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The Commercial and Economic Importance of the Beluga whale: the Past and the Future

La importancia comercial y económica de la beluga: El pasado y el futuro

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ABSTRACT:

The article presents information about the commercial and economic significance of the beluga whale, traditionally hunted by the indigenous peoples of Russia, Canada and the United States. It reflects the current situation of the population and environmental monitoring of the beluga in its natural habitat. Historical and ethnographic facts reflecting the peculiarities of beluga whaling are reported herein, as well as the use of beluga raw materials for various economic purposes. The experience of organizing the beluga whaling industry in the 1920s in the USSR is presented. Information on the use of the beluga for exhibition, as well as for scientific and educational purposes in oceanariums and aquariums is summarized. The prospects of the industry in terms of production and innovation management (deep processing of raw material of beluga, ecological tourism) are discussed.
Keywords: beluga whale *Delphinapterus leucas*, whaling craft, history, ethnography, the USSR, ecotourism.

RESUMEN:

El artículo contiene información sobre la importancia comercial y económica de las belugas tradicionalmente extraídas por los pueblos originarios de Rusia, Canadá y los Estados Unidos. Se refleja la situación actual de la población de belugas y el monitoreo ecológico en sus hábitats naturales. Se presentan hechos históricos y etnográficos que reflejan las peculiaridades de la caza de belugas, así como el uso de la beluga como materia prima para diversos propósitos económicos. Se presenta la experiencia de organizar la caza del belugas en la década de 1920 en la URSS. Información generalizada sobre el uso de la beluga con fines demostrativos, científicos y educativos en acuarios y oceanarios. Se discuten las perspectivas de la industria en el marco de la gestión de producción e innovación (procesamiento profundo de la materia prima de beluga, turismo ecológico).
Palabras clave: beluga Delphinapterus leucas, caza, historia, etnografía, URSS, ecot

1. Introduction

The study of the biological characteristics and commercial opportunities of animals is necessary for the purposes of bioeconomics and ecobiopolitics and for understanding of the rational use of raw materials, as well as the development of the most optimal strategy for the removal of individual animals from natural populations for introduction into productive and economic activities. Furthermore, biological studies allow us to determine the range of available environmental measures and to assess bio-ethical and legal risks associated with irrational or illegal exploitation of certain species of the animal world (Kiladze, 2017). The beluga whale is the most convenient object, the study of which allows scientists to tackle the afore-mentioned issues in both fundamental and applied research, and also allows people in business — industrialists, entrepreneurs, owners of aquariums and oceanariums — to deal with said issues.

The beluga whale is one of the few species of marine mammals whose catch in Russia is allowed under the total allowable catch limit, which indicates possible prerequisites for whaling of this species (Boltnev et al., 2016). It is important to note that whaling activities aimed at the production of beluga whales in the territorial waters of the Russian Federation are not regulated by the rules of the International Whaling Commission (Gorbacheva, Shcherbakova, 2014). We believe that the quoted production of the beluga is due to a sufficient population size of this toothed whale, providing conditions not only for the successful reproduction of this species, but also for the gradual revival of the active industrial beluga whaling, based on principles of rational nature management. In 2013, the total allowable catch of the beluga was set at 1060 whales (Boltnev et al., 2016).

Presently, industrial-oriented harvesting of the products of the beluga whaling is not carried out and is limited only to the traditional hunting that meets the subsistence needs of the indigenous peoples of the Far North and the Far East of Russia. For example, local residents of coastal settlements near the Sea of Okhotsk annually catch an average of 2-4 beluga whales in one locality, and the total production does not exceed 200 individuals (Shpak, 2010). It is apparent that such withdrawal of individuals cannot threaten the Okhotsk Sea population of this species.

