

The Olar et.al. study differed in that it specifically instructed survey participants to "vote" prices based upon the understanding that the funds to pay for the recovery programs being evaluated by them would come from their own pockets. The survey instrument stated "It is very important that you 'vote' as if this were a real vote. You need to imagine that you actually have to dig into your household budget and pay the additional costs." It is interesting to note that this study found that the probability of voting for a recovery program decreased when the price of the recovery program increased beyond a particular threshold, i.e. once the annual cost of the recovery program exceeded approximately \$100 Million (\$84/household/year), support and WTP for the program diminished.

### Discussion and Conclusions

There does not appear to be any significant variation in WTP among different geographic regions in Canada. Older, higher income Canadians tend to indicate higher WTP values than younger, lower income citizens. Gender differences in WTP values are not confirmed by either of the studies reviewed.

WTP values are highly influenced by the species being considered. Species preference does not appear to be influenced geographically in Canada although there is a tendency for WTP values to be higher amongst certain segments of Canadian society (e.g. Atlantic fishers had higher WTP values for fish species). There is a greater WTP if the recovery program is expected to have a high level of success, i.e. there is a high probability that the objectives of the recovery program will be met.

WTP increases slightly if the recovery program is expected to result in the species population increasing by more than 50% and slightly more again if increased by up to 200%. A change in listing status at the end of the recovery program does not appear to significantly influence WTP. It appears that Canadians are WTP for recovery programs that result in the species being down listed by a single category (endangered to threatened or threatened to special concern), but WTP diminishes significantly for more aggressive recovery programs (i.e. ones that result in a species being down-graded by more than one category). The Rudd study only involved species identified as threatened, while the Olar et.al. study involved two species identified as threatened and one as endangered. Since both studies indicate that Canadians are WTP for recovery actions for either endangered or threatened species, this would suggest that the status of the species at the time of listing does not have a significant bearing on WTP.

The question of whether Canadians are WTP more for recovery programs that achieve objectives in a shorter time frame versus a longer time frame, neither of the aforementioned studies specifically address this issue. In the absence of direction on this matter, it is proposed that WTP is likely to be higher for a shorter recovery period for two reasons. First shorter term results are more tangible for Canadians to understand and appreciate (e.g. the species will recover in my lifetime or my children's lifetime; there is a reasonable investment period to see a return). Second, it can be argued that uncertainty regarding the success of recovery programs in achieving listing objectives increases with the duration of the recovery period. For example,



factors such as climate change, national and global economics, global political stability, natural disasters have an increased probability of influencing the outcome of a recovery program over the longer term.

Lastly, there is no evidence to suggest whether or not WTP is influenced when a recovery program is directed at a species that is designated as threatened (or endangered) in several geographic regions, but the recovery effort is targeted to one region only. As previously noted, in the Olar et.al. study, survey respondents indicated relatively similar concerns for marine mammals at risk in the St. Lawrence Estuary as they did for those at risk elsewhere in Canada. In the case of beluga, of the seven identified populations in Canada, one is designated by COSEWIC as endangered, 3 are designated as threatened, one is designated as "special concern", and the remaining two are designated as "not at risk." At the time the Olar et.al. survey was conducted (2006) the COSEWIC (2004) report articulating beluga designations was already published, so presumably the WTP findings of that report are based upon the knowledge by some portion of the survey respondents that St. Lawrence Estuary beluga were not the only population considered at risk in the country.

In light of the above findings, their application to an assessment of non-use/passive values for the Cumberland Sound beluga SE analysis are discussed below. As well, the assumptions concerning non-use/passive values presented at the Scoping Stage, in light of these findings, are revisited.

With respect to Cumberland Sound belugas, it is expected that they would be considered a preferred species on a Canada-wide basis amongst all age, gender, and income classes, and therefore receive a relatively high WTP value. In both the Rudd (2007) and Olar et.al. (2007) studies, whales were ranked high in species preference order. Further, the Olar et.al. (2007) study found that 80.3% of Canadians surveyed were "somewhat" or "very" familiar with beluga. DFO reports<sup>51</sup> "In recent years, the beluga has attracted public attention, especially with respect to the problems of toxic contaminants and human disturbance. The St. Lawrence Estuary beluga population, isolated from those in the Arctic and residing in the southern extreme of its range, has turned the beluga into a symbol for the conservation of marine habitats in Canada. Public awareness of the beluga has also been raised through the recognition given by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) to the *endangered* or *threatened* status of some beluga populations in Canadian waters."

