DFO Submission to NMRWB

Public Hearings (Jan. 21-23)

Modification of Total Allowable Take and Non Quota Limitations for Eastern Hudson Bay Beluga in the Nunavik Marine Region

Kuujjuaraapik, Québec

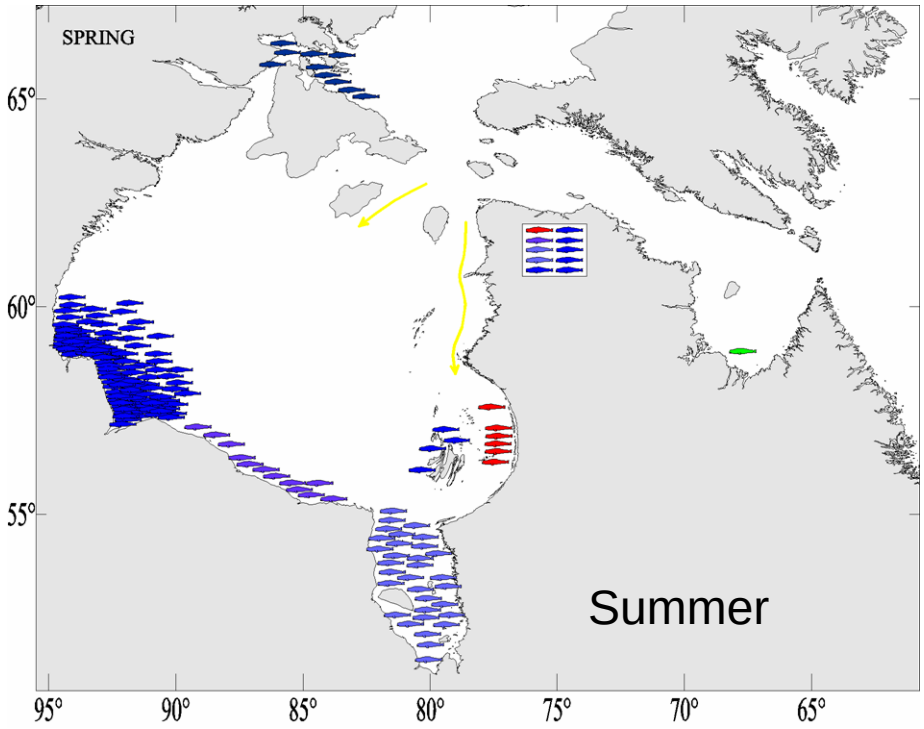
Lake Laberge, Yukon Territory, Canada. Shutterstock

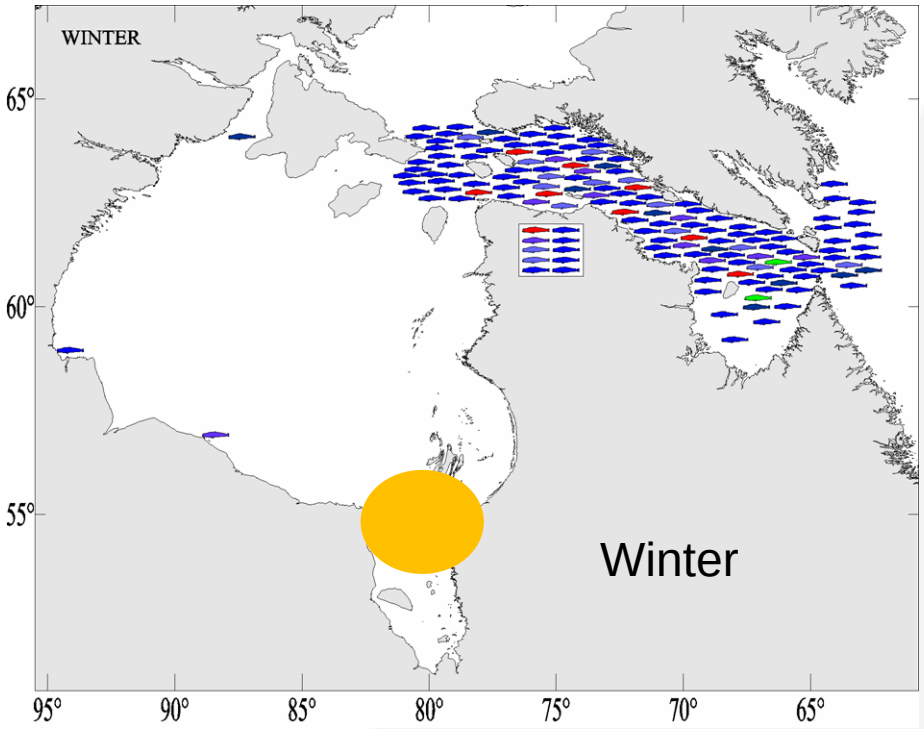
Overview

Science information
Management considerations
Position on options

Seasonal distribution of belugas

- 2 or more stocks, overwintering in HS
- Today-James Bay stock, overwinters in JB





Why manage?

