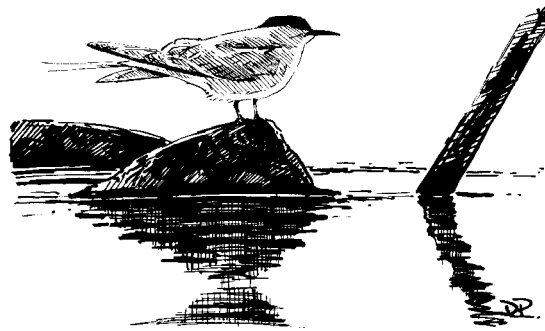


International (East Atlantic) Action Plan

Roseate Tern *Sterna dougallii*



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**Prepared by BirdLife international on behalf of the
European Commission**

International (East Atlantic) Action Plan for Roseate Tern *Sterna dougallii*

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Timetable:

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Reviews

This action plan should be reviewed and updated every four years. An emergency review will be undertaken if sudden major environmental changes, liable to affect the European population, occur within the species' range, or if the species experiences a sudden significant decline in numbers .

Geographical scope

The action plan needs active implementation in France, Ireland, Portugal (Azores, Selvagens and Madeira), the United Kingdom, Ghana and Senegal. Action may also be required in Spain (Canary Islands), where very small numbers of Roseate terns breed in some years (probably under 10 pairs).

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Summary

The Roseate Tern *Sterna dougallii* was identified as 'near-threatened' in the ICBP World Checklist of Threatened Birds (Collar & Andrew 1988), but was not so listed in 1994 (Collar, Crosby & Stattersfield 1994). It is classified as a 'SPEC 3' species and 'Endangered in Europe' because of its large decline in numbers (Tucker & Heath 1994), and is listed in Appendix II of the Bonn and Bern Conventions, also Annex I of the EC Birds Directive. It has a restricted distribution in Europe, breeding only in a few coastal localities in north west Europe and on small Atlantic islands (Azores and a small number of pairs in Madeira/Selvagens and the Canaries).

The population appears to be increasing in Ireland (after former large decreases), but with a corresponding decrease in the UK and France. Numbers are also thought to have declined on the Azores.

Wintering areas are poorly known, but include inshore waters of Ghana and adjacent countries of West Africa, at least early in the non-breeding season.

Threats and limiting factors

Breeding season

- Poor breeding success caused by:
 - Uncontrolled disturbance - high
 - Predation - high
 - Reduced food availability in summer - unknown
- Competition for nest sites - low/medium
- Loss of breeding habitat - low/medium

Non-breeding season

- Poor survival of full-grown birds caused by:
 - Persecution on the wintering grounds - incompletely known, potentially high
 - Food shortage in winter - unknown, potentially high
 - Disturbance at, or loss of, roosts - low
- Climatic change - unknown

Conservation priorities

- Ensure the protection and appropriate management of current and recently occupied Roseate Tern breeding sites throughout the range of the east Atlantic population.
- Encourage international co-operation and action to ensure the protection of the east Atlantic population of the Roseate Tern outside the breeding season.

- Support further research to determine the major factors limiting Roseate Tern numbers in the eastern Atlantic.
- Carry out regular monitoring of survival and productivity at breeding colonies to assess population trends.

Introduction

The Roseate Tern is a BirdLife International 'Species of European Conservation Concern' Category 3 (SPEC 3) indicating that, although its global population is not concentrated in Europe, it does have an unfavourable conservation status there (Tucker & Heath 1994). The Roseate Tern is listed on Appendix II of the Bonn and Bern Conventions, and on Annex 1 of the European Community Directive on the Conservation of Wild Birds and so is a species for which member states must take special conservation actions and notify suitable sites as Special Protection Areas (SPAs). The whole European range of this species lies within the boundary of the EU; in France, Republic of Ireland, Portugal (Azores, Selvagens/Madeira), the UK and Spain (Canary Islands).