The major threat to Cumberland Sound belugas is harvest mortality and the only difference between the three Listing Scenarios is the size of the allowable harvest during the recovery period. Therefore it is assumed that regulation of the harvest would result in a high probability of recovery program success for all three Listing Scenarios because other than enforcement, there are no other major actions required to achieve the recovery target population (e.g. restrictions on commercial use, habitat protection, changes in industrial operations, etc.)

The literature indicates that WTP increases slightly if the recovery program is expected to result in the species population increasing by more than 50% and slightly more again if increased by up to 200%. The recovery target for Cumberland Sound belugas is 5,926 animals (70% of pre-

<sup>51</sup> [http://www.dfo-mpo.gc.ca/zone\\_underwater\\_sous-marin/beluga\\_beluga-eng.htm](http://www.dfo-mpo.gc.ca/zone_underwater_sous-marin/beluga_beluga-eng.htm)



whaling population) and the current population is estimated at 2,018 animals (in 2002), indicating that the listing objective will increase the population by 194% over the recovery period, albeit more quickly under Listing Scenarios #1 and #2. This suggests that WTP values on this attribute, under all Listing Scenarios, would be similar.

As previously discussed, although the literature does not provide guidance on whether Canadians are WTP more for recovery programs that achieve objectives in a shorter time frame versus a longer time frame, for reasons discussed above, for purposes of this SE analysis, it is assumed that WTP is higher for shorter term recovery periods. Therefore, it is assumed that WTP for Listing Scenario #1, which has the shortest recovery period (40 years) would be higher to an unknown extent than Listing Scenario #2 (55 year recovery period), and Listing Scenario #2 would solicit a higher WTP value than Scenario #3 (90 year recovery period).

It is not anticipated that the current designation of Cumberland Sound belugas as "threatened" would have any influence on WTP and since all three Listing Scenarios are designed to down-grade the species from threatened to special concern, and thus there is no reason to believe that there would be any difference in WTP amongst these three scenarios. Once recovery targets have been achieved, the literature suggests that people are not WTP more to have recovery programs achieve a further down-grading of listing status. Therefore, WTP during a post recovery period is assumed to remain stable, i.e. Canadians will be WTP to have beluga maintained at a "species of concern" status level, but will not be WTP additional monies to have the species down-graded to "not-at-risk" status.

Finally, the yearly costs associated with recovery programs are not expected to differ amongst the three Listing Scenarios, with the exception of Inuit loss of harvesting opportunities in Listing Scenarios #1 and #2. The difference lies in the total number of years that recovery actions must be implemented. The Olar et.al. study reveals two important things. One, Canadians appear WTP annually for recovery programs that last for at least a 50-year period. And two, Canadians appear WTP for recovery programs up to a threshold cost (\$100 million). This suggests that so long recovery program costs for the Cumberland Sound beluga are below \$100 million/year, WTP values will be similar amongst the three Listing Scenarios, at least for the first 50 years.

In conclusion, based upon the above analysis, the assumptions concerning non-use/passive values presented at the Scoping Stage have been adjusted/refined as follows.

On the one hand it could be assumed that WTP for Listing Scenario #3 will be nil to low because of the long recovery period resulting from the "no change in harvest levels" approach in this scenario. The literature reveals that WTP is highly correlated with the probability of recovery success and it has been discussed that the longer the recovery period, the greater the uncertainty of success and the longer the wait for a return on "investment", the lower the WTP values. On the other hand Rudd (2007) points out that Canadians are ... "concerned not so much with the magnitude of outcomes or how those outcomes were defined as with knowing that efforts were being made to protect endangered species. Thus, it's clear that Canadians are WTP for efforts directed at protecting species at risk, but would they be prepared to pay at all or as much for a recovery program that does nothing to address the most immediate threat to population recovery, i.e. leaves harvest levels at the status quo? Are the recovery management

program and reporting initiatives triggered by a *SARA* listing sufficient for citizen's to be WTP for Listing Scenario #3, and if so to what degree? It is beyond the scope of a first level tier SE analysis to arrive at a more definitive answer than WTP for Listing Scenario #3 would likely be less than for the other two Listing Scenarios and possibly no different than the baseline (WTP assumed to equal zero).

