



## Current ecosystem processes in steppe near Lake Baikal

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The steppes and forest steppes complexes of Priol'khonie at the Lake Baikal (southern Siberia, Russia) were studied in this research. Recreational activity has a significant impact on the Priol'khonie region. During soviet time this area was actively used for agriculture. Nowadays, this territory is the part of Pribaikalskyi National Park and special protection is needed. As the landscapes satisfy different human demands there are many land-management conflicts.

The specific climate and soil conditions and human activity lead to erosion processes on study area. Sediment loads are transferred into the Lake Baikal and cause water pollution. Consequently, vegetation cover and phytomass play an important role for regulating hydrological processes in the ecosystems.

The process of phytomass formation and its proactive role playing on sedimentation and mitigate silt detaching by rill and inter-rill erosion are considered in the research as important indicators of the ecosystem functions for steppe landscapes. These indicators were studied for the different land cover types identified on the area because the study area has a large variety of steppe and forest steppe complexes, differing in the form of relief, soil types, vegetation species composition and degree of land degradation.

The fieldwork was conducted in the study area in the July and August of 2013. Thirty-two experimental sites (10 x 10 m) which characterized different types of ecosystem were established. The level of landscape degradation was estimated. The method of clipping was used for the valuation of above-ground herbaceous phytomass. The phytomass of tree stands was calculated using the volume-conversion rates for forest-steppe complexes.

For the quantification of transferred silt by inter-rill erosion in different conditions (vegetation, slope, soil type, anthropogenic load) a portable rainfall simulator was created with taking into account the characteristics of the study area.

The aboveground herbaceous phytomass of the steppe complexes varied from 0.4 to 2.64 t/ha. Apical stony and sloping grass-forb landscapes and areas of settlements and recreation facilities had the lowest values. Forest steppes were characterized by low crown density, non-large stand density, which was represented mainly by larch. Phytomass stock ranged from 30.78 to 282.24 t/ha. Maximum values corresponded to the forest steppe with larch on steep slopes.

The maximum values of the silt matter transfer (up to 124 g/m<sup>2</sup>) corresponded to areas with a strong recreation pressure with the lower value of vegetation cover (from 0 to 45%) and aboveground herbaceous phytomass (0.4 – 0.6 t/ha). During experiment with using rainfall simulator defined different sensibility to soil erosion, for example, for Caragana steppe with sagebrush on the undisturbed area trapped silt is 12 g/m<sup>2</sup> and for anthropogenic disturbed patch – 84 g/m<sup>2</sup>. For Sagebrush steppe trapped silt changed from 4 to 16 g/m<sup>2</sup>.

The study shows strong landscapes transformation leading to loss of biodiversity, the reduction of phytomass production and water percolation.