Studying the structure of pricopopulations and quality of seed seeds of bushes Ural river loan

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Abstract. The article presents the results of studying the species structure, abundance and quality of seed material of shrubs in the floodplain of the Ural River. The most frequently encountered species was Rosa majalis and Lonisera tatarica (the frequency of occurrence for both species is 63%), which remain viable after more or less prolonged flooding with flood waters and withstand their alluvial sleep. Rhamnus cathartica (53.6%) and Prunus spinosa (51.2%) can also be attributed to the number of commonly seen species. The least encountered species were Elaeagnus angustifolia, Euonymus verrucosa, Cotoneaster melanocarpus, Corylus avellana, Crataegus ambigua, which were found in only one type of forest. At the same time, germination, viability and high quality met standard quality indicators. Cerasus fruticosa seeds were characterized by the highest sowing qualities, the least - by Ribes nigrum.

1. Introduction

The protective role of floodplain forests growing in conditions of temporary flooding by spring or summer floods is to prevent the destruction of river banks, retain dead vegetation residues and mineral sediments carried by water, and accelerate the formation of high parts of the floodplain terrace. In addition, floodplain forests protect against floods, stabilize river flow, thereby protecting agricultural land. The increasing anthropogenic load in the floodplain of the Urals leads to the disruption of the formed natural complexes of floodplain forests [1, 2].

The shrub layer plays a huge role in the water protection function of floodplain forests. However, not all shrubs are able to withstand more or less prolonged flooding with flood waters and their alluvium falling asleep. The issue of restoration of floodplain forests is highly relevant. In this regard, an attempt was made to study the seed productivity of the most common shrubs of floodplains of economic importance.
2. Material and research methods

The study of floodplain shrub vegetation was conducted on the territory of the floodplain of the Ural River in the Ilek village - Skvorkino village (the length of the research route is about 2000 km).

The studied part of the Ural River valley (Ilek - Skvorkino village) is located in the zone of real (typical) steppes: fescue-feather grass poor grass steppes on southern chernozems, dark chestnut soils, chestnut soils and light chestnut soils, in the Yergenin-Zavolzhsky sub-province of the Zavolzhsko-Kazakhstan steppe province. The southern boundary of the fescue steppes passes, in the limits of the Ural valley, in latitude between the villages Yanaykin and Skvorkin. The floodplain of the Ural River is characterized by a combination of two landscapes - a forest and a meadow. Floodplain forests are represented by oak forests, elm forest, white poplar forest, sedge forest and willow grove. Aspen and birch are found in the northern part of the study area, forming small groves. You can also meet linden and alder there. The latter is found mainly in the mouths of the Ilek, Kindel, Yembulatovka and Bykovka rivers.

More than a hundred geobotanical descriptions have been conducted in various types of forests. The total length of geobotanical profiles was 18.6 km. Studies of trees and shrubs were carried out in the period from 2013 to 2018 according to generally accepted methods [3-5]. When defining herbarium material, perennial reports and determinants were used [6-10]. The nomenclature of plants is in accordance with modern requirements [10]. Used methods of systematic and geographical analysis taken at present [11].

The quality of seed material was determined according to state standards [12, 13, 14]. The germination, viability and purity of the seeds were determined.

3. Study of shrubs in the floodplain of the Ural River

The vegetation of the flood plain of the Urals is characterized by an unequal attitude to watering and alluviality. Under the conditions of an intensively expressed alluvial process of flooded flow-through drained habitats, the most flood-tolerant rocks settle on the freshly laid down alluvium. These include such tree and shrub species, which from a young age retain their viability after more or less prolonged flooding with flood waters and withstand their alluvium falling asleep. This group is represented by bush willows, wild rose. Poorly tolerant breeds (buckthorn, Tatar honeysuckle, hawthorn, etc.) at a young age do not withstand long-term flooding, but retain the ability to regenerate from the roots and root neck of the stem.

In addition to these factors, the distribution of vegetation from the river’s living channel to the native banks is influenced by changes in the mechanical composition of the soil, topography and groundwater level.

On heavy sediments of the riverbed floodplain, which are overfilled for a period of more than 60 days with a groundwater depth of -7 m, willows settle - almond willow (Salix triandra), basket osier (S. viminalis), shelyuga (S. acutifolia) and white willow (S. alba).

In the central floodplain, in conditions of moderately expressed alluvial process on floodplain, floodplain-sod soils, most of the floodplain forest types grow - willow groves, sedge forests, white poplar forests, elm forests and oak forests, which are distributed on different parts of the floodplain depending on the duration flooding. Fresh groundwater occurs at a depth of 1.5-6 m.

Depending on the type of floodplain forest, the range of species that make up the shrub layer differed significantly. The most frequently encountered species was Rosa majalis and Lonicera tatarica (the frequency of occurrence for both species is 63%), which remain viable after more or less prolonged flooding with flood waters and withstand their alluvial sleep. Rhamnus cathartica (53.6%) and Prunus spinosa (51.2%) can also be attributed to the number of commonly seen species. The least encountered species were Elaeagnus angustifolia, Euonymus verrucosa, Cotoneaster melanocarpus, Corylus avellana, Crataegus ambiguus, which were found in only one type of forest.

Data on the abundance of shrubs are presented in the table.
maple blackberry lily of the valley forest types were characterized by the almost complete absence of the shrub layer.

The abundance of species depends not only on the ability of plants to withstand adverse environmental conditions, but also the quality of the seeds that these plants produce. This indicator is important for reforestation. A study of the quality of seed material of economically valuable species of shrubs showed that shrubs had seeds with high rates of sowing qualities. Germination, viability and good quality met standard quality indicators. *Cerasus fruticosa* seeds were characterized by the highest sowing qualities, the least - by *Ribes nigrum* (figure).

