condition of steelhead upon release.....	19

# Introduction & Purpose

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In July of 2010, Fisheries and Oceans Canada (DFO) hired Ecotrust Canada (EC) to be the sole service provider for the Biological Sampling and Catch Monitoring Program for the 2010 Area 3 & 4 salmon seine and gillnet fisheries, and for the two following years as necessary. After a successful season in 2010, work continued over the winter to prepare the program for its second year, including the development of curriculum and material to support the Program. In 2011, Ecotrust Canada delivered the 9-day Pacific Fisheries Observer course in Prince Rupert and provided coverage as requested for commercial salmon seine and gillnet openings. The retention of Chum for biological sampling, and detailed compliance monitoring for both seine and gillnet vessels, were introduced in 2011 and continued in 2012.

For the 2012 salmon season, the Biological Sampling and Catch Monitoring Program for the North Coast began June 25<sup>th</sup> and continued to August 6<sup>th</sup>. While not all of the commercial salmon openings were monitored, coverage included random sampling and monitoring of the seine and gillnet fleets within Statistical Areas 3 and 4, including Sub-Areas 3B Tracy/Boston, 3C, 4-12 and 4-RGS.

The purpose of this Program was to have EC Fisheries Observers use a combination of biological sampling and catch monitoring to acquire the necessary information regarding catch data, salmon age, and origin required by DFO for the ongoing management and allocation of TAC to different user groups, as outlined in the Pacific Salmon Treaty. In addition, the information collected will contribute to DFO understanding of 2012 salmonid encounter rates, and provide insight into the NC salmon fleet's level of compliance with current fishing regulations for this season.

The 2012 Program also included biological sampling of Chum in Area 3. In 2010, Chum were sampled prior to release during a one-day experimental seine study in Area 3. In 2011 and 2012, a more extensive Chum sampling program was implemented on multiple seine and gillnet openings to improve the stock composition knowledge of chum within Area 3 salmon fisheries. Biological sampling for Chum included the collection of DNA tissue punches and otoliths.

A further goal of Ecotrust Canada's engagement since 2010 has been to increase capacity at the local level for First Nations' participation in DFO and Stock Assessment programs. In 2012, we continued to move towards this goal: local First Nations were invited to, and involved in planning discussions, provided Observers and data reviewers, and the Lax Kw'alaams Fisheries Program provided at-sea vessel support.

## Season Overview

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Following the commencement of the 2012 season, the monitoring & biosampling objectives for the North Coast fishery became more detailed and also included:

- Collection of matched Sockeye DNA/scale samples, and Chum DNA and otoliths, during gillnet openings on June 25<sup>th</sup> and 26<sup>th</sup>, and July 2<sup>nd</sup>
- Collection of matched Sockeye DNA/scale samples, and Chum DNA and otoliths, during seine openings on July 9<sup>th</sup> and August 6<sup>th</sup>
- Collection of matched Sockeye DNA/scale samples during seine openings on July 24<sup>th</sup>
- Collection of matched Sockeye DNA/scale samples during gillnet openings on July 25<sup>th</sup>
- Collection of Chum DNA and otolith samples during gillnet openings on July 28<sup>th</sup> and 29<sup>th</sup>

Details specific to the 2012 North Coast salmon season regarding sampling requirements, protocol, and data forms were developed and designed by EC Fisheries Program management staff, in conjunction with the DFO Science Authority.

## Our Approach

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EC Fisheries Program staff worked closely with the DFO Salmon Management, DFO Science Authority, processing and industry management, local First Nations and fishers to keep up to date with the scope of the fishery, the possibility and timing of commercial openings per gear type per Area, and with the movement, size and distribution of both the seine and gillnet fleets in the North Coast region. This ensured that Observers were deployed randomly and appropriately throughout the fleet, so that the information and samples collected were relevant and representative of each fishery and Statistical Area.

There were three main elements to the 2012 program: catch monitoring, biological sampling and compliance monitoring.