Objectively, the nature protection status of the beluga can be considered more favorable than other cetaceans, as evidenced by the absence of the beluga from the list of species in the Red Book of the Russian Federation. According to the Red List of the International Union for Conservation of Nature (IUCN Red List), the beluga is classified as a species with a minimum risk of extinction («LC»). Moreover, the species is included in Annex II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (Pavlinov, Filatova, 2012; Lowry et al., 2017). Environmental protection mechanisms of a regional nature are implemented for some populations of the species. According to modern estimates, the world population of the species may exceed 200,000 individual animals (Lowry et al., 2017).

The significance of the presented research is related to the fact that the program of the President of the Russian Federation "Beluga — white whale" is currently being implemented under the auspices of the Russian Academy of Sciences and the Russian Geographical Society (http://programmes.putin.kremlin.ru/beluha/program). A systematic study of the biology of the beluga is carried out by the staff of the Severtsov Institute of Ecology and Evolution of the Russian Academy of Sciences. The main focus of research is on the problems of genetics, physiology, estimation of population size and distribution, as well as migrations of the beluga (Shpak, 2010, 2012). In the latter case, scientists have tagged a number of individuals with satellite transmitters, which allowed their movement to be tracked and their seasonal habitats to be determined (Kuznetsova et al., 2016). In addition, modified airplanes (L-410, An-38) intended for aerial surveys of beluga populations (Shpak, 2012) are used for these purposes. Unmanned aircraft can also be used to track and account for the whales, allowing environmental studies to be conducted remotely (Fortune et al., 2017).

The aim of this work is to collect and analyze historical and ethnographic information on beluga whaling. In addition, we have made an attempt to show the possibilities of practical use of the beluga for alternative commercial purposes.

2. Methods and Design of Research

An analysis of early and recent literature was conducted to identify certain trends in the possible drawing of the beluga into commodity and economic circulation. The text of the article is supplemented with illustrations. A video of a beluga whale recorded at the Center for Oceanography and Marine Biology Moskvarium in Moscow was used.

The work is devoted to the following aspects: (1) the early history of the beluga industry; (2) the organization of the beluga industry in the early years of Soviet power; (3) the significance of the beluga for scientific and educational activities; and (4) conclusions about the commercial and economic significance of the beluga.

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3. Early History of the Beluga Industry: Global Experience and Domestic Practices

Since ancient times, the indigenous peoples of Russia, Canada, and Alaska caught the beluga for its fat, skin, and meat, which were used for food and other household purposes (Beluga Whales, 2018). The most active beluga whale hunting developed during the 18th-19th centuries, which led to a decrease in the natural population of the species. A vivid example of such irrational exploitation of the beluga is whaling in the Canadian Arctic (Reeves, Mitchell, 1987).

From time immemorial, the Indians and Eskimos (Inuit inhabitants) of northern Canada hunted beluga whales to meet a variety of vital needs, and now this hunting is an element of the ethnographic tradition. The Inuit inhabitants are believed to hunt the beluga not only as a valuable source of food and technical animal raw materials, but also for leisure, since they perceive this occupation as a cultural identification (Oparin, Usmanskaya, 2010). Over the centuries, this beluga industry, as well as the use of reserve stocks of marine mammals for the needs of the Inuit, was quite sufficient to cover the needs of the native peoples, so it did not cause damage to the beluga population (Kingsley, 2000).

The methods of extracting the beluga gradually became more diverse. Thus, already in 1720, instead of nets these hunters used spears, many of which were lodged at the bottom of the Gulf of St. Lawrence (Kleinenberg et al., 1964). The first attempts at commercial whaling of belugas were organized in Richmond Fort as early as the middle of the 18th century, but this undertaking was not successful, so in 1759 the whaling was stopped (Reeves, Mitchell, 1987). Large-scale commercial hunting for beluga in the Hudson Bay and in James Bay was resumed after 100 years. Analyzing the archives of the Hudson's Bay Company, Reeves and Mitchell found that for the period from 1854 to 1868, at least 8,294 beluga whales were caught (Reeves, Mitchell, 1987). Such intensive hunting substantially undermined the population of marine mammals in this region, an effect which remains even at the present time (Kingsley, 2000).