- A ‘stock’ is a management unit established to avoid local depletions and loss of genetic diversity
- WHB, EHB & UB beluga form stocks
- Limits placed on harvesting of EHB & UB because of conservation concerns for them

Aerial survey estimates and standard errors (SE) of abundance for Eastern Hudson Bay (EHB), western Hudson Bay (WHB), James Bay (JB) and Ungava Bay (UB). No dedicated effort since 2008 in UB

Year	EHB estimate (SE)	WHB estimate (SE)	JB estimate (SE)	UB	
1985	4 282 (557)		4 720 (614)	*	
1987		31 124 (6 967)			
1993	2 729 (1 092)		8 205 (1 969)	*	
2001	2 924 (1 404)		17 285 (4 148)	*	
2004	4 274 (1 581)	51 761 (15 875)	8 364 (2 509)		
2008	2 646 (1 244)		19 439 (12 830)	*	
2011	3 351 (1 642)		14 967 (4 490)		
2015	3 819 (1 642)	54 500 (5 329)	10 615 (2 654)		
				<100*	

*** No belugas have been seen on transect in UB. However, belugas have been detected offline. This information has been used to generate an estimate of less than 100 animals for this summer stock. If no hunting the highest pop we could expect is 300**

Participation Sampling 2016-2018

Village	2016-18	%	
Kuujjuarapik	16	90+	★
Umiujaq	27	11	
Inukjuak	65	8	
Puvirnituk	44	23	
Akulivik	45	51	★
Ivujivik	88	20	
Salluit	126	38	
Kangiqsujuaq	105	65	★
Quaqtaq	101	90+	★
Kangirsuk	59	19	
Aupaluk	30	50	★
Tasiujaq	50	48	★
Kuujjuaq	99	21	
Kangiqsualujju	44	23	

	N samples	N events	% WHB	95% CI	(CV samples / events)	% EHB	95% CI	(CV samples / events)	% Unknown
Spring (Feb 1 - Aug 31)									
Hudson Strait	770	347	82,9	78.5 - 87	0.02/ 0.03	11,7	8.1 – 16	0.15/0.17	5,3
NE Hudson	2	1	ND			ND	-	-	-
Ungava Bay	122	76	87,4	77.8 - 94.6	0.04/ 0.05	6,0	0.8 - 15.8	0.63/0.65	6,6
Fall (Sept 1 - Jan 31)									
Hudson Strait	454	180	67,6	60.3 - 74.5	0.04/ 0.05	29,1	22.4 - 36.3	0.09/0.12	3,3
NE Hudson	31	14	49,1	26.4 - 72	0.23/ 0.24	44,5	23.5 - 66.5	0.26/0.25	6,5
Ungava Bay	4	4	ND	-	-	ND	-	-	ND

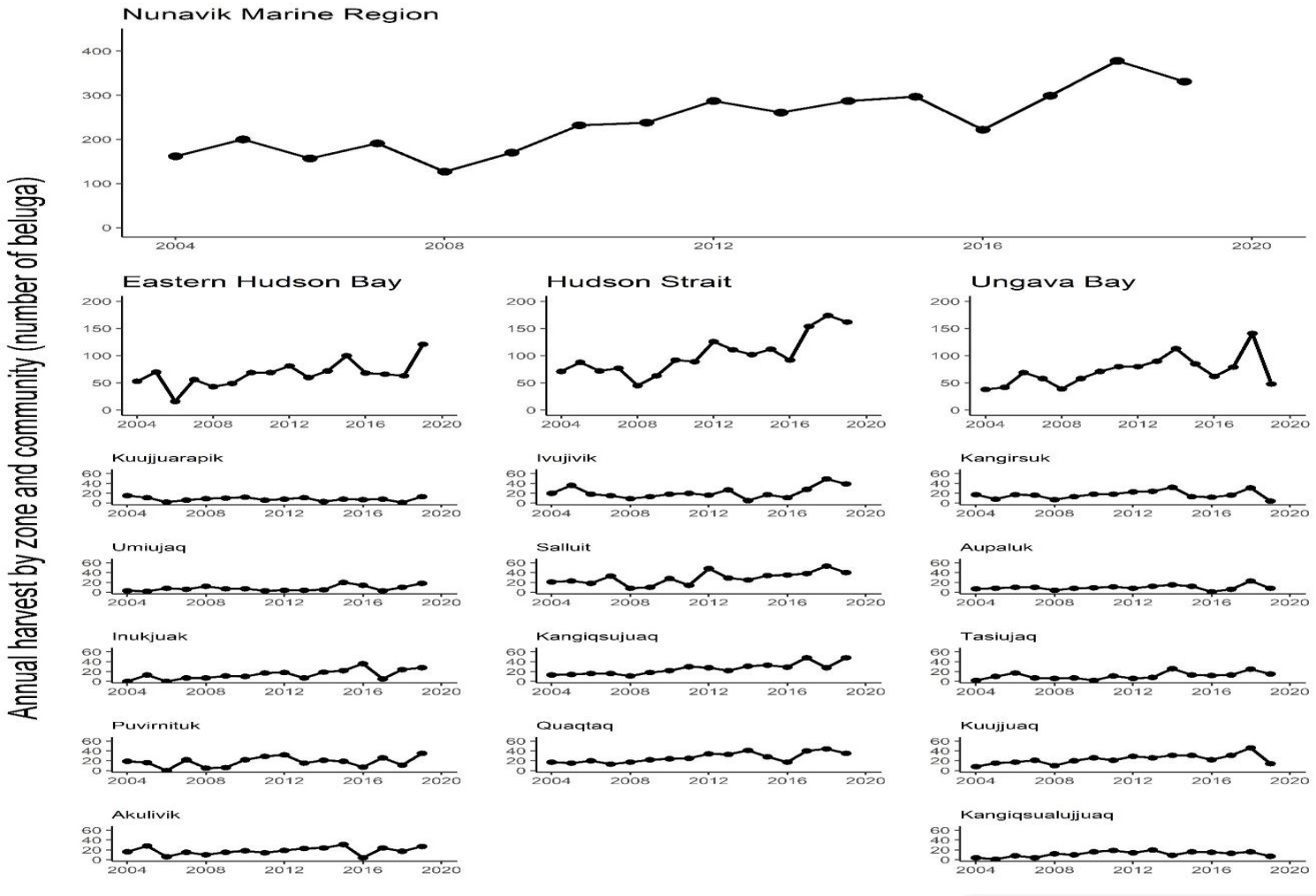
Pilot project-single vs larger samples. On the fly vs following the plan, small benefits????

