

between variables like area of damage, area and proportions of different types of forests and moose population were analyzed by fitting linear mixed-effects model with exponential spatial correlation.

Based on our analysis, the area of damaged seedling stands were best explained by moose population density and area of Scots pine seedling stand in the region. In addition, area of deciduous seedling stands and proportions of different age classes of forests seemed to have regionally varying effects on browsing damages. Results provide tools for analyzing role of moose damages in scenario analyses for future forest resources.

THE IMPORTANCE OF THE KOSTOMUKSHA NATURE RESERVE IN MAINTAINING THE NUMBERS OF GAME BIRDS

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The Kostomuksha Nature Reserve has been functioning since 1983. During these years, about 150 bird species (110 breeding species) have been registered here (Sazonov, 1997, 2015; Simonov, Matantseva, 2017; new data). Thirty-five of these species belong to the list of hunting resources of the Russian Federation (Federal Law No. 209-FZ of July 24, 2009 (with the amendments and additions of July 30, 2013, March 30, 2013) and are not included in the Red Data Book of the Russian Federation (2001) and Karelia (2007).

Following the researchers studying game animals in Russia (Fokin, Ayrapetiantz, 2005; Khrabryi, 2012), we have divided the game birds of Karelia, which have ever been noted in the reserve, into three groups according to their distribution, abundance, population stability, and relevance for people in Karelia and adjacent regions: 1) significant resources (high economic value, relatively high population size);

2) potential resources (not traditional game species, but can be accidentally bagged); 3) reserve resources (high value, but low numbers).

The following species could be attributed to the first group: *Branta leucopsis*, *Anser albifrons*, *Anser fabalis*, *Anas platyrhynchos*, *Anas crecca*, *Anas penelope*, *Anas clypeata*, *Aythya fuligula*, *Bucephala clangula*, *Lyrurus tetrrix*, *Tetrao urogallus*, *Tetrastes bonasia*, *Gallinago gallinago*, *Scolopax rusticola*. The second group includes *Gavia stellata*, *Gavia arctica*, *Mergus serrator*, *Mergus merganser*, *Vanellus vanellus*, *Tringa ochropus*, *Tringa glareola*, *Tringa nebularia*, *Actitis hypoleucos*, *Philomachus pugnax*, *Columba palumbus*, *Columba livia*. The third group consists of *Anas acuta*, *Anas querquedula*, *Lagopus lagopus*, *Pluvialis apricaria*, *Tringa erythropus*, *Xenus cinereus*, *Numenius arquata*, *Numenius phaeopus*, *Limosa limosa*.

The major importance of the reserve in resource species conservation relates to the birds of the first group, which reproduce on its territory. Particularly, special protection should be provided to such a rare subspecies as the Taiga Bean Goose (Western) *Anser fabalis fabalis*, which can breed here. The exceptions are the Barnacle Goose *Branta leucopsis* and the Greater White-fronted Goose *Anser albifrons* occurring in the reserve only in small numbers during migration. Despite the small numbers of birds from the second and the third categories, the reserve plays an important role in their protection by creating untouched and isolated from human disturbance nesting sites for rare species.

We also have a special task to estimate the role in the protection of these species provided by the inside parts of the reserve and its periphery boarding with the transformed habitats, particularly cutting areas. Now we are collecting materials on this topic.

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