

# HISTORICAL PARALLELS OF MORICSALA AND LAGODEKHI – TWO 100-YEAR OLD PROTECTED NATURE AREAS IN LATVIA AND GEORGIA

Valdis Pilāts, Māris Laiviņš

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Nature protection is part of our modern life. Numerous countries have allocated a great part of their territories for protected nature areas. One hundred years ago, nature conservation and protected areas were still under development in their initial stages. In this review we look back upon the events and driving forces which led to establishment of the first protected areas of Latvia and Georgia. Having very different natural conditions, both Moricsala Nature Reserve (Latvia), and Lagodekhi Nature Reserve (Georgia) show a lot of similarities in their histories. Although they are far apart they have close ties with the same people and same processes in the world community. Natural and social background, outstanding personalities and powerful scientific societies were the most important preconditions for establishment of the first nature reserves. Political events and ideological aspects also influenced their management and research. Designed by scientists as nature etalons for research, their scientific importance has considerably increased during the last 100 years. Created as solitary islets of protected nature, both reserves are currently part of a nationally and internationally recognized network of protected areas.

Key words: nature reserves, natural heritage, history, Kupffer, Mlokosiewicz.

Valdis Pilāts, Nature Conservation Agency, Baznīcas iela 7, Sigulda, LV-2150, Latvia, e-mail: valdis.pilats@daba.gov.lv

Māris Laiviņš, Institute of Biology, University of Latvia, Miera iela 3, Salaspils, LV-2169, Latvia, e-mail: m.laivins@inbox.lv

## INTRODUCTION

A century ago, two protected areas – Lagodekhi and Moricsala were established. 1912 is supposed as the year of their foundation and both are regarded as the oldest protected areas in Georgia and Latvia, respectively. Frequently they are named also among the first strict nature reserves (*zapovednik* – in Russian) of the former Russian Empire, as Georgia and Latvia were part of it.

Both protected areas are situated far away (ca

2500 km) from each other and in different biogeographic regions of Europe. Moricsala is situated in a plain landscape of the Boreal region, while Lagodekhi lies on the Greater Caucasus range of the Alpine region (Anon. 2013a). Moreover, both reserves are situated in countries with different histories. Nevertheless, establishment of protected areas in Moricsala and Lagodekhi reflects a similar course of events both in these particular countries, and on a wider scale – in the whole world. It is just coincidence that both protected areas were established in the

same year. Though, appearance of those protected areas was an etiological result of processes going around that time.

In this paper we tried to look behind the single fact of the *birth* of Moricsala and Lagodekhi protected areas: why they were established at that time, at that place. We also tried to reconstruct the social environment during last 100 years in relation to the history of both protected areas. The significance both of facts regarding foundation of these protected areas, and the territories themselves are also dealt with.

The background for the authors' input is quite different. M. Laiviņš has devoted more than 3 years to studying vegetation of Moricsala Island. The history of protected areas in Latvia and of Moricsala Reserve in particular, has been among his research subjects. V. Pilāts has visited Moricsala Reserve (in 2002 and 2008) and Lagodekhi Reserve (in 2009 and 2012) as well as quite many other protected areas. Some of them are named in our paper to illustrate one or another process. We are using the term *nature reserve* (NR) that refers to the particular place as protected area despite of its exact status in respective time.

## GEOGRAPHICAL LOCATION OF SITES

The Moricsala Strict Nature Reserve is located in western Latvia (N 57°11'35", E 22°7'47") ca 40 km from the Baltic Sea coast. Nowadays it includes two islands: Moricsala – the island of Morics (in Latvian) (82.31 ha) and Lielalksnīte Island (31.11 ha), and part of Usma Lake aquatorium (704.71 ha). The elevation of Usma Lake is 22 m above sea level, the elevation of both islands – just a few meters above Usma Lake level. Most of Moricsala Island is covered by boreal and mixed broad-leaved forests.

Lagodekhi Strict Nature Reserve is located in the most north-eastern part of Georgia (N 41°54'00", E 46°20'00"), almost in the central part of the Greater Caucasus range. Currently it occupies 22 266 ha on the southern slopes of

the range and the elevation of the area varies between 400-3500 m above sea level. There is a vertical zoning of climate and biota from beech forests up to alpine zone. Several gorges including the Lagodekhi Gorge with fast mountainous streams are essential parts of the NR.

## PRECONDITIONS FOR CREATION OF NATURE RESERVES

The establishment of Moricsala and Lagodekhi NR on the exact time and place was defined by several preconditions. Some of them were determined by natural conditions, others derived from social and political developments.

### Natural heritage of sites

In the 19th century, forests in Latvia were extensively managed and in many regions suffered from severe felling. Only in the north-western part of Latvia, including Moricsala Island, forests remained rather intact (Zunde 1999). There are no exact data available on the management of the Moricsala forests before establishment of NR. A hundred years ago, old-growth forests covered 66 % of the island's area. Trees were not used for felling but during the summer the whole island was used for cattle grazing (Kupffer 1931).

Most forests of the Moricsala Island belong to the boreal forest type with dominating tree species *Betula pendula* and *Alnus glutinosa*, and mixed broad-leaved forests, which are dominated by *Tilia cordata* and *Quercus robur*. This small island reflects the fact that Latvia is located in the contact zone of boreal coniferous forests and nemoral temperate deciduous forests. The species typical for both forest biomes can be found also on Moricsala Island. Moreover, many species in Latvia as in the whole of Northern Europe are either on their eastern or western edge of their ranges (Hallanaro & Pylvänäinen 2002).

Most of the island's area is covered by ground vegetation typical of broad-leaved deciduous forests. In comparison to other forest types in

Latvia, vegetation of broad-leaved forests is rich in plant species. Currently, 2/5 of all vascular plants found in Latvia are recorded in very small area of Moricsala Island (representing 1/60 000 of the area of Latvia).

The three largest islands in Usma Lake including Moricsala are valuable bird nesting sites. Together, they are currently recognized as one of the bird areas of European Union importance in Latvia (Račinskis 2004). It hosts for example osprey *Pandion haliaetus* and white-tailed eagle *Haliaeetus albicilla*. More detailed descriptions of Moricsala Island nature values are given in the following publications: Kupffer 1931, Laiviņa & Laiviņš 1980, Лаивиньш 1983, 1989, Лаивиня 1987.

In Lagodekhi forests occupy about 70% of the NR territory and they are growing at altitudes from 450 m to 2 000-2 300 m. Above this height subalpine and alpine meadows are situated, which in turn are replaced by the subnival zone at an altitude of 3 000 m. The broad-leaf forest is also the dominating biome there, though it is quite different from that growing on Moricsala Island. The dominant broad-leaf tree species is *Fagus orientalis*. It represents an interzonal element because it is growing starting from lowland forests up to high-mountain ones. The second most dominant is *Carpinus caucasica*. On southern slopes it grows in mixtures with *Quercus iberica*, *Castanea saliva* and *Carpinus orientalis*. On northern slopes *C. caucasica* grows together with *F. orientalis*, *Ulmus foliacea* and *U. glabra*. Third subdominants are maples (*Acer velutinum*, *A. platanoides*, *A. campestre*) growing mainly in lowland areas together with *Tilia caucasica* and *Ulmus elliptica*. Alluvial terraces are occupied mainly by *Alnus subcordata*, *Pterocarya pterocarpa* and *Fraxinus excelsior*. Woody vines (*Hedera helix*, *Smilax excelsa*, *Periploca graeca*, *Clematis vitalba*) are common as well.

