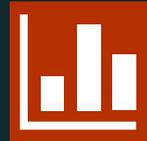


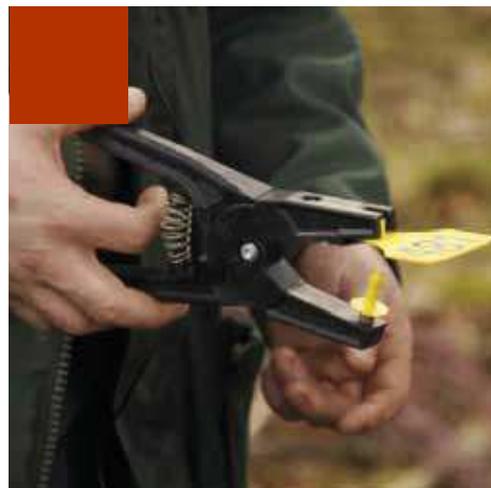
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Integrated management of invasive geese populations in an international context : a case study

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Growing breeding populations of geese exert a negative ecological, economic as well as social impact in Flanders and The Netherlands. These populations include invasive non-native greater Canada goose *Branta canadensis*, native greylag goose *Anser anser*, feral domestic goose *A. anserf. domestica*, mixed populations of wild and domesticated barnacle goose *Branta leucopsis*, as well as a number of non-native species like Egyptian goose *Alopochen aegyptiacus*, bar-headed goose *A. indicus* and magellan goose *Chloephaga picta*. The EU co-funded Interreg IV-A project INVEXO (www.invexo.be) (2009-2012) focused, among others, on the management of native and non-native summering geese. The general aim was to develop an integrated, sustainable management in favour of both biodiversity, agriculture and the recreational sector. The approach combined efforts on prevention with ethical management methods and a clear communication to different the stakeholders and the public. Management measures intervened on reproduction (pricking eggs) and on the number of birds (culling trough moult capturing and shooting). Measures were implemented opportunistically in space and time, resulting in a mixed, diffuse deployment throughout the project area. Limitations in the scientific follow-up did not allow to discern the effectiveness of separate management measures. However, the combined management efforts were closely monitored and their overall impact was assessed by annual counts of the summering geese populations in the region using a fixed sample of counting areas. The census showed greylag goose to be the most common species, followed by greater Canada goose, Egyptian goose, barnacle goose and feral goose. Trends in the average number of geese per municipality and per year were modelled using Generalised Estimating Equations (GEE GLM). The analysis showed a significant decrease in the number of Canada goose since the beginning of the project (2010 versus 2011 and 2012 respectively). It was unclear which population response (e.g. dispersion, reproduction) was responsible for this decline. When the province of east-flanders, where moult captures were applied most intensively, was considered separately, a significant yearly decrease was noted. Moreover, incorporating the number of Canada goose caught with moult captures as a fixed effect in the GEE model, showed a significant effect of caught numbers on modelled estimates. Although suggesting a link between moult captures and population numbers, this approach would assume other management efforts to be evenly applied and distributed over the project area, which was not the case. Moreover, the number of geese in the entire area hardly decreased in the last year of the project. Recent research indicates that Canada geese disperse over large distances within Western Europe, blurring a possibly significant effect of a local action over the years. For other species no trend could be detected. Future work will include dynamic population modelling to estimate the combined effect of management measures, as well as thorough monitoring of geese populations as the basic elements of a sound adaptive management plan for geese in the region. In addition, this approach requires continuous dialogue between partners and stakeholders. In this respect, the Invexo project has provided a strong impulse.