

HOW LONG DOES THE EDGE EFFECT BY CLEAR-CUTS OF ASPEN FOREST LAST ON THE CARABID ASSEMBLAGES OF BIOLOGICALLY VALUABLE ASPEN FORESTS?

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A landscape fragmentation is one of the most relevant threats for forest biodiversity. The impact of forest fragmentation, probably, is particularly relevant in old-growth aspen forests because of their especially high biodiversity. Mainly, aspens of large dimensions and their dead wood provide the biodiversity of old-growth aspen forests regeneration of which is restricted by the current cutting age of aspens (31 year).

Estimation of the impact of clear-cut originated edge effect is required for the assessment of landscape fragmentation in aspen forests using, for example, ground beetles – generally accepted indicators of biodiversity. The aim of this work is to establish the clear-cuts originated edge effect on the ground beetle assemblages of old growth aspen forests and to determine changes in the zone width of the edge effect during forest succession.

The research was done in the Ābeļi and Nīcgale aspen forests in 2011 by collecting ground beetles with pitfall traps in 120 m wide zone of the edge among aspen stands of different succession stages. Totally 7974 individuals and 67 species of ground beetles were trapped. The edge effect was established by 16 carabid species – indicators for some of the forest succession stages.

The width of clear-cut originated edge effect changed together with the aspen forest succession after clear-cut. The edge effect affected the main part of the indicator species of clear-cuts thru the time when a young forest stand (5 – 10 years aged) was regenerated instead of an aspen clear-cut. For the indicator species of old-growth aspen forests, relevant and negative impact of the edge effect was noticed with a temporal delay when aspens were 15 – 30 years aged growing instead of a previous clear-cut. Then the zone of the edge effect was around 20 m wide in the direction from the edge to an old-growth forest. When aspen stand (40 – 55 years aged) had reached again the cutting age instead of a former clear-cut, the carabid assemblages of aspen forests did not confirm considerable impact of the edge effect.

For future researches of the forest fragmentation, saproxylophagous invertebrates could be potentially more useful to establish the clear-cut originated edge effect on old-growth aspen forests till previously clear-cut aspen stands have reached again the cutting age because saproxylophagous invertebrates are tighter related to old large dimension aspens and their dead wood. While ground beetles are affected by soil conditions and forest microclimate, and it seems that the conditions are renovating sufficiently in the aspen stands which have reached the cutting age after previous clear-cut. Therefore between those stands and old-growth aspen forests the edge effect was not relevant anymore.