Although beyond the policy period covered in this SE analysis, the other refinement pertains to the assumption about the direction of impact on non-use/passive values in the post-recovery period. At the Scoping Stage, it was not clear how values might change under the three Listing Scenarios. The direction of impact has been changed from unknown to no change based upon the finding by Olar et.al. that Canadians are generally not WTP more to have a species downgraded more than one status category. Therefore the "no change" characterization reflects that people will be WTP to have beluga maintained at the post-recovery risk status of "special concern" but that WTP will not be less or greater than that of the recovery period.

**APPENDIX C: Assessment of Recovery Strategy Actions/Tasks  
Which Would be Incremental under a Listing Scenario**

**\*Actions and Tasks are from  
DFO Draft Recovery Strategy for Cumberland Sound Belugas (2005)**



ACTION#	ACTION	TASKS	ASSUMPTIONS REGARDING INCREMENTAL COSTS UNDER A LISTING SCENARIO
1	Continue to monitor and assess the population status of Cumberland Sound belugas using scientific and Inuit approaches to gauge recovery progress.	<p>1.1 Conduct regular aerial surveys for continued research assessment of population size to monitor recovery.</p> <p>1.2 Develop a means to regularly collect and document hunters' observations to obtain information on beluga population size and distribution to monitor recovery.</p>	<p>Assume incremental to listing as frequency of surveys would have to increase to every 5 years to be compliant with SARA.</p> <p>A program was started in 2004. Assume existing program is the baseline and would continue under a listing scenario, but not incremental to the listing scenario.</p>
2	Maintain a sound sustainable and continuing Inuit subsistence hunt.	<p>2.1 Continue to collect hunt data to assist in estimating hunt mortality: number struck-and-landed, number struck-and-sunk and number wounded-and-escaped.</p> <p>2.2 Develop a Fisheries management plan for Cumberland Sound belugas.</p> <p>2.3 Assist with training hunters on proper beluga hunting techniques and uses including a discussion of new techniques. The purpose of this would be to increase the efficiency of hunts by reducing losses and maintaining a sustainable hunt.</p> <p>2.4 Continue ongoing communication with local hunters during development of the Recovery Strategy and Management Plan and subsequent updates.</p>	<p>Assume current data collection is the baseline and these baseline activities would continue under a listing scenario, but not incremental to the listing scenario.</p> <p>FMP has been developed and is supposed to be reviewed and modified every three years or as more info becomes available. Assume this is the baseline and the frequency of review would continue, but not be incremental to the listing scenario.</p> <p>Hunter training to reduce incidence of struck and lost and best hunting practices have been developed and delivered in workshops conducted in 2003. NTI has covered the costs of the workshops to date and therefore it is assumed they would continue to cover the cost, even if under a listing scenario the frequency of workshops were to increase.</p> <p>The FMP includes provisions for on-going communications, but it is assumed that these communications are not incremental to listing. Assume that the Recovery Strategy "ongoing" communications would be costs that are incremental to listing.</p>

