ARPHA Conference Abstracts 9: e202244
doi: 10.3897/aca.9.e202244

OPEN ACCESS

Conference Abstract

Costs and scale in invasive species eradication: A global synthesis across taxa and methods

Pete Robertson[‡], Ben Rowland[‡], John Kean[§], Aileen Mill[|], Steven Rushton[‡], Riccardo Scalera[¶], Orsi Toth[#]

‡ Newcastle University, Newcastle, United Kingdom
§ NZ Inst for Bioecon Sci, Hamilton, New Zealand
| Newcastle University, Newcastle upon Tyne, United Kingdom
¶ Roma Tre University, Roma, Italy
# Hunvati utca, Budapest, Hungary

Corresponding author: Pete Robertson (peter.robertson@newcastle.ac.uk)

Received: 01 Jun 2026 | Published: 17 Aug 2026

Citation: Robertson P, Rowland B, Kean J, Mill A, Rushton S, Scalera R, Toth O (2026) Costs and scale in invasive species eradication: A global synthesis across taxa and methods. ARPHA Conference Abstracts 9: e202244. https://doi.org/10.3897/aca.9.e202244

Abstract

Effective management of invasive alien species (IAS) requires robust estimates of the costs and feasibility of eradication in different contexts. We compiled a global dataset of 301 successful IAS eradications for which both cost and spatial extent were available, spanning multiple taxa, environments, and geographic regions. We examined how eradication costs scale with area and assessed the influence of taxonomic group, control method, and geographic context.

Across all cases, eradication cost increased strongly with area, with area alone explaining over half of the observed variation (Fig. 1). The relationship was consistently sub-linear, indicating pronounced economies of scale whereby cost per unit area declined as project size increased. Incorporating taxonomic group and control method substantially improved model performance, highlighting the importance of biological and operational differences among eradication programmes. In contrast, island versus mainland context, eradication duration, and completion year did not significantly improve explanatory power once area and taxon–method effects were considered.

© Robertson P et al. This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

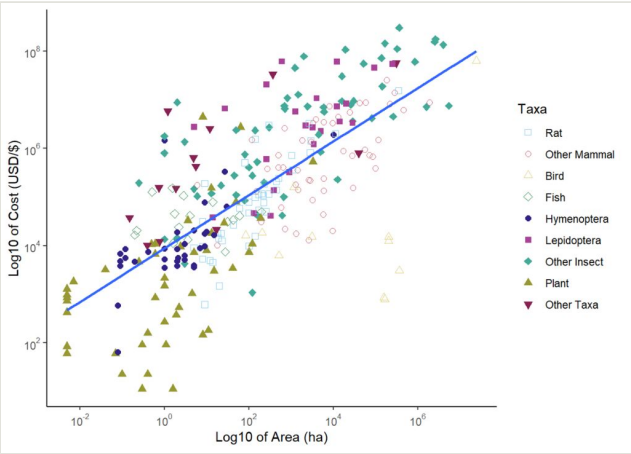

Figure 1.

Relationship between the area over which an eradication was conducted and the total cost.

Analysis of cost per unit area confirmed that larger programmes were more cost-efficient, despite higher total costs. Examination of the distribution of eradication areas by taxon-method reveals highly skewed patterns, with most interventions occurring at relatively small scales but a small number of large-scale programmes demonstrating that eradication is feasible over much larger areas under certain conditions. These observed maxima provide “realised feasibility envelopes” for each taxon-method that can inform expectations for future interventions.

Although results are subject to biases in reporting and data heterogeneity, they demonstrate that simple scaling relationships—augmented by taxonomic and methodological information—can provide useful, order-of-magnitude estimates of eradication costs. These findings offer a quantitative foundation for prioritisation and resource allocation, supporting more effective and efficient IAS management under global biodiversity targets.

Keywords

invasive species, eradication, cost, management, scale.

Presenting author

Aileen Mill

Presented at

Neobiota 2026, the 14th International Conference on Biological Invasions

Acknowledgements

With thanks to the European Commission who funded part of the data collection for this research through the contract with IUCN 07.0202/2017/763436/SER/ENV.D.@ “Technical and scientific support in relation to the implementation of regulation 1143/20147 on IAS. The EU keeps worldwide ownership of the results of this contract. JK's contribution was supported by AgResearch through the Better Border Biosecurity (B3) collaboration. We also acknowledge the helpful advice and comments on the manuscript from the DIISE team.

Grant title

IUCN 07.0202/2017/763436/SER/ENV.D.@ “Technical and scientific support in relation to the implementation of regulation 1143/20147 on IAS, Better Border Biosecurity (B3) collaboration

Hosting institution

Newcastle Univeristy

Author contributions

Peter Robertson was responsible for the concept, all authors contributed data, assisted with analysis and commented on the manuscript

Conflicts of interest

The authors have declared that no competing interests exist.