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NATURAL HERITAGE OF TAIMYR: CHALLENGES FOR ITS CONSERVATION AND SUSTAINABLE USE

ABSTRACT. The article discusses the natural heritage of Taimyr (northern Siberia) within the perspective of the environmental conditions of the region. The assessment of its significance is based on the results of many years of Russian-Dutch ecological expeditions. Issues discussed are the responsibility for the preservation of heritage, the interests of the local indigenous peoples, and the role of public authorities. Based on the results of a pilot project, the feasibility of developing ecotourism as one of the most effective forms of sustainable use of the heritage is demonstrated.

KEY WORDS: natural heritage, Taimyr, Arctic, protected areas, indigenous people, Russian-Dutch expeditions, ecotourism.

INTRODUCTION

The Taimyr Peninsula is one of the largest socio-economic regions of the Russian Arctic, characterized by a unique combination of environmental features and almost pristine state of natural systems. The uniqueness of Taimyr is due, primarily, to its geographical position: the Peninsula is the northernmost

of the continental land masses not only in Eurasia, but in the world, resulting in a singular diversity of its landscape structure.

From north to south within the Taimyr Peninsula (Fig. 1), there is a transition in natural landscapes ranging from the polar desert in the far north (75° N) to the forest-tundra at the latitude of the Norilsk industrial complex. The enormous territory occupied by the Peninsula – about 1,200 km from east to west and over 1,000 km from north to south – resulted in a significant variation in the availability of natural resources: various mineral ores and precious stones, water resources, commercial hunting species and reindeer. Except for the heavily polluted zone around the axis Dudinka – Norilsk in the south, the harsh climatic conditions and remoteness of Taimyr from the developed areas of the country (no highways nor train connections to other parts of Siberia) contributed to the conservation of the fragile natural ecosystems of the Peninsula in an almost intact state. Through a combination of these factors, Taimyr today is one of the last major etalons of pristine nature in the world.

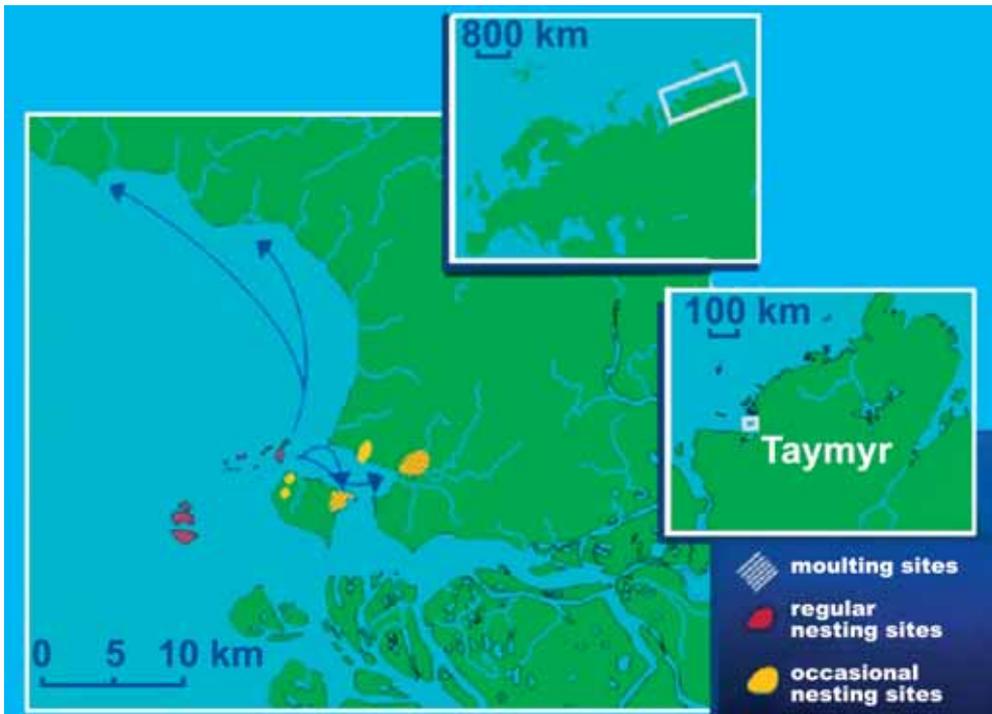


Fig. 1. Western Taimyr Peninsula, Eastern Siberia, Russia and the expedition study area in the Pyasina Delta