ACTION#	ACTION	TASKS	ASSUMPTIONS REGARDING INCREMENTAL COSTS UNDER A LISTING SCENARIO
3	Continue to assess and protect beluga habitat in Cumberland Sound.	2.5 Continue analyses of past and future trends of the population to aid in understanding levels of risk associated with various hunt mortalities and developing appropriate hunt management and conservation strategies.	Currently ongoing and frequency linked to frequency of aerial surveys (see Task 1.1) Linked to more frequent aerial surveys in Task 1.1 under a listing. Assume cost for trend analysis/risk analysis will be incorporated into the cost of more frequent aerial surveys.
		2.6 Continue research on genetic diversity in Cumberland Sound and stock discrimination between Cumberland Sound population and other arctic beluga populations to ensure appropriate hunt management and conservation strategies are in place.	Samples have been obtained and analyses done. Assume this is the baseline and these activities would continue under a listing scenario, but not incremental to the listing scenario.
		3.1 Continue to define beluga winter habitat through surveys, tagging studies and other research to identify areas that may require protection (e.g., potential conflict with commercial fisheries and future industrial activity).	Winter survey done in 2003 and winter ice distribution work done in 2004; several ongoing activities. Since habitat impacts not significant threat, assume baseline and existing habitat programs would continue under a listing scenario, but not incremental to listing.
		3.2 Delineate important spring habitat to identify areas that may require protection.	Same as 3.1.
		3.3 Produce a map of important, and critical if possible, habitat in Cumberland Sound, develop an understanding of why these areas are important for belugas, and establish appropriate protective measures for each area and the Sound as required.	Same as 3.1.



ACTION#	ACTION	TASKS	ASSUMPTIONS REGARDING INCREMENTAL COSTS UNDER A LISTING SCENARIO
4	Continue to assess threats and ensure that environmental and human activities do not adversely affect Cumberland Sound belugas.	4.1 Continue to investigate and assess all current and emerging environmental threats in the region that potentially threaten the population by developing a means to regularly collect and document hunters' observations of killer whale and polar bear sightings and behaviour, and environmental conditions (e.g., entrapments, climate change).	These are ongoing activities. Assume ongoing activities are the baseline and would continue under a listing scenario, but not incremental to listing.
		4.2 Continue to investigate and assess all current and emerging human activities in the region that potentially threaten the population (e.g., commercial fisheries, pollution, noise and disturbance) through monitoring and reporting by the Pangnirtung HTO.	These are ongoing activities. Assume ongoing activities are the baseline and would continue under a listing scenario, but not incremental to listing.
		4.3 Establish guidelines for human activities as needed.	No such activity now. We can't speculate on whether the activity would be permitted under listing with guidelines etc. because we don't know what the activity is. If whale watching is the activity, assume that under listing scenario the status quo re: whale watching would remain, i.e. no whale watching and recovery strategy would preclude whale watching. So assume the requirement to establishment guidelines would continue under a listing scenario, but not incremental to listing.
		4.4 The Recovery Team should assess new license applications for exploratory marine fisheries in Cumberland Sound to ensure they do not pose a threat to belugas.	It is presumed that this activity (assessing new license applications) occurs now. Assume would continue under a listing scenario, but not incremental to listing.



ACTION#	ACTION	TASKS	ASSUMPTIONS REGARDING INCREMENTAL COSTS UNDER A LISTING SCENARIO
5	Promote a better understanding of the Inuit and scientific knowledge of Cumberland Sound belugas, threats and actions needed to promote recovery to gain public support for and implementation of the Strategy and associated Action Plan(s).	4.5 Develop appropriate restrictions, as needed, to minimize net entanglements.	It is presumed that this activity occurs now. Assume would continue under a listing scenario, but not incremental to listing.
		4.6 Mitigate pollution (e.g., garbage dumping, purging of ballast/bilge water and oil) through existing federal legislation with the aid of responsible departments.	Activity occurs now under existing legislation. Assume would continue under a listing scenario, but not incremental to listing.
		4.7 Continue research on heavy metals and halogenated organic contaminants to assess the effects of current concentration levels on the health of Cumberland Sound belugas.	Ongoing. If non-point source pollution, then uncontrollable, i.e. nothing could be done specific to listing. As contaminants are not identified as a threat, assumed contaminant studies would continue, but not be incremental to listing.
		5.1 Develop and implement communications programs by the community and DFO.	Assume incremental to listing This is linked to Tasks 2.2 and 2.4.
		5.2 Upon completion of the Recovery Strategy, produce communication and education materials about Cumberland Sound beluga and the Strategy to promote understanding and support of the Strategy within the community, Nunavut and elsewhere.	Assume incremental to listing.