The decline in Roseate Tern numbers in western Europe (and in some populations elsewhere) has been severe, long-lasting and well documented, although the reasons behind this decline remain obscure. It is possible that the cause of the decline lies outside Europe - factors acting either in the Azores or in the wintering quarters in coastal areas of West Africa could be responsible. Little is known of the threats experienced by this species in the Azores and research is currently being undertaken to study it there. From 1985 to 1994, the RSPB and ICBP/BirdLife International funded an educational programme by the Government of Ghana to try to reduce the incidence of winter trapping in Ghana and Senegal. This was implemented by the 'Save the Seashore Birds Project, Ghana'. In 1994, the project's activities were taken over by the Ghana Wildlife Society. There was a similar project in Senegal, run by the Ligue pour la Protection des Oiseaux (LPO).

Background Information

Distribution and population

The Roseate Tern is nearly cosmopolitan, but its global range is highly fragmented (it breeds in isolated localities along the coasts and on the islands of the north east Atlantic, the Atlantic seaboard of Canada, the USA, Caribbean islands and Central America, South and East Africa, Madagascar, Oman, India, Sri Lanka, island groups in the Indian and Pacific Oceans and Australia). The nominate race is confined to Europe, North America and South Africa.

Europe holds around 3% of the global population of the Roseate Tern, with two separate breeding populations (see Map 1 below). The smaller population is found only very locally in the UK, Ireland and France, but the European stronghold is the Azores (Portugal), which hold about two thirds of the European population. The Roseate Tern has bred in small numbers in Spain (mainland and the Canary Islands), Madeira, southern France, western Germany and perhaps Denmark. See Annex for recent data. It was apparently formerly abundant in Tunisia but no longer breeds there. Both European breeding populations winter south to southern Africa. British, Irish and Azores ringing recoveries suggest that West Africa, particularly Ghana, is the main wintering area (Nisbet 1980, Gochfeld 1983, Monteiro unpubl. data), although trapping here may give a higher proportion of recoveries than elsewhere.

An accurate assessment of breeding numbers is more difficult than for related species because of their generally less open nest sites. It is likely that a peak of perhaps 3,500 pairs in Britain and Ireland was reached in the late 1950s and early 1960s, but a 1990 survey showed a decline in the British and Irish population to approximately 490 pairs (a decline in Ireland from over 1800 pairs in 1969-70 to around 400 pairs in 1990). In the same year, the French population (in Brittany) numbered around 100 pairs while the population in the Azores is believed to have declined to a small extent and numbered around 1,200 pairs in 1990.

It appears from ringing studies that output from the Rockabill colony in the Republic of Ireland is extremely important in maintaining the other breeding colonies in north west Europe. For example, in 1995 it was discovered that at least 50% of the ringed individuals on Coquet Island (north east England) had been ringed as chicks on Rockabill. The most recent survey of Roseate Terns in Europe (1998) recorded around 1,676 pairs in total (see Appendix 1) though a small number of pairs in isolated island colonies may have been missed. In the Azores, in 1998, there were 895 pairs, a decrease from the 1,020 pairs in 1997, and reversing the recent recovery to the pre-1993 population levels. Elsewhere in Europe, in 1998 there were 658 pairs in Ireland, 65-70 pairs in France and 53 pairs in the United Kingdom, making a European total of 1671-1676 pairs (this total excludes the very small Canary Islands population, for which no recent figures are available).

Life history

Breeding

In the north Atlantic, the Roseate Tern almost always nests with other species of tern, usually Common *Sterna hirundo* but sometimes Arctic *S. paradisaea* and Sandwich *S. sandvicensis* Terns. In the Republic of Ireland it is also found among colonies of Black-headed Gulls *Larus ridibundus* (O Merne *pers comm*), and this association with more aggressive species may give some protection from potential predators.

