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TOWARD A EUROPEAN INFORMATION SYSTEM ON INVASIVE ALIEN SPECIES IN EUROPEAN ISLANDS

DRAFT VERSION

Report prepared by
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INTRODUCTION

Islands contribute significantly to global biodiversity: in fact, island biota cover only 5% of the planet's area but 10 of the 34 biodiversity hotspots are comprised wholly in islands and a further 10 include offshore islands (Fonseca et al. 2006).

At the same time, islands represent particularly fragile ecosystems where long isolation has led to the evolution of endemic species perfectly adapted to the context, but highly susceptible to perturbation. It is estimated that one-fifth of the world's threatened amphibian fauna, one-quarter of the world's threatened mammals and more than one-third of the world's threatened birds are endemic to island biodiversity hotspots (Fonseca et al. 2006).

Considering all these factors and the limited extention of many islands, conservation of insular ecosystems represent not only a particularly urgent measure to preserve biological diversity, but also a more feasible target, if compared to the same case in continent (Courchamp et al. 2003).

The majority of documented extinctions has been on islands, as opposed to mainlands (Figure 1 A from Sax and Gaines 2008) and the same trend is confirmed if we only consider extinctions caused by invasive alien species (IAS) (Figure 1 B from Sax and Gaines 2008).

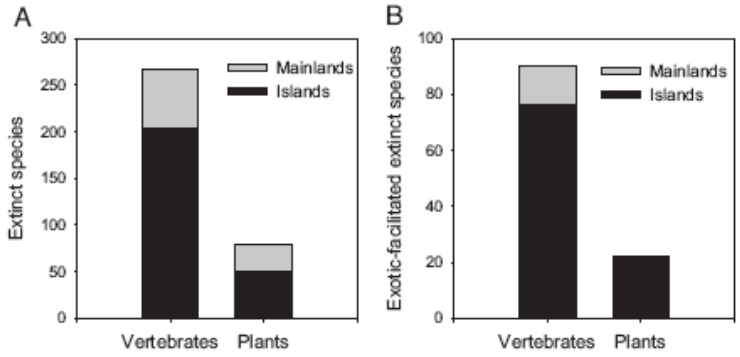

Figure 1 – Extinction pattern over the last 500 years, from Sax and Gaines (2008). A) The majority of documented extinctions have been on islands, as opposed to mainlands, for both terrestrial vertebrates (birds, mammals, reptiles and amphibians) and plants. B) Extinctions facilitated by invasive alien species (IAS) (i.e. in which IAS are listed as at least one of the factors contributing to a specie extinction) show the same pattern, with many more extinctions on islands compared to mainlands.

The role of IAS in the extinction of native species has been recently discussed by several authors (e.g. Gurevitch and Padilla 2004). However, it is in general acknowledged that IAS are the most significant driver of population declines and species extinctions in island ecosystems worldwide (Reaser et al. 2007) and one of the major current treaths to European biodiversity (Hulme 2007; Hulme et al. 2009).

Tackling the impact of IAS on European islands is thus crucial to protect the regional biological diversity: islands in Europe have suffered a fast depletion of endemic taxa but continue to be havens for ground nesting birds, for resting migrant birds and for many relict species, in addition to the remnant endemic species, especially plants and invertebrates (Orueta 2009).

Also the European Strategy on Invasive Alien Species (Genovesi and Shine 2004) schedules special measures for isolated ecosystems to prevent or minimize adverse impacts due to biological invasions.

The importance that the European institutions assign to biological invasions is confirmed by the recent EC Communications adopted in 2006 and 2008[1], as well as by the amount of funds spent by EU on the issue in the last decade: between 1992 and 2006, the average annual budget spent for IAS issues

[1] http://ec.europa.eu/environment/nature/invasivealien/docs/1_EN_ACT_part1_v6.pdf

by LIFE and the RTD Framework Programmes has been about 10 million EUR per year, but in the period 2004-2006 it increased to 18,3 million EUR (Scalera 2009).

AIMS

The aim of the present work is to provide European decision makers with an in-depth analysis of biological invasions on European islands, in order to permit a science-based prioritisation of action toward IAS in island ecosystems, with particular reference to eradication of key invasives.

For this aim, a work structured in 4 key steps has been initiated. First of all an inventory of European islands has been commenced. Secondly, a review of presence/absence data on European islands, of both key IAS and native species affected by these IAS. Finally, an up-date review of eradication programmes that have been or are being carried out on European islands has been produced, with information regarding the possible factors affecting the chances of success of removal campaigns.

A comparative analysis of the information described above may in the future permit to highlight the geographical contexts where it is more urgent and appropriate to act, and where radications would be more effective to prevent impacts of IAS on biodiversity.

GEOGRAPHIC AND TAXONOMIC SCOPE

The scope of the European IAS island information system extends over biogeographic borders of the region and covers the overseas territories of European countries. Regarding IAS the report covers data on all taxa, from vertebrates and invertebrates, to plants. Marine aquatic species are excluded from the scope of the report.

METHODS

Data have been collected by reviewing scientific and grey literature and through a specific questionnaire produced and circulated among key experts directly contacted.

More in details, information on island characteristics have been collected from experts, as well as from the collaboration with Global Islands Database (GID) manager. This database is being produced under a project led by WCMC with the support of the Italian Government; the GID dataset comprises information on many islands characteristics, including island name, size, coordinates, climate, elevation, population etc.

In regard of the specific aim of this work, we implemented a database including information on the following islands characteristics: island name, archipelago, country, region, size (in ha) and coordinates (in decimal degree) (input data mask in Figure 2).

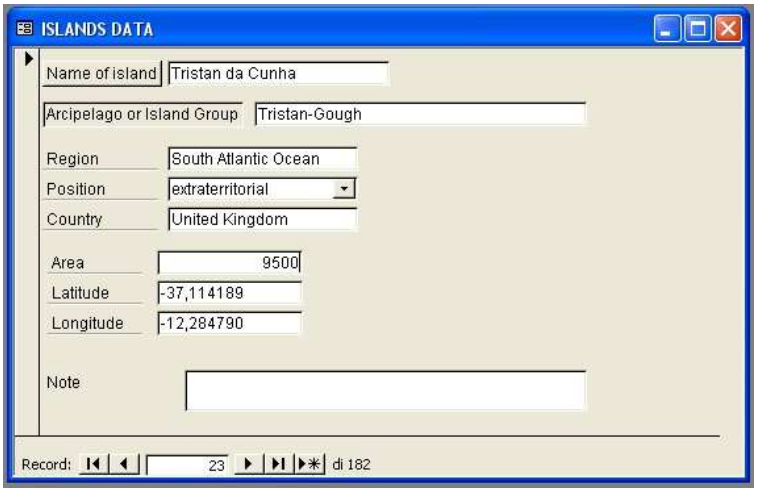

Figure 2 – Input data mask for island.