## APPENDIX D: Beluga Population Monitoring Estimate

Based upon Personal Communication with Pierre Richard, Research Scientist, Marine Mammal Research Program, Arctic Research Division, Central & Arctic Region, Fisheries and Oceans Canada by telephone on Nov. 3rd, 2009 and email correspondence dated Nov. 13th, 2009.

Mr. Richard has been involved in CS Beluga population research since 1983. The most recent population survey was done in August of 2009 (an attempt was made in 2005 but was not successful due to inclement weather). Optimal time of year for aerial survey for CS Beluga is August. Duration of survey time is highly dependent upon weather, but generally the survey can be accomplished in a 7-12 day window. Costs below are based upon actual 2009 unit costs and a scenario where the actual field survey occurs over 12 days.

### 1. Planning Stage

Activities include developing the sampling plan, contacting Pangnirtung locals, travel arrangements, air charter arrangements, equipment preparation and testing. This involves about a month's work:

i) Res2 level, \$335/day plus 20% benefits= \$402/day rate) x 10 days (2 weeks)	\$ 4,020
ii) BI2 Level DFO person (197/day + 20% benefits = \$236.40/day rate) x 10 days (2 weeks)	\$ 2,364
Sub-Total	\$ 6,384

### 2. Field Stage

a) DFO Travel Costs	
i) Winnipeg to Iqaluit airfare (\$1900 x 3 people)	\$ 5,700
ii) Accommodation/Meals in Iqaluit (\$350/day x 3 people x 2 nights)	\$ 2,100
iii) Accommodation/Meals in Pangnirtung (\$400/day x 3 people x 12 days)	\$ 14,400
iv) Vehicle rental in Pangnirtung (12 days x \$200/day)	\$ 2,400
b) Pangnirtung Field Crew (2 individuals)	
i) Stand by days \$50/day/person x 2 people x 5 days	\$ 500
ii) Flying days \$250/day/person x 2 people x 7 days)	\$ 3,500
c) Air Charter	
i) aircraft 30 hours x \$2,000/hr.	\$ 60,000
ii) accommodation/meals (2 pilots x 12 days (7-12 days) x \$400/day	\$ 9,600
d) DFO personnel time	
i) Res2 Level \$402/day x 1 person x 18 days (3 days travel to/from Iqaluit, 3 days in Iqaluit, and 12 days in Pangnirtung)	\$ 7,236
ii) BI2 Level \$236.40 x 18 days	\$ 4,255
iii) EG1 Level (\$143/day + 20% benefits = \$171.60) x 18 days	\$ 3,089
Sub-Total	\$112,780



### 3. Data Analysis and Reporting

Activities include digital film production, map products, analysis of field data, trend analysis, report drafts, peer review, and report finalization.

Contracted services (film, mapping, etc.)	\$20,000
Image analysis – EG-6 Level staff 15 days @ 281/day	\$ 4,215
Draft report preparation RES02 Level staff 60 days (3 months) x \$402/day	\$24,120
Peer Review process (travel \$2,500 plus RES02 Level staff 5 days x \$402/day)	\$ 4,510
Community reporting (travel \$3,500 plus RES02 Level staff 5 days x \$402/day)	\$ 5,510
IFMP process (travel \$3,500 plus RES02 Level staff 10 days x \$402/day)	\$ 7,520
Pre- SARA process (travel \$2,500 plus RES02 Level staff 10 days x \$402/day)	\$ 6,520
Science advise to NWMB (travel \$3,500 plus RES02 Level staff 5 days x \$402/day)	<u>\$ 5,510</u>
Sub-Total	\$77,905
<b>TOTAL</b>	<b>\$197,069</b>
<b>ROUNDED TO</b>	<b>\$200,000</b>