**Table 1.** The abundance of shrub vegetation in the floodplain forests of the Ural River according to the Drude scale

| Forest type                      | Rosa majalis | Rubus cathartica | Prunus spinosa | Elaeagnus angustifolia | Spirae crenata | Ribes nigrum | Cerasus fruticosa | Frangula alnus | Crataegus sanguinea | Viburnum opulus | Chamaecytisus reticulatus | Amygdalus communis | Amygdalus communis | Amygdalus communis | Aldrovandia fasciculata | Cotoneaster melanocarpus | Cornus avellana | Crataegus ambigua |
|----------------------------------|--------------|------------------|---------------|------------------------|----------------|--------------|-----------------|----------------|---------------------|----------------|--------------------------|---------------------|---------------------|---------------------|------------------------|------------------------|----------------|----------------------|
| Willow blackberry grove          | sol          |                  |               |                        |                |              |                 |                |                     |                |                         |                     |                     |                     |                        |                        |                |                      |
| Black poplar willow blackberry  | sol          | sol              | sol           | sol                    |                |              |                 |                |                     |                |                         |                     |                     |                     |                        |                        |                |                      |
| Black poplar grove blackberry    |              |                  |               |                        |                |              |                 |                |                     |                |                         |                     |                     |                     |                        |                        |                |                      |
| Black poplar inermis grove       |              |                  |               |                        |                |              |                 |                |                     |                |                         |                     |                     |                     |                        |                        |                |                      |
| Black poplar reedgrass grove     |              |                  |               |                        |                |              |                 |                |                     |                |                         |                     |                     |                     |                        |                        |                |                      |
| Black poplar sedgy grove         |              |                  |               |                        |                |              |                 |                |                     |                |                         |                     |                     |                     |                        |                        |                |                      |
| Black poplar blackberry shrubby  |              |                  |               |                        |                |              |                 |                |                     |                |                         |                     |                     |                     |                        |                        |                |                      |
| White poplar blackberry forest   |              |                  |               |                        |                |              |                 |                |                     |                |                         |                     |                     |                     |                        |                        |                |                      |
| Elm-whitepoplar blackberry forest|              |                  |               |                        |                |              |                 |                |                     |                |                         |                     |                     |                     |                        |                        |                |                      |
| White poplar lily of the valley  |              |                  |               |                        |                |              |                 |                |                     |                |                         |                     |                     |                     |                        |                        |                |                      |
| White poplar shrubby forest      |              |                  |               |                        |                |              |                 |                |                     |                |                         |                     |                     |                     |                        |                        |                |                      |
| White poplar aristolochia forest  |              |                  |               |                        |                |              |                 |                |                     |                |                         |                     |                     |                     |                        |                        |                |                      |
| White poplar inermis forest      |              |                  |               |                        |                |              |                 |                |                     |                |                         |                     |                     |                     |                        |                        |                |                      |
| White poplar reedgrass forest    |              |                  |               |                        |                |              |                 |                |                     |                |                         |                     |                     |                     |                        |                        |                |                      |
| White poplar sedgy forest        |              |                  |               |                        |                |              |                 |                |                     |                |                         |                     |                     |                     |                        |                        |                |                      |
| Elm blackberry forest            |              |                  |               |                        |                |              |                 |                |                     |                |                         |                     |                     |                     |                        |                        |                |                      |
| Elm aristolochia forest          |              |                  |               |                        |                |              |                 |                |                     |                |                         |                     |                     |                     |                        |                        |                |                      |
| Forest type                                  | Rosa majalis | Rhamnus cathartica | Prunus spinosa | Elaeagnus angustifolia | Spiraea crenata | Ribes nigrum | Crataegus fruticosa | Frangula alnus | Crataegus sanguinea | Viburnum opulus | Chamaecyparis pyramidalis nana | Cotoneaster salicifolius | Corylus avellana | Crataegus ambiguua |
|---------------------------------------------|--------------|--------------------|---------------|------------------------|-----------------|--------------|---------------------|----------------|---------------------|----------------|-----------------------------|---------------------|------------------|----------------------|
| Elm lily of the valley forest               | sol          | sol                | sol           | sol                    | sol             |              |                     |                |                     |                |                             |                     |                  |                      |
| Oak-elm lily of the valley forest           | sol          | sp                 | sol           | sp                     | sol             |              |                     |                |                     |                |                             |                     |                  |                      |
| Oak blackberry forest                       | sol          | sp                 | sol           | sp                     | sol             |              |                     |                |                     |                |                             |                     |                  |                      |
| Oak viburnum-blackberry forest              | sol          | sp                 | sol           | sp                     | sol             |              |                     |                |                     |                |                             |                     |                  |                      |
| Oak nettle forest                           |              |                    |               |                        | sol             |              |                     |                |                     |                |                             |                     |                  |                      |
| Oak aristolochia forest                     | sol          |                    |               |                        | sol             | sol          |                     |                |                     |                |                             |                     |                  |                      |
| Oak lily of the valley forest               | sol          | sol                | sol           | sp                     | sol             | un           |                     |                |                     |                |                             |                     |                  |                      |
| Oak shrubby lily of the valley forest       | sol          | sol                | sol           | sol                    | sol             | sol          | sol                 | sol            | sol                 | sol            |                             |                     | sp               |                      |
| Oak nettle lily of the valley forest        | sol          | sol                |               |                        |                |              |                     |                |                     |                |                             |                     |                  |                        |
| Oak hazel lily of the valley forest         |              |                    |               |                        |                |              |                     |                |                     |                |                             |                     |                  |                        |
| Oak celandine forest                        |              |                    |               |                        |                |              |                     |                |                     |                |                             |                     |                  |                        |
| Aspen blackberry forest                     | sol          | sp                 | sol           | sp                     | sol             |              | sol                 | sp              | sol                 | sol            |                             |                     | sp               |                      |
| Aspen lily of the valley forest             |              |                    |               |                        |                |              |                     | sp              | sol                 | sol            |                             |                     |                  |                        |
| Birch-aspen shrubby lily of the valley forest|              |                    |               |                        |                |              |                     | sp              | sol                 | sp             |                             |                     |                  |                        |
Figure 1. Quality of seed material of bushes Ural river loan

4. Conclusion
Thus, under the conditions of anthropogenic impact on the ecosystem of floodplain forests of the Ural River (uncontrolled harvesting of wood, berries and mushrooms, the destruction of the grass-shrub layer as a result of recreation and grazing, and the extraction of dams and dams) occurs changing the species structure of price populations. Particularly acute impact of this effect on shrub and herbaceous vegetation. Formations Salix alba, Tilia cordata, Alnus glutinosa, Acer negundo are almost completely devoid of underbrush. The issue of renewal of the shrub layer can be solved by seed collected in the populus nigra, populus alba, ulmus laevis, quercus robur, populus tremula formations. The quality of seed of shrubs in floodplain associations fully complies with the requirements of state standards. The use of zoned seeds greatly increases the efficiency of the process of reforestation.

Acknowledgments
The studies were performed in accordance with the plan of research works Federal Research Centre of Biological Systems and Agrotechnologies of the Russian Academy of Sciences (No. 0761-2019-0004).

Conflict of Interest: Authors declares that they has no conflict of interest.

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