In recent decades, Indigenous Canadians have experienced some difficulties associated with traditional exploitation of natural resources because of the prohibitions previously imposed on the hunting of the bowhead whale. Meanwhile, due to the environmental protection measures, the art of traditional whale hunting and processing, unfortunately, is being forgotten by the indigenous inhabitants. At the same time, understanding the importance of the traditional way of life of Native Canadians, the Canadian authorities have made an effort to preserve the system of knowledge and understanding of the beluga and bowhead whale from the position of indigenous peoples, an important ethnographic element, which makes it possible to understand the necessity of preserving the traditional system of farming (Oparin, Usmanskaya, 2010). In 1998, a corresponding report was published on the beluga (Kilabuk, 1998).

Beluga whaling has a long history for the indigenous northern peoples of Russia, the Pomors, who were among the first to engage in whaling in the White Sea (Kleinenberg et al., 1964). Primitive hunting for beluga whales is believed to have started in the 9th century, when hunters could use hand harpoons or wait for marine mammals in the mouths of rivers (Sleptsov, 1955; Tomilin, 1962; Kleinenberg et al., 1964). According to the Novgorod chronicle, the skin of the beluga was used already from the XI century, and it was

considered even as a tribute to the indigenous peoples of the North (Kleinenberg et al., 1964).

Beluga raw materials have been used to meet a wide variety of needs. Beluga fat was needed as a lubricant or fuel for a light source (Beluga Whales, 2018). Northern peoples made belts from beluga skins, giving them considerable elasticity and flexibility which was preserved even at very low temperatures. This property was acquired via the treatment with jaw fat of the beluga (Sleptsov, 1955). In addition, the skins went to the rawhide, from which the peoples of the Far North made harnesses for deer (Ostroumof, 1929). The meat and fat were used for food, and also as feed for sled dogs. The meat intended for dogs was buried in the ground to a depth of 1.5 m, where it was kept for two months, and then, before the onset of cold weather, it was excavated and used as food (Ostroumof, 1929; Drukker, Gakichko, 1936; Sleptsov, 1955). For a long time Eskimos used the skin of beluga, narwhals and bowhead whales together with subcutaneous fat to prepare *muktuk* — a traditional dish that is consumed raw but frozen (Kleinenberg et al., 1964). In addition, the muktuk is subjected to various types of culinary processing, including pickling. Studies have shown that the epidermis of whales is rich in vitamin C, and the subcutaneous fat is rich in vitamin D (Geraci, Smith, 1979).

In concluding this section, we note that the artisanal methods of hunting beluga and processing its raw materials could not contribute to the development of the industry, but merely reflected the traditional way of life of indigenous peoples, closely related to their natural environment.

