



EDI ENVIRONMENTAL DYNAMICS INC.

Natural Resource Consultants

Commercial Chum Roe Economic Feasibility

CRE 26N-06

Prepared for:

VUNTUT GWITCHIN FIRST NATION

Box 94
Old Crow, Yukon
Y0B 1N0

and

YUKON RIVER PANEL

Box 20973
Whitehorse, Yukon
Y1A 7A2

Prepared by:

Isaac Anderton

EDI ENVIRONMENTAL DYNAMICS INC.

402 Hawkins Street
Y1A 1X8

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1.0 INTRODUCTION

Members of the Vuntut Gwitchin First Nation in the community of Old Crow have fished for chum salmon (*Oncorhynchus keta*) for countless generations. Today, utilization of the catch is primarily for dog food, although some are also utilized for human consumption. Recently, there has interest from the Vuntut Gwitchin Government (VGG) to explore the possibility of shipping chum salmon roe from Old Crow to be processed and marketed as smoked roe in some capacity with the Yukon Salmon Cooperative. The chum harvest ranges from 4,000 to 6,000 fish per year, and this represents a potential annual harvest of up to 2,700 pounds of roe. The goal of this project will be to assess whether or not this roe can be successfully marketed through the Yukon River Salmon Cooperative (YRSC) and provide some financial return to Old Crow fishers.

Objectives of this project included:

- Determine the economic feasibility of marketing Porcupine River chum salmon roe through the Yukon Salmon Cooperative. This includes details of the costs, options, and methods for chum salmon roe harvested in the existing Vuntut Gwitchin fishery to be marketed through the Yukon Salmon Cooperative;
- Assess the legal requirements for marketing Porcupine River chum salmon roe through the Yukon Salmon Cooperative;
- Increase the profile and value of the salmon resource in Old Crow and the Yukon.

2.0 METHODS

EDI Environmental Dynamics Inc. (EDI) staff conducted research with appropriate individuals and agencies to assess the economics and logistics of sending chum salmon roe outside of Old Crow to be processed and marketed as smoked roe. Fisheries and Oceans Canada (DFO) staff were contacted with a request to provide a legal/regulatory perspective and direction in regards to this potential chum salmon. Information obtained was then detailed in this report.

3.0 RESULTS/DISCUSSION

The results of this project are detailed in sub-sections 3.1, 3.2, & 3.3. There are two processing options addressed; the first of which is the possible processing and marketing of chum roe at a facility in Vancouver, while the second is the possible processing and marketing of chum roe through the YRSC in Dawson City.

3.1 Logistics

Handling and shipping requirements to get chum salmon roe from Old Crow to processing facilities are very specific and strict. The roe must be packed in air-free, water-free, containers and shipped immediately after it is removed from the fish. It must also be kept at low temperatures (ideally below 5°C), but without freezing. Upon shipping, the roe must reach a processing facility within approximately 24 hours. If any of these conditions are not met, then roe quality can decline dramatically, thereby decreasing available revenue through increased wastage and value loss. It must be noted that revenues are generated only from product sold on the market, therefore, roe un-processed or un-sold due to loss of quality in shipping or

handling, is a liability. Some of the total weight of shipped roe will be lost in processing, however, proper handling techniques can minimize this loss.

A functional shipping schedule would be required, such as shipping three days per week from Old Crow. Female chum captured in the days before, or on each shipping day, could be kept whole and at as low of a temperature as possible without freezing. The best option to achieve this would be for each fisher to keep their female chum submerged in the river until the roe is removed and packed for shipping. This would keep the fish at a stable low temperature, as required. Methods of keeping the fish submerged could include stringing the fish through their gills and securing them in the river, or, by containing them in a submerged net or pen. A live holding tank or pen would be preferable, but may require more work to establish and utilize.

Flights from Old Crow leave between 10:40 AM and 1:40 PM (six days a week), and therefore it would be ideal if the fish could be kept in water until the morning of shipping, when the roe could be removed and immediately sealed in appropriate air-free packaging and shipped in appropriately cooled containers. The best option would be for all fishers to bring their female chum to a central location, such as the beach below the Old Crow Nursing Station (near the air terminal), where the roe could be stripped from the fish and immediately packed for shipping. The contribution of each fisher would have to be weighed and documented. The containers would then be taken to the Air North terminal where they would require priority shipping and delivery to a processing facility. The roe would have to be packed in durable, airtight, sealed plastic bags, surrounded by frozen sealed ice packs. Reusable coolers could be employed if processing was to be completed in Dawson City with the YRSC. However, with the option of processing the roe at a facility in Vancouver, single use coolers would be required due to logistical challenges associated with returning coolers from Vancouver. If the Vancouver processing option was to be considered, it would be possible for the roe to reach the Vancouver facility close to 24 hours after shipping, provided delays are not significant, and priority shipping was provided on Air North. Shipping to the YRSC for processing in Dawson City would be feasible within 2-3 hours.

3.2 Economics

The economics of shipping chum salmon roe for commercial sale outside of Old Crow have been determined to be feasible on a cost recovery basis within limited parameters. The costs and revenue available have been assessed under two different potential processing scenarios, one of which would provide fishers with a modest price per pound of roe shipped while the other would provide a lower price. Spreadsheets detailing the economic analysis including assumptions, notes, a projection of production, and income statements are located in Appendices A to E. Analyses of both possible processing options are included, and the resulting figures have been confirmed by the YRSC (Duncan Pers. Comm., 2006).

The two different processing scenarios involve shipping the roe to a processing and marketing company in the Vancouver area, who would then process and market the roe, or, shipping the roe to the Yukon River Salmon Cooperative to be processed in Dawson City before marketing outside of the Yukon. Currently, the YRSC is in its final planning stages before major construction and processing start-up. Some operational aspects, such as test-marketing and production, have been pre-implemented to validate markets and firm up outsourcing partnerships. The cooperative will be increasing its production to planned levels over the next few years and any collaboration with roe processing would be best organized at earlier and more flexible stages (Duncan Pers. Comm., 2006).

The option of processing and marketing the roe through the YRSC would provide the most optimal seasonal returns, which in most cases would be under \$500 per fisher. These returns would be paid to fishers on a per-pound basis, and rates would be based upon the price received from the YRSC less all associated costs of shipping and handling.

The option of processing and marketing the roe through a company in the Vancouver area would provide limited seasonal returns of under \$200 per fisher, and in some cases less than \$100. As above, these returns would be paid to fishers on a per-pound basis, and rates would be based upon the price received from the processor less all associated costs of shipping and handling.

The positive difference in returns using the YRSC option versus that of another Vancouver based processor can be attributed to savings gained through decreased shipping and administrative costs. That is, administrative costs associated with the operation (including facilitating payment for all expenses) can be absorbed by the YRSC, as well, shipping costs of finished product from Dawson will be conducted on a large scale and therefore most of these costs can also be absorbed by the YRSC. In the case of the use of a Vancouver based processor, administrative costs would have to be incurred by the First Nation or another organization in Old Crow. Therefore, these costs would have to be covered by the revenue generated from the roe.

3.3 Legal/Regulatory Considerations

Fisheries and Oceans Canada was formally contacted in writing to obtain a legal and regulatory position regarding the potential marketing of Porcupine River chum salmon roe. Fisheries and Oceans Canada replied in writing to request further information from the Vuntut Gwitchin First Nation regarding the legal details of the request. After further consideration, the VGG has decided that they do not wish to pursue this initiative further at this time due to the limited economic viability of such an undertaking (Graupe Pers. Comm., 2007).

4.0 DISCUSSION/CONCLUSIONS

The results of this study indicate that while the economics of marketing Porcupine River chum salmon roe are marginal, the opportunity to market through the YRSC will likely make such an undertaking a little more attractive. Further, utilizing the YRSC option would also be logistically simpler and more failsafe than compared to the option of processing the roe through a Vancouver facility. As indicated in Section 3.2, the projected returns would likely provide a small income to Old Crow fishers which in-turn would likely only offset a portion of their fishing costs (fuel, nets, boats, etc.). Considering this, it is not likely that marketing chum roe would generate any additional fishing pressure on chum stocks than that already generated for subsistence purposes.

The decision by the VGG to not pursue this initiative further at this time therefore eliminates the requirement of a legal and regulatory position from DFO at this time. Should the VGG decide to resume this undertaking in the future, the economic analysis may provide a valuable starting point, however, changing circumstances and up to date economics/market prices would have to be re-considered. In addition, the legal question will have to be revisited with the DFO at that time.

It should be noted that if the economics of this initiative change favourably in the future, the VGG will be interested in once again pursuing this initiative with the YRSC.