From this perspective, Taimyr is of particular interest in identifying its role in the dynamics of the global ecosystem that currently have a special topicality in relation to global change. This interest is manifest in the growing number of international research projects, among which a cooperation of more than 20 years between Russian and Dutch ecologists and geographers to study high-latitude ecosystems. The results of these studies, conducted mostly in the vast region of the Pyasina River delta, give reason to consider the ecosystems and the natural landscapes of the region as a whole to be an absolute priority category of natural resources to be preserved for the benefit of present and future generations, i.e. natural heritage.

NATURAL HERITAGE OF TAIMYR

The presence of large areas of pristine nature on the Taimyr Peninsula is reflected in the existence of the three largest Russian state nature reserves: the Great Arctic, the Putorana

and the Taimyr Strict Nature Reserves. In the global system of nature reserves, they are characterised above all by a high level of biodiversity and occurrence of habitats for rare species. Precisely these reserves constitute the ecological framework of one of the 200 ecoregions of the world (Global 200) identified by WWF with the denotation "coastal tundra of Siberia and the Taimyr Peninsula", which to our opinion is not a very accurate indication.

The Pyasina River delta, among other areas of the Peninsula, has high biodiversity value; in 1995, it was designated as one of the clusters of the "Great Arctic" reserve (Fig. 2). The Pyasina site covers an area of more than one million hectares of the delta of the Pyasina River and the adjacent large areas, as well as numerous islands of the coastal waters of the Kara Sea. The cluster projected so that its boundaries comprise the entire range of biological and ecological diversity aspects of the Arctic, that need of protection. The wetlands of



Fig. 2. Clusters of the “Great Arctic” state nature reserve

the Pyasina delta have an acknowledged international significance: many animal and plant species are listed in the Red Books of Russia and of the Krasnoyarsk Krai. The bird fauna of the “Great Arctic” reserve includes 124 species, 55 of which have been observed to nest in its territory. The mammal fauna of the reserve is represented by 16 species, four of them marine animals.

The value of the Pyasina delta area has been repeatedly confirmed by the results of scientific research, including a series of international expeditions from 1990–1999 [Ebbinge et al., 2000]. In 2002–2008, at the Pyasina site research was carried out by a series of international integrated ecological expeditions (Fig. 3) organized with the assistance of Alterra (Wageningen University



Fig. 3. A snap-shot of a working day of the expedition (a discussion of counting nests on the islands)
(photo by V. Grabovsky)

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The coast of the Taimyr Peninsula and the islands of adjacent waters are the summer habitats of hundreds of thousands of water birds from different regions of the world. Most of them spend the winter in Europe, some in South Africa, Asia and even Australia. But every year they invariably return to the vast expanses of the Arctic coast of Russia melting up in June.

The delta complexes are the most favorable habitat for water birds. For example, on

the right-bank side of the Pyasina delta, in addition to numerous watercourses, rivers, and wetlands, there are over 260 lakes. The developed drainage system, significant reserves of food in the polygonal swamps and wetlands along the lowlands, and the lack of disturbance create optimal conditions for the existence of numerous water birds, which are one of the main objects of protection in the reserve (Fig. 4). It is home to 16 Red-Book birds species, four species of nesting geese, Bewick's swan, and four species of ducks. Within the reserve, there are nesting and molting areas of up to 80% of the population of brent goose (*Branta bernicla*), wintering in Western Europe [Ebbinge and Mazurov, 2006] (Fig. 5). Here, also red-breasted geese (*Branta ruficollis*) – a rare species emblematic for Taimyr – nest. In the last decade, there was a marked steady growth of this species and the expansion of its range to the north. At the same time, there was a decrease in the population of brent goose (with almost 100,000 individuals, compared with the beginning of the 1990s), which could not but cause concern of the international community of ornithologists and ecologists



Fig. 4. A typical landscape of northwestern Taimyr. Polygonal tundra (view from a helicopter; photo by P. Glazov)



Fig. 5. Brent goose (*Branta bernicla*) – the main object of study of the international environmental expeditions to the Taimyr Peninsula in 2004–2008 (Photo by F. Kottaar)

[Pakina, 2006]. In particular, this fact alarmed scientists from the Netherlands: the wintering black geese in this country that breed in the “Great Arctic” are symbolic for international biodiversity.