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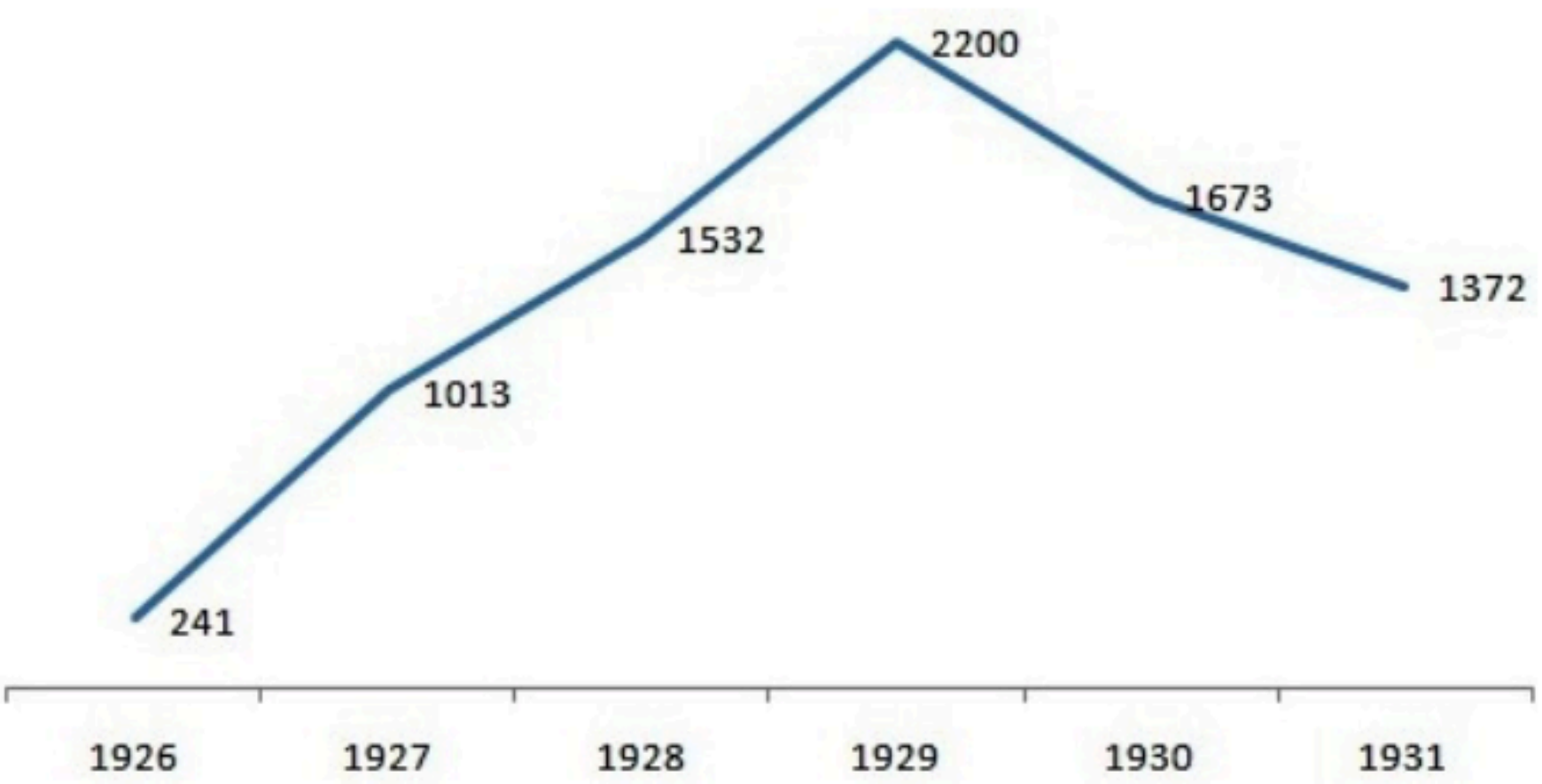
4. Organization of the Beluga Whaling Industry in the Early Years of Soviet Power

In the era of Tsarist Russia during the XIX – early XX centuries whaling was largely controlled by the American whaling fleet, which achieved more commercial success than the Russian fleet (Vakhrin, 1988). The situation changed with the advent of Soviet power, at the stage of industrialization, which made it possible to intensify the hunting of the beluga, and also to organize systematic scientific research.

In the early years of the Soviet Union, beluga whaling acquired an organized character, while the level of production was scientifically justified and rational from the point of view of environmental positions, as evidenced by the statistics of those years (Fig. 1). In Soviet times, such fishing gear as nets, seines, firearms, and harpoon guns were used (Sleptsov, 1955; Tomilin, 1962). Aircraft were later used for field reconnaissance (Bel'kovich, 1960).

Figure 1

Trends in extraction of beluga *Delphinapterus leucas* (in animal units) for 1926–1931 in the USSR



(from: Sleptsov, 1955)

Beluga whaling was organized in terms of the distribution of duties within each artel. The activity of one of such artels, which traded beluga in the Yenisei Bay in 1927, was described in detail (Ostroumof, 1929).