### Catch Monitoring

Observers were required to keep detailed catch-monitoring records on a set-by-set basis (including vessel names, statistical area and location fished) and enumerate and record all salmon species caught and released in both the seine and gillnet fisheries. Additional catch-monitoring responsibilities included the evaluation of the condition of non-retention salmon species (including Chinook, Coho, Chum and Steelhead, depending on the opening) upon release, and identification, monitoring and recording of bird species encounters for Environment Canada. For the third year, EC partnered with Environment Canada on a project where all of the Observers were tracked throughout the openings using SPOT personal GPS tracking devices.

### Biological Sampling

Observers were required to meet DFO weekly biological sampling objectives for each Area and each gear type to the best of their ability, dependant on the scope of the fishery and the size of each fleet. Biological sampling requirements were revised and confirmed prior to each opening according to DFO requirements.

Objectives for sampling sockeye:

- 100 matched DNA to 2 scale samples per area per day
- Sample target is 10-20 samples per set
- Samples should be representative of the distribution of catch in the fleet

Objectives for sampling chum:

- 120 matched DNA to 2 otolith samples per area per day
- Post-orbital to fork length for each chum
- Sample target is 10-20 samples per set
- Samples should be representative of the geographic distribution of the fleet

During each opening, EC took every advantage to ensure that random sampling was maximized between sets and amongst the fleet within each sub-area, and per species sampling objectives. Depending on time, weather, and the availability of fish, EC Observers did their best to guarantee that no more than 20 Sockeye samples were taken per seine set, and no more than 10 samples were taken per gillnet set if catch and effort appeared sufficient to meet sampling targets. If the Observer was having difficulty keeping up with the incoming number of non-retention species, he/she suggested the vessel crew put these fish in revival tanks until proper enumeration, samples and/or measurements could be taken.

## Compliance Monitoring

In addition to monitoring catch data, Observers were expected to record harvester compliance with a number of predetermined objectives decided upon by DFO and Industry, including handling of released fish, revival box condition and Observer treatment. In addition to compliance reporting, Observers were also required to record and report any observed Irregularities seen onboard the vessel on which they were deployed (e.g. ramping, non-operational revival tanks, non-retention species kept on-board the vessel).

## Results

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### Catch Monitoring & Biological Sampling

Catch monitoring, biological sampling and compliance monitoring was required on nine occasions:

- June 25<sup>th</sup> & 26<sup>th</sup>: Area 3 gillnet
- July 2<sup>nd</sup>: Area 3 gillnet
- July 9<sup>th</sup>: Area 3 seine
- July 24: Area 4 seine
- July 25: Area 4 gillnet
- July 28<sup>th</sup> & 29<sup>th</sup>: Area 3 gillnet
- August 6<sup>th</sup>: Area 3 seine

A summary of biological sampling activities conducted per day is listed in Table 1.

Date	Management subarea	Gear	Collection of sockeye DNA & scales	Collection of chum otoliths and DNA
6/25/2012	3C	GN	Y	Y
6/26/2012	3C	GN	Y	Y
7/2/2012	3B Tracy Boston	GN	Y	Y
7/9/2012	3B Tracy Boston	SN	Y	Y
7/24/2012	4-12	SN	Y	N
	4-RGS	SN	Y	N
7/25/2012	4-12	GN	Y	N
	4-RGS	GN	Y	N
7/28/2012	3C	GN	N	Y
7/29/2012	3C	GN	N	Y
8/6/2012	3B Tracy Boston	SN	Y	Y

Table 1: Summary of biological sampling activities conducted, by date, subarea and gear type

The number and species of salmon encountered was recorded for each set observed (Table 2). The composition of observed catch, by date, subarea and gear type, is summarized in Table 3. Chum were permitted to be retained by vessels on July 2<sup>nd</sup> and 9<sup>th</sup>.