Studies conducted in the Arctic by scientists from different countries have revealed a close relationship between the state of populations of different species of birds and mammals. For example, the breeding success of many migratory birds is influenced by the condition of the population of lemmings (Fig. 6), whose population dynamics in recent years have been subject to serious disturbances. There is evidence of disruption of a three-year cycle of abundance of lemmings in the Scandinavian Arctic and the tundra of Alaska. Many scientists tend to explain this phenomenon of the nature by global warming. The Taimyr Peninsula is the last region on the planet where the cyclical fluctuations in the number of lemmings until 1994 remained normal.



Fig. 6. Lemming (Siberian lemming – *Lemmus sibericus*) is an important link in the trophic (food) chain of tundra ecosystems (photo by D. Pakin)

The need to trace the full range of complex interactions in arctic ecosystems that determine the success of reproduction of populations of migratory birds was the main reason for the organization of systematic research in the Pyasina delta. The idea was supported by the administration of the "Grand Arctic" reserve as well as by the Russian and the Dutch branches of World Wildlife Fund (WWF) and by the Royal Netherlands Embassy in Moscow.

The results of the international expedition confirmed the existence of a correlation between the state of populations of different species (including water birds, birds of prey, and various mammals) in the Arctic. The assumption of the decrease of reproduction of brent geese in connection with the absence of a peak in the population of lemmings in the summer seasons of 2004 and 2006 was confirmed. New and more accurate data on the number and distribution of nesting sites of birds, both on the mainland and the islands were obtained. At the same time, the hypothesis of the relation of climate change on the population of lemmings could not directly be confirmed [Ebbingge and Mazurov, 2006]; a three-year cycle still remains on the Taimyr Peninsula, and the last significant population peak was recorded in 2005.

Based on the results of the recent expeditions, as well as on modern scientific concepts [Mazurov, 2005], we note the following aspects of the scientific value of the nature of Taimyr, exemplified by the Pyasina delta:

- preserved pristine state of the nature in general;
- etalon status of the natural complexes;
- high biological and landscape diversity of the territory and of aquatic systems;
- the presence of rare, valuable, and endangered species;
- high aesthetic value of landscapes;

- relatively well scientifically studied area, especially in comparison with other regions equally difficult to reach.

The above-mentioned features confirm the importance of the functioning there of a Strict Nature Reserve – the institution designed to preserve the pristine nature and conduct relevant research and scientific observations of changes in the state of natural systems.

The findings on the value of natural systems of the Pyasina cluster can be extended to other parts of Taimyr. First, these are the ranges of existing natural protection areas such as, in particular, the Putorana state nature reserve. The uniqueness of the landscapes and the scientific value of the natural systems of the Putorana reserve provided the basis for its nomination to be included in the List of the World Heritage sites by UNESCO. In 2010, this proposal was adopted by the World Heritage Committee, which reflected the recognition of the global natural heritage values of the Taimyr region by the international community.

The existing nature reserves of Taimyr do not yet form a complete comprehensive ecological network in the region, as would be required in the interest of preserving the region's natural heritage. New components of this system will be the regional wildlife reserves "Agape" and "Gorbita" that were approved in the Taimyr Dolgan-Nenets Region (the authority competent for the Taimyr peninsula). Giving these habitats a conservation status will enhance the preservation of their highly valuable wetlands and aquatic areas of international significance. Further development of the ecological network of Taimyr will increasingly mitigate the growing risk to natural heritage of the region associated, primarily, with the expansion of economic activities in the North.

HUMAN GEOGRAPHY OF THE STUDY AREA

The most important indicator of the economic development of an area is its population or population density. Until now,



Fig. 7. The eastern boundary of the Pyasina cluster of the “Great Arctic” reserve runs along the course of the Khutudabiga River. A view of the river in the middle reaches (photo by P. Tsarkov)

the vast expanses of the Taimyr tundra have been virtually uninhabitable. The members of the expedition did not observe any traces of settlements, except for some seasonal structures of commercial fishermen. In general, adjacent to the “Great Arctic” reserve vast territories, as well as many other regions of the Far North, are characterized by extremely low population density.