In the 1920s, beluga whaling as well as processing and harvesting of products of the beluga whale industry were carried out in the following sequence: (1) Nets were placed in the Yenisei Bay at a distance of 200 meters from the shore, forming a 1-kilometer-long chain of individual nets, stretching to the middle of the bay; (2) A white whale caught in the net was extricated or its the caudal fin immediately cut off, as the probability of entanglement of the animal is high around this part; (3) The live or already dead animal was tied at fins and tail, placed head forward along the boat's direction, and towed in this position to the butchering site either in the immediate vicinity of the catch (within 200 m), or at some distance (up to 3 km from the catch site); (4) Upon approaching the shore, the beluga was untied, and with the help of ropes rolled onto the shore. This operation was carried out by four to six people, depending on the mass of the caught animal; (5) The carcass was stacked between logs, and the skin and subcutaneous fat were extracted. A deep incision was made along the middle line to the muscle tissue, seizing the *chunzha* (epidermis), skin and subcutaneous fat, then the caudal fin was removed if it had not previously been chopped off. Circular incisions were made around the head at the level of the ear holes. These cuts were enough to gently remove the skin; (6) The fat was separated with knives and scrapers, in addition, the liquid portion of fat drained from the skins into specially prepared troughs; (7) The beluga skins were pickled in barrels with bread pre-ferment and water for 3–4 days, then the chunzha was knocked down on the deck as shown in Figure 2, in the final stage, the skins were dried outdoors for 4–7 days, after which they were packed in bales (Ostroumof, 1929). The complexity of the described processes manifests not only in the number of specialists involved, but also in the time allotted for performing any given operation. Thus the extraction of beluga whales on the shore took 3 hours and the work of five artel members, the shooting of the skin was carried out by three people for an hour, the separation of fat from the skin took 3 hours, which also involved three members of the artel, the removal of the chunzha was carried out by two employees for an hour, and so on (Ostroumof, 1929).

Figure 2
Removal of the *chunzha* (epidermis) from the skin of the beluga *Delphinapterus leucas* by means of a "tupik" (fleshing knife). The skin was placed on the deck

(from: Ostroumof, 1929)

Obviously, the described methods of the beluga industry are the simplest and most primitive, but in the 1920s, such approaches were considered the only possible ones. This already applies to the history of the beluga whaling.

Simultaneously with the activation of whaling activities, scientific studies related to the investigation of the commodity and technological properties of animal raw materials obtained from the beluga were started. These studies were carried out by G.F. Drukker and S.I. Gakichko from 1929 to 1932, and in 1936 their extensive article was published in the Proceedings of VNIRO (Drukker, Gakichko, 1936). The authors gave comprehensive information about the commodity science and technology of animal raw materials (skins, fat, meat, bones, guts, blood, tendons, and viscera) (Drukker, Gakichko, 1936). In 1947 the Mezhdunarodnaya Kniga publishing house published the seminal work of B.A. Kuznetsov "Commodity of secondary kinds of animal raw materials", where the author summarized the available information on the importance of additional animal raw materials in the economy and industry, including those obtained in the beluga whaling (Kuznetsov, 1947). This book was reissued in 2005 (Kuznetsov, 2005).

In 1964, the fundamental book "Beluga Whale: The Experience of a Monographic Description of the Species" was published, the authors of which were the leading specialists of the time in marine mammals, namely: S.E. Kleinenberg, A.V. Yablokov, V.M. Bel’kovich and M.N. Tarasevich. This book provides a comprehensive study of the biology, ecology, morphology, and hunting of the beluga (Kleinenberg et al., 1964). This monograph is still considered the most authoritative and exhaustive publication in the world literature devoted to the beluga.

To conclude this section, we point out that, under favorable conditions, the whaling activity on the beluga can be revived, which will significantly expand the range of animal raw materials. At the same time, it is necessary to set up modern research on the innovation potential of the beluga whaling industry, research which is aimed not only at finding new ways of processing, but also at forming a complete system that not only implements the concept of low-waste production, but also allows the achievement of better economic

indicators.