Diversity of plant species is another characteristic feature of Lagodekhi NR - almost 2/3 of the plants growing in Georgia can be found there. Lowland forests of Lagodekhi are compared even

to subtropical forests occurring in the Colchis (Kolkhida), on the eastern coast of the Black Sea. For a long time, the Lagodekhi area is famous for its rich game fauna. The East Caucasian tur *Capra cylindricornis*, chamois *Rupicapra rupicapra* and red deer *Cervus elaphus* should be mentioned first. They attract large carnivores: lynx *Lynx lynx*, grey wolf *Canis lupus* and brown bear *Ursus arctos*. Lagodekhi is known also of big raptors: bearded vulture *Gypaetos barbatus*, imperial eagle *Aquila heliaca*, golden eagle *Aquila chrysaetos* and steppe eagle *Aquila nipalensis*. More detailed descriptions of Lagodekhi NR natural values are given by Chikovani et al. (Чиковани и др. 1990), Kvavadze & Stuchlik (1996) and Chvediani (Цхведиани 2012).

### Isolation

Essential factor in history of Moricsala and Lagodekhi NR was their isolation from the surrounding world as *islands of nature*, especially in the case of Lagodekhi. Though Moricsala in fact is an island in a lake, its geographical isolation is rather relative. Probably other unknown factors prevented the island from greater human impact. We do not know why the forests of Moricsala and neighbouring areas were left unfelled as written by Zunde (1999).

It is known that mountainous areas, especially on mountain tops, are regarded as pseudo-insular biotas where spots with specific vegetation isolated each from the other like true islands serve as refuge for certain species (e.g., Vuilleumier 1970, Brown 1971). Caucasus Mountains were an isolated refuge for many species during glaciations (e.g., Zazanashvili & Mallon 2009). Lagodekhi NR, having no geographical barriers (except the Greater Caucasus range to the North from Lagodekhi), was isolated from human impact due to historical (political) conditions.

By the early 16th century the Christian Georgia became a battleground between two great rival Muslim powers: the Ottoman (Turkish) Empire from the West and Persian (Iranian) Empire from the East. The campaigns of the Persians to bring eastern Georgia under their sway were

particularly devastating. Tens of thousands of Georgians were killed or deported to Persia. The region around Lagodekhi was depopulated. Moreover, the region was unsafe for living due to raids of nearby Islamic Dagestan tribes. The situation starts to change gradually only when Georgian territories were annexed to the Russian Empire and a small Russian garrison was stationed in Lagodekhi village in the 19th century (Цхведиани 2012).

### Social preconditions

The idea of protection of special places is ancient and general. Probably every nation in a stage of heathenism had sacred groves or other landscape features. Prohibitions regulating human behaviour with respect to holy groves are known also in Latvia (Laime 2009) and mountainous regions of Georgia (Devidze 2012).

A well-known habit of noble people was protection of hunting grounds. Such areas for hunting were also for the Russian tsars (Реймерс & Штильмарк 1978, Shtilmark 2003, Марков и др. 2009) and kings of Georgia (Devidze 2012). In Russia they were called as *zapovedny mesto* - closed places. In the 19th century, according to Jepson and Whittaker (2002), natural history and hunting were two great passions of elite society that influenced worldviews concerning the human-nature relationship. At that time natural history was the domain of theologians, philosophers, scientists and aristocrats. The same can be said regarding Latvia and Georgia of 19th century too.

At the turn of the 19th century Romanticism developed (e.g., Welzholz & Johann 2007). *Naturalness* and *return to nature* were important ideals of that time. Being confronted with progressing industrialization and urbanisation, people searched for a simple, honest, harmonic and secure life. One of those who called for a return to nature in order to restore humanity to its natural goodness was French philosopher Jean-Jacques Rousseau. In addition, it was regarded as a question of progress to assert the right of wilderness. Forests, dunes, fens, heaths, rocks and

glaciers - wilderness was considered an essential complement to the cultural land which should be protected. Already at the beginning of the 19th century, scenic nature sights and beautiful landscapes were popular tourist attractions. There is a presumption that the Russian Emperor, Alexander I, during his visit to Punkaharju Esker (SE Finland) in 1803, liked its beauty and therefore gave the order to stop forest felling there (Vuorisalo and Laihonon 2000). It created a precondition for the establishment of the Crown Park on Punkaharju Esker already in 1843, as well as for conferring Nature Reserve status for the area in 1991 (Table 1, Anon. 2013b).

In 1819 another romantic, Prussian naturalist and explorer Alexander von Humboldt, introduced in wide use the term *Naturdenkmal* - nature monument. According to him, a *Naturdenkmal* could refer to spectacular natural objects, such as trees or rocks, but also 'untouched' nature in general, when distinguished for its rarity, peculiarity or beauty. In 1840 the first official protection of a geological monument in Bavaria was initiated when King Ludwig I gave orders to preserve the Weltenburger Enge at the Danube River (Lagally 2007).

A transition to an organized preservation of nature and its monuments started in the late 19th century when the conflict between modern industrial society and nature became more marked and idea of nature conservation found increasing numbers of supporters in many parts of Europe. Organized preservation of nature is very much connected with the name of Hugo Conwentz (1855–1922). In 1904 the Prussian government commissioned Conwentz to report on the need to protect natural monuments. His book "The Endangerment of the Natural Monuments and Suggestions for their Conservation" depicted the causes of damage to Nature. He declared: "Not only here in Prussia, but in almost every cultured country one has come to the conclusion that something must happen immediately in order to prevent complete destruction of primordial nature" (cited from Kay 2011). This book inspired conservationists nationwide and even worldwide. Conwentz developed further the concept of *Naturdenkmal*:

Table 1. Chronology - main events in history of Moricsala and Lagodekhi Nature Reserves

year	Moricsala	Lagodekhi	elsewhere (selected examples)
1803			Russian Emperor Alexander I forbids cutting of trees in the scenic Punkaharju Esker (SE Finland)
1840			Bavarian King Ludwig I gives order to conserve geological monument the Weltenburger Enge at the Dunabe River
1843			the status of a Crown Park granted to Punkaharju Esker
1846 & 1848	the first entomological studies by pastors J.Bitner and J.Kawal carried out		
1853-1861		naturalist L.Mlokosiewicz does his military service in Caucasian Division of the Russian Army settled in Lagodekhi settlement and explores the local nature	
1867-1909		L.Mlokosiewicz returns and settles at Lagodekhi for the rest of his life working as Inspector of Forests for the Signakhi District	
1868			lighthouse-keeper F.H. Mangelus transforms the Island Långskär (Åland Archipelago) to unofficial bird sanctuary
1872			Yellowstone - the first National Park in the World established
1882			on substantiations prepared by physician and zoologist B. Dybowski two sancturies for the sable <i>Martes zibellina</i> - predecessors of Kronotsky Zapovednik established at Kamchatka
1889		L.Mlokosiewicz writes letter to Actual State Councilor of the Russian Empire A. Strauch convincing him for the need of Lagodekhi nature protection	
1893	the first visit by botanist K.Kupffer		

