2002 CHUM SALMON
TAG RECOVERY PROJECT
YUKON RIVER
(MINTO TO FORT SELKIRK)

Prepared for:

YUKON RIVER PANEL
and
FISHERIES AND OCEANS CANADA

Prepared by:

Selkirk First Nation
with
Can-nic-a-nick Environmental Sciences

NOVEMBER, 2002

ACKNOWLEDGEMENTS

The Selkirk First Nation would like to thank Beverly Brown and Jake Duncan, both Yukon Habitat Stewards, for establishing this project and securing financial assistance through the Yukon River Restoration and Enhancement Fund. The Selkirk First Nation also gratefully acknowledges the efforts of Fred Green of the Selkirk First Nation and Hugh Monaghan, the Executive Secretary of the Yukon River Panel, for financial administration of the project. The efforts of Pat Milligan are also acknowledged for his technical support on behalf of Fisheries and Oceans Canada. Recognition and thanks are also extended to the field assistance of Robert van Bibber, Adam van Bibber and Nick de Graff.

1.0 INTRODUCTION

The Chum Spawning Ground Tag Recovery program that is annually conducted on the Yukon River between Minto and Fort Selkirk continues to be administered and managed by the Selkirk First Nation (SFN). The involvement of SFN people in fisheries management projects within their Traditional Territory has recently increased as a result of the finalization of the SFN land claim agreement. Together with the Habitat Conservation and Stewardship Program initiated by Fisheries and Oceans Canada (DFO) the SFN have increased their capacity to participate and initiate various fisheries management projects in watersheds situated near the community of Pelly Crossing, Yukon.

The primary objective of the Chum Spawning Ground Tag Recovery program is to gather in-season mark re-capture data to assist DFO fisheries management biologists to estimate run abundance on the mid mainstem of the Yukon River. This is achieved through recovering spaghetti tags to determine the ratio of tagged to untagged chum salmon in the Minto index area that extends from Minto Landing downstream to Fort Selkirk. Presently there is a stock rebuilding program for Canadian origin chum on the Yukon River. The means of measuring success or failure of this program is the mark-recapture estimates. Chum stocks have been weak since 1997 and in 2002 stock strength was again insufficient to allow for a more intensive tag recovery effort by the commercial fishery. This project therefore focuses as an independent check of tag to untagged ratios within spawning sites in the Minto index area. Other objectives of this program includes the collection of 50 to 100 chum DNA samples, the determination of a sex ratio of spawning fish and establishing GPS coordinates of major redd concentrations in key spawning sites in the Minto index area. It is believed that projects such as this also aid in current and future land use planning initiatives by identifying important chum spawning habitat.

2.0 METHODS

Spaghetti tags applied by DFO at fish wheels near the Yukon-Alaska border were recovered through foot surveys and seining of known chum spawning locations on the

Yukon River between Minto and the confluence of the Pelly River at Fort Selkirk. Field work was conducted between October 29th and November 1st 2002, a period considered to be well after peak spawn to avoid disturbing salmon redds and salmon actively engaged in spawning. Spawning locations were located using a hand held GPS and previously referenced coordinates (SFN 2001). New waypoints were established for sites containing high concentrations of redds. All locations were accessed using a small boat and motor. The three person crew collected tags by walking the perimeter of the spawning area in addition to enumerating carcasses on the shore. At locations where significant numbers of chum were observed in the water seine nets were used to capture fish. Both live spent fish and carcasses in the sloughs were enumerated and marked by hole punching the operculum and released at each capture site. Seining at each site continued until the proportion of previously captured fish became excessive. The sex, spawning condition and a visual inspection for markings of all seine captured chum salmon were recorded. In addition a small piece of tissue from the operculum was retained from 67 live chum salmon using a hole-punch for future DNA analysis. All tissue samples were immediately placed in alcohol for long term storage and subsequent analysis by DFO.

3.0 RESULTS

A total of 4 field days were spent enumerating chum salmon at 9 spawning sites. At 4 of these sites seining was used to capture live fish and carcasses that were contained in the sloughs. During the survey a total of 26 spaghetti tags were recovered that included 22 orange Canadian tags and 3 green and 1 red tag of US origin. Of the 22 orange spaghetti tags recovered only 4 of these were removed from captured fish in the seine (Table 1).

Altogether the 9 surveyed sites resulted in the enumeration of 533 chum salmon in varying body condition. Of the 533 enumerated, 290 were whole chum salmon that were captured and enumerated using a seine at 4 of these sites. All seined fish were visually inspected for upper and lower caudal punches as well as an adipose clip or punch (Appendix C). The balance or 243 fish were nearly all carcasses and were enumerated along the shoreline of each spawning site. In most cases these carcasses were not whole

fish, having been dismembered by animals such as eagles, ravens and bears. The remnants were mainly in the form of carcass heads that were frozen into the substrate. Another 6 were enumerated but not captured at site W55.

Of the 290 chum salmon captured in the seine 63 percent were live fish in their final stages of spawn. Whole intact carcasses represented 37 percent of the catch. The reasonably good body condition of all seined fish from the water enabled sexual determination and visual inspection for fin clips or hole-punches. As previously mentioned only 4 fish were captured with orange spaghetti tags and no other markings were apparent on any of the other 286 inspected fish. The male to female sex ratio was calculated to be .36 males to each female fish (105 males:185 females).

Table 1 Summary of the results from enumerating spawning chum salmon and tag recoveries from the Minto index area, 2002.

