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RECREATIONAL USE OF LAKE SVITYAZ FORESTS

Is evaluated the state of forests near Svityaz lake, and also the degree of the recreational improvement of this territory. It is established that the vacationers more frequently use southwestern and north-eastern shores of lake. The greatest degree of recreational improvement is revealed on the grassy beach of southwestern shore and before the forest adjacent down it. More than half of forests (54.1%) of those utilized for leisure they relate down those strongly disrupted and those degraded, which is explained as far as the fourfold exceeding of recreational load. Recommendations up the restoration of the disrupted forest ecosystems are given.

Introduction. During the last decades in connection with the growth of urban population in Belarus and improvement of transport availability demand for service connected with recreation is increasing. Forest and water landscape play a considerable role here as well as nearby territories. Thus, if recreation demand on a forest landscape is high and stability of plant community and improvement grade is low there is a danger of stability violation and even degradation of natural ecosystems.

Lake Svityaz is very popular among holiday-makers and tourists. This natural object has a lot of characteristics that make him unique and promote big attractiveness:

- the lake is roundish by shape with gently sloping sand bottom, transparent water and practically similar level that make it suitable for family rest [1];
- rare plant species grow in the lake [1];
- connection with A. Mitskevich who devoted three writings to the lake and also a legend about its appearance and closeness to other historical places give historical importance to the lake;
- good transport availability;
- availability of some recreational infrastructure (beaches and some elements of beautification);
- forests surrounded the lake with old oak groves and spruce forests (average age is 170 years).

As an object for the research forest plants have been chosen which are used by holidaymakers at full. Forest areas directly border upon the lake and also a grass beach and a camping area relate to it.

The research of the conditions of forest ecosystems surrounded the lake and actively used for rest has been based on the current in the Republic regulations of recreational forest management [2]. For each territory degree of recreational digression has been established, class of sanitary assessment and plant formation development. Simultaneously, presence and condition of recreational elements improvement have been taken into account. Twice (20.07.2013, 04.08.2013) record of attendance of forests by holidaymakers was carried out [3]. For calculation of acceptable recreational loading indices developed by Gosstroy of BSSR together with BelNIIP of town building and BSU [4].

On the territory of “Svityaz” branch of the health resort “Magistralny” recording of holiday-makers has not been carried out. It also has been excluded from permissible load calculation.

Main part. Republican landscape reserve “Svityazyanskiy” was founded in 1970 to preserve lake Svityaz, unique landscapes near the lake, wild plants and animals related to the species from the Red book of the Republic of Belarus and also their sites.

Availability of transport rout near the lake provided intensive recreational usage of its coast line. The south-western, southern and less south-eastern coasts where access from the auto-road R5 (Baranovichi-Novogrudok-Ivie) is provided are used for the rest to the fullest extent.

Maximal number of holidaymakers is registered on south-western coast situated very close to the auto road P5. This zone has the highest level of improvement. A big part of improvement elements is situated at the grass (central) beach with two summerhouses on its territory, four changing cabins, garbage cans and a place for garbage containers, a table with forest furniture, pier connected by paths with summerhouses and the auto-road P5. In next to the beach plantations from the south there is a stationary toilet and a building of a rescue station. Along the auto-road P5 there are two free (one southerner and the other northerner the grass beach) and one paid guarded car park (opposite to the beach) for 1000 cars. On the other side of the road in the plantation there is a place for a camping area with shelters and summerhouses. In summer itinerant trade is organized near the beach. There are no elements of improvement on southern and south-eastern coasts.

Access road to the lake from the side of the village Miratichi (Korelich district) determines the second popular coast zone for recreation situated on eastern and north-eastern coasts. The level of improvement here is considerably lower. A narrow sand beach was formed because of decrease of water level in the lake. In thin forest stand borders upon the road there is a toilet, changing cabins and a bench. Parking of a small number of cars is possible.

Health resort is situated on the northern coast of the lake (area 12 ha, 84 places). Local recrea-

tional areas situated on the north-western coast and holidaymakers can go from the access road to the health resort. Western and north-western coasts are used for the rest to a lesser extent because of swamping and, correspondingly, worse forest passing ability. Holidaymakers can reach this area from the auto-road R5.

Coastal plantation has got street name plates on nature protection theme with information about the sanctuary and etc.

Total area of nearby forests actively used by population for rest made 22.2 ha. Camping area situated on forest covered lands occupies 3.7 ha.

Coastal plantation mainly represented by oak groves and spruce forests: mixed in terms of composition forest stands, single-storied and mixed in terms of age. Apart from oak and spruce compositions include birch, black alder, hornbeam, pine, asp, linden, maple and so on. Black alder spiraea or sedgy and birch forests sorrel, long-mossed and brooked-grass and also pine wood sorrel. Under the curtains of spruce sorrel forest and oak grove there is a camping area. Average age of oak groves is 170 years, of spruce forests – 120 years. Forest stand with density of 0.6–0.7 predominate and among oak groves – 0.4–0.6.