year	Moric sala	Lagodekhi	elsewhere (selected examples)
1898	E. Midendorf-ornithologist, member of Naturalists' Society of Dorpat, visits and gives recommendations for conservation of the island		the Sabi Game Reserve - predecessor of the Kruger National Park proclaimed in the South Africa
1903		Lagodekhi Gorge is rented to E. Demidov as game reserve	
1904			Conwentz initiates European wide campaign to designate nature monuments
1909	the first complex expedition to island by Naturalists' Society of Riga		<b>lighthouse-keeper A. Toom transforms 6 Vaika Islands (West-Estonian Archipelago) to unofficial bird sanctuary</b> the 1st International congress for the care of nature <i>"Congresse Internationale pour la Protection des Paysages"</i> held in Paris <b>the first European National Parks established in Sweden</b>
1910	K. Kupffer suggests an idea of creating nature reserve at meeting of Naturalists' Society of Riga; idea gets support from I. Borodin - member of the Imperial Saint Petersburg Academy of Sciences	botanist N. Kuznecov suggests an idea of creating nature reserve at meeting of the Imperial Saint Petersburg Academy of Sciences	Naturalists' Society of Riga starts to support A. Toom in bird protection on the Vaika Islands
1911	regulations issued by Domains Board preventing the island from further exploration	meeting of Caucasus filial of Imperial Russian Geographical Society devoted to Lagodekhi protection held	
1912	the island is put under the jurisdiction of Naturalists' Society of Riga	idea on nature reserve in Lagodekhi Gorge accepted by vicegerent of Russian Tsar in Caucasus region	
1913			Consultative Commission for the International Protection of Nature established at Berne with signatories from 17 European countries; I. Borodin and G. Kozhevnikov - representatives of Russia

<b>year</b>	<b>Moricsala</b>	<b>Lagodekhi</b>	<b>elsewhere (selected examples)</b>
1915-1918	WW1 in territory of Latvia		
1918	foundation of independent state- Republic of Latvia	foundation of independent state- Democratic Republic of Georgia	
1918-1920	Latvian War of Independence		
1918-1921		Georgian War of Independence	
1921	the island is declared as monument of nature and turns under the authority of Ministry of Education	incorporation of Georgia in Transcaucasian SFSR and later in USSR	
1929		Lagodekhi Gorge and adjacent area declared as State's Strict Nature Reserve	
1931	the monograph on Moricsala Island published by K.Kupffer		
1933			the first effort to clarify terminology for protected areas at the International Conference for the Protection of Fauna and Flora, in London - four protected area categories distinguished
1935		increase of the area of nature reserve: next gorges included	
1936		zoological expedition by Georgian Academy of Science	
1940	incorporation of Latvia in USSR		
1941-1945	WW2, Latvia occupied by Germany		
1945		increase of the area of nature reserve: alpine pastures included	
1946	regulations issued by Government of Latvia prohibiting forest cut in island		
1947		Administration (including scientific staff) of the nature reserve established	

<b>year</b>	<b>Moricšala</b>	<b>Lagodekhi</b>	<b>elsewhere (selected examples)</b>
1948			The International Union for Conservation of Nature established
1951	reduction of the system of protected areas in USSR		
1957	Governmental regulations on nature conservation adopted: 4 NR established, int. al. Moricšala Strict Nature Reserve in which aquatory of the Usma Lake also included		
1958		the Law on Nature Protection	
1961	another reduction of the system of protected areas started in USSR		
1970		increase of the area of nature reserve: additional forested areas included	
1972			Lahemaa - the first National Park of the former USSR established in Estonia
1977	territory enlarged - Lielalksnītes Island included		
1979	Administration (including scientific staff) established for 3 nature reserves including Moricšala NR		EU Council Directive 79/409/EEC on the conservation of wild birds adopted
1973 - 1979	rigorous vegetation studies by M.Laiviņš and S.Laiviņa		
1991	independence of Latvia resumed	independence of Georgia resumed	Punkaharju Esker receives the status of Nature Reserve
1991-2003		period of disorder in the country	
1992			EU Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora adopted; Natura 2000- EU wide network of nature protection areas introduced
1993	the Law "On the Protected Areas"		
1996		the Law "About the system of Protected areas"	



year	Moricsala	Lagodekhi	elsewhere (selected examples)
2003		reorganization of Nature Reserve: it is divided in Lagodekhi Strict Nature Reserve and Lagodekhi Managed Nature Reserve; total area slightly increased; several paths for tourists opened	
2004	the Moricsala Strict Nature Reserve declared as N2000 site, adjacent Viskūžu Island declared as sanctuary, both protected areas putted on a list of Important Bird Areas in Latvia as joined area		

nature monuments, like great works of art, should be guarded against ruin. Conwentz's vision of *Naturdenkmal* promoted the establishment of organisations intended to designate and manage nature monuments. In 1906 the first institution for nature conservation - *Staatliche Stelle für Naturdenkmalpflege in Preussen* was established in Prussia (Germany). Conwentz was appointed as the head of this institution. In 1909 the Swedish government followed the example of Prussia and also established a national nature conservancy as well as founded the first National Parks in Europe.

Ideas of nature conservation found lot of supporters in society. Conwentz (1914) wrote that in Prussia „societies of the most varied interests have co-operated actively in the protection of natural monuments. More than 100 societies have now definitely included this object in their statutes, while hundreds of natural history, tourist and similar societies have voted funds to purchase natural monuments.” Among those societies were also *Verein Jordsand* established in 1907 for protection of marine birds (Neumann, Schneider 2007).

For this short description on history of protected areas in Western Europe we used also publications of Anuchin (Анучин 1914), Boreiko (Борейко

2004) and EEA 2012.

The 19th century was a time when natural sciences met rapid development also in the Russian Empire. Smurr (2008) has expressed an opinion that a great number of the members of the St. Petersburg Academy of Sciences (currently the Russian Academy of Sciences) being ethnically and linguistically German maintained close ties to the European and German scientific and intellectual elite in particular. At least Russian leading naturalists were well informed (see e.g. Анучин 1914 and Бородин 1914) about the processes in Europe, and Germany in particular. Probably therefore ideas of nature conservation developed in Germany were easily transformed also to the Russian Empire.

According to Shtilmark (2003), the scientific foundation of the protected areas in Russia was laid by Vasily Vasilyevich Dokuchayev - geologist and founder of soil science. In 1894 he not only established a research station nearby Starobilsk, Ukraine, but also marked off about 12 ha of virgin steppe for conservation purposes as well as gave scientific background for the need to preserve virgin steppe. Probably he was the first who postulated that the parcel of untouched habitat (virgin steppe) has to serve

as standard (etalon or reference area) for other (managed) plots. Dokuchayev has argued that the state should protect (*zapovedat*) any piece of virgin steppe in south Russia similarly as it has been done with famous tsars' hunting ground in Belovezhskaja Pushcha. It is worthwhile to mention that, according to Boreiko (Борейко 1997), at least in 1997 that a 12 ha plot of virgin steppe was still preserved as part of the Junitskij botanical sanctuary (*Yunitskiy Zakaznik*).