With regard to the data on presence/absence of alien species, a reference list of key IAS has been produced, based on the DAISIE list "100 of the worst", and on the results of an earlier review paper (Genovesi 2005) (Figure 3).

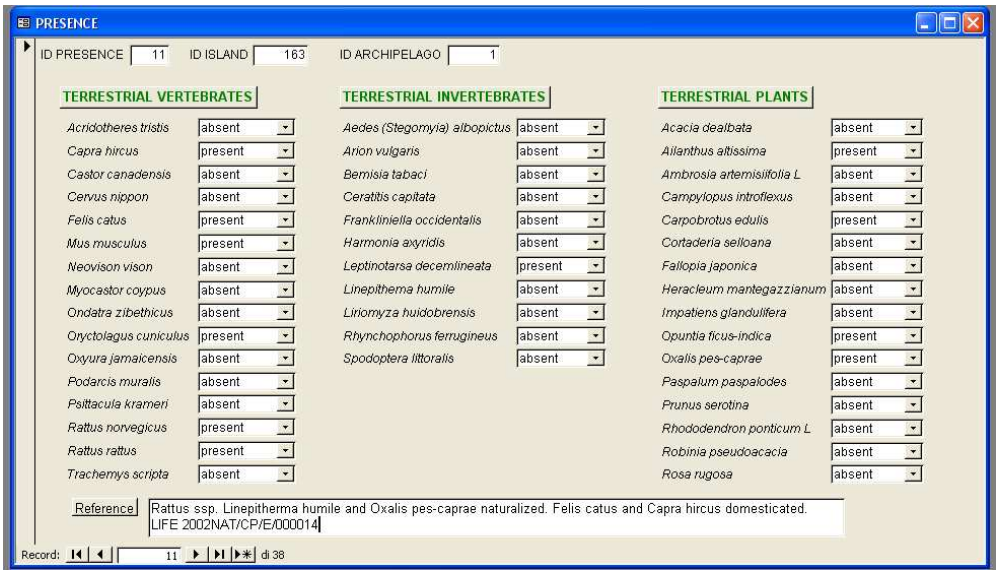

Figure 3 – Input data mask with a reference list of selected invasive alien species.

Concerning data on native species directly affected by aliens, name of native species, name of alien species and references were collected (Figure 4).

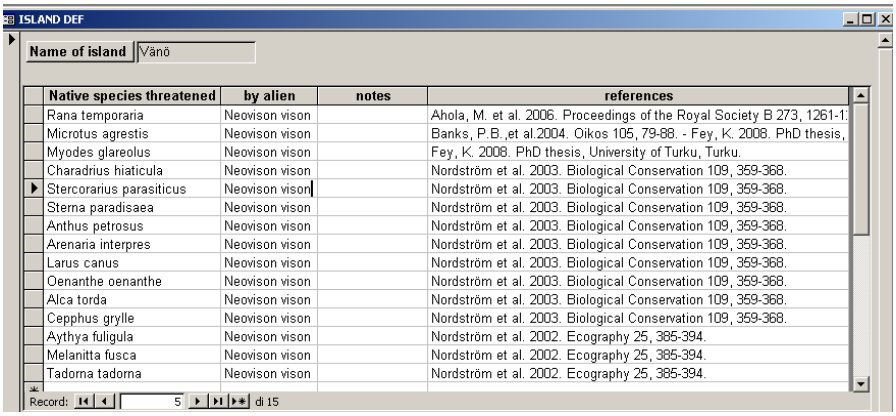

Figure 4 – Input data mask on the native species directly threatened by invasive alien species.

Regarding the latter information (threatened species affected by IAS), data are being collected through a search in the GISD, data contained in the Species Information System of IUCN, and available literature (e.g. Ruffino et al. 2009, Banks et al. 2008, Bonesi and Palazon 2007). Since this part of the work is still at a preliminary stage, no data on this aspect are reported in the present document.

Finally, concerning eradication campaigns we collected data on: target IAS, year of introduction, start date and end date of the eradication programme, status of eradication (successful, unsuccessful, uncompleted, on going, being confirmed, re-invaded, unknown), pre- and post-eradication monitoring, overall cost of the programme, techniques used, contacts and references. Information on the taxonomy of the target species were also added to the database. In Figure 5 the input data mask about eradication programme is shown.

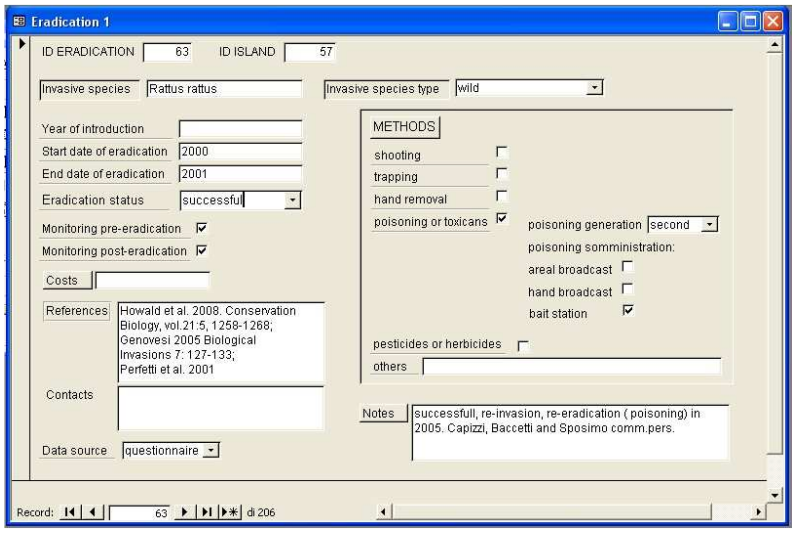

Figure 5 – Input data mask for eradication programmes.

RESULTS

All information collected in the present study have been stored in a relational database implemented in Microsoft® Access 2003. The overall structure of the database is synthesized in Figure 6.