The closest to the base camp at the mouth the Pyasina River is the small urban settlement of Dixon, located at a distance of about 200 km to the west (about an hour by helicopter). One of the oldest Russian hydro-meteorological stations (founded in 1916) is located there. In the Soviet period, Dixon was one of the most important ports in the Arctic Sea Route, which predetermined the rapid development of this settlement. In the post-Soviet period, the intensity of freight traffic in the Arctic Sea has fallen sharply, which resulted in the decline of Dixon.

The distance to the nearest settlement to the northeast and southeast of the base complex of the reserve, i.e., to the border post at Cape Chelyuskin, and to temporary camps of geologists on the islands the Severnaya Zemlya archipelago, as well as to the settlements in the Khatanga valley, is 600–700 km. Much closer to the camp is a small village of Ust-Tareya (about 150 miles in a straight line or three times longer by the meanders of the Pyasina basin). It is difficult to overestimate its importance for aviation operation in the region; however, it has been almost completely depopulated in recent years.

Under current conditions, transport of people and goods to the reserve is almost only possible by helicopter from the airport Valyok, located near the city of Norilsk in more than 500 km to the south. Communication with the developed parts of the continent is also possible by sea and river routes, but due to climatic conditions and the economic situation at the present time, these routes are almost never used.

Thus, the territory of the “Great Arctic” reserve is located in one of the most remote and inaccessible Arctic regions of Russia and the world at large, which makes it especially appealing for studying natural processes in ecosystems.

At the same time, the territory is a historical zone of vital interest of the local native peoples. This is reflected, among other things, in the local toponyms. Despite the predominance of Russian toponyms in the names of geographical features (rivers, lakes, mountains, capes, etc.) there are many native names, including those captured on modern maps, down to the coast of the Kara Sea. An example is the River Khutudabiga (Fig. 7), which means “river rich in life”. The Nganasans, an indigenous people of Taimyr, gave this river its name, with reason. The river and its surroundings are known not only for the rich fish stocks but also for the abundance of game species, including many geese and wild reindeer.

The presence of local toponyms in the investigated region is the most obvious indication of this region’s cultural heritage, represented, first of all, by the local indigenous population. Precisely these people have preserved to this day the extremely fragile nature of their land and specifically they are vitally interested in its preservation in the future. Therefore, the policy of conservation of natural heritage of the region should be formed in the interests of the native Taimyr peoples and with their participation.

THE POPULATION AND THE INDIGENOUS PEOPLE OF TAIMYR

Today, the population of the Taimyr Dolgan-Nenets region of the Krasnoyarsk Krai (the region corresponds to the former Taimyr Autonomous District) is about 53 thousand people. Within the Taimyr Dolgan-Nenets region, there is Norilsk industrial district (180 thousand population), which is administratively subject to the administrative center of Krasnoyarsk and is not part of the Taimyr Dolgan-Nenets region. The population

density of this actual autonomous region, even including Norilsk, has an extremely low value of about four persons per km², which is about 30 times lower than the average in Russia [Chistobaev, 2003].

The ethnic structure of the population is dominated by Russians who came to the Taimyr Peninsula in the XVIIth century, when the region was annexed by the Russian Empire. They are followed by Ukrainians and Tatars. A particularly rapid growth of these and of other ethnic groups took place in the XXth century, which was due to economic development of the region. A crucial role in economic development of Taimyr was played by the Norilsk industrial complex and the associated construction of the sea ports in Dixon and Dudinka.

The large-scale economic development of Taimyr that began in the Soviet period, radically changed the lives of the indigenous population. It was almost completely converted from a nomadic to a settled way of life. These people were consistently subjected to a policy of state paternalism, incompatible with fundamental interests of the indigenous people, which often gave rise to social and socio-environmental problems that even grew dramatically in the post-Soviet period.

The indigenous people of the Taimyr Dolgan-Nenets Region are currently represented by five ethnic groups: Dolgans, Nenets, Nganasans, Evenks, and Enets [Peoples and religions ..., 1999]. Their current number of inhabitants belonging to these groups is, to our estimate, about 10,200. However, the ethnic groups vary greatly in size: the number of the largest ethnic group is about 30 times greater than that of the smallest group.

In recent years, there is a steady upward trend in the Taimyr indigenous population, mainly due to the excess of births over deaths. Over the period between the 2002 and 2005 censuses, it increased with 320 people, a relative increase of 1,07%. However, there

is a significant variation in these indicators among ethnic groups, which does not allow considering this situation safe from the standpoint of the stability of the native population. Thus, the demographic growth of the Nenets – the second largest indigenous group in the region – is approximately 1,5 times higher than that of Dolgans, who are the largest group [Chistobaev, 2003]. But an even greater contrast is in the reproduction of the population between the smallest groups of indigenous people, the Taimyr – Evenks and Ents: the former group shows the largest increase in the region (3,67%), while the latter group suffers a threatening decrease of – 8,79%, close to the depopulation.

The largest indigenous people of Taimyr are Dolgans (self-designations: *Dolgan*, *Tyakihi*, *Saha*), living mainly in the basins of the Khatanga and Pyasina Rivers, on the right bank of the Yenisei, and mainly in the administrative area of the Khatanga district and in the Dudinsk City Council territory. Outside the Taimyr Dolgan-Nenets Region, Dolgans live in Yakutia, which is the traditional habitat of migratory exchange. The Dolgan language actually belongs to the Yakut language group. Dominant church adherence of Dolgans, like of most of Yakuts, is the Russian Orthodox religion. Along with that, Dolgans retained many traditional religious beliefs, especially those related to animism, shamanism, and the deification of the forces of nature.

The traditional Dolgans' occupations include reindeer breeding, wild reindeer and bird hunting, and fishing. Their occupation determined the specificity of their way of life: like most people in this region, Dolgans have traditionally led a nomadic life. However, the seasonal routes of Dolgan reindeer herders were significantly shorter than that of other people of Taimyr. In summer, their herds were out in the tundra while in winter in the forest-tundra.

The staple of the traditional Dolgan's food is reindeer meat: raw, frozen, or boiled. The use of shredded frozen fish (either cooked or

raw) is widespread. Folklore and applied arts are well developed, including decorating clothes and shoes with ornamental reindeer fur. Traditionally reindeer and mammoth bone carving are popular.

In the Soviet period, the absolute majority of Dolgans switched to a sedentary life, leaving the traditional places of occupation, resulting in many areas of Taimyr almost entirely losing the indigenous people. Furthermore, experts believe Dolgans to be the most urbanized people of Taimyr, currently living in predominantly large settlements in the region. They seem to have been able, better than other ethnic groups, to appreciate the benefits of urban life (living conditions, access to education, health care, social security, etc.) in comparison with the nomadic life and to effectively adapt to it.

However, as evidenced by numerous data, this adaptation took place not without affecting the mentality of the natives. In urban areas, it is more difficult to maintain traditional working practices and cultural customs. The situation was complicated by the arrival of “civilization diseases”: social dependency, alcoholism, crime, chronic illness, suicide, etc. The above problems worsened dramatically in the post-Soviet period, superimposed on the explicit and hidden unemployment, which hit the hardest the indigenous people of the North. Almost all of them were unable to adapt to market conditions, to live in a competitive environment that is incompatible with the traditional mentality and the system of spiritual values of these people.

It is obvious that the current difficult socio-economic situation in the Russian North actually “squeezes out” the indigenous people from urban and rural settlements to the tundra and forces them to return to the traditional economy, which, though not promising prosperity, can, under favorable conditions, ensure survival.

In this situation, it is objectively inevitable that Dolgans and other ethnic groups turn

to the previously neglected Taimyr grazing, hunting, and fishing lands. Naturally, this interest will manifest itself in the claims of indigenous communities and/or families in recovery and preservation of property rights to their ancestral lands, covering, apparently, almost the entire territory of Taimyr. In the medium to long term, one should expect the spread of these claims to the most northern regions as well, not excluding the study area of the expedition, the Pyasina delta. One might also assume that in the future, it may be the ethnic interests that will be the decisive factor for the regional policy on the Taimyr Peninsula and the Russian North in general.

The territory of the Taimyr Peninsula is the living environment of the local indigenous people, first of all of Dolgans and Nenets, to which they have the undoubted historical rights. Obviously, in these circumstances, these rights in some cases may compete or even conflict with the federally designated status of certain areas, such as nature reserves. In this regard, improvement of the legislative base for the northern territories should take into account the current situation and prospects of its development.