Another steppe research station and *zapovednik* (strict nature reserve) was organized by the *St. Petersburg Society of Naturalists* in 1914, and the station was administered by a special commission lead by Ivan Parfjonovich Borodin (Shtilmark 2003). Borodin, Russian botanist and academician of the St. Petersburg Academy of Sciences, and Grigorij Aleksandrovich Kozhevnikov - professor of the Moscow University are regarded as most outstanding personalities promoting the establishment of system of protected areas (*zapovedniks*) in Russia (Shtilmark 2003, Борейко 2004). Their ideas (Кожевников 1909, Бородин 1914) were announced and discussed in several scientific meetings and conferences, e.g., at the 50th anniversary of the *Imperial Russian Society for the Acclimatization of Animals* (1908) and at 12th Conference of Russian Naturalists and Physicians during December 28, 1909 - January 6, 1910. According to Borodin (Бородин 1914) during the 1st Meeting of the Baltic Historians in Riga in 1908 a special session was held on protection of monuments of nature and culture within East Baltic region. Numerous publications on the need for protected areas appear in the press as well (Ostergren & Shvarts 1998, Shtilmark 2003).

According to Boreiko (Борейко 2001), in the Russian Empire three approaches existed for establishment of protected areas: scientific, ethically-aesthetic and practical. The last one dominated in the early stage of nature protection. The Russian Empire was rich in game species but some of its populations were depleted already by the 19<sup>th</sup> century. Therefore protection of certain game species in certain areas were among the first nature conservation attempts.

For example, probably the first protected area for the sable *Martes zibellina* was set up in 1882 at Kamchatka in a place where the Kronotsky Biosphere Zapovednik is currently situated. Substantiations for establishment of the sable sanctuary was prepared by Benedykt Tadeusz Dybowski – a researcher of Polish origin who studied medicine at Dorpat (Tartu) University, was member of *Russian Geographical Society* and devoted great part of his life to zoological studies of Baikal Lake and the Pacific coastline of Russia (Лядыгин & Артюхин 2007).

## ROLE OF PERSONALITIES

People leading the movement for nature protection such as Conwentz in Prussia were also in other countries. We already named Borodin and Kozhevnikov as ideologists of development of *zapovedniks* in the Russian Empire. Behind each idea of a particular protected area usually we can find particular person such as Dokuchayev in Ukraine and Dybowski in Kamchatka. Initially many protected areas in the Russian Empire, analogously to many West European countries, were established by rich and enlightened landowners. Among them most famous was Friedrich von Falz-Fein who has studied natural sciences also in Dorpat (Tartu) University and later in 1898 established on his land the well-known Askania-Nowa NR (Анучин 1914, Борейко 2001).

Human wealth and social status were not yet determining factors. In the history of seabird protection, two lighthouse-keepers pioneered the way. First, lighthouse-keeper F.H. Mangelus established an unofficial bird sanctuary on the Island Lågskär (Åland Archipelago, Finland) already in 1868 (Vuorisalo & Laihonen 2000). Forty years later the islets of Vaika (West-Estonian Archipelago) became also an unofficial bird sanctuary thanks to Artur Toom, supervisor of the lighthouse on the island of Vilsandi. In 1909 Toom started to rent 6 islets of Vaika (in German - *Inseln Waika*) to restrict collection of eggs from nests by inhabitants of Vilsandi Island and to improve the breeding conditions of birds (Anon. 1934, Rode 1937, Jüssi 1982, Шергалин

2012).

Also the establishment both of Moricsala, and Lagodekhi NR would not happen, at least that time, without the contribution of two outstanding personalities.

The first, Karl Reinhold Kupffer (1872–1935), was one of the leading Baltic German botanists in the late 19th century and the beginning of the 20th century. The following extracts from his bibliography is given from publications of Meder (1936) and Adamonyte & Vimba (2003).

Kupffer had studied botany and mathematics at Dorpat (Tartu) University. During 1921–1927, he was appointed as a docent for botany at the Herder Institute in Riga and, in 1927–1930, he worked there as a professor. Kupffer was also a member of the *Naturalists' Society of Riga*; he was elected an honorary member in 1920 and the chairman of the Society in 1921.

Kupffer's main scientific interests were plant taxonomy and biogeography. He investigated the factors determining the distribution of plants and developed ideas about the spatial gradients of their distribution. His monograph *Grundzüge der Pflanzengeographie des Ostbaltischen Gebietes*, published in 1925 is a very important source of information for plant biogeography. At the beginning of the 20th century, Kupffer studied the development of the flora and its history. He was particularly interested in floristic development after the glaciation and in the immigration of various plant species.

Kupffer collected and organised an herbarium of the East Baltic (currently Estonia and Latvia) flora. In total, the *Herbarium Balticum* contained 1200 species, of which 120 species were recorded by Kupffer for the first time in the region.

Kupffer was one of those who introduced nature conservation ideas to the public of that time. Kupffer's first visit to Moricsala Island in 1893 probably serves as a prelude to his nature conservation activities. He did not only botanical

studies, but also wrote about the necessity to protect rare plant species (e.g., Kupffer 1908). It was Kupffer who organised the first expedition to Moricsala Island in 1909 accompanied by different researchers of the *Naturalists' Society of Riga*. It was he who developed the idea about the nature reserve on Moricsala Island (Kupffer 1910). Having studied the flora and vegetation of the Moricsala Island for many years, Kupffer published a comprehensive geobotanical study of this area (Kupffer 1931).

The second man, Ludwik Franciszek Młokosiewicz (1831-1909), was a Polish explorer, amateur zoologist and botanist, who during his life studied the Caucasus Mountains. The biography given below is based on Internet articles of Pjotr Zgonnikov (Згонников 1990, 2010, 2011-2012) and Giga Chikhladze (2005).

Młokosiewicz was born in Warsaw, in an aristocratic family. At the age of twenty-two he joined the Caucasian Division of the Russian Army. During his military service Młokosiewicz created a regimental park at Lagodekhi, a small settlement in the foothills of the south-eastern slopes of the Caucasus in NE Georgia as well as started to explore the nature in Lagodekhi surroundings. At that time, a small garrison was stationed in Lagodekhi designed to repulse periodical attacks of Shamil's commandos. Legendary guerrillas of Shamil could shoot him many times travelling alone in local forests but never were in his way. The regimental park became the best Caucasian army park, perhaps the best in the entire Russian Empire. Młokosiewicz dispensed fruits and decorative plant saplings also to local inhabitants.

In 1861 due to his pacifistic view, Młokosiewicz resigned from the army and travelled south to explore the deserts of Persia. On return to Tiflis (Tbilisi), he was arrested as a suspect and sent into exile, to Russia. Thereafter, he left for Poland. Nevertheless in his motherland he felt miserable, missing the Caucasus. In 1867 he managed to get back, remaining at Lagodekhi for the rest of his life. He is a brilliant example of those people to whom *return to nature* became

as way of life. Mlokosievicz was a true follower of ideas generated by Jean-Jacques Rousseau and Lev Tolstoj. Born in an aristocratic family he lived the life of a modest peasant (and naturalist simultaneously). Together with his family he lived outside the village in a forest on foodstuffs grown in his garden and barn.

On his return to the Caucasus, Mlokosievicz was appointed as Inspector of Forests for the Signakhi District. Since then he devoted himself entirely to nature studies in the Caucasus. He travelled often, collecting botanical and zoological specimens and supplied foreign museums with them. Mlokosievicz became particularly famous after the discovery of Caucasian Black grouse *Tetrao mlokosiewiczi*, Eldar pine *Pinus eldarica* and Caucasian salamander *Mertensiella caucasica*. His other discoveries included yellow-flowering peony *Paeonia mlokosewitschii*, Lagodekhi gentian *Gentiana septemfida* var. *lagodechiana* and other endemics of the Lagodekhi Gorge. Over sixty new flora and fauna species were discovered by Mlokosievicz with many of them named after him.