Date	Subarea	# of vessels	Gear	Sockeye	Pink	Coho	Chum	Chinook	Steelhead	Total
6/25/2012	3C	19	GN	365	1	1	38	5	0	410
6/26/2012	3C	12	GN	37	0	0	20	1	0	58
7/2/2012	3B Tracy Boston	12	GN	31	1	0	44	0	0	76
7/9/2012	3B Tracy Boston	35	SN	100	631	19	1892	8	0	2650
7/24/2012	4-12	19	SN	2155	42	4	3	2	9	2215
	4-RGS	3	SN	216	12	0	0	1	1	230
7/25/2012	4-12	14	GN	1065	17	1	0	3	9	1095
	4-RGS	10	GN	666	31	1	0	3	5	706
7/28/2012	3C	16	GN	140	664	10	83	0	1	898
7/29/2012	3C	12	GN	73	163	34	40	0	1	311
8/6/2012	3B Tracy Boston	14	SN	7	2215	23	97	0	0	2342
Grand Total				4855	3777	93	2217	23	26	10991

Table 2: Species encountered on all sets monitored

Date	Subarea	# of vessels	Gear	Sockeye	Pink	Coho	Chum	Chinook	Steelhead
6/25/2012	3C	19	GN	89.0%	0.2%	0.2%	9.3%	1.2%	-
6/26/2012	3C	12	GN	63.8%	-	-	34.5%	1.7%	-
7/2/2012	3B Tracy Boston	12	GN	40.8%	1.3%	-	57.9%	-	-
7/9/2012	3B Tracy Boston	35	SN	3.8%	23.8%	0.7%	71.4%	0.3%	-
7/24/2012	4-12	19	SN	97.3%	1.9%	0.2%	0.1%	0.1%	0.4%
	4-RGS	3	SN	93.9%	5.2%	-	-	0.4%	0.4%
7/25/2012	4-12	14	GN	97.3%	1.6%	0.1%	-	0.3%	0.8%
	4-RGS	10	GN	94.3%	4.4%	0.1%	-	0.4%	0.7%
7/28/2012	3C	16	GN	15.6%	73.9%	1.1%	9.2%	-	0.1%
7/29/2012	3C	12	GN	23.5%	52.4%	10.9%	12.9%	-	0.3%
8/6/2012	3B Tracy Boston	14	SN	0.3%	94.6%	1.0%	4.1%	-	-
Total		166		44.2%	34.4%	0.8%	20.2%	0.2%	0.2%

Table 3: Species composition on all sets monitored

The condition upon release was recorded for all non-retention species observed. Note that there were Chum kept for science and retention fisheries throughout the season. Table 4 provides the summary of all non-retained species during observed sets. See Appendix 1 for further breakdowns by opening.

Species	Vigorous Not Bleeding	Vigorous bleeding	Lethargic not bleeding	Lethargic bleeding	Appears dead	Unknown
Coho	55	0	19	1	12	2
Chum	20	0	2	0	0	3
Small Chinook	4	2	0	0	0	0
Large Chinook	9	0	2	0	0	0
Steelhead	15	0	3	2	2	3

**Table 4: Condition of observed non-retained species upon release**

Collecting biological samples was the top priority of Observers on fishing grounds, however, there were some openings during which it was not possible to meet the requested sampling targets. The ability of Observers to meet these targets was influenced by a number of factors including the distribution of the fleet, number of deployed Observers, gear type, fishing effort, length and frequency of sets, actions of the crew, timing of arrival on vessels, and the number of vessels fishing. There was a support vessel breakdown on July 2<sup>nd</sup> that also impacted the ability of Observers to meet sampling targets for that date.

Sockeye samples were collected during seven openings; a total of 405 matched scales and DNA tissue punches were collected. These results are summarized in Table 5.

Date	Gear Type	Management subarea	# of vessels sampled	# of Sk samples collected
6/25/2012	Gillnet	3C	14	84
6/26/2012	Gillnet	3C	6	16
7/2/2012	Gillnet	3B Tracy Boston	8	47
7/25/2012	Gillnet	4-12, 4-RGS	11	51
		<b>Subtotal gillnet</b>	<b>39</b>	<b>199</b>
7/9/2012	Seine	3B Tracy Boston	6	85
7/24/2012	Seine	4-12, 4-RGS	13	115
8/6/2012	Seine	3B Tracy Boston	3	6
		<b>Subtotal seine</b>	<b>22</b>	<b>206</b>
		<b>Total</b>	<b>61</b>	<b>405</b>

**Table 5: Number of vessels sampled and sockeye samples collected, by opening and gear type**

Chum samples were collected during both retention and non-retention openings for that species. On openings where vessels were permitted to retain Chum, Observers tagged Chum on vessels and recorded the post-orbital to fork length, and otoliths were recovered at processing facilities and landing stations. During openings where harvesters were not permitted to retain Chum, Observers removed Chum from the commercial fishing vessel and sampled them onboard the support vessel. A total of 500 samples was collected over seven openings. Samples per opening are summarized in Table 6.