**APPENDIX E: Estimated DFO Costs for a Pre-Listing Consultation  
Meeting with Inuit Parties**

	DFO Consultation Specialist	DFO Biologist	Justice Dept Lawyer	TOTAL
<b>Salaries:</b>				
Daily Rate	\$325 <sup>(1)</sup>	\$309 <sup>(2)</sup>	\$354 <sup>(3)</sup>	
Pre-Meeting Preparation- 3 days	\$975	\$927	\$1,062	\$2,964
Meeting -5 days	\$1,625	\$1,545	\$1,770	\$4,940
Post-Meeting Follow-up – 3 days	\$975	\$927	\$1,062	\$2,964
			Sub-Total	\$10,868
<b>Expenses:</b>				
Airfare <sup>(4)</sup>	\$3,160	\$3,160	\$3,160	\$9,480
Accommodation/Meals <sup>(5)</sup>	\$2,250	\$2,250	\$2,250	\$6,750
Meeting Room Rental <sup>(6)</sup>				\$1,000
			Sub-Total	17,230
			TOTAL	\$28,098
			ROUNDED TO:	\$28,100
<p>Cost estimate assumes a team of three individuals with experience levels listed below would attend in Pangnirtung to conduct consultation based upon personal communication with Mark Skiba, Policy Advisor, Central and Arctic Region, Fisheries and Oceans Canada, November 24, 2009.</p> <p><sup>(1)</sup> DFO Consultation Specialist - PM5/PM6 Level - salary range (effective June 21, 2010) \$72,148-\$96,725; mid-range salary = \$84,436/260 working days per year = \$325/day. Treasury Board of Canada, Rates of Pay for the Public Service of Canada.</p> <p><sup>(2)</sup> DFO Biologist - BI3/BI4 Level - salary range (effective June 21, 2010) \$65,816-\$94,680; mid-range salary = \$80,248/260 working days per year = \$309/day. Treasury Board of Canada, Rates of Pay for the Public Service of Canada.</p> <p><sup>(3)</sup> Justice Department Lawyer - LA-2(I) Level - salary range (effective since March 1, 2005) Step 1-9 range \$75,622-\$108,241; mid-range salary = \$91,932/260 working days per year = \$354/day. Treasury Board of Canada, Rates of Pay for the Public Service of Canada.</p> <p><sup>(4)</sup> Cost estimate assumes all three individuals based in Winnipeg. Flights are Winnipeg to Ottawa and Ottawa to Pangnirtung via Iqaluit based upon fares listed on-line at Air Canada and First Air for regular class fare.</p> <p><sup>(5)</sup> Cost estimate assumes a rate of \$450/day covering accommodation, meals, taxi, and incidentals.</p> <p><sup>(6)</sup> Cost estimate assumes a rate of \$500/day covering meeting room rental, refreshments and lunch in Pangnirtung for two days.</p>				



## APPENDIX F: $\Sigma$ PV Benefit and Cost Tables

**TABLE 1: BASELINE SCENARIO**

Discount Rate	0.03	ΣPV BENEFITS - ΣPV COSTS \$2,690,340.53	
Inflation Rate	0.01		
Inuit Food	\$182,500.00		
Recovery Actions	\$200,000.00		

  

YEAR	Inuit Food		Population Monitoring	
	FUTURE\$	PV\$	FUTURE\$	PV\$
1	\$184,325.00	\$178,956.31		
2	\$186,168.25	\$175,481.43		
3	\$188,029.93	\$172,074.02		
4	\$189,910.23	\$168,732.78		
5	\$191,809.33	\$165,456.42		
6	\$193,727.43	\$162,243.67		
7	\$195,664.70	\$159,093.31		
8	\$197,621.35	\$156,004.12		
9	\$199,597.56	\$152,974.91		
10	\$201,593.54	\$150,004.52		
11	\$203,609.47	\$147,091.82	\$220,924.43	\$164,388.52
12	\$205,645.57	\$144,235.66		
13	\$207,702.02	\$141,434.97		
14	\$209,779.04	\$138,688.66		
15	\$211,876.83	\$135,995.68		
16	\$213,995.60	\$133,354.98		
17	\$216,135.56	\$130,765.57		
18	\$218,296.91	\$128,226.43		
19	\$220,479.88	\$125,736.60		
20	\$222,684.68	\$123,295.11	\$244,038.01	\$135,117.93
TOTALS		\$2,989,846.97		\$299,506.45