5. Scientific and Educational Significance of the Beluga

Scientific investigations related to the distribution, migration, physiology, and behavior of the beluga have recently gained global significance, given the shifts in the arctic climate, which gives grounds to view the beluga as a model species and a bioindicator for the Arctic (Shpak, 2010, 2012). Given the circumpolar nature of the distribution of the beluga, its study is international in nature and is conducted within the framework of international research projects (Lowry et al., 2017).

For informational and demonstration purposes, beluga whales may be of interest for keeping in oceanariums and aquariums, which have now gained popularity around the world. The practice of demonstration of beluga whales began long ago, in 1860, in the territory of the USA (Miller, Stacey, 2018). Beluga whales, compared with other trained marine mammals, are exhibited somewhat less often. It is known that in 1967 a special pool (15 × 8 × 5 m) made of thick glass was built for the four belugas in the New York aquarium. Two years later, a young narwhal was placed in this pool (Klumov, Sokolov, 1971).

In Russia, interest in capture and demonstration of beluga whales appeared relatively recently, which required the setup of specialized procedures for catching them. Therefore an annual withdrawal from the natural population from several whales to several dozen is made within the framework of this catching (Shpak, 2010, 2012). Working on whales in aquariums and oceanariums, it is necessary to carry out research on the biology of marine fauna, and also to conduct educational work with school children and students (Klumov, Sokolov, 1971). Such experience has been gained by the Center for Oceanography and Marine Biology Moskvarium, which opened in 2015 in Moscow (Fig. 3). Many scientific organizations and educational institutions in Moscow have concluded agreements with this organization on cooperation.

Figure 3

Beluga whale *Delphinapterus leucas* performs the commands of the coach.
The Center for Oceanography and Marine Biology Moskvarium, Moscow. Video frame.

Video shot by A.B. Kiladze

Beluga whales, which are readily trained, can serve not only as participants in demonstration shows in "marine zoos", but also provide benefit for such activities as finding certain objects sunk in the sea, or for recording underwater videos where this is impossible for humans. Beluga whales do not exhibit aggression towards humans, and have even been reported to save drowning people (Babenko, 2013).

Currently, sightseeing tours in the Far North and the Far East are in high demand. The program of such tours could include visits to the natural habitats of beluga whales and other

whales. Some tour operators already offer similar environmental programs. There is even such a concept as *whale watching,* which grants the opportunity to see and photograph a whale jumping out of the water (Hoyt, 2009). Preservation and relevance of the indigenous hunting practices suggest the possibility of organizing gastronomic tours, within which the participants of the trip will be able to taste the national cuisine of the Chukchi and Eskimos using whaling products. It will of course be necessary to analyze the investment attractiveness of these business areas, to identify the potential for commercialization of various recreational areas based on the biological potential of beluga whales and other cetaceans.

6. Conclusion

In conclusion, we note that the beluga is of extreme interest as an object of biological studies connected with unique morphological adaptations to the conditions of the Arctic. We believe that if there is a sufficient number of the Russian beluga population, its whaling will become active and give grounds to consider the economic significance of the species. In order to maximize profit, it is advisable to use the strategy of deep processing, which is the basis of low-waste technologies. In assessing the beluga as an object of bioeconomics, it should be noted that presently, the resource potential of the beluga is used only partially, which is due to a justifiable system of ecobiopolitics that protects the species from excessive exploitation. It is obvious that such a system of checks and balances is simply necessary to preserve not only national but also global biological diversity.

In our opinion, there is sufficient basis for scientifically grounded commercial and economic activities for beluga whaling, with a balance between the interests of environmental protection institutions and industrial entrepreneurs, which will lead to a significant increase in economic potential from the extraction and processing of this whale.