Being a very enthusiastic field biologist, he was also self-effacing regarding the publishing of his discoveries. Mlokosievicz delivered a lot of his observations to other researchers. He has written small articles for local, i.e. Caucasian, magazines covering a lot of his broad interests: consequences of human interference in natural processes, nature friendly methods of forestry, catastrophic processes in nature, etc.

The merits of Mlokosievicz in nature studies were awarded with a Silver Medal of the *Russian Imperial Geographical Society*, and the Gold Medal of the *Paris Society of Acclimatization*. He was elected a correspondent of the Zoology Museum of the Academy of Sciences in St. Petersburg, a member of many scientific societies and institutions in Russia and abroad.

Mlokosievicz used his contacts for arguing about the need to protect nature of Lagodekhi Gorge. For example, as early as in 1889, Mlokosievicz wrote a letter to the Actual State Councilor of the Russian Empire Aleksander Aleksandrovich

Strauch, convincing him for need to protect Lagodekhi. He also invited many leading biologists of Russia to Lagodekhi and turned them into supporters of the idea for the nature reserve in Lagodekhi. Unfortunately he died three years before his great idea was actualized. Mlokosievicz died during his last travel for a study in Dagestan. Nevertheless the appeal of Mlokosievicz for protection of Lagodekhi Gorge was caught by other activists and institutions of nature conservation who managed at least to get moving the legal process of establishment of the protected area.

Overall, the ideas by certain researchers expressed already in the 19th and early 20<sup>th</sup> century significantly influenced the formation of the ideological platform for later (also contemporary) nature protection systems throughout much of the World.

## ROLE OF SOCIETIES AND SCIENTIFIC INSTITUTIONS

Looking to a modern perspective we can state that at the turn of the 20<sup>th</sup> century both scientific progress and wide involvement of the enlightened part of society had reached the level when individual initiatives in nature protection steadily turned into wide processes of establishment of protected areas.

More and more people joined the scientific community. Science went beyond universities as numerous natural history societies became active centres of scientific activity (e.g., Stradiņš 2012). In the Russian Empire among the first societies was the *Naturalists' Society of Moscow* (established in 1805), *NS of Riga* (1845), *NS of Dorpat* (nowadays Tartu) (1853) and *NS of St. Petersburg* (1868), *Societas pro Fauna et Flora Fennica* (1821), *Russian Geographical Society* (1845), *Russian Entomological Society* (1859). All societies usually produced their own magazines. For example *Naturalists' Society of Riga* (further in the text - NSR) regularly published the magazine *Korrespondenzblatt des Naturforscher-Vereins zu Riga* both with scientific articles and popular papers on actual issues.

Natural history societies promoted not only exploration of nature but within these societies ideas about the need for nature protection were incubated. Within *Naturalists' Society of Moscow*, for example, nature protection items became one of the topics of society meetings since 1905 (Бородин 1914, Иноземцев 1981). Worth mentioning is fact that among the honorary and corresponding members of the NSR were both Borodin and Conwentz (Anon. 1910a). One of the favourite destinations for expeditions of members of the NSR was Saaremaa Island (in German - *Ösel*). In 1909, having studied its nature already for several years, ornithologist Ferdinand Erdman Stoll and his companions met lighthouse-keeper Toom. They were impressed both by wildlife of the West-Estonian Archipelago and by activities of Toom. Therefore NSR established the biological research station in Western Saaremaa as well as started to support Toom and add to the Society's duties a rental contract of islets of Vaika in 1910 (Meder 1924, Stoll 1935, Rode 1937). This event is regarded as start of the Vilsandi Strict Nature Reserve (Куллапепе 1989), while NSR itself usually pointed to the establishment of the biological station as its main achievement there (e.g., Meder 1924). Also Borodin, who had visited the biological station for several times (Anon. 1913a), has not named the Vaika Islets as protected area in his paper (Бородин 1914). Nevertheless, in 1934 NSR appointed Tomm as its corresponding member on the occasion of the 25th anniversary of his initiative (Anon. 1934).

A similar strategy was used by the NSR also regarding Moricsala: it applied for the right to become legal possessor of the island. Besides, also in the case of Moricsala Island all started with research. In 1909 Kupffer organized an expedition of members of NSR to Moricsala. Later on the results of expedition were discussed in the meetings of the Society. There the idea was raised up to protect the Moricsala Island from cattle grazing and hay mowing as well as to establish a protected area where to carry out scientific research (e.g., Kupffer 1910).

The idea of the NSR to create a protected area on Moricsala Island was announced by its member,

another botanist Fjodor Bucholtz at the 12th Congress of Russian Naturalists and Physicians held in Moscow in late 1909 (Anon. 1910b). The idea at once was supported by Borodin when he gave the speech on need to protect areas interesting in botanical and geographical terms at the same congress (Meder 1924). Later Borodin supported the protection of Lagodekhi Gorge as well (Згонников 2010).

In 1911 due to activities of the NSR and active support of the St. Petersburg Academy of Sciences, the regulations were issued by the local Domains Board preventing the island from further exploration. Finally the Moricsala Island was put under the jurisdiction of NSR in 1912. One of the first activities of the NSR toward practical protection of Moricsala Island was elaboration of visitation rules of the newly created NR (Meder 1924). It was declared that visitation is allowed only with a permit issued by NSR (Anon. 1913b). The establishment of Moricsala NR, or *Die Naturschonstätte Moritzholm* as it was named by NSR, was highly approved by Borodin who emphasized that the NSR is the first society which moved from words to deeds (Бородин 1914).

One of the societies where ideas of creation of nature preserves in Russia were discussed much was the *Imperial Russian Geographical Society*. Under the auspices of this Society and on initiative and under the aegis of Borodin, the *Permanent Commission on Nature Preservation* was organized in 1912. The *Imperial Russian Geographical Society* has several regional branches including one in the Caucasus. Probably it was one of the most active branches supporting creation of protected areas. It had its own *Commission on Nature Preservation* and a special *Guardianship Committee* for establishing and running protected areas. During 1911-1914, thanks to activities of the Caucasian branch of the *Imperial Russian Geographical Society*, many protected areas were established (Анучин 1914, Бородин 1914, Zaikovs 1926, Shtilmark 2003).

Among them were Lagodekhi Gorge and groves of *Pinus eldarica* – both discovered and proposed

for protection by Młokosiewicz. Concerning Lagodekhi Gorge, the name of Nikolai Ivanovich Kuznetsov - geobotanist and professor of Dorpat (Tartu) University should be also mentioned. In 1910 and 1911 he made reports on Lagodekhi Gorge both to the Imperial Saint Petersburg Academy of Sciences and the Caucasian branch of the *Imperial Russian Geographical Society*. Consequently the Caucasian branch addressed an appeal to state administration of the Caucasus arguing to stop the delivering of the wood from Lagodekhi Gorge to local inhabitants and to recognize the area as a NR. It is known that in 1912 the application for establishment of a NR was accepted by the vicegerent of the Russian tsar in the Caucasus region (Бородин 1914, Згонников 2010).

It is also worth mentioning that in 1913 the 13th Conference of Russian Naturalists and Physicians took place in Tiflis (Tbilisi) and it was attended by Convetz who gave the speech there (Анучин 1914, Бородин 1914). In 1915 Anna Młokosiewicz, entomologist and the daughter of Ludwig Młokosiewicz, gave a report on Lagodekhi Gorge at the yearly meeting of the *Russian Entomological Society* (Згонников 2010).