**TABLE 2: LISTING SCENARIO #1**

Discount Rate	0.03
Inflation Rate	0.01
Inuit Food	-
Recovery Actions	200,000.00
Consultation	84,300.00
NU/Passive Values	209,000.00

ΣPV BENEFITS - ΣPV COSTS (Excluding NU/Passive Values)
- \$712,528.01

ΣPV BENEFITS - ΣPV COSTS (Including NU/Passive Values)
\$2,711,461.12

Benefits
Costs

YEAR	Inuit Food		Recovery Actions		Consultation		Non-Use/Passive Values	
	FUTURE\$	PV\$	FUTURE\$	PV\$	FUTURE\$	PV\$	FUTURE\$	PV\$
1	\$0.00	\$0.00			\$85,143.00	\$82,663.11	\$211,090.00	\$204,941.75
2	\$0.00	\$0.00					\$213,200.90	\$200,962.30
3	\$0.00	\$0.00					\$215,332.91	\$197,060.12
4	\$0.00	\$0.00					\$217,486.24	\$193,233.71
5	\$0.00	\$0.00	\$210,202.01	\$181,322.10			\$219,661.10	\$189,481.59
6	\$0.00	\$0.00					\$221,857.71	\$185,802.34
7	\$0.00	\$0.00					\$224,076.29	\$182,194.53
8	\$0.00	\$0.00					\$226,317.05	\$178,656.77
9	\$0.00	\$0.00					\$228,580.22	\$175,187.71
10	\$0.00	\$0.00	\$220,924.43	\$164,388.52			\$230,866.02	\$171,786.00
11	\$0.00	\$0.00					\$233,174.68	\$168,450.35
12	\$0.00	\$0.00					\$235,506.43	\$165,179.47
13	\$0.00	\$0.00					\$237,861.50	\$161,972.10
14	\$0.00	\$0.00					\$240,240.11	\$158,827.01
15	\$0.00	\$0.00	\$232,193.79	\$149,036.36			\$242,642.51	\$155,743.00
16	\$0.00	\$0.00					\$245,068.94	\$152,718.86
17	\$0.00	\$0.00					\$247,519.63	\$149,753.44
18	\$0.00	\$0.00					\$249,994.82	\$146,845.61
19	\$0.00	\$0.00					\$252,494.77	\$143,994.24
20	\$0.00	\$0.00	\$244,038.01	\$135,117.93			\$255,019.72	\$141,198.23
TOTALS		\$0.00		\$629,864.91		\$82,663.11	\$4,647,991.55	\$3,423,989.14



**TABLE 3: Listing Scenario #2**

Discount Rate	0.03
Inflation Rate	0.01
Inuit Food	\$89,024.00
Recovery Actions	\$200,000.00
Consultation	\$84,300.00
NU/Passive Values	\$119,000.00