5.0 ACKNOWLEDGEMENTS

Funding for this project was provided by the Yukon River Panel's Restoration and Enhancement (R&E) Fund. The R&E fund was established under the Yukon River Agreement to conserve Yukon River salmon. Hugh Monaghan, Executive Secretary of the Yukon River Panel provided administrative direction and assistance; Rick Ferguson (Fisheries and Oceans Canada) provided technical support to the project; William Josie and Shel Graupe (Vuntut Gwitchin First Nation – Natural Resources) provided general project direction.

6.0 REFERENCES

Personal Communications:

Duncan, J. 2006. Email communications regarding roe marketing feasibility. November, 2006.

Graupe, S. 2007. Email communication regarding VGG's current decision to not pursue the project further. April, 2007.

APPENDIX A

Economic Assumptions

(Note that references to Option 1 in spreadsheets refer to the option of processing and marketing the roe through a facility in Vancouver, while references to Option 2 refer to the option of processing and marketing the roe through the YRSC in Dawson City.)

INCOME STATEMENTS BASED ON THE FOLLOWING ASSUMPTIONS

	<u>OPTION1</u>	<u>OPTION2</u>
1 Pounds per minimum shipment:	100	25
2 Maximum number of shipments/season:	20	25
3 Minimum number of shipments/season:	1	1
4 Est. of shipments/season:	10	15
5 Total annual poundage:	1,125	1,125
6 % at Grade1:	60%	75%
7 % at Grade2:	30%	20%
8 % at Grade3:	10%	5%
9 Wastage/Reduction factor:	10%	10%
10 \$Grade1:	\$ 9.00	\$ 9.00
11 \$Grade2:	\$ 8.00	\$ 8.00
12 \$Grade3:	\$ 7.00	\$ 7.00
13 Sales Commission rate:	7%	7%
14 Per shipment cost of single-use containers (/50lbs):	\$ 15.00	\$ 15.00
15 Per shipment cost of multiple-use containers (/50lbs):	\$ 40.00	\$ 10.00
16 \$/LB Shipping YOC-YDA:	\$ 0.50	\$ 0.50
17 \$/LB Shipping YDA-YXY:	\$ 0.75	-
18 \$/LB Shipping YXY-YVR:	\$ 0.75	-
19 Shipping Finished Product from Dawson	-	\$ 0.10
20 Handling fees (Old Crow, per shipment):	\$ 100.00	\$ 100.00
21 Roe Purchase Price:	\$ 1.17	\$ 2.71
22 Processing Fee/LB	\$ 2.50	\$ 2.50
23 Admin Fee (Old Crow, 10% of costs administered)	\$ 471.63	\$ -

APPENDIX B

Notes on Assumptions

(Note that references to Option 1 in spreadsheets refer to the option of processing and marketing the roe through a facility in Vancouver, while references to Option 2 refer to the option of processing and marketing the roe through the YRSC in Dawson City.)

NOTES ON ASSUMPTIONS

- 1 100 in option 1 due to handling minimums via Vancouver processors, lower minimums via YRSC Ltd.
- 2 MAX If production were to increase, participation in roe fishery increased, etc.
- 3
- 4 Estimated as per Production worksheet
- 5 From Production, after TTL Est., M/F ratio, and participation rate.
- 6 Assuming that with shorter shipping - higher grades achieved in Dawson via YRSC Ltd.
- 7
- 8
- 9 This is from raw roe (paid out) to finished selling weights. There are skins, etc. discarded which reduces overall weights.
- 10 Price per grade as per Czar's 2005 invoice (attached to email for example - invoice was from 1,500lbs chum M+F)
- 11
- 12
- 13 As per Czar's Caviar invoice - typical rate, can find lower rate, but workmanship and percent sold goes down.
- 14 Styrofoam shipping containers, est. landed cost in Old Crow/each.
- 15 Reusable coolers, estimated return shipping only.
- 16 Air North from Old Crow to Dawson
- 17 Air North from Dawson to Whitehorse
- 18 Air North from Whitehorse to Vancouver
- 19 Shipping of Finished Product from Dawson
- 20 Old Crow coordinator collecting each shipment and dropping at airport.
- 21 Per pound rate received by fishers, after all other costs covered.
- 22 This is usually based on finished weights - have used in-weights (conservative, overestimate) as there would also be handling fees (ie. airport pick-up).
- 23 Admin. Fees for processing finances/paperwork in Old Crow.

APPENDIX C

Projected Production (hypothetical)

(Note that references to Option 1 in spreadsheets refer to the option of processing and marketing the roe through a facility in Vancouver, while references to Option 2 refer to the option of processing and marketing the roe through the YRSC in Dawson City.)

CHUM ROE PRODUCTION (eg.)

TOTAL OLD CROW CHUM CATCH: 5,000
 PARTICIPATION RATE: 50%
 AVERAGE TTL CATCH PER WEEK/PARTICIPATING: 2,500
 PERCENTAGE FEMALE: 0.5 1,250 females
 LBS ROE/FEMALE: 0.9 1,125 lbs

		<u>FISHER1</u>	<u>FISHER2</u>	<u>FISHER3</u>	<u>FISHER4</u>	<u>FISHER5</u>	<u>FISHER6</u>	<u>FISHER7</u>	<u>FISHER8</u>	<u>FISHER9</u>	<u>FISHER10</u>	<u>TTL</u>	<u>W-DIST.</u>	
1	WEEK1	MON	5	5	5	5	5					25		
2		WED	10	10	10	10	10	5	5	5	5	75		
3		FRI								5	7.5	12.5	112.5	112.5
4	WEEK2	MON	10	10	10	10	10					50		
5		WED	10	10	10	10	10	10	10	10	10	100		
6		FRI	10	10	10	10	10			10	15	75	225	225
7	WEEK3	MON	20	20	20	20	20					100		
8		WED	20	20	20	20	20	20	20	20	20	200		
9		FRI	20	20	20	20	20	10	10	20	10	150	450	450
10	WEEK4	MON	10	10	10	10	10					50		
11		WED	10	10	10	10	10	10	10	10	10	100		
12		FRI	10	10	10	10	10			10	15	75	225	225
13	WEEK5	MON	5	5	5	5	5					25		
14		WED	10	10	10	10	10	5	5	5	5	75		
15		FRI								5	7.5	12.5	112.5	112.5
			150	150	150	150	150	50	60	60	100	105	1,125	1,125

PER FISHER GROSS REVENUE

OPTION 1 \$ 175.50 \$ 175.50 \$ 175.50 \$ 175.50 \$ 175.50 \$ 58.50 \$ 70.20 \$ 70.20 \$ 117.00 \$ 122.85
 OPTION 2 \$ 406.50 \$ 406.50 \$ 406.50 \$ 406.50 \$ 406.50 \$ 135.50 \$ 162.60 \$ 162.60 \$ 271.00 \$ 284.55

APPENDIX D
Income Statement for Option 1 (Vancouver Processing)

OPTION 1

Outsourced Processing & Sales via Vancouver/Lower Mainland area Roe Processors

INCOME STATEMENT

REVENUE:

Sales @ Grade	
Grade 1	\$ 5,467.50
Grade 2	\$ 2,430.00
Grade 3	\$ 708.75
 TOTAL SALES:	<hr/> <u>\$ 8,606.25</u>

EXPENSES:

Roe Purchases	\$ 1,316.25
Handling Fees (Old Crow)	\$ 1,000.00
Shipping Container	\$ 150.00
Shipping Fees	
YOC-YDA	\$ 562.50
YDA-YXY	\$ 843.75
YXY-YVR	\$ 843.75
Processing Fees	\$ 2,812.50
Sales Commission	\$ 602.44
Admin Costs (Old Crow 10%)	\$ 471.63
 TOTAL EXPENSES:	<hr/> <u>\$ 8,602.81</u>

TOTAL NET INCOME (LOSS): \$ 3.44

APPENDIX E
Income Statement for Option 2 (YRSC Processing)

OPTION 2

Outsourced Processing & Sales via Dawson/YRSC Ltd.

INCOME STATEMENT

REVENUE:

Sales @ Grade	
Grade 1	\$ 6,834.38
Grade 2	\$ 1,620.00
Grade 3	\$ 354.38
 TOTAL SALES:	<hr/>
	<u>\$ 8,808.75</u>

EXPENSES:

Roe Purchases	\$ 3,048.75
Handling Fees (Old Crow)	\$ 1,500.00
Shipping Container	\$ 150.00
Shipping Fees	
YOC-YDA	\$ 562.50
YDA-YXY	-
YXY-YVR	-
Product from Dawson	\$ 112.50
Processing Fees	\$ 2,812.50
Sales Commission	\$ 616.61
 TOTAL EXPENSES:	<hr/>
	<u>\$ 8,802.86</u>

TOTAL NET INCOME (LOSS):	<hr/>
	<u>\$ 5.89</u>