An important component of the living environment of the local indigenous population, who in the long term will be increasingly involved in the economy, is its natural heritage. This perspective includes both positive opportunities as well as the inevitable risks. Let us illustrate this with the example of ecotourism as the most promising use of natural heritage.

OPPORTUNITIES AND RISKS OF ECOLOGICAL TOURISM DEVELOPMENT

Until now, the fishing and recreational appeal of the Taimyr coast have been known to only a relatively limited number of individual fishermen and rare tourists, whose impact on the nature was narrowly local and relatively small. However, in view of the above-mentioned circumstances,

the situation can quickly change toward, for example, the formation of a sufficiently substantial tourism (ecotourism, sport fishing and hunting tourism) and a concurrent increase in tourist numbers associated with environmental risks.

The investigation on the potential for the development of ecological tourism in the “Great Arctic” reserve was conducted considering the fact that tourism, even ecotourism, is also, apart from the obvious advantages over traditional types of tourism, a definite threat to the natural systems. Today, the definition of “ecological” is often used merely as a marketing label to create a more appealing image of this kind of activity. Ecological tourism in reality is a complex interaction of various structures, including regional and local administrations, the management of nature reserves, private businesses, local communities, etc.

In the summer of 2005, a pilot project on ecotourism in the northwest of the Taimyr Peninsula [Henkens et. al., 2005] was implemented. Along with the assessment of conditions for the development of ecotourism at the field camp at the Pyasina Delta, the prospects of an ecological tour there were evaluated. The Khutudabiga River was chosen as an object of investigation, which represents great interest in terms of landscape and biological diversity, as well as being traditionally attractive for the organization of sport fishing. In the course of the project, the conditions for the arrangement of the ecological tours in this region, including all possible types, i.e., educational, sport, adventure, and fishing, were assessed.

The Khutudabiga River is located in the northwestern part of the Taimyr Peninsula and pours directly into the Kara Sea in its southeastern part. The mouth of the river is about 30–40 km north from the Pyasina River mouth. The northern boundary of the Pyasina site of the state nature reserve “Great Arctic” runs along the Khutudabiga River.

The remoteness of the area, poor transport accessibility, and the need to use the most expensive type of transport, i.e., helicopter, resulted in a high degree of conservation of the local natural systems and of their biological and landscape diversity.

A necessary premise for tourism development and for its effective management is to identify issues that are of interest for the potential visitors to the reserve and to the adjacent areas. The development of tourism on the Taimyr Peninsula involves the use of all available there specific characteristics defined by the natural environment. Opportunities for tourism development in the region are limited, by a short tourist season, harsh conditions, and a poorly developed transport network. However, these aspects are also advantageous for targeting the group of tourists interested in the opportunity to visit extremely remote areas unaffected by human activities.

Comparing the Taimyr region with other regions of tourist attention, its main features can be identified as follows [Ebbinge and Mazurov, 2006]:

- remoteness of the region;
- 24-hour polar day;
- complex interactions between components of ecosystems, such as the snowy owl, lemmings, arctic foxes and migratory birds;
- opportunity to observe beluga and other rare marine mammals;
- vast expanses of tundra landscapes;
- settlements of indigenous people with their traditional way of life.

The studies were conducted from July 26 to August 16, in the most favorable period for the organization of tours. In the area, the beginning of mid-July to early September, is characterized by the best mild weather



Fig. 8. By mid-summer, arctic fox pups leave the den and begin an independent life (photo by P. Glazov)

conditions. Snow cover is virtually non-existent, snow patches remaining only in the lowlands on the northern slopes, and the tundra shows all its variety of colors and biological activity. The air temperature ranges from +5–+10°C, occasionally rising to +16–+18°C or more. Mosquitos and midges are rare.

The fauna of the study area is often described as “poor”, which is understandable considering harsh natural conditions. At the same time a high degree of preservation of the natural systems, vast open spaces, and the polar day create a unique opportunity to observe much of the animal world, including rare species. Numerous water birds and wader birds can easily be observed at suitable locations. On the ledges of coastal cliffs there are often nests of peregrine falcons, snowy owl, and other rare birds. Different types of waders and quail are common to the tundra. Among the mammals, one is likely to see a fox (Fig. 8), reindeer, and musk ox, sometimes wolf, and many lemmings in years of peak population. Directly at the bay, i.e., in the point of contact of the river and the sea,

there are sightings of seals, as well as of “sea hare” – bearded seal. There are also sightings of whales at the mouth of the Khutudabiga.