In the beginning of 1920s new societies were established in the independent Latvia, among them the *Society of Natural Science Students of Latvian University* (1920), *Latvian Society of Biology* (1921), *Latvian Society of Geography* (1923) and *Latvian Society of Natural Sciences* (1923) (Buchbinders 1939). While societies of the 19th century united mainly Baltic Germans, members of the new ones came from Latvian intellectuals. Similar to the NSR, new societies of natural sciences also declared nature conservation as one of their activities. The *Latvian Society of Natural Sciences* started to publish a magazine about the natural sciences *Daba (Nature)* (e.g., Anon. 1926) which was more approachable for the Latvian public in comparison to the magazine issued by the NSR in the German language. New societies promoted not only studies of nature and raised public awareness on nature protection issues (e.g., Lancmanis 1922, Zaikovs 1926),

but also, in some cases, became managers of certain NRs. At that time protected areas, called as *dabas pieminekļi* - nature monuments, were under supervision of the Forest Department (Ministry of Agriculture). The latter had the right to put them under the jurisdiction of other state institutions, societies or even private persons (Anon. 1922). The NR Staburadze, for example, was put under the jurisdiction of the *Latvian Society of Natural Sciences*, and the Society had even established a special commission to develop nature conservation plan for this NR (Anon. 1926). Another NR, the Klaucēnu Lake was put under the jurisdiction of the School Museum of the Ministry of Education since 1924 (Siliņš 1930).

The NSR continued their activities also during the 1920s and 1930s and it repeatedly applied for reestablishment of its authority over Moricsala Island. However, at that time supervision of Moricsala NR was under the Ministry of Education (Anon. 1921, Meder 1924), most likely due to ideological reasons.

## NATURE RESERVES DURING THE POLITICAL SYSTEM CHANGES

The ideology driven by political power has significantly influenced protected areas in countries of former Russian Empire. Both the Moricsala and Lagodekhi NR as well as other protected areas of Latvia and Georgia have undergone the same course of historical events: collapse of the Russian Empire, era of the Soviet Union and its collapse, establishment of independent states, including two world wars, etc.

Development of the state system of *zapovedniks*, started during the Russian Empire, was continued steadily and with a lot of obstacles also in Soviet Russia, and later in the whole of the Soviet Union (Shtilmark 2003). According to Chikovani et al. (Чиковани и др. 1990), in the Lagodekhi Gorge the poaching recrudesced due to wars and the building of new states after the October (Bolshevik) Revolution in Russia in 1917. Most likely, illegal felling of wood also restarted as several villages are situated nearby

to the forested gorges and mountain slopes of Lagodekhi area. Demand for wood always was high there. The status of the Strict Nature Reserve was (re)introduced for Lagodekhi Gorge only in 1929 when Georgia was part of the USSR. Lagodekhi NR remained under the control of the USSR Agricultural Ministry until the late 1950s when it was put under the jurisdiction of the Socialistic Georgian Republic. During the Soviet era (until 1990) 14 strict nature reserves and five hunting reserves were subsequently established in Georgia (MEPNR 2010).

Moricsala NR luckily survived both World War I and shifts of political powers. Sarma (1958) has mentioned that plans to cut the forest of Moricsala Island were drawn during World War I, though was not carried out. After the war, uncontrolled visitation of the island started. At the same time the NSR - the guardian of Moricsala NR itself – was not able even to visit the island during 1916-1917 (Meder 1924).

In 1918, though the Republic of Latvia was proclaimed, the war was not over. The status of Moricsala Island as a protected area was re-established only in 1921 (Anon. 1921).

The system of protected areas existing in Latvia during 1920-30s was destroyed by the annexation of the independent state to the Soviet Union in 1940. For a long time nothing came place of these, probably due to World War II and to ideological attacks against the system of *zapovedniks* in the USSR.

It seems that World War II also did not directly affect Moricsala Island and Lagodekhi NR. This cannot be said about other protected areas: some became war zones and suffered from different military activities, others were used as sources for various resources. In most cases it was felling of forest, but for example in the Zhiguli NR at Volga River, even the oil was extracted (Shtilmark 2003, Кудинов 2007). In Germany, protected sea islands with waterfowl colonies were used for collection of birds' eggs, e.g., it is reported that at Island Schleimünde owned by *Jordsand Society* 20 000 eggs of gulls has been collected

in 1941 (Anon. 1941).

After World War II, i.e. in 1946 new regulations on forest management were issued by the government of the Soviet Latvia. The woodland of Moricsala Island was included in the so-called *first category forests* where management activities were very limited (Sarma 1958).

In 1951 as part of an ideological program to take control over nature, the system of protected areas was almost eliminated in the Soviet Union: 88 of the 128 *zapovedniks* were abolished, and the area of protected lands was reduced from approximately 12 600 000 ha to 1 384 000 ha (Ostergren & Shvarts 1998, Shtilmark 2003, Борејко 2001). Lagodekhi NR survived, but all other NRs in Georgia were abolished (Чиковани и др. 1990). Also Zhiguli NR was closed (Кудинов 2007). After the death of Stalin the system of *zapovedniks* steadily recovered, and even new NRs were established. Among them there was Moricsala Island which in 1957 obtained the official status of a strict nature reserve equal to other *zapovedniks* in the USSR. Two years later Zhiguli NR was re-established (Кудинов 2007).

By the year 1961 again 93 *zapovedniks* covering 6 300 000 ha existed (Ostergren & Shvarts 1998). However, in 1962 Khrushchev launched another attack on the system of protected areas in order to bring more land into economic production (Boreiko 2001). In 1964, after this re-organization, 66 *zapovedniks* protected 4 267 400 ha of land (Ostergren & Shvarts 1998). Lagodekhi and Moricsala NR survived, while e.g. Zhiguli NR was eliminated for the second time (Кудинов 2007). The system of *zapovedniks* again began to recover when Khrushchev was removed in 1964.

In the Soviet Union *zapovedniks* in general were regarded as etalons of nature where no human activities including the visitation, except scientific research, are allowed. However divergence from this approach is known not only during the war time and periods of reduction of *zapovedniks*. In 1934 new regulations were issued which envisaged definite functions of *zapovedniks*, in particular (re)acclimatisation of wild animals

and plants (Shtilmark 2003). In other words, the nature within *zapovedniks* had to be enriched by economically valuable species. For example in Zhiguli NR the sika deer, *Cervus nippon* were introduced from the Russian Far East in 1938 (Кудинов 2007).

As far we know both Lagodekhi and Moricsala NR did not suffer from such human intervention in nature. Though, it is worth mentioning that after establishment of Moricsala NR, it was considered to introduce therein such rare and endangered species as *Taxus baccata*, *Hedera helix*, *Ciconia nigra*, *Pteromys volans*, etc. Fortunately these ideas were refused (Kupffer 1910). At the same time undesirable “enrichment” of fauna has happened indirectly, e.g. North American raccoon *Procyon lotor* has invaded Lagodekhi NR (Giorgi Sulamanidze, pers. comm.), and the raccoon dog *Nyctereutes procyonoides* invaded Moricsala NR from the areas where these mammal species were introduced.

In the Russian Empire and later in the former Soviet Union the system of *zapovedniks* was developed not only as a network of protected areas: in almost every *zapovednik*, an administration was established with the purpose to ensure both its protection and scientific research. Such an administration for Lagodekhi NR was established already in 1947 (Чииковани и др. 1990), in Moricsala NR - only in 1979. In the case of Lagodekhi, its administration was running only particular NR. Moricsala NR was managed by the administration of Slitere NR in which responsibility were three *zapovedniks* in western part of Latvia.

The next political events which were reflected in the histories of both NR were the collapse of the Soviet Union and the re-establishment of independent Republics of Latvia and Georgia in 1991. While management of Moricsala NR as well as other protected areas in Latvia was not affected much by political events, this was not so for Lagodekhi NR. In Georgia, near-civil war and anarchy broke out. Poaching recommenced in Lagodekhi NR and the populations of tur, red deer, roe deer, chamois, brown bear and wild boar

were severely reduced (Anon 2012a).

In following years in both countries the Laws on Protected Areas System was adopted (in 1993 in Latvia; in 1996 in Georgia) and the systems of protected areas were reorganized. They were based on protected area management categories classification developed by the International Union for the Conservation of Nature (IUCN). By 2010 in Georgia, in addition to 14 strict nature reserves, there were also 8 national parks, 14 nature monuments, 12 managed reserves, and two protected landscape areas covering, in total, 7.16 % of country's territory (MEPNR 2010). In 2003 Lagodekhi NR was enlarged by 6 000 ha as well as divided in two parts with different management. The largest (22 266 ha) and former territory kept the status of strict nature reserve. The smallest (1 992 ha) southern part of NR situated as the strip between strict NR and adjacent villages is designated as a managed reserve. In addition, new functions – educational and recreational – have been delegated to the Administration of Lagodekhi NR (Anon. 2012a).

By 2012, in Latvia there were 681 protected natural areas. Of them four were national parks, 42 nature parks, nine areas of protected landscapes, 260 nature reserves, four strict nature reserves, 355 nature monuments and seven protected marine areas. In total, protected nature areas covered 11.3 % of the country. In 2004 Latvia joined the European Union scale network of protected nature areas. Altogether 327 territories (including Moricsala NR) were declared as Natura 2000 sites, i.e. part of the network (Anon. 2012b).

Despite all events listed above, both the Lagodekhi, and Moricsala NR have been oases of almost untouched nature for the whole period of their existence, i.e. a non-intervention regime was more or less ensured there. While in Lagodekhi in certain periods, especially during 1917-1929 and in the 1990s, its game fauna suffered from poaching, the Moricsala NR always attracted visitors. Sometimes visitation was so intensive that ground vegetation was influenced (Laiviņa & Laiviņš 1980). Nowadays the potential risk



from too much recreational activity exists in Lagodekhi NR.

## LEGAL MATTERS

Here we are presenting a retrospection on legal aspects behind the foundation both of Moricsala, and Lagodekhi NR. One hundred years is a quite long time period for historical memory. Not all developments have been recorded, not all documents are preserved and many facts have faded from our memory. Probably, some authors therefore named Moricsala (established in 1912) as the first nature reserve in the Russian Empire (Реймерс & Штильмарк 1978), while some others (Марков и др. 2009) named Kronotskij NR (1882), some (Shtilmark 2003) - Vaika Island NR (1910), some (Kronītis 1982) – Lagodekhi NR (1912). Usually private, regional and state protected areas are distinguished, and only those appointed by the state are recognized as legal ones. Nevertheless, even in the case of a state NRs there is no consensus: Inozemcev (Иноземцев 1981) names Suputinskij NR (current Usurijskij Zapovednik) as the first (1911), Gorjashko (Горяшко 2006) - Barguzinskij Zapovednik (1916), but Ostergren & Shvarts (1998) name Iljmenskij Zapovednik (1920) as the first state reserves in Russia.

Moricsala NR, of course, from its start was not a state *zapovednik* – there were no state-level decrees on its establishment. At the same time it was established on state owned land, and the NSR became only as manager of Moricsala Island. When the independent Republic of Latvia was proclaimed, soon its government started to establish protected areas and nature monuments. The Moricsala Island probably was the first one deserving attention of the new government. In early 1921 the regulations called *Rules for visitors of Moricsala Island* were issued (Anon. 1921). In its first paragraph it was stated that the Ministry of Education is taking Moricsala Island under its jurisdiction and proclaiming it as conservation area. The next year, i.e. in 1922 the government issued the regulations on forest preservation (Anon. 1922) giving legal bases to establish protected nature monuments including parks and

protected forests. This legal act can be regarded as the foundation of the system of protected areas in Latvia. The Forest Department of the Ministry of Agriculture was nominated as the governmental body responsible for the management of state owned nature monuments.

The Forest Department prepared and announced one-by-one the list of protected nature monuments. Moricsala NR likely became the only nature monument which was declared as protected twice. The first was regulations of the Ministry of Education in 1921; the second legal act was the 4th list of protected forests, nature monuments and parks accepted by government in January 24, 1924 (Anon. 1924). Moricsala Island was No. 20 on the list and was declared as protected forest and natural splendour. Nevertheless in the popular-science literature (e.g., Lancmanis 1922, Jansons 1936) it was called as *rezervāts* as the Latvian equivalent for Russian *zapovednik* (in English- strict nature reserve).

Taking into account only state level legal acts, the year 1921 should be regarded as the official birthday of Moricsala NR.

Regarding the Lagodekhi Gorge, it is known that in 1903 the state-owned land of this area was rented to the rich landowner E. Demidov for hunting purposes (Чиковани et al. 1990, Згонников 2010). Strict surveillance of the area was introduced and populations of game recovered in result. Moreover, almost no hunting occurred (Згонников 1990, 2010). Therefore Markov et al. (Марков et al. 2009) has named Lagodekhi as one of the first private reserves in the Russian Empire. Similar to Moricsala Island, Lagodekhi Gorge obtained the status of *state zapovednik* much later – in 1929 (Чиковани и др. 1990, Shtilmark 2003). According to Zgonnikov (Згонников 2010), it is not known whether Lagodekhi Gorge obtained any official status of protected area in the Russian Empire as happened, for example, with the grove of Eldar pine in Georgia. Borodin (Бородин 1914) pointed out that arguing for protection of Lagodekhi Gorge was successful. Anuchin (Анучин 1914) with the reference to the article (Сосновский

1913) of Dmitriĭ Ivanovich Sosnovskij – botanist and member of the *Commission on Nature Preservation* within Caucasian branch of the *Imperial Russian Geographical Society* – has pointed out that Lagodekhi Gorge was one of 6 already acknowledged sanctuaries (*zakazniks*) in the Caucasus.

Protected areas had a similar history elsewhere, too. For example the Norderoog Island (Germany) was created as a private bird sanctuary in 1909 when the society *Verein Jordsand* bought this island in the Wadden Sea (Watenmeer) for 12 000 German golden marks. Though it was recognized as an official (state) nature reserve only in 1939 (Wangering, Wilk 2007, Anon. 2012c).

Those events reflect the concepts of that time. As stressed in the EEA (2012) Report, in the 19th century initial steps toward creation of protected areas were led by private organizations and societies. Only by the early 20<sup>th</sup> century did the states start to play the leading role in establishment of protected areas as well as to fix their legal status.

In our opinion, the most important events were the moments when actions were introduced for actual nature protection on the site, no matter of their legal status. From this point of view we can state that Moricsala Island has lasted as a protected area since 1911 (when Domains Board issued Regulations), but Lagodekhi Gorge - since 1903 (when a private game reserve was established).

## RESEARCH

Protected areas are established due to different reasons. In the 19th century in Western/Central Europe, the monument preservation approach predominated, while in North America safeguarding of magnificent sceneries prevailed (e.g., Анучин 1914, Бородин 1914). In both continents, protected areas were already initially considered as important tourism resources. Development of tourism was one of driving forces for nature conservation there (e.g.,

Welzholz & Johann 2007). In the Russian Empire, according to Shtilmark (2003), two different courses in relation to protected areas emerged: creation of game reserves on the one hand and preservation of virgin etalons of nature with non-intervention management on the other hand. There were calls to establish *zapovedniks* of the etalon type in each geobotanical region to have the opportunity of studying untouched nature. According to Shtilmark (2003) and Kudinov (Кудинов 2007), in 1914 Vladimir Nikolajevich Sukachov, an active supporter of this approach, in his article on nature conservation in Zhiguli Mountains suggested not only to protect forests at the Samara bend of the middle Volga River, but also for the first time proposed to develop a programme of scientific research within nature reserve.

The NSR and Kupffer in particular had a similar approach. Moricsala NR was necessary as a site of scientific interest to carry out research. The following research directions were proposed by Kupffer (1910): hydrobiology of Usma Lake, chemical and physical properties of soils, flora and plant communities, fauna, distribution of different natural components (sedimentary rocks, soils, vegetation and animal species) as well as regular observations (according to current terminology - monitoring) of the status of flora and fauna.

Until the World War I, members of the NSR carried out quite intensive and broad research. When the Republic of Latvia was established, appeals were made to students and scientists to study natural monuments (Līdumnieks 1924). Despite the fact that there were few naturalists among Latvians at that time (Skuja 1939), the NSR, representing mainly people of German origin, was pushed aside from research on Moricsala Island most likely due to ideological reasons. It took time until Latvian naturalists began research there in the late 1920s.

At that time Kupffer also resumed his studies on Moricsala Island which turned into comprehensive review (Kupffer 1931), where data from him and other researchers were summarized. Within this

monograph, the lists of vascular plants, mosses, lichens and myxomycetes is given, maps of plant communities drawn and data on morphology of the island and chemical composition of the soils are summarized. At the same time, data on algae of the Moricsala Island (Skuja 1931) as well as on fauna, flora of vascular plants and mosses, and morphometry of Usma Lake (e.g., Ozoliņš 1930, 1931, Ozoliņa 1931) were published.

After World War II, research in Moricsala NR was resumed only in 1957 and it mainly covers studies on plant communities and soils (Аболинь и др. 1979) as well as on flora and fauna (Лайвиньш 1983).

Studies in Moricsala NR are ongoing also in the 21<sup>st</sup> century. Additional data on beetles (e.g., Barševskis et al. 2005), molluscs (Pilāte 2009), vascular plants (Rēriha 2007), mosses (e.g., Strazdiņa et al. 2011) and dynamics of woodlands (Brūmelis et al. 2011) have been summarized and published.

In sum, we can state that the research programme developed by Kupffer for the Moricsala NR in general is implemented. Of proposed research directions less attention has been paid to the mapping of different natural components and to monitoring of the status of flora and fauna.

Studies on fauna and flora of Lagodekhi were started by Młokosiewicz but, as pointed out above, he mainly conducted field studies and wrote relatively few scientific papers. He has not summarised his findings as Kupffer did it. Thorough faunistic and floristic studies of Lagodekhi NR resumed only in the 1930s.

As pointed out above, during the time of former USSR both the Lagodekhi NR and the Moricsala NR were managed by administrations whose duties included scientific research. Nevertheless, the most considerable input in research of both NRs and Moricsala in particular came from outside, i.e. by scientists not connected with administrations of the NRs. For example, regular vegetation studies of Moricsala Island were

carried out by the Forest Research Institute during 1972-1974. As of 2012, no more scientific staff was involved in the administration of Lagodekhi NR (Giorgi Sulamanidze, pers. comm.), nor in the Kurzeme Regional Administration of the Nature Conservation Agency responsible for management of Moricsala NR.

Here we just sketched the background and approaches for research in both protected areas. Extended overview on scientific research in Moricsala NR is given by Laiviņa & Laiviņš (1980, Лайвиня & Лайвиньш 1989), Laiviņš (Лайвиньш 1983) and Reihmanis (2009), but in Lagodekhi NR - by Chikovani et al. (Чиковани и др. 1990).

## NATURE CONSERVATION AND SCIENTIFIC IMPORTANCE

At the end of his monograph, Kupffer (1931) emphasizes the crucial importance of Moricsala as a strictly protected area. He points to three main points. Firstly, taking into account the fact that the island is surrounded by waters of Usma Lake and therefore the approach to the island is limited, the vegetation of Moricsala Island is relatively natural and untouched. Consequently the vegetation corresponds to the status of natural forests (*Urwald*), which is rare in Europe. Secondly, as processes on the island are relatively natural without direct human influence it is possible to observe the formation and development of different plant communities (grasslands, brushwood, forest) and changes in species composition. Thirdly, if long-term studies would be carried out on the relationships between plant species and community composition, the microclimate and soils of the site might be detected; plants are one of the best indicators showing mutual influence of biotic and abiotic factors.

In our opinion, both the aspects of importance and research directions pointed out by Kupffer are also topical nowadays. Brūmelis et al. (2011) emphasized that Moricsala NR provides an excellent reference area for future generations as natural hemiboreal woodland, and there have been very few studies on the dynamics of natural

broadleaved forest in Europe, probably due to lack of primeval forests of this type.

A somewhat different approach was offered by Jansson (2002). While for the largest part of island, natural development is recommended, in a smaller part of it clearings and grazing are prescribed to preserve light demanding species settled there before the nature reserve was established.

Currently, discussion among scientists is still open regarding whether or not intensification of activities of wild boars, beavers and cormorants should be allowable. In the management plan for Moricsala Reserve (Reihmanis 2009), regulatory activities to limit the influence of the above mentioned animals as well as management of meadows are acknowledged.

Lagodekhi is famous for its well preserved beech and hornbeam virgin forests. At the same time one of the most pronounced features of Lagodekhi Reserve is endemism. For example, 121 species of Lagodekhi flora are endemic to the Caucasus and 9 species are endemic to Georgia (Anon. 2012d). While fauna and flora of Moricsala Island were formed after the last glaciation, the Caucasus was a refuge for many species during the glaciations. It is one of the reasons why *Conservation International* has ranked the Caucasus among the planet's 34 most diverse and endangered hotspots - biologically rich regions (Mittermeier et al. 2011). Another leading nature conservation organization, the *World Wildlife Foundation*, has identified the Caucasus as one of the Earth's 25 biologically richest and most endangered terrestrial ecoregions (Myers et al 2000). High biological values of Lagodekhi NR designate it as one of the hotspots of this biologically diverse region.

## CONCLUSIONS

We can conclude that both Moricsala and Lagodekhi NRs were encouraging examples in the development of a system of protected areas both in Latvia and Georgia and, moreover,

in the entire Russian Empire. Being the first in these regions, now they are part of a wide network of protected areas. Thanks to their first discoverers, Kupffer and Młokosiewicz and numerous followers who ensured protection of both sites during last 100 years, they are still high value etalons of wild nature. Both Moricsala and Lagodekhi NRs certainly will serve as outstanding reference areas for future studies of our natural heritage.

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