Bibliographic references

Babenko, V.G. (2013). *Životnye: mlekopitaûŝie Rossii* [Animals: Mammals of Russia]. Moscow: AST. 96 pp. [In Russian]

Bel'kovich, V.M. (1960). *Nekotoriye biologicheskiye nabliudeniya za belukhoy s samolyota* [Some biological observations on the white whale from the plane] // Zoologichesky Zhurnal. V. 39(9). P. 1414–1422. [In Russian]

Beluga Whales: Animal InfoBook (2018). Available at https://seaworld.org/en/animal-info/animal-infobooks/beluga-whales/longevity-and-causes-of-death. Accessed on 1 March 2018.

Boltnev, A.I., Grachev, A.I., Zharikov, K.A., Zabavnikov, V.B., Kornev, S.I., Kuznetsov, V.V., Litovka, D.I., Myasnikov, V.G., Shafikov, I.N. (2016). *Resursy morskih mlekopitaûŝih i ih promysel v 2013 g.* [Resources of marine mammals and its harvest in 2013] // Trudy VNIRO. V. 160. P. 230–249. [In Russian]

Drukker, G.F., Gakichko, S.I. (1936). *Tihookeanskaâ belukha kak promyšlennoe syr'e* [Pacific beluga whale as an industrial raw material] // Trudy VNIRO. V. III. P. 53–130. [In Russian]

Fortune, S.M.E., Koski, W.R., Higdon, J.W., Trites, A.W., Baumgartner, M.F., Ferguson, S.H. (2017). Evidence of molting and the function of "rock-nosing" behavior in bowhead whales in the eastern Canadian Arctic // PLoS ONE. V. 12(11): e0186156. https://doi.org/10.1371/journal.pone.0186156

Geraci, J.R., Smith, T.G. (1979). Vitamin C in the diet of Inuit hunters from Holman, Northwest Territories // Arctic. V. 32(2). P. 135–139.

Gorbacheva, M.V., Shcherbakova, A.V. (2014). *Tovarovedenie i èkspertiza dopolnitel'nyh vidov syr'â životnogo proishoždeniâ* [Commodity studies and examination of additional types of raw materials of animal origin]. Moscow: INFRA-M. 136 pp. doi: 10.12737/703 [In Russian]

Hoyt, E. (2009). Whale watching. In: Encyclopedia of Marine Mammals, 2nd Edition (Perrin, W.F., B. Würsig and J.G.M. Thewissen, eds.). San Diego, CA: Academic Press. P. 1219–1223.

http://programmes.putin.kremlin.ru/beluha/program [In Russian]

Kilabuk, P. (1998). A Study of Inuit Knowledge of the Southeast Baffin Beluga. Iqaluit: Nunavut Wildlife Management Board. 74 p.

Kiladze, A.B. (2017). Bioeconomy and ecobiopolitics in the natural resources management system // Espacios. V. 38(59). Page 7.

Kingsley, M.C.S. (2000). Numbers and distribution of beluga whales, *Delphinapterus leucas*, in James Bay, eastern Hudson Bay, and Ungava Bay in Canada during the summer of 1993 // Fishery Bulletin. V. 98(4). P. 736–747.

Kleinenberg, S.E., Yablokov, A.V., Bel'kovich, V.M., Tarasevich, M.N. (1964). *Belukha: opyt monograficheskogo opisaniya vida* [Beluga Whale: The Experience of a Monographic Description of the Species]. Moscow: Nauka. 456 pp. [In Russian]

Klumov, S.K., Sokolov, V.E. (1971). *Okeanarii SŠA i Âponii. V kn.: Morfologiâ i èkologiâ morskih mlekopitaûŝih*[Oceanariums in USA and Japan. In: Morphology and ecology of marine mammals]. Moscow: Nauka. P. 153–172. [In Russian]

Kuznetsov, B.A. (1947). *Tovarovedenie vtorostepennyh vidov životnogo syr'â* [Commodity studies of secondary types of animal raw materials]. Moscow: Mezhdunarodnaya Kniga publishing house. 276 pp. [In Russian]

Kuznetsov, B.A. (2005). *Tovarovedenie vtorostepennyh vidov životnogo syr'â* [Commodity studies of secondary types of animal raw materials]. Moscow: Aquarium-Print Ltd. 384 pp. [In Russian]