	N samples	N events	% WHB	95% CI	(CV samples / events)	% EHB	95% CI	(CV samples / events)	% Unknown
Hudson Strait Pilot Project	45	9	68.5	48.7 - 85.2	0.13/0.14	25	6.6 - 50.3	0.35/0.46	6.7

Sanikiluaq harvests

Sanikiluaq Season	N samples	N events	% WHB	95% CI	(CV samples / events)	% EHB	95% CI	(CV samples / events)	% Unknown
Spring (Apr. 1 - Jun. 30)	301	107	76,8	69.2 - 83.7	0.02/0.05	1,6	0 - 6.6	1.01/1.17	21,6
Extended spring (Apr. 1 - Jul. 14)	324	120	75,1	67.2 - 82.2	0.03/0.05	4,6	1.1 - 10.2	0.43/0.52	20,4
Summer (Jul. 1 – Aug. 31)	31	18	61,5	32.8 - 86.2	0.16/0.23	25,6	4.9 – 56	0.37/0.53	12,9
Fall (Sept 1 - Nov 30)	45	30	97,8	91.8 - 99.9	0/0.02	0,0	-	-	2,2
Winter (Dec. 1 - Mar. 31)	56	7	31,3	6.1 - 65.6	0.24/0.51	36,6	9 - 70.7	0.21/0.45	32,1

Harvest data: current harvests ~400/y, vs 875 HBC commercial harvest



What do we do with information?
Put all information together to make a population model

- Total =Current abundance + Births – Deaths-harvests

Eg current Population =100

- 10 calves are born, but there are 7 deaths due to natural causes. So the population after 1 year=103 , but if we have a hunt of 2 animals, then the population size after 1 year is 101

