

**Michel Batisse Award for Biosphere Reserve Management
Application form**

Please fill in and sign your application and mail it to your MAB National Committee/National Commission for UNESCO in your home country for endorsement. The MAB National Committee/National Commission will make a selection and send the country candidate to: MAB Secretariat, Division of Ecological and Earth Sciences, UNESCO, 1 rue Miollis, 75732 Paris Cedex 15, France. Applications must be received by UNESCO **no later than 30 September 2008 to be eligible. Only applications in English and French are accepted. Applications that are not endorsed by a MAB National Committee or a National Commission for UNESCO are not eligible for consideration.**

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8. Title of case study:

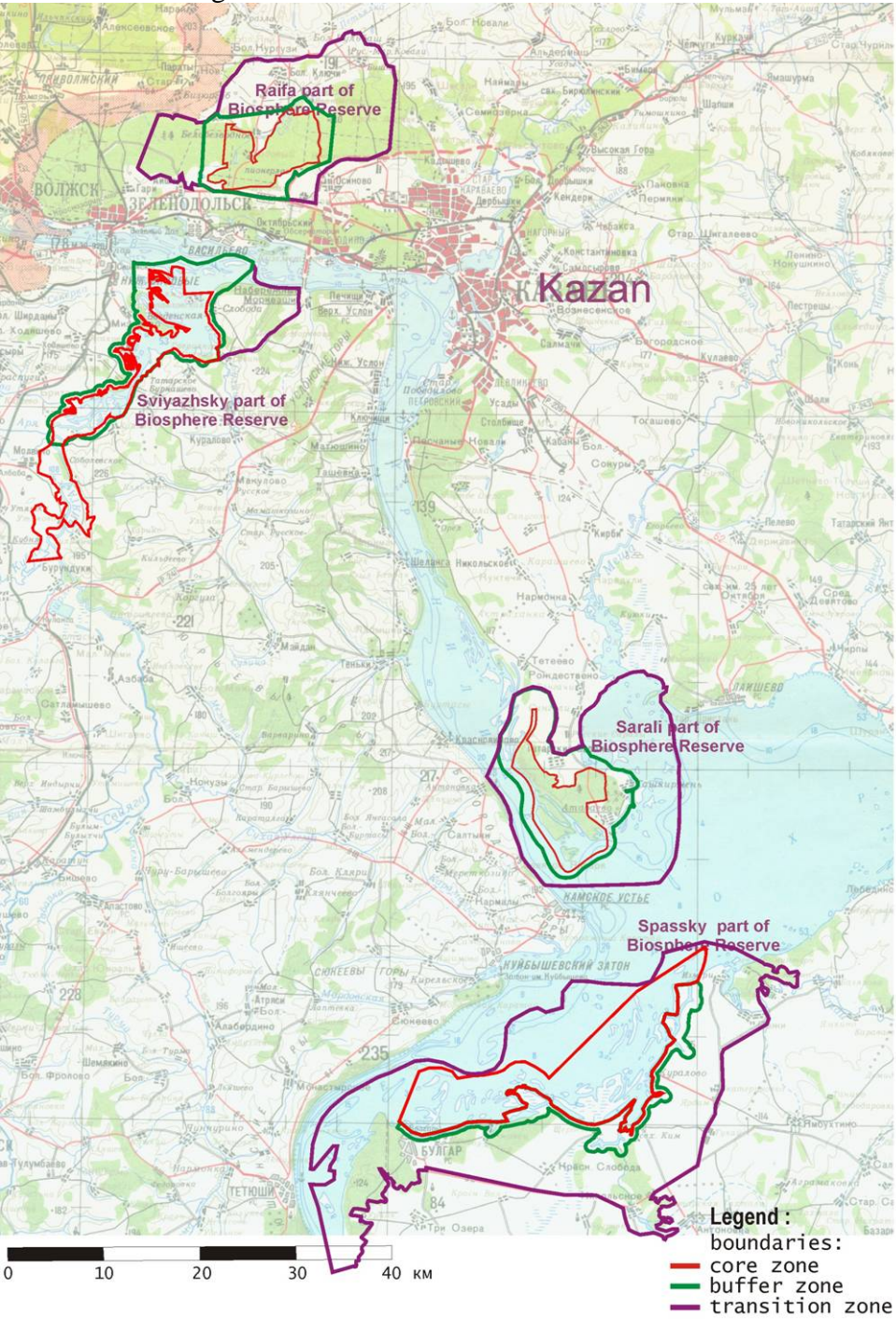
Nature management, conservation, restoration of biological and landscape diversity and social-economic activity in Great Volzhsko-Kamsky Biosphere Reserve.