Date	Gear Type	Management subarea	# of vessels sampled	# of Chum samples collected
6/25/2012	GN	3C	19	84
6/26/2012	GN	3C	12	24
7/2/2012	GN	3B Tracy Boston	12	79
7/28/2012	GN	3C	16	66
7/29/2012	GN	3C	12	39
		Subtotal gillnet	71	292
7/9/2012	SN	3B Tracy Boston	35	120
8/6/2012	SN	3B Tracy Boston	14	88
		Subtotal seine	49	208
Grand Total			120	500

Table 6: Number of vessels sampled and chum samples collected, by opening and gear type

## Compliance Assessments

Compliance assessments were introduced in 2011 and utilized on select salmon seine and gillnet openings. Their original intent was to aid the seine industry in assessing how well the conditions of their Marine Stewardship Certification (MSC) were being met throughout the fleet. The assessment criteria were developed with DFO and industry partners to be gear, set and vessel specific, and intended to capture a broad assessment of compliance which encompassed both positive and negative events and incidents.

Compliance assessment criteria were modified for 2012 and recorded for as many sets as possible, once the biological sampling and catch monitoring had been completed. In cases where there was non-compliance with a Condition of Licence was observed, a separate Irregularity Report was generated and submitted to DFO Conservation & Protection Branch.

## Gillnet Compliance Assessments

Gillnet compliance assessments were completed for 90 sets on 53 vessels. The presence/absence and operation of revival boxes were of particular interest, and results are summarized in Tables 7 & 8.

Date	Gear type	# of vessels	# of sets	Fish Handled carefully during picking			Vessel retained prohibited species					Revival Box present with water & pump in operation			
				N/A	UKN	Y	N	N/A	not recorded	UKN	y	N	not recorded	UKN	y
6/25/2012	GN	11	17	1		16	3	10	2		2	2	2	5	8
6/26/2012	GN	6	12	1		11	5	7				1		4	7
7/2/2012	GN	8	9	2	2	5	3	6						2	7
7/25/2012	GN	17	24		1	23	23			1		2		1	21
7/28/2012	GN	8	16		1	15	15			1				1	15
7/29/2012	GN	3	12		1	11	11			1		1		1	10
<b>Total</b>		<b>53</b>	<b>90</b>	<b>4</b>	<b>5</b>	<b>81</b>	<b>60</b>	<b>23</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>6</b>	<b>2</b>	<b>14</b>	<b>68</b>

Table 7: Compliance observed during gillnet fisheries, per set

N/A = not applicable; generally when there were no fish in the set

UNK = unknown – Observer could not confirm

Y = yes

N = no

Gear Type	Total # vessels	Criteria during set	Yes	No	Unknown	Not recorded
GN	53	Revival box present	51		2	2
		Revival box present with water	48	3	10	2
		Revival box present with water and pump in operation	44	5	11	2

Table 8: Observed status of revival boxes on gillnet vessels

## Seine Compliance Assessments

Compliance assessments were completed for 71 sets on 20 seine vessels. Table 9 provides a summary by set, while Table 10 provides details about the status of revival boxes.

Date	Gear type	# of vessels	# of sets	Fish handled carefully during brailing		Fish handled carefully during sorting		Vessel retained prohibited species				Box present with water & pump in operation		
				N/A	Y	N/A	Y	N	N/A	UNK	y	N	UNK	y
7/9/2012	SN	6	35		35		35	35				7		28
7/24/2012	SN	12	22	1	21	1	21	22				4	2	16
8/6/2012	SN	2	14		14		14	14						14
<b>Total</b>		<b>20</b>	<b>71</b>	<b>1</b>	<b>70</b>	<b>1</b>	<b>70</b>	<b>71</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>2</b>	<b>58</b>

Table 9: Compliance observed during seine fisheries, per set

N/A = not applicable; generally when there were no fish in the set

UNK = unknown – Observer could not confirm

Y = yes

N = no

Gear Type	Total # vessels	Criteria during set	Yes	No	Unknown
SN	20	Revival box present	20		
		Revival box present with water	17	4	1
		Revival box present with water and pump in operation	16	5	1

Table 10: Observed status of revival boxes on seine vessels, per vessel

# Discussion & Recommendations

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## Training, staff and capacity

For the 2012 North Coast Catch Monitoring and Biological Sampling program, EC provided DFO with Observers for nine commercial salmon openings. The Lax Kw'alaams Fisheries Program provided staff and a zodiac that was utilized for at-sea Observer support, and a total of ten individuals performed Observer duties. In addition, there were two people who supported data entry of set logs and compliance assessments, and a team of four Program Management staff who supported the delivery of the 2012 program.

A North Coast Area 3 & 4 Catch Monitoring and Biosampling program-specific training was delivered mid-June, just prior to the first commercial opening. This pre-deployment training focused on sampling and monitoring protocols and how to fill out specific datasheets required for 2012. The training was provided to all new and returning staff, DFO Stock Assessment field technicians, and the Area 3 Charter Patrol staff in an effort to work towards consistent data collection methods. Additional training was provided on an ongoing basis to individuals who needed support in species identification, completing datasheets and reviewing data for completeness.

The protocol and delivery for these training sessions were designed and provided by Fisheries Program staff at EC; both the training sessions and the Program were based on the experience and expertise of EC's Fisheries Program staff within these areas, and was informed by the long-standing relationships that had been developed with DFO, North Coast community organizations, fishermen, and processing industry management.

An ongoing challenge is the retention of skilled and trained Observers. In order to support a trained pool of Observers, it is essential to provide opportunities. The 2012 season had fewer opportunities than 2011, it is not full-time employment, and it requires workers to be ready with little notice. We will continue to explore and support opportunities for these trained Observers with other DFO programs using similar skill sets, as this will retain capacity in the community. A success in 2012 was working with the Creel Survey program to provide further employment to two of the at-sea Observers.

Contributing to First Nations capacity at the local level was done through: inviting local First Nations Fisheries Programs to submit candidates for training and employment; training and employment of First Nations individuals as Observers; planning discussions on at-sea coverage to broaden exposure to, and understanding of, multiple program elements; training and mentoring in data entry and review; empowering experienced Observers to train and support others in the field; recommending four Observer candidates to the creel survey program; contracting Lax Kw'alaams Fisheries Program to deliver at-sea support; and working with Lax Kw'alaams Fisheries Program to share staff during openings.

### Recommendations:

1. Encourage DFO to utilize trained Observers for additional fisheries contracts and opportunities as a means to retain skills and experience in the community.
2. Be prepared to deliver training to Observers in 2013, due to the challenge of retention.

3. Deliver training (formal or informal) to new and less experienced At-Sea Coordinators and vessel operators in 2013 prior to their deployment. Review data and communication protocols, best practices, and strategies to ensure monitoring is maximized and random.
4. Continue to explore ways to support, build capacity and provide opportunities for First Nations Fisheries Programs and First Nations candidates.

## **Data forms and protocols**

Data forms and protocols were confirmed at the beginning of the season, and printed for small binders that could be used by EC Observers, DFO Stock Assessment technicians and DFO charter patrol staff. Consistency between data forms was useful, particularly given the amount of data being recorded at-sea.

Compliance assessment forms were used for the second year. Both the seine and gillnet compliance assessment forms were reviewed with representatives from DFO and the fishing industry prior to the season for consensus on what data should be collected. There were concerns raised about what data is required and why; communication about the forms with the fleet; and the purpose of them. Throughout the season, efforts were made to be as objective as possible and many of the changes since 2011 reflected this goal.

Establishing a process for addressing Irregularity reports was discussed with Conservation and Protection at the beginning of the season, and they requested that completed forms be scanned and submitted via email. This was done throughout the season, in addition to providing information prior to deployments that EC Observers would be in the field.

Protocols and sampling objectives, as well as deployment, should be confirmed a minimum of 24 hours prior to a commercial opening, and ideally with 48 hours of notice. It was challenging for program staff and Observers to respond to last minute requests and changes, but there is an ongoing commitment to deliver the Program as best we are able. Advance notice and communications will be helpful and ongoing. To address this challenge, and the changing sampling requirements, daily sampling plans were created for Observers and At-Sea Coordinators that clearly identified the sampling objectives, vial colours and subareas to target, what forms were required to be submitted at the end of the opening, and additional information necessary for that particular opening. The fishery notice was printed on the back of the sampling plans, and they formed the context for the pre-deployment brief as well as post-deployment debrief and checklist.

There were more regular meetings between EC and DFO staff that resulted in positive communication, better understanding of priorities and ensured the best coverage of sampling objectives in the field. Prior to each opening, staff would be in communication about which organization would cover which areas; confirm sampling protocols; create a check in and back-up plan for openings; and share information. We would encourage this to continue.

### **Recommendations:**

5. Any changes to data forms should be made and agreed to prior to the first opening, and printed to be used in small binders.
6. Confirm process for sharing Irregularity reports with C&P staff prior to 2013 commercial openings.
7. Requirements for monitoring and/or sampling, and sampling objectives, should be confirmed no later than 24 hours prior to a commercial opening, and ideally with 48 hours of notice.
8. Continue to foster frequent communication during the salmon season between EC and DFO staff.

## Partnership with Environment Canada

Ecotrust Canada worked with Environment Canada to collect information on seabird abundance and mortality on seine and gillnet openings. Data forms were filled out, dead seabirds recovered, and both were sent to the Pacific Biological Station. The completion of bird survey forms is a requirement in the Catch Monitoring and Biosampling contract; feedback from Environment Canada is that the information is useful and appreciated, and from Observers that it is not too time consuming aboard vessels. Bird surveys were not completed for 100% of the sets monitored, due to making sampling a priority. Training materials on seabird identification and supplies (including datasheets, garbage bags, and information packages for fishermen) were provided by Environment Canada.

Environment Canada also provided SPOT units for each Observer that allowed real-time tracking of their locations in the field, and added an additional a SOS safety feature that can be utilized during emergencies. This was useful, particularly when working with new At-Sea Coordinators who required assistance locating the Observer. It should also be noted that all Observers were tracked using GPS during their deployments, and this data is available to be downloaded onto maps of the area in which they collected data. Environment Canada has suggested that they would be more than willing to share this data and mapping tool with DFO for their use, as there is the potential to superimpose it onto rest of the data that was collected by EC Observers during the 2012 opening.

Due to time and budget constraints, a seabird training was not formally delivered prior to deployment, although Observers were provided with identification guides, and some had participated in training in 2011. For stronger data, a training module dedicated to seabirds is recommended.

Recommendation:

9. Continue to partner with Environment Canada and support the completion of bird surveys during commercial openings. Request the use of SPOT units for 2013.
10. Sharing of Environment Canada SPOT data and mapping tool with DFO for use with the Observer data collected during the 2012 season.
11. Deliver a training module which includes seabird identification, completing Environment Canada datasheets, and the importance of seabird data for 2013.

## Ongoing Program Delivery, Supplies & Communications

An annual challenge will be predicting the scope and nature of the fishery and establishing mechanisms to support program delivery. In 2010, EC was asked to monitor four commercial openings; in 2011, we monitored 16 and in 2012, nine. We were pleased with the increased opportunities for Observers and recognize the importance of having a program that is flexible, responsive and adaptive.

A means of quality control and feedback implemented by EC were the voluntary 'Skipper Comment Forms' provided to vessel operators by Observers while they were on-board getting samples during the Program. After these forms were filled out by willing Skippers, they were brought back to the EC office to help EC Fisheries Program staff in managing Program delivery. Comments provided from vessel operators regarding the conduct of the samplers included:

EC noted some challenges with communication between Observers and vessel operators, and also in the importance of Observers being able to clearly articulate the monitoring program and its purpose to participating fishermen.

Observers participated in a debrief after each opening, and were encouraged to give us feedback in terms of program successes, challenges and potential changes for next year. Further one-on-one follow up conversations about program delivery and improvements occurred with Observers who monitored multiple openings.

It was a benefit to continue work with the Lax Kw'alaams Fisheries Program in 2012; they had extensive local knowledge of Area 3 and the fleet operating there, and were able to adapt to changing needs of the program. The Metlakatla Fisheries Program was also engaged in discussions about the program, and provided vessel support in 2011, but there were fewer opportunities for participation in Area 4 in 2012.

Additional supplies may need to be investigated and purchased next year, including life vests and GPS units for each Observer. In 2010 and 2011, DFO provided hand-held GPS units, however, there were not enough for all openings. It would also facilitate communications to have a marine VHF radio.

Communication with the fleets is extremely important and requires ongoing attention. EC is aware that it is impossible to reach every vessel, and make sure that every fishermen is aware of the Program prior to each season and opening, however we are positive that implementing a more intensive information protocol prior to Program delivery will help drastically reduce resistance to Observers in general, and the Program delivery in particular. A meeting was held with industry representatives prior to the season opening, and letters to fishermen detailing the program, what could be expected at-sea and what Observer duties were, were dropped off at multiple locations in Prince Rupert and Port Edward and given to Observers and DFO C&P to distribute. A frequent comment from fishermen is the desire to see the results of the previous year's sampling program and we would be pleased to help distribute it. Some fishermen were reluctant to retain Chum for sampling purposes, despite Observers explaining the program and rationale; fishermen felt that many studies had occurred and the results had not been shared.

Communication between Ecotrust Canada and DFO was ongoing and frequent throughout the season. Although EC is aware that the nature of the salmon fishery, and its management, means that it often difficult to plan very far ahead, we still hop that communications and planning between DFO and EC happen in as timely a manner as possible to sufficiently address any issues that may arise. Despite these concerns, EC is confident that the Program and its delivery were successful, and that we met our deliverables as outlined in the original proposal submitted to DFO.

Ecotrust Canada provided Observers for 9 commercial salmon openings. There were 168 sets monitored, 405 sockeye samples collected, and 500 chum sampled and/or retained for sampling.

We also recognize the positive experiences of our Observers who were deployed for the 2012 season; each of them expressed how much they enjoyed working for EC, and getting to have a better understanding of their duties and the reasons behind them. EC staff saw continual improvement in work that was handed in, and it was obvious that the training and additional feedback given following deployment made a positive difference in the data quality. All of the Observers agreed that season was still too short and they are looking forward to working with EC next summer. This is true of EC staff as well.

Recommendations:

12. Continued use of skipper comment forms.
13. Continued engagement with local First Nations for planning, Observers and at-sea vessel support
14. Purchase additional GPS units and other supplies as required by sampling protocols.
15. Storage of samples to remain at the DFO office in Prince Rupert.
16. Distribution of program information continue and be made available to the fleet in multiple formats (letters, updates at meetings) prior to next year's commercial openings.
17. Any results, particularly results of the chum otolith testing, be made available for distribution to fleet.
18. Communications and planning between EC and DFO happen in as timely a manner as possible.
19. Make efforts to retain trained Observers for 2013.



# Appendix 1: Conditions of non-retention species upon release

Date	Subarea	Gear	Vigorous Not Bleeding	Vigorous bleeding	Lethargic not bleeding	Lethargic bleeding	Appears dead	Unknown
6/25/2012	3C	GN	1	-	-	-	-	-
6/26/2012	3C	GN	-	-	-	-	-	-
7/2/2012	3B Tracy Boston	GN	-	-	-	-	-	-
7/9/2012	3B Tracy Boston	SN	18	-	1			
7/24/2012	4-12	SN	3	-	-	-	-	-
	4-RGS	SN	-	-	-	-	-	-
7/25/2012	4-12	GN	-	-	1	-	-	-
	4-RGS	GN	-	-		-	-	1
7/28/2012	3C	GN	4	-	-	-	6	-
7/29/2012	3C	GN	11	-	17	1	5	-
8/6/2012	3B Tracy Boston	SN	18	-	-	-	1	1
Total			55	0	19	1	12	2

Table 11: Condition of coho upon release

Date	Subarea	Gear	Vigorous Not Bleeding	Vigorous bleeding	Lethargic not bleeding	Lethargic bleeding	Appears dead	Unknown
6/25/2012	3C	GN	-	-	-	-	-	3
6/26/2012	3C	GN	-	-	-	-	-	-
7/2/2012	3B Tracy Boston	GN	-	-	-	-	-	-
7/9/2012	3B Tracy Boston	SN	-	-	-	-	-	-
7/24/2012	4-12	SN	3	-	-	-	-	-
	4-RGS	SN	-	-	-	-	-	-
7/25/2012	4-12	GN	-	-	-	-	-	-
	4-RGS	GN	-	-	-	-	-	-
7/28/2012	3C	GN	17	-	2	-	-	-
7/29/2012	3C	GN	-	-	-	-	-	-
8/6/2012	3B Tracy Boston	SN	-	-	-	-	-	-
Total			20	0	2	0	0	3

Table 12: Condition of chum upon release

Date	Subarea	Gear	Vigorous Not Bleeding	Vigorous bleeding	Lethargic not bleeding	Lethargic bleeding	Appears dead	Unknown
6/25/2012	3C	GN	-	-	-	-	-	-
6/26/2012	3C	GN	-	-	-	-	-	-
7/2/2012	3B Tracy Boston	GN	-	-	-	-	-	-
7/9/2012	3B Tracy Boston	SN	2	1	-	-	-	-
7/24/2012	4-12	SN	1	-	-	-	-	-
	4-RGS	SN	-	-	-	-	-	-
7/25/2012	4-12	GN	-	1	-	-	-	-
	4-RGS	GN	1	-	-	-	-	-
7/28/2012	3C	GN	-	-	-	-	-	-
7/29/2012	3C	GN	-	-	-	-	-	-
8/6/2012	3B Tracy Boston	SN	-	-	-	-	-	-
Total			4	2	0	0	0	0

Table 13: Condition of small chinook upon release

Date	Subarea	Gear	Vigorous Not Bleeding	Vigorous bleeding	Lethargic not bleeding	Lethargic bleeding	Appears dead	Unknown
6/25/2012	3C	GN	4	-	-	-	-	-
6/26/2012	3C	GN	-	-	-	-	-	-
7/2/2012	3B Tracy Boston	GN	-	-	-	-	-	-
7/9/2012	3B Tracy Boston	SN	3	-	1	-	-	-
7/24/2012	4-12	SN	-	-	-	-	-	-
	4-RGS	SN	-	-	1	-	-	-
7/25/2012	4-12	GN	-	-	-	-	-	-
	4-RGS	GN	2	-	-	-	-	-
7/28/2012	3C	GN	-	-	-	-	-	-
7/29/2012	3C	GN	-	-	-	-	-	-
8/6/2012	3B Tracy Boston	SN	-	-	-	-	-	-
Total			9	0	2	0	0	0

Table 14: Condition of large chinook upon release

Date	Subarea	Gear	Vigorous Not Bleeding	Vigorous bleeding	Lethargic not bleeding	Lethargic bleeding	Appears dead	Unknown
6/25/2012	3C	GN	-	-	-	-	-	-
6/26/2012	3C	GN	-	-	-	-	-	-
7/2/2012	3B Tracy Boston	GN	-	-	-	-	-	-
7/9/2012	3B Tracy Boston	SN	-	-	-	-	-	-
7/24/2012	4-12	SN	7	-	-	1	-	-
	4-RGS	SN	1	-	-	-	-	-
7/25/2012	4-12	GN	5	-	2	-	-	2
	4-RGS	GN	1	-	1	-	2	1
7/28/2012	3C	GN	-	-	-	1	-	-
7/29/2012	3C	GN	1	-	-	-	-	-
8/6/2012	3B Tracy Boston	SN	-	-	-	-	-	-
Grand Total			15	0	3	2	2	3

Table 15: Condition of steelhead upon release