Enumeration Survey	Count	Canadian Spaghetti Tags Recovered	Tag Ratio
Chum Carcasses on Shore*	243	18***	13.5 fish per tag
Chum Captured in Slough**	290	4	72.5 fish per tag
Total	533	22	24.2 fish per tag

* includes 6 live post spawn fish observed at site W55
** includes seined carcasses
*** includes 2 tags found on slough bottom

4.0 DISCUSSION

4.1 Chum Tag Recovery Timing

The last week of October was targeted to conduct this year's project to be consistent with previous surveys and to avoid disturbance to spawning fish. However unlike the fall of 2001, 2002 was exceptionally warm with all of the survey sites remaining open and free of ice allowing good access to sampling sites with the seine. Based on local knowledge, this year's project was conducted approximately two weeks after the peak spawn period (Fred Green, pers com). The peak of spawning activity is thought to coincide with an increase in bear and bird activity as observed by local people who live near the river. While additional ripe chum salmon were expected to move into

the area (Pat Milligan, pers com) no ripe or pre-spawn fish were observed at any of the surveyed sites. Live chum salmon that were seined were well beyond the spawning peak, with few females maintaining positions over constructed redds. Most of the enormous amount of bear sign at the spawning sites was old, with only one black bear sighting during the project. Enumerated carcasses along the shoreline were typically the remains of what wasn't consumed by scavengers and many of those remaining in the water had already putrefied. While it appears that the project could have started earlier, comparisons in run timing to the previous year suggests that the peak spawning period may vary. Based on this artifact it is recommended that future tag recovery projects should be initiated in the second week of October to avoid freeze-up and snow that hinders enumeration and limits terrestrial tag recovery. SFN field workers could therefore provide an early reconnaissance to spawning grounds to monitor for peak spawning period while collecting shoreline tags prior to live sampling. Non-the-less caution should always be taken to avoid excessive disturbance to any fish that are actively spawning.

4.2 Chum Salmon Spawning Sites

Big Creek Slough (W58) has long been known as an important chum spawning area by Elders in Pelly Crossing. Elders have traditionally harvested chum in this area since the 1940's (Laberge Environmental 2000). Of the 9 sites that were assessed in both 2001 and 2002, Big Creek Slough represents the largest concentration of spawning chum salmon in the Minto index area. As with previous surveys other areas where spawning chum salmon are concentrated include site W51, just upstream of Fort Selkirk and site W52 where relatively warm groundwater was found in 2001 (see Appendix A). At all of the other surveyed sites spawning chum salmon and carcasses were less evident as many of these sites were either logistically difficult to access or difficult to seine due to poor site configurations. At the main spawning sites other freshwater species were observed in the seine catch and included arctic grayling, round whitefish and the occasional juvenile lake whitefish. Slimy sculpin were also observed camouflaged among the substrate at many locations.

4.3 Chum Salmon Tag and Sex Ratios

It was noted during the survey that the lack of snow cover on the ground is believed to have resulted in an increase in tag recoveries and shoreline enumeration estimates from the previous year. In 2001 only 6 spaghetti tags were found unattached to fish either in the water or along the shoreline compared to 22 unattached tags (including US origin tags) that were collected in 2002. A ground cover of snow in any particular year would significantly increase the estimated ratio of unmarked fish to those that are tagged.

The use of a seine in 2002 greatly aided in the enumeration and sex determination of fish contained in the sloughs. Large areas could be "swept" with the seine catching both live fish and carcasses that would normally be out of reach with a gaff. With fish being captured, marked and then released, with each subsequent seine fewer and fewer unmarked fish were being caught. This artifact enabled the survey crew to confidently sample the majority of fish contained in each respective slough. Fortunately the weather cooperated and the ponds remained open throughout the 2002 project. In 2001 enumeration estimates were difficult due to poor water visibility combined with ice conditions which prevented some locations from being sampled with gillnets. Future tag recovery projects should be standardized in their assessment techniques to allow for statistical comparisons between regions.

4.0 REFERENCES

LaBerge Environmental Services. 2000. *Characterization of Chum Spawning Sloughs Located Near the Mouth of Big Creek, Yukon.* Prepared for the Yukon River Panel under the Yukon Restoration and Enhancement Fund.

Selkirk First Nation. 2001. *2001 Chum Spawning Ground Recoveries-Minto Area.* Prepared for the Yukon River Panel under the Yukon Restoration and Enhancement Fund. 19 p.