9. Definition of a management issue/problem:

GVKBR is situated in the middle of the European part of Russia in the high-density population region – in Tatarstan Republic (the population density is 120 persons/sq. km), with highly developed industry and agriculture. Only 17 % of the region is covered by forest. The GVKBR consists of four clusters: Raifa Forest, Sarali Land between Rivers, Spassk Insular Archipelago, Sviyzhsk Wetland Area. All of them are not far from the capital of Tatarstan Republic - city Kazan (see map). In correspondence to the Seville strategy, all clusters have core area, buffer zone and transition zone.

The territory of the BR is distinguished for its biodiversity. The natural communities of coniferous, mixed, broadleaved forests, meadow steppes, herbaceous and sphagnum swamps, meadows and lakes together with the aquatic and semi-aquatic systems of the largest in Europe Kuibyshev Reservoir are present here. On the territory of the BR 900 species of higher plants, 180 species of mosses, 210 species of lichens, more than 800 species of macromycetes, 343 species of vertebrates were registered. The territory of the BR is the

mixture of areas, used by “wild nature”, agrocoenoses, intensive forestry, recreation, traditional forms of nature management.



Despite the severe anthropogenic press, the territories, which were not touched by people activity, were preserved in the region, in the first hand the clusters of GVKBR “Raifa Forest” and “Sarali Land between Rivers”. The territory of the “Raifa Forest” formerly, before the 20-ties of the XX c. belonged to Raifa Virgin Monastery. The intensive forestry on that territory was strictly forbidden. This is the reason that at present the Raifa forests are one of the oldest in the Eastern Europe. The uniqueness of the Raifa forests is also determined by following reason: these forests are some kind of the micro model of the East European forests, where the latitude zonation is imitated. Raifa part of the reserve has been the polygon for the nature study programs since the 80-ties of the XIX century. On the BR’s territory the history

and architectural monuments “Volzhskaya Bulgaria” (IX century), “Island-City Sviazhsk (XVI century) and “Raifa Virgin Monastery” (XVII century) are located.

The main problem of the core area and buffer zone of the “Raifa Forest” cluster is the erosion processes, which take place in the agrolandscapes located in the water-collecting basin. The sedimentations washed away from the fields, get into the BR’s rivers and lakes and cause their shallowing. Moreover, in spring the snow melts in the fields very quickly (compared with the forests), and the mass of water, as if in the tube, speeds away from the territory of the BR. The result is - landscape drying and boreal species disappearance. The Raifa cluster of the GVRBR has been undergoing subtle but steady changes in recent decades due to hydrological impacts. Sediment from upstream agricultural lands is causing the filling of lakes and bogs. The landscape is also drying, causing the loss of boreal species (biodiversity). The drying may be due to lower off-peak stream flows from forest conversion to agriculture, which could cause a drop in the groundwater level.



Result

Erosion processes



Forest dry out

The next problem is rational wildlife management in the transition area. The biggest part of this area is wetlands and islands, shallow lands, gulfs, bays of the Kuibyshev reservoir. The several waterfowls, snipes, muskrats, beavers, minks inhabit these biotopes. But the irrational agriculture management on islands and wetlands, trapping, limited the wildlife population productivity. From the other hand the high density of wild boar population has impact on the plants, including rare and endangered species.

The effectiveness of protection and management of the biosphere reserve is highly connected with interrelation with local community and administrative structures. The aim of this study is to develop and to realize the measures to solve the problems of nature management, conservation and restoration on the basis of landscape and wildlife population investigations, involving the help of public support.

10. Solution(s) and/or mitigation measure(s) identified:

To fulfill the waterflow and sedimentation monitoring on the lakes and rivers of the BR.

To analyze the depth and area dynamics of the BR's lakes.

To determine the critical points and volumes of erosion.

