Economic Use of Wetlands in a Historical Context

N G Dmitruk and M P Druzhnova
Yaroslav-the-Wise Novgorod State University, 41, ul. B. St. Petersburgskaya, Veliky Novgorod, Russian Federation
E-mail: n_g_dmitruk@mail.ru

Abstract. The article dwells on the problem of economic use of wetlands in the process of historical development of forest marshland areas in the northwest of the East European Plain. The authors consider changes in the traditional use of the resources of wetland areas, and the prospects for present day rational use of natural resources.

1. Introduction
Wetlands occupy vast areas in the forest zones of Russia; since ancient times they were a settlement place actively involved in economic turnover. On the one hand, wetlands hinder the development of the territory; on the other hand, they are a habitat for various animals and a storehouse of natural resources for humans. With the growth of the population, the involvement of wetland areas in economic activity was increasing; however, nowadays, when the anthropogenic impact is lessening, there is a reverse tendency to return wetlands to their natural state. The recent research has shown a change in options of environmental management of wetlands.

2. Objects and methods of research
The research object is the wetlands, mainly of the Novgorod region, as well as of the adjacent territories of the Leningrad and Pskov regions – Tesovskoye, Rdeyskoye wetlands, Polistovo-Lovatsky wetlands, and swamps in the Volotovsky district of the Novgorod region. The main research methods are the field observation, comparative historical and geographical analysis of existing research on the problem.

3. Results and discussion
The wetlands in various regions of the world have been thoroughly studied. The analysis of research works shows that there is both a general scientific analysis and narrow specialized studies related to the functioning of wetlands, the chemical composition of waters, the analysis of the drift of trace elements, successions, changes in economic use, etc. [1, 2, 3, 4]. Within the Novgorod Land, wetlands became a place of residence for small groups of people as early as during the development of tribal relations. The attractiveness of such “inconvenient” territories was evident; they provided protection from enemy attacks and the wealth of game, which opened up ample opportunities for hunting. Bog moss, sphagnum, was used as an antiseptic, bedding, filler and insulating material. The bogs were the places to pick up mushrooms (coral milky caps, milk mushrooms, suede boletus, rough boletus, russule, etc.) and berries (cranberries, lingonberries, blueberries). The natural trade was bee-keeping. Peat was used as a fuel, and later the properties of “bog ore” were discovered for the production of iron. Later, the options for using the wetland resources changed. The production of iron articles from local resources has long lost its relevance; today, it is mentioned only in archives and museum expositions.
According to various estimates, wetlands occupy from 11 to 19 percent of the Novgorod region and adjacent territories. Mostly raised sphagnum bogs with a ridge-hollow complex are widespread here. The largest massifs are Polistovo-Lovatsky, Nevsky, Igorevsky, Belebolkovskoye, Spassky mosses and others. Wetland complexes have become widespread on poorly drained flat plains, where they are represented by sphagnum bogs of the raised type. Bogs of the transitional type are less common – sphagnum with shrubs (lingonberries, blueberries), filamentous sedge, birch and pine. In some places there are low-lying hynnum-herbal, sedge bogs with bogbean and horsetail. In some areas they are forested with birch, willow, black alder (the latter received a peculiar name “mangrove alder forests”).

Lowland bogs usually adjoin river valleys, lake terraces, and are located in hollow depressions where there is an inflow of groundwater [5]. A feature of such waters is their formation in the area close to carbonate rocks; as a result, the waters have high hardness. In some places of the Tesovo-Netylsky massif, low-lying peat is 7–12 meters thick. Low-lying peat is used in agriculture as a fertilizer; in the second half of the twentieth century, its extraction was widespread in the Novgorod region. The extracted peat was mainly used for fuel; there were proposals to suspend the extraction in order to preserve this valuable resource for agriculture. The development of technology and a sharp economic decline during the collapse of the Soviet Union brought significant changes to the use of peat lands. Today they are worked out mainly for the production of soil mixtures, peat pots. Sphagnum is used in the production of medicines and in the chemical industry.

During the Soviet period, extensive irrigation engineering works were carried out in wetlands. The reclaimed land was used in agriculture – in particular, cultivated meadows were made for hayfields and pastures [6]. The decline in agricultural activities, the lack of irrigation engineering works in the post-Soviet period led to new processes in the wetland biocenoses in the areas where peat layer had been removed. Areas with significant waterlogging and dominant reed vegetation were identified. The spots covered with cranberries are being formed there. In drier places, the oppressed birches, thickets of heather and blueberries grow. Deprived of vegetation during peat extraction, the areas are now covered with impassable thickets. There are sharp contrasts between the areas where peat had been removed and the areas near the reclamation ditches with the lines of birch trees 3 to 5 meters high. Under the birches, there are small patches of lingonberry, blueberry, wild rosemary and heather.

The issues of preserving natural landscapes, including wetlands, have acquired particular relevance in regards to ever-increasing anthropogenic influence. One should note the creation of specially protected natural areas within the wetlands [7, 8]. In the adjacent areas of the Novgorod and Pskov regions, the territories of two protected areas – the Rdeysky and Polistovsky state natural reserves – merge. In the Novgorod region, the Rdeysky reserve is located within the Holmsky and Poddorsky districts; the Polistovsky reserve is located in the Bezhanitsky and Loknyansky districts of the Pskov region. Both reserves protect the Polistovsko-Lovatetskaya bog system; being one of the largest in Europe, it is preserved in its natural state and plays an important water protection role. The reserves are home to many protected species of plants and animals, including those listed in the Red Book of the Russian Federation and the International Union for the Conservation of Nature and Natural Resources. The river Polist’ originates from this place; there are many small lakes, some of them have the status of a natural monument.

The protected natural area, in accordance with Russian legislation (Federal Law “On Specially Protected Natural Areas” dated 03.14.1995 N 33-FZ), is subject to the strictest protection regime – not only any kind of nature management activity is prohibited here, but the presence of visitors is also excluded. There are also serious prohibitions within the security zone: visitors cannot stay overnight, light fires, or leave vehicles. Construction of capital objects, logging and burning of vegetation, disposal of garbage and waste, hunting are prohibited here. Rare and endangered plant species cannot be destroyed here. All of the above determines the primary task of the reserve – the preservation of the conservation mode. However, some possible activities have been identified for protected areas. Among them is research, which is carried out not only by the employees of the organization, but also by other
scientists who have received permission to conduct research in the reserve. The reserves also carry out environmental education, organize activities for tourists and guided trips [9]. There are significant differences in the organization of the work of protected natural areas in relation to tourists and trips. The guided trips programs have existed in the reserves for some time already, and a variety of souvenirs has been produced.

There is an ecological trail “Visiting Panikelki” in the Rdeysky State Reserve, which can be visited by no more than 200 people a year. Its length is a little less than five kilometers, some of the sections have wooden decks; there is an opportunity to climb the observation tower. Along the way, sightseers can get acquainted with the history of the region, military operations on its territory, plant communities, features of the succession process, types of wetlands; they can also observe the mineral island from afar. These opportunities are used by the small number of visitors to the protected areas, among them are mostly students.

There are more opportunities for the guests of the Polistovsky State Reserve. Its visitors can become not only the guided tour participants but also tourists. In the visitor center, located in the village of Bezhanitsy, there is the museum, where one can get acquainted with an interactive exposition about the wetlands of the Polistovsko-Lovatsky massif. An interesting exhibit is the aquarium showing how a real swamp functions. Visitors can get accommodation in guest houses of Tsevlo and Gogolevo villages, they can order food cooked according to old village recipes in a Russian oven. Sauna services are also offered here. There are unique guided tours in the villages, where one can get acquainted with the surrounding nature, the way of life, the history of the region, and the economic activities of the local people.

The reserve offers several routes that can be visited at different times of the year. Tourists are offered walking and boat trips, snowmobiling. Some of the routes are equipped with special wooden decks, information stands. Tourists can visit the mineral island, climb the observation tower, and see swamp vegetation, thickets of black alder – a kind of “mangroves”. Flooded areas with black alder are a fairly common biocenosis in the bogs of Novgorod, Pskov and Leningrad regions. The distribution of alder forests in the northwest of the East European Plain is a characteristic process in the area of secondary forests [10]. Tourists reach the routes in the protected zone by specially equipped vehicles provided by the reserve. During the trips, people are introduced to plant communities, the peculiarity of the bog life; one can watch birds, observe the beavers’ constructions, and feel extreme while moving around in swamp vehicles. The reserve also offers a cranberry bog tour and cuisine master classes. A special attention is given to work with students who can have educational and apprentice internship in the reserve. Students master the primary skills in scientific research, which, in turn, benefits the reserve. Thus, the development of scientific tourism as a specific activity is carried out in the protected areas.

4. Conclusion
The wetlands of the northwest of the East European Plain are an important element of the natural landscapes of the region. In the second half of the twentieth century, they were actively involved in economic activities through the extraction of peat, land reclamation and further use in agriculture. The result of this use was a radical change in the bog complexes. Since the end of the twentieth century, there has been a fundamental change in the use of natural resources within the bog massifs. The factors of change are the decline in agricultural work and areas, the development of technologies, the demand for recreational services, and an environmentally responsible attitude to economic activity. As a result, large protected areas are being formed; bog areas can be assigned to organizations that promote the recovery of natural bog landscapes and contribute to maintaining the ecological balance and sustainable development of the regional economy.

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