Kuznetsova, D.M., Glazov, D.M., Shpak, O.V., Rozhnov, V.V. (2016). Winter distribution and migrations of beluga whales (*Delphinapterus leucas*) in the White Sea based on satellite tracking data // Biol. Bull. Russ. Acad. Sci. V. 43. P. 914–917. https://doi.org/10.1134/S1062359016080124

Lowry, L., Reeves, R., Laidre, K. (2017). *Delphinapterus leucas*. The IUCN Red List of Threatened Species 2017: e.T6335A50352346. http://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T6335A50352346.en. Downloaded on 28 January 2018.

Miller, L.J., Stacey, R. (2018). Marine parks, zoos, and aquariums. In: Encyclopedia of Marine Mammals. Bernd Würsig, J.G.M. Thewissen, Kit M. Kovacs (Eds). 3ed edition. London: Academic Press. P. 566.

Oparin, D.A., Umanskaya, A.I. (2010). *Problemy prirodopol'zovaniâ saamov Kol'skogo poluostrova i inuitov Vostočno-Kanadskoj Arktiki (Nunavut) / Issledovaniâ po prikladnoj i neotložnoj ètnologii* [The problems of wildlife management of the Saami of the Kola Peninsula and the Inuit of the Eastern Canadian Arctic (Nunavut) / Studies on Applied and Urgent Ethnology]. Moscow: IEA RAS. Issue 220. 46 pp. [In Russian]

Ostroumof, N. (1929). *K izučeniû belukhi Delphinapterus leucas Pallas i promysla ee v Enisejskom zalive* [To the investigation of the white grampus *Delphinapterus leucas* Pall and his trade in the gulf of Yeniseï] [sic] // Reports of the Siberian Scientific Station of Fisheries. V. IV. Part 1. Krasnoyarsk. 38 pp. + ill. [In Russian]

Pavlinov, I.Ya., Filatova, O.A. (2012). Order Cetacea. — Pavlinov I.Ya., Lissovsky A.A. (Eds.). The Mammals of Russia: A taxonomic and Geographic Reference (Archive of the Zoological Museum of MSU. Vol. 52). Moscow: KMK Sci Press. P. 390–428.

Reeves, R.R., Mitchell, E. (1987). History of white whale (*Delphinapterus leucas*) exploitation in eastern Hudson Bay and James Bay. Ottawa: Can. Spec. Publ, Fish. Aquat. Sci. 95 45 pp.

Shpak, O. (2010). *Belukha: perspektivy issledovaniâ vida v Rossii* [Beluga whale: prospects of research on the species in Russia] // Okhota i okhotnich'e khoziaistvo. № 8. P. 20–22. [In Russian]

Shpak, O. (2012). "*Belukha — belyj kit*" ["Beluga — white whale"] // Neptune. № 2. P. 96–100. [In Russian]

Sleptsov, M.M. (1955). *Kitoobraznye dal'nevostočnyh morej* [Cetaceans of the Far Eastern seas]. Vladivostok: Primorskoye Publishing House. 162 pp. [In Russian]

Tomilin, A.G. (1962). *Kitoobraznye fauny morej SSSR* [Cetacean fauna of the USSR seas]. Moscow: Publishing House of the USSR Academy of Sciences. 212 pp. [In Russian]

Vakhrin, S.I. (1988). *Istoriâ osvoeniâ prirodnyh resursov Ohotskogo i Beringova morej Kamčatskogo promyslovogo bassejna (dooktâbr'skij period). V kn.: Racional'noe ispol'zovanie bioresursov Kamčatskogo šel'fa* [The history of development of natural resources of the Okhotsk and Bering seas of the Kamchatka commercial basin (pre-October period). In: Rational use of bio-resources of the Kamchatka shelf]. Petropavlovsk-Kamchatsky: Far Eastern Book Publishing House. P. 5–6. [In Russian]

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