To develop and realize the complex of measures on optimization of water and wetlands ecosystems and protection all the boreal landscape.

To evaluate the factors, limiting the waterfowl populations, to develop and realize the plan of organization and biotechnical measures to increase the productivity its populations

To investigate the structure and productivity of muskrat population for its rational management.

To developed and realize the system of wild boar population regulation.

For increasing the ecological education activity to make the reconstruction of arboretum and nature museum, create the new visit-center

To increase the interrelations with scientific and education organizations, with local community and administration structures.

11. Methods, processes and approaches for implementing solution(s) and/or mitigation measure(s):

a). To increase the core area for improvement of the ecologic sustainability of the reserve's ecosystems in general.

b). To plant willow on the woodless areas along rivers for decreasing of the river-bed erosion.

c). To re-establish beaver populations; their dams will catch sediment, lengthening the life of lakes and bogs. The dams will raise the level of surface water which, in turn, will raise the local groundwater level and provide a mesic environment for declining populations of boreal species. Baseline information will be obtained from permanent plots, remote sensing images, and the reserve's records of lake measurements (Gorshkov et al., 1999).

d). To determine the waterfowls nesting density, to calculate the percent of nest destruction and to find out in quantitative indices the reasons of its destruction. To develop and realize the system of protection and biotechnical measures, directed on increasing the biological productivity of waterfowl populations.

e). To investigate the demography and spatial structure of muskrat population for rational management. We trapped muskrats and marked them by toe clipping at the beginning of the reproductive season. In addition females were labeled with the osteotopic radioisotope ^{45}Ca (half-life = 165 days). After this, animals were released at the place of capture. 142 individuals were marked by toe clipping and 63 females were radioactively labeled. At the end of reproductive season the mass trapping of muskrats was organized and all capture sites were mapped. 3522 individual muskrats were trapped and analyzed, and the bones of all animals were screened for presence of radioactivity. Radioactivity was found in 342 individuals from 49 family plots (Gorshkov, Pudovkin, 2002; Gorshkov, 2006 b).

f). To monitor the wild boar population dynamics and spatial structure; to investigate on experimental plots its influence on natural ecosystems and agricultural crops and to develop the regulation measures for optimization wild boar population density (Gorshkov, Gorshkov, Sarvarov, 2002 b).

g). To increase the interrelations with local community.

h). To strive for the additional support of GVKBR activity by administrative structures.

i). To extend collaboration with scientific organizations in biodiversity studies and in research of nature and social processes.

j). To create in BR the attractive objects for visitors.

k). To attract Raifa Virgin Monastery, located in the buffer zone, to GVKBR's activity.

12. Results and outcome:

a). The area of the Raifa cluster's core zone was increased on 2057 ha by the Resolution of Russian Federation Government. Due to that, the whole water basin of Ser-Bulak River, where boreal plants and animals concentrate, got under the special protection. The same situation is with the area of Sumka river's valley covered with forest.

b). More than 2 thousand willows were planted along banks of Sumka River. The young criminals from the Raifa correctional college took part in this action.

c). 21 beavers were released on the territory of Raifa cluster. After several years the beaver population increased to 90 animals. The beavers created around 40 dams. The investigations on the sample plots illustrated, that cascade of three dams during the high-water period stopped 4,3 tones of sediments, which constituted 55 % from the total amount of sediments (Gorshkov et al., 2002 a; Gorshkov, 2006 d). Every year 0,46 thousand tones of sediments fell into Raifa lake before beaver reintroduction; after reintroduction the amount reduced fivefold - to 0,09 thousand tones (Bakin, Gorshkov, Unkovskaya, 2003). This data illustrate the role of beavers' dams in the protection of BR's aquatic ecosystems. Besides, the areas of moist territories increased and it provided for the conservation of boreal species.

d). We registered 23 species of hunting waterfowl. 15 of them are nesting ones, others are met during migrations. The main factors, which limit the waterfowl's reproduction, are: the cattle grazing, machine haymaking, influence of predators, flooding of the islands and shores, due to specificity of the hydroelectric power station's regime. The changing water level of the reservoir is one of the major factors, which determine the population productivity. Just so, the water level rising during the nesting period causes flooding of the 5-21 % nests of waterfowls. Indirect influence of such hydro regime causes the reduction of the suitable nesting areas, when the water level rises. In this case, the density of nests increases and after that more nests are additionally ravaged by the predators. The waterfowl nests destruction from machine haymaking (Fig. 1) and cattle grazing is 7-8 % and 12-16 %, respectively. In general, the effectiveness of waterfowl reproduction is not high. The small ones are born only from 7-41 % of the nests. Meanwhile the biological productivity is 30-50 birds per 1 sq. km (Gorshkov, 2006 a; Gorshkov, 2006 d).