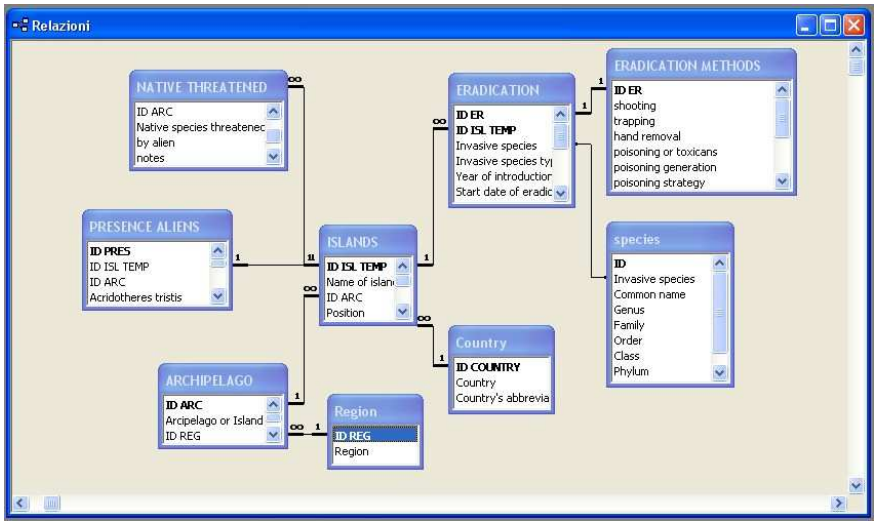

Figure 6 – Structure of the relational database developed for the present review.

Data on more than 50,000 European islands are available, mostly due to the GID. The organization of these information is still in course. More detailed information have been collected for a subset of 182 European islands through direct literature search and/or information collected from experts.

The collection of presence/absence data of key IAS is still in course and will require a continuation of work. Pilot integrated datasets on IAS presence, native threatened species, and management programmes (control or eradication) have been implemented for selected areas, where these data were available (islands of Macaronesia; islands of some areas of the United Kingdom; Finland). We plan to also produce complete datasets for the UK overseas territories and the Baleari, for which part of the available information are only at the archipelago level.

Regarding eradications, data on 207 campaigns have been recorded in the present review (a full list is reported in Annex 1). These programmes have been or are being carried on 158 islands, belonging to 12 different European countries.

More than 70% of eradication programmes have been realised in France and the United Kingdom (Figure 7), that are the two European countries with the major overseas territories.

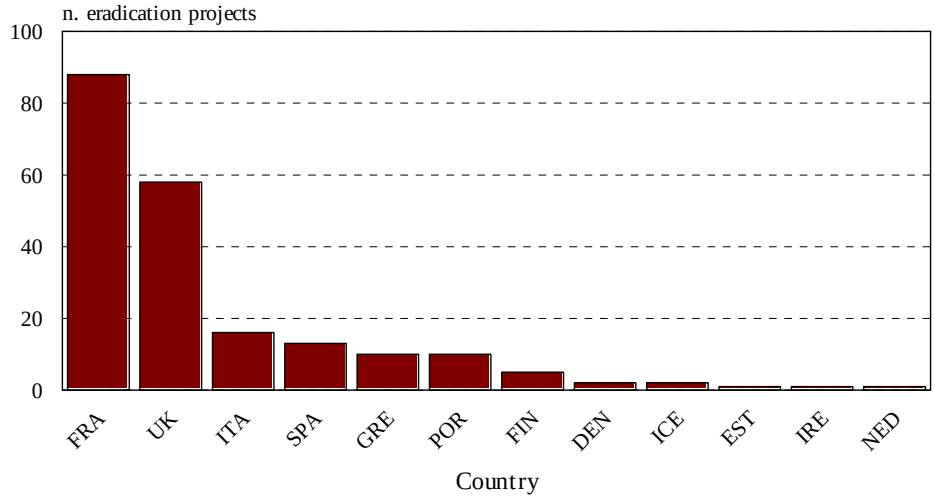

Figure 7 – Number of eradication projects recorded per country.

Most of the eradication have been documented on islands of the North Atlantic Ocean (47) and in the Mediterranean Sea (44). An overall picture of the eradication programmes by region is reported in Table 1.

Table 1 – Number of eradications projects recorded per region.

Region	n. eradications
North Atlantic Ocean	47
South Atlantic Ocean	27
Mediterranean sea	44
Macaronesia	14
Caribbean sea	24
Pacific Ocean	35
Indian Ocean	16
Total	207

At present, 11 eradication programmes are in course of implementation, while 13 have still to be confirmed; in 17 cases the results of the campaigns are not known. Table 2 shows an overall picture of the status of reported eradications.

Table 2 –Eradications status of the recorded campaigns

Eradication status	n. eradications
successful	*143*
unsuccessful	*18*
uncompleted	*5*
being confirmed	13
on going	11
unknown	17
Total	207

Of the total number of eradication campaigns considered in the present review, final result have been reported for 166 cases (in *italic* in Table 2); of these, 86% are reported as successfully completed, and 11% as unsuccessful. Since successes programs are in general more likely to be reported than failures, it is possible that the success rate is biased. In two cases (Tuscan Archipelago-

Italy) a re-invasion of rats has been recorded during a survey carried on some years after the end of a successful eradication. The reason is probably the very limited distance (< 500 m) recorded between the islets and the main island (Isola d'Elba) where the species is already present.

Considering the result of eradication per region (Figure 8), the highest rate of successes (95%) is reported in the Caribbean Sea. In Macaronesia and the South Atlantic Ocean, the success rate exceeded 90% (92% and 91% respectively). Only in the Indian Ocean the success rate is below 80% (73%).

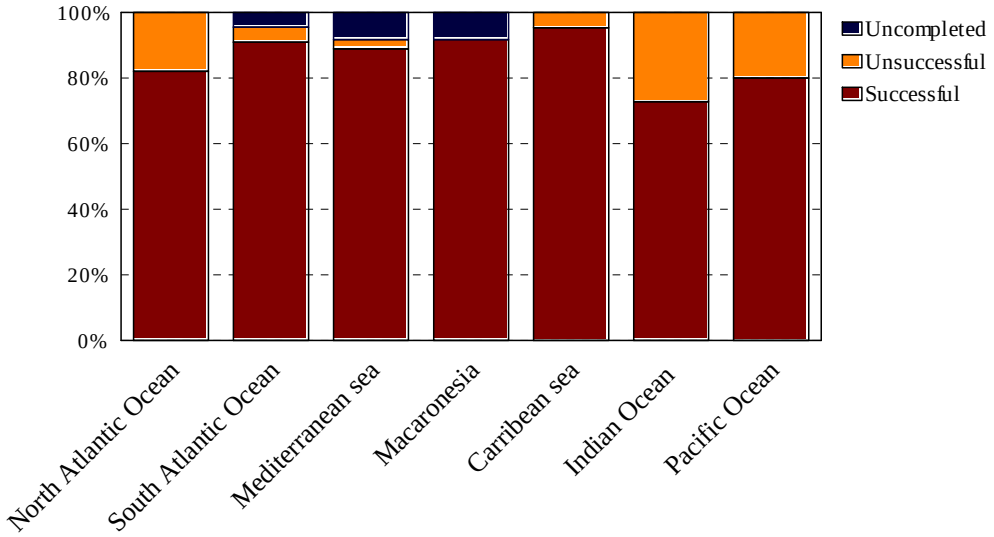

Figure 8 – Rate (in %) of successful, unsuccessful and uncompleted eradication recorded per region.

The size of the islands where eradications have been realized ranges from 0.10 ha (Folaccheda, Mediterranean sea) to 925,100.00 ha (Cyprus, Mediterranean Sea). However, the mean size of islands where a successful eradication has been reported is 7,331 ha (s.d.=39,229, range=0.05-364,011 ha), while the mean area of islands where an eradication has failed is of 75,741 ha (s.d.= 219,324, range=1.3-678,600 ha).

The majority of islands (64%) where there has been a successful eradication is smaller than 100 ha; 3 islands of Macaronesia (where the common myna has been eradicated) are > 150,000 ha.

In the last decades the number of projects is rapidly increased (Figure 9). Fifty percent of successful eradications carried on in Europe were completed in the 2000-2009 period (Figure 10).

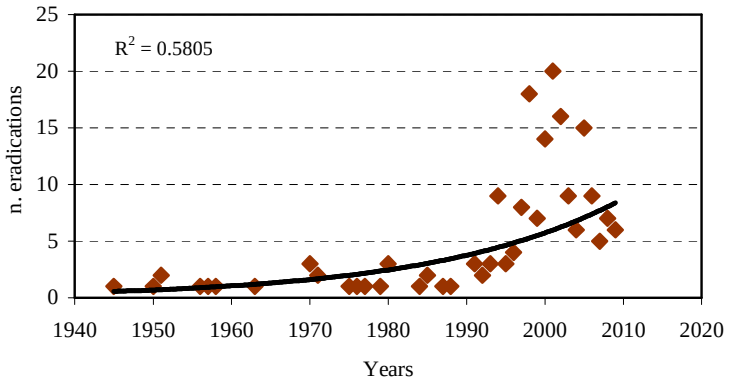

Figure 9 – Trend in the number of eradication projects carried on in Europe.

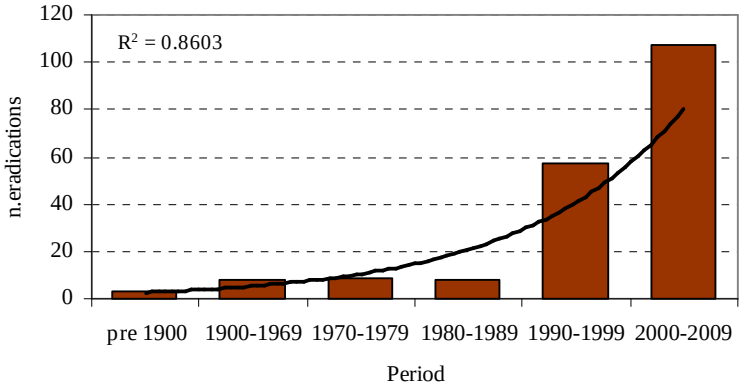

Figure 10 – Frequency of successful eradications recorded per decade from the XVII century.

Thirty six species have been targeted by eradication campaigns, 20 of which where *Chordata*, 11 *Magnoliophyta*, 3 *Artropoda* and 1 *Pinophyta*. Considering only the *Chordata*, *Rodentia* account for 64% of all eradications, while both *Carnivora* and *Artiodactyla* for 13% of the total number of projects (Figure 11). Rats (*Rattus* spp.) are the most common target (n=113, 55%), followed by goat (n=21, 10%).

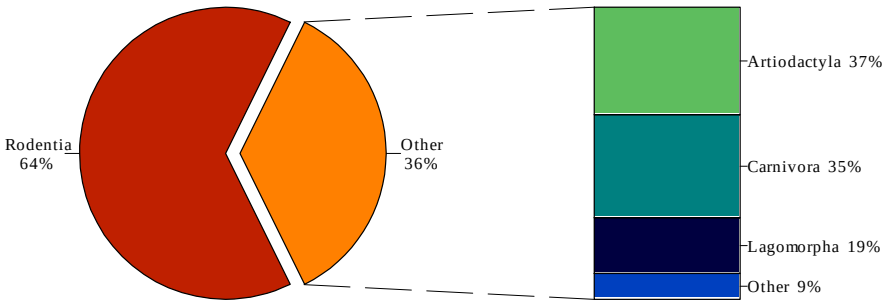

Figure 11 – Frequency of eradications by taxonomic order.

Comparing the results of the present study with the data reported by Genovesi (2005), we managed to collect information on 20 eradications not covered in the previous review, most of which were extracted from the work by Howald and co-authors (2008) on rodents eradications, from the review by Campbell and Donlan (2004) on goat eradications and the review by Nogales and co-authors (2004) on cats eradications.

Only for 26 eradications (13%) it was possible to gather information on the economic costs of the campaigns. For these cases, the cost ranged from the 200 € spent for the eradication of *Oxyura jamaicensis* in the Balearic Archipelago (Spain) to the € 2,247,951 spent so far to eradicate the American mink from the islands of Lewis and Harris in the Outer Hebrides (UK).

Costs can vary much even when considering programs targeting specific taxonomic groups, such as carnivores (Figure 12). Very limited result till now the cost for the eradication of birds.

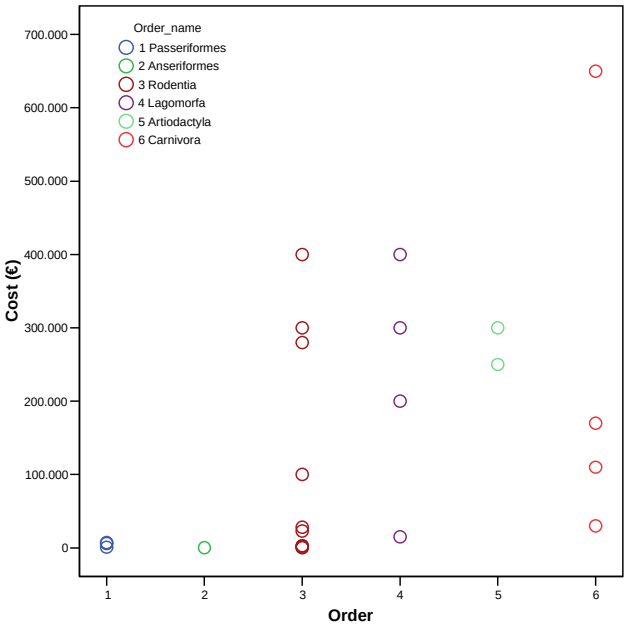

Figure 12 - Eradication cost per taxonomic order. Data on two project on the American mink, both exceeding 1,000,000 €, were excluded from the analysis.

Considering only islands smaller than 100ha, no correlation between the cost of the program and the size of the island has been highlighted so far.

As far as the removal techniques are concerned, eradications targeting plants have been usually carried on by hand removal, while projects targeting animal species have been most commonly carried on with poison baits (n=137), especially in the case of rats, mice, cats and rabbits. Traps have been used in 60 cases (often associated with poisoning) and shooting in 28. Many successful eradication campaigns (43%) have been carried on by applying several techniques. This percentage vary widely among target species (Figure 13): for example, all the eradications of *Rattus exulans* (n=14) have been conducted using only one techniques (poisoning) while for the other two species of rats multiple techniques are used in 40% of the cases.

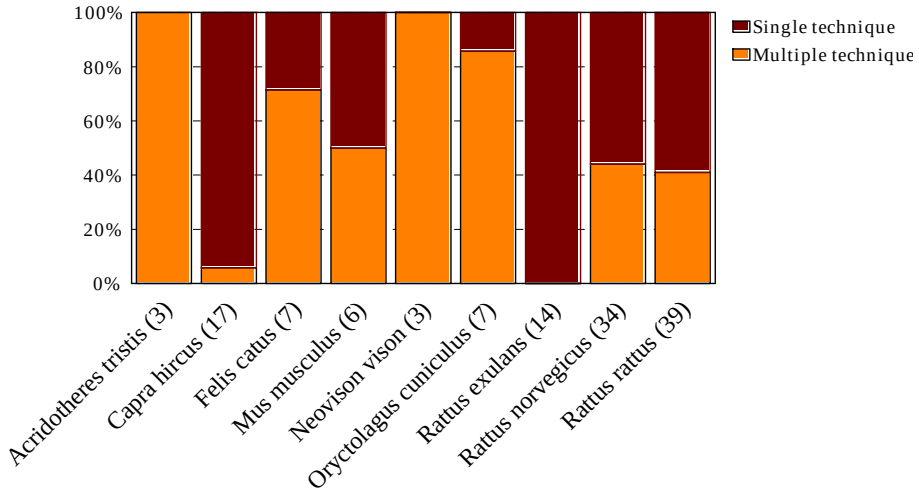

Figure 13 - Rate (in %) of eradication campaigns with single or multiple techniques used per species. Only species with more than 2 successful eradication carried out are considered.

DISCUSSION AND CONCLUSIONS

Despite the crucial role of islands for European biodiversity, and the increase in researches on biological invasions carried on in Europe, the general level of information on IAS on island ecosystems in Europe remains limited. No agreed inventory of islands has been produced and in this regard the ongoing effort to realise a global inventory by the GID is indeed a very important improvement in the available information.

The collection of information on the presence of selected IAS and on the presence of native or endemic species affected by IAS, has highlighted several challenges and problems and therefore the results so far gathered remain preliminary. The use of reference lists of IAS presence is complicated by the extensive geographic scope of the review, that covered the European region as well as overseas territories often located in the tropics. For this reason the tentative list developed using DAISIE resulted very useful for assessing islands of Europe, but was not adequate for covering islands of the overseas territories.

Regarding the eradications, the present review provides an update of the data reported in Genovesi (2005) and confirm the constant increase in the implementation of this powerful management tool in Europe. The result of the present report permitted to highlight the constant increase of the application of eradications and to identify some elements at the basis of the success of these programs.

The implementation of an island by island relational database integrating information on islands, presence/absence of selected species and on eradications, has faced several technical challenges. For example, information on eradications often relate to very small islets, while information on presence of alien species, as well as o presence of native/endemic species, in many cases refer to island groups. Furthermore, studies on the impacts caused by IAS to native species are still very limited.

In conclusion, the preliminary results of this assessment confirm the potential efficacy of an integrated analysis of information on island characteristics, presence/absence of key IAS and of threatened species, and of the available technical tools. Such an approach may in fact permit a science-based prioritisation of candidate islands and species for eradications. However, for this aim a continuation of the work started with the present review is needed.

Contacts have been started with research groups working on islands of other areas of the world, in order to explore the possibility to join efforts with the aim of creating a single global database of eradications on islands and, possibly, of key alien species on world islands. This development will be discussed in a thematic workshop planned at next Island Invasive Eradication and Management Conference, that will be held in Auckland New Zealand next February 10-12 (www.cbb.org.nz/conferences.asp). We believe that a possible joined work on the topic of the present report would provide a crucial tool to enhance more stringent and effective conservation policies at the global scale and would significantly improve on the ground responses to biological invasions.

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ANNEX 1 - LIST OF THE ERADICATIONS RECORDED ON THE DATABASE OF INVASIVE ALIEN SPECIES (IAS) IN EUROPEAN ISLANDS

Name of island	Region	Country	Invasive species	End date of eradication	Eradication status	Costs
Anholt	North Sea	DEN	*Pinus mugo*	2005	being confirmed	
Læsø	North Sea	DEN	*Pinus mugo*	2005	being confirmed	
Hiiumaa	Baltic sea	EST	*Neovison vison*	1999	successful	
Korppoo	Baltic sea	FIN	*Neovison vison*	2001	successful	
Nauvo	Baltic sea	FIN	*Neovison vison*	2001	successful	
Trunsö	Baltic sea	FIN	*Neovison vison*		on going	€ 170.000,00
Utö	Baltic sea	FIN	*Neovison vison*		on going	€ 110.000,00
Vänö	Baltic sea	FIN	*Neovison vison*		on going	€ 30.000,00
18 islets	Mediterranean sea	FRA	*Rattus rattus*	2000	successful	
6 islets	North Atlantic Ocean	FRA	*Rattus norvegicus*	2000	unsuccessful	
Amsterdam	Indian Ocean (sub-antartique)	FRA	*Capra hircus*	1957	successful	
Australia	Indian Ocean (sub-antartique)	FRA	*Rattus rattus*	2004	unknown	
Australia	Indian Ocean (sub-antartique)	FRA	*Mus musculus*	2004	unknown	
Bono	North Atlantic Ocean	FRA	*Capra hircus*	1993	successful	
Bono	North Atlantic Ocean	FRA	*Rattus norvegicus*	1994	successful	
Burgaux	Carribean sea	FRA	*Rattus rattus*	2002	successful	
Cézembre	North Atlantic Ocean	FRA	*Rattus rattus*	2004	unsuccessful	
Chatellier	North Atlantic Ocean	FRA	*Rattus norvegicus*	1994	successful	
Clipperton	Pacific Ocean	FRA	*Sus scrofa*	1958	successful	
Dumet	North Atlantic Ocean	FRA	*Vulpes vulpes*	2003	successful	
Enez ar C'hrizienn	North Atlantic Ocean	FRA	*Rattus norvegicus*	1996	successful	
Fajou	Carribean sea	FRA	*Mus musculus*	2001	successful	
Fajou	Carribean sea	FRA	*Rattus rattus*	2002	unsuccessful	
Fajou	Carribean sea	FRA	*Herpestes auropunctatus*	2001	successful	
Fajou	Carribean sea	FRA	*Oryctolagus cuniculus*	1995	successful	
Folaca	Mediterranean sea	FRA	*Rattus rattus*	2001	successful	
Folaccheda	Mediterranean sea	FRA	*Rattus rattus*	2001	successful	
G'i	Southwest Pacific Ocean	FRA	*Rattus exulans*	1998	successful	
Grand Congloué	Mediterranean sea	FRA	*Rattus rattus*	1999	being confirmed	

Grande Terre	Indian Ocean (sub-antartique)	FRA	*Oryctolagus cuniculus*	1956	unsuccessful	
Grande Terre	Indian Ocean (sub-antartique)	FRA	*Felis catus*	1977	unsuccessful	
Hardy	Carribean sea	FRA	*Rattus rattus*	2002	successful	
Name of island	Region	Country	Invasive species	End date of eradication	Eradication status	Costs
Île aux Chevaux	North Atlantic Ocean	FRA	*Rattus norvegicus*	2002	successful	
île aux Cochons	Indian Ocean (sub-antartique)	FRA	*Oryctolagus cuniculus*	1997	successful	
Ile aux Moines	North Atlantic Ocean	FRA	*Capra hircus*	1993	successful	
Ile aux Moines	North Atlantic Ocean	FRA	*Rattus norvegicus*	1994	successful	
Île aux Moules	Indian Ocean (sub-antartique)	FRA	*Rattus rattus*	2005	unknown	
Île aux Rats	North Atlantic Ocean	FRA	*Rattus norvegicus*	1994	successful	
Île des Morts	North Atlantic Ocean	FRA	*Rattus norvegicus*	2005	unsuccessful	
Île du Château	Indian Ocean (sub-antartique)	FRA	*Rattus rattus*	2002	unknown	
Île du Château	Indian Ocean (sub-antartique)	FRA	*Mus musculus*	2001	unknown	
Île Guillou	Indian Ocean (sub-antartique)	FRA	*Felis catus*	1995	successful	
Île Haute	Indian Ocean (sub-antartique)	FRA	*Ovis aries*	2009	successful	
Île Plate	North Atlantic Ocean	FRA	*Rattus norvegicus*	1994	successful	
île Verte	Indian Ocean (sub-antartique)	FRA	*Oryctolagus cuniculus*	1992	successful	
Kemenez	North Atlantic Ocean	FRA	*Mustela putorius*	2003	successful	
Laregnere	Southwest Pacific Ocean	FRA	*Rattus exulans*	1998	successful	
Lavezzu	Mediterranean sea	FRA	*Capra hircus*	1994	successful	
Lavezzu	Mediterranean sea	FRA	*Rattus rattus*	2000	successful	
Le Loc'h	North Atlantic Ocean	FRA	*Rattus norvegicus*	2003	unsuccessful	
Le Prédour, Grande Terre	Southwest Pacific Ocean	FRA	*Rattus rattus*	2010	on going	
Le Prédour, Grande Terre	Southwest Pacific Ocean	FRA	*Oryctolagus cuniculus*	2010	on going	
Le Prédour, Grande Terre	Southwest Pacific Ocean	FRA	*Cervus timorensis russa*	2010	on going	
Ledenez Kemenez	North Atlantic Ocean	FRA	*Mustela putorius*	2003	successful	
Makapu	Pacific Ocean	FRA	*Rattus exulans*	2003	unknown	
Mato	Southwest Pacific Ocean	FRA	*Rattus rattus*	1998	successful	
Mekiro	Pacific Ocean	FRA	*Rattus exulans*	2003	unknown	
Motu-o-ari	Pacific Ocean	FRA	*Rattus exulans*	2003	unknown	
Ndo	Southwest Pacific Ocean	FRA	*Rattus exulans*	1998	successful	
Nge	Southwest Pacific Ocean	FRA	*Rattus exulans*	1998	successful	
Otoi iti	Pacific Ocean	FRA	*Rattus exulans*	2007	successful	
Percé	Carribean sea	FRA	*Rattus rattus*	1999	successful	

Name of island	Region	Country	Invasive species	End date of eradication	Eradication status	Costs
Petit Congloué	Mediterranean sea	FRA	*Rattus rattus*	1999	being confirmed	
Plane	Mediterranean sea	FRA	*Rattus rattus*	2005	successful	
Poirier	Carribean sea	FRA	*Rattus rattus*	2002	successful	
Redika	Southwest Pacific Ocean	FRA	*Rattus exulans*	1998	successful	
Rimains	North Atlantic Ocean	FRA	*Rattus norvegicus*	1994	successful	
Rocher de Cancale	North Atlantic Ocean	FRA	*Rattus norvegicus*	1994	successful	
Rouzic	North Atlantic Ocean	FRA	*Rattus norvegicus*	1951	successful	
Saint-Paul	Indian Ocean (sub-antartique)	FRA	*Capra hircus*	1874	successful	
Saint-Paul	Indian Ocean (sub-antartique)	FRA	*Rattus rattus*	1996	successful	
Saint-Paul	Indian Ocean (sub-antartique)	FRA	*Oryctolagus cuniculus*	1997	successful	
Saint-Paul	Indian Ocean (sub-antartique)	FRA	*Mus musculus*	1997	unsuccessful	
Signal	Southwest Pacific Ocean	FRA	*Rattus exulans*	1998	unsuccessful	
St. Riom	North Atlantic Ocean	FRA	*Rattus norvegicus*	2000	unsuccessful	
Surprise	Southwest Pacific Ocean	FRA	*Mus musculus*	2005	successful	
Surprise	Southwest Pacific Ocean	FRA	*Rattus rattus*	2005	successful	
Taere ere	Pacific Ocean	FRA	*Rattus exulans*	2005	successful	
Taere ere	Pacific Ocean	FRA	*Mus musculus*	2005	successful	
Teanaone & Tepapuri	Pacific Ocean	FRA	*Rattus exulans*	2003	unknown	
Teuaua/Ua-Uka	Pacific Ocean	FRA	*Rattus rattus*	1987	unsuccessful	
Teuaua/Ua-Uka	Pacific Ocean	FRA	*Rattus exulans*	1988	unsuccessful	
Teuaua/Ua-Uka	Pacific Ocean	FRA	*Rattus exulans*	1995	unknown	
Tiarao	Pacific Ocean	FRA	*Rattus exulans*	2008	unknown	
Tiarao	Pacific Ocean	FRA	*Rattus rattus*	2008	unknown	
Tomé	North Atlantic Ocean	FRA	*Rattus norvegicus*	2002	successful	
Toro	Mediterranean sea	FRA	*Rattus rattus*	1991	successful	
Trébéron	North Atlantic Ocean	FRA	*Rattus norvegicus*	2005	unsuccessful	
Trielen	North Atlantic Ocean	FRA	*Capra hircus*	1998	successful	
Trielen	North Atlantic Ocean	FRA	*Rattus norvegicus*	1996	successful	
Uatermbi	Southwest Pacific Ocean	FRA	*Rattus exulans*	1998	successful	
Uatio	Southwest Pacific Ocean	FRA	*Rattus exulans*	1998	successful	
Uie	Southwest Pacific Ocean	FRA	*Rattus exulans*	1998	successful	
Uo	Southwest Pacific Ocean	FRA	*Rattus exulans*	1998	successful	
Vahanga, Tuamotu	Pacific Ocean	FRA	*Rattus exulans*	2000	unsuccessful	

Vua	Southwest Pacific Ocean	FRA	*Rattus exulans*	1998	successful	
Atalanti	Mediterranean sea	GRE	*Capra hircus*	1979	successful	
Cyprus	Mediterranean sea	GRE	*Rhynchophorus ferrugineus*	2009	being confirmed	
Kasidis	Mediterranean sea	GRE	*Rattus rattus*	2005	successful	
Kastronisia-1	Mediterranean sea	GRE	*Rattus norvegicus*	2006	successful	
Name of island	Region	Country	Invasive species	End date of eradication	Eradication status	Costs
Kastronisia-1	Mediterranean sea	GRE	*Rattus rattus*	2006	successful	
Kastronisia-2	Mediterranean sea	GRE	*Rattus norvegicus*	2006	successful	
Kastronisia-2	Mediterranean sea	GRE	*Rattus rattus*	2006	successful	
Koufonisi (Lefki)	Mediterranean sea	GRE	*Capra hircus*	1976	successful	
Lachanou	Mediterranean sea	GRE	*Rattus rattus*	2005	successful	
Polemika	Mediterranean sea	GRE	*Rattus rattus*	2005	unknown	
Flatey Island	North Atlantic Ocean	ICE	*Rattus norvegicus*	1971	successful	
Flatey Island	North Atlantic Ocean	ICE	*Mus musculus*	1971	successful	
Horse	North Atlantic Ocean	IRE	*Capra hircus*	1994	successful	
Capraia	Mediterranean sea	ITA	*Ailanthus altissima*	2001	uncompleted	
Gemino di Fuori (Elba)	Mediterranean sea	ITA	*Rattus rattus*	2000	successful	
Gemino di Terra (Elba)	Mediterranean sea	ITA	*Rattus rattus*	1999	successful	
Giannutri	Mediterranean sea	ITA	*Rattus rattus*	2007	successful	€ 100.000,00
Isola dei Topi	Mediterranean sea	ITA	*Rattus rattus*	2000	reinvaded	
Isola delle femmine	Mediterranean sea	ITA	*Rattus norvegicus*	2009	successful	€ 23.000,00
Isola delle femmine	Mediterranean sea	ITA	*Oryctolagus cuniculus*	2009	unknown	€ 15.000,00
Isola delle femmine	Mediterranean sea	ITA	*Opuntia ficus-indica*	2002	successful	
Isola delle femmine	Mediterranean sea	ITA	*Solanum sodomaeum*	2006	successful	
Isola La Scola	Mediterranean sea	ITA	*Rattus rattus*	2001	successful	
Isolotto d'Ercole	Mediterranean sea	ITA	*Rattus rattus*	2000	successful	
Molara	Mediterranean sea	ITA	*Rattus rattus*	2008	being confirmed	
Pianosa	Mediterranean sea	ITA	*Felis catus*	2007	uncompleted	
Procida	Mediterranean sea	ITA	*Ceratitis capitata*	1970	unsuccessful	
Scoglio La Peraiola	Mediterranean sea	ITA	*Rattus rattus*	2000	reinvaded	
Zannone	Mediterranean sea	ITA	*Rattus rattus*	2007	successful	
Klein Curacao	Carribean sea	NED	*Capra hircus*	1996	successful	
Bugio	Macaronesia	POR	*Capra hircus*	2008	being confirmed	€ 300.000,00
Bugio	Macaronesia	POR	*Oryctolagus cuniculus*	2008	being confirmed	€ 300.000,00