In the area of the start of the tour (approximate coordinates: 74°30'N, 90°00'E), a group of four was dropped by helicopter along the Kutudabiga. They continued farther down the river by inflatable boats. Rafting on the river was done in a mixed mode, alternating with sufficient stops to get acquainted with the natural phenomena. In some of the most picturesque places, suitable for placement of the camp, the stays were longer, up to two days. In places most favorable for fishing, camps were set. Fishing was organized based on the “catch and release” principle, which, in general, is typical for fly fishing, the most sporting method of fishing that is also the most gentle and “environmentally friendly.”

Experience has shown that tourism development on the Taimyr Peninsula is quite feasible. Decisive for the development of this sphere of activity are such aspects as ensuring the safety of tourists, especially important in the Arctic, and increasing the service level. In addition, transport accessibility remains one of the main factors determining the development of ecotourism in remote regions in the short term.

Sustainable tourism can contribute to the international status of the “Great Arctic” nature reserve and the involvement of the local communities in the management of the reserve. One can assume that this will also help reducing the incidence of unauthorized hunting and fishing on its territory, as well as providing an additional source of income. The benefits of the development of this work may be directed toward increasing the involvement of participation of the local population in the management of the reserve and the development of long-term cooperation with other community agencies engaged in the management of the Taimyr region.

There is no doubt that the organization of environmental and any other types of tourism

in the territories of national parks should be accompanied by monitoring changes in the natural environment, ecosystems, etc.

Currently, many areas of the Russian North, characterized by a significant natural heritage, have a protection status. For professionals it is clear that designation of such a status improves the protection of their natural and cultural heritage. In this case, the protected areas actually acquire a new quality: they are universal human heritage subjected to a strict social imperative of their priority preservation as public good. This fact largely determines the relatively high preservation requirements of natural systems within the boundaries of nature reserves. At the same time, economic realities require a more flexible approach to the conservation of natural resources. Ecotourism is one of the few options for meeting the needs of society in preserving their heritage and wise and sustainable use of natural resources in the interests of not only present but also future generations.

CONCLUSION

The foregoing discussion suggests the following conclusions regarding the natural assets of the Taimyr Peninsula:

- they are of particular natural and cultural heritage value, implying the need for conservation;
- they show a large spatial variation and characteristic temporal dynamics;
- they are of interest to different users, whose number may increase and interests may give rise to competing claims;
- they are vulnerable to a number of risk factors, induced by various uses of which the incidence and intensity in the future may increase significantly;
- they are within the competence of various administrative bodies that still are in the



Fig. 9. Willem Barents Biological Station in the Bay of Medusa created with the funds of the Government of the Netherlands concurrent with the creation of the “Great Arctic” reserve

course of establishing their regulative jurisdiction.

These features fully allow inclusion of the natural assets discussed above into the category of “natural heritage” [Mazurov, 2005], i.e. having special values as public goods, which suggests first of all their preservation for the benefit of present and future generations. The need to preserve this heritage as a basis for maintaining the ecological balance in the Russian Arctic and harmonious development of indigenous people must be supported by an appropriate legislative framework at both the regional and federal levels.

Until now, the Russian government carried the responsibility for preserving the unique natural heritage of Taimyr, including the establishment and maintenance of nature protection sites and other protected areas, such as the “Great Arctic” reserve. The State represents the interests of the entire population, including the local indigenous population who is objectively interested the most in preserving the heritage. It can be argued that, as awareness of their interests and of their role in preserving their natural heritage grows, the Taimyr indigenous people will take a more active role in the responsibility for it, which fully corresponds to their own cultural traditions. Responsibility for the preservation and for passing on the unique and precious natural heritage of Taimyr to future generations is now with the local indigenous population and the population of Russia as a whole.

A situation is gradually developing now where the natural environment of Taimyr is increasingly being perceived as a heritage, the preservation of which is of equal interest for the entire local population, the Russian State, a number of foreign nations – the countries associated with Russia at the ecosystem level (Fig. 9), and, to some extent, the world community. Largely due to the international nature of research, understanding is being formed that there is no second Taimyr in the world and that this Taimyr plays an indispensable role in ensuring a sustainable and prosperous future for mankind.

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