Fig. 1. The results of machine haymaking.

For intensification of the reproduction we developed and introduced the management plan, which included amendments of the time of cattle grazing and haymaking. The second measure was the introduction of artificial floating nests. In these constructions the nests of waterfowl are protected from flooding, cattle grazing, haymaking and predators. Testing of these artificial nests showed, that in the cause of existing density of nesting in natural conditions (30-70 nests/1 sq. km) and 50 % its inhabitation, 20 artificial nests replaced 100 ha of nesting areas (Fig. 2). The calculation shows, that on the experimental territory (nesting area - 1 thousand ha), 200 artificial nests can increase twice the waterfowl's population biological productivity. The outcome of practical introduction of our recommendation was the increase of waterfowl population's biological productivity on 42-47 % (Gorshkov, 2006 a; Gorshkov, 2006 d).

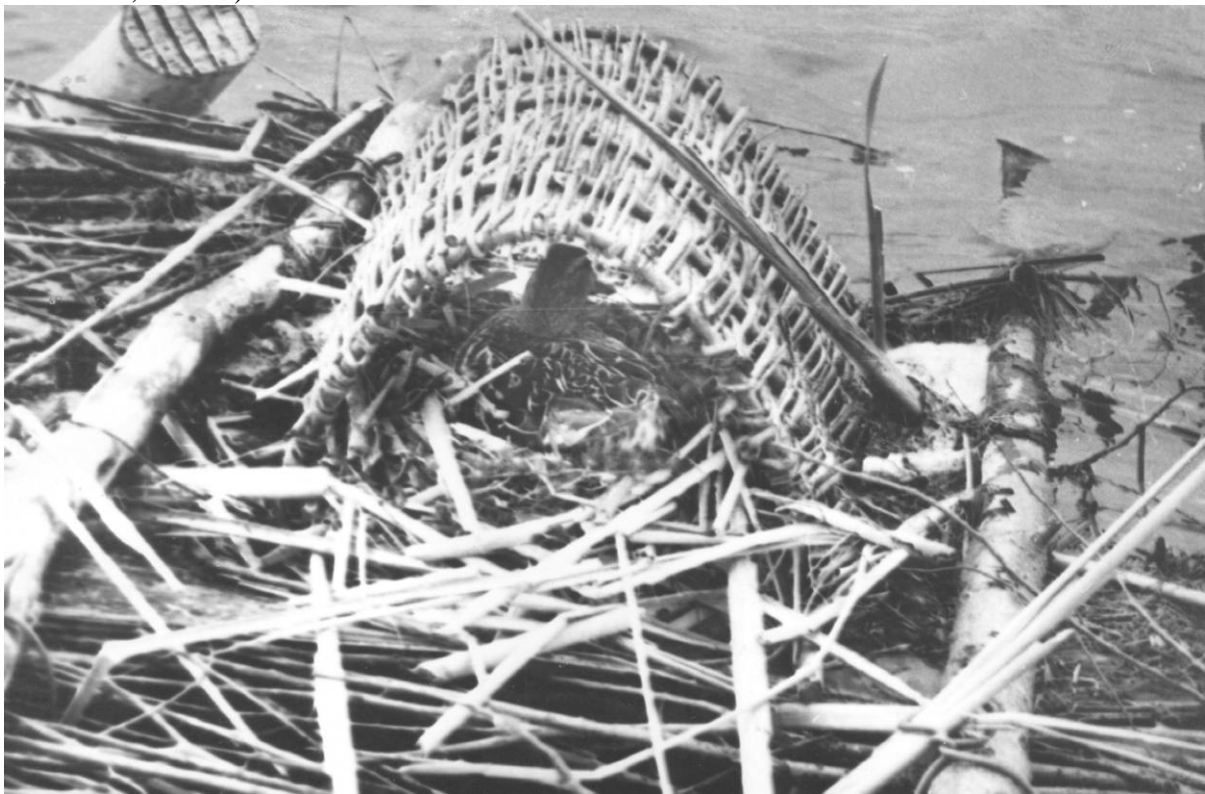


Fig. 2. Artificial floating nest

e). The results of the muskrat population spatial structure investigation showed, that in coastal area of the reservoir some biotopes provide for muskrats the optimal conditions, other – suboptimal conditions. The migration process took place in spring and in autumn. The muskrat population had a cyclical spatial structure, which is characterized by transformation of spring “mosaic” type of settlement into a “random” one; at the end of reproduction period. In autumn the process of transformation took the opposite direction. The population density at this period in the suboptimal biotopes decreases because the part of the animals migrates to the optimal biotopes. The probability of muskrat survival (Gorshkov, Pudovkin, 2002; Gorshkov 2006 b) is shown at the Fig.3.

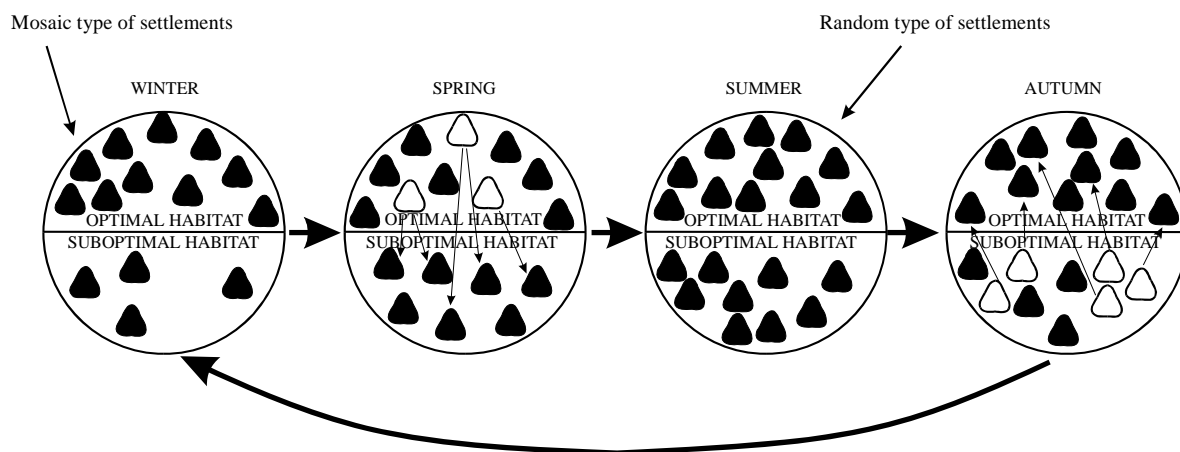


Fig. 3. Spatial structure of muskrat population

On the basis of this information we suggested to change the trapping tactics. Usually, the trappers first of all trapped the optimal biotopes and to the suboptimal ones migration of muskrats are lower, compared to the resident part of population, which occupies the optimal biotopes. For rational management of muskrat resources it is necessary to begin the trapping from suboptimal biotopes to reduce the muskrat potential elimination. Only later, the trapping must be performed in the optimal biotopes. The experimental muskrat trapping team, using this method, was the champion in the Republic muskrat-trappers competition during several years, without destroying of the population reproduction potential. We also determined the optimal quota for trapping, which is 60-75 % animals from their autumn numbers (Gorshkov, 2005).

f). Earlier, wild boar didn't inhabit the Tatarstan Republic, including the territory of modern biosphere reserve. In 1971 the introduction program was started. The size of the reserve's wild boar population grew up and sometimes the density reached 10 animals per 1 thousand ha. This situation was determined by several factors. On the reserve's territory the disturbance factor is practically absent. In winter – the most difficult period for wild boar population due to deep snow - the animals find good conditions in thick fir-tree forests. Also they have enough of the preferred food in the croplands with corn, wheat, sunflower, vegetables, which surround reserve's forests. However, numerous wild boar herds disturbed by their digging activity protected boreal plants; some other animal groups and limited the biodiversity, in general (Gorshkov, 2006 c). We began to approach this problem by negotiations with landlords. We suggested them to change the crops in the nearby to reserve fields, from wild boar preferred ones (corn, wheat, etc) to perennial grasses, which are not favorite forage for the wild boar. After few years of negotiations we got the consensus with landlords, the nearby to reserve's forests fields were sown by perennial grasses, the wild boar population density fell down to 3-5 animals per 1 thousand ha; also their harmful activity was decreased.

g). The contacts with the local communities strengthened not only by the ecological education actions, such as “March for Parks”, excursions to arboretum and nature museum, lectures and round tables, photo and art exhibitions, collaborations with mass-media and publishing activities but with the improving their livelihoods. For example, the reserve pump-house provides one of the villages with water without any charge for its inhabitants. The same situation is with the rubbish remove from near-by settlements.

All human activities are forbidden in the core area, except visits to natural museum and arboretum, but we give the special permissions to local people for gathering berries and mushrooms and for fishing in some parts of the reserve.

The large fur-factory, in the past located in the reserve's surroundings became bankrupt and now the reserve's administration employed the people, who were formerly working at this factory, for the arboretum reconstruction according to the signed agreement on the labor exchange.

The criminal situation in the nearby countryside is not very stable. Some incidents took place, such as robbery of the shop, hijacking of cars. The reserve rangers three times arrested the robbers and passed them to the police. Five rangers of our reserve received the certificates and the valuable presents from the Ministry of Internal Affairs. of Republic of Tatarstan. The local community is very thankful and supports the reserve staff activity in preventing criminal situation.

The administration of the reserve helps local population to overcome the bureaucratic barriers in contacts with regional authorities. If there is something wrong with the health of people, inhabiting the countryside, the reserve vehicles transport the sick person to hospital. Moreover, sometimes the reserve's carpenters make the coffins (free of charge) for deceased people from the poor families and provide the vehicles for burial.

As the reserve administration has an active position in contacts with local community, both local administration and population support the reserve activities. The reserve's administration initiated the ecological VIP club "Grey Woodpeckers" organization. This idea was supported by WWF Moscow office. According to the established rules the main directions of the Club activities are:

The development of balanced interrelations between people and nature;

Participation in planning and realization of the actions directed to nature conservation and the reserve development;

Participation in providing for conditions, aimed for comfort living in the transition area settlements;

Realization and defense of civil, economic, social and cultural rights of the Club members, promotion of their hobbies;

Development of other activities, which do not contradict the law.

The eligible members of the Club may be the male citizens, inhabiting the GVKBR's settlements, not younger, than 40 years old, wishing to solve the ecological and social problems inside GVKBR.

Today 16 persons are the members of the Club. They are: directors of the leading Kazan theatres, head of the monastery, judge, official of Kazan City Administration, artist, director of the large factory, director of the Raifa correctional college for young criminals, vice director of the building company, businessmen, colleagues and friends of GVKBR (all of them are living in the near-by to GVKBR settlements).

During 3 years activity the members of the Club tried to solve several problems in BR's social life. For example, they sponsored March for Parks and Day for Birds, provided for the New Year's celebration presents to children and old peoples. Moreover the Club sponsored natural museum's restoration, ranger service and security of BR staff. Besides the members of the club periodically hold the meetings in some sites of BR and visited the theatres in Kazan city.

h). The Earth Charter is very popular in the governmental circles of the Tatarstan Republic. In 2000 the president of the Republic declared that Tatarstan Republic is ready to be the experimental plot for the Earth Charter principles' realization. In 2001 the Tatarstan Republic Parliament adopted a resolution "About the project of Earth Charter". From this point with the support of government, parliament, ministries, NGOs the project "Tatarstan –

the territory of sustainable developing and Earth culture” started. Since the aims of MAB program and Earth Charter program coincide (Table 1) it is necessary to direct the activity of both Programs into one channel. This point was emphasized in the plenary presentation on conference “Earth Charter” in Kazan – 2007(Gorshkov, 2007 a). It is important to underline that at the present both programs interact at the level of joint activities of GVKBR and Ministry of Ecology and Natural resources of Tatarstan Republic.

“Agreement on collaboration to provide the effective development of Great Volzhsko-Kamsky Biosphere Reserve MAB UNESCO and to realize the principles of Earth Charter in Tatarstan Republic” between Ministry of Ecology and Natural Resources of Tatarstan Republic and GVKBR was signed. The subject of agreement is: landscape and biological diversity conservation, establishment of approaches, aimed to provide and develop the balanced interrelations between people and nature, participation in realization of Earth Charter principles in Tatarstan Republic. GVKBR interacts also with numerous institutions of Tatarstan Republic (Gorshkov, 2007 b) (Fig. 4)

Table 1. The common principles of MAB Program and Earth Charter

MAB Program	Earth Charter
Landscape, ecosystem, species protection	To protect nature resources for defending the life-support systems, biodiversity and nature heritage
Assistance in economic and social development, which is sustainable in ecological and cultural aspect	To aspire to economic and social truth, bearing ecological responsibility
Supporting the demonstration projects for ecological education, staff raising in the fields of nature protection, scientific research and monitoring	To provide the education possibility, which promote the sustainable development; apply scientific achievements in the process of sustainable development

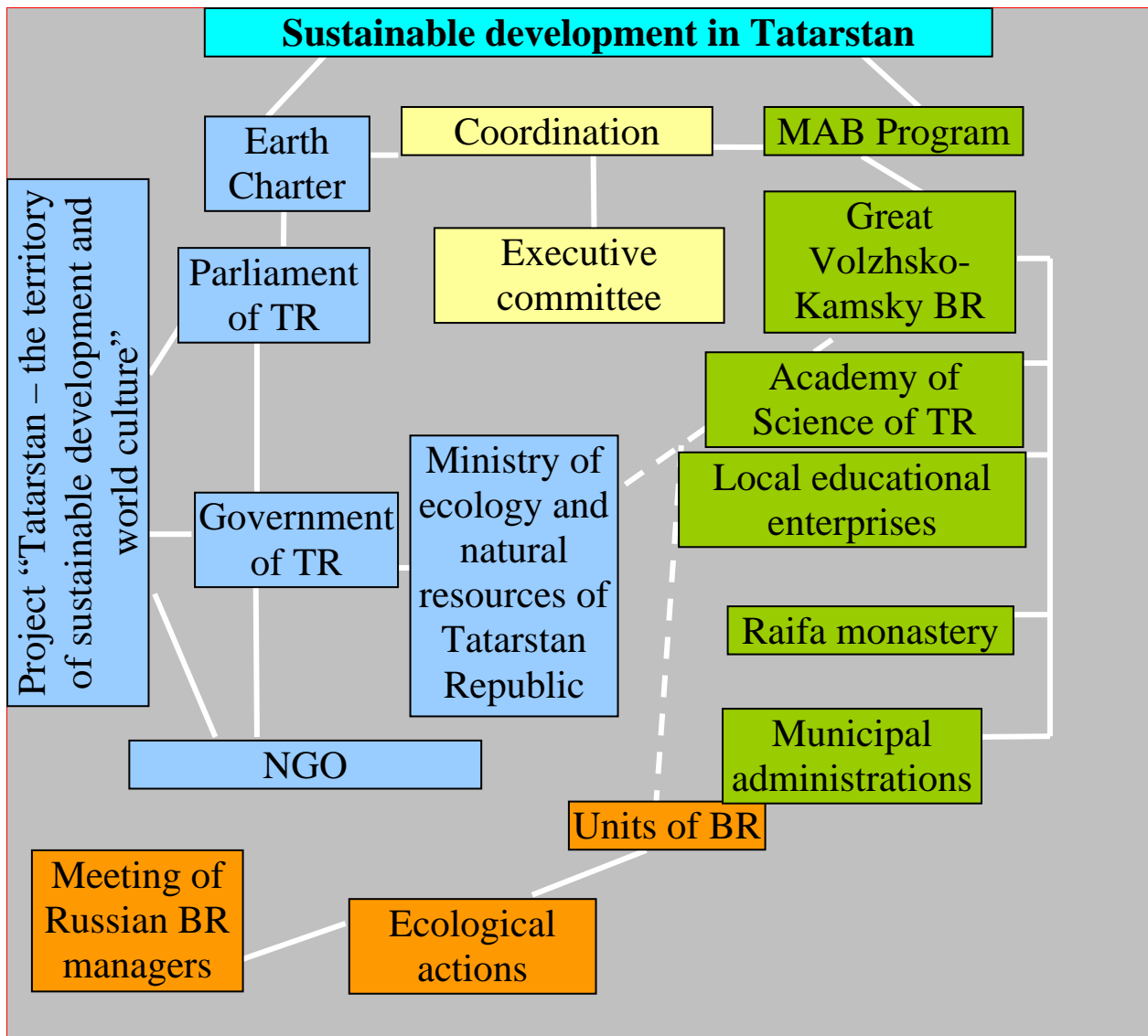


Fig. 4. The scheme of interaction between MAB UNESCO and Earth Charter programs in Tatarstan Republic

i). GVKBR made the collaboration agreements with Kazan State University (Ecology, Geography and Biology faculties), Tatarstan Republic Academy of Science (Institute of Ecology of Nature Systems), All-Russian Research Institute of Wildlife Management and Fur Farming, Institute of Global Climate and Ecology of Russian Climate Service and Russian Academy of Science (RAS), Institute of Volga Basin (RAS), Centre of Sociology Investigation (S.-Peterburg), Mittelbe Biosphere Reserve (Germany) (Gorshkov, 2006 c). The leading scientists of Kazan institutes are the members of GVKBR's scientific council.

j). For attracting the visitors we reconstructed BR's arboretum, where more than 500 species of exotic trees and bushes were collected and the Reserve's nature museum, where 36 biogroups are presented (Gorshkov, 2006 c), built the visit-centre (Company Coca-Cola sponsored the last project).

k). The collaboration agreement between Raifa Virgin Monastery and GVKBR was signed. The seminar of Russian and Byelorussian BR's and the First Euro-American beaver congress were held on the basis of GVKBR and Raifa Monastery. The nature protected posters are located near the monastery's walls, and the monastery performs the "green buildings" with the BR's help.

Below is the example of GVKBR and Raifa Monastery collaboration. Both the Volzhsko-Kamsky Reserve and the local country cemetery, which is located right at the boundaries of the core zone, faced the unexpected problem. Many illegal graves were made at the nearby territory, invading the area of the Reserve. Even the people from the cities of Kazan and Zelenodolsk were buried there. The reasons for that were, probably, the beauty of the countryside and the free ceremonies, as opposite from the city cemetery ones. The local community couldn't control the situation due to the lack of finances to hire the guards. The rangers of the Reserve, while stopping the illegal procedure, could get in a very complicated situation. The problem, indeed, was quite delicate. At that point we remembered that according to the church rules, only big sinners were buried outside the cemetery fence. We turned to the Head of the Raifa Monastery to help us solve the problem. After that the monks had prepared the special posts, reminding in their special style, how improperly was to be buried outside the territory, which had been blessed to be a cemetery and put them at all the entrances. Besides, the Monastery organized the special sermon at the cemetery, blessed it and put a big Cross at the central entrance. As a result the problem with the illegal graves was peacefully solved.

13. Comparison of results and outcome to those expected at the stage of the definition of solution(s) and/or mitigation measure(s):

Famous for his sayings former Russian Premier-Minister Victor Chernomyrdin used to say: "We wished as better, but it came out as always". We can not evaluate our results like that and we proud that we have thanks to MAB Programme and support of the local and republican authorities remarkable achievements.

14. Lessons learned:

The team of enthusiasts possessing professional knowledge may solve complicated problems.

Don't change the horses on the ford.

The eyes frightened, hands working.

During negotiation first of all it is necessary to show the benefit of your partner.

The work with wildlife populations is easier, than the work with people population.

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16. Annexes and supporting documents:

APPLICATION ENDORSED BY THE PRESIDENT/SECRETARY OF THE MAB
NATIONAL COMMITTEE/NATIONAL COMMISSION FOR UNESCO

FOR SUBMISSION TO UNESCO

(Date) (Signature of the President/Secretary of the MAB National Committee/National Commission for UNESCO)

August 19, 2008 _____



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