

Red squirrel (*Sciurus vulgaris*) population fluctuation is related to climate change more than Korean pine seed production

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Tree ring width of Korean pine was measured to reconstruct the annual average temperature and precipitation in the past > 200 years in Liangshui Natural Reserve in Heilongjiang province. Based on the historic data of red squirrel population and Korean pine seed production, we attempted to investigate the relationship between red squirrel population fluctuation and climate change as well as seed production. Our results showed that tree ring width index (TRDI) was closely correlated with annual average temperature. Seed production of Korean pine trees was highly dependent on the average temperature and precipitation in the current year, especially in the spring and summer. We found that red squirrel population fluctuation was closely correlated to annual average temperature rather than Korean pine seed production. Our results revealed that climatic factors are more important than food availability in determining reproduction and survival of red squirrel population.

Keywords: red squirrel; population fluctuation; seed production; climate change