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Harvest and use of polar bears in Chukotka:

Results of 1999-2012 studies



Ref. UDC 639.111.77:502.313:39(=55)

LBC 47.1 + 28.688

K755

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Approved to print by Scientific board of IBPN FEB RAS

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Harvest and use of polar bears in Chukotka: Results of 1999-2012 studies. Moscow: Pi Kvadrat, 2014. — 148 p. with figures.

ISBN 978-5-9904685-7-3

The Decree of the Council of Ministers of the RSFSR of 1956 “On Measures of protection of animals in the Arctic» provided for a complete ban on the polar bear harvest in the Russian Federation since 1957. This Decree was applicable to the indigenous peoples of Chukotka and deprived them of the right to officially hunt polar bear for the traditional needs. This ban is in effect to date. The monograph first described the real attitude of the indigenous peoples to polar bear, the methods, techniques and scale of illegal harvest over the 60-year period of the ban. The degree of effectiveness of prohibiting the traditional hunting for the conservation of population, and mechanisms of the uncontrolled harvest management were considered. The sociological studies conducted by the authors in 1999-2012 in Chukotka were taken as a basis. The book is intended for biologists, sociologists, anthropologists, lawyers, officers of state environmental conservation and law enforcement entities, public organizations on conservation and protection of rights of indigenous peoples of the North.

UDC 639.111.77: 502,313: 39 (= 55)

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**ANATOLY KOCHNEV
EDUARD ZDOR**

HARVEST AND USE OF POLAR BEARS IN CHUKOTKA:

RESULTS OF 1999-2012 STUDIES

Moscow
2016

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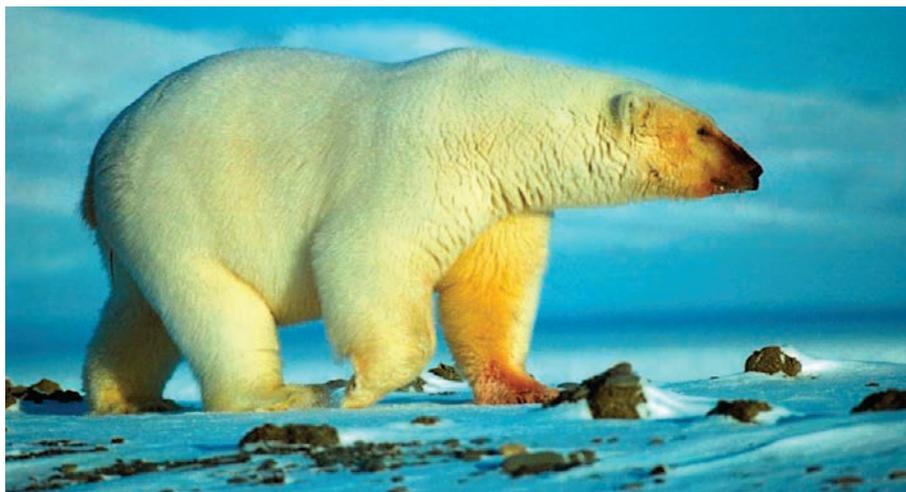
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INTRODUCTION



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In 1956, the Council of Ministers of the Russian Soviet Federative Socialist Republic issued an order “On measures of wildlife protection in the Arctic”, which introduced a full ban on polar bear harvest in the Russian Federation starting from 1957¹ (with the exception of catching them for zoos under licenses). The reason for such drastic measures was long-term gradual extermination of the animal, which became a whole industry during the large-scale reclamation of the Soviet Arctic territories. During more than half a century this legislative decision was considered to be a progressive step in nature conservation, which allowed to restore the polar bear population in the Russian Arctic, and was a source of pride for the Soviet Union and Russia.

I first came to Chukotka in 1983 and almost immediately learned about cases of polar bear harvest without permits by local hunters. Sometimes the local hunting inspector found it out, and the hunters paid fines. Usually they were

¹ On measures of wildlife protection in the Arctic. Order of the Council of Ministers of the Russian Soviet Federative Socialist Republic from November 21, 1956 #738. URL (in Russian):

<http://allmedia.ru/laws/DocumShow.asp?DocumID=36290&DocumType=0>

old people who hardly spoke any Russian and didn't even attempt to hide the fact that they killed a polar bear – for example, during ice edge hunting for the ringed seal. But most often, hunters were able to harvest and use a polar bear without it going public.

Nevertheless, the situation gave no reason for concern. The Alaska-Chukotka polar bear population was declared restored and was considered to be the largest in the Arctic.

The economic and political transformation of Russia that started in the late 1980s, accompanied by the crisis, led to the degradation of the nature conservation activities over a few years and put the indigenous people of Chukotka on the brink of survival. In the early 1990s, the supply of food from central regions of the country to Chukotka sharply declined, state support of sovkhoz² stopped, and, consequently, so did payments to hunters and reindeer herders. Once again, the surrounding nature became the main provider of food (primarily, marine mammals) for the Chukchi and Eskimo. During this time, I worked in the Wrangel Island Zapovednik (State Reserve), and experienced the “pleasures” of living in a small distant village in the new economic conditions. The staff of the nature reserve had hardly any contact with the villagers from continental Chukotka, but even then we suspected an increase in illegal polar bear hunting, judging by fragments of rumors that reached them. Nevertheless, the protected status of the island and the abundance of polar bears in their acknowledged “maternity home” gave the impression that this hunting wasn't exerting excessive pressure on the population.

In 1999, I resumed the research on the continent, and after visiting several native villages, I was shocked by the scale of the polar bear harvest. In those years, the hunters did not receive salaries, and the supply of ammunition, petroleum, oil and lubricants, replacements parts for outboard engines and snowmobiles, was close to minimum. In most indigenous villages, it was impossible to provide enough food for the people just by hunting the allowed species of marine mammals such as walrus and different seal species. Mass hunting for walruses and seals requires significant

² State-owned farms

resources while providing relatively small yield. I know cases when people went walrus hunting under sail due to lack of gasoline, and in one of the villages I witnessed how a lead wire, accidentally found in the tundra, became an object of barter trade due to severe shortage of ammunition. Years with high levels of ice coverage made it impossible to harvest a sufficient number of walruses on the coastal haulouts, and brought a severe hardship to the people living on the Arctic coast. In some villages, people starved in the second half of the winter, and the hunger drove them to steal meat from each other and to kill sled dogs to avoid feeding them.

The only big game available for hunting in winter is the polar bear. Now instead of scaring them off with flare guns and snowmobiles, as it was the case in the 1980s, the local people often just killed them and distributed the meat among the family members and the retired people. They did this with the silent approval of the village administration, which was incapable of feeding the residents otherwise. Sometimes, the polar bears were butchered openly, right in the middle of the village. No one punished or fined the hunters, because in some villages there were no hunting inspectors at all, and in those where they were present, they were concerned with their own survival and did not feel they had a moral right to punish the starving people. A market of polar bear skins emerged, as they became almost the only source of income alongside with walrus tusks, pensions, and child benefits. The whole male population of a village took part in the hunt.

As none of the experts had even a remote knowledge of the situation, I set a goal to assess the illegal hunting level for the polar bear in Chukotka. The most effective method seemed to be a survey of the local people, who hardly tried to conceal the catch for the endangered species in those times, and readily opened up.

I was given an excellent opportunity to travel in Chukotka, meet the hunters and gather the survey data by the Association of Traditional Marine Mammal Hunters of Chukotka (ChAZTO), which invited me to be the scientific supervisor of their project, “Traditional knowledge of Chukotka native peoples regarding polar bear habitat use”. This project was launched in 1999 with support from Alaska Nanuq Commission and U.S. National Park Service. Additional data was gathered in the mid-2000s for the

project “Polar bear in the material and spiritual culture of Chukotka native peoples”. Finally, we tried to understand the current situation in 2011-2012 with support from WWF-Russia.

Those were different projects with different goals, but they were all based on interview and questionnaire surveys of the native peoples of Chukotka. The wording of questions on polar bear harvest and use differed, and so did the methods of data collection. The opinion of locals on this complicated topic has also been changing. Therefore, direct comparison of the results of those studies, conducted in different years and for different projects, seems to be inappropriate. Nevertheless, in this work we attempted to assess the dynamics of illegal polar bear harvest and use, as there is no other research that could shed light on this sensitive issue.

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DATA AND METHODS

In 1999-2005, the research was based on individual conversations with most active hunters and elders in native villages located in the polar bear habitat in Chukotka (Kochnev et al., 2003, 2005, 2006, 2008).

Interviews took the form of free-flowing conversations on the given topic, guided by the interviewer with a number of specific questions for each topic (Appendices 1, 2). For example, during the conversation on traditional and modern use of products from the killed polar bear, the hunter could fail to mention the use of some of the animal's organs or methods of their treatment and preparation. In such cases the interviewer asked leading questions, for example "Were intestines (heart, liver, lungs) of the polar bear used to prepare meals? What cooking method was used? Are they still used for meals today?" etc. In 1999-2003 interviews were focused on the traditional knowledge of polar bear ecology, and in 2004-2006, their main focus was on the cultural and social role of the polar bear. Therefore, in some cases, interviewers talked to the same people in the studies of different time periods. We joined such repetitive interviews taken from the same person for different projects into one text file and treated it as one interview. In total, during the whole period of the research in 1999-2006, 118 people from 22 native villages of Chukotka were interviewed (Fig.1, Table 1). However, the topic of the polar bear harvest and use of its derivatives was covered only in 112 interviews, which we used in the analysis. In other 6 cases either the interviewers did not discuss the topic with the respondents, or the respondents declined to discuss it.

In 2011-2012, a different method of data collection was used. Taking into account the interview plans used in 1999-2005, staff of WWF-Russia developed 2 types of questionnaires with fixed multiple-choice answers and a possibility to explain them in a free form. One of the questionnaires was aimed at hunters, reindeer herders, and fishermen, i.e. the villagers who are directly involved in nature use (hereafter classified as "hunters", Appendix 3). The second questionnaire was given to the villagers who are not directly

involved in nature use activities, such as teachers, housing and utility workers, medical and administrative staff, artists and performers, etc (hereafter classified as “other locals”, Appendix 4). The questionnaire survey was conducted locally by the coordinators of the Association of Traditional Marine Mammal Hunters of Chukotka (ChAZTO) – local people, each one of whom chose respondents for the questionnaires in their own settlement and sometimes in neighboring villages. In 2011, the study was done as a pilot project only in 8 indigenous villages of Chukotka, where 43 “hunters” and 41 “other locals” filled in the questionnaires. In 2012, the questionnaires were edited and updated based on the results of the pilot project (Appendices 5, 6). This time, the study covered all (24) settlements of Chukotka, located in the polar bear habitat, including such major urban centers as Provideniya and Egvekinot, and the town of Pevek (see Fig. 1, Table 1). All settlements, except one (Amguema), are located on the seacoast. The total number of respondents included 111 “hunters” and 116 “other locals”. Since often the same people responded to questionnaires in the settlements of Chukotsky and Iultinsky districts in 2011 and 2012, we decided against joining the data from these two years into the single set, but we can use the results from the two years for comparison.

It is worth mentioning that at all times, the interviews and questionnaires were anonymous.

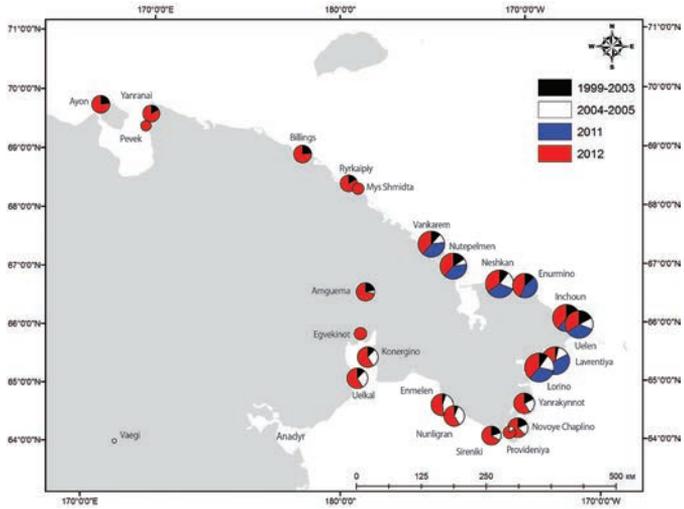


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Table 1 Distribution of the respondents across Chukotka settlements in 1999-2012

Settlement	Number of respondents				Interviewers
	1999–2003	2004–2005	2011	2012	
Vaegi		1			Tagrina
Uelkal	2	5		10	Kavry, Tnanykvat, Susyp
Konergino	2	5		10	Kavry, Tnanykvat, Nomenkau
Egvekinot				7	Koluzatov
Amguema	3	1		10	Kavry, Rultyet
Enmelen	1	8		10	Tanko, Mymrin, Tagrina, Etugye
Nunligran	1	6		10	Tanko, Mymrin, Tagrina, Tneviri
Sireniki	3	2		10	Tanko, Mymrin, Inmugye
Provideniya		1		6	Tagrina, Kalyuzhina
Novoye Chaplino	3	3		10	Yetylin, Tanko, Mymrin, Tagrina, Makotrik
Yanrakynnot	3	4		10	Yetylin, Tanko, Mymrin, Tagrina, Apalyu
Lorino	3	6	10	12	Kochnev, Kalyanto, Eineucheivun, Inankeuyas
Lavrentiya	1	4	14	10	Kochnev, Eineucheivun, Etytegin
Uelen	5	4	10	10	Yetylin, Siv-Siv, Kochnev, Zdor, Eineucheivun, Vukvutagin
Inchoun	6	1	10	11	Kochnev, Eineucheivun, Siv-Siv
Enurmino	3		10	10	Kochnev, Rinetejin
Neshkan	3	6	10	10	Kochnev, Kalyanto, Zdor, Eineucheivun, Rinetejin
Nutepelmen	4	2	10	10	Kavry, Kochnev, Penet, Galyagirgin
Vankarem	3	3	10	10	Kavry, Kochnev, V.Tayan, I.Tayan
Ryrkaipiy	2			10	Kavry, Kochnev, Yttygyrgyn
Mys Shmidta				6	Yttygyrgyn
Billings	3			10	Kavry, Mashkova
Yanranai	2			10	Kochnev, Ranav
Pevek				5	Ranav
Ayon	3			10	Kochnev, Papalgin
CHUKOTKA	56	62	84	227	

Fig.1 Distribution of the respondents across settlements in different time periods of data collection in 1999-2012. Size of symbols corresponds to relative number of the respondents



The goals of the projects implemented in 1999-2005 and in 2011-2012 differed, and so did the form of questions and expected answers. For this reason, in this work we will focus on the data gathered in 2011-2012, and will use the older data only in cases when they help assess the trends in harvest and use of polar bear, and can illustrate a certain statement.

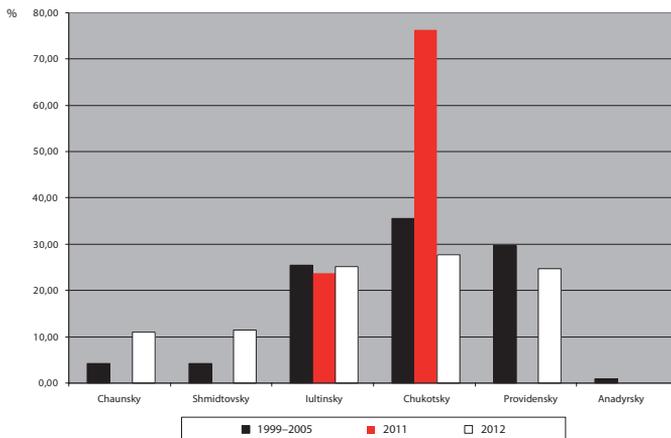
DISTRIBUTION OF THE RESPONDENTS IN CHUKOTKA'S ADMINISTRATIVE DISTRICTS

In 1999-2005, the majority (35.59%) of respondents were from the Chukotsky district, a smaller number were interviewed in the Providensky and Iultinsky districts (29.66% and 25.42%, respectively) (Fig.2). In the Western Chukotka (the Shmidtovsky and Chaunsky districts) the number of respondents was small, 8.48% in total. Only one respondent came from the Anadyrsky district.

In 2011, the questionnaire survey was a pilot project and was focused on the villages of the Chukotsky district (76.19%) and on the northern coast of the Iultinsky district (23.81%). In 2012, the research had a larger scale and covered 5 districts of Chukotka. The respondent ratio was more balanced and correspondent to the number of settlements in each district

(see Fig.2). In the Shmidtovsky and Chaunsky districts the sample of the respondents was less than half the size of that in the Iultinsky, Providensky and Chukotsky districts, due to a smaller number of settlements.

Fig. 2 Distribution of the respondents in Chukotka's administrative districts



Traditionally, the coastal hunting was not very widespread along the western coast of the Chukchi Sea and on the coast of the East Siberian Sea. The indigenous people of these districts mostly lived on reindeer herding and actively harvested marine animals only during the summer migration of reindeer to the coast. Some families used to be permanently based on the coast living off fur trade, but in the 1970s Russian trappers arrived and became a serious competitor to native hunters, gradually driving them out of the trade. This way, by the time of our research, there remained very few locals in the Western Chukotka who possessed the required experience and knowledge about the polar bear and its habitat.

The surveys did not take place in 2 districts of Chukotka: Anadyrsky and Bilibinsky. The former was not included in the sample because polar bears appear there only occasionally. The coast of the Bilibinsky district is located within the regular habitat of the polar bear, but currently all its villages are situated inland.

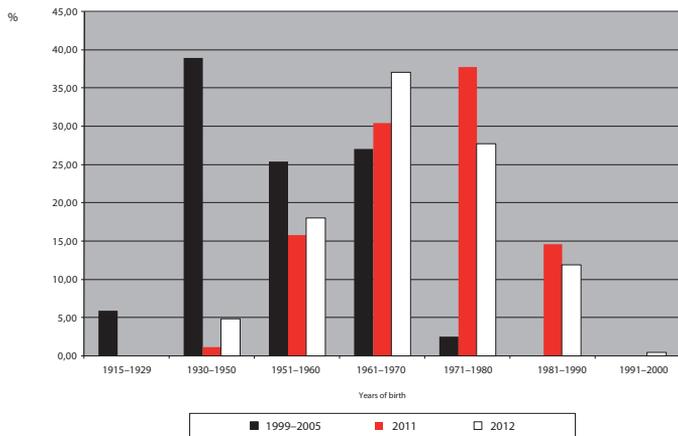
In 2011, Chukotka went through an administrative reform, in particular, the Shmidtovsky district ceased to exist, with half of it merging with the Iultinsky district, and another half with

the Chaunsky district. Nevertheless, for the sake of comparing the data, we use the old administrative division in this work.

AGE OF THE RESPONDENTS

In 2011-2012, the authors of the questionnaire chose not to ask the respondents about their exact age, but rather asked them to choose the age group by year of birth (Appendices 3, 4). The years were mostly grouped in

Fig. 3 Age of the respondents



decades, but the years before 1951 were grouped in two decades (1930-1950). We used the same classification for the respondents during the surveys of 1999-2005, adding an age group for those born in 1915-1929.

As you can see from Fig. 3, in 1999-2005 the sample was dominated by respondents from older age groups compared to 2011-2012. This is due to the fact that the project goal in 1999-2005 was to collect traditional ecological knowledge about rituals, rites and folklore connected with the polar bear. For this reason we tried to first of all interview people of older generations. Besides, since the first surveys took place, the social life of the settlements has changed, with younger generations starting to play a more important role. For example, 12-15% of the 2011-2012 questionnaire respondents were born in 1981-1990, while this age group was completely absent from the interview sample of 1999-2005. The number of those born in 1971-1980 was way

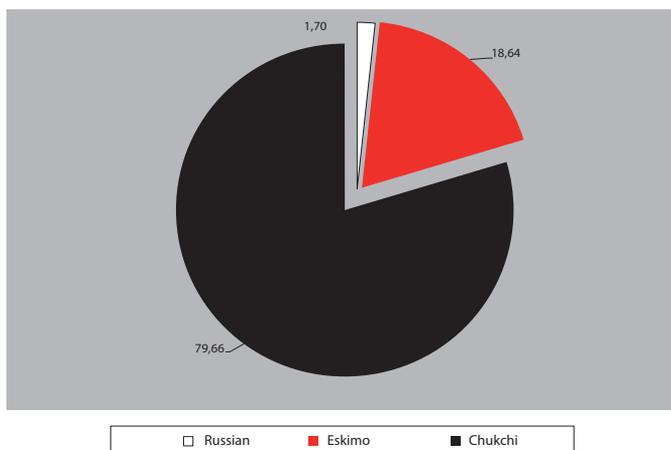
bigger in the later sample, which on the other hand didn't have any respondents born in 1915-1929. Those born in 1930-1950 were the biggest group (39%) in the surveys of 1999-2005, but constituted only 1.2 – 4.9% of the sample in 2011-2012 (see Fig. 3).

Despite the younger sample of the respondents in 2011-2012 compared to 1999-2005, the respondents born in 1951-1970 had similarly sized samples in both cases, since in both time periods they were the most active and socially important representatives of the population. They represented 52.5% of the total number of respondents in 1999-2005, 46.3% in 2011, and 55.1% in 2012.

LENGTH OF STAY IN CHUKOTKA AND ETHNIC COMPOSITION OF THE RESPONDENTS

Both in 1999-2005 and in 2011-2012, the main goal was to assess the knowledge and attitude of the indigenous people of Chukotka, Chukchi and Eskimo, regarding the polar bear. Therefore, the absolute majority of the respondents belong to native peoples. In 1999-2005, only two Russian hunters from the western villages took part in the survey, as they had been involved in the trade for over 30 years and had inherited a rich array of traditional knowledge about the natural environment of their hunting areas as they had started by learning from indigenous hunters (Fig. 4).

Fig. 4 Ethnic composition of the respondents in 1999-2005 (%)



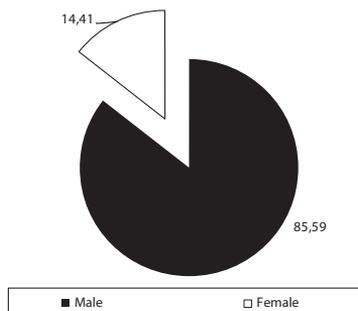
In 2011-2012, ethnic composition of the respondents was not specified, but judging by the respondents' length of stay in Chukotka, it is clear that most respondents either belong to indigenous peoples or were born in Chukotka (Table 2). The “hunters” category has only one respondent in the 2012 survey who came from outside but had lived in Chukotka for over 40 years. The “other locals” category had more migrants, 12.2% in 2011 and 14.8% in 2012 (see Table 2). Most often, people who had come from the central regions of the country took part in the survey in towns and big district centers such as Pevek and Mys Shmidta.

Period (years)	Hunters				Other locals			
	2011		2012		2011		2012	
	Number	%	Number	%	Number	%	Number	%
Not specified	—	—	—	—	—	—	1	0,86
1–5	—	—	—	—	1	2,44	2	1,72
6–10	—	—	—	—	1	2,44	3	2,59
11–20	—	—	—	—	—	—	4	3,45
21–30	—	—	—	—	1	2,44	3	2,59
31–40	—	—	—	—	2	4,88	3	2,59
41–50	—	—	1	0,9	—	—	2	1,72
From birth	43	100,0	110	99,1	36	87,8	98	84,48

GENDER OF THE RESPONDENTS

In 1999-2005, mostly male hunters took part in the survey. Women were rarely interviewed, they constituted only 14.4% of the respondents (Fig. 5). Usually they were elderly representatives of native ethnic groups who had been life

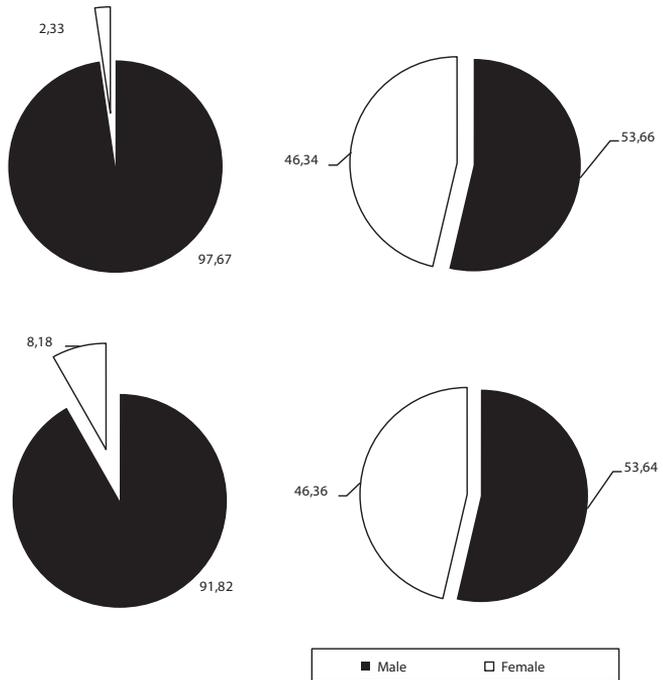
Fig. 5 Gender of the respondents in 1999-2005 (%)



companions of hunters or reindeer herders in their time, or had been members of folk groups.

In 2011, the questionnaire did not ask the respondents to specify their gender. Nevertheless, answers to other questions, especially those related to profession (“teacher”, “administrative officer”, “kindergarten teacher”), often revealed the gender of the respondents⁴. In 2012, the questionnaire included the gender field, but one respondent from the “hunters” category and 6 respondents from the “other locals” category did not specify it. Women were represented even in the “hunters” category. They were mostly wives of hunters and reindeer herders, whose share grew in the 2012 study compared to 2011 (Fig. 6). In the “other locals” category women were represented almost equally to men and virtually in the same proportion in 2011 and in 2012 (see Fig. 6).

Fig. 6 Gender of the respondents in 2011-2012 (%)



⁴ The Russian language has grammatical gender, which means that the gender of the respondent can be identified depending on what grammatical form they used when specifying their profession.

PROFESSIONAL BACKGROUND OF THE RESPONDENTS

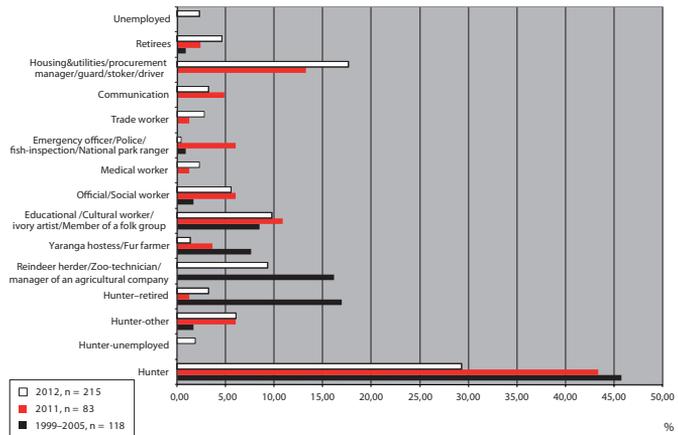
13 people did not answer the question about their professional background: 1 in 2011 and 12 in 2012. Therefore, the sample for the profession was 84 in 2011 and 227 in 2012.

Fig. 7 shows that both in 1999-2005 and 2011, most respondents were hunters for marine mammals. This category includes not only those who work as professional hunters for the native community, but also those who combine hunting with other jobs, as well as the unemployed and retired who live off hunting. In total, the hunters constituted 64.41% in 1999-2005 and 50.6% in 2011. In 2012, the composition of the respondents was more diverse, and hunters comprised only 40.47%. The next biggest group in the sample of 1999-2005 was reindeer herders (16.1%). It is well known that for many centuries, reindeer herding has been a traditional method of nature use for a big proportion of the indigenous peoples of Chukotka. Throughout the year, reindeer herd in the inland areas, so reindeer herders do not meet the polar bear as frequently as the coastal residents of Chukotka. Nevertheless, the nomadic way of life of the deer herders is very traditional and has remained virtually without change during the past few decades. The herders rarely come in contact with the modern civilization and have kept many aspects of the traditional culture, which were lost by the sedentary population of the coast, but were of great interest in the research of 1999-2005. In 2011, the questionnaire survey was focused on the coastal villages of the Chukotsky and Iultinsky districts, where reindeer herding is either non-existent or, in villages such as Lorino and Neshkan, is a secondary activity compared to hunting, so the herders were not represented in the study. In 2012, the scale of the survey was wider, and the sample included residents of the Western Chukotka and southern districts of the Chukotka peninsula, as well as one inland village, Amguema. Here, reindeer herding is the dominating agricultural activity, however, the “herders” category, even after including other workers of this sphere (zoo-technicians, managers), constituted only 9.3% of the sample and took the fourth place by the number of respondents.

In 1999-2005, the third and fourth places by the number of respondents were taken by those involved in education and

culture (8.47%) and “Yaranga⁵ hostess” category (7.63%). The first category was dominated by elderly women who sing, dance and play the drums in various Chukchi and Eskimo folk groups. Bone carving artists and teachers of indigenous ethnic background constituted smaller groups in this category. The second category included women who were life companions of hunters and reindeer herders, and keepers of the home and many cultural traditions. In 2011-2012, the “educational and cultural” category was also on the third place by the number of respondents, 10.84% in 2011 and 9.77% in 2012 (see Fig. 7). However, the composition of this group of respondents was different, as it included, first of all, school and kindergarten teachers, as well as museum, library and village club workers. Many of them came from the central regions of the country and did not belong to the indigenous ethnic groups of Chukotka. There were almost no members of folk groups among them. The “Yaranga hostess” category was represented only by a few women, some of whom also worked as breeders at the local domesticated Arctic fox farm, and comprised only 3.61% in 2011 and 1.4% in 2012.

Fig. 7 Professional background of the respondents in 1999-2012



The second largest category of the respondents in 2011-2012 were housing and utility workers, as well as various stokers, guards, supply managers, and drivers. These fields provide most jobs in the Chukotka settlements, both for local

⁴ Traditional tent-like mobile home of the Chukchees

people and for those who moved here from other regions. This category comprised 13.25% of the sample in 2011, and 17.67% in 2012 (see Fig. 7). In 1999-2005, people of these professions were not included in the sample.

A significant part in the sample of 2011 was taken by the staff of law enforcement and wildlife agencies (firefighters, police, fisheries control, Beringia Nature-Ethnic Park), as well as social and administrative workers. Both categories comprised 6.02% each from the total number of respondents. In 2012, the law enforcement and controlling agencies were represented significantly less, only 0.47% from the sample, but social and government workers remained an important proportion in the sample (5.58%). In 1999-2005, these categories were not interviewed much (comprising respectively 1.69% and 0.85% of the respondents).

Members of other professions (communications and trade, doctors), as well as the retired who are not involved in hunting and reindeer herding, comprised from 1.2 to 4.82% in 2011 and from 2.33 to 4.65% in 2012 (see Fig. 7). In 1999-2005, out of these categories, only few retired people took part in the survey (0.85%).

Finally, the unemployed category was only represented in the 2012 survey (2.33%).

In general, the questionnaire surveys of 2011 and 2012 included respondents of most types of professional background represented in the coastal Chukotka settlements. The interviews of 1999-2005 had a significant bias towards hunters and elders, which is justified by the different goals and tasks of the projects compared to those of 2011-2012.



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GEOGRAPHICAL ZONING

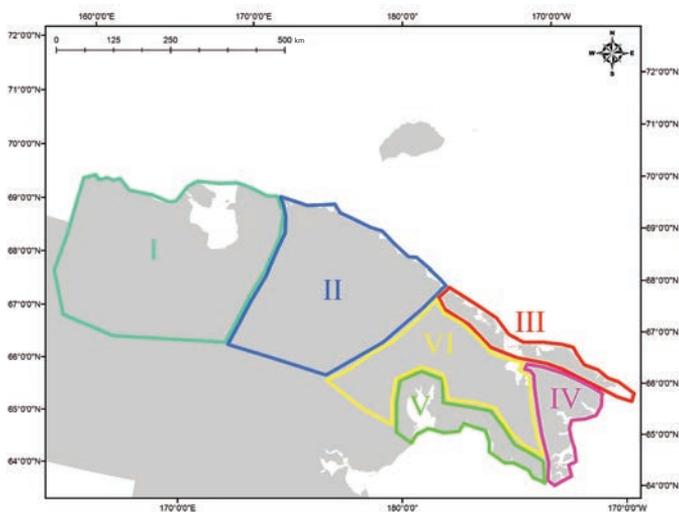
Based on the results of the project “Traditional knowledge of Chukotka native peoples regarding polar bear habitat use” (Kochnev et al., 2003), we allocated 6 zones in Chukotka, which differed in the abundance of polar bears and their significance in the local economy. The zoning was based on the following criteria:

- frequency of encounters with polar bears;
- number of settlements;
- ethnic/occupation composition of the people;
- dominating economic activities.

The zone borders are shown in Fig. 8.

Fig. 8 Zoning of northern Chukotka by polar bear habitats and intensity of polar bear use:

I – “East Siberian”;
II – “Long Strait”;
III – “Chukchi Sea”;
IV – “Bering Strait”;
V – “Gulf of Anadyr”;
VI – “Tundra”



Zone I (“East Siberian”) included most of the area of the Bilibinsky and Chaunsky administrative districts of the Chukotka Autonomous Okrug. It is characterized by regular coastal encounters with polar bears, and rare polar bear visits to the inland. Four settlements are located within this zone, including the large town of Pevek. All settlements are concentrated around Chaun Bay, with one of them,

Rytkuchi village, situated on its southern coast, where polar bears are exceptionally rare visitors. We did not include that village in the interview and questionnaire plans in any of the projects. The coastal settlements have a significant proportion of non-local population. The marine mammal hunting has traditionally been almost non-existent. The native people are mostly involved in reindeer herding.

Zone II (“Long Strait”) includes the coast of the strait with adjacent areas of the East Siberian and Chukchi Seas from Aachim Peninsula to the estuary of the Amguema River, as well as the inland. The borders of this zone almost coincide with the borders of the former Shmidtovsky administrative district, and the zone is currently located on the territory of the Iultinsky and Chaunsky districts. The coastal encounters of polar bears here are very frequent, in particular, due to the proximity of Wrangel and Herald Islands, protected by the status of a strict nature reserve. The inland is also regularly visited by polar bears. The zone has 3 settlements, of which Mys Shmidta and Ryrkaipiy villages are located so close to each other, that they are practically merged. The share of non-locals is significant, but not as large as in Zone I. Marine mammal hunting is not widespread. Most locals are reindeer herders, with very few hunters.

Zone III (“Chukchi Sea”) spreads over a narrow coastal line from the estuary of the Amguema River to Cape Dezhnev and Big Diomed Island and includes the northern part of the Iultinsky and Chukotsky districts. The polar bears are frequent visitors to the coast, and also regularly appear in the inland due to winter and spring movements from the Bering Sea. This is the most populated zone. It has 6 native villages, dominated by the indigenous people. The part of non-locals is small. The main livelihood is marine mammal hunting. Reindeer herding is not widespread and is present in only one village.

Zone IV (“Bering Strait”) has one of the shortest coastlines along the strait and the Chirikov Basin and is located in the Chukotsky and Providensky administrative districts. Nevertheless, it includes 5 settlements, three of which, Provideniya, Lavrentiya and Lorino, are relatively populated. Lavrentiya and Provideniya are district centers; most non-locals live there. The rest are native villages, dominated by indigenous people. Polar bear encounters

are regular but much less frequent than in Zone III. In winter and spring, polar bears are also regular guests in the inland areas, located far from the coast. Sea hunting is one of the main activities of the local population, especially in the village of Lorino. Two villages have reindeer herding groups.

Zone V (“Gulf of Anadyr”) occupies the Bering Sea coast of the Providensky and Iultinsky districts, from Provideniya Bay to Kresta Bay, with last of them included. It has 6 settlements, three of which, including the large district center of Egvekinot, are concentrated around Kresta Bay. Polar bears pay rare but regular visits to this zone, including the inland part. The share of non-locals in the population is large. The indigenous people are involved in marine mammals hunting, but it is less developed here compared to Zone IV and especially Zone III. The main livelihood in the village of Konergino is reindeer herding. There are also reindeer herding groups in three other settlements.

Finally, zone VI (“Tundra”) includes inland territories of the Eastern Chukotka, belonging to the Iultinsky, Providensky and Chukotsky districts. The only settlement here is Amguema, which is a large reindeer-herding center. Besides Amguema herders, residents of Zones III, IV, and V, also bring their herds here. Marine mammals hunting, same as any other hunting, is only a secondary activity for the residents of Zone VI, during their visits to the coast.

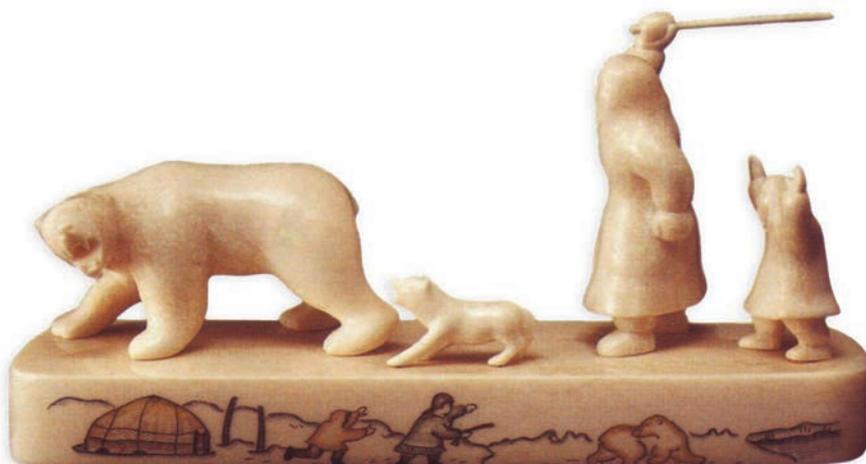


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The reindeer meat is often exchanged for the products of sea hunting from the coastal residents. Polar bears are rare in these remote inland areas, but they are quite regular in winter and spring, during their movements from the Bering Sea to the Chukchi Sea.

More southern and southwestern areas of Chukotka are visited by polar bears on exceptionally rare occasions, and they are of little interest to this study. Further in this book, we will use the described system of zoning for the analysis of the survey data.

POLAR BEAR IN SETTLEMENTS



In all of the studies, polar bear visits to Chukotka settlements and the local people's solutions to this problem were an important component.

ENCOUNTERS WITH POLAR BEARS IN SETTLEMENTS

In 2011-2012, separate questions on the frequency of polar bear visits were included in the questionnaires. Since there were different questionnaires developed for the “hunters” and “other locals” categories, the questions were worded differently in each case. In 2011, the hunters could choose one of the five possible responses without specifying the frequency of polar bear visits to settlements (Appendix 3). At the same time, other locals had only 4 answer options, but in each case, the frequency of visits was specified to make the choice easier (Appendix 4). In 2012, the same principle was used, but the questionnaire for the hunters also specified the frequency of visits, in a different way than that of the other locals' questionnaire (Appendices 5, 6).

In 1999-2005, we did not ask to specify the frequency of polar bear encounters in settlements (Appendices 1, 2).

However, a number of respondents (n = 51) still made these assessments in their interviews. Therefore, it is possible to compare the responses of two different time periods.

Despite the inhomogeneity of the data, we managed to systematize it by introducing the following scale of polar bear visits to settlements:

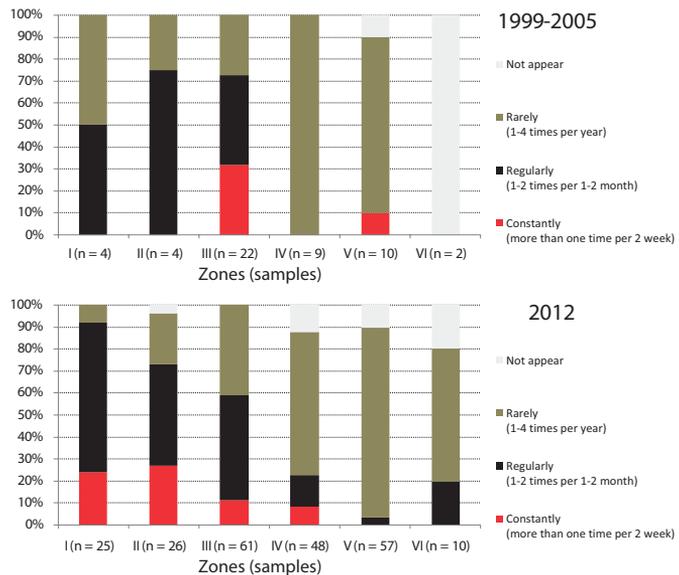
- not observed;
- rarely (1-4 times a year);
- regularly (1-2 times in 1-2 months);
- constantly (more than once in two weeks)

In all studies, the respondents pointed out that polar bear visits are seasonal by nature. For example, in some villages there could be up to several dozens of polar bear encounters in one month in fall, but no encounters at all the rest of the year. For this reason, respondents found it difficult to stick to the proposed scale, which suggested a certain steadiness in the frequency of these encounters throughout the calendar year. Also, the poll of the hunters in 2011 did not specify the number of polar bear encounters for each response option, and the respondents from different villages with completely different frequency of polar bear visits sometimes chose the same answer. For example, a hunter living in Zone IV could describe 10 polar bear encounters during a year as “frequent”. And the same response option could be chosen by a hunter from Zone III, which was visited by 20 polar bears in just 2 months. For this reason, and also since the 2011 study polled only respondents from two zones, we did not use those data and limited the comparison to the studies of 1999-2005 and 2012 (Fig. 9).

As you can see from the figure, people living on the coast (zones I-III) more often assessed polar bear visits as frequent and regular than those living on the Bering Sea coast (zones IV-V) and inland (Zone VI). This is typical for both time periods. However, there is a certain dynamic trend in polar bear visits. The frequency of polar bear encounters in settlements was higher in 2012 than in 1999-2005. The animals started to appear even in settlements and reindeer herding areas in Chukotka’s inland territories (Zone VI), which was not observed in 1999-2005. In 1999-2005, polar bears were most frequent in settlements of Zone III, which

is logical, since marine mammal hunting is very widespread here, and the settlements are located near walrus terrestrial haulouts. According to the data from 2012, the number of polar bear visits to this zone somewhat declined, but they become more frequent in villages located in Zones I and II. This can be explained by the development of a large walrus terrestrial haulout on Cape Shmidt in 2007 (Boltunov, Nikiforov, 2008). A large number of dead walruses, ready to be eaten, started to attract a lot of polar bears to this location, and therefore to the two local settlements as well. Besides, the freeze-up of Chukchi and East Siberian Seas starts later and later, which forces polar bears to stay longer on the coastal areas of Zones I and II. This also affects the frequency of polar bear visits to settlements and weather stations.

Fig. 9 Respondents' estimations of number of encounters with polar bears in Chukotka settlements by zones in 1999-2005 and 2012



WAYS OF PROTECTING LOCAL COMMUNITIES

In 1999-2005, when we tried to find out traditional methods of scaring polar bears away from the settlements, it turned out that they did not exist, and may have never existed. Older people that had seen the times when polar bear hunting was allowed, remembered 8 such cases of polar bear visits to the settlements, and in all of these cases, the animal was killed (data from 6 villages, zones I, IV, and V). Here is one of such stories:

“Before there was less noise in the villages than now, so polar bears came more often. People woke up very early then, in the morning women took a bucket with waste out of Yaranga and to the dumping area. So once, a girl called Salika went out. The parents noticed that she hadn’t come back for a while, and the mother said to her husband: “Have a look what’s going on”. It turned out that a polar bear grabbed the girl by the head. Salika had long braids, and the bear tore them off with skin and swallowed. The father ran quickly inside, took the gun and shot that bear” (Zone V).

We collected 12 more stories about the period before 1956 from different Chukotka villages, which don’t give details of specific cases, but describe the general opinion of locals about polar bear visits. They all say that any polar bears that appeared near villages or herding camps were always killed or at least people tried to kill them.

Here are some of the quotes:

“I don’t know any protection methods. We did not scare them away from the village. Why lose the food?” (Zone IV)

“People did not scare the bear away from camps and villages. We always killed them” (Zone V)

“In the old times, when a polar bear came to the village, it was considered a big stroke of luck” (Zone III)

“Before, if a bear came to the house, the hunter had to kill it no matter what. Today people react in different ways” (Zone III)

“Usually, the polar bear was noticed long before it approached the Yarangas. We learned to be attentive and careful from childhood. The Umka⁵ belongs to the one who

⁵The Chukchi name of a polar bear

sees it first. If it happened in the summer, we hid all dogs in Yarangas, so that they didn't bark at the Umka, or it would run away to the open sea. All people also hid in Yarangas. Then several hunters took different positions and stayed still. So when the Umka approached the Yarangas, hunters surrounded it, and one of them killed it. In winter, we also hid the dogs, but kept two or three most experienced ones ready. If the polar bear sensed danger and ran to the ice before reaching the camp, we released the dogs, and one or two hunters ran after the bear. After it was killed, more went on dog sleds to help cut the bear and transport the meat and skin" (Zone III).

Therefore, before the ban was introduced, polar bears were not lured off when approaching camps or villages. On the contrary, it was one of the most common ways to hunt them. To further illustrate it, we will quote Georgiy Ushakov (1972). When describing the hunting of Eskimo that were brought to Wrangel Island from the Bering Strait coast in 1926, he says, *"Out of twenty three bears [killed by the Eskimo — Anatoly Kochnev], eighteen approached the settlements themselves, and only five were killed on hunting trips".*

One of our respondents made a notable remark: *"If a polar bear appears, it wants to become our kill" (Zone V)*. It shows that the modern indigenous peoples of Chukotka still believe that the bear approaches people when they need its meat and skin. The animal voluntarily sacrifices itself to its brothers, humans, so it is met as a valued guest, with special rituals, after which the animal resurrects (Bogoraz, 1939; Menovshchikov, 1959; Krupnik, 2000; Kochnev, 2004a). Such beliefs were also held by other peoples regarding the brown bear (Yudin, 1972; Amamich, 1977; Shepard, 1993).

The hunting ban introduced in 1956 broke the traditional mindset of the indigenous peoples of Chukotka. Polar bears were no longer hunted near the villages, although it didn't happen immediately. In 1960, four years after the ban was introduced, only on Wrangel Island alone, several illegal polar bear hunting cases were filed (Velizhanin, 1965). Stories of some of our respondents also demonstrate that for quite a long time, the people of Chukotka didn't accept this legislative measure and didn't change the traditional approach to animals that appeared in settlements:

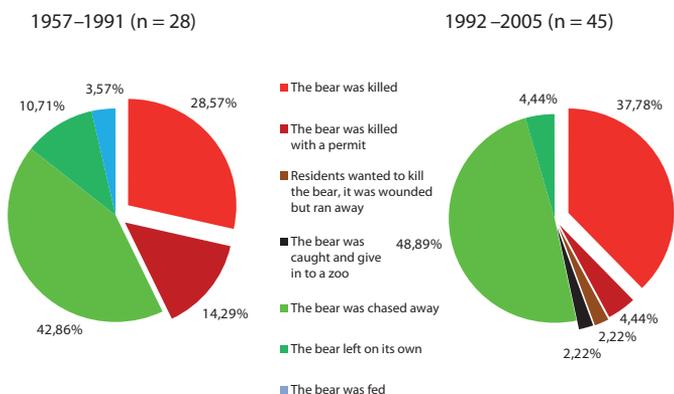
“It happened in 1959 or 1960, in spring or late winter. I was a small child, we looked out of the window. About five polar bears came from the ice right into the village. They were all killed by the hunters right on the sea coast near the village” (Zone V).

Since it was impossible to kill the animal in the village without publicity and subsequent sanctions, peaceful safety methods were gradually adopted in the settlements. The bears were scared off with noise, shots in the air, flares or vehicles.

“Till the 1990s, polar bear visits brought joy to the whole village. People didn’t want to consume its meat all the time because in those times we harvested a lot of other marine animals, and the stores were full of food too. Often people didn’t even scare the bears away, and didn’t take away the meat that the bear stole. Everything that the polar bear did in the village was met with laughter. Only if they approached the dogs or intended to visit human dwelling, they were scared away with gun shots” (Zone III).

Out of 28 cases of polar bear encounters in the villages from 1956 to 1991 (16 villages, Zones I-V), almost half (42.86%) ended in the animals being scared away (Fig. 10). In several other cases (10.71%) people didn’t even try to actively drive the bears away, so the animals left the settlement on their own, after feeding on the cutting waste and stolen meat. If an orphaned polar bear cub came to the village, it was often fed and photographed with (3.57%). However, the animals were shot as often as they were scared away (see Fig. 10).

Fig. 10 Reaction of local communities to polar bears approaching human habitation and settlements in Chukotka in 1957-1991 and 1992-2005 (based on interview surveys conducted in 1999-2005)



It is worth noting that for the analysis we used a visit to the human dwelling, not each individual polar bear, as a unit of measure. In some cases, several bears could be killed at once, as in the story that was cited earlier, when in 1959 or 1960, 5 animals were shot. For example, in 1976, 3 different animals were shot after a bear killed an elderly woman. In another case, two bears were shot at the same time, after they came to the fur farm, broke the pens and started killing the Arctic foxes. In total, 12 cases of polar bears killings during the visits to settlements resulted in the deaths of 20 animals. Out of those, only one third were done after obtaining the required permits. In other cases, the shooting didn't go public, especially when it happened in distant hunting cabins, terminals or reindeer herding camps. It was due to the fact that the elderly native residents of Chukotka couldn't speak Russian very well, and were unable to prove that they killed the animal to protect their lives, especially when there were no witnesses to confirm that. We know of at least three cases when in the 1980s elderly hunters had to pay fines after shooting polar bears for self-protection. Even when there was a high chance of proving their innocence, it required spending a lot of time for various explanatory notes, testimonies, and police reports, which the indigenous peoples of Chukotka are still wary of. Therefore they preferred to keep silence about the polar bear shootings in any case.



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In the 1990s, the situation changed again. During the severe shortage of food, arms, ammunition, vehicles and funds for buying those things, the local people went back to hunting polar bears that approached settlements or their surroundings. It was facilitated by the start of the sea ice shrinking in the Arctic seas, which forced polar bears to come on the coast in large numbers in summer and fall and visit settlements in search for food (Kochnev, 2006). Besides, the non-natives started to massively leave the region in the 1990s, and the indigenous people felt no need to hide the incidents of polar bear harvest from their own. Only in large settlements they tried to conceal the shootings. Here are some descriptions of those times given by the locals:

“We didn’t try to scare off the bears much. We first drove it away with shots, off-road vehicles, “Buran” snowmobiles, and then only further from the village we shot it to avoid the accusations in poaching” (Zone IV).

“Now people try to shoot them, people scared them off only in the past” (Zone III).

“Usually, when they come to the village, they’re immediately killed for meat. When I came back from the army, it was already a universal thing. Only in the early 1990s they still tried to scare the bears away” (Zone III).

“In the neighboring village they kill a bear as soon as they see it. We don’t have many bears. But 3-5 years ago [1999-2001 — Anatoly Kochnev] people killed them the moment they noticed them” (Zone IV).

Despite this, the analysis of 48 cases of polar bear visits in 1992-2005 described by our respondents (17 villages, Zones I-V) shows that the ratio of peaceful conflict resolution to shooting had remained practically the same as in 1957-1991 (see Fig. 10). It may be explained by the memory bias of the respondents, who, when talking about the past years of 1957-1991, remembered first of all rare, but memorable events of shooting the animals, rather than the ordinary cases of scaring them off. Besides, the fur farms and fur trade were closed down in the 1990s in almost all villages; those used to be a major source of conflict and often resulted in shooting polar bears in the Soviet times. It is also possible that in some cases when the bears were scared off, the respondents only knew or only chose to speak about how the bear was treated

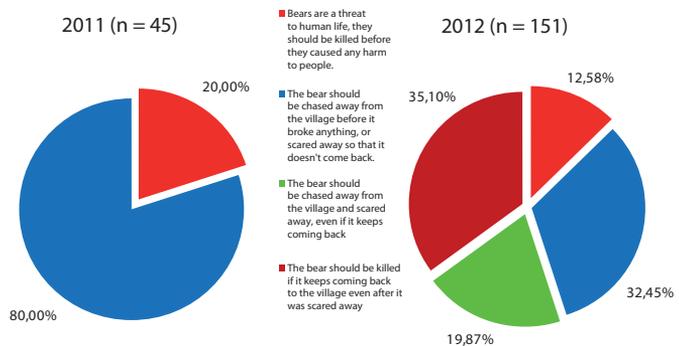
in the village itself, omitting what happened later. However, sometimes, after scaring the bear away from the village, the hunters could shoot it, which the respondents may not have known. For example, three respondents told us about the same situation when a female polar bear came to the village with two one year old cubs. Two of them said that the “family” was chased away to the water. However, only the third respondent was in the whaleboat that later followed the bears, and when they were at a sufficient distance from the village, the hunters killed all three of them.

In any case, the data gathered during the interviews show that very often, polar bears that approached villages were not killed. Some animals were scared off by dogs even before the owner made a decision to shoot or not. Some animals were scared away by the people themselves, if they had enough meat supplies, and the bears behaved cautiously and were non-intrusive.

During the studies of 2011-2012, the questions about people’s reaction to polar bear visits to settlements were worded differently for the categories of “hunters” and “other locals” (Appendices III-VI). For the hunters, the question was, “*What, in your opinion, should be done with polar bears that approach the settlement or wander around close to the settlement?*” In 2011, there were only two response options, “*to kill*” or “*to scare off*”. Since it’s sometimes difficult to give an unambiguous answer, some respondents chose both options, “*to kill*” and “*to scare off*”, which makes the collected data less valuable. One of the respondents chose the option “*to scare off*”, but noted that if a bear creates problems for the village (keeps coming back, shows aggression), it should be killed. The results are as follows (Fig. 11): only 20% of the sample believe that polar bears are mortally dangerous and should be killed whenever they are approaching the village or its surroundings. The rest chose the option “*to scare and chase away*”. Of course, those who held the middle ground ended up in either the first or the second group. As we expected, the option “*to kill before it caused any harm*” was more popular in Zone IV (36.6%, n = 11) than in Zone III (14.71%, n = 34), where polar bears are more frequent visitors and the hunters are better at understanding their behavior.

In 2012, the question was worded in the same way, but there were 4 response options. Besides the two options mentioned above, the two additional ones were as follows: “The bear should be scared off from the village, even if it keeps coming back” and “the bear must be killed if it keeps coming back to the village even after it was scared away”. Thanks to more diversity in response options, the understanding of the hunters’ opinions became more complex, and again, some hunters chose several response options instead of one (see Fig. 11). The share of radical opinions (“to kill before it caused any harm”) decreased dramatically, and in Zone III (n = 38) no one chose this response option. This answer was most frequent either in zones where polar bears are very rare (Zone V, 23.26%, n = 43), or which had recent cases of polar bears attacking humans (Zone I, 20.0%, n = 20) (Zone II, 16.67%, n = 12). The most popular response option was the most balanced one, “to kill if the bear comes back after being scared away” (see Fig. 11).

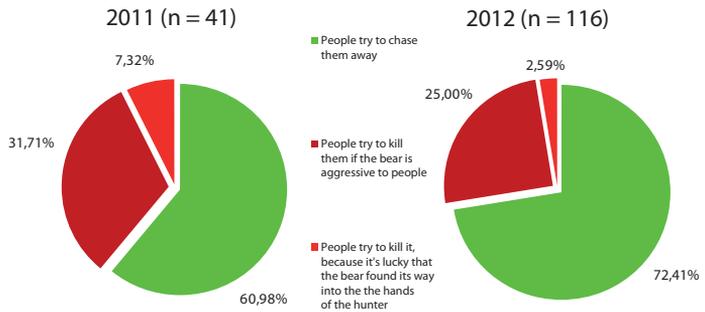
Fig. 11 Responses of “hunters” on how to deal with polar bears approaching Chukotka settlements; surveys in 8 villages (zones 3-4) in 2011 and 22 villages and larger settlements (zones 1-6) in 2012



While we asked the “hunters” their opinion on the proper mode of behavior, the “other locals” category was asked what people actually do when polar bears that approach the settlement. Both in 2011 and in 2012, there were three response options (Appendices 4, 6).

The collected data demonstrate that in real life, polar bears that entered the settlement are very rarely shot intentionally for meat and skin (from 2.59 to 7.32%). Much more often, people kill animals that seem to pose danger to them and their property (Fig. 12). They still, of course, use the meat and skin of these problem bears with the exception of those

Fig. 12 Responses of “other locals” on how to deal with polar bears approaching Chukotka settlements; surveys in 8 villages (zones 3-4) in 2011 and 24 villages, larger settlements and towns (zones 1-6) in 2012



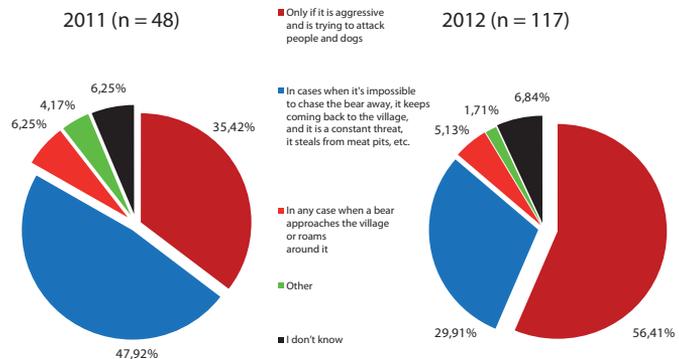
who were killed with a special permit from the Federal Service for Supervision in the Use of Natural Resources. The part of shot animals decreased in 2012 compared to 2011, which is probably due to the inclusion of new zones in the study, where marine mammal hunting is not very widespread, the locals have very few weapons, and bears come here less frequently than to Zones III and IV, to which the study of 2011 was limited. The number of scared off animals considerably exceeds that of the shot animals, and the difference is much bigger than in our estimations based on samples of real-life incidents in 1957-2005 (see Fig. 10). We can give several reasons for that. First, as we already mentioned, our respondents remembered, first of all, the most outstanding cases, which ended in the bear death. It is especially true for the period of 1957-1991. Therefore, the number of bears that were scared away from settlements with peaceful methods could be much higher in those years than demonstrated by the study. Second, the “other locals” category is less informed about the final results of various conflicts than the hunters who took an active part in their resolution. For example, most locals could remember the bear being scared away, when in reality the hunters just chased it away from the human dwellings, and shot later. So in all probability, the part of the killed polar bears is currently higher than reported by the “other locals“. An indirect proof of that is that there is no significant difference in the preference of peaceful cases as compared to the shooting cases according to the responses of the “hunters” (see Fig. 11).

Another question that was included in the questionnaire for “other locals” in both years: “*In which cases are polar bears*

that approached the settlements, are killed?” This question to a certain extent repeats the previous one, so probably, for this reason more than 6% of respondents both in 2011 and 2012 chose the “I don’t know” response option (Fig. 13), and some chose two response options.

As was expected, the two most popular answers were “killed if showing aggression” and “killed when posing a constant threat and can’t be scared away”. This option was also the second most frequent one after “scaring off” as the answer to the previous question. However, the ratio of these two responses changed significantly in different years (see Fig. 13). In 2011, much more respondents chose the option when the bears were killed if they frequently came back to the village and posed a threat to the property, but did not show open aggression to people and dogs. In 2012, the share of such responses decreased almost in half with a corresponding growth for the response option that suggested shooting only aggressive animals. Most likely, it is due to a wider geographical scope and sample size of the 2012 study. The response option that suggested that any polar bear that approached the settlements was killed was unpopular both in 2011 and in 2012, and was chosen by a share of respondents that varied from 5.13% to 6.25% (see Fig. 13).

Fig. 13 Cases in which polar bears approaching Chukotka settlements are killed; surveys of “other locals” in 8 villages (zones 3-4) in 2011 and in 24 villages, larger settlements and towns (zones 1-6) in 2012



Sometimes the respondents chose the “Other” option, but in different years very different answers fell into that category. One person from Zone III commented on his choice in 2011, saying that the bears that approached villages were killed only when the residents were in need of its meat. Another

respondent from the same zone also chose the “Other” option, adding, “*we must take them*”, which means the same as the response option that suggests killing the bears in any case. On the contrary, in 2012, two respondents from the same zone commented on their choice of “Other” option by saying: “*In our village we do not kill, we scare away*”. And one of them added that the drastic change in the treatment of polar bears happened approximately in 2009.

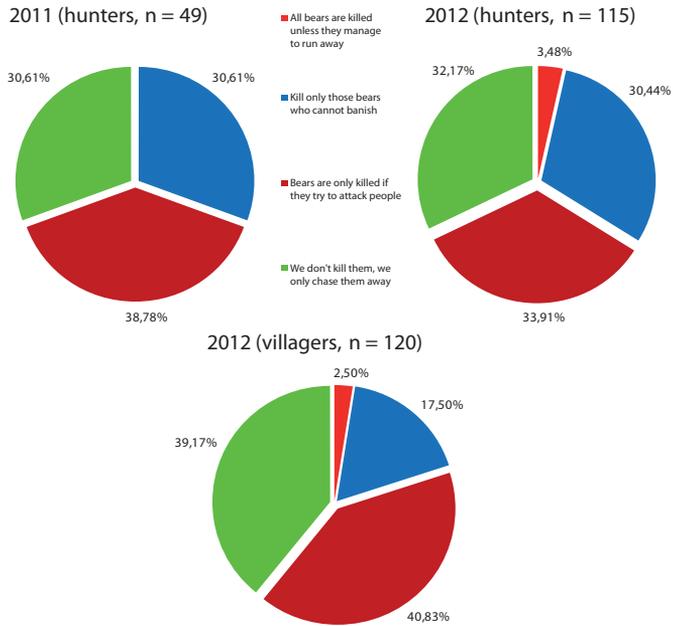
The question was worded differently for the “hunters” category: “*By your estimations, what share of bears that entered settlements are killed, and what share are scared away?*” Such question requires numeric answers, for example, in fractions or percent. However, the response options to this questions were close to those in the “other locals” questionnaire, i.e. suggesting that the polar bear was killed depending on how it behaved, with an additional option, “we don’t kill them at all, we just scare them away”.

In 2012, the question with exactly the same response options was included in the “other locals” questionnaire. But it was worded differently: “*Who else and for what reasons kills the polar bears?*”, and probably, it required different answers. It was already the third question in the questionnaire asking the respondents’ opinion on the same issue, just with different wording. We think this poor design of the questionnaire significantly decreased the value of the collected data as the respondents got tired of answering the same question over and over again.

The responses received from the “hunters” in 2011 and in 2012 were almost identical despite the difference in the geographical scope and the sample size (Fig. 14). The responses of the “other locals” differed greatly from those of “hunters” in favor of a more tolerant approach to polar bears that come to settlements. This example very well demonstrates that the responses of “other locals” reflect their own vision of the relationship between humans and polar bears rather than the actual situation.

In 2012, some respondents said that hunters killed any bears that were available in settlements or their surroundings. The share of such answers is very small and most likely, they relate to the earlier period of the 1990s and first half of the 2000s when the polar bear harvest was important to the local people.

Fig. 14 Cases in which polar bears approaching Chukotka settlements are killed; surveys of “hunters” in 8 villages (zones 3-4) in 2011 and 22 villages and larger settlements (zones 1-6) in 2012, as well as “other locals” from 24 villages, larger settlements and towns (zones 1-6) in 2012



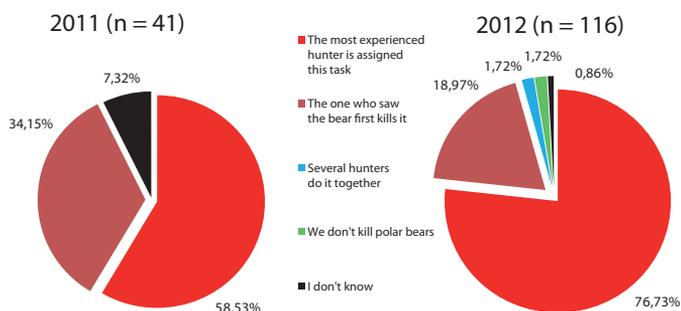
In spite of the inhomogeneity of the data collected by different methods in different time periods, we can conclude that the approach to polar bears today has become more tolerant. Shootings of animals in the settlements take place much less frequently than in 1992-2005, when in several distant villages people killed most of the bears that approached them. First of all, this is due to an improved quality of life in the villages, and the possibility to store the meat of other marine mammals and to buy the food from other regions in the stores decreased the consumption of polar bear meat. Another important factor is the appointment of police inspectors in most native villages in the late 2000s, who usually came to Chukotka from central parts of the country. With them present in the villages, open shootings of polar bears, which were typical before 2005, became impossible. However, the presence of the inspectors does not exclude the possibility of polar bears being killed secretly outside of the settlement.

WHO SHOOTS PROBLEM POLAR BEARS?

As we already said in the previous chapter, whenever a polar bear appeared close to human dwelling before 1957, people did their best to kill it. Almost all men took part in the process. After the ban, when hunting became illegal, animals that came to the village were scared away whenever possible. If the bear showed aggression or made any damage, it was killed by either the police, or, in villages that did not have police, by one of the hunters with the special permit. In the 1990s, most native villages did not have police inspectors, and, judging by the stories of the locals and by the author's own observations, the polar bears were killed by whoever managed to come there first with a weapon.

We only tried to find out which of the residents usually killed the polar bears that came to the settlements in the questionnaire for "other locals". Both in 2011 and 2012, there were only two response options: "*The most experienced hunter is assigned this task*" and "*The one who saw the bear first kills it*". The respondents tried to stick to these two answers, but they were obviously insufficient to describe the existing situation. 7.32% of the 2011 sample said they didn't know the answer, sometimes adding that the decision can vary depending on the case. In 2012, 4.3% of the respondents either said they didn't know, or suggested their own response options, mostly one of the two: "*Several hunters do it together*" and "*we don't kill polar bears*" (Fig. 15).

Fig. 15 Who shoots polar bears approaching Chukotka settlements; survey of "other locals" from 8 villages (zones 3-4) in 2011 and 24 villages, larger settlements and towns (zones 1-6) in 2012



In general, most replied that the shooting of the polar bear is assigned to the most experienced hunter (or several experienced hunters). In 2012 there were more of these responses because the sample included Zones I, II and VI, where hunting is not widespread and there are very few armed natives. Therefore, by “experienced hunters” the responders first of all meant people who had weapons and, in some cases, a personal vehicle (a snowmobile, a ATV). In 2011, the survey was limited to Zones III and IV, where marine mammal hunting is the main livelihood for indigenous people. They have the highest share of people who said that the polar bear was killed by whoever noticed it first (see Fig. 15), meaning that almost any man has the necessary weapon and experience to kill the problem bear.

Despite the fact that very few specifically stated that hunters often cooperate to kill a bear, it is a quite wide-spread method of killing, not only the animals that pose a threat to the settlement, but also in any polar bear hunting. It is important for the safety of hunters as they can protect each other, and for the butchering as it is very difficult to do it alone on such a large kill. This was often mentioned by elderly respondents when recollecting the hunting before 1957. This was also the usual way of hunting polar bears in 1992-2005.

It is interesting that none of the respondents mentioned the cases when the police or local administration killed problem bears. Because out of 8 polar bears officially killed in 2011-2012, only once the shooting was done by hunters for self-protection. The rest of the animals were killed by the police with the help of local administration. It seems that first of all, it is due to the absence of this response option in the questionnaires. The two options offered by the questionnaire immediately made the respondents think of the incidents when hunters shot the bears. On the other hand, it allows us to suspect that a certain significant number of polar bears are still shot unofficially by local hunters.

GOALS AND FEATURES OF POLAR BEAR HUNTING



SOCIAL CHARACTERISTICS OF HUNTERS AND GOALS OF HUNTING

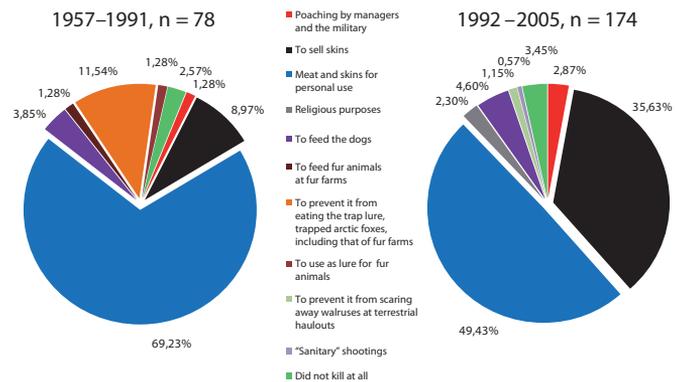
Besides shooting problem polar bears that approached settlements, there is also specialized hunting for polar bears. To find out reasons for such hunting, questionnaires of 2011-2012 had the following questions: “*Does intentional hunting for polar bear exist?*” and “*What are other reasons for killing polar bears in Chukotka?*” Since the suggested response options for both questions were similar, the first question was asked only in the 2011 questionnaire for “other locals”, and was further excluded from the questionnaire. The second question was included in the questionnaires for both categories of respondents and in both years.

We also systematized the data collected during the interviews of 1999-2005 in a similar way to the questionnaires of 2011-2012 to find out the reasons for hunting and the composition of hunters in previous time periods (Fig. 16). Respondents named several reasons for killing and using polar bears. After excluding all responses connected to problem bears, we were left with different samples for 1957-1991 and 1992-2005.

Since the main goal of the interviews of 1999-2005 was to find out methods of the use of polar bear derivatives, certain uses mentioned by the respondents were obviously secondary, which were not the reason for killing the animal.

For example, polar bear meat was partly used as a lure in fur trapping (mentioned only by one respondent for the period of 1957-1991) or to feed sled dogs (3.85% in 1957-1991 and 4.6% in 1992-2005). Out of 8 respondents that mentioned feeding dogs with bear meat in 1992-2005, two noted that dogs were usually reluctant to eat it, two more said that they preferred to eat the meat themselves, and gave it to the dogs only when there was nothing else to feed them with or when the bear meat started to rot. Three respondents said that you couldn't give polar bear meat to dogs, and one of them cited the elders, who said that dogs that tried the meat became uncontrollable at the sight of a polar bear and it could end badly for the musher. Only one hunter mentioned giving each dog a piece of bear meat after butchering it to get them used to the smell for future hunting.

Fig. 16 Goals of polar bear hunting; results of interviews conducted in 1999-2005 (105 respondents from 21 settlements)



Religious uses are also secondary, because traditionally, certain rituals and rites were performed after the kill of any animal (Bogoraz, 1939). We did not find any incident in ethnographic literature or in the interview data when a polar bear was killed specially for religious purposes. 2.3% of respondents in 1992-2005 mentioned using parts of the killed polar bear as amulets, Yaranga protectors and ritual food. However, the animals were killed for different purposes, and the religious use was collateral.

Several other reasons for killing bears were mentioned very rarely. For the period of 1957-1990, one respondent mentioned that polar bears were killed to feed Arctic foxes at the fur farm. According to him it happened only once in the 1960s when the conditions for hunting other marine

mammals, which are usually used for this purpose (walrus, seals), were very unfavorable. Two more respondents mentioned that in 1992-2005, people killed polar bears that came close to walrus terrestrial haulouts in summer and fall, to avoid polar bears preventing the walruses from gathering at the haulout place. It is possible that this happens more often than established by the interviews because we heard of such incidents happening in certain districts of Chukotka, but they were not mentioned by our respondents from these districts. One respondent from the 1992-2005 period said that sometimes thin and dirty polar bears with signs of a disease or an injury were killed for “sanitary” reasons. Probably, in this case people also thought that the bear can be dangerous to them.

A significant factor in shooting polar bears in the Soviet period of the study (1957-1991) was the fur trade. Almost all respondents from Zones “Long Strait” and “East Siberian” said that polar bears were killed when they ate the lure for the Arctic foxes and emptied their traps. Here are some of the quotes:

“When we set traps for Arctic foxes, bears constantly ate the lure from the trap and carried away the foxes. We often shot them for this. When they ate the fox’s lure, they made me very angry. I followed them on a dog sled and killed”;

“When trap hunting was widespread, we mostly shot bears who were “looters”. About 2 bears per every hunter a year”.

This reason for shooting bears was first of all typical for Western Chukotka, where Arctic fox trade was one of the most important industries in the Soviet times. At the same time, marine mammal hunting wasn’t widespread here because of low numbers of walruses, seals and cetaceans, and the lure for the Arctic fox was hard to get and considered very valuable. This is why hunters reacted so strongly to the “looting” done by polar bears. We did not hear of such cases in the Eastern Chukotka, where sea hunting for large marine mammals such as walruses and whales is very widespread. Stories about polar bears attacking caged Arctic foxes at farms fall in the same category. In total, shootings linked to fur trade and fur farms (with the exception of cases when bear meat was used as lure and feed at the farm), constituted 11.54%. In the 1990s fur trade and fur farms ceased to exist, and therefore conflicts with polar bears over the lure did so too.

Although we have information about quite active hunting for polar bears at isolated meteorological stations and border guard outposts in the Soviet times, during this study we collected only one testimony of this sort for the period of 1957-1991. The respondent only casually mentioned the military, stressing that bears were regularly killed by Russian professional trappers who explored the whole coast to the west of Kolyuchin Bay in those years. It is possible that they were again speaking about the competition with the bear for the lure. Other respondents didn't have anything to say on the matter. In 1992-2005, hunting by non-natives became more frequent. At least, we heard about it from five respondents from different districts of Chukotka:

“There are a lot of strange vehicles roaming around, different prospectors keep coming to tundra, and we have a polar bear land here. Some of the newcomers like to hunt for bear skins” (Zone II).

“At least twice I heard about strangers coming on off-road caterpillars and killing bears. Once border guard people killed a polar bear on the outpost” (Zone IV).

Nevertheless, hunting by non-native population in 1957-1991 constituted only 2.87% from the total sample. 36 respondents who were specifically asked about it, as well as about the use of off-road caterpillars and helicopters in hunting for polar bears, gave negative answers:

“I did not see or hear about non-locals killing bears” (Zone IV).

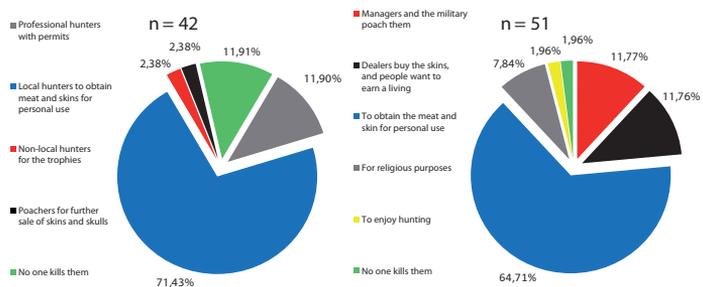
“I don't know about anyone hunting from an off-road caterpillars or a helicopter or a large vessel” (Zone III).

Therefore, the main hunters and consumers in both time periods were native people. The main goals for hunting were the meat and skins for personal use (69.23% in 1957-1991 and 49.43% in 1992-2005). And while in 1957-1991, trading polar bear pelts was a relatively rare thing (8.97%), in 1992-2005 it was mentioned as one of the hunting goals in 35.63% of the responses.

As we noted earlier, during the pilot questionnaire survey in 2011, “other locals” were given two questions with partly overlapping responses. All respondents answered the first question, but when answering the second one, one of the respondents chose the “*I don't know*” option. Some people

chose several answers, so the sample sizes for two questions were different (Fig. 17). In both cases, the dominating answer was that polar bear hunting is done by “local hunters for its meat and skins”, for “personal use of meat and skins”. Most of other response options had the same meaning. For example, the answer “professional hunters with permits”, chosen by 5 respondents, basically means the same, as all professional hunters that live in Zones III-IV, are indigenous people, i.e. the same “local hunters”. It is unlikely that the respondents wanted to highlight the fact that the hunters had the permits, especially since two of them did not use this word when filling in the questionnaire. The other three could be talking about permits for shooting problem bears or be sincerely mistaken when believing that hunters from village communities had already been allowed to use the quota. Options “to enjoy hunting” (1 respondent) and “for religious purposes” (4 respondents) are not self-sufficient, and are collateral to the main hunting goal, i.e. to get the meat and the skin.

Fig. 17 Goals of polar bear hunting, according to responses of “other locals” from 8 villages (zones 3-4) in 2011



It is interesting that the response option “non-local hunters for the trophies” (1 respondent) and “poaching by managers and the military” (6 respondents) were chosen by different number of respondents, even though they seem to practically mean the same. However, most of our respondents must have understood the first option specifically as trophy hunting, and they didn’t consider hunting by local “bosses” and “military men” as trophy hunting. In any case, the share of this type of hunters is relatively small. One of the respondents confirmed that such hunting exists, but added, “occasionally”.

The same variation exists in responses about skin trade as the goal of hunting. In the first case, this response option

was worded as follows: “*poachers for selling skins and skulls*”. Only one respondent chose this option. In the second case, the wording was softer, “*dealers buy the skins, and people want to earn a living*”, and was chosen by 6 people. Meanwhile, 5 respondents out of these six also said that the goal was “*personal use of meat and skins*”.

Thereby, local people do not distinguish very well between selling the skins and using them personally, e.g. for making clothes, shoes, covers for dog sleds, etc. Today, such use of skins is a rare phenomenon, and when respondents chose the option “*personal use of meat and skin*”, they usually meant eating the meat, while possibly selling the skin if there is demand, and that in their opinion also was “*personal use*”. In the mindset of the local community, such hunting is not poaching, despite of its inclusion in Red list of endangered species and other Russia’s legislative restrictions.

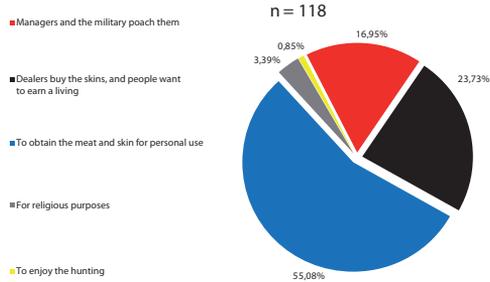
For the same reason, the option “*poachers for selling skins and skulls*” was unpopular, especially since polar bear skulls usually are not sold, and are used for hunting rituals. The public opinion considers as poachers only those hunters that kill bears solely for selling their skins, without eating the meat. Such cases sometimes took place in the 1990s, and many respondents condemned them. However, in cases when the bear meat is used for meals, selling its skin, which is not very useful in daily life, was not considered shameful.

It is difficult to explain why when answering the first question, 5 respondents said that they “*don’t kill bears at all*”, and when answering the second one, only one did so. It is probably due to the different wording of the questions. This response option was not included in the questionnaire, and was added only by those who were not happy with the available options. In the questionnaires for both the “other locals” in 2012, and the “hunters” in both years, this option was absent (Fig. 18-19).

In general, if we join the option “*personal use of meat and skin*” with selling the skin, and religious needs, as secondary to the first one, they collectively were chosen by 83 to 96% of the sample in the “other locals” category in 2012 and in the “hunters” category in 2011-2012. The part of those who said that people wanted to earn a living by selling the skins grew in 2012 and was about the same for the “other locals” and “hunters” categories (see Fig. 18-19). It is most likely

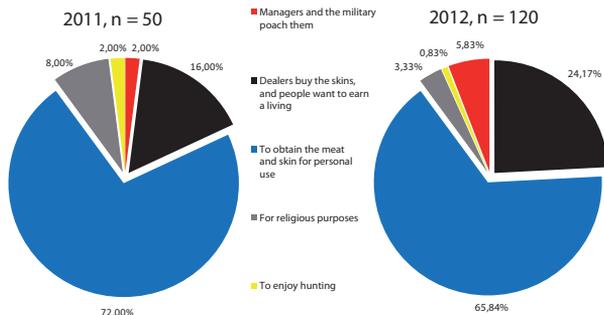
due to the fact that the questionnaire included the southern and western districts of Chukotka where skin trade is more frequent (while the harvest volumes are smaller).

Fig. 18 Goals of polar bear hunting, according to responses of “other locals” from 24 villages, larger settlements and towns (zones 1-6) in 2012



The option “*poaching by managers and the military*” was chosen by only one respondent in the “hunters” category in 2011 (2%), and by 7 people in 2012 (5.83%). Even more popular this answer was with the “other locals” in 2012: 20 respondents (16.95%). It is obvious that such cases can take place more often in areas with high density of non-local population, i.e. in the south and west of Chukotka (Zones I, II and V), which the 2011 study did not cover. It also explains why this option was more popular both with “hunters” and “other locals” in 2012. And both in 2011 and 2012, “other locals” chose this option twice as often as the hunters (see Fig. 17-19). As in general, the level of knowledge of “other locals” in polar bear hunting is lower than that of the hunters, they could assess the level of poaching among non-locals based on their assumptions instead of facts. In any case, this type of hunters is far from being the dominant one when it comes to killing polar bears.

Fig. 19 Goals of polar bear hunting, according to responses of “hunters” from 8 villages (zones 3-4) in 2011 and 24 villages, larger settlements and towns (zones 1-6) in 2012



Based on the results of the survey we can conclude that the main social group of those who harvest and use polar bears are indigenous hunters who use the meat for cooking meals, and usually sell the skins.

DEN HUNTING

Since usually dens serve as a winter shelter for female polar bears who produce offspring, during den hunting, with rare exceptions, hunters get either pregnant females, or females with cubs. In the old times, the indigenous people of Chukotka did not hunt for polar bears in dens. Traditional beliefs held that it was *“unacceptable to break into anyone’s home, even if it’s a fox den, because every dwelling has a drum and protective spirits, who can take swift revenge”* (Bogoraz, 1901, 1991).

In the late 19th century Russian settlers in the estuary of the Kolyma River were already actively hunting in dens, in particular, on Medvezhyi (Bear) Islands, and kept doing so all the way till the ban came into force in 1957. They hunted in spring and killed both the females and the cubs (Leontjev, 1962; Bogoraz, 1991). The native people in the western parts of Chukotka were mostly involved in reindeer herding. For this reason, in the late 19th century den hunting was avoided only in the Eastern Chukotka (Bogoraz, 1991).

During the Soviet times, principles of the planned economy were imposed on the local trades, combined with a active fight against shamanism and superstitions.

Probably during this period a lot of traditional beliefs were abandoned, and den hunting became a norm. As early as in the 1920s this hunting method became one of the most popular ones on Wrangel Island and remained so till the ban was introduced (Mineev, 1946; Bulanov, 1970). However, during the interviews of 1999-2005, out of 36 respondents who expressed an opinion on this matter, 12 (33%) said that there used to be a traditional taboo on den hunting in the past. Those were mostly elderly people born before 1968. Here is an example of such statement (respondent born in 1939, Zone III): *“Father did no allow us to harvest a sleeping, yawning bear, a female bear with cubs or in a den, and also bears that moved across the whole continent*

[the respondent is talking about bears who migrated by land from the Bering Sea to the Chukchi Sea — Anatoly Kochnev], *and also, if the wife is pregnant. The hunter and his family can become ill. I respect these taboos*". It is interesting that during the interview with the son of this respondent (hunter born in 1967) he repeated some of these beliefs, quoting his father, but could not explain what would happen if these rules were broken.

Three out of 12 respondents mentioned that despite the taboo, people sometimes hunted in dens during the hungry times if they couldn't harvest anything else. One of them (born in 1923, Zone III) noted that the hunter was forced to do it "*at his own risk*". Another one (born in 1940, Zone III), said: "*If one has to kill it, then before approaching the den, he had to ask the female bear for her permission and explain that need drove him to kill*".

Three respondents complained that the young did not know about the taboos and did not respect them. A retired man born in 1923 (Zone III), said: "*You cannot kill bears in dens and female bears with small cubs. Disrespect of this taboo can bring disease to your children, and if the wife is pregnant, to a miscarriage, or birth of weak children or their death. Young hunters who haven't yet formed a family and don't have children, can't kill a pregnant female bear. It will bring them infertility and loneliness. Today people have changed, and life has changed. The rituals and rites are done with alcohol. Many are done in haste and in the wrong way. Now killing a bear is always a joy, because skin can be exchanged for food, guns and bullets. No one respects the taboos. Anyone can kill as many bears as they want without asking the senior member of the family. Hence all the trouble*".

Four of the respondents (11.1%) from the total sample (n=36) did not mention any traditional taboos, but said that they didn't harm animals in dens, and cited specific examples when they chose not to hunt when have found out a den. A respondent born in 1915 (Zone III), said: "*I didn't come across dens very often, and wasn't interested in them at all. I didn't kill females in dens, I wanted to spare the future offspring*". A respondent born in 1964 (Zone V): "*So, we were going by a skin-boat in winter, close to a place called Anitikok. There was a polar bear in a den there. The*

cabin boy started to climb up, but I stopped him — it is dangerous. Bears can slide down from the hill very quickly on the snow. Later a female bear with two very small cubs came out. I was glad that we hadn't shot them earlier. It is sad to shoot such fluffy cubs. It was in 1987. Later we saw more polar bears there”.

Three (8.3%) said that they didn't know about any traditional taboos, and one respondent (2.8%, Zone III) firmly denied their existence: *“There haven't been any taboos on den hunting. Hunters competed who gets a cub first out of the den, for clothes”.*

The rest of the respondents (44.4%) did not talk about the traditional taboos, and talked either about den hunting in general, or described specific cases of den hunting, when either they or their neighbors participated. These stories come from all time periods (before 1957, 1957-1991, and 1992-2005). Two of them told a story about unsuccessful den hunting. One (Zone III) mentioned den hunting saying that *“We try not to kill in dens. But in general, we shoot a bear when we see it”.* Another respondent said that his neighbors from the village hunted in dens, but he did not get involved in it himself.

One way or another, 21 respondents (58.3%) confirmed that den hunting was widespread in 1992-2005. The studies helped collect 15 stories about specific cases of den hunting that took place in those years, from 10 respondents. Twice the animals left the den before the hunters came to kill them. In one case, a male was killed in a den, but the rest were females with cubs. In the late 1990s and early 2000s two areas had high concentrations of dens, and according to some respondents, people killed 2-3 females every year.

The question about den hunting was included only in the questionnaires of 2011-2012 for the “other locals” category (Appendices 4, 6). In 2011, 78% (n = 41) of respondents said that they didn't know of any cases of den hunting, and 4.9% noted that there hadn't been such incidents either in 2010, or 2011, and 17.1% said that in their villages, this hunting method was not used. Three specified that den hunting was not allowed by the traditional customs. At the same time, only short time before that (1992-2005) den hunting was a common method in five villages out of the eight that took part in the survey of 2011.

The sample of 2012 was more representative both geographically and size-wise. This time, out of 116 people, 88.8% said that they did not know of any cases of den hunting. Seven specified that bears did not have dens in their areas. The same remark was made by one respondent (0.9%) who said that they did never hunt in dens. 8.6% of respondents said that den hunting wasn't practiced either in 2011 or in 2012. Only two respondents said that they had heard of cases of den hunting, one of them remembered such a case take place in 2011, and another one, in 2012.

The absence of the question about den hunting in the "hunters" questionnaire makes the collected data less valuable, since "other locals" are less informed about the methods of hunting. Still, the results of the questionnaire surveys give some optimism. It is obvious that in most native villages, polar bear den hunting either stopped completely, or decreased to minimum.

HUNTING FOR FEMALES WITH CUBS

In general, almost any den hunting, described in the previous chapter, results in harvesting a female with cubs. The only exceptions are rare cases when solitary male bears were found in their temporary dens. However, the fact that the bear is in the den, as was pointed out earlier, is a very important factor in the traditional beliefs of Chukchi and Eskimo. Animals outside of dens have a different status, and therefore, are treated differently by the hunters.

We did not find any information in ethnographic and historical literature about any taboos against hunting for females with cubs similar to those about animals in dens. Out of 46 respondents in the sample, who somehow mentioned this topic during interviews of 1999-2005, stories of 17 people referred to the period before 1957. 58.8% (10 people) of these respondents confirmed that females with cubs were killed, and half of them said just that the skins of cubs were used for making clothes and shoes, because an adult animal's skin is too hard to prepare and sew on. Two specified that usually, they used one-year or two year old cubs for making clothes, but not cubs of year. One respondent added that the meat of cubs is more tender and tasty than that of adult animals.

Out of the remaining five who spoke about hunting for females with cubs before 1957, one respondent said that cubs had been caught for zoos, and two did not give any details of the use of this bear category. Two more said that one could kill a female with cubs only if one needed to keep a human life, but otherwise hunting for them was not allowed.

It is interesting that two out of ten respondents (both were women) stressed that if the hunter killed the female, he also obliged to kill the cubs, and not to leave them alive.

The remaining 7 people said that there was a taboo against killing females with cubs, and according to the beliefs, its disrespect brought disease or death on the hunter. Two of them pointed out that it wasn't allowed to kill females with "small" cubs, and another one (Zone III) said that *"you can't shoot a female with cubs that just got out of the den"*. It seems that according to those three (and maybe others too), the taboo wasn't referring to one year old or two year old cubs that were big, but still followed their mother.

Five stories refer to the period of 1957-1991. Only one of them mentioned the issue of hunting for females with cubs. Here is the full story: *"In 1988... a whale was beached during a storm. In winter, a lot of polar bears gathered there. Father said that we'd go to where the whale was and try to kill a bear for meat. We went on snowmobiles – father, uncle, and me. We approached the whale. I was young and hot-tempered, and had wanted to prosecute one of the bears, but father said that it was a female with babies. Father scolded me and said that I should be more careful. While father was teaching me, uncle killed a bear, and we dragged it with the help of our "Buran" snowmobile about 3 kilometers away from that place where the bears were feeding"* (Zone III). As can be seen from the story, despite the fact that the goal of the trip was to harvest a bear, senior hunters did not allow killing a female with cubs. Most likely, this approach was a norm when both polar bears and other food in the village were abundant. We should point out that the training of the young hunter, transferring the traditional norms of treating the animal took place right during the hunting.

The remaining four stories demonstrate that females with cubs were also killed after the ban in 1957-1992. However, most likely, it wasn't a widespread phenomenon, because all four respondents always specified the reason for killing

the animals. Two of them mentioned killing females with cubs that interfered with the fur trapping, i.e. ate the lure and tore the Arctic foxes that got into the traps. One spoke about an incident when the bear family took away his hard-earned seal and started to fight the sled dogs. In another story, a female with one of two yearlings was killed after entering the lobby of a house.

There are 28 stories about 1992-2005 that shed light on the issue, and four of them belong to the respondents that also mentioned it when talking about other time periods. Eight of them (32.1%) said that females with cubs shouldn't be killed, and half of them just stated it without giving any reasons. Two referred to the taboo that was handed down from generation to generation in their families, and added that they had respected this taboo all their life. Finally, two said that they just felt sorry for females with small cubs.

Three people (10.7%) said that they didn't know of any traditional taboos, but did not say if hunting for them took place or not. Seventeen (60.7%) of the respondents confirmed that hunting for females with cubs took place in 1992-2005. Three of them only mentioned cases when they were forced to do it to protect themselves: *"In the 1990s, dog team started to run after a female bear with cubs, and I couldn't stop the sled. I was forced to kill both the female and the cubs"* (Zone III). Five said that people tried to kill the cubs to make clothes: *"They are shot everywhere. Sometimes, females with cubs. Cubs are valued for the skin, it is easier to work with"* (Zone IV). Two mentioned shooting bears with cubs for eating the lure for the Arctic fox, and in one case, two families were killed at the same time (5 animals): *"In 1993, in October, I counted 18 bears. Maybe there were even more. A beluga whale had been beached, it was covered in young ice. We were on our way to set the lures. We killed five bears: one family, which consisted of a female, one animal the size of the female, two smaller ones and a very young one. We first killed the bear that was the size of the female, but the rest of the animals didn't flee. Then we killed another smaller one. All the bears began to run away, and we killed one more bear. The female with the youngest baby still was standing there. When we approached one of the killed bears, the female started to attack us, and we killed it. The baby stayed there, and tried*

to drag its mother with its teeth to the shore, so I killed it too. We had enough meat for the whole winter” (Zone III). One respondent (Zone III) said that people killed females with very young cubs (of year), who were “*very thin, even walked unsteadily*”, probably meaning something like a sanitary shooting. The remaining six either told stories about hunting for females with cubs without giving any reasons for it, or said that they had been harvested but did not mention any details about specific cases. In four stories out of 9 about harvesting females with cubs or just cubs, cubs were older than one year. Three out of 28 respondents believed that hunting for females with cubs should be completely banned. During the surveys of 2011-2012, only the questionnaires for the “other locals” included questions about hunting for females with cubs (Appendices 4, 6). The age of the cubs was not asked. In 2011 95% (n = 41) of the respondents said that they did not know of any incidents when females with cubs had been killed, and one added that it did not happen in either 2010 or 2011, and another one said that in his village, no one hunted for such animals.

In 2012, when the sample was bigger and included 116 respondents, 88.8% said that they did not know of any cases of hunting for females with cubs. 6 respondents (all from Zone V) specified that in their districts they usually saw solitary bears, and hardly ever females with cubs (probably meaning cubs of year). 8.6% said that hunting for females with cubs was not practiced either in 2010 or 2011. One of them added that such animals hadn’t been killed “*in a long time*”, thus indirectly confirming the fact that such cases took place in the 1990s. Only three respondents said that they knew about shootings of females with cubs (all in 2011), and in one case, most likely, the respondent was talking about the allowed shooting of females with yearlings after a tragic accident, when a bear attacked a person.

Unfortunately, “hunters” were not polled on the subject, although their level of knowledge on the issue is much higher than that of the “other locals”. Nevertheless, it’s obvious that even if killing females with cubs is more widespread than shown by the surveys, the majority of the local people does not support it.

USE OF POLAR BEAR HARVEST PRODUCTS



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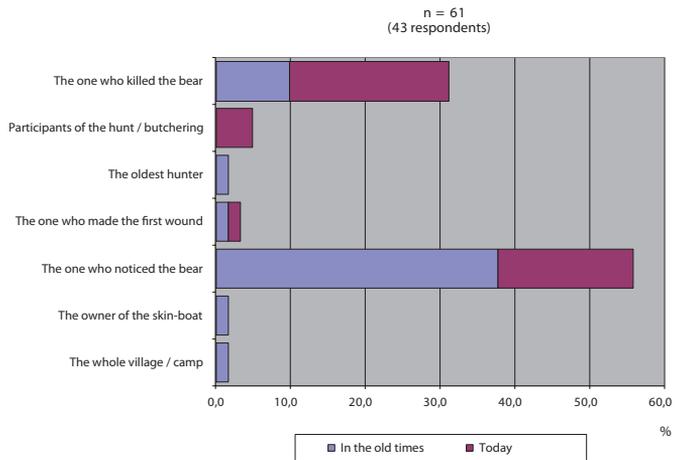
PRINCIPLES OF THE DISTRIBUTION OF HARVEST PRODUCTS IN THE COMMUNITIES BASED ON INTERVIEWS CONDUCTED IN 1999-2005

In 1999-2005, 65 respondents (58%, $n = 112$) spoke about the ownership for the killed polar bear and principles of distributing the skin, meat and insides, out of which 24 (36.9%) spoke about the modern times, 16 (24.6%) spoke about times before 1956, 25 (38.5%) spoke about both periods. It is worth noting that this subject was covered by 51% of the younger respondents ($n = 49$), 57% of the middle-aged group ($n = 35$) and 71% of the elderly group (born before 1940, $n = 28$). There is an obvious trend among the respondents to be more interested in the issues of ownership and distribution of the kill as they get older. It can be explained by the fact that older people gradually stop hunting, so the distribution of the animals in the community worries them much more than it does the younger hunters, who can provide for themselves and their families.

OWNERSHIP OF THE POLAR BEAR

43 respondents explained who became the owner of the killed polar bear. Many of them spoke both about the older and modern times, sometimes describing several different scenarios, so in total, there were 61 different responses. We distributed this sample in 7 main categories, with the majority (86.8%) of answers falling into one of the two of them, either “the one who noticed it” and “the one who killed it”. The rest of the categories got only from 1.6 to 4.9% of replies (Fig. 20).

Fig. 20 Ownership of the polar bear



The one who noticed the bear first

55.7% of all answers (n = 61) stated that the polar bear belongs to the one who first noticed it and told other hunters about it. This custom was very widespread among the Chukchi and Eskimo on Chukotka, Alaska, and Greenland, both in relation to polar bears and beached whales (Bogoraz, 1934; Mineev, 1946; Ushakov, 1972; Kishchinskiy, 1976; Uspenskiy, 1989; Tein, 1992; Sandell, Sandell, 1996; Jolles, 2002; Russell, 2005).

Our respondents didn't try to explain this custom, but of course, it is based on the belief that the polar bear comes “for a visit” and brings its skin and meat as a “gift”. Therefore, the one who noticed the bear becomes its “hospitable” host, the rituals with the skin and head take place in their home, and

they must entertain the “great guest” with songs and dances (Bogoraz, 1939; Mineev, 1946; Rubtsova, 1954; Ushakov, 1972; Takakava, 1990; Tein, 1992; Veket, 1997). *“The Umka belongs to the one who first saw it. The ritual must take place in their Yaranga”* (hunter born in 1927, Zone III). *“The killed polar bear always belongs to the one who first saw it even if that person did not take part in the killing”* (hunter born in 1941, Zone III). *“There was this woman who saw the polar bear. Everything was brought to her house. That’s how it was done before. When we butchered it, we brought it inside, put near the fireplace with the skins, and anointed it with the internal lard from a reindeer and with sausage”* (woman born in 1936, Yaranga hostess, Zone IV).

A hunter born in 1969 (Zone III) cites the following example: *“If one hunter first discovers the bear, follows its track, but the bear runs away and another hunter sees it and shoots it, the bear and especially the skin still belong to the first hunter”*. The same respondent says that the same principle was used for den hunting, i.e. the bear belonged to the one who first found the den.

With this ownership rule, it is inevitable that people will argue who first saw the bear, especially when the bear wanders near the village. Our respondents did not say how such conflicts are resolved today. However, in the old times, a number of methods were used to solve these situations. It seems that one of the most widespread was “talking” to the killed bear. *“In conflict situations, we place the end of an ice chisel under the bear’s head and ask who it belongs to. If the head rises with difficulty or doesn’t rise at all, the bear is against the named candidate, if the head rises easily, it supports him”* (hunter born in 1915, Zone III). *“Before, people brought the head to a Yaranga and asked it. We put the head on the floor and tied it with a rope to a staff called ‘ken’unen’. If the head answered “yes”, it was easy to lift, if “no”, it couldn’t be lifted. Not all bears answered the questions (i.e. raised and dropped the head), only about every fourth or fifth male, females did it more often. Young people were not allowed to take part in the questioning, only older people talked to the head. I attended it only twice. We asked who was the first to see it, and it responded. The skin belonged to the one who the head chose. If we asked it about the man who shot but did not see it first, the bear gave a*

negative answer. The bear always belonged to the one who saw it, that's why we asked" (hunter born in 1925, Zone IV). Sometimes the argument was resolved by an agreement between the hunters. *"A childhood memory. Tneny and Giunkeu saw a polar bear. Tneny saw it first, but Giunkeu took the gun and ran to the bear. Tneny saw where the bear went, took the gun too, and caught up with Giunkeu and said: "I saw it first, it's mine. But let's do this: the belongs to the one in whose direction it looks first". The bear turned to Tneny. He killed it, and they both dragged it home"* (member of a folk group, born in 1940, Zone V).

Later, when harvesting polar bears was no longer a life-sustaining necessity, many hunters didn't always follow this tradition and refused to kill someone else's bear. Most likely, it was then that the one who noticed the bear let the killer have it (2 respondents). *"If the person who saw the bear before the kill refused to take it, then the hunter who killed it could have it"* (hunter born in 1967, Zone III). *"Sometimes the one who first saw the bear didn't want it. Then the ritual was done in the Yaranga of the hunter who killed it"* (hunter born in 1945, Zone V).

Two respondents said that the violation of the ownership for the polar bear could bring divine punishment. *"If someone takes someone else's bear, they can get a bad disease or die"* (hunter born in 1927, Zone III). *"There was a situation when the hunter wasn't the bear's owner, but he killed it and took it. After several days he died. Older men say that he died because of that incident"* (hunter born in 1946, Zone V).

The person who noticed the bear only has the right for the skin and the skull. According to the tradition, the "owner" of the bear and his family distribute the meat among other members of the community, which was repeatedly pointed out by the respondents. *"The one who saw the bear, owns it. But if he takes the whole bear, everyone knows that he is a greedy man. Next time if he sees a bear, no one will want to shoot it"* (hunter born in 1972, Zone III).

The one who killed the bear

The second most popular answer (31.1%, n = 61) was that the polar bear belongs to the one who made the kill shot. More than 2/3 of such statements relate to the modern times (see Fig. 20). Respondents usually know the rule according

to which the bear belongs to the one who noticed it first, but say that today, this rule is rarely observed or not observed at all. *“The bear belongs to the one who killed it, old customs were forgotten”* (hunter born in 1915, Zone III). *“Today, whoever kills is the owner. Before it belonged to the one who saw it. It was this way probably around the 1930-50s”* (hunter born in 1957, Zone IV).

Some respondents say that both the one who saw and the one who killed have the ownership. In some cases, they're talking about a common situation when the hunter who noticed and the hunter who killed is the same person. *“The kill, especially the skin, always belonged to the one who saw and killed the polar bear”* (reindeer herder born in 1942, Zone IV). Other respondents most likely talk about the first violations of the old custom. *“Bear belongs to the one who first saw it. For example, if an old hunter sees it, the bear belongs to him. And of course, it belongs to the one who killed it. But it is important that it belongs to the one who first saw it because he found the bear. Sometimes, the one who killed takes the bear, it is important, because he found it”* (reindeer herder, born in 1931, Zone V). *“Every family has its own initiation ritual for young hunters. I remember when Nova was still a boy, he killed a polar bear, and there was an initiation ritual for him. The parents took the meat, skin, but for some reason didn't share it with anyone”* (member of a folk group, woman born in 1938, Zone IV).

At least one respondent (reindeer herder born in 1941, Zone V) says that there has never been any ownership of the polar bear for the one who noticed it: *“Now the kill belongs to the one who killed. And before the rule was the same, the one who harvested, owns the harvest. I think that anyone can spot it, but the kill must rightfully belong to the one who killed”*.

If the one who killed the bear becomes its owner, than similarly to the situation when the owner is the one who saw it, that person has to share and distribute the meat among his fellow villagers. *“The one who killed the bear, distributes it as its owner”* (Yaranga hostess, born in 1940, Zone IV).

It is clear that the ownership of the one who killed started to dominate over the ownership of the one who noticed after 1956 (see Fig. 18). When comparing these two categories we get the following result. Out of 29 responses that describe

the time period before the hunting ban, 79.3% name the one who noticed the bear first as its owner. Only 45.9% (n=24) of the responses say the same about the period after 1956, the rest consider the one who killed to be the owner. We can assume that besides the general changes in the traditional mentality of the indigenous people, the views on the ownership were also influenced by the fact that the one who killed the bear took on the greatest risk after hunting for polar bears became illegal. From the legal point of view, it was the one who killed the animal, not the one who noticed it, who committed the crime and was punished with a fine.

Participants of the hunt and the butchering

Three respondents (see Fig. 20) said that the participants of the hunt and the butchering must share the killed polar bear. All these answers referred to the modern times, and first of all, referred to the cases when the bear was killed on the water or on drifting ice from a boat, a skin-boat or a whaleboat. In this case, the whole team joins efforts to harvest the animal: the helmsman, the shooter, etc. *“If the bear is killed from a whaleboat, by a crew, then the harvest belongs to everyone. If we are in a dog sled, and there are two of us, and I saw the bear first, then I get the head and the skin is mine. But the meat is divided in two”* (hunter born in 1961, Zone V). *“If a group of hunters kill a bear, then the animal must be divided between all”* (hunter born in 1964, Zone V).

The one who made the first wound

Two respondents said that the priority in the ownership of the polar bear was given to hunters who first wounded the animal, therefore limiting its movement. *“The bear belonged to the one who made the first shot. Before, from a bow, now, from a gun”* (female teacher born in 1934, Zone IV). *“Anyone can see, but few can kill. It’s the same as in walrus hunting: it is most important who harpooned it first, because harpooning is the most important thing. The same applies to hunting for polar bears. Here, it is important who hit it first”* (hunter born in 1963, Zone V).

The senior hunter

A member of a folk group born in 1930, from the Eskimo tribe of Nugagmit (Zone IV) said that in the old times, the killed polar bear belonged to the most senior member of the

hunting group that killed the bear. It wasn't very clear from her answer whether she meant the oldest one or the highest-ranking one (the owner of the skin-boat, gun or the head of the family or tribe). Most likely, in this case she was talking about the age of the hunter.

The owner of the skin-boat

A hunter born in 1949 (Zone V) said that in the old times, the owner of the bear was 'ytvermechynn', the owner of the skin-boat, the head of the skin-boat crew. Most likely, he was talking about hunting by the crew of a skin-boat or whaleboat on the water or broken sea ice. Skin-boat crews are known to be a stable social unit even outside of the navigation period. The members of the crew lived in the same part of the village, went together on trade and other trips not only on the skin-boats, but even on dog sleds in winter (Bogoraz, 1934). Therefore, 'ytvermechynn' could play the leading role in the distribution of the killed bear in different situations. Vladimir Bogoraz (1934) gave a detailed description of the priorities that the owner of the skin-boat had in the distribution of walrus, bearded seal skins and baleen, however, according to him, the polar bear first of all belonged to the one who first saw it.

The whole village or camp

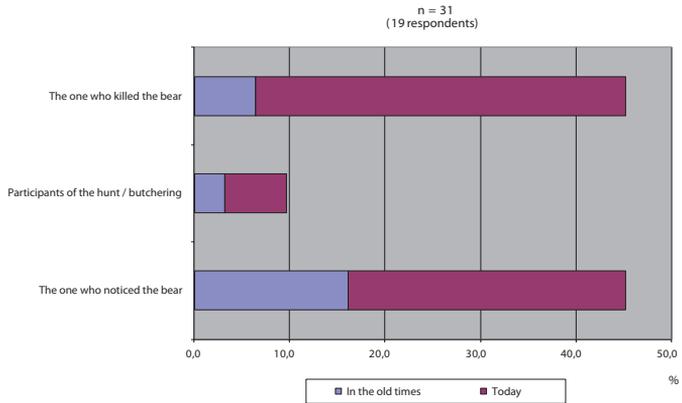
A Yaranga hostess (born in 1935, Zone V) said that the harvested polar bear belonged to all villagers: "*When a polar bear was killed, its meat was distributed to everyone, and belonged to everyone. People had a very strong spirit of community. Everyone ate it, and shared it, as if it was one fish or a hare that we shared, or a seal, we ate everything together*". Since she didn't say anything about the ownership of the skin and the responsibility for conducting the ritual, we can assume that in this case she was talking about the distribution of the meat, not about the ownership of the polar bear in general.

OWNERSHIP OF THE SKIN

Nineteen respondents didn't say anything about who owned the polar bear, but made a special emphasis on who was the owner of the skin. The total number of these responses was 31, both about the period before 1956, and after. All responses can be broken down to 3 types of owners, of which "*the one who noticed*" and "*the one who killed*" constitute

together 90.4% of the sample and have the same share each (Fig. 21). When comparing these two categories, same as for the whole polar bear, after 1956 there is a clear trend of the ownership of the one who killed dominating over the ownership of the one who noticed. Out of 7 statements referring to the period before the hunting ban, 71.4% name the first who saw the bear as the owner. For the period after 1956, this response was given only in 42.9% of the cases (n=21), the rest considered the one who killed to be the owner of the skin.

Fig. 21 Ownership of polar bear skins



When speaking about the ownership of the one who noticed first, many respondents emphasized their statements saying that anyone could be that person, any member of the community, even those who had nothing to do with hunting. *“The skin belongs to the one who first saw the bear, even if it is a child or a woman”* (hunter born in 1948, Zone III). One of the respondents (hunter and reindeer herder born in 1955, Zone III) described a truly “noble” behavior of hunters in the old times: *“Before, a hunter, after killing a polar bear, took the meat, and left the skin. Because it was possible that someone followed the bear tracks before him, then that person was supposed to have the skin. If no one took the skin by the next day, then the hunter took it”*.

Same as in the case of the whole polar bear, several hunters could dispute the skin. A hunter born in 1964 (Zone V) talked about peaceful resolution of such conflicts in a form of an

anecdote: *“So, here’s how it happened. My older brother told me this story. A bear was walking from far away in the direction of the hunters, along the seacoast. They had a bet: they will shoot it and run to it, and the kill will belong to the one who first reached the killed bear. There was a sly elderly man with them. He heard the bet and went to the seashore in advance, and began to wait for the hunters to kill the bear. They shot it and started to run. But the old man came out and put his foot on the killed bear. So, he became the owner of the skin”*. Two respondents described cases when those, who were, by the common opinion, the rightful owners of the skin, let another hunter or the owner of the gun used in the hunt have it.

A hunter born in 1960 (Zone III) mentioned a belief that the person who took the polar bear skin without the right for the ownership would be punished by divine forces: *“You can’t take a bear skin that belongs to someone else, there will be trouble. It is well-known”*.

Similar to the ownership issue of the whole polar bear, most respondents confirm the custom to consider the one who noticed the bear as the rightful owner of its skin, but they also say that many people break this rule. *“The one who first saw the bear should own the skin. Even if that’s a child. Sometimes people do as the custom says, but not very often, because the hunter doesn’t want to give away the skin”* (hunter born in 1963, Zone III). *“The skin belongs to the one who first saw the bear, even if it’s a woman. Today few people respect this rule”* (hunter born in 1940, Zone III). A number of respondents, mostly the young ones, never even mentioned the ownership right of the one who saw the bear.

Three respondents spoke about the ownership right being shared by the participants of the hunt or the butchering. Two of them were talking about the modern times. *“When we were at Neran, I saw it, but we killed it together. I think the skin belonged to both of us, me and the man who was with me”* (hunter born in 1964, Zone V). A hunter born in 1936 (Zone IV), when remembering the times before 1956, said: *“Once, we went in a whaleboat from Lorino to Akkani. We saw a bear in the sea. He dived like a beluga whale. We killed it from a gun. He didn’t sink. It was an average size. Our team leader took the skin, sold it to a procurement center, and we divided the money among the whole team”*.

Most likely, here the “team leader” can mean the same as ‘ytvermechyyyn’, the head of the skin-boat crew. In the Soviet times, when boats and skin-boats were no longer a personal property, and belonged to kolkhoz⁶ and sovkhos⁷, the leader of official sea hunting teams, whether he was appointed or selected by popular vote, continued to play the role that the owner of the skin-boat used to, and distributed the kill, or, as in this case, the profit from selling it, among the members of his team.

Therefore, it can be concluded that the ownership of the skin is determined similarly to the ownership of the whole polar bear. As only the skin of the polar bear has decent market value, it is an object that requires set ownership rules. Both the respondents who spoke about the ownership of the whole polar bear and those who made an emphasis on its skin, were in fact speaking about the same thing. And it was this way in the older times as well. Vladimir Bogoraz (1934) and other authors, when discussing the ownership of the polar bear, considered not only economic but also religious aspects of the ownership rules. Therefore, they and their respondents viewed the polar bear as a whole being. From a utilitarian approach, the skin ownership comes to the fore, because it is the most valuable unit of trade. This aspect of the problem was described by Nikolay Kallinikov (1912), who said that the one who saw the polar bear first had the right for the skin first of all. Some of our respondents, as we can see, also made the biggest emphasis on the skin because of its market value.

OWNERSHIP AND DISTRIBUTION PRINCIPLES FOR THE MEAT

33 respondents spoke on the subject, giving 60 different responses, which can be divided between 10 categories of members of local communities who have the priority right for the ownership or share of the meat from the killed polar bear (Fig. 22).

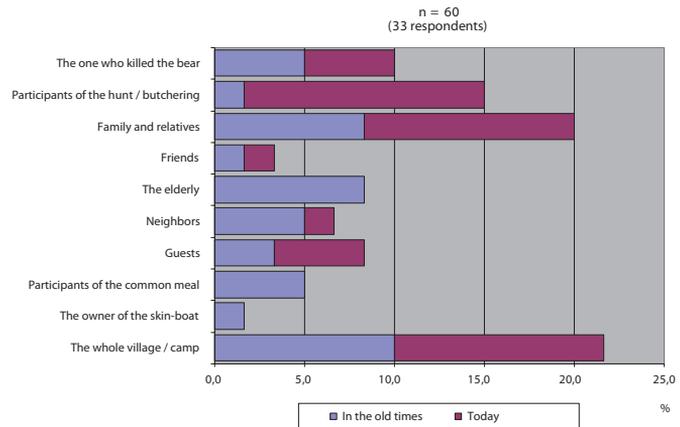
Most often (21.7%), people said that the meat was distributed between all of the villagers. Furthermore, for the period before 1956, this response had a slightly smaller part than for the modern times (see Fig. 22). “*My father hunted*

⁶ Collective community farms

⁷ State-owned farms

them. He gave the meat to everyone, you should always share the kill” (Yaranga hostess, born in 1942, Zone V). “When a polar bear was killed, the meat was given to everyone, and belonged to everyone. People had a very strong spirit of community” (Yaranga hostess, born in 1935, Zone IV). “The one who killed the bear, takes the skin, and distributes the meat to all the people. So I ate it too. My husband was surprised where I got fresh meat. He wasn’t a hunter himself. He worked as a plasterer and stove setter” (member of a folk group, born in 1944, Zone IV). “A good hunter, if he harvested a polar bear, will bring the meat to the village and share with the people” (hunter born in 1960, Zone III). “And the second bear was all taken to pieces by the villagers. Even a tractor was sent to pick up the meat” (hunter and reindeer herder, born in 1961, Zone V).

Fig. 22 Priority groups for polar bear meat distribution



The second most mentioned category of people who got the meat (20%) consists of the relatives of the owner. That being said, the part of these responses referring to the modern times is somewhat larger than that referring to the period before 1956 (see Fig. 22). “The meat was only shared with close family. When a bear was killed, the Yaranga was always crowded. Everyone hurried to eat some fresh meat” (hunter and reindeer herder, born in 1945, Zone II). “We try to hide the killed polar bear from the big bosses and from the Russians, but we don’t hide it from each other. We share the meat with our relatives” (hunter born in 1963, Zone IV).

“When a bear was killed, all the meat was eaten, all of it. You gave it to the all relatives” (hunter born in 1964, Zone V).

The third place was taken by the participants of the hunt and butchering (15%), with most of these responses referring to the modern times. *“The killed polar bear is divided between the hunters, and the skin belongs to the one who killed the bear”* (hunter and reindeer herder, born in 1951, Zone III). *“If several people had been hunting, then the skin belonged to the one who first discovered the polar bear, and the meat was divided by agreement”* (hunter born in 1962, Zone IV). *“We were moving in a whaleboat. We met a polar bear. We discussed what to do, and started shooting. And we all shared the meat”* (hunter born in 1964, Zone V). Only one respondent (female, teacher, born in 1934, Zone IV) said that in the old times, participants of the hunt, alongside with some other groups (in this particular case, the elderly people) had a priority during the meat distribution: *“When the bear was killed, the meat was given, first of all, to the elderly people, and then was distributed among the hunters”*. Most likely, in most cases, the participants of the hunt and butchering first took their own share, and then distributed it among their relatives, although our respondents did not say so directly.

Ten percent of the responses point at the one who killed the bear as the owner of the meat, referring equally to all time periods (see Fig. 22). Most respondents added that in that case, the person who killed the bear did not take all of the meat, but had the priority of choosing the best pieces and was the one responsible for the distribution of meat among the villagers. *“The skin and the meat go to the main hunter who killed the bear, but usually everyone shares the kill with the fellow villagers”* (member of a folk group, female, born in 1938, Zone IV). *“The one who harvested the bear, distributes it as its owner”* (Yaranga hostess, born in 1915-1940, Zone IV).

The next most mentioned category is elderly people (8.3%). It is worth noting that all such responses refer to the period before 1956. *“It was very important to treat the elderly with some meat”* (hunter born in 1915, Zone III). *“The meat was cut and almost all of it was given to the elderly”* (hunter born in 1940, Zone III). Furthermore, two respondents (both were Eskimo) recalled a custom, according to which all of the first kill of a young hunter was given to the oldest residents

of the village. *“So, if a boy, teenager or a young man killed something for the first time: a duck, a ringed or bearded seal, the kill was usually given to the old people, neighbors”* (member of a folk group, female, born in 1938, Zone IV). *“I only know that when someone kills his first whale or seal, the kill was taken away from him. People let an old woman – vayagak’it – to take away the first kill. The hunter gets upset and has an incentive to harvest again. People later explain to him, why you can’t take the first kill home: you should give it to everyone, if you want to be a successful hunter. Old women usually take the first kill away. But of course, they say some words while doing so, I don’t know, I haven’t seen them take it away”* (teacher, female, born in 1934, Zone IV). Most likely, this custom has the same roots as the one of Alaska Eskimo from Cape Point Hope. There, the oldest women, when getting their share of meat from the hunter that harvested its first animal, could also ask for additional treat. This request was always satisfied in order to secure good luck in hunting for the future (Rainey, 1947). An equal part of responses (8.3%) mention the “guests”, with those referring to the times before 1956 being slightly less frequent than those referring to the modern times (see Fig. 22). *“After the ritual, the meat and the lard were distributed to all who came to the house”* (reindeer herder born in 1931, Zone V). *“People are happy when hunters kill a polar bear. Everyone comes, and the bear meat is distributed, one piece for everyone”* (hunter and reindeer herder born in 1957, Zone IV). *“Sister took all the meat off the bones. Whoever came, got some from her”* (hunter and reindeer herder born in 1964, Zone IV).

Neighbors were mentioned slightly less frequently (6.7%). Most of those responses refer to the old times and only one refers to the modern time (see Fig. 22). *“If a hunter came back with bear meat, at any time, even at night, he must to immediately bring a little bit of meat to his neighbors and family. And everyone started to boil the meat immediately”* (hunter born in 1940, Zone III). *“If a young hunter wants to have good luck, he always gives the first kill to the neighbors”* (hunter born in 1944, Zone III).

Three respondents (5,0%) when speaking about the old times, made an emphasis on the fact that the meat of a polar bear wasn’t just distributed, it was cooked for the common

meal in the house of the owner for all those who lived at the camp. “*When someone killed their first bear, common dinners were made*” (hunter born in 1915, Zone III). “*There was a custom. The whole community gathered, and all ate the meat of the Umka*” (hunter born in 1939, Zone III). Such meals, mostly gathering the residents of the village who were related to each other, were described by Valentina Veket (1997).

One respondent mentioned that in the old and modern times, the priority in the distribution of meat is given to both family and friends of the bear owner.

Finally, a hunter born in 1949 (Zone V) said that in the old times, all of the meat of the polar bear was given to ‘*ytvermechyyyn*’, i.e. the head of the skin-boat crew. Most likely, he was talking about the right of the skin-boat owner to distribute the meat.

It should be noted that most of the named categories (participants of the hunt, relatives, friends, neighbors, guests), also fall under the definition of the “skin-boat crew”. We already mentioned earlier that those crews were stable social units in coastal villages in the early 20th century. Members of the crew were often related to each other or on friendly terms, put Yarangas close to each other in the same part of the village (i.e. were each other’s neighbors) and visited each other frequently (i.e. were each other’s guests) (Bogoraz, 1934). Furthermore, small camps were usually one family-owned “skin-boat crew”.

The oldest residents of the herding camp were always treated as the most respected members of the community both in Chukotka (Kallinikov, 1912) and in Alaska (Rainey, 1947). No wonder that this category is constantly mentioned by our respondents as the priority group in meat distribution. It may seem strange that they were not singled out when describing the modern times. A possible reason is that when talking about the modern times, the respondents mostly referred to the late 1990s when illegal harvest of polar bear was most widespread. This period coincided with the economic collapse in Russia and almost complete loss of any profit by the native people of Chukotka. However, when most hunters and their families had no disposable money and became totally dependent on the hunting, elderly retired people had a certain advantage, as they got very small, but

stable retirement benefits. We can assume that during those times, hunters started to distribute less meat to the elderly people, who could sometimes afford to buy food in stores for their benefits.

It is difficult to say why the respondents didn't mention "poor people" as one of the groups of people who could have priority in meat distribution (i.e. single women, widows with children, disabled people). Such people, if they had no one to take care of them, always got their share of meat (Bogoraz, 1934; Veket, 1997).

However, most of the respondents said that the meat was distributed to all the villagers that were willing to get it. This principle of polar bear meat distribution is also typical for many districts of Alaska (Spencer, 1959; Luton, 1986). The principles are similar for the distribution of such animals as beluga whales and other whales (Bogoraz, 1934; Luton, 1986). However, some respondents complained that the meat distribution to all villagers happens less and less often: *"Today, the young people rarely share with the village. Only if people learn about it themselves, they come to take some"* (hunter born in 1940, Zone III).

Some respondents named the best parts of the meat that always belonged to the animal owner — either the one who noticed or the one who killed it. *"The one who noticed the bear always got the skin and the meat from the neck"* (hunter born in 1941, Zone III). *"The hunter that killed the bear takes the meat from the right paw, the brisket, all the insides"* (hunter born in 1943, Zone IV).

OWNERSHIP AND DISTRIBUTION PRINCIPLES FOR THE LARD

Most respondents did not say anything about the distribution of the lard. Most likely, when talking about the meat, they were also talking about the lard. Only one reindeer herder born in 1931 (Zone V) spoke separately about the lard, saying that the lard was cut and shared with anyone who visited the owner of the killed polar bear.

OWNERSHIP AND DISTRIBUTION PRINCIPLES FOR THE INSIDES

Only two respondents spoke separately about the insides when referring to the modern times. A hunter born in 1943

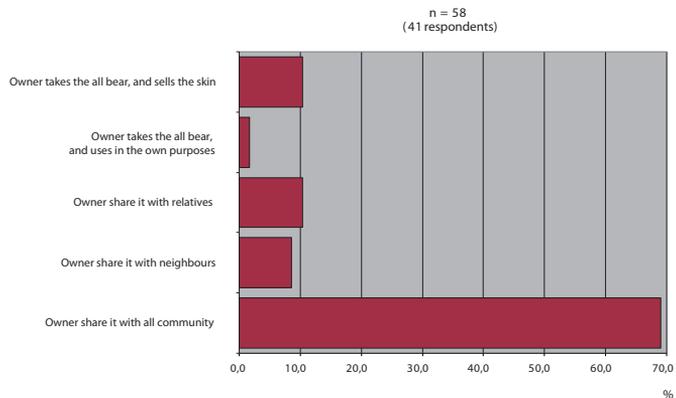
(Zone IV) pointed out that the priority right for all the insides was given to the owner of the bear, in this specific case, the one who killed it: *“The hunter that killed the bear takes the meat from the right paw, the brisket, all the insides, with the exception of the liver because it is poisonous”*.

A reindeer herder born in 1937 (Zone III), on the contrary, said that the insides were distributed between all the participants of the butchering: *“The meat, the kidneys, the heart, the intestines were divided equally between everyone who was present at the butchering”*. Most likely, in most cases, when talking about meat distribution, the respondents were also talking about the insides, even when they didn’t mention them.

PRINCIPLES OF THE DISTRIBUTION OF HARVEST PRODUCTS IN THE COMMUNITIES BASED ON QUESTIONNAIRE SURVEYS CONDUCTED IN 2011-2012

In the studies of 2011 and 2012, the issue of the distribution was mentioned only in the 2011 questionnaire for the “other locals” (Appendix IV). “Hunters” were not asked about it, and in 2012, “other locals” weren’t asked about it either.

Fig. 23 Distribution of polar bear derivatives, according to responses of “other locals” from 8 villages (zones 3-4) in 2011



In 2011, the question was worded as follows: *“If a local hunter kills a polar bear, what does he do with the harvest?”*, with 6 response options (Appendix IV). 41 respondents answered this question, sometimes choosing multiple options. One of the options, *“The kill belongs only to the hunter, he*

takes everything” was not chosen by anyone. Two more options that point to the hunter’s personal use of the polar bear products, constituted 12% in total (Fig. 23), while for the period of 1999-2005, such responses constituted 10% (n = 30). It is important to point out that a significant part (26.7%) responses in 1999-2005 named the “*participants of the hunt / butchering*” as a priority group in the meat distribution because hunting for the bear and especially the butchering are usually collective tasks due to the hard work that they involve (Fig. 24). There was no such response option in the 2011 questionnaire, therefore, participants of the hunt and butchering partly fell into the group of those who killed the bear, and partly in the group of the people with whom the hunter shared the kill.

Fig. 24 Butchering of a polar bear, 2003.



Therefore, it is likely that for this reason in the study of 2011, there were more responses (88%) saying that the owner shared the kill with the other villagers, including the family and neighbors, than in 1999-2005 (63.2%) (see Fig. 22, 23). In any case, it is clear from both the interviews and the questionnaires that in all time periods, the distribution of the polar bear meat, lard and liver among the villagers has been an important element of life in the mentality of the native peoples of Chukotka. It is important to understand though, that it does not apply to the polar bear skin. Both in the older and modern times, it belonged either to the one who noticed the bear first, or the one who killed it. The 2011 questionnaire did not ask the respondents specifically about the ownership of the skin, but we assume

that it is unlikely that the views of the Chukotka people have radically changed over the few years that had passed since the previous study.

USE OF POLAR BEAR IN TRADITIONAL DIET

It has been known for a long time that the Chukchi and Eskimo eat polar bear meat (Galkin, 1929; Ushakov, 1972; Uspenskiy, 1977; Tein, 1992; Afanasjeva, Slichenko, 1993). Ferdinand Wrangel (1948) when retelling his voyages in the 1820s, said: *“Polar bear meat is a delicacy to the Chukchi... They mix the meat stock with snow and make a special drink out of it, which they serve in big wooden mugs. Every Chukchi carries a small drilled reindeer bone that they use to sip the drink from the mug”*. After the hunting ban of 1957, ethnographic, medical and biological publications no longer mentioned the consumption of the polar bear meat, because it became a hidden activity. However, in 2000-2001 a questionnaire for one of the sociological studies on the role of whaling (Litovka et al., 2002) developed by the Institute of Biological Problems of the North (Far East Branch, Russian Academy of Sciences, Magadan) was distributed to find out the role of different food products in the diet of the indigenous people. The meat and lard of the polar bear were not singled out in the questionnaire for obvious reasons, but in the “other meat” choice field the residents of coastal villages often mentioned “bear meat” alongside with the meat of snow sheep and elk, meaning polar bear meat.

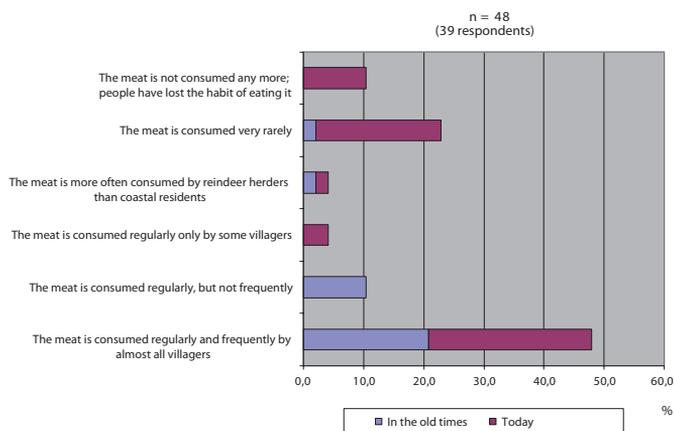
In 1999-2005, we tried to assess the volumes of polar bear meat consumption in different districts of Chukotka both before and after the hunting ban of 1956. The sample included the statements of 39 respondents (34.8%, n = 112), out of which 23 (59.0%) spoke about the modern times, 9 (23.1%) referred to the period before 1956, 7 (17.9%) mentioned both time periods. In total, we collected 48 responses, which were broken down into 6 categories (Fig. 25).

The meat is consumed regularly and by everyone in the village.

47.9% of responses fall into this category, with 2/3 of them referring to the modern times. *“Before, people consumed a lot of polar bear meat”* (reindeer herder born

in 1931, Zone V). “In the old times, every family harvested 2-4 polar bears. Some killed even more, because polar bear meat is very tasty” (hunter born in 1915, Zone III). “The meat is very tasty, life is difficult without it. When I see a bear, I immediately think about its meat: “Young lamb is coming!” I want to kill and eat it. In the Soviet times, people regularly killed it for the meat, and during the past decade the harvest size have hardly changed. Maybe, people killed a bit more” (hunter born in 1963, Zone IV). “It’s just that now, people [kill it—Anatoly Kochnev] for their personal use, for the meat. The meat is also very tasty. Especially in the hard times, when there was no food at all, after “Perestroika”. So we did it secretly, because, well, we had to bring some meat home. When a bear was killed, all meat was eaten, absolutely all” (hunter born in 1964, Zone V). It should be noted that polar bears are much more rare on the Bering Sea coast than on the Arctic coast. Therefore, the hunting possibilities for the population of those districts differ greatly. However, the residents of southern villages stated that both before and now they regularly and frequently consumed polar bear meat, and the number of such statements was somewhat higher than in the northern villages. Most likely, the assessments made by the respondents do not reflect the real situation. If by regular and frequent bear meat consumption northern residents meant that every family harvested 2-4 bears every year, southern residents have a much lower standard: it’s also 2-4 bears, but for the whole village.

Fig. 25 Consumption of polar bear meat by indigenous people of Chukotka (according to interview surveys conducted in 1999-2005)



The meat is consumed regularly, but not frequently.

10.4% of responses fall into this category. They all refer to the period before 1956, and all, with the exception of one, refer to Chukotka's Bering Sea coast. *"The elders said that people had harvested polar bears around Lake Achchen and other places. It was a long time ago. Those elders are long dead"* (hunter born in 1955, Zone V). *"Before, everyone hunted, harvested 1-2 polar bears per year. The meat was shared"* (member of a folk group, female, born in 1940, Zone V). *"My father hunted them. In total he has killed no more than four bears. He gave the meat to everyone, you should always share the kill"* (Yaranga hostess, born in 1942, Zone V).

The meat is consumed regularly only by some of the villagers.

Here, we tried to give a quantitative assessment of those who consume polar bear meat as opposed to those who don't do it for one reason or another, in two villages, on the Arctic coast (Zone II) and on the Pacific coast (Zone V). Both villages are mostly populated by reindeer herders, and marine mammal hunting is a secondary activity. For the Arctic village, the assessment was made by a hunter and reindeer herder born in 1945, and for the Pacific village, it was also made by a hunter and reindeer herder, born in 1946. In spite of its closest location to Wrangel Island and therefore, despite it being a very popular destination for polar bears, only 30% of the native people of the Arctic village consume bear meat (in total, the village has 280 residents, including 30 Russians). In the Pacific village, polar bears are relatively rare, and its meat is consumed by only 11% of the population, mostly older people (in total, there are 450 residents in the village, including 50 non-locals from central regions of the country).

The meat is more often consumed by reindeer herders than by coastal residents.

Two respondents said that people living in reindeer herding camps consumed polar bear meat much more regularly than in coastal villages, both in the old and modern times. *"Especially before, tundra people ate polar meat very often"* (reindeer herder born in 1931). *"Reindeer herders quite often see polar bears and kill them. People in tundra killed*

them more often than here on the coast. At least, it was this way in the 1970-80s. When you visit reindeer herders, they often have polar bear skins hanging at home. And they see polar bears more often. I saw skins in all three reindeer herding camps" (hunter born in 1955). These seemingly controversial statements can be easily explained. Both of these respondents come from a village on the southern coast of Chukotka Peninsula (Zone V). Ice cover here is unstable throughout the whole winter and spring, because there is a permanent polynya next to the coast. Most bears, if they find themselves in this area and got separated from the ice cover, don't stay long near the coastal line and move by their inland routes to the coast of Chukchi Sea (Kochnev et al., 2003). Sometimes, such movements are massive by nature, and reindeer herders, which keep moving across inland areas, take their chance to shoot the animals. Even in the Soviet times, the reindeer herding groups were not controlled by law enforcement, hunting and fishing control agencies, and even less so today. For this reason, they never ran the risk of being accused of poaching. This situation is reflected in the testimonies of our respondents on the subject.

The meat is rarely consumed.

Responses of this time have the second biggest part in the sample (22.9%). Almost all of them refer to the modern times, and over 70%, as was expected, come from the southern part of Chukotka peninsula (Zone V). There are different reasons for the rare consumption of polar bear meat. Most respondents link it to the hunting ban, which sets some people off, while others simply lost the tradition of cooking and using the meat in meals. *"Young hunters are afraid to eat the bear meat. They don't even know how to cook it for meals"* (hunter born in 1943, Zone V). *"The traditional hunting has ceased to exist, especially in our village. People don't want to hunt for the polar bear. What are you going to do with it? You can't sell the skin. Maybe someone in the village killed it, I don't know. But it's unlikely that they would have managed to keep it secret, probably, villagers are afraid to kill bears"* (hunter born in 1955, Zone V). *"I haven't heard of polar bears being killed in our village. But I did try a piece of bear meat here"* (reindeer herder born in 1941, Zone V). *"A whole generation of people grew up, who don't consume polar bear meat at all. At first, elderly*

hunters were afraid to hunt it, and by now they have got out of the habit, after the long hunting ban” (hunter born in 1963, Zone V). In one of the southern villages, there was a mass outbreak of Trichinosis after eating polar bear meat, which signified the loss of traditional polar bear cooking methods. After that incident, the villagers were afraid to consume polar bear meat: *“We killed it once, people ate it and got poisoned. We never ate that meat again. Maybe we boiled it the wrong way, or the bear itself was poisoned. Now we are scared to eat this meat”* (hunter born in 1954, Zone V).

Another reason for rare bear meat consumption was given by only one respondent from the Arctic coast (hunter and reindeer herder, born in 1949, Zone II): *“People don’t take the meat very often nowadays, because they try to rip it and throw everything out as soon as possible. They mostly shoot them for the skin”*.

An interesting explanation for rare consumption was given by an old reindeer herder from an inland village in Zone VI that lies in the middle of active land movements of polar bears: *“It takes a while to boil the meat, you need a lot of wood, that’s why people rarely kill them”*. It is true, people use shrub branches to make fire in tundra, and to store a big amount of them is an arduous task.

The only respondent who spoke about the times before 1954 was also a reindeer herder from Zone IV.

Meat is not consumed any more.

The last type includes responses of 5 respondents (10.4%) that refer to the modern times. One of them comes from a village on the Arctic coast in Zone II. In spite of the village location in a district where polar bears are common inhabitants of the coastal waters, the respondent (hunter born in 1960) says: *“We don’t eat polar bear meat any more. We got out of this habit”*. The reason for this is the location of the village just 5 kilometers away from a large urban settlement, which at the time of the interview also was the district center. The native people came under heavy cultural and economic influence of the immigrants from the central regions of the country. Besides, marine mammals hunting has traditionally been little developed here. The native people have been involved in reindeer herding and

only hunted for marine mammals during the summer migrations of the reindeer herds to the coast. Some families permanently lived on the coast and worked in fur trade, but in the 1970, Russian fur trappers came here, making strong competition to the native hunters, and gradually drove them from the trade. Thus the traditions of using polar bear meat in cooking have been completely lost here. Besides, the proximity of the district center and law enforcement agencies forced the local people to be careful, and illegal hunting was brought to a minimum in the Soviet times. In the 1990s, the bear hunting became large-scale, but the indigenous people made only half of the whole harvest (the rest were killed by the non-natives), and mostly for the skin.

The remaining four respondents live on the southern coast of the Chukchi Peninsula, where polar bears are quite rare. They gave different reasons for the loss of polar bear consumption. One of them is the hunting ban: *“In the old times, people hunted and ate it. And then it disappeared, it turns out it was banned”* (Yaranga hostess born in 1936, Zone V). The lack of interest in hunting (here, most likely, the experienced government official is not fully honest): *“The local indigenous people do not hunt”* (government official, born in 1938, Zone V). Hunting only for the sake of selling the skin: *“They take the skin, and usually leave the meat. The young people don’t eat it”* (hunter and reindeer herder born in 1945, Zone V).

Table 3 Preparation and consumption of harvest products for meals in hunters’ families in Chukotka in 2010–2012, based on questionnaires (kilograms, average per family)

Year	2010	2011		2012
Zones	III–IV Consumed	III–IV Stored	All zones Consumed	All zones Stored
N	43	43	111	111
Walrus	600	259	253	131
Ringed seal	267	56	112	53
Whale	192	34	101	63
Fish	142	68	115	74
Reindeer	51	22	89	43
Polar bear	22	2	4	3
Game birds	18	5	19	6
Hare	6	2	17	8
Wild plants and mushrooms	16	9	28	19
TOTAL	1313	457	737	399

The questionnaire surveys of 2011-2012 tried to assess what part the polar bear meat had in the traditional diet. For this purpose, the questionnaire contained a table, where hunters had to assess how many kilograms of different products of hunting their family had consumed during the past year and had stored for the current period (Appendix V). The assessment of the average value per family showed that the share of bear meat is very modest in the traditional diet and is similar to that of such small hunting products as game birds (duck, geese, partridge), hare meat and wild plants and mushrooms (Table 3, Fig. 26-27). Furthermore, a relatively high consumption level, 22 kg per family, was registered only in zones III and IV, which were covered by the 2011 study. In 2012, when the survey was conducted in all the six zones, the average consumption dropped by more than 5 times (see Table 3, Fig. 26-27). This shows that polar bear harvest is not very widespread and happens only from time to time in the western and inland Chukotka, where reindeer herding is widespread, as well as on the southern

Fig. 26 Proportion (%) of various harvest products used for consumption in 2010 and prepared and stored in winter 2011 by hunters' families in Chukotka (average per family), based on responses of "hunters" from 8 villages (zones 3-4 in 2011)

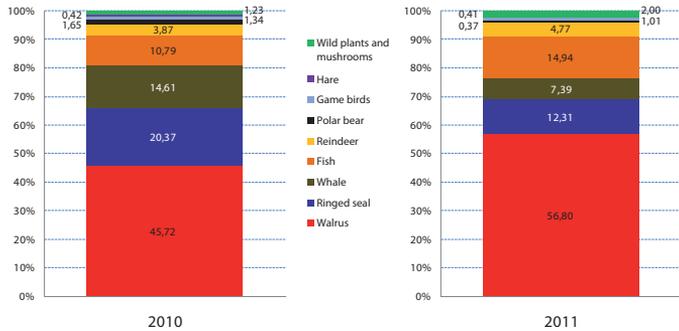
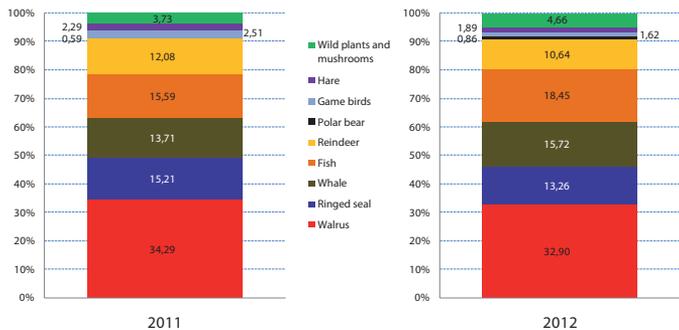


Fig. 27 Proportion (%) of various harvest products used for consumption in 2011 and prepared and stored in winter 2012 by hunters' families in Chukotka (average per family), based on responses of "hunters" from 24 villages, larger settlements and towns (zones 1-6) in 2012



coast of Gulf of Anadyr, where polar bears are rare, i.e. in zones I, II, V, and VI. Besides, the results of the 2012 study could be affected by the fact that the native people lost any hope for getting the official harvest quota, and become more secretive in this matter.

It should be pointed out that the amount of stored bear meat is much smaller than the amount that was used throughout the year (see Table 3). The reason for this is that the native people often don't have conditions for freezing and preserving large volumes of meat and fish. Only the meat and fat of marine mammals such as walrus, whale and seal can be stored in the community's ice-houses, as well as in traditional meat pits where the meat gets fermented. According to the native people, polar bear meat is not suitable for long-term storage with these methods, and is usually consumed fresh within several days after it was killed.

USE OF POLAR BEAR SKINS IN EVERYDAY LIFE

The indigenous Arctic peoples, include those living in Chukotka, have always found the thermal isolation and water resistance of polar bear skins very useful. Most often, the skins were used to make soles and upper part of shoes (water-resistant “torbaza”⁸), for fur trim on the edges of “malakhai”⁹ and “kukhlyanka”¹⁰, for elbow and knee patches on hunting wear, for sewing trousers, “chizhi”¹¹, mittens, for harness straps and “chaat”¹². They were used to sew fur curtains (that used as sleeping place in the Yarangá), as a rug for sitting, as seats on sleds, to protect belongings from rain (instead of tarpaulin); small pieces of skins were perfect for “voydaniye” (covering the runners of the sled with water, to create a thin layer of ice for more speed). Polar bear skins were used to drag skin-boats and equipment to the edge of the fast ice; children used them as a sledge, to go down snow slides in winter (Ushakov, 1972; Kishchinskiy, 1976; Gurvich, 1983; Bogoraz, 1991; Kochnev, 2004b; Kochnev et al., 2005).

⁸ Traditional tall boots

⁹ A fur hat with ear flaps and a large back flap for protecting the neck

¹⁰ Male closed dress made from animal skin

¹¹ Stockings with fur inside

¹² A lasso

As prices for polar bear skins started to grow in early 20th century, the locals started to use them less for personal needs, and their daily use went down drastically in the 1960s. This was partly due to the replacement of traditional materials with the imported ones and the increasing purchasing power of the native people. However, the most important reason was the ban on hunting polar bears, which made all handiworks from skin and fur stand out and could possible lead to a police investigation and fine. Nine respondents interviewed in 1999-2005 said that in the 1960-80s, people often threw out the skin and just took the meat when killing a bear. Most frequently, they dumped the skin in the water, either the whole thing, or after cutting it into pieces. Four respondents described this method of hiding the evidence. *“In the 1960s and 70s, people also killed polar bears when they could. They just took a little bit of meat to treat themselves, and dumped the rest in the sea...”* (a hunter born in 1960, Zone IV). *“In the 1970s and 80s, people threw the skin into an ice hole, and only took the meat”* (hunter born in 1960, Zone III). *“When someone accidentally killed a polar bear, he cut the skin in pieces and threw them into the water”* (hunter born in 1960, Zone III). Four respondents mentioned cases when people didn’t take the skin off the bear and hacked it with the meat as on a walrus. A hunter and reindeer herder born in 1949 (Zone IV) said that people used this method to butcher an old bear that had a bad skin. In other cases the hunters explained that this method was used because in those years, it was very difficult to sell the skin or use it in daily life, because law enforcement agencies could notice that and punish the guilty. For this reason, hunters avoided the arduous and long method of taking the entire skin off the bear, and instead, they just cut it with the bear to save time. *“Before, bears were butchered like walruses, people didn’t take the skins off. Today, the entire skin is taken off”* (hunter and reindeer herder born in 1954, Zone III). *“In the 1980s, skins were cut with the meat, to avoid the hassle. Today, skins are treated with more care”* (hunter born in 1963, Zone III). Finally, according to one hunter and reindeer herder born in 1952 (Zone III), sometimes the skin was just cut in pieces and left in the ice pressure ridges. It is important to add that the situation changed by the mid-1990s, when the quality of life in the village became extremely low, which was pointed out by the respondents.

The illegal market of polar bear skins started to expand and the supply of goods from the central regions of the country dropped to a minimum, and polar bear skins once again became an element of the everyday life of the native people. In 1999-2002, we witnessed the use of polar bear skins for making trousers and shoes (“torbaza”) (Fig. 28). Usually, pieces of the skin served as rugs on sleds (Fig. 29), especially since the use of dog sleds increased dramatically due to severe shortage of gasoline. However, even in those years, the daily use of polar bear skins was limited because they became a very valuable source of income. For personal use, people usually used cut or damaged skins.

Fig. 28 “Torbaza”, traditional tall boots with soles made from polar bear skin, for hunting on ice, 2002



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Fig. 29 A mat from polar bear skin on a dog sled, 2002. A piece of polar bear fur hanging on the handle bar was used to cover the runners of the sled with water, to create a thin layer of ice for better sliding



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In 2011-2012, the questionnaire studies once again tried to assess the importance of polar bear skins compared to other traditional products. Hunters had to answer how many pieces of different products their family used in daily life throughout the year that preceded the survey, and stored for the current period (Appendix V).

The calculation of the average value per family demonstrated that the use of polar bear skins in modern life is a rare phenomenon: there is approximately one skin per 7-10 families (Table 4). Zones III and IV, where the 2011 study took place, use polar bear skins somewhat more often. The most widely used hunting products in these zones are seal skins and walrus tusks, which in total constituted 84.8% of all consumption in 2010 and 75.9% of all stored products in 2011 (Fig. 30). Indeed, seal skins are important as they are used to sew clothes and make belts. However, walrus tusks have long lost their practical use in daily life, and are stored only for domestic production of carved and engraved souvenirs for sale. Therefore, many hunters did not distinguish between the use of hunting products in daily life and for trade, even though the questionnaire did. Most likely, this is also true for polar bear skins, and it is possible that some of the skins listed by the hunters were for sale and not for personal use.

Table 4 Preparation and consumption of harvest products for everyday use in hunters' families in Chukotka in 2010-2012, based on questionnaires (number of pieces, average per family)

Year	2010	2011		2012
Zones	III-IV Consumed	III-IV Stored	All zones Consumed	All zones Stored
N	43	43	111	111
Reindeer skin	0,60	0,12	2,69	2,10
Ringed seal skin	6,44	1,14	2,60	1,92
Walrus tusks	6,49	0,40	1,17	0,80
Skins of fur animals	0,51	0,19	1,19	0,36
Walrus skin	0,88	0,09	0,40	0,12
Polar bear skin	0,14	0,00	0,10	0,07
Baleen	0,19	0,09	0,03	0,03
TOTAL	15,25	2,02	8,18	5,40

In 2012, the study covered all six zones, but the average value for the use and storage of polar bear skins did not change much (see Table 4). However, this time, reindeer skins became the most popular product (Fig. 31). It happened because the questionnaire study included reindeer herding areas of western and inland Chukotka.

Fig. 30 Proportion (%) of different harvest products used in everyday life in 2010 and prepared and stored for everyday use in winter 2011 in hunters' families in Chukotka (average per family), based on responses of "hunters" from 8 villages (zones 3-4) in 2011

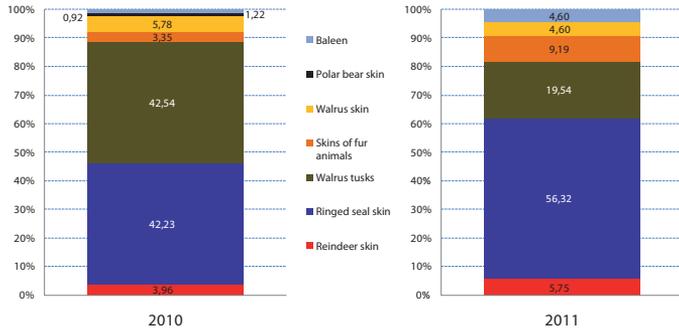
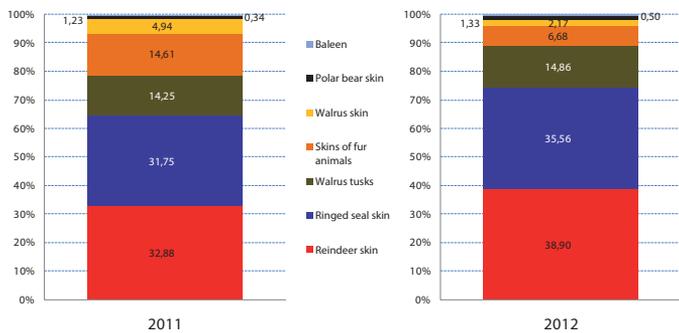


Fig. 31 Proportion (%) of different harvest products used in everyday life in 2012 and prepared and stored for everyday use in winter 2012 in hunters' families in Chukotka (average per family), based on responses of "hunters" from 24 villages, larger settlements and towns (zones 1-6) in 2012.



TRADE OF POLAR BEAR SKINS

The native people of Chukotka started to regard polar bear skins as objects of trade only in the 19th century, and for a long time, Chukchi and Eskimo separated the head and paws with claws from the skin after hunting, which significantly decreased the market value of the skin. Sergey Buturlin (1913) wrote about this custom still present in the early 20th century: *“One Russian Orthodox Christian fur hunter was once proving to me that selling the killed animal with the head is a big sin. Chukchi have the same belief. When I tried to persuade rich Chukchi man Kyaukel to get me a polar bear with the skull and paws, he kept trying to turn it into a joke, but finally said that it would be very scary: an empty skin, and suddenly with a head and claws; wherever you put it, it would be looking into the sky. This deformation affects the market value of the skin. Even 10-15 rubles is a high price for a piece of bear fur without the head and*

legs, and can be justified only by the existence of a certain demand for them in Yakutia, for use as bed covers”.

For a very long time, the price for them was low; in the mid-19th century, polar bear skins were sold cheaper than those of the Arctic fox and even reindeer at markets (Uspenskiy, 1977). In early 20th century, the price for skins began to grow, and accordingly the harvest size and trade volume (Sokolnikov, 1927; Uspenskiy, 1969; Fig. 32). That being said, the turnover from the trade with American dealers was more than 6 time bigger than that of the trade at fairs in Russia (Uspenskiy, 1969).

Fig. 32 *Airing and drying of polar bear skins before loading them on a trade ship. Chukotka, 1920s.*



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In the Soviet times, as the native people started to join collective farms, the polar bear skin trade became centralized and state-controlled, and remained so all the way till the hunting ban in 1957. The skin trade resumed on the private level only after the ban, but, according to the old-timers, the demand for polar bear skins in the 1960s was relatively low. It was most likely due to the low density of non-local population, special mentality, low purchasing power, and almost complete absence of private initiative in the Soviet Union of those times. The shadow market for polar bear skins began to form in Chukotka in the 1970s and further developed in the 1980s, as the Soviet people started to accumulate available cash. Skins were bought as luxury goods alongside with cars, furniture sets and clothes of foreign brands. But even then, the sale of skins was not a wide-spread phenomenon and was mostly done by non-native hunters, who completely occupied this niche in the Western Chukotka in the 1970s. During that period, indigenous people only harvested polar bears for their meat, and with rare exceptions, dumped the skins in the sea, as we said in the previous chapter.

In the 1990s, fur trade became unprofitable, and most non-native fur trappers either left Chukotka or switched to a different business. However, polar bears became an important meat source in winter for the indigenous people whose quality of life dropped below the poverty line. Natives went back to using skins in daily life, but by the mid-90s, dealers from other regions and crew from cargo ships began to massively buy the skins from the local residents. The basic price for the skin was low in 1999-2002: from around 3-7 thousand rubles in a distant national village to 12-20 thousand rubles in a district center, if the hunter managed to transport the skin there. But even these modest money could significantly improve the life of the indigenous people, who were almost devoid of funds. However, polar bear skins were more often exchanged for food, alcohol, household appliances, second-hand outboard engines and snowmobiles from passing ships.

In the 2000s, the quality of life of the native people improved and stabilized. In the middle of the first decade of the 21st century, the basic price for a polar bear skin grew to 25-35 thousand rubles. However, the demand decreased. Most likely, this very peculiar market had been already saturated during the previous decade. Besides, since the villagers started to accumulate funds, dealers now could earn money legally by reselling food, appliances, vehicles, vehicle parts, etc to the locals. Storing and transporting polar bear skins was now an unreasonable risk, especially with the strengthening of law enforcement in Chukotka and Russia in general. This could be the reason for the dramatic growth in the prices, with potential middle-income buyers no longer being able to afford the illegal product. At the same time, the market segment of rich trophy collectors switched to the Canadian pelts, with much higher quality than those from Chukotka, and are absolutely legal.

In the late 2000s and early 2010s we repeatedly heard hunters in Chukotka say that it was very difficult to sell a polar bear skin. Now that they earned some, albeit modest, money at the tribal agricultural communities, they were reluctant to sell the skins at the knockdown prices of 10-15 years ago. First of all, because it is very time-consuming to remove fat from the skin and process it to make a pelt. Currently, same as in the Soviet times, polar bears are more

often killed for the meat, and pelts are sold only occasionally. It seems that unless there is a new wave of demand for the skins with higher price level, people will again start cutting and dumping them in the sea as they did in the 1960s-80s.

The questionnaire surveys of 2011-2012 tried to assess the place of polar bear skin in the trade of traditional animal products. Hunters were asked how many (kilograms or items) they prepared for sale or sold during the year that preceded the study (Appendix V). The question was not worded correctly, because any traditional hunting (including polar bear hunting) means that the native people prepare the products primarily for personal use, as gifts to relatives and neighbors, or as barter for reindeer products. People only sell the surplus products, and on an occasional basis, without any well-established scheme of trade. The only exceptions are walrus tusks and baleen, which are produced specially for the sale to artists: bone carvers and engravers. Fish is also partly caught and prepared for trade.

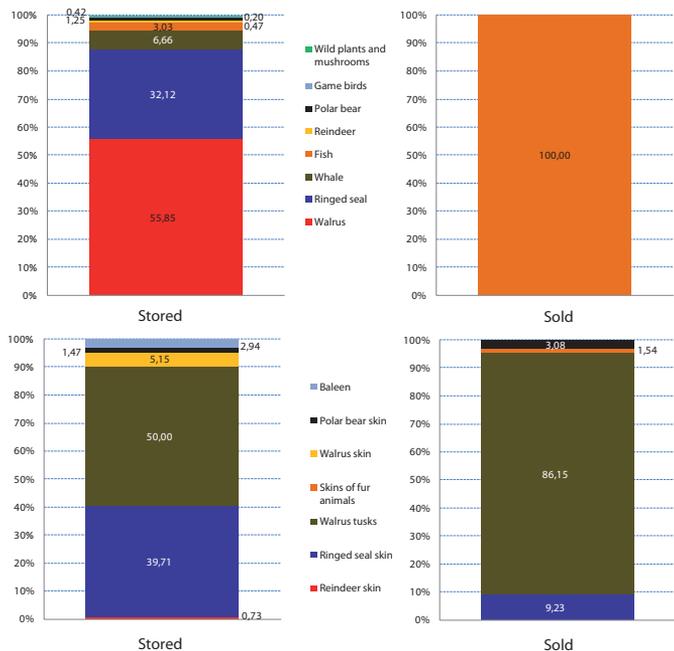
Table 5 Preparation of harvest products for trade by hunters' families in Chukotka in 2010-2011, based on questionnaires (kilograms and number of pieces, average per family)

Year	2010	2011		2012
Zones	III-IV Stored	III-IV Sold	All zones Stored	All zones Sold
N	43	43	111	111
Walrus	109,19	0,00	4,14	0,63
Ringed seal	62,79	0,00	1,49	0,45
Whale	13,02	0,00	0,27	0,00
Fish	5,93	1,63	9,69	5,14
Reindeer	0,93	0,00	0,72	2,00
Polar bear	2,44	0,00	0,00	0,00
Game birds	0,40	0,00	0,50	0,14
Wild plants and mushrooms	0,81	0,00	1,94	1,66
TOTAL	195,51	1,63	18,75	10,02
Reindeer skin	0,02	0,00	0,07	0,05
Ringed seal skin	1,26	0,14	0,44	0,14
Walrus tusks	1,58	1,30	0,34	0,14
Skins of fur animals	0,00	0,02	0,11	0,08
Walrus skin	0,16	0,00	0,04	0,02
Polar bear skin	0,05	0,05	0,10	0,09
Baleen	0,09	0,00	0,03	0,02
TOTAL	3,16	1,51	1,13	0,53

The calculation of the average value per family showed that one polar bear skin per 10-20 hunters was processed and sold in 2010-2011 (Table 5). If we assume that the scale of the trade was the same in both years, it means that half of it took place in Zones III and IV, which took part in the 2011 survey. Store of polar bear meat, as well as the meat of other marine mammals for sale (see Table 5, Fig. 33) is clearly an deviation that partly reflects the barter trade with reindeer herders, but mostly was mentioned in the questionnaires because many hunters could not distinguish between making products for personal use and for sale.

In 2010, the trade turnover of food products in Zones III-IV consisted solely of fish, even though it constituted only 3% of all food products prepared by the respondents for sale (see Fig. 33). Walrus tusks dominated (86%) in the turnover of other (non-food) products. Polar bear skins made 3.1% of the turnover, which means that they were more actively sold than the skins of walrus, reindeer, Arctic foxes and other fur animals, and more than the baleen (see Fig. 33).

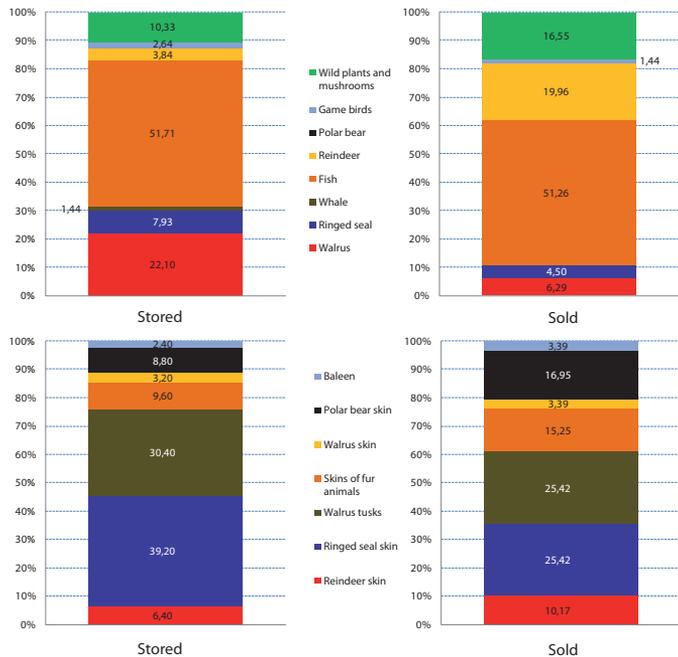
Fig. 33 Proportion (%) of different harvest products prepared for trade and sold in 2010 by hunters in Chukotka (average per family), based on responses of “hunters” from 8 villages (zones 3-4) in 2011



In 2012, when the study covered all six zones, including those dominated by reindeer herding, fish also dominated the turnover of food products: it constituted slightly more than half of all sales, followed by reindeer and wild plants and mushrooms, which are brought to procurement centers and sold via private stores in some of the large settlements and towns (Fig. 34). Polar bear meat was not used in the trade.

Walrus tusks dominated the turnover for other (non-food) products, but with a smaller margin than in 2011. Seal skins were second most important product of trade, followed by polar bear skins, which constituted 17% of the trade turnover (see Fig. 34).

Fig. 34 Proportion (%) of various harvest products prepared for trade and sold in 2011 by hunters in Chukotka (average per family), based on responses of “hunters” from 24 villages, larger settlements and towns (zones 1-6) in 2012



Therefore, despite the decrease in the demand, polar bear skins still have a significant part in the turnover of hunting products. It should be noted, however, that the total turnover of hunting products is very small and does not bring hunters and their families any substantial financial benefits.

POLAR BEAR HARVEST SIZE IN CHUKOTKA



The data described in the previous chapters clearly indicates that the order of the Council of Ministers of the Russian Soviet Federative Socialist Republic “On measures of wildlife protection in the Arctic” in 1956 and the introduction of the total ban on hunting for the polar bear in Russia did not fully stop its harvest in Chukotka throughout all the years that followed. A natural question arises: how many polar bears were harvested during that time and are killed now? It is important to know the answer to that question in order to model the population, to understand its long-term dynamics and to make efficient decisions on its management. Taking into account the hidden nature of this hunting, it is not an easy task, and the accuracy of the estimations will be always low, and a subject of intense discussions. However, any attempt at estimating the illegal harvest size with

transparent and repetitive methods, instead of speculative “expert” assumptions, is valuable. Even though it may not give realistic quantities of polar bears that are annually withdrawn from nature by humans, at least it provides benchmark that can help in developing conservation measures.

The first estimation of the illegal polar bear harvest in Chukotka was made on the basis of the interview survey of the native people completed in 1999-2003 (Kochnev, 2004b). We estimated the annual harvest at 180-284 animals for 1994-2003 based on the data collected from 32 hunters from 16 native villages.

A interview survey was also done in 2004-2005. This time, the respondents were asked to assess the harvest size in their home villages in different time periods: before 1957, in 1957-1990, in 1994-2003, and for the period of time when the interviews were taken, i.e. 2004-2005. Those data was merged with the data of the previous interview surveys for updated estimations. The estimations of the harvest size were made with the following method. Every respondent usually gave the minimum and maximum limits for the harvest in their home village (“6-8 bears every year”, “in some years we didn’t catch any, and in others we killed as many as seven”). We calculated the average minimum and the average maximum harvest limits, as well as the average value of annual harvest for every village, using the existing estimations. After that, we grouped the villages in zones (see Fig. 8) and summed these average values, which resulted in margin and average harvest sizes for each of the six zones. The sum of all harvest sizes in the zones was the harvest estimation for the whole of Chukotka. In some villages, we did not manage to get any information on certain time periods. For example, there were no data from one village in Zone II for the period of 1994-2003, from 3 villages in zones II, III and IV for the period of 1957-1990, and from 8 villages in zones I-V for the period of 2004-2005. When calculating the values for the period of 1994-2003, we made our own estimations of the harvest size for village that did not provide any data. They were based on indirect data from neighboring settlements, as well as on data about the occurrence of polar bears around that village. In the 1990s and early 2000s, hunting for polar bears in distant villages

was done almost in the open, and in most interviews, the respondents gave very forthright estimations of its annual catch. Taking into account the level of openness and also the more representative sample size of the data for the period of 1994-2003, we relied on it as reference data and used it to assess the harvest sizes in other time periods. We did this by calculating the percentage ratio of average annual harvest size between all villages in 1994-2003, and used that ratio to estimate the harvest size for the villages that did not provide any data for the periods of 1957-1990 and 2004-2005.

1910–1956

We could not make harvest estimations for the period before 1957 as there remained very few hunters who had killed bears in those times. Those who we managed to interview were unable to give an adequate estimation of the annual catch in villages in the times before the ban, both due to their old age and since so many years have passed since. However, the following estimations of annual harvest sizes in Chukotka were made for the 20th century period before the ban: in 1910-1930, 300 per year, in the 1940s, 200 per year, in the early 1950s, 100 per year (Uspenskiy, 1977).

1957–1993

It is believed that after the hunting ban was introduced in 1957, the polar bear harvest decreased dramatically, and consisted mostly in shooting problem bears. For example, Stanislav Belikov (1991) said that based on the official documents, 47 bears were shot between 1975 and 1983. Out of this number, about 30 were killed to protect human lives or property, and the remaining 17 animals, most likely, were registered in protocols of the wildlife control as the result of poaching. Thus it can be calculated that Stanislav Belikov estimated the illegal catch in that period as 2 bears per year.

However, the data collected with our interviews show that the native people did not stop to take a polar bears throughout the Soviet times in spite of the ban. Most respondents hunted themselves, and remembered those times very well. However, the data for this period are much less reliable than that for 1994-2003, because in the Soviet times, incidents of polar bear kill were deep-cover and hidden even from fellow villagers.

For this reason, a lot of respondents remembered how many bears they had killed themselves, but found it difficult to give estimations for the whole village. According to our calculations, in the period after the ban was introduced in 1957 and till the time when the economic crisis of the 1990s began, an average of 74 bears were annually killed in Chukotka (lim 53-95) (Table 6). Even if this estimate is overstated, there is no doubt that the introduction of the ban led to an insignificant decrease in the harvest level of polar bears.

Table 6 Estimates of annual polar bear harvest size in Chukotka in 1957-1990 (based on data from 30 respondents from 17 villages)

Zones	N	Min	Max	Average
East Siberian	3	5,00	14,00	9,50
Long Strait	1	10,00	13,00	11,28
Chukchi Sea	9	17,67	33,33	25,75
Bering Strait	5	6,50	10,00	8,08
Gulf of Anadyr	11	7,83	16,33	12,08
Tundra	1	6,00	8,00	7,00
TOTAL	30	53,00	94,67	73,70

1994–2003

With the start of the economic crisis, the illegal hunting on polar bears became wide-spread in Chukotka, spurred by the economic hardships experienced by the native people, as well by the increasing coastal occurrences of polar bears due to gradual shrinking of ice cover in the Chukchi Sea. The meat was the main motivation to hunt, while pelt trade became an important source of income only in the second half of the 1990s. According to our estimates, about 209 bears were harvested annually in Chukotka in 1994-2003 (lim 163-256) (Table 7). This value is smaller than the one we published earlier (Kochnev, 2004) as we included additional data, collected from 24 respondents in 2004-2005, to the sample.

Table 7 Estimates of annual polar bear harvest size in Chukotka in 1994-2003 (based on data from 56 respondents from 19 villages)

Zones	N	Min	Max	Average
East Siberian	4	2,00	4,00	3,00
Long Strait	1	35,00	50,00	42,50
Chukchi Sea	24	85,83	134,96	110,40
Bering Strait	12	20,80	35,80	28,30
Gulf of Anadyr	18	14,18	24,37	19,28
Tundra	2	5,00	6,50	5,75
TOTAL	61	162,82	255,63	209,22

2004–2005

In the 2000s, economic situation in Chukotka began to stabilize. As a consequence, the illegal catch of polar bears began to decrease. By our estimates, an average of 123 bears were annually killed in Chukotka in 2004-2005 (lim 102-143) (Table 8). The sale of pelts became less active, but the native people were not ready to refuse from the meat.

Table 8 Estimates of annual polar bear harvest size in Chukotka in 2004-2005 (based on data from 23 respondents from 11 villages)

Zones	N	Min	Max	Average
East Siberian	0	1,90	2,59	2,25
Long Strait	0	26,95	36,76	31,86
Chukchi Sea	7	61,50	80,78	71,14
Bering Strait	6	9,62	14,57	12,10
Gulf of Anadyr	8	1,00	3,13	2,06
Tundra	2	1,50	5,50	3,50
TOTAL	23	102,49	143,33	122,91

2010–2012

If in the earlier years, the data on illegal harvest was collected via interviews, the studies of 2011-2012 gathered data with questionnaires, and there were different versions for two population groups, “hunters” and “other locals”. In both years, “hunters” were asked to assess how many bears were killed in their home village and in the winter of that year. “Other locals” answered only one question in 2011, “According to your estimations, how many polar bears are killed in Chukotka every year?”, and in 2012, they were also asked to assess harvest size in their home village and in a neighboring one (without specifying which).

Let’s study the results of the assessment of total annual harvest size in Chukotka by “other locals”. In 2011 we did a pilot study, and the questionnaire was filled in by only 41 respondents from 8 villages, located on the coast of the Bering Strait and the Chukchi Sea. 12 respondents chose not to answer that question at all, and 6 respondents only assessed the harvest in their own village, but could not give any estimates for the whole of Chukotka. Therefore, the sample included only 23 estimations. They ranged from 0 to 60 bears of annual catch (on average, 31 animals) (Table 9).

Table 9 *Estimates of annual polar bear harvest size in Chukotka in 2010-2012 based on all questionnaire responses of “other locals”*

Year of survey	N	Min	Max	Average
2011 (Zones III-IV)	23	0	60	30,74
2012 (All zones)	116	0	40	8,03
ON AVERAGE		0	50	19,39

In 2012, the respondents were asked to give any estimate that they could think of, even when they were not sure what to answer. As a result, we got estimations from all 116 respondents from all 6 zones, but the estimated annual harvest was 4 times lower than the previous time (on average, 8 animals) (Table 9). Most likely, most respondents who did not know how to answer the question just put a zero in the corresponding field. This was especially frequently done by respondents from zones where use of polar bear is not very wide-spread. Thus the value received in 2012 is overwhelmingly low and does not reflect the real situation.

We decided to remove the deliberately wrong answers from the analysis. First of all, we removed all “zero” estimates from the sample. They cannot be taken into account if only because in 2010-2012, only officially, 8 problem bears were shot in Chukotka, which was widely covered by the media. In some cases, the respondents estimated the harvest in their or neighboring village at several animals, but still, in the column for the total harvest in Chukotka, put a zero, which did not make any sense. There were 3 such answers in 2011 and 43 in 2012, including all of the responses from 3 settlements from the 2012 survey, so they all had to be removed.

The responses were also considered as clearly incorrect when a respondent gave the same estimates for the total harvest in Chukotka and for their or neighboring village. It is an impossible situation, because the respondent should have been aware that the total harvest in Chukotka was not limited to one or two villages. These responses (14 in total) were all from the 2012 survey.

Finally, the third type of incorrect responses about the total harvest in Chukotka included those that gave the estimate of exactly 29 bears. This is the size of the quota that was assigned to Chukotka by the U.S.-Russia Polar Bear Commission. Respondents who gave this figure were clearly informed about this quota and tried to give an artificial assessment of the harvest level in Chukotka based on that

quota size instead of the actual situation. There were two such responses in 2011 and four in 2012.

After the removal of these incorrect responses, there remained 18 responses in the 2011 sample and 55 responses in the 2012 sample. The estimates for annual take became higher, but still the estimate for 2012 was almost three times lower than that for 2011 (Table 10).

Table 10 Estimates of annual polar bear harvest size in Chukotka in 2010-2012 based on questionnaire responses of “other locals” excluding obviously unreliable data

Year of survey	N	Min	Max	Average
2011 (Zones III-IV)	18	18	60	36,06
2012 (All zones)	55	2	40	13,96
ON AVERAGE		10	50	25,01

We will now try to analyze the data that the respondents provided when assessing the harvest level in their home villages. “Other locals” were asked to give a general estimate of the harvest in their village, without specifying the period of time. Also, this question was only asked in the 2012 questionnaire, and during the 2011 pilot survey the “other locals” were not asked to assess the catch in their villages. However, 8 respondents from the 2011 sample, being unable to estimate the harvest in the whole of Chukotka, gave estimates of the catch in their own villages instead. We used the data from both years to calculate the average index for the harvest in villages (“animals per village”).

The questionnaire for the “hunters” was different, both for 2011 and 2012. They were asked to assess the harvest for the year that preceded the year of the survey, and also for the period of time that had passed from the beginning of that year to the moment of the survey, which in both years took place mostly from April to June. Therefore, in 2011 we received responses that summed up the harvest levels for both 2010 and for the first 4-6 months of 2011. Approximately the same was done during the 2012 study, with the exception of several zones: “Long Strait” and “East Siberian”, where the questionnaire survey was conducted in November. The data from the “hunters” that referred to different time periods was divided into different categories marked by the correspondent year (Tables 11-13).

The estimation of the annual harvest sizes for villages was done with three methods. At first, we calculated the

average harvest index (“animals per village”) in villages for each sample, and later extrapolated that index to all 24 settlements that are located within the usual polar bear habitat in Chukotka, which participated in the 2012 questionnaire survey (see Table 11). The estimates of the annual harvest size varied a lot, from 15 bears for 2012 (2012 sample of “hunters”) to 73 bears for unspecified time period (2011 sample of “other locals”).

Table 11 Estimates of annual polar bear harvest size in Chukotka in 2010-2012 based on the extrapolation of the average number of polar bears harvested per village where the surveys took place to 24 settlements

Year	Category	N of villages	n respondents	Min	Max	Average	TOTAL (24 villages and towns)
2011 (Zones III-IV)	Other locals	3	8	0,00	6,63	3,04	73
	hunters 2010	8	25	0,00	6,50	2,55	61,2
	hunters 2011	8	28	0,00	6,00	1,83	43,92
2012 (All zones)	Other locals	24	116	0,00	5,00	0,79	18,89
	Other locals*	22	87	0,00	5,00	0,94	22,56
	hunters 2011	22	106	0,00	5,20	0,83	19,92
	hunters 2012	22	106	0,00	3,20	0,61	14,64

* excluding respondents who put a zero in all 3 fields when assessing harvest volumes (“in your village”, “in the neighboring village”, “in the whole of Chukotka”)

The second method consisted in calculating the average annual harvest for each village based on all estimates available for that village. Then the villages were grouped in zones (see Fig. 8) and the sums of the average estimates provided the average harvest volumes for each of the 6 zones and therefore for the whole of Chukotka (see Table 12). The 2011 questionnaire data was only partly used: the estimations of harvest sizes for zones that the 2011 study did not cover were made on the basis of the data provided by “hunters” from 8 villages in zones III-IV based on the harvest percentage ratio between villages from the previous study about the 1994-2003 time period, and data from the survey of “other locals” was excluded. The estimations of the annual harvest ranged from 14 bears for 2012 (sample of “hunters 2012”) to 36 bears for 2010 (sample of “hunters 2010”).

Table 12 Estimates of annual polar bear harvest size in Chukotka in 2010-2012 based on the sum of average harvest amounts calculated per each settlements (the numbers are rounded)

Zones	2011 (Zones III-IV) *		2012 (All zones)			
	Hunters 2010	Hunters 2011	Other locals	Other locals**	Hunters 2011	Hunters 2012
N of settlements	8	8	24	22	22	22
n of respondents	25	28	116	87	106	106
East Siberian	0	0	1	1	0	1
Long Strait	6	3	0	0	1	0
Chukchi Sea	15	9	14	16	11	11
Bering Strait	11	10	2	2	5	2
Gulf of Anadyr	3	2	2	2	1	0
Tundra	1	1	0	0	0	0
TOTAL	36	25	19	21	18	14

* With the exception of zones “Chukchi Sea” and partly “Bering Strait”, the data for other zones was estimated on the basis of the percentage ratio that existed between the zones in 1994-2003

** Excluding respondents who put a zero in all 3 fields when assessing harvest volumes (“in your village”, “in the neighboring village”, “in the whole of Chukotka”)

Finally, the third method was used based on the assumption that most respondents underestimated the harvest levels for their own village because they knew that it was illegal. In particular, this assumption is confirmed by comparing the harvest size estimations given by the “other locals” for their home village and for a “neighboring village” in 2012. The estimates for the “home village” from 55 respondents from 19 settlements were on average 1,6 lower than for the “neighboring” one. Moreover, currently people are starting to conceal the kill of polar bear even from their neighbors and fellow villagers, as it used to be in the Soviet times. For this reason, it became more difficult for the respondents to assess the estimate of annual harvest in their village than it was in 1994-2003. The most reliable data both in 2011 and 2012 were collected in two villages on the coast of the Chukchi Sea, the reliability of the data from the remaining 22 settlements is much lower. In 1994-2003, these two villages harvested 18.56% of the total estimated polar bear harvest in Chukotka. Taking these data as basis for calculation and using the percentage ratio for the harvest between different villages in 1994-2003, we obtained the estimates of the annual harvest, from 28 bears for 2012 (sample of “hunters 2012”) to 56 bears in 2010 (sample of “hunters 2010”) (see Table 13).

Table 13 Estimates of annual polar bear harvest size in Chukotka in 2010-2012 based on the most reliable data from two villages in the Chukchi Sea zone (the estimates made in proportion with harvest size ratio between the settlements in 1994-2003, the numbers are rounded)

Zones Categories	2011 (Zones III-IV) *		2012 (All zones)		
	Hunters 2010	Hunters 2011	Other locals	Hunters 2011	Hunters 2012
East Siberian	1	0	0	0	0
Long Strait	11	7	7	6	6
Chukchi Sea	30	17	17	15	15
Bering Strait	8	4	4	4	4
Gulf of Anadyr	5	3	3	3	2
Tundra	1	1	1	1	1
TOTAL	56	32	32	29	28

As a result, by using different survey and calculation methods and different samples, we obtained 22 estimations of annual polar bear harvest size in Chukotka for the period from 2010 to 2012 (see Tables 9-13). The minimum was 8 animals (“other locals”, 2012, all responses), the maximum was 73 animals (“other locals”, 2011, based on average “animals per village” values), and the average was 30 animals.

Let’s now consider the reliability of all the estimates. The estimate that was based on the survey of “other locals” in 2012, without excluding incorrect responses, which constituted more than half of the sample (61), seems to be the least reliable. The number of incorrect responses in 2011 was much lower (6), but many respondents didn’t give any estimates at all, for this reason, all the data from Table 4 should be disregarded

Taking into account that “other locals” are less informed about the polar bear hunting than “hunters”, the data collected from the latter category seems to be preferable. For this reason, for further analysis we will only use the data provided by “hunters”. Out of those responses, the least reliable seem to be those given for the same year when the survey took place, both for 2011 (44 bears) and 2012 (15 bears), because they referred only to the first half of the year, while the highest occurrence of polar bears on the coast of Chukotka is in the months from August to November. We know about several cases of polar bears being shot on the coast of the Chukchi Sea that took place in 2012 after the survey was completed.

The reliability of estimates based on the average value of “animals per village” from the data of 2011 is also dubious, as it is only based on the data from 8 villages located in the

zones of “Chukchi Sea” and “Bering Strait”, where the level of polar bear harvest has always been high and in 1994-2003 constituted 66.3% of the total harvest in Chukotka. Therefore, the extrapolation of that data to all 24 settlements gives an overestimated value.

Therefore, the most adequate seem to be the harvest estimates for the year preceding the survey, collected from “hunters” in both years, with the exception of the 2010 sample “hunters”, calculated by the extrapolation of the average value of “animals per village” (see Table 11). After excluding all estimates with dubious reliability, we were left with 5 values for the final calculation of the annual harvest in 2010-2011, i.e. 18-56 (32 on average) polar bears per year.

It is important to point out that this calculation (same as other estimates made during the surveys of 2011-2012) refer to the period when the occurrence of polar bears on the coast was relatively low after the record low Arctic sea ice in the fall of 2007. The increase in the density of polar bears in the coastal areas, which happened for example in the fall of 2012, can lead to an increase in the harvest sizes.

Moreover, there is a chance of considerable underestimation of the annual harvest related to the socio-psychological changes in the views of the native peoples on the subject of polar bears that have been observed in the recent years. In the 2000s they were expecting the official polar bear harvest quota to be introduced in Chukotka, and were relatively open on the subject of illegal hunting, usually provided general information about the harvest in their village and made a sincere effort to assess it. However, when in 2010 the Ministry of Natural Resources of the Russian Federation did not allow the native people to hunt the quota set by the US-Russian Commission, many of them were no longer ready to speak openly on the topic. People are more and more reluctant to discuss it, even with their fellow villagers, and this trend is growing very fast. One of the evidences is that people gave very low estimates of the annual harvest during the 2012 survey compared to those of 2011. For example, we said earlier that two villages provided us with the most reliable estimates, which we used as base data in the last calculation method; however, even the hunters from those two villages gave higher estimates of the harvest for the several winter and spring months of 2011 than when next

year, they were asked to give the estimate of the total harvest for 2011. And this is despite the fact that after the survey in 2011, these villages had a successful hunting season throughout the rest of the year.

Therefore, it is most likely that in the coming years, we won't be able to adequately assess the polar bear harvest levels in Chukotka as it will be impossible to have an open discussion on the subject with the native people, as it was the case before, from 1957 to 1990.

The interviews and questionnaire surveys of the local peoples of Chukotka in 1999-2012 allowed us not only to assess the sizes of the illegal harvest of the polar bear, but also demonstrate that after the hunting ban of 1957, not only did the hunting continued, but it also only slightly decreased. The sharp growth in the harvest level in 1994-2003 was related, first of all, to the economic hardships experienced by the residents of native villages. Throughout the 2000s, the polar bear harvest was gradually declining and today does not constitute more than 15-20% of that of 1994-2003. It is partly related to the decrease in the occurrences and availability of polar bears in the coastal areas of Chukotka. However, the main reason for the decline of the harvest is the growing quality of life of the people in the villages, the sufficient supply of goods from other regions, and the self-regulation of the polar bear hunting by ethnic communities.



CONCLUSION

There is no doubt that polar bear hunting and use by the native peoples of Chukotka are a rooted ancient tradition which has never ceased, no matter what legislative decisions have been taken by the government. The absolute ban on polar bear hunting implemented on the territory of Russia by an order of the Council of Ministers of the Russian Soviet Federative Socialist Republic “On measures of wildlife protection in the Arctic» in 1956 was an ill-considered action aimed at addressing foreign policy objectives rather than the actual conservation of the species. Surely, it played a role in restoring the number of polar bears in the Russian Arctic, dramatically reducing commercial harvest and shooting of animals by polar explorers, meteorologists, soldiers and sailors. However, the ban could not end the traditions of the Chukchi and Eskimo that had been living for centuries next to the polar bear. For them, the ban meant only a change in the «rules of the game», i.e. conditions and methods of polar bear kill and use of skins. In other words, polar bear hunting went underground and did not change much in its aims or scope. The growth of the Alaska-Chukotka polar bear population, which was celebrated in the late 1980s (Uspenskiy, 1989; Belikov, 1991, 1992), occurred under the influence of favorable ice conditions and food resources, as well as due to the lack of commercial pressure from the newly arrived migrants from other parts of Russia, but not due to the lack of native traditional harvesting.

During the 20th century and till today, the levels of polar bear harvest in Chukotka has been changing a lot, but mostly for biological (population size and availability of the animals), and socio-economic (quality of life in native villages and demand for skins) reasons. All legislative measures taken in respect of the polar bear for the past 60 years have had little impact on the levels of its harvest. The primary purpose of polar bear harvest is to obtain meat for personal use and as a treat for other villagers. At the same time, its part in the total diet is small. If in the 1990s, polar bear meat was an important seasonal food product, now it is more of a delicacy. Skins are a significant source of additional income.

By their share, they are second only to fish, walrus tusks and seal skins. However, sales of any harvest products, including polar bear skins, do not bring substantial financial benefits to hunters and their families and are apparently a relatively small part of the annual budget. Skins are rarely used for domestic needs, since their sale as pelts is more lucrative. Domestic use of products made of bear fur are unpopular because they can be easily noticed and can cause undesirable consequences for the owner.

In most cases the polar bear is not the primary purpose of hunting. It is killed during traveling and hunting for other species, and not each time. Hunters decide to kill the polar bear if it is within shooting distance and easy to approach, if polar bear meat has not been in the diet of his family for a long time, and if there are no undesirable witnesses. It is important to have sufficient time and appropriate weather for butchering and skinning. Young and large polar bears are harvested most often. Thin and dirty animals are not killed, except for rare cases when a bear is clearly sick. There is self-limitation on the kill of animals in dens and females with cubs. At least, the public opinion in villages does not support these types of hunting, although when the food supply was poor in the 1990s, and even in the early 2000s, it was taking place in some areas on the coast.

In 1994-2003, most often people killed bears who came to the village or to a hunting hut themselves. Such hunting is closest to the traditional one, all the more so as hunters used to move across the tundra and on the sea ice on foot or their travels were restricted by dog sleds due to a lack of fuel and spare parts for motor vehicles. Despite these limitations, the amount of killed bears in those years was the highest, because it is in the 1990s that ice in the Chukchi Sea started to shrink in the summer and autumn. Because of this, polar bears began to frequently appear on the shore and approach human habitation in search for food. In addition to obtaining meat and skins, such shooting ensured safety of villagers, sled dogs and property. Regular visits of polar bears to the settlements continue today, however, the attitude towards them has become more tolerant. More often they are chased away, although shooting near villages in some areas of Chukotka continues to be one of the most common methods of hunting. This is especially true of problem bears. An

official permit to shoot such animals can be received within a few days, but usually people don't apply for it. This is largely due to the fact that the conflict situation always happens unexpectedly, and one has to instantly make a decision on shooting in self-defense. Moreover, if you make this incident public, it will require a lot of bureaucratic paperwork, so people usually prefer not to disclose these cases.

Despite frequent statements that trophy and sport hunting of polar bears are thriving in Chukotka, our data show that this is not the case. The amount of cases when bears are shot by non-natives has been very low, and the main social group of hunters and consumers of polar bears are inhabitants of native villages.

So nowadays, polar bear hunting in Chukotka most often looks like as follows: hunters kill an animal in a good condition when the possibility arises, use its meat for food and keep the skin in the hope of selling it. In case of low demand for skins or difficulties in storage (for example, there is a risk that the police finds it), the skin is cut into pieces and dumped in the sea or thrown away.

Estimates of the sizes of illegal polar bear harvesting, obtained in our study, do not claim to be absolutely true, which is quite natural given the hidden nature of this phenomenon. Nevertheless, these data allow us to confidently say that after the hunting ban of 1957, the actual harvest by the local people slightly declined. The dynamics of the harvest levels corresponds both to the social and economic changes in the Chukotka region, and to the changes in natural conditions. This suggests that our estimates are close to reality. The average values annual illegal harvest was 74 animals in 1957-1993, 209 in 1994-2003, 123 in 2004-2006 and 32 in 2010-2011. The main mechanism that determines the dynamics of harvest is the change in the standard of living of the rural population. Annual harvest quota for the needs of the native people, adopted by the US-Russia Polar Bear Commission, was 29 bears for each side in 2010-2013. Thus, the current illegal harvest in Chukotka only slightly exceeds the allocated quota. Although it is possible that the outcome of the survey could be affected by the fact that the Ministry of Natural Resources of the Russian Federation denied the indigenous people in the use of the quota, and they lost all hopes for

legalization of hunting and became more secretive in this matter.

It must be said that the signing of the U.S.-Russia Agreement and the establishment of the Commission was of great importance to the native peoples of Chukotka. Whereas the Eskimos of Alaska, for whom hunting has never been banned, needed to restrict the harvest due to the implementation of the quota, for the Russian Eskimos and Chukchi this meant recognition of their national traditions after more than half a century of neglect. This was a turning point, when the indigenous hunters could become involved in the cooperation with state authorities in the management of the Alaska-Chukotka polar bear population, which includes not only limited harvest, but also a variety of activities for its protection. But this did not happen: the use of quotas in Chukotka was frozen and frustrated hunters returned to the illegal killing of polar bears. Thus, in the coming years, we will likely not be able to reasonably assess the amount of killings of the polar bear due to a lack of opportunity to speak frankly on this subject with the local people, as it was in the period from 1957 to 1990.

The ban on traditional hunting of polar bears in the late 1950s had a number of negative consequences for the conservation of the Alaska-Chukotka population. The hidden nature of this hunt along with the fight against shamanism and superstition led to the disappearance of many rituals and beliefs that had been specifically designed to limit hunting or use certain categories of bears (Kochnev, 1994a). Lack of internal constraints among hunters largely caused the surge of harvest, which occurred in the 1990s. Moreover, the ban automatically outlawed all Chukchi and Eskimos living in the coastal line of Chukotka, thus depriving state and public organizations from the possibility of having an open dialogue, working in the search for compromise solutions and relying on these for some or other protective measures. Simply put, the state lost its most important ally in the conservation of the polar bear. This could have been avoided if the order «On wildlife protection in the Arctic» had provided for the opportunity to hunt for the needs of indigenous people of the North, as it was done, for example, for the walrus.

This attitude to the traditions and needs of native people of Chukotka has played and continues to play a negative

role in the conservation of the Alaska-Chukotka polar bear population. During the last decade, there appeared a lot of publications and comments both in the print media and on the Internet that state that polar bear hunting has never been a tradition of the Chukchi and Eskimos, that its meat is not eaten because of trichinosis, that harvest is commercial and only for profit, and that the concept of «traditional needs of indigenous people» is used by some lobbyists who are trying to earn millions on skin trading and trophy hunting (for example, Ovsyanikov, 2001). The level of reasonableness and honesty of such statements can be estimated on the basis of our research materials. Such publications and even activities of special websites became particularly intense since the beginning of the work of the U.S.-Russia Polar Bear Commission, which in 2010 defined the size of the quota for the traditional harvest for native peoples of Alaska and Chukotka. This information campaign is completely built on speculations without any ethnographic or sociological foundation and appeals to the emotions of people who have grown up and have been educated in the urban environment, and who know nothing about Chukotka, its history, natural features and lifestyle of the native peoples. This campaign led to the creation of some kind of virtual, mythologized Chukotka, where the problem of the relationship between the man and the polar bear is easily solved by yet another statute, decree or order. In reality, however, this problem requires a comprehensive approach and persistent long-term cooperation among a large number of people and organizations before there could be any improvements, and the situation will be completely controlled by the State. We hope that the research material contained in this book will help all interested readers understand the true state of affairs, including those responsible for making certain decisions aimed at preserving the Alaska-Chukotka polar bear population.

Anadyr – Vankarem – Moscow

2013

ACKNOWLEDGEMENTS



The authors express their sincere gratitude to all participants of interviews and questionnaire studies, which helped collect the data that became the basis of this book, and especially to the indigenous people, who were not afraid to openly answer questions related to the illegal harvest and use of polar bears in Chukotka.

The book contains pictures and photos of arts made from walrus tusks by Chukchi and Eskimo artists Roshilin, Kililoy, Vukvutagin, A.Tymnetagin and D.Eynes, from the funds of the Museum Center «Chukotka Heritage», as well as from books by E.S. Rubtsova (1954), A.K. Efimova and E.N. Klitina (1981) and by M.M. Bronshtein et al. (2002). The authors of the photos are Anatoly Kochnev, Vladilen Kavry and Sergey Vartanyan.

APPENDICES

Appendix 1.

Interview design, Chukotka villages, 1999-2004

The name of the village and the number of the respondents

Last name, first name, patronymic

Card code:

Date:

Time:

Year of birth:

Number of years living in the village:

Years spent actively hunting:

Hunting areas:

DENS

MOVEMENTS

FEEDING

BEARS IN THE VILLAGE

BEARS IN THE REINDEER HERD

MORTALITY

HUNTING METHODS

USE OF HUNTING PRODUCTS

STATE OF THE POPULATION

HOW TO PROTECT ONESELF FROM A BEAR ATTACK

RITUALS AND CUSTOMS

SOURCES OF MY KNOWLEDGE OF POLAR BEAR

SPOTTED SEAL

BEARDED SEAL

WALRUSES

BELUGA WHALES

WHALES

Appendix 2.

Polar Bear in Material and Spiritual Culture of the Indigenous People (Work Plan and Interview Design in 2005-2006)

Developers:

Anatoly KOCHNEV, scientific supervisor of Association of Traditional Marine Mammal Hunters of Chukotka (ChAZTO); head of the Laboratory of Marine Mammals Studies in the Chukotka Branch of Pacific Research Fisheries Center (ChukotTINRO)

Vladilen KAVRY, chairman of Association of Traditional Marine Mammal Hunters of Chukotka (ChAZTO)

3 persons from each village should be interviewed: one elderly man, one active hunter 40-50 years old, one young hunter 20-30 years old. If possible, then several elderly people should be interviewed (including one woman). When choosing respondents, if possible, include hunters that took part in the project “The traditional knowledge of the indigenous peoples of Chukotka about the polar bear and its habitat”.

Everything must be recorded down in detail, only what the respondent said, without one’s own assumptions and conjectures (they can be added separately, in brackets). You shouldn’t leave the village until the work is fully completed.

Name of the village and number of the respondent

Last name, first name, patronymic

Date:

Time:

Year of birth:

Ethnic background: Chukchi, Eskimo, Even, Yukaghir, etc.

Short bio of the respondent: in which camp or settlement they were born, where they lived and where they worked during lifetime (and in which years)

Hunting areas: for hunters, specify the boundaries of hunting grounds, for reindeer herders, the boundaries of the herding area, where they worked during different periods of life.

HUNTING METHODS

What methods of hunting for polar bears existed in the past? What weapons or traps were used? If possible, the respondent should describe the characteristics and design of the weapon. Do they still have something from the past, for example a spear for hunting on polar bears? What modes of transportation were used, or was it done on foot? Were there special clothes? Was there a special preparation procedure? Where did they harvest polar bears (on the coast, in the tundra, on the fast ice, on the ice edge, on the clear water)? How did the hunting methods differ depending on the environment of hunting? Were young hunters somehow prepared for hunting on polar bears?

What hunting methods exist today? How does it happen? Are bears chased by hunters or kill them occasionally? Has the respondent harvested any bears himself? What mode of transportation was used (on foot, sled dogs, snowmobile, boat)? What weapon was used? Have they ever heard about a polar bear being harvested from an ATV, caterpillars or a helicopter by the military, tourists, etc?

The behavior of the bear when hit with a cold weapon or a firearm. What did hunters do in the past and what do they do now when the polar bear was wounded (is it required to chase the animal till it is killed, the chasing tactics and the method of making the mortal blow or shot)?

If the respondents possess an old artifact such as a spear that was used in the past to polar bear kill, please take a photograph.

USE OF HUNTING PRODUCTS

Describe the methods of butchering, transportation to the village, and storage of the killed polar bear. Are there any differences between how it was done in the past and today, and if there are, what are they.

How was the polar bear used in the past (meat, subcutaneous and internal fat, insides (intestines, kidneys, liver, lungs, stomach, heart, bile), blood, meat from the head, tongue, eyes, skin, claws, bones, skull, teeth) – for eating, feeding sled dogs, in traditional medicine, for sewing clothes and shoes, as Protector of Yaranga, festive dining cloth, prize in competitions, gift, etc? Have any bear parts been used by shamans for religious rituals, healing, etc? If some parts were not useful, what was done with them (dumped in the water, thrown out, given to dogs, something else)? If there was a taboo on using certain parts (liver), why? What were the methods of cooking the edible parts (meat, lard, blood, insides) – boiling, drying, salting, raw, sour, anything else? How was the skin treated?

The same questions about the use of polar bears today. Are all skins sold or there are cases when they are thrown out, cut with the meat during the butchering? What are the modern methods of pelt production and treatment (the traditional by air drying, wet salting, chemical, etc). What is the price that the hunters of this village get for the skin (minimum and maximum for a raw and cured pelt)? If

pelts are mostly bartered, what and in what amount can be exchanged for a pelt? From who: marines, businesses, etc? Does the respondent have any suggestions for improving the use of polar bear products?

SELF-PROTECTION FROM POLAR BEAR ATTACKS

The traditional methods of avoiding conflicts with polar bears. Were there any traditional precautionary measures when hunting on ice (akyn¹³, rope, looking around, taking off clothes, talking to the bear, something else), during sled rides, hiking, sleeping out? Were there any traditional methods of scaring off the approaching bear when one didn't have a weapon (taking off clothes, saying certain words, making noise, etc)? How was the bear chased away from the camp, habitation, meat pits? Or were they always killed? Maybe there were spells or amulets that scare off the bear?

How are bears scared off today? What precautionary measures are taken? Does the respondent consider the polar bear to be dangerous? What should be done to avoid the attack? What should be done to prevent the bear from coming to the village? Were there cases when a bear attacked a human? (Detailed description).

Behavior, gender, age, appearance, and physical condition of the bear that can help determine its level of aggression or danger to humans.

RITUALS AND CUSTOMS

What rituals, customs, beliefs related to the polar bear existed in the past? Ask for the detailed description of the rite of thanksgiving when a bear is killed. Ask for the meaning of every action and word (placement of the animal before butchering. Head, eyes, sacrum. What words are pronounced? What are the treats?). Has there ever been a custom when after kill a polar bear, a hunter could not go hunting for several days or was not allowed to kill a second polar bear during that time? Was the head carried to the Yaranga, and what was done with it? When did people start to perform the rite of thanksgiving in a different way (at the site of the butchering)? Have such rituals existed when killing other animals (walrus, bearded seal, ringed seal etc), were any bear parts used during those rituals?

Were there any feasts related to the polar bear and its harvest (in detail)? How were skull altars made, when did people come to those altars? Where is the location of such altars around the village? Maybe, there existed other rituals and feasts ("kymetti" and "kilvetti", etc), where bear parts or drawings were used or it was mentioned (beginning of the hunting season, return of skin-boats to the sea, anything else). Were any bear parts (skin, skull, etc) used in funeral or wake ceremonies? Rolling and tumbling in the snow, on the ground after the funeral – what does it mean and is it the imitation of the behavior of polar bears?

¹³ A tool that consists of a long rope attached to a pear-shaped wooden head with metal hooks pointing in the direction of the rope.

What omens were related to the polar bear (eyes for pregnant women, avoid looking at bears during the breeding season, anything else)? How were dreams involving polar bears interpreted (injured bear, hunting for bear, bear attack, etc)?

What taboos existing in bear hunting (if it yawns, if it puts a paw as if to protect itself, a female with cubs, in dens, in large numbers, if the hunter's wife is pregnant, etc).

Who makes the decision to kill the polar bear (a hunter, several hunters, the elders, the hunter's parents)? Who do the killed bear and its skin belong to (the one who first saw it or the one who killed it)? How it used to be in the old times and how is it done today?

What rituals, beliefs, omens are respected today and in what form? Does the respondent respect them? What about other hunters in the village? Young people? When did people stop to respect some of those rites?

If the respondent does not know the explanation of some of the rituals, please put down "does not know".

If the respondent says that there are altars from polar bear skulls in the surroundings of the village, ask them to show it.. Please count and record down the number of skulls, and take a photograph. If it is possible, ask the respondent to show in action how certain thanksgiving rituals were or are performed. Photograph what the respondent will show.

LEGENDS, MYTHS, TALES

Record down in detail tales and legends featuring the polar bear, either as a character or as harvest. If the respondent does not know any, put it down.

SONGS AND DANCES

Does the respondent know of any songs and dances? Make a video or an audio. If they don't know of any, ask them if they can recommend a fellow villager.

If there is a native folk group in the village, please talk to its leader: do they know of any dance related to the polar bear. Ask them to perform the dance in the appropriate clothes, take photographs and make videos.

APPLIED ARTS

Did polar bears feature in the design of clothes, in the embroidery and decoration in past, do they today? If there are any objects of this kind, please photograph or sketch them.

Polar bear in bone carving and engraving. Are there ivory artists in the village? Talk to them, record down the main designs related to the polar bear that they use in their work. Take photographs if they have artwork of this kind.

GLOSSARY

What words and expressions do Chukchi (Eskimo) have related to the polar bear harvest, rituals, use (meals, clothes) etc that the respondent is aware of. Ask them to remember as many as possible. Record everything down with utmost accuracy.

ANNUAL HARVEST SIZE

How many polar bears did the hunters approximately harvest per year in the village where the respondent lived before the hunting ban (1956)? If the respondent does not know, at least ask them to compare the harvest volumes in those times to those in the 1970-80s and today (less, more). How many bears were approximately harvested by hunters per year during the strict ban on the hunting (1957-19990)? How many bears do the hunters of the village approximately harvest today (after 1993-1995)? How many are harvested by the indigenous people and by non-natives?

SOURCES OF MY KNOWLEDGE OF TRADITIONS AND HARVEST OF POLAR BEAR

Parents, family, elderly, acquaintances, friends, other hunters, personal experience. Maybe, they cited something that they read in books? Media, TV, cinema, school, educational institution?

ADDITIONAL INFORMATION

BEARS IN THE VILLAGE

Incidents when bears entered the settlement. Date. Gender and age of the animal. What did attract the animal to the village? The animal's behavior. How was it scared off (or killed)? How does the respondent determine its gender and age?

BEARS IN THE REINDEER HERD

Has the respondent seen or heard of such incidents. Date. Gender and age of the animal. The bear behavior. Has the respondent heard of cases when a polar bear killed reindeer?

MORTALITY

Has the respondent ever seen dead polar bears? Reasons of death. Has the respondent hear of any causes of deaths of polar bears other than hunting?

Appendix 3.

QUESTIONNAIRE

“Views of the Sea Hunters of Chukotka on the Current State of the Polar Bear” (2011)

Association of Traditional Marine Mammal Hunters of Chukotka (ChAZTO) is conducting a survey of the indigenous peoples of Chukotka about the conservation of nature of our land, which has forever been the environment and the source of life of our peoples. The researchers are interested in the current relationship between the indigenous people of the North and the animals of Chukotka. Your opinions will help us develop recommendations on polar bear use in our villages. Please answer several questions on the subject.

Some questions have multiple choice answers. Please choose the response option that you agree with, and circle the number of that option. You will need to answer the other questions with your own words. Please put down your response in the allocated field in the questionnaire.

Your frank responses will help the researchers and the local administration to develop efficient measures on the conservation of the natural riches of Chukotka, the traditional lifestyle and identity of the indigenous people.

We thank you in advance for your participation in the survey.

1. What role do the products of hunting, fishing and gathering have in the diet of your family?

№	Name of product	Consumed in the previous year (in kg)	Stored for this winter (in kg)
1	Fish		
2	Meat of ringed seal		
3	Meat of walrus		
4	Meat and blubber of whale		
5	Meat of reindeer		
6	Meat of polar bear		
7	Game birds (partridge, goose, duck)		
8	Mountain hare		
9	Wild plants and mushrooms		

12. What share of bears that entered villages do you think are killed and are scared away?

- a. All bears are killed unless they manage to run away.
- b. Bears are killed only if they can't be scared away.
- c. Only bears that try to attack people are killed.
- d. We don't kill them, we chase them away.

13. What are other reasons for killing polar bears in Chukotka?

- a. Poaching by managers and the military.
- b. Dealers buy the skins, and people want to earn a living
- c. To enjoy the hunting
- d. For religious purposes (to perform rituals and rites)
- e. To obtain the meat and skin for personal use.

14. How many bears were killed by the residents of your village?

- a. Last year
- b. This winter
- c. None
- d. I don't know

The fields below are for personal information and are not required, but that data will be very useful for our research:

Year of birth (please underline):

1930–1950; 1951–1960; 1961–1970; 1971–1980; 1981–1990.

Profession (reindeer herder, hunter, mechanic, housing and utility worker, etc)

Employer _____

How many years have you been living in Chukotka? _____

How many years have you been living in this village? _____

Thank you for your active involvement in the research and your frank responses!

Appendix 4.

QUESTIONNAIRE

“Views of the Residents of native villages of Chukotka on the Current State of the Polar Bear” (2011)

Dear colleague,

The Agreement on the Conservation and Management of the Alaska-Chukotka Polar Bear Population, signed by the Governments of the United States of America and the Government of the Russian Federation on October 16, 2000, in Washington (USA), came into force on September 23, 2007.

According to the Agreement, and taking into account the provisions of the national law of each Party, the indigenous peoples of Chukotka and Alaska were allowed to harvest polar bears for subsistence purposes, as well as for the production and sale of handicrafts and hand-made clothes. To coordinate the activities in the frame of this Agreement, the U.S.-Russia Polar Bear Commission was created, and included representatives of the Parties and of the indigenous peoples of Chukotka and Alaska.

On June 7-9 2010, the U.S.-Russia Polar Bear Commission had a meeting in Anchorage (Alaska). At the meeting, the Commission made the decision to set a quota for the harvest of the polar bear by the indigenous peoples of Chukotka and Alaska for subsistence purposes. The size of the quota is 58 polar bears, and this quote is divided between Alaska and Chukotka in half. Therefore, the Russian part of the quota consists of 29 animals.

According to the Agreement, the allocated quota includes all types of harvest, including shot problem animals, animals shot or caught for scientific or cultural purposes, as well as all known cases of illegally harvested polar bears. For this reason, it is important to determine the scale of illegal harvest of polar bears in Chukotka, as accurately and realistically as possible. Without that data and the relevant correction of the Russian part of the quota, the Ministry of Natural Resources and Environment of the Russian Federation would not be able to start issuing permits for harvesting polar bears.

For this reason, Association of Traditional Marine Mammal Hunters of Chukotka (ChAZTO) is conducting an assessment of the volumes of the polar bear harvest in the Chukotka Administrative Okrug. We are asking you to contribute to this

research by answering the questions of the questionnaire below. Your opinion can help develop recommendations on the use of polar bears in our villages.

1. Did you know about the introduction of the quota for polar bear harvest?

- Yes, I knew about it
- No, I didn't know about it

2. What do you think about this quota?

- I approve of it (why?) _____
- I disapprove of it (why?) _____
- I don't know

3. Within the 2011 quota, it will be allowed to harvest 29 polar bears in Chukotka. Do you think this is enough to meet the subsistence needs of the indigenous people of Chukotka?

- It is totally sufficient
- It is definitely insufficient
- I don't know

4. How often (according to your own observations or truthful stories of the local people) do polar bears approach the villages?

- Constantly (once every one or two weeks)
- From time to time (less than once a month)
- Rarely (once or twice a year)
- Never

5. Do bears come alone or in pairs (groups)?

- Alone
- In pairs (groups)
- I don't know

6. What do you think local people usually try to do with the polar bears that entered the village or are wandering around in its surroundings?

- They try to chase them away
- They try to kill them if the bear is aggressive to people
- They try to kill it, because it's lucky that the bear found its way into the hands of the hunter

7. In what cases are polar bears that entered the village killed?

- Only if it is aggressive and is trying to attack people and dogs
- In cases when it's impossible to chase the bear away, it keeps coming back to the village, and is a constant threat, steals from meat pits, etc

- In any case when a bear enters the village or constantly roams around near it
- Other _____
- I don't know

8. Who usually kills the bear?

- The most experienced hunter is assigned this task
- The one who saw the bear first kills it

9. Who else and for what reasons kills polar bears?

- Managers, non-locals and the military poach it
- The local people to earn a living by selling skins to dealers
- Any hunters to enjoy the hunting
- The local people for religious purposes
- The local people to obtain meat and skins for personal use

10. Do people intentionally hunt for polar bear?

- Yes, professional hunters with permits
- Local hunters to obtain meat and skins for personal use
- Non-local hunters for the trophies
- Poachers for further sale of skins and skulls

11. Do you now of any cases when polar bears were shot in dens?

- Yes, it happened last year (how many times?) _____
- Yes, it happened this winter (how many times?) _____
- I don't know

12. Do you know of any cases when females with cubs were shot?

- Yes, it happened last year (how many times?) _____
- Yes, it happened this winter (how many times?) _____
- I don't know

13. By your estimates, how many polar bears are harvested in Chukotka every year?

14. How important is polar bear harvest to native people? How great are the needs in its meat, skins for personal use and what quota size is necessary to meet these needs?

15. If a local hunter killed a polar bear, what does he do with the kill?

- It is his harvest only, he takes everything _____
- He must share it with other people (why?) _____
- family, neighbors, fellow villagers – underline
- He takes the meat and insides, and sells the skin
- Other _____

16. Do you think there is a threat that polar bears will go completely extinct because of hunting?

- Yes
- No
- I don't know

The fields below are for personal information and are not required, but that data will be very useful for our research:

Year of birth (please underline):

1930–1950; 1951–1960; 1961–1970; 1971–1980; 1981–1990.

Profession

Profession _____

How many years have you been living in Chukotka? _____

How many years have you been living in this village? _____

Thank you for your active involvement in the research and for your frank responses!

Appendix 5.

QUESTIONNAIRE

“Views of the Sea Hunters of Chukotka on the Current State of the Polar Bear” (2012)

Association of Traditional Marine Mammal Hunters of Chukotka (ChAZTO) is conducting a survey of the indigenous peoples of Chukotka about the conservation of nature of our land, which has forever been the environment and the source of life of our peoples. The researchers are interested in the current relationship between the indigenous people of the North and the animals of Chukotka. Your opinions will help us develop recommendations on polar bear use in our villages. Please answer several questions on the subject.

Some questions have multiple choice answers. Please choose the response option that you agree with, and circle the number of that option. You will need to answer the other questions with your own words. Please put down your response in the allocated field in the questionnaire.

Your frank responses will help the researchers and the local administration to develop efficient measures on the conservation of the natural riches of Chukotka, the traditional lifestyle and identity of the indigenous people.

We thank you in advance for your participation in the survey.

1. What role do the products of hunting, fishing and gathering have in the diet of your family?

No	Name of product	Consumed in the previous year (in kg)	Stored for this winter (in kg)
1	Fish		
2	Meat of ringed seal		
3	Meat of walrus		
4	Meat and blubber of whale		
5	Meat of reindeer		
6	Meat of polar bear		
7	Game birds (partridge, goose, duck)		
8	Mountain hare		
9	Wild plants and mushrooms		

- c. The bear should be chased away from the village and scared away, even if it keeps coming back
- d. The bear should be killed if it keeps coming back to the village even after it had been chased away

12. What share of bears that entered villages do you think are killed and are scared away?

- a. All bears are killed unless they manage to run away.
- b. Bears are killed only if they can't be scared away.
- c. Only bears that try to attack people are killed.
- d. We don't kill them, we only chase them away.

13. What are other reasons for killing polar bears in Chukotka?

- a. Managers and the military poach them.
- b. Dealers buy the skins, and people want to earn a living
- c. To enjoy the hunting
- d. For religious purposes (to perform rituals and rites)
- e. To obtain the meat and skin for personal use.

14. How many bears were killed by the residents of your village?

- a. Last year
- b. This winter
- c. None
- d. I don't know

The fields below are for personal information and are not required, but that data will be very useful for our research:

Year of birth (please underline):

1930–1950; 1951–1960; 1961–1970; 1971–1980; 1981–1990.

Profession (reindeer herder, hunter, mechanic, housing and utility worker, etc. Underline or add your own answer)

Employer _____

How many years have you been living in Chukotka? _____

How many years have you been living in this village? _____

Gender: male, female

Thank you for your active involvement in the research and your frank responses!

Appendix 6.

QUESTIONNAIRE

“Views of the Residents of native villages of Chukotka on the Current State of the Polar Bear” (2012)

Dear colleague,

The Agreement on the Conservation and Management of the Alaska-Chukotka Polar Bear Population, signed by the Governments of the United States of America and the Government of the Russian Federation on October 16, 2000, in Washington (USA), came into force on September 23, 2007.

According to the Agreement, and taking into account the provisions of the national law of each Party, the indigenous peoples of Chukotka and Alaska were allowed to harvest polar bears for subsistence purposes, as well as for the production and sale of handicrafts and hand-made clothes. To coordinate the activities in the frame of this Agreement, the U.S.-Russia Polar Bear Commission was created, and included representatives of the Parties and of the indigenous peoples of Chukotka and Alaska.

On June 7-9 2010, the U.S.-Russia Polar Bear Commission had a meeting in Anchorage (Alaska). At the meeting, the Commission made the decision to set a quota for the harvest of the polar bear by the indigenous peoples of Chukotka and Alaska for subsistence purposes. The size of the quota is 58 polar bears, and this quote is divided between Alaska and Chukotka in half. Therefore, the Russian part of the quota consists of 29 animals.

According to the Agreement, the allocated quota includes all types of harvest, including shot problem animals, animals shot or caught for scientific or cultural purposes, as well as all known cases of illegally harvested polar bears. For this reason, it is important to determine the scale of illegal harvest of polar bears in Chukotka, as accurately and realistically as possible. Without that data and the relevant correction of the Russian part of the quota, the Ministry of Natural Resources and Environment of the Russian Federation would not be able to start issuing permits for harvesting polar bears.

For this reason, Association of Traditional Marine Mammal Hunters of Chukotka (ChAZTO) is conducting an assessment of the volumes of the polar bear harvest in the Chukotka Administrative Okrug. We are asking you to contribute to this

research by answering the questions of the questionnaire below. Your opinion can help develop recommendations on the use of polar bears in our villages.

1. Have you heard about the introduction of the quota for polar bear harvest for the indigenous people of Chukotka?

- Yes
- No

2. What do you think about this quota?

- I approve of it (why?) _____
- I disapprove of it (why?) _____
- I don't know

3. The quota will be allowed to harvest 29 polar bears in Chukotka every year. Do you think this is enough to meet the subsistence needs of the indigenous people of Chukotka?

- It is totally sufficient
- It is definitely insufficient
- I don't know

4. How often (according to your own observations or truthful stories of the local people) do polar bears approach the villages?

- Constantly (once every one or two weeks)
- From time to time (less than once a month)
- Rarely (once or twice a year)
- Never

5. Do bears come alone or in pairs (groups)?

- Alone
- In pairs (groups)
- I don't know

6. What do you think local people usually try to do with the polar bears that entered the village or are wandering around in its surroundings?

- They try to chase them away
- They try to kill them if the bear is aggressive to people
- They try to kill it, because it's lucky that the bear found its way into the hands of the hunter

7. In what cases are polar bears that entered the village killed?

- Only if it is aggressive and is trying to attack people and dogs
- In cases when it's impossible to chase the bear away, it keeps coming back to the village, and is a constant threat, steals from meat pits, etc

- In any case when a bear enters the village or constantly roams around near it
- Other _____
- I don't know _____

8. Who usually kills the bear?

- The most experienced hunter is assigned this task
- The one who saw the bear first kills it

9. Who else and for what reasons kills polar bears?

- All bears are killed unless they manage to run away.
- Bears are killed only if they can't be scared away.
- Only bears that try to attack people are killed.
- We don't kill them, we only chase them away.

10. What are other reasons for killing polar bears in Chukotka?

- Managers, non-locals and the military poach it
- The local people to earn a living by selling skins to dealers
- Any hunters to enjoy the hunting
- The local people for religious purposes
- The local people to obtain meat and skins for personal use

11. Do you now of any cases when polar bears were shot in dens?

- Yes, it happened last year (how many times?) _____
- Yes, it happened this winter (how many times?) _____
- I don't know _____

12. Do you know of any cases when females with cubs were shot?

- Yes, it happened last year (how many times?) _____
- Yes, it happened this winter (how many times?) _____
- I don't know _____

13. By your estimates, how many polar bears are harvested in Chukotka every year?

In your village _____
 In the neighboring village _____
 In Chukotka _____

14. How important is polar bear harvest to the native people?

- It is necessary
 - If it is necessary, how much meat does one family need? _____
 - If it is necessary, how many skins does one village need? _____
 - If it is necessary, what quota is required per village? _____

- It is not necessary
- I don't know

15. Do you think there is a threat that polar bears will go completely extinct because of hunting?

- Yes
- No
- I don't know

The fields below are for personal information and are not required, but that data will be very useful for our research:

Year of birth (please underline):

1930–1950; 1951–1960; 1961–1970; 1971–1980; 1981–1990.

Profession: educational worker, medical worker, administrative worker, housing and utility worker, other (please underline or add your own response) _____

Employer (school, kindergarten, hospital, trade, other) _____

How many years have you been living in Chukotka? _____

How many years have you been living in this village? _____

Gender: male, female

Thank you for your active involvement in the research and for your frank responses!

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Harvest and use of polar bears in Chukotka: Results of 1999-2012 studies.

Cover photo: © Anatoly Kochnev

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Photo on the back cover: © Anatoly Kochnev

Managing editor: M. Stishov

Corrector: A. Aksenov

Design, layout: S. Popova

Signed to print: 30.01.2016

Format of edition: 62*94 / 16

Offset printing

Set: Georgia

Circulation: 500 copies.

Cond. print sheet: 9.98

Publisher: WWF-Russia

Address: 109052, Moscow, Smirnovskaya str., 19/11