Bugio	Macaronesia	POR	*Mus musculus*	2008	being confirmed	€ 300.000,00
Deserta Grande	Macaronesia	POR	*Felis Catus*	1984	successful	
Deserta Grande	Macaronesia	POR	*Oryctolagus cuniculus*	1998	successful	€ 200.000,00
Deserta Grande	Macaronesia	POR	*Capra hircus*		uncompleted	€ 250.000,00
Praia islet	Macaronesia	POR	*Oryctolagus cuniculus*	1997	successful	
Selvagem Grande	Macaronesia	POR	*Capra hircus*	1900	successful	
Name of island	Region	Country	Invasive species	End date of eradication	Eradication status	Costs
Selvagem Grande	Macaronesia	POR	*Oryctolagus cuniculus*	2002	successful	€ 400.000,00
Selvagem Grande	Macaronesia	POR	*Mus musculus*	2003	successful	€ 400.000,00
Alegranza	Macaronesia	SPA	*Felis Catus*	2002	successful	
Conills (Ibiza)	Mediterranean sea	SPA	*Rattus rattus*	1999	successful	
Dragonera (Mallorca)	Mediterranean sea	SPA	*Capra hircus*	1975	successful	
Gran Canaria	Macaronesia	SPA	*Acridotheres tristis*	2006	successful	€ 890,00
Isla de los Lobos	Macaronesia	SPA	*Felis Catus*	2002	successful	
Isla grossa	Mediterranean sea	SPA	*Oryctolagus cuniculus*	1993	unknown	
Mallorca	Mediterranean sea	SPA	*Acridotheres tristis*	2007	successful	€ 6.000,00
Menorca	Mediterranean sea	SPA	*Oxyura jamaicensis*	2001	successful	€ 200,00
Menorca	Mediterranean sea	SPA	*Carpobrotus edulis*	2005	uncompleted	
Montana clara	Macaronesia	SPA	*Oryctolagus cuniculus*	2001	successful	
Ray Francisco (Isla del Rey)	Mediterranean sea	SPA	*Rattus rattus*	1992	successful	
Ray Francisco (Isla del Rey)	Mediterranean sea	SPA	*Rattus rattus*	2000	successful	
Tenerife	Macaronesia	SPA	*Acridotheres tristis*	2000	successful	€ 7.262,00
Alisa Craig	North Atlantic Ocean	UK	*Rattus norvegicus*	1991	successful	
Ascension	South Atlantic Ocean	UK	*Capra hircus*	1945	successful	
Ascension	South Atlantic Ocean	UK	*Felis catus*	2004	successful	€ 650.000,00
Ascension	South Atlantic Ocean	UK	*Schinus terebinthifolius*	2009	being confirmed	
Ascension	South Atlantic Ocean	UK	*Ficus elastica*	2009	being confirmed	
Bay Cay	Carribean sea	UK	*Rattus rattus*	2002	successful	
Bottom Tussac	South Atlantic Ocean	UK	*Rattus norvegicus*	2001	successful	€ 2.783,00
Calf Island	South Atlantic Ocean	UK	*Rattus norvegicus*	2001	successful	
Calf Islet	South Atlantic Ocean	UK	*Rattus norvegicus*	2001	successful	
Canna	North Atlantic Ocean	UK	*Rattus norvegicus*	2006	successful	€ 618,79
Cardigan	North Atlantic Ocean	UK	*Rattus norvegicus*	1980	successful	
Double	South Atlantic Ocean	UK	*Rattus norvegicus*	2001	successful	€ 321,00

Ducie	Pacific Ocean	UK	*Rattus exulans*	1997	successful	€ 27.992,00
Gough	South Atlantic Ocean	UK	*Arrhenatherum elatius*	2006	successful	
Gough	South Atlantic Ocean	UK	*Sagina procumbens*		on going	
Gough	South Atlantic Ocean	UK	*Senecio burchellii*	1980	successful	
Gough	South Atlantic Ocean	UK	*Conyza sumatrensis*	1980	successful	

Name of island	Region	Country	Invasive species	End date of eradication	Eradication status	Costs
Grand Cayman	Carribean sea	UK	*Myopsitta monachus*		on going	
Grand Jason	South Atlantic Ocean	UK	*Capra hircus*		successful	
Grass Land	South Atlantic Ocean	UK	*Rattus norvegicus*	2000	successful	
Guana	Carribean sea	UK	*Capra hircus*	1991	successful	
Handa	North Atlantic Ocean	UK	*Rattus norvegicus*	1997	successful	
Harpoon	South Atlantic Ocean	UK	*Rattus norvegicus*	2001	successful	
Holy	Irish Sea	UK	*Capra hircus*	1963	unsuccessful	
Horse	South Atlantic Ocean	UK	*Rattus norvegicus*	2001	successful	
Inaccessible	South Atlantic Ocean	UK	*Capra hircus*	1872	successful	
Inaccessible	South Atlantic Ocean	UK	*Sus scrofa*	1950	successful	
Inaccessible	South Atlantic Ocean	UK	*Phormium tenax*		on going	
Jersey	North Atlantic Ocean	UK	*Lymantria dispar*	??	unknown	
Lewis and Harris	North Atlantic Ocean	UK	*Neovison vison*		on going	€ 2.247.951,00
Little Cayman	Carribean sea	UK	*Felis catus*		on going	
Long Cay	Carribean sea	UK	*Felis catus*	1999	unknown	
Low Cay	Carribean sea	UK	*Rattus rattus*	2000	successful	
Lundy	North Atlantic Ocean	UK	*Rattus norvegicus*	2004	successful	
Lundy	North Atlantic Ocean	UK	*Rattus rattus*	2004	successful	
Nonsuch	Carribean sea	UK	*Rattus norvegicus*	1985	successful	
Nonsuch	Carribean sea	UK	*Rattus rattus*	1985	successful	
Nonsuch	Carribean sea	UK	*Rattus rattus*	2005	successful	
Oeno	Pacific Ocean	UK	*Rattus exulans*	1997	successful	€ 279.921,00
Outer	South Atlantic Ocean	UK	*Rattus norvegicus*	2001	successful	
Pitcairn	Pacific Ocean	UK	*Felis catus*	1997	successful	
Pitcairn	Pacific Ocean	UK	*Rattus exulans*	1998	unsuccessful	
Puffin (Seiriol's Island)	Irish Sea	UK	*Rattus norvegicus*	1998	successful	
Pusey Cay	Carribean sea	UK	*Rattus rattus*	2002	successful	

Ramsey	North Atlantic Ocean	UK	*Rattus norvegicus*	2000	successful	
Rat Island	South Atlantic Ocean	UK	*Rattus norvegicus*	2001	successful	
Sandy Cay (White Cay)	Carribean sea	UK	*Rattus rattus*	2002	successful	
Sim Cay	Carribean sea	UK	*Rattus rattus*	2002	successful	
St.Elena	South Atlantic Ocean	UK	*Capra hircus*	1970	unsuccessful	
St.Elena	South Atlantic Ocean	UK	*Equus asinus*		uncompleted	
Tea	South Atlantic Ocean	UK	*Dusicyon griseus*	2008	being confirmed	
Name of island	Region	Country	Invasive species	End date of eradication	Eradication status	Costs
Top Tussac	South Atlantic Ocean	UK	*Rattus norvegicus*	2001	successful	€ 2.586,00
Tristan da Cunha	South Atlantic Ocean	UK	*Capra hircus*	1951	successful	
Tristan da Cunha	South Atlantic Ocean	UK	*Felis catus*	1970	successful	
Uists	North Atlantic Ocean	UK	*Neovison vison*	2006	being confirmed	€ 1.854.559,00
White Cay (Sandy Cay)	Carribean sea	UK	*Mus musculus*	1998	successful	
White Cay (Sandy Cay)	Carribean sea	UK	*Rattus rattus*	1998	successful	
William Dean Cay	Carribean sea	UK	*Rattus rattus*	2002	successful	