The eggs are laid between late April (in the Azores, May elsewhere) and late July, the young fledging from early June to August, depending on latitude. The clutch size is 1-2 (tending to be high in Ireland, c1.8, and low in the Azores, varying between 1.52 in the western islands and 1.25 in the central and eastern islands (L Monteiro *pers comm*); the European mean is c1.5). In the United States, occasional larger clutches of 3, exceptionally 4, are regarded as being laid by more than one female (Blodget *et al* 1998). There is one brood but a replacement clutch may be laid if the nest fails at the egg stage or even after young chicks have died (information from USA). The age of first breeding is three to four years, occasionally two (Nisbet 1981).

The breeding success of Roseate Terns is difficult to study, since birds often nest in cover. Nisbet (1981) concluded that, in the absence of predation, breeding success is usually very high in the north Atlantic. Whether this is high enough to enable recruitment to the breeding population to equal or exceed losses due to mortality is not yet known, though breeding success does not appear to be significantly worse in Britain and Ireland than in the USA. Studies in the USA suggest that the productivity required to maintain the population, based on an estimate of survival rates, is approximately 1.4 chicks per pair for the N.W. Atlantic. We have no knowledge of demography for the Azorean population but the survival rate is known to be low for this population.

Wintering

Roseate Terns spend only about three to four months on their breeding grounds and travel to West Africa for the northern winter (eg a count of 211+ in Ghana in 1991, including 10 British-ringed and 4 Azores-ringed individuals). Thus factors acting away from their breeding grounds may have major effects on adult or juvenile mortality. Some birds travel very rapidly and British-bred birds ringed as chicks have been recovered from Ivory Coast/Ghana in August. There has been a preponderance of ringing recoveries from Ghana in the period August to April and recent studies have confirmed the presence of birds from north western Europe and the Azores during the winter. However, the whereabouts of Roseate Terns between December and their return to the breeding areas in April/May remains unknown. Birds have been sighted on the coast of Brazil at this time, and although these are presumed to be from the North American population they may include birds which breed in the east Atlantic.

Demography

Studies to determine recruitment and mortality rates in the north-eastern Atlantic population are now underway but their significance remains unknown. An analysis of the ring-resighting data from Rockabill, Coquet and Lady's Island Lake shows that the adult survival rate is approximately 0.80 and the first year survival rate is 0.46. There is evidence for inter-colony movements among N.W. European colonies (Ratcliffe 1997), this being related to the

distance between them, suggesting that the colonies are operating as components of a metapopulation. A bird from Rockabill has also been recovered in a colony in the USA (O Merne *pers comm*). Simulation modelling of the survival rates and observed productivity data suggest that the population will decline slowly at the rate of 2% per annum over the next century. Adult survival seems to be low compared to other terns and so this should be the focus of management efforts at breeding colonies and in the wintering grounds. The population trends are very sensitive to changes in adult survival rate, with an increase of 2% being sufficient to stabilise the population.

Feeding

Foraging is done predominantly in small, mixed groups of terns, but generally further offshore than other *Sterna* species up to 10km from the breeding colony (O Merne *pers comm*), and they sometimes feed in association with predatory fish such as Tuna and Mackerel, and with diving auks. The food is mainly small shoaling fish, within Britain and Ireland especially Sandeels *Ammodytidae* (particularly in the pre-hatching period) and Sprats *Clupidae* (increasingly taken after the chicks hatch). There is some inter-colony variation. On Rockabill, courtship feeding observations indicated that the main prey was Sandeel (60%, N = 334), with Sprat (10%) and Rockling (16%) being less common and the remainder of the fish being unidentified. During the chick rearing period, Sprats were more common (58%, N = 214), Sandeels less so (24%) and Rockling and other gadoids rare (1% of each). In contrast to Rockabill, the most common prey at Lady's Island Lake during chick rearing was the Sandeel (81%, N=128), with Sprats comprising 16%.

The diet is more varied in the Azores, changing from year to year depending on the relative abundance of suitable prey species. In one study at Vila Islet, Trumpet Fish *Macroramphosus scolopax*, Sauