

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

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Impact scoring for established non-native birds in Europe has shown Canada goose (*Branta canadensis*) to have the highest environmental, economic (agricultural damage) and social impact. Among the ecological effects are overgrazing, fouling, trampling of vegetation such as reed beds and meadows, bioturbation of oligotrophic fens and pathogen transmission. Management of invasive geese in the region (western Flanders, eastern Flanders, Zeeuws-Vlaanderen) was, until recently, mainly done by egg pricking and hunting. Within the framework of the EU co-funded Interreg projects Invexo and RINSE, the coordination of egg pricking and hunting was enhanced and additional moult captures (n=131) were performed on a larger cross-border scale. Moult captures were very successful for Canada geese, with a total of 7829 caught between 2010 and 2013. Greylag geese (*Anser anser*), although comparable in density, tended to move away from catching sites during the moulting season. In relation to density, catch success for feral goose (*Anser anser* f. *domestica*) was high. Barnacle geese (*Branta leucopsis*) moult later and were therefore only caught in very low numbers. The reported numbers of Canada geese culled by hunters also increased in the same period with over 7000 birds shot per season. The overall impact of the combined management efforts was assessed by annual simultaneous counts of the geese populations in the region using a fixed sample of counting areas. Trends in the average number of geese per municipality and per year were modelled using gee-GLMs. This showed a significant decrease in the number of Canada and feral goose since the beginning of the project. In east-Flanders, where moult captures were applied most intensively, a significant yearly decrease was noted. Here, the modelled decline was in line with the trend in the absolute numbers of Canada geese which showed a 40 % reduction since 2010. For the species caught in high numbers, the impact was significant over four years, and related to catch effort. Although this approach suggests a link between moult captures and population numbers it also assumes other management efforts to be evenly applied over the project area, which was not the case. When analysed on a larger geographical scale, the number of geese in the entire area hardly decreased in the last year. Recent research indicates that Canada geese disperse over large distances within Europe, blurring effects of a local action over the years. Goose captures were performed within the EU co-funded Interreg Invexo (www.invexo.eu) (2010-2012) and the Interreg 2Seas project RINSE (www.rinse-europe.eu) (2012-2014), which seeks to improve awareness of the threats posed by INNS, and the methods to address them. Future work will be to upscale management and implement adaptive management backed by population models and thorough monitoring. This requires continued investment in prevention, awareness raising and generating public support. At short term, if the result of these actions is to be maintained after the Interreg project RINSE finishes, there is an urgent need for institutional coordination, formalised cooperation between stakeholders and structural funding of this initiative.