ΣPV BENEFITS - ΣPV COSTS (Excluding NU/Passive Values)  
\$745,927.53

ΣPV BENEFITS - ΣPV COSTS (Including NU/Passive Values)  
\$2,695,471.59

Benefits
Costs

YEAR	Inuit Food		Recovery Actions		Consultation		Non-Use/Passive Values	
	FUTURE\$	PV\$	FUTURE\$	PV\$	FUTURE\$	PV\$	FUTURE\$	PV\$
1	\$89,914.24	\$87,295.38			\$85,143.00	\$82,663.11	\$120,190.00	\$116,689.32
2	\$90,813.38	\$85,600.32					\$121,391.90	\$114,423.51
3	\$91,721.52	\$83,938.18					\$122,605.82	\$112,201.69
4	\$92,638.73	\$82,308.31					\$123,831.88	\$110,023.02
5	\$93,565.12	\$80,710.09	\$210,202.01	\$181,322.10			\$125,070.20	\$107,886.65
6	\$94,500.77	\$79,142.91					\$126,320.90	\$105,791.76
7	\$95,445.78	\$77,606.15					\$127,584.11	\$103,737.55
8	\$96,400.24	\$76,099.24					\$128,859.95	\$101,723.23
9	\$97,364.24	\$74,621.58					\$130,148.55	\$99,748.02
10	\$98,337.88	\$73,172.62	\$220,924.43	\$164,388.52			\$131,450.03	\$97,811.17
11	\$99,321.26	\$71,751.79					\$132,764.53	\$95,911.92
12	\$100,314.47	\$70,358.55					\$134,092.18	\$94,049.56
13	\$101,317.62	\$68,992.37					\$135,433.10	\$92,223.35
14	\$102,330.79	\$67,652.71					\$136,787.43	\$90,432.61
15	\$103,354.10	\$66,339.06	\$232,193.79	\$149,036.36			\$138,155.31	\$88,676.63
16	\$104,387.64	\$65,050.93					\$139,536.86	\$86,954.76
17	\$105,431.52	\$63,787.80					\$140,932.23	\$85,266.32
18	\$106,485.83	\$62,549.20					\$142,341.55	\$83,610.66
19	\$107,550.69	\$61,334.66					\$143,764.97	\$81,987.15
20	\$108,626.20	\$60,143.69	\$244,038.01	\$135,117.93			\$145,202.61	\$80,395.17
TOTALS		\$1,458,455.55		\$629,864.91		\$82,663.11		\$1,949,544.05



**TABLE 4: LISTING SCENARIO #3**

Discount Rate	0.03
Inflation Rate	0.01
Inuit Food	182,500.00
Recovery Actions	200,000.00
Consultation	28,100.00
NU/Passive Values	22,000.00

ΣPV BENEFITS - ΣPV COSTS (Excluding NU/Passive Values)
\$2,332,427.70

ΣPV BENEFITS - ΣPV COSTS (Including NU/Passive Values)
\$2,692,847.61

Benefits
Costs

YEAR	Inuit Food		Recovery Actions		Consultation		Non-Use/Passive Values	
	FUTURE\$	PV\$	FUTURE\$	PV\$	FUTURE\$	PV\$	FUTURE\$	PV\$
1	\$184,325.00	\$178,956.31			\$28,381.00	\$27,554.37	\$22,220.00	\$21,572.82
2	\$186,168.25	\$175,481.43					\$22,442.20	\$21,153.93
3	\$188,029.93	\$172,074.02					\$22,666.62	\$20,743.17
4	\$189,910.23	\$168,732.78					\$22,893.29	\$20,340.39
5	\$191,809.33	\$165,456.42	\$210,202.01	\$181,322.10			\$23,122.22	\$19,945.43
6	\$193,727.43	\$162,243.67					\$23,353.44	\$19,558.14
7	\$195,664.70	\$159,093.31					\$23,586.98	\$19,178.37
8	\$197,621.35	\$156,004.12					\$23,822.85	\$18,805.98
9	\$199,597.56	\$152,974.91					\$24,061.08	\$18,440.81
10	\$201,593.54	\$150,004.52					\$24,301.69	\$18,082.74
11	\$203,609.47	\$147,091.82	\$220,924.43	\$164,388.52			\$24,544.70	\$17,731.62
12	\$205,645.57	\$144,235.66					\$24,790.15	\$17,387.31
13	\$207,702.02	\$141,434.97					\$25,038.05	\$17,049.70
14	\$209,779.04	\$138,688.66					\$25,288.43	\$16,718.63
15	\$211,876.83	\$135,995.68	\$232,193.79	\$149,036.36			\$25,541.32	\$16,394.00
16	\$213,995.60	\$133,354.98					\$25,796.73	\$16,075.67
17	\$216,135.56	\$130,765.57					\$26,054.70	\$15,763.52
18	\$218,296.91	\$128,226.43					\$26,315.24	\$15,457.43
19	\$220,479.88	\$125,736.60					\$26,578.40	\$15,157.29
20	\$222,684.68	\$123,295.11	\$244,038.01	\$135,117.93			\$26,844.18	\$14,862.97
TOTALS		\$2,989,846.97		\$629,864.91		\$27,554.37	\$489,262.27	\$360,419.91