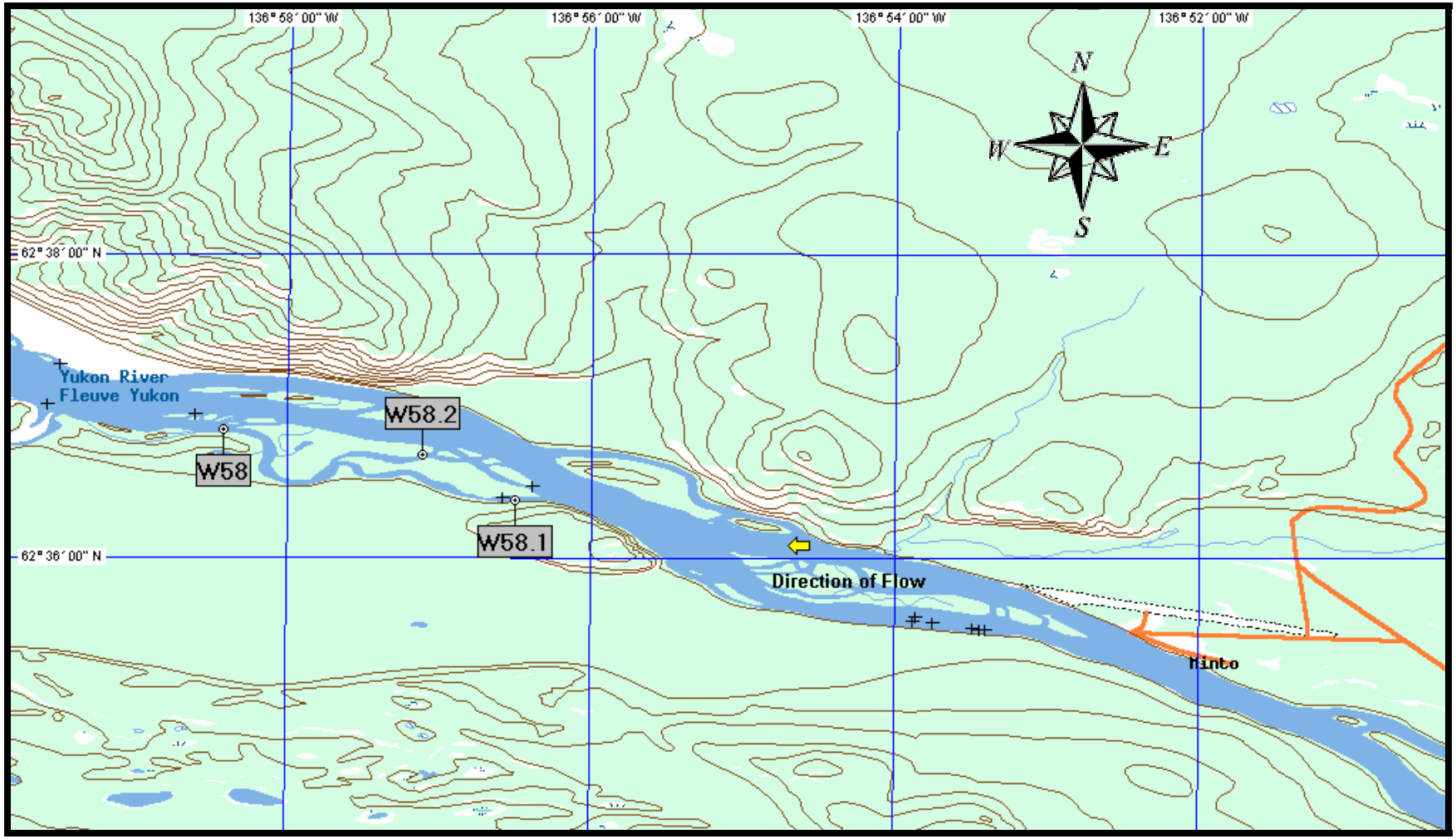
5.0 PERSONAL COMMUNICATION

Fred Green
Director of Lands and Resources
Selkirk First Nation
Pelly Crossing, Yukon

Pat Milligan
Stock Assessment Biologist
Fisheries and Oceans Canada
Whitehorse, Yukon

APPENDIX A

SAMPLING SITES MAPS AND PHOTOS



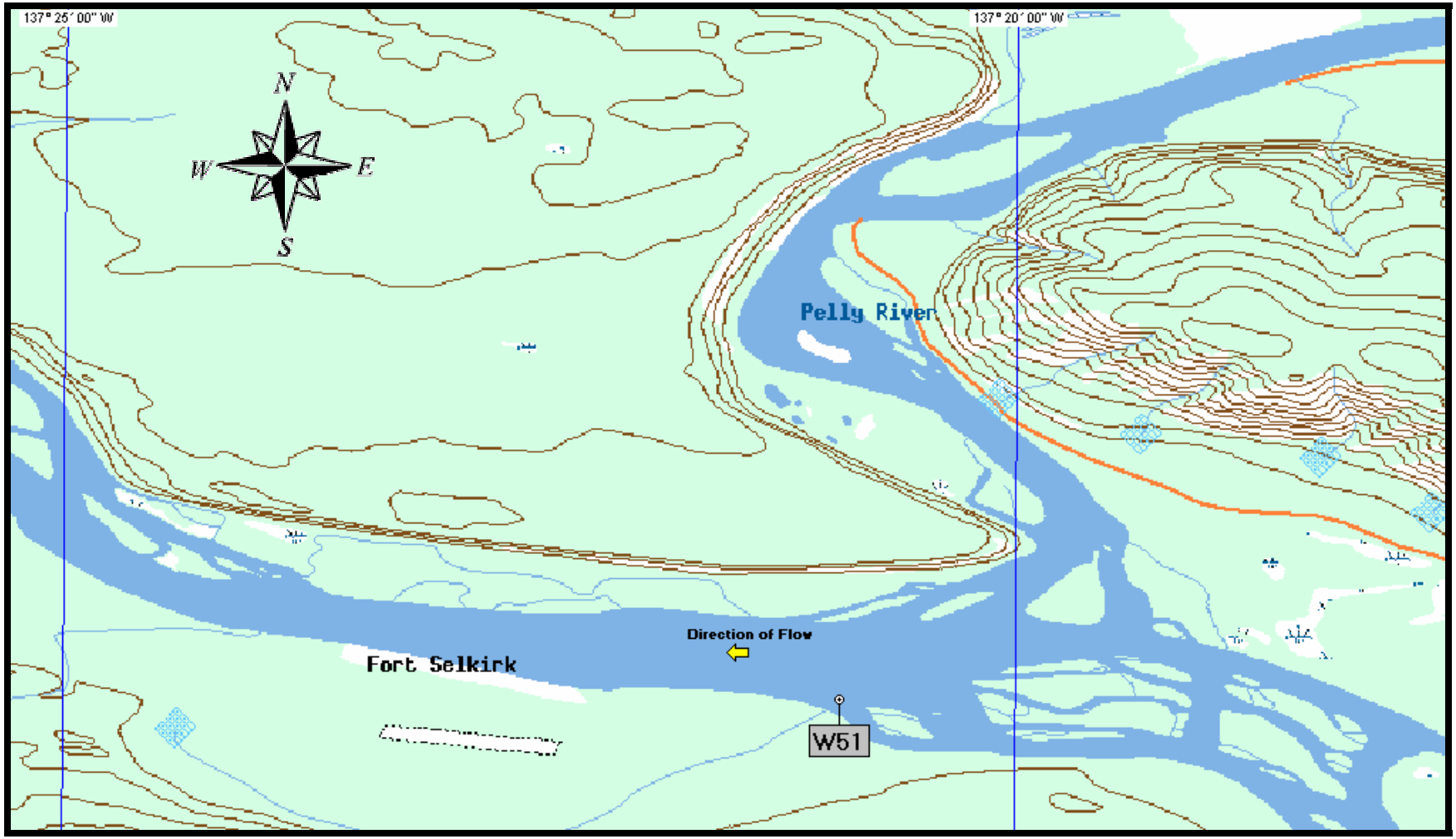
BIG CREEK SLOUGH

LOCATION OF SAMPLE SITES, OCTOBER 2002

1 0 1 2 3 km

SCALE 1 : 50,000

W58·····Sample Site



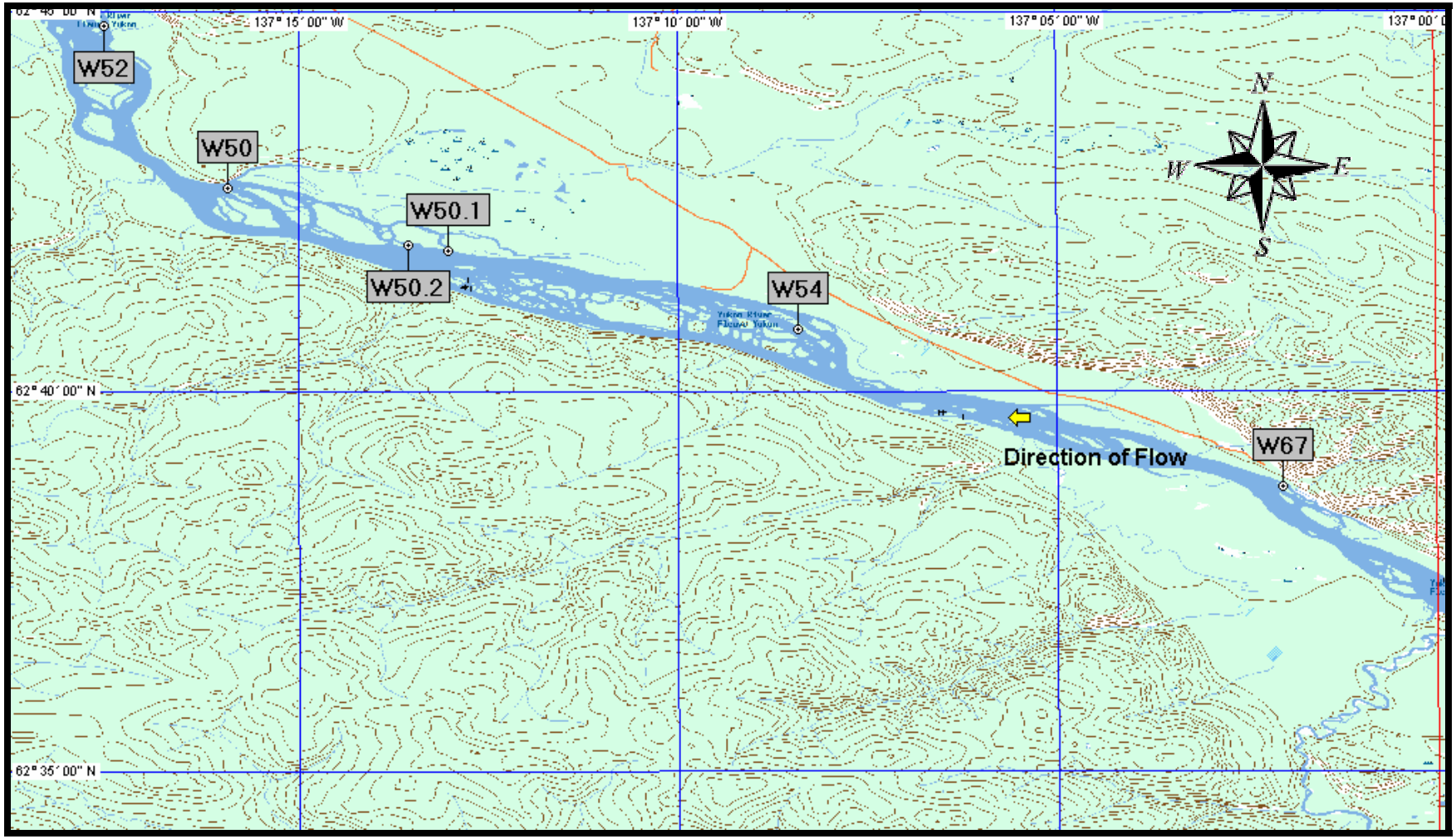
FORT SELKIRK

LOCATION OF SAMPLE SITES, OCTOBER 2002

1 0 1 2 3 km

SCALE 1 : 50,000

W51·····Sample Site



INGERSOLL ISLANDS

LOCATION OF SAMPLE SITES, OCTOBER 2002

1 2 3 4 km

SCALE 1:50,000

W51·····Sample Site

Appendix A Photos

Site W51 (above) just upstream of Fort Selkirk where the use of the seine net (bottom) made it possible to capture post spawning chum salmon.

Appendix A Photos

Site W50 at the entrance of Rock Face Slough (top) where several spawned out carcasses were captured. Site W52 (bottom) where chum salmon redds were prolific.

APPENDIX B

UPDATED WAYPOINTS - 2002

Appendix B Updated Waypoints of Sample Sites of 2002 Chum Salmon Tag Recovery Program

Waypoints		Updated Map Reference*			Description
W50	N	62	42	40.3	Rock Face Slough - Downstream Outlet
	W	137	15	56.6	
W50.1	N	62	41	50.8	Rock Face Slough - Upstream Inlet #1
	W	137	13	2.2	
W50.2	N	62	41	55.2	Rock Face Slough - Upstream Inlet #2
	W	137	13	33.2	
W51	N	62	46	19.5	Slough just above Ft.Selkirk on Left Bank of Yuon River
	W	137	20	55.2	
W52	N	62	44	48.8	Warmsprings above confluence of Pelly River on Right Bank of Yukon River - Chum Spawning Ground
	W	137	17	35.3	
W54	N	62	40	48.7	Ingersoll Islands - Chum Spawning Ground
	W	137	8	24.4	
W58	N	62	36	50.8	Big Creek Slough Chum Spawning Ground
	W	136	58	32.5	
W58.1	N	62	36	22.7	Big Creek Slough - Upstream Inlet #1
	W	136	56	30.1	
W58.2	N	62	36	40.0	Big Creek Slough - Upstream Inlet #2
	W	136	57	11.0	
W67	N	62	38	45.0	Slough across from Big Creek - Right Bank of Yukon River Downstream Outlet
	W	137	2	2.2	

***Position Format: hddd° mm' ss.s" (NAD 27)**

APPENDIX C

CHUM SALMON BIOLOGICAL DATA

Appendix C Chum Salmon Biological Data

Sample	Date	Site	Sex	Tag Color / Number	DNA Sample	Condition*
1	30-Oct-02	W50	M	no marks	no	SC
2	30-Oct-02	W50	M	no marks	no	SC
3	30-Oct-02	W50	F	no marks	no	SC
4	30-Oct-02	W50	M	no marks	no	SC
5	30-Oct-02	W50	F	no marks	no	SC
6	30-Oct-02	W50	M	no marks	no	SC
7	30-Oct-02	W50	F	no marks	no	SC
8	30-Oct-02	W50	F	no marks	no	SC
9	30-Oct-02	W50	F	Orange - A06926	no	SC
10	30-Oct-02	W50	F	no marks	no	SC
11	30-Oct-02	W50	M	no marks	no	SC
12	1-Nov-02	W51	F	no marks	no	S
13	1-Nov-02	W51	F	no marks	no	S
14	1-Nov-02	W51	F	no marks	no	S
15	1-Nov-02	W51	F	no marks	no	S
16	1-Nov-02	W51	F	no marks	no	S
17	1-Nov-02	W51	F	no marks	no	S
18	1-Nov-02	W51	F	no marks	no	S
19	1-Nov-02	W51	F	no marks	no	S
20	1-Nov-02	W51	F	no marks	no	S
21	1-Nov-02	W51	F	no marks	no	S
22	1-Nov-02	W51	F	no marks	no	S
23	1-Nov-02	W51	M	no marks	no	S
24	1-Nov-02	W51	F	no marks	no	S
25	1-Nov-02	W51	F	no marks	no	S
26	1-Nov-02	W51	F	no marks	no	S
27	1-Nov-02	W51	M	no marks	no	S
28	1-Nov-02	W51	F	no marks	no	S
29	1-Nov-02	W51	F	no marks	no	S
30	1-Nov-02	W51	F	no marks	no	S
31	1-Nov-02	W51	F	no marks	no	S

* SC = spent carcass
S = spent live fish

Appendix C Chum Salmon Biological Data

Sample	Date	Site	Sex	Tag Color / Number	DNA Sample	Condition*
32	1-Nov-02	W51	F	no marks	no	S
33	1-Nov-02	W51	F	no marks	no	S
34	1-Nov-02	W51	F	no marks	no	S
35	1-Nov-02	W51	F	no marks	no	S
36	1-Nov-02	W51	F	no marks	no	S
37	1-Nov-02	W51	F	no marks	no	S
38	1-Nov-02	W51	F	no marks	no	S
39	1-Nov-02	W51	F	no marks	no	S
40	1-Nov-02	W51	F	no marks	no	S
41	1-Nov-02	W51	F	no marks	no	SC
42	1-Nov-02	W51	F	no marks	no	SC
43	1-Nov-02	W51	F	no marks	no	SC
44	31-Oct-02	W52	M	no marks	no	S
45	31-Oct-02	W52	F	no marks	no	S
46	31-Oct-02	W52	F	no marks	no	S
47	31-Oct-02	W52	M	no marks	no	S
48	31-Oct-02	W52	F	no marks	no	S
49	31-Oct-02	W52	M	no marks	no	S
50	31-Oct-02	W52	F	no marks	no	S
51	31-Oct-02	W52	F	no marks	no	S
52	31-Oct-02	W52	F	no marks	no	S
53	31-Oct-02	W52	F	no marks	no	S
54	31-Oct-02	W52	F	no marks	no	S
55	31-Oct-02	W52	F	no marks	no	S
56	31-Oct-02	W52	M	no marks	no	S
57	31-Oct-02	W52	F	no marks	no	S
58	31-Oct-02	W52	M	no marks	no	S
59	31-Oct-02	W52	F	no marks	no	S
60	31-Oct-02	W52	F	no marks	no	S
61	31-Oct-02	W52	F	no marks	no	S
62	31-Oct-02	W52	F	no marks	no	S

* SC = spent carcass
S = spent live fish

Appendix C Chum Salmon Biological Data

Sample	Date	Site	Sex	Tag Color / Number	DNA Sample	Condition*
63	31-Oct-02	W52	F	no marks	no	S
64	31-Oct-02	W52	M	no marks	no	S
65	31-Oct-02	W52	F	no marks	no	S
66	31-Oct-02	W52	F	no marks	no	S
67	31-Oct-02	W52	F	no marks	no	S
68	31-Oct-02	W52	M	no marks	no	S
69	31-Oct-02	W52	F	no marks	no	S
70	31-Oct-02	W52	F	no marks	no	S
71	31-Oct-02	W52	F	no marks	no	S
72	31-Oct-02	W52	F	no marks	no	S
73	31-Oct-02	W52	F	no marks	no	S
74	31-Oct-02	W52	F	no marks	no	S
75	31-Oct-02	W52	M	no marks	no	S
76	31-Oct-02	W52	F	no marks	no	S
77	31-Oct-02	W52	F	no marks	no	S
78	31-Oct-02	W52	F	no marks	no	S
79	31-Oct-02	W52	F	no marks	no	S
80	31-Oct-02	W52	F	no marks	no	S
81	31-Oct-02	W52	F	no marks	no	S
82	31-Oct-02	W52	M	no marks	no	S
83	31-Oct-02	W52	F	no marks	no	S
84	31-Oct-02	W52	F	Orange - S027938	no	SC
85	31-Oct-02	W52	F	no marks	no	S
86	31-Oct-02	W52	F	no marks	no	S
87	31-Oct-02	W52	F	no marks	no	S
88	31-Oct-02	W52	F	no marks	no	S
89	31-Oct-02	W52	F	no marks	no	S
90	31-Oct-02	W52	F	no marks	no	S
91	31-Oct-02	W52	F	no marks	no	S
92	31-Oct-02	W52	F	no marks	no	S
93	31-Oct-02	W52	M	no marks	no	SC

* SC = spent carcass
S = spent live fish

Appendix C Chum Salmon Biological Data

Sample	Date	Site	Sex	Tag Color / Number	DNA Sample	Condition*
94	31-Oct-02	W52	M	no marks	no	SC
95	31-Oct-02	W52	M	no marks	no	SC
96	31-Oct-02	W52	M	no marks	no	SC
97	31-Oct-02	W52	M	no marks	no	SC
98	31-Oct-02	W52	F	no marks	no	SC
99	31-Oct-02	W52	F	no marks	no	SC
100	31-Oct-02	W52	M	no marks	no	SC
101	31-Oct-02	W52	M	no marks	no	SC
102	31-Oct-02	W52	F	no marks	no	SC
103	31-Oct-02	W52	F	Orange -S027080	no	SC
104	31-Oct-02	W52	F	no marks	no	SC
105	31-Oct-02	W52	M	no marks	no	SC
106	31-Oct-02	W52	F	no marks	no	SC
107	31-Oct-02	W52	M	no marks	no	SC
108	31-Oct-02	W52	F	Orange - S027735	no	SC
109	31-Oct-02	W52	F	no marks	no	SC
110	31-Oct-02	W52	M	no marks	no	SC
111	31-Oct-02	W52	M	no marks	no	SC
112	31-Oct-02	W52	M	no marks	no	SC
113	31-Oct-02	W52	F	no marks	no	SC
114	31-Oct-02	W52	M	no marks	no	SC
115	31-Oct-02	W52	F	no marks	no	SC
116	31-Oct-02	W52	M	no marks	no	SC
117	31-Oct-02	W52	F	no marks	no	SC
118	31-Oct-02	W52	M	no marks	no	SC
119	31-Oct-02	W52	M	no marks	no	SC
120	31-Oct-02	W52	M	no marks	no	SC
121	31-Oct-02	W52	F	no marks	no	SC
122	31-Oct-02	W52	M	no marks	no	SC
123	31-Oct-02	W52	M	no marks	no	SC
124	31-Oct-02	W52	F	no marks	no	SC

* SC = spent carcass
S = spent live fish

Appendix C Chum Salmon Biological Data

Sample	Date	Site	Sex	Tag Color / Number	DNA Sample	Condition*
125	31-Oct-02	W52	M	no marks	no	SC
126	31-Oct-02	W52	M	no marks	no	SC
127	31-Oct-02	W52	M	no marks	no	SC
128	31-Oct-02	W52	M	no marks	no	SC
129	31-Oct-02	W52	M	no marks	no	SC
130	31-Oct-02	W52	M	no marks	no	SC
131	31-Oct-02	W52	F	no marks	no	SC
132	31-Oct-02	W52	M	no marks	no	SC
133	31-Oct-02	W52	M	no marks	no	SC
134	31-Oct-02	W52	M	no marks	no	SC
135	31-Oct-02	W52	M	no marks	no	SC
136	31-Oct-02	W52	F	no marks	no	SC
137	31-Oct-02	W52	F	no marks	no	SC
138	31-Oct-02	W52	M	no marks	no	SC
139	31-Oct-02	W52	M	no marks	no	SC
140	31-Oct-02	W52	M	no marks	no	SC
141	31-Oct-02	W52	M	no marks	no	SC
142	31-Oct-02	W52	F	no marks	no	SC
143	31-Oct-02	W52	F	no marks	no	SC
144	31-Oct-02	W52	F	no marks	no	SC
145	31-Oct-02	W52	M	no marks	no	SC
146	31-Oct-02	W52	F	Green - 034503	no	SC
147	31-Oct-02	W52	F	no marks	no	SC
148	31-Oct-02	W52	F	no marks	no	SC
149	31-Oct-02	W52	M	no marks	no	SC
150	31-Oct-02	W52	F	no marks	no	SC
151	31-Oct-02	W52	F	no marks	no	SC
152	31-Oct-02	W52	M	no marks	no	SC
153	31-Oct-02	W52	M	no marks	no	SC
154	31-Oct-02	W52	M	no marks	no	SC
155	31-Oct-02	W52	F	no marks	no	SC

