Seabird on islands: general overview and a case study

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Abstract

We first make a review of what is known on the impacts of seabirds on islands (on soil, vegetation, invertebrates,...) and on adjacent marine habitats. We will then show how biological invasions (especially by introduced mammals like rats or cats), by reducing the number of breeding seabirds, can have cascading effects on an entire ecosystem. We present some clear evidence that island restoration projects consisting of eradicating introduced mammals not only benefit to seabirds but also to other seabird-driven interactions and components. In a second part we present the ecological changes (including native biodiversity recovery) observed on Tromelin Island 13 years after rat eradication. The study concerns seabird and vegetation monitoring as well as the study of the ecology and impact of mice (another introduced mammal, that we failed to eradicate). Overall, the seabird community changed drastically in terms of number of breeding species (from 2 species at the time of rat eradication in 2005 to 6 species in 2018) and in terms of bird numbers (from less than 300 breeding pairs to more than 3000 breeding pairs). Meanwhile, the vegetation changed in term of plant abundance, coverage and diversity. Other major factors like soil structure, climate and marine influences very clearly shaped the organization of the vegetation. Mice were very abundant and fed mostly on plants and insects. Recent observations suggest however that some mice may have changed their foraging behavior by attacking chicks of masked boobies. Based on these findings we built a conceptual model showing the interactions and retroactions between the various components of this naturally simplified island ecosystem (marine habitats, soil, climate, vegetation, introduced mammals and seabirds) and made some recommendations in terms of island restoration and management.

Keywords: island ecosystem dynamics, biological invasions, ecological restoration, plant – animal interactions

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