- Population size= 100 +10 births -7 deaths-2 kills
- =101

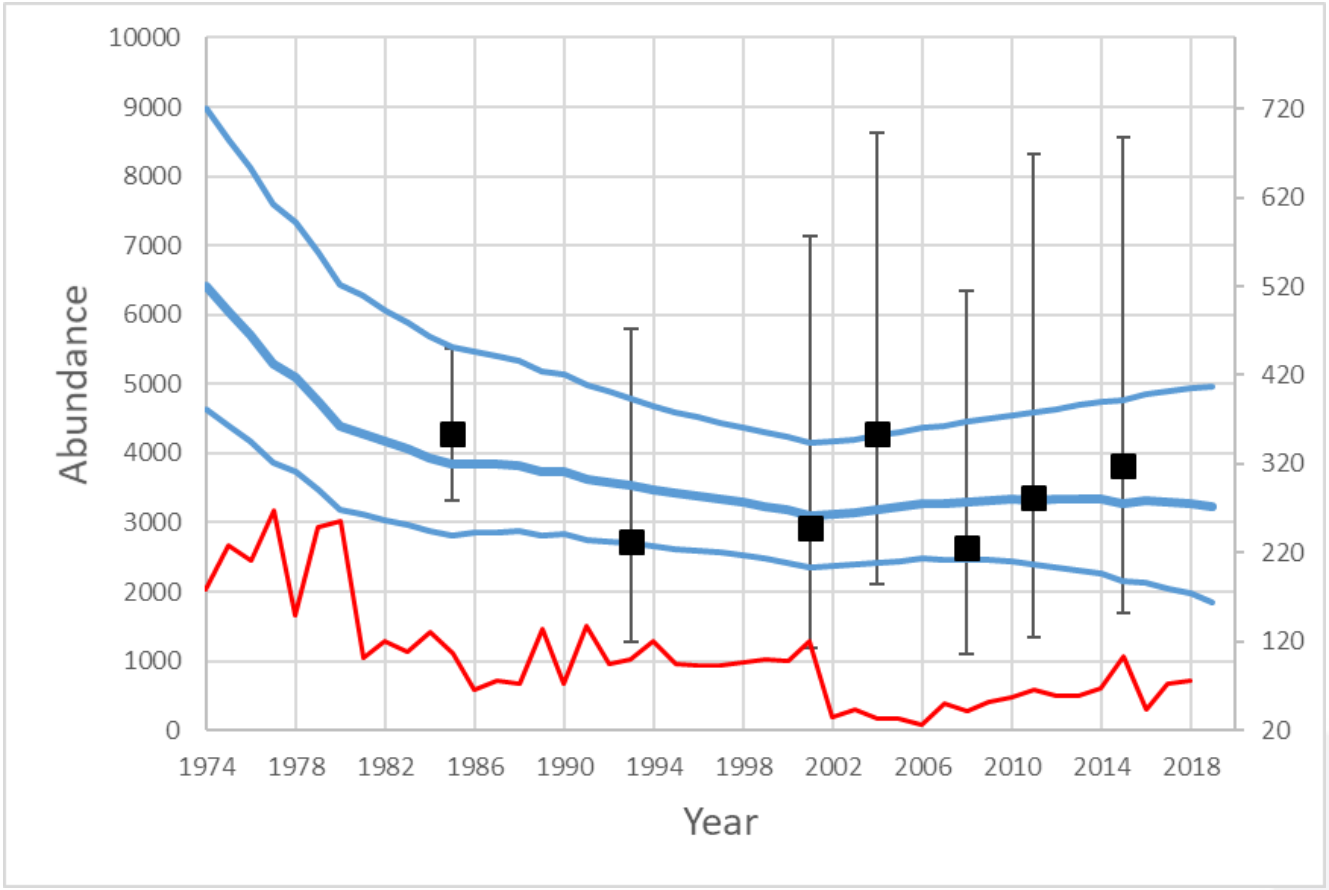
Nunavik beluga model

- Where is the information coming from:

- **Model Total =Current size+ Births – Deaths-harvests**

- Current size= aerial surveys
- Lambda=Births-deaths, assume beluga are normal and have a rate of increase of 3%
- Harvests= weekly reports of kills
- %EHB =Kills * the proportion of EHB in harvest
- But not all animals killed are recovered, additional correction

Estimated population from model



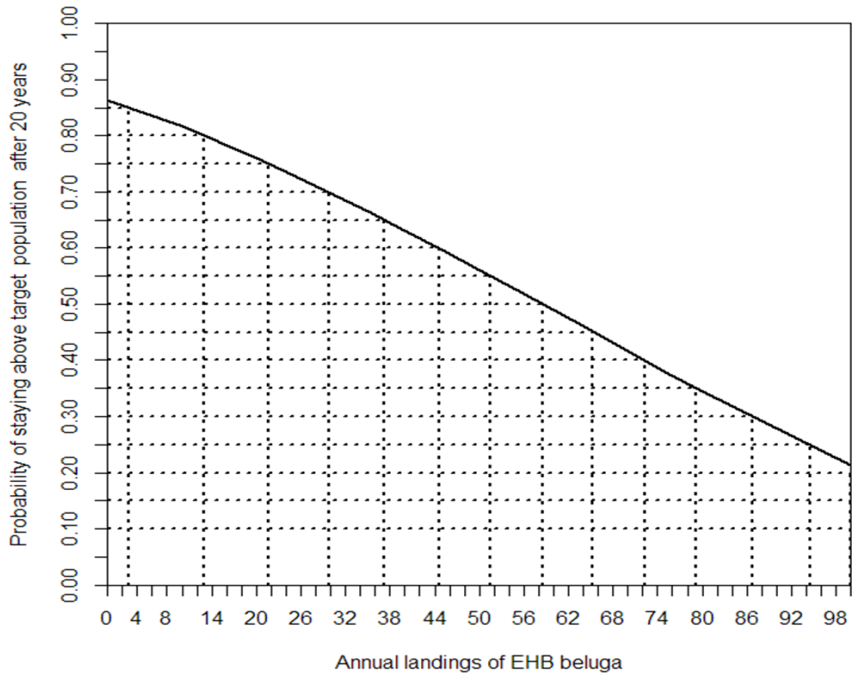
At last assessment N=3400,

New runs suggest there has been a slight decline.

Need a new survey- complete update in fall 2020

Nunavik beluga management objective: Protect EHB whales, by taking more WHB whales, assuming no conservation concern for WHB.

EHB TAT≤ 58 animals



WHB belugas

Harvest limit. PBR= **753**

2015 landed catch= **495**

total catch=**584** (18%S&L)

Additional capacity

=**753-584=169 total**.