* SC = spent carcass
S = spent live fish

Appendix C Chum Salmon Biological Data

Sample	Date	Site	Sex	Tag Color / Number	DNA Sample	Condition*
156	31-Oct-02	W52	M	no marks	no	SC
157	31-Oct-02	W52	M	no marks	no	SC
158	31-Oct-02	W52	F	no marks	no	SC
159	31-Oct-02	W52	M	no marks	no	SC
160	31-Oct-02	W52	F	no marks	no	SC
161	31-Oct-02	W52	M	no marks	no	SC
162	31-Oct-02	W52	M	no marks	no	SC
163	31-Oct-02	W52	F	no marks	no	SC
164	31-Oct-02	W52	F	no marks	no	SC
165	31-Oct-02	W52	M	no marks	no	SC
166	31-Oct-02	W52	F	no marks	no	SC
167	31-Oct-02	W52	M	no marks	no	SC
168	31-Oct-02	W52	M	no marks	no	SC
169	31-Oct-02	W52	M	no marks	no	SC
170	31-Oct-02	W52	F	no marks	no	SC
171	31-Oct-02	W52	M	no marks	no	SC
172	31-Oct-02	W52	F	no marks	no	SC
173	31-Oct-02	W52	M	no marks	no	SC
174	31-Oct-02	W52	F	no marks	no	SC
175	31-Oct-02	W52	M	no marks	no	SC
176	31-Oct-02	W52	F	no marks	no	SC
177	31-Oct-02	W52	M	no marks	no	SC
178	31-Oct-02	W52	F	no marks	no	SC
179	31-Oct-02	W52	M	no marks	no	SC
180	31-Oct-02	W52	F	no marks	no	SC
181	31-Oct-02	W52	M	no marks	no	SC
182	31-Oct-02	W52	M	no marks	no	SC
183	31-Oct-02	W52	F	no marks	no	SC
184	31-Oct-02	W52	F	no marks	no	SC
185	31-Oct-02	W52	F	no marks	no	SC
186	29-Oct-02	W58	M	no marks	Yes	S

* SC = spent carcass
S = spent live fish

Appendix C Chum Salmon Biological Data

Sample	Date	Site	Sex	Tag Color / Number	DNA Sample	Condition*
187	29-Oct-02	W58	F	no marks	Yes	S
188	29-Oct-02	W58	M	no marks	Yes	S
189	29-Oct-02	W58	F	no marks	Yes	S
190	29-Oct-02	W58	F	no marks	Yes	S
191	29-Oct-02	W58	F	no marks	Yes	S
192	29-Oct-02	W58	F	no marks	Yes	S
193	29-Oct-02	W58	M	no marks	Yes	S
194	29-Oct-02	W58	F	no marks	Yes	S
195	29-Oct-02	W58	F	no marks	Yes	S
196	29-Oct-02	W58	F	no marks	Yes	S
197	29-Oct-02	W58	F	no marks	Yes	S
198	29-Oct-02	W58	F	no marks	Yes	S
199	29-Oct-02	W58	F	no marks	Yes	S
200	29-Oct-02	W58	F	no marks	Yes	S
201	29-Oct-02	W58	M	no marks	Yes	S
202	29-Oct-02	W58	F	no marks	Yes	S
203	29-Oct-02	W58	F	no marks	Yes	S
204	29-Oct-02	W58	M	no marks	Yes	S
205	29-Oct-02	W58	F	no marks	Yes	S
206	29-Oct-02	W58	F	no marks	Yes	S
207	29-Oct-02	W58	M	no marks	Yes	S
208	29-Oct-02	W58	F	no marks	Yes	S
209	29-Oct-02	W58	F	no marks	Yes	S
210	29-Oct-02	W58	F	no marks	Yes	S
211	29-Oct-02	W58	F	no marks	Yes	S
212	29-Oct-02	W58	F	no marks	Yes	S
213	29-Oct-02	W58	F	no marks	Yes	S
214	29-Oct-02	W58	M	no marks	Yes	S
215	29-Oct-02	W58	M	no marks	Yes	S
216	29-Oct-02	W58	F	no marks	Yes	S
217	29-Oct-02	W58	M	no marks	Yes	S

* SC = spent carcass
S = spent live fish

Appendix C Chum Salmon Biological Data

Sample	Date	Site	Sex	Tag Color / Number	DNA Sample	Condition*
218	29-Oct-02	W58	F	no marks	Yes	S
219	29-Oct-02	W58	F	no marks	Yes	S
220	29-Oct-02	W58	F	no marks	Yes	S
221	29-Oct-02	W58	F	no marks	Yes	S
222	29-Oct-02	W58	F	no marks	Yes	S
223	29-Oct-02	W58	F	no marks	Yes	S
224	29-Oct-02	W58	F	no marks	Yes	S
225	29-Oct-02	W58	F	no marks	Yes	S
226	29-Oct-02	W58	F	no marks	Yes	S
227	29-Oct-02	W58	F	no marks	Yes	S
228	29-Oct-02	W58	F	no marks	Yes	S
229	29-Oct-02	W58	F	no marks	Yes	S
230	29-Oct-02	W58	F	no marks	Yes	S
231	29-Oct-02	W58	F	no marks	Yes	S
232	29-Oct-02	W58	M	no marks	Yes	S
233	29-Oct-02	W58	F	no marks	Yes	S
234	29-Oct-02	W58	M	no marks	Yes	S
235	29-Oct-02	W58	F	no marks	Yes	S
236	29-Oct-02	W58	F	no marks	Yes	S
237	29-Oct-02	W58	M	no marks	Yes	S
238	29-Oct-02	W58	F	no marks	Yes	S
239	29-Oct-02	W58	F	no marks	Yes	S
240	29-Oct-02	W58	F	no marks	Yes	S
241	29-Oct-02	W58	F	no marks	Yes	S
242	29-Oct-02	W58	F	no marks	Yes	S
243	29-Oct-02	W58	M	no marks	Yes	S
244	29-Oct-02	W58	F	no marks	Yes	S
245	29-Oct-02	W58	F	no marks	Yes	S
246	29-Oct-02	W58	F	no marks	Yes	S
247	29-Oct-02	W58	F	no marks	Yes	S
248	29-Oct-02	W58	F	no marks	Yes	S

