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Työn nimi Arbetets titel – Title The effect of changes in the forest landscape to the occurrence of the Siberian jay ( <i>Perisoreus infaustus</i> ) in Ostrobothnia, Finland. (in Finnish)			
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Tiivistelmä Referat – Abstract <p>Based on satellite image interpretation and field work I analysed the status and changes in the South-Ostrobothnian forest landscape within the past two decades. I analysed and modelled which features of the landscape best explain the occurrence and reproductive success of the Siberian jay (<i>Perisoreus infaustus</i>) based on census and my landscape classification data, and propose how the area suitable for the Siberian jay has changed within the study period.</p> <p>The Siberian jay is a monogamous, sedentary bird, which prefers mature coniferous forests. It is also found in commercially managed forests of South-Ostrobothnia, where they inhabit 1–5 km<sup>2</sup> large territories. The populations have declined, possibly due to diminishing and fragmentation of old growth forests. The female lays 1–5 eggs in march–may. In South-Ostrobothnia, most of the juveniles do not leave their birth territory during their first summer. The territories that juveniles do not leave are of highest quality. By comparing them to territories not producing young it is possible to identify which landscape features might affect the success of the Siberian jay.</p> <p>The satellite images used were obtained with the Landsat TM5-sensor on July 20th 1987 and July 12th 2005. I converted the images into Finnish KKK 3 –georeferencing system and rectified them geometrically. I spectrally rectified the satellite image of 1987 to match that of 2005 with Histogram matching -method using unchanged areas as reference for the band-to-band regression. I classified the study area into three classes based on the field data gathered from 83 plots in June 2006. The classes were spruce dominated forests (at least 1/3 of canopy coverage spruce), other forests and open areas. For the Siberian jay, spruce dominated forests represent breeding habitat, other forests can be used for dispersal, and open areas are a dispersion barrier. The Kappa-values and percentage of plots correctly classified were 0.80 and 89 % for 2005, and 0.68 and 84 % for 1987, respectively.</p> <p>I studied the landscape structure and its change surrounding the feeders checked in 2005 and 142 random forest points with radii of 250, 500, 750, 1000, 1500 and 2000 m. I divided the feeders into four groups: those, where no Siberian jays were seen (N=442), those where only adults were seen (N=45), those with one juvenile (N=26) and those with at least two juveniles (N=17). I analysed the landscape surrounding the same points with the same radii also for the classified satellite image of 1987. I calculated various landscape metrics from the areas. All the feeders are situated near roads at 1–1.5 km intervals in spruce dominated patches, so they do not represent the average forest structure of the study area.</p> <p>Between 1987 and 2005 spruce dominated forests have diminished from 15.2 % to 12.2 %. The average size of spruce dominated forest patches has decreased from 2.0 ha to 1.4 ha and they have become more regular in shape. Open areas have increased from 22.3 % to 27.9 % of the study area. The landscape structure explains the occurrence and reproductive success of the Siberian jay. In particular the feeders with at least two juveniles stand out: they differ statistically significantly from random points in 15, from empty feeders in 12 and from adult feeders in three landscape metrics. Feeders with adult jays differ statistically significantly from random points in 13 landscape metrics and from empty feeders in six. Usually significant differences between the landscape analysis classes were found at radii of at least 750 metres although the differences between class means were often largest with smaller radii.</p> <p>I used binary logistic regression to model areas best suited for Siberian jays and their reproduction. Of the one explanatory variable models the amount of open area on 1500 metre radius best explained the occurrence of Siberian jays, whereas the best explanatory variable for the occurrence of at least two juveniles was the ln-transformed ratio of spruce dominated forests and open areas on 1500 metre radius. Several juveniles are found with 50 % chance in areas where spruce dominated forests are at least twice as abundant as open areas. Such areas have decreased in the study area 1987–2005 from 30 % to 12 %.</p> <p>As the areas suitable for reproduction decline, sink areas grow. The Siberian jay population in the study area is increasingly dependent on an ever diminishing amount of breeding pairs and the negative consequences of inbreeding may become common unless immigration continues.</p>			
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