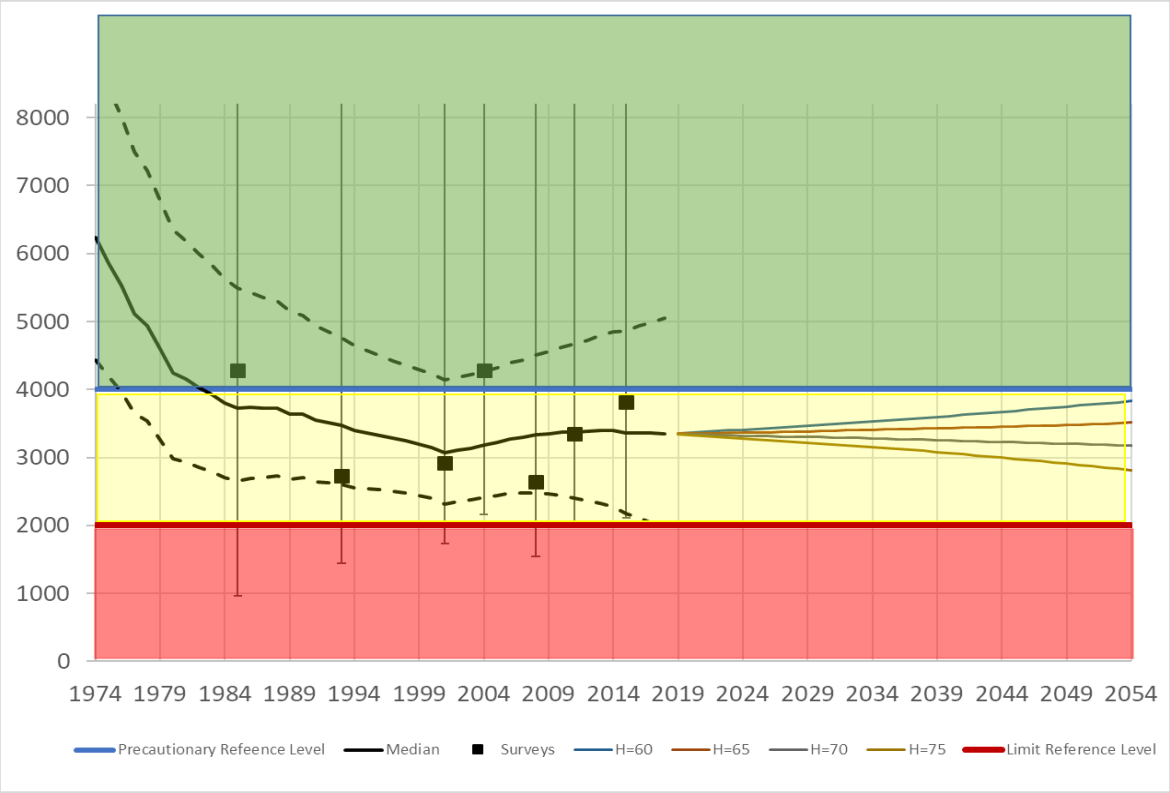
Including 18% S&L=139

39% S&L/no report =103

Additional WHB whales available: 103-139

Precautionary Approach

Contributes to NILCA requirement for the restoration and revitalization of depleted populations of wildlife and wildlife habitat



- Every year, the Sanikiluaq HTA shares its local harvest statistics with the co-management organizations.
- Lucassie will speak tomorrow about the Sanikiluaq voluntary summer harvest closure
- Sanikiluaq harvest is mostly non-EHB belugas. Genetics results indicate that in general, < 5 EHB belugas are killed per year.

Belcher Islands									
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Sanikiluaq	47	32	61	76	26	170	43	30	50

Area of Harvest	2015		2016		2017		2018	
	Quota	Landed Catch	Quota	Landed Catch	Quota	Landed Catch	Quota	Landed Catch
Western-Northern-Southern Hudson Bay								
Arviat	NRQ	100	NRQ	30	NRQ	120	NRQ	
Baker lake	NRQ	2	NRQ	0	NRQ	1	NRQ	
Cape Dorset	NRQ	0	NRQ	4	NRQ	13	NRQ	10
Chesterfield In.	NRQ	15	NRQ	30	NRQ	NR	NRQ	15
Coral Harbour	NRQ	100	NRQ	60	NRQ	79	NRQ	27
Hall Beach	NRQ	7	NRQ	3	NRQ	NR	NRQ	
Igloolik	NRQ	NR	NRQ	12	NRQ	NR	NRQ	
Iqaluit	NRQ	8	NRQ	16	NRQ	NR	NRQ	
Kimmirut	NRQ	22	NRQ	30	NRQ	20	NRQ	10
Rankin Inlet	NRQ	160	NRQ	50	NRQ	200	NRQ	
Naujaat	NRQ	11	NRQ	19	NRQ	19	NRQ	8
Whale Cove	NRQ	35	NRQ	55	NRQ	50	NRQ	37

Evolution of the TAT over the 2017-2020 management plan

	TAT of East Hudson Bay (EHB) Beluga
Initial TAT 2017-2020 plan	187
2017 : Addition of the Hudson Strait Pilot Project	1,5
2018 : Addition of the Hudson Strait Pilot Project	2,25
2019 : Additionnal allocation autorized by DFO's minister	15,45
TOTAL	**206,15**

Harvest data over the 2017-2020 management plan

Year	Beluga harvested	EHB value	Impact on EHB stock per harvest	Proportion of EHB in total harvest
2017	299	62	2/10	20%
2018	378	68	2/11	18%
2019	367	88,1	2/8	24%
Interim decision	68	15,45	2/9	22%
After nov. 15th	41	11,95	2/7	29%
TOTAL	1044	218,1	2/10	20%

Management objective

- Current objective: to maintain a stable stock (i.e sustainable yield)
- DFO suggests a new Direction toward a management objective of stock growth
- Tools toward that goal;
  - Research activities;
  - Precautionary Approach;
  - Integrated Fisheries Management Plan.

Integration of reseach and science findings in management plan

- DFO encourage:
  - Identification of research priorities
  - Integration of Traditional Knowledge in research (i.e Hudson Strait Pilot project)
  - Proper mechanism to incorporate new research results into managment
  - Conduct risk-assement of new management measures

Plan Implementation considerations

- Allocations and roles of partners
- Monitoring
- Compliance
- Enforcement
- Communications
- Collaboration

Allocations and Roles of Partners

- Real time awareness of remaining TAT has been a concern frequently expressed locally
- What follows the allocations is very important:
  - Communication Strategy : important to offer explanations, regular and efficient communication among partners
    - The operational level of LNUKs, Wardens, hunters and Fisheries officers needs frequent updates
    - Improve communication on management objectives

Monitoring

- Harvests are reported from hunters to the KRG Uumajuit Wardens network
- DFO compiles and shares harvest data with Science and co-management partners
- Efficient organizational structure relying on :
  - In-field collaboration
  - Frequent communication and training
  - Follow-up and quality-control

Compliance

- Compliance is expected from hunters but has been uneven within the last plan timeframe
- Ways to Improve compliance could be explored through an action plan :
  - Readiness in case of non-compliance with a prepared set of progressive measures
  - Investigating why non-compliance happened
  - This plan should be communicated
- Any modification of management measures should imply an impact assessment on compliance

Enforcement

- Community based approach implemented
- Fisheries officers receive a wide range of feed back on their presence : provocative and unsufficeint at the same time
- The invitation is made to every stakeholder for an open dialogue over the way enforcement is done

Communications

- DFO encourages greater communication among all of the different beluga co-management partners,
  - From the co-managers to the community level and the other way as well
  - Monitoring if messages are consistent with management decisions, and well understood
- The Board should also support the partners in their communication efforts – provide a communication strategy to follow

Collaboration

- DFO would like to see more collaboration between parterns
  - Positive experience should be promoted
  - When the level of trust appears altered between stakeholders, partners to address the situation

Plan renewal and adjustments

- Last year of a plan is a critical period
- To consider any changes, sufficient details are imperative to assess the ability of the new system to ensure conservation
- Science planning to prepare modifications
- Scientific assessment of changes is needed

Recommendation of status quo

- The EHB population has stabilized since the implementation of this system.
- System already understood and implemented, flexible enough to test scenarios
- DFO position suggests to prioritize general management practices benefitng any plans
  - Any transformation would benefit from valuable information and framework it can implement
- Enable reconciliation of the interim TAT

Minor tweaks to the current plan

- Genetic information update and flexibility
  - Recent initiatives to improve DFO genetic analysis capacities
  - 2020 aerial survey will also bring new information
  - Review of management framework
- Management of closed areas
  - Areas where harvest has higher risks and impacts
  - Research and close monitoring should precede any consideration to allow harvests, with a clear management of expectations
  - Sanctuaries and habitat enhancement

Regional TAT and seasons

- Option that involves actual tools (closure of zones) to reduce interdependencies.
- Sharing the actual TAT between regions has not been detailed nor is the governance of this option for hunters access to other regions
- EHB harvest happens everywhere in NMR: visible measures are needed to minimize impacts
- An implementation of this option is premature and would be a risk for conservation if implemented for 2020 hunt season.

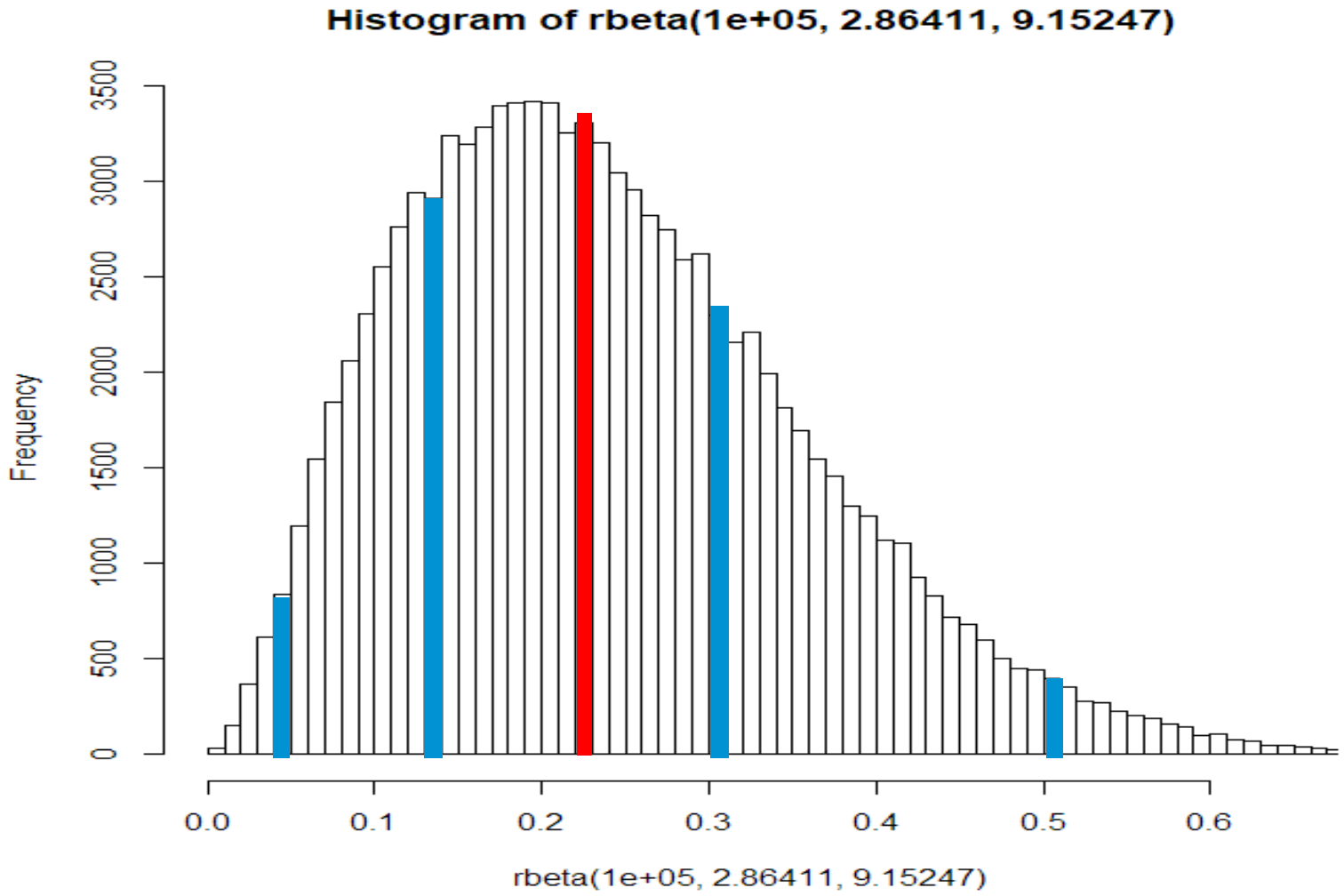
Non quota limitation only or no TAT

- Any management system must be assessed in its ability to address conservation concerns
- A removal of a TAT means an important effort to estimate and predict the impact the harvests will have on the EHB population
  - Not a realistic time frame before hunt season
  - It also introduces a higher risk for conservation
- TAT system provides flexibility and conservation
  - Maintaining it allows experiments
  - Its replacement might generate more limits

Conclusion

- Conservation also means recovery of the population.
- Precautionary Approach has that potential
- DFO recommendation of a 2-year roll over of the current system enables:
  - A situation that could be labelled as transitory
  - The implementation of improved management practices, direction, organization, etc.
  - The consideration for new scientific information
  - The proper assessment of new framework

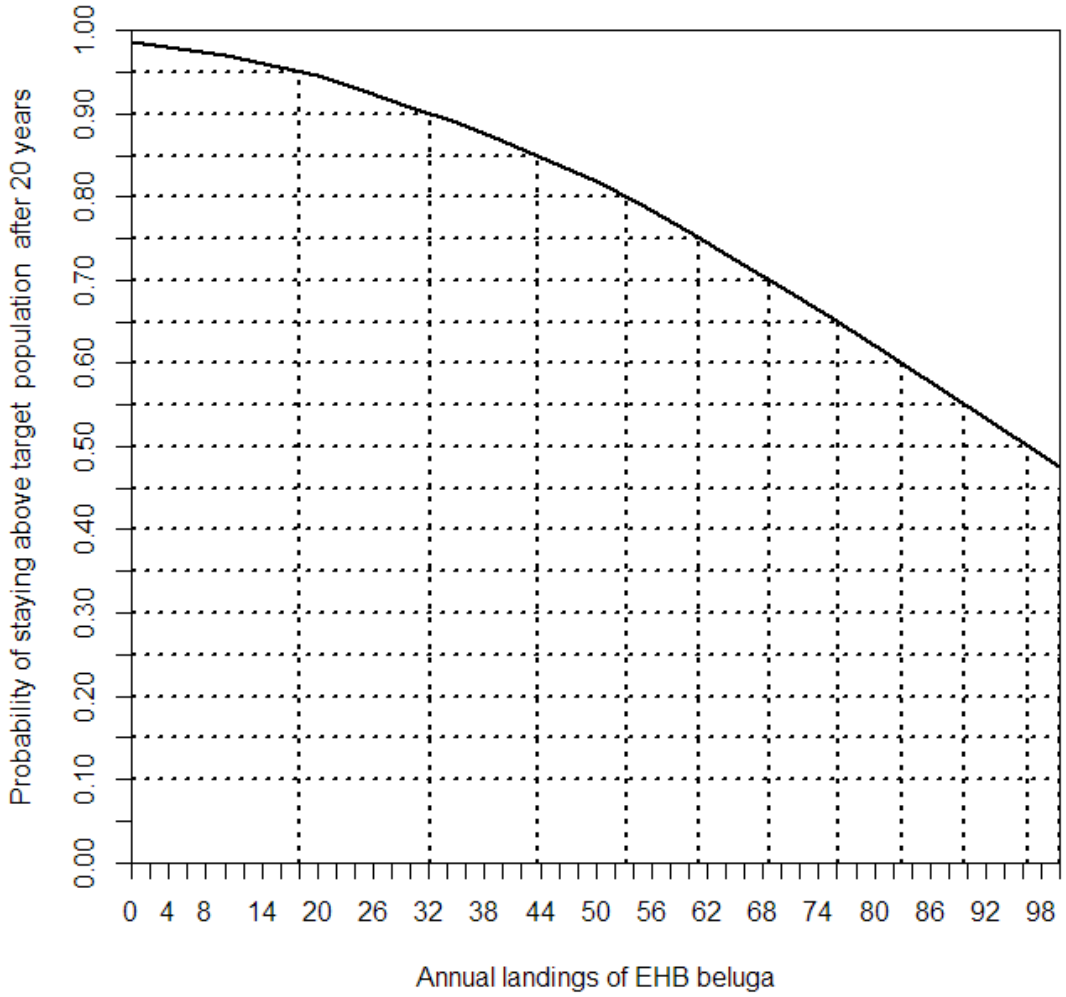
A sampling example with a median of 0.22, with 10,000 draws