* SC = spent carcass
S = spent live fish

Appendix C Chum Salmon Biological Data

Sample	Date	Site	Sex	Tag Color / Number	DNA Sample	Condition*
249	29-Oct-02	W58	F	no marks	Yes	S
250	29-Oct-02	W58	M	no marks	Yes	S
251	29-Oct-02	W58	M	no marks	Yes	S
252	29-Oct-02	W58	F	no marks	Yes	S
253	29-Oct-02	W58	M	no marks	no	SC
254	29-Oct-02	W58	M	no marks	no	SC
255	29-Oct-02	W58	F	no marks	no	SC
256	29-Oct-02	W58	M	no marks	no	SC
257	29-Oct-02	W58	M	no marks	no	SC
258	29-Oct-02	W58	M	no marks	no	SC
259	29-Oct-02	W58	F	no marks	no	SC
260	29-Oct-02	W58	M	no marks	no	SC
261	29-Oct-02	W58	M	no marks	no	SC
262	29-Oct-02	W58	F	no marks	no	SC
263	29-Oct-02	W58	F	no marks	no	SC
264	29-Oct-02	W58	F	no marks	no	SC
265	29-Oct-02	W58	M	no marks	no	SC
266	29-Oct-02	W58	F	no marks	no	SC
267	29-Oct-02	W58	F	no marks	no	SC
268	29-Oct-02	W58	F	no marks	no	SC
269	29-Oct-02	W58	M	no marks	no	SC
270	29-Oct-02	W58	M	no marks	no	SC
271	29-Oct-02	W58	M	no marks	no	SC
272	29-Oct-02	W58	M	no marks	no	SC
273	29-Oct-02	W58	M	no marks	no	SC
274	29-Oct-02	W58	F	no marks	no	SC
275	29-Oct-02	W58	M	no marks	no	SC
276	29-Oct-02	W58	F	no marks	no	SC
277	29-Oct-02	W58	F	no marks	no	SC
278	29-Oct-02	W58	M	no marks	no	SC
279	29-Oct-02	W58	M	no marks	no	SC

* SC = spent carcass
S = spent live fish

Appendix C Chum Salmon Biological Data

Sample	Date	Site	Sex	Tag Color / Number	DNA Sample	Condition*
280	29-Oct-02	W58	F	no marks	no	SC
281	29-Oct-02	W58	M	no marks	no	SC
282	29-Oct-02	W58	F	no marks	no	SC
283	29-Oct-02	W58	F	no marks	no	SC
284	29-Oct-02	W58	M	no marks	no	SC
285	29-Oct-02	W58	F	no marks	no	SC
286	29-Oct-02	W58	M	no marks	no	SC
287	29-Oct-02	W58	F	no marks	no	SC
288	29-Oct-02	W58	M	no marks	no	SC
289	29-Oct-02	W58	F	no marks	no	SC
290	29-Oct-02	W58	F	no marks	no	SCC

Total Catch = 290 **Total Males = 105** **Total Females = 185**

* SC = spent carcass
S = spent live fish

APPENDIX D

CHUM SALMON TAG RECOVERY DATA

Appendix D Chum Salmon Tag Recovery Data - 2002

Sample	Date	Recovery Site	Tag Color	Tag Origin	Tag Number	Location
1	30-Oct-02	W50	Orange	Canada	A06926	On Carcass in Slough
2	30-Oct-02	W50	Orange	Canada	S027944	On Shore
3	30-Oct-02	W50.1	Lime Green	USA	35587	On Shore
4	1-Nov-02	W51	Orange	Canada	A06778	On Shore
5	1-Nov-02	W51	Orange	Canada	A09002	On Shore
6	31-Oct-02	W52	Lime Green	USA	34503	On Fish in Slough
7	31-Oct-02	W52	Orange	Canada	A06244	Found in Bear Scat
8	31-Oct-02	W52	Dark Green	USA	25488	Found in Slough
9	31-Oct-02	W52	Orange	Canada	S027138	Found in Slough
10	31-Oct-02	W52	Orange	Canada	S027080	On Fish in Slough
11	31-Oct-02	W52	Orange	Canada	A09474	On Shore
12	31-Oct-02	W52	Orange	Canada	S027938	On Fish in Slough
13	31-Oct-02	W52	Orange	Canada	S027735	On Fish in Slough
14	31-Oct-02	W52	Orange	Canada	S027714	On Shore
15	31-Oct-02	W52	Orange	Canada	S027883	On Shore
16	31-Oct-02	W52	Orange	Canada	S027605	On Shore
17	31-Oct-02	W52	Red	USA	32156	On Shore
18	31-Oct-02	W52	Orange	Canada	S027650	On Shore
19	31-Oct-02	W52	Orange	Canada	no number	On Shore
20	30-Oct-02	W54	Orange	Canada	A08116	On Shore
21	30-Oct-02	W54	Orange	Canada	A06999	On Shore
22	30-Oct-02	W54	Orange	Canada	A08707	On Shore
23	29-Oct-02	W58	Orange	Canada	A09870	On Shore
24	29-Oct-02	W58	Orange	Canada	C05290	Found in Slough
25	29-Oct-02	W58	Orange	Canada	A06616	On Shore
26	29-Oct-02	W58	Orange	Canada	A09800	On Shore