Gray whale Eshrichtius robustus coastal counts and harvest monitoring results off Chukotka Peninsula, Russian Far East, 2011

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ABSTRACT

Key words: gray whale, distribution, number, harvest, sex-age and size structure, physiological state, body condition index

In 2007-2011, significant variations in number of gray whales present in Mechigmensky Bay as well as their irregular distribution were found. Information on gray whale biology coming annually from harvest in Mechigmensky Bay cannot answer all questions about population parameters such as abundance and distribution. However**,** the absence of skinny and "stinky" whales in 2011, high body conditions index and high stomach fullness of examined animals evidence stable feeding conditions for gray whales along the Chukotka Peninsula in the recent years.

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In Russian:
Результаты береговых учетов и мониторинга серого кита Eschrichtius robustus в прибрежных водах Чукотского п-ова в 2011 году

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Ключевые слова: серый кит, распространение, встречаемость, промысел, половозрастная и размерная структура, физиологическое состояние, коэффициент упитанности

Проведенные в 2007-2011 гг. исследования подтвердили неравномерность распределения серых китов и существенные колебания их количества в Мечигменском заливе. Собираемая ежегодно информация по биологической характеристике китов, добываемых в Мечигменском заливе, не позволяет сделать какие-либо выводы по состоянию численности и другим параметрам популяции серого кита. Однако отсутствие худых особей и характер упитанности добытых и осмотренных нами животных может косвенно свидетельствовать о том, что условия нагула серого кита у берегов Чукотского полуострова на протяжении последних лет не ухудшаются.

Chukotka off shore waters are very important for summering Gray whales, which are usual to see everywhere along its coast there from Northern Kamchatka till eastern East-Siberian Sea. But highest concentration of Gray whales is in the off shore waters of Chukotka Peninsula, which traditionally attracted attention of aboriginal whalers; therefore the concentration of Native villages is high there too.

Therefore the main goal and objectives of our researches concentrated at i/ monitoring of numeral, distributional and behavioral changes of gray whales off Chukotka Peninsula; and ii/ collecting morphophysiological data from Gray whales, captured in Chukotka Peninsula coastal waters.

MATERIAL AND METHODS

Visual observations on gray whales were conducted in Mechigmensky Bay coastal waters from July to October (**Fig. 1**). We observed the animals from the coastal point near 82 ft high above the sea. From that view point in normal weather conditions, a whale blow could be seen at the distance up to 5.4 nautical (n) miles. Thus only small part of Mechigmensky Bay coastal waters within a radius about 10 km (5.4 miles) was observed. The research area was divided into 5 sectors (**Fig. 2**). The sea was scanned in the morning and only when the weather was perfect: waves up to 1-2 balls and full visibility. Observations were made with Steiner Skipper 7x50 binoculars with HD stabilized compass and lasted for 40-50 minutes.

Examination of captured Gray whales was conducted in Lorino village (Chukotsky District of Chukotka autonomous region, Russia; **Fig. 1**). The majority of landed whales were hunted in 3 separate areas of the bay: eastern (E), central (C) and western (W) parts (**Fig. 1**). All whales were investigated when cut in vicinity of Lorino village.

We collected the following data from each specimen:

1. Sex;
2. Zoological length (from the snout to fluke crotch by projection);
3. Weight and size of ovaries and testes;
4. Physiological state [whale was regarded as mature in males with a body length ≥ 36.4 ft and females ≥ 37.7 ft];
5. Stomach fullness (full, half-full, with few food remains, empty);
6. Blubber thickness (at the level of the fin end) and a general body condition;
7. Chin patches' number;
8. Presence and size of a "Sebaceous gland";
9. Morphometry measurements "Snout-eye distance" and "Fin girth and length";
10. Presence of unusual odor and taste of blubber and meat.

In 5-years period we investigated 158 landed Gray whales (**Table 2**).

Data on whaling in other villages of Chukotka in 2007-2011 was kindly given by Committee of Fishery of Department of agricultural politic and nature management by Government of Chukotka autonomous region.

We also used the body condition index, which is very important parameter to characterize the feeding conditions on the Gray whale foraging grounds, i.e. blubber thickness related to whale length.

RESULTS AND DISCUSSION

Coastal counts in 2011 showed decreasing of gray whales sightings in Mechigmensky bay (**Fig. 2**) comparing with previous two years (Blokhin, Litovka, 2010).

During the season the number of whales in Mechigmensky bay was not constant. The highest (15 whales) was registered at June 30, the lowest (4) at July 3. More frequently we have seen single whales (64.7 %). Also we have not seen groups with 3 and more animals in it. As usual whales were not traveling for the long distance and stayed in one spot periodically diving and showing flukes. Such feeding behavior was noticed in the bay during all previous years.

In 2011 a quota to harvest 135 gray whales was issued to native whalers from 20 villages in Chukotka. The first and the last whale in the season were landed in Lorino village at May, 15 and November, 8. During the whole season 123 gray whales were harvested, 58 of them or 47.2% in Lorino. There were 65 (52.8 %) females and 58 (47.2 %) males, average size of which was 10.4 and 10.6 meters respectively.

Totally from June to September we examined 21 gray whales, harvested by Lorino village native whalers in Mechigmensky bay.

The sex ratio of the gray whales landed in the Mechigmensky bay was close to 1:1 (**Table 1, 2**). Among females the subadults were dominating (73.0 %), in opposite among males the adults were dominating (60 %). Average age of females (9.2 years) was less than males (10.3 years). The biggest (12.5 m) and smallest whale (7.7 m) were females 21 and 1 year old.

Generally in the harvest there was predomination of subadult whales (57.1 %). The average length of harvested whales in 2011 was higher than in previous two years. Respectively the portion of subadult whales decreased (**Table 2**). The one of the possible reasons of subadults harvest decreasing might be the recent notice about

decreasing of both population reproduction level and number of cows with calves migrating along California coast (Perryman et al., 2010).

Although the high level of subadults in the harvest there were no IWC rules violations. Aboriginal whalers did not hunt on calves, followed by mothers; and there were no signs of milk in the stomachs of whales.

The yearling gray whales had a highest body condition index (1.5 %); the lowest one's shown subadult whales older 1 year (0.81 % - in **Table 3**).

Besides of the aboriginal whaling the gray whales are hunted by killer whales. Among 21 investigated landed Gray whales 10 animals had flukes and flippers with scratches and damages by killer whales. There are annually from 50 to 60 orcas in this region, staying here 6 months period and predating on Gray whales and other marine mammals. Though gray whales are on the third position after walrus and seals in the killer whales diet off Chukotka Peninsula the orca's predation press rate in recent years decreased from 3÷8 killed gray whales (Average 4.43 – Melnikov, Zagrebin, 2005) in 1993-2000 till 1÷4 (Ave 1.67) in the period of 2004-2009 in this water area; and it is much smaller (≤10 %) than in Alaska coastal waters. Taking this everything into account the total killer whales press on gray whales in Bering Strait is almost equal to aboriginal whaling, but they are both at least twice smaller than annual calf production.

An absence of skinny and "stinky" whales in the bay, the stabile both body condition index (**Table 3**) and the stomach fullness index (about 92.5 % of full and half-full stomachs) may evidence the feeding conditions for whales in Chukotka waters are not worsening in recent years.

ACKNOWLEDGEMENTS

Authors are thankful to leaders of Native Society of "Keper" (Lorino village) for their technical and logistical support in conducting the researches.

Also we would like to thank Dr. Valentin Ilyashenko, Russian Federation IWC Commissioner, for his overall support of our project.

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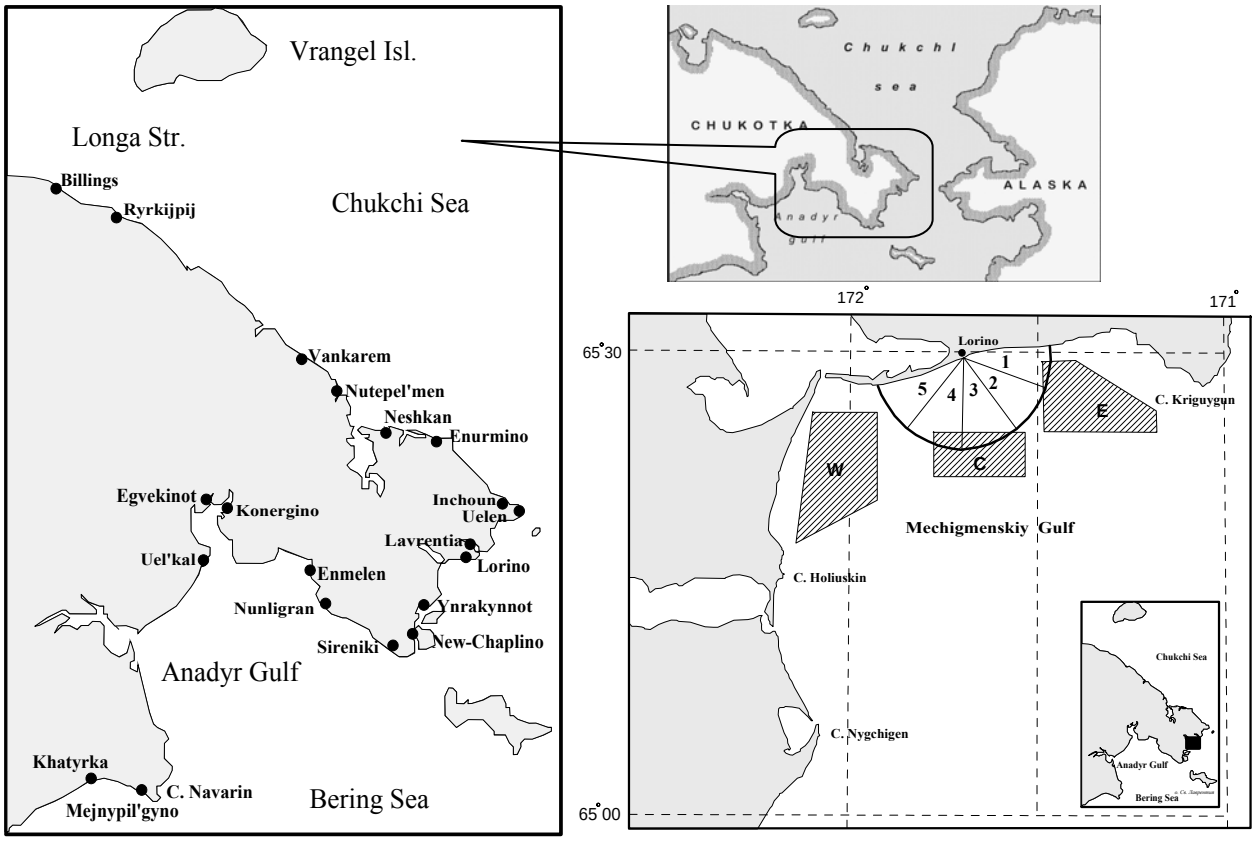

Figure 1. Native whaling villages of Chukotka, observation water area and observation sectors in the Mechigmen Bay (Blokhin, Litovka, IWC 2009-2011)

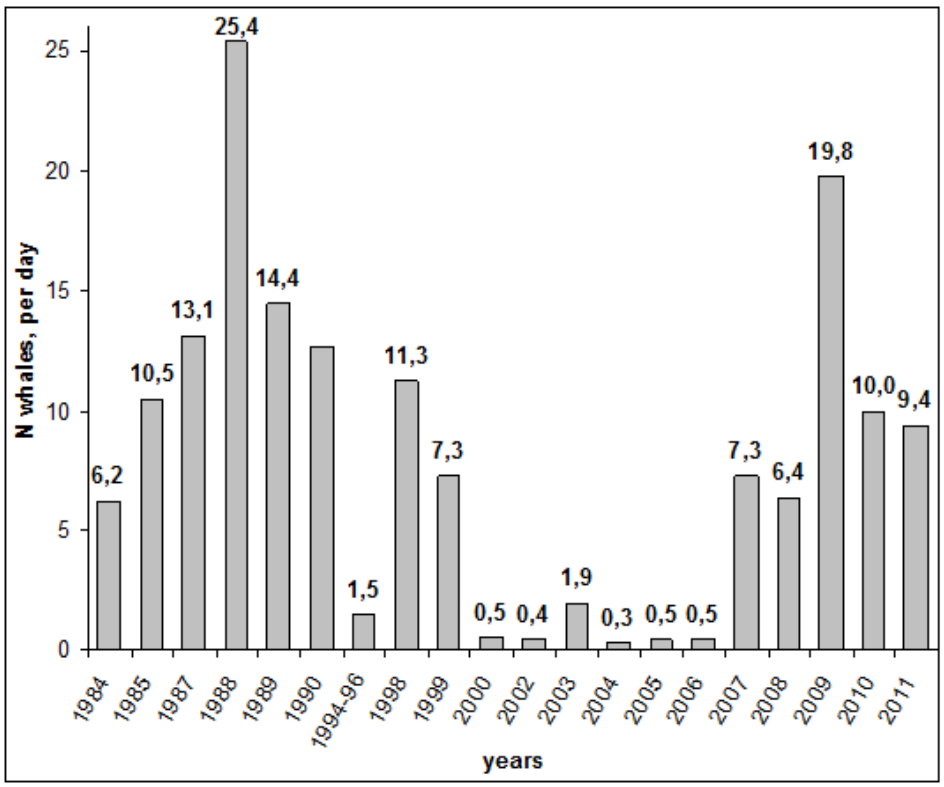

Figure 2. Number of sighted gray whales in Mechigmensky bay, 1984-2011

Table 1. Data, collected from gray whales, harvested in Mechigmensky Bay, 2011

#	Date	Harvest area	Sex	Length, m	Adult/ Subadul	Age, years	Blubber		Stomach fullness
							cm	Body cond index %	
1	June 23	W	♀	8.6	Subad	2	7	0.81	full
2	June 27	C	♂	12.4	Ad	20	13	1.05	half
3	June 29	W	♀	12.5	Ad	21	11	0.88	half
4	July 02	EC	♂	9.9	Subad	2.5	8	0.81	full
5	July 05	EC	♂	10.4	Subad	5	10	0.96	half
6	July 11	W	♀	10.1	Subad	4	9	0.89	half
7	July 16	C	♂	9.7	Subad	3	8	0.82	half
8	July 19	W	♀	7.7	Subad	1	8	1.04	few
9	Aug 10	C	♀	11.0	Subad	5	11.5	1.05	half
10	Aug 16	C	♀	9.1	Subad	2	8.5	0.93	half
11	Aug 17	W	♂	7.6	Subad	1	8.5	1.12	half
12	Aug 18	E	♂	12.1	Ad	20	12.5	1.03	full
13	Aug 19	ES	♀	8.0	Subad	1	12	1.50	half
14	Aug 21	C	♂	11.1	Ad	10	11	0.99	half
15	Aug 25	E	♀	11.0	Subad	6	12	1.09	half
16	Aug 29	E	♂	12.0	Ad	15	9	0.75	full
17	Aug 30	W	♂	11.3	Ad	12	10	0.88	half
18	Aug 30	W	♀	12.1	Ad	27	11	0.91	half
19	Sept 01	C	♀	11.5	Subad	7	11	0.96	full
20	Sept 02	W	♀	12.0	Ad	25	11	0.92	half
21	Sept 02	W	♂	11.9	Ad	20	9	0.76	half

Table 2. Sex, size and physiological conditions of gray whales, landed in Mechigmensky Bay 2007-2011

Characteristics	2007	2008	2009	2010	2011	Sum for 5 years
Landed whales	126	127	115	118	123	609
Observed whales	39	29	33	36	21	158
Females						
% in harvest	61.5	48.3	42.4	50	52	
% subadults	87.5	42.9	92.8	94.4	73	
% yearlings	41.7	14.3	28.6	16.7	-	
% pregnant*	67.0	25.0	0	100	-	
% barren*	33.0	75.0	100	-	100	
Ave length, meters	9.3	11.0	9.1	9.5	10.3	
Ave age, years	1.9**	1.9**	2.1**	2.7	3.5**	
Males						
% in harvest	38.5	51.7	57.6	50	48	
% subadults	60.0	80.0	68.4	72.2	40	
Ave length, meters	9.8	9.3	8.7	9.8	10.8	
Ave age, years	1.2**	1.6**	1.8**	2.8**	2.9**	

*Note: *- from adults; ** - without adults*

Table 3. Body conditions of gray whales, harvested in Mechigmensky bay, 2007-2011

Month / Year	July	August	September
Yearlings			
2007 (n=14)	1.02	1.22	1.16
2008 (n=10)	1.51	1.21	1.29
2009 (n=9)	1.43	1.40	1.27
2010 (n=4)	1.31	-	1.23
2011 (n=3)	-	1.22	-
Subadults > 1 year			
2007 (n=15)	0.81	0.86	0.85
2008 (n=7)	0.94	0.92	0.93
2009 (n=17)	0.72	0.76	0.81
2010 (n=26)	0.86	0.88	0.88
2011 (n=9)	0.86	1.0	-