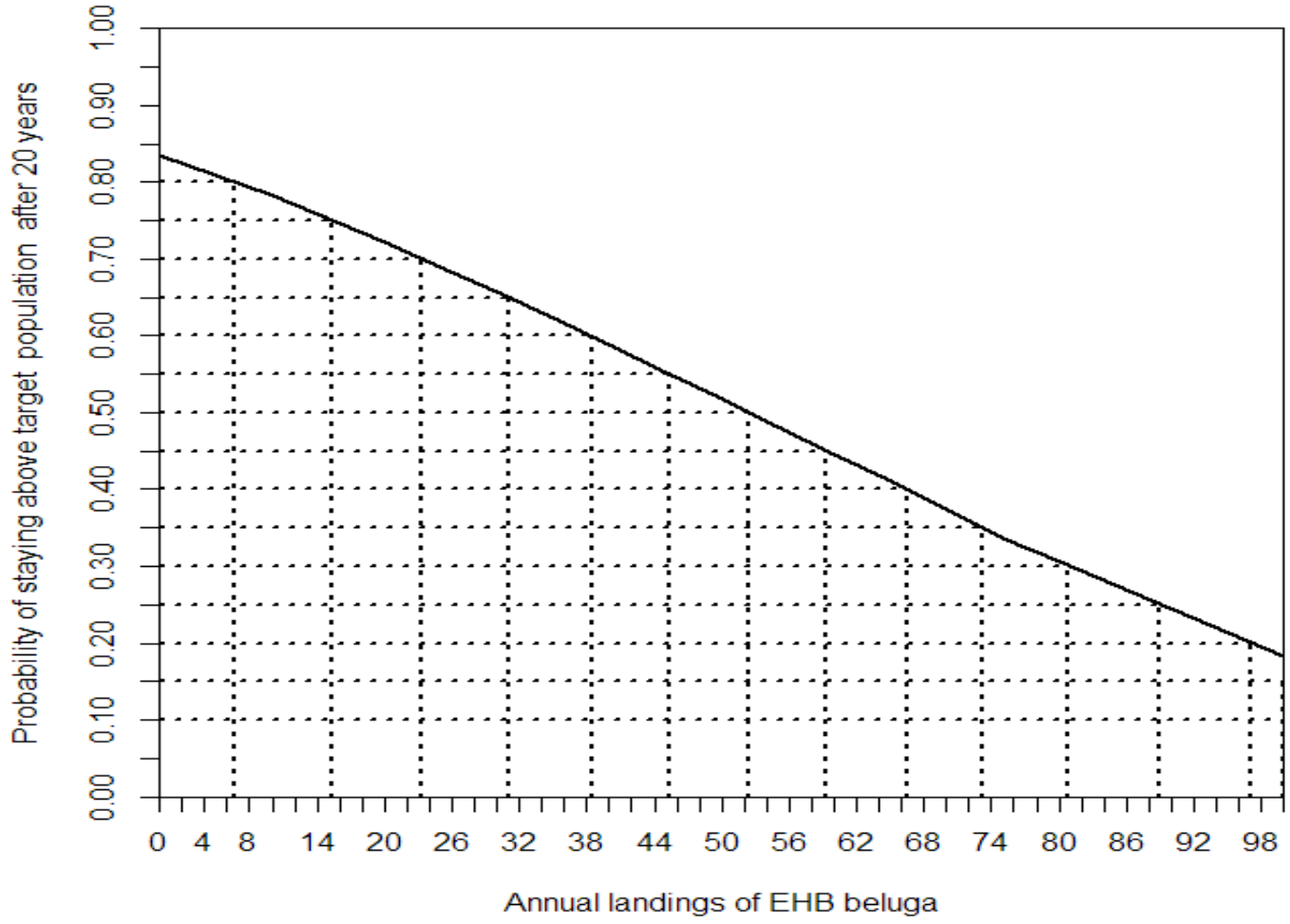
Number of Samples since 2006

	2006	07	08	09	10	11	12	13	14	15	16	17	18	Total
Kuujjuarapik	**0**	**5**	**3**	**6**	**4**	**6**	**3**	**8**	**8**	**6**	**13**	**7**	**4**	**73**
Umiujaq	**0**	**3**	**6**	**5**	**3**	**3**	**0**	**0**	**3**	**5**	**0**	**3**	**0**	**31**
Inukjuak	**0**	**6**	**1**	**7**	**3**	**4**	**8**	**0**	**0**	**0**	**2**	**0**	**3**	**34**
Puvirnituk	**0**	**6**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**9**	**1**	**18**
Quaqtaq	**14**	**12**	**15**	**9**	**15**	**28**	**23**	**11**	**30**	**19**	**15**	**51**	**38**	**280**
Tasiujaq	**11**	**5**	**5**	**9**	**5**	**2**	**0**	**5**	**0**	**7**	**6**	**7**	**11**	**73**
Sanikiluaq	**5**	**15**	**16**	**18**	**15**	**30**	**17**	**53**	**21**	**79**	**35**	**20**	**37**	**361**

Probability of remaining above PA critical limit of 2000 in 20 years



Probability of being above 3500 in 20 years



Trends in weekly observations from 3 villages, LOESS curve fit to data