Examination of the condition of this territory revealed that practically along the whole territory of the lake there are areas with very damaged and deteriorated forest ecosystems (Table). Their total area makes 14 ha. Plantation on the territory of the camping area and nearby plantation are also very damaged.

Such areas are characterized by a considerable part of completely grassless territory and predominance of weeds and grain plants in live ground cover. Soil is very compressed here, almost all the trees have mechanical damage, many of them are stricken with disease and inhabited by destructive insects and their roots are often exposed. It can cause gradual dying off of sensitive to recreation European spruce and also very damaged trees of European white birch, common pine, European hornbeam and etc.

On deteriorated areas group-grassy glade complexes are formed where forest stand is represented by single units of more resistant common oak and live ground cover by weeds and meadow plants. If recreational loading remains at the modern level this will cause further simplification of the composition and destruction of the forest stands growing on the

coast of the lake. In heavily damaged plantations single cases of spruce, birch and maple young growth is registered. In damaged plantations natural regeneration has not been registered. A great number of bonfire sites are observed at the all areas.

Considerable part of forest ecosystems (11.9 ha) can be characterized as moderately damaged and slightly damaged. At this areas damage of forest stand is lesser and group regeneration of spruce, hornbeam and birch is observed.

In case of increase of recreational loading of this territory or long period of recreational exposure forest plant community can get the stage of heavily damaged.

Sanitary condition of forest ecosystems (Table) is mainly good (I or II classes) and only at some areas is satisfactory (III class). Deterioration of sanitary condition takes place because of gradual dying off of spruce, more rarely birch or oak. Sometimes insignificant pollution of the areas is observed. In general, dead trees are removed by Svityaz forestry employees on time. Travelling within the territory is either free in almost all the directions or limited by the density of undergrowth, the second story and rarely forest stand (Table).

In accordance with the detailed recording of visitors that was carried out on the western coast of the lake on summer Sunday (04.08.2013) with comfortable weather conditions about 7.5 thousand people were having rest (excluding the camping area) at the whole territory of the lake. On summer Saturday with uncomfortable weather conditions (20.07.2013) – 3.5 thousand of people. In summer period on Saturday with uncomfortable weather conditions number of holidaymakers (according to the Sunday survey) was more, i.e. on some days off over 7,5 thousand people visit the lake in summer.

Calculation of recreational loading taking into account occupied area by holidaymakers, type of forest and maximum permissible load [4] has shown that maximum permissible one-time load on this territory in summer period at the weekends with comfortable temperature for the rest («peak» days) makes 2080 people a day, including lands covered with forest (coastal forests and camping area) – 1580 people a day.

Thus, 2-4 times load abuse on the coastal area is observed that has already caused negative consequences.

Landscape characteristics of examined plantations

Index	Area on stages or classes, ha				
	I	II	III	IV	V
Recreational digression	–	9.8	2.1	7.6	6.4
Sanitary condition	6.3	16.7	2.9	–	–
Passing ability	18.6	6.7	0.6	–	–

Employees of Svityaz forestry parallel with communal services are responsible for forest management in coastal forests and rubbish removal. They are in charge of dying off trees cutting. From spring to autumn two waste attendants are hired by division of forestry for rubbish removal. Rubbish removal is carried out by communal services as often as containers are filled. At maximal recreational load on summer days off the number of waste attendants is not enough. Involvement of forestry employees into rubbish removal distracts them from their main responsibilities. In summer period daily duty of forestry establishment employees, militia (including SAI), Emergency Situations Ministry and nature protection inspectorate is organized.

To minimize negative impact of recreation on forest ecosystems and prevent plantation digression near lake Svityaz SFE «Novogrudok forestry enterprise» it is necessary to take measures on forming resistant to holidaymakers forest stand with dominance of oak, pine, birch, maple, ash, elm, linden, spruce, hornbeam and black alder. At this, natural substitute of degrading forest stand with local application, if necessary, assistance measures for natural forest regeneration are of a great importance. In case of necessity of natural environment recovery at some areas it is possible to use temporary restrictions of free access to them with putting warning plates and simultaneous realization of rehabilitative measures.

Conclusion. Lake Svityaz is ver popular among holiday makers. Holidaymakers more often use south-western and north-eastern coasts. The highest level of recreational improvement is observed on the grass beach of south-western coast and neighboring plantation. Over a half of the coastal plantation (54.1%), using for the rest, are related to heavily damaged and degraded that is explained by 2-4-times load abuse.

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