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THE LARGE-SCALE REMOVAL OF MAMMALIAN INVASIVE ALIEN SPECIES IN NORTHERN EUROPE.

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The eradication of mammalian invasive alien species (IAS) is increasingly used as a management tool. Numerous examples exist of successful eradications, typically from small islands (<10km²), but there are also a few examples from more extensive areas. This paper reviews large scale mammalian IAS removals from Northern Europe (Great Britain (GB), Ireland and Belgium), drawing on 14 large programmes undertaken since the 1930s, of which 12 (86%) were considered successful, a similar rate to that observed on islands. They include five geographically distinct muskrat eradications, coypu, Himalayan porcupine, Pallas' squirrel, two grey squirrel programmes of which one was unsuccessful, and four American mink programmes, of which one failed. In each case the control was primarily based on the daily checking of static traps. The cost of eradication was best predicted by area, with the number of animals removed adding only a modest improvement to the estimate. The cumulative cost of removal increased with geographical area whilst the cost per unit area decreased; similar relationships to those previously described from island eradications. Crudely, a doubling of area controlled resulted in a 10% reduction in cost per unit area, although there was no evidence that cost-effectiveness had increased through time. Reviewing these programmes, three different objectives were apparent, true eradication; complete removal to a barrier or buffer zone with ongoing control to prevent recolonization; and local control to limit damage or spread. Large-scale programmes bring challenges of scale, uncertainties around costs, the definition of their objectives and confirmation of success, a need to improve efficiency and different considerations for managing the risks of recolonization. The costs of such large scale programmes may be reduced by novel technologies or increased use of volunteer effort. The high costs support the rapid response to new invasions as best practice to reduce the environmental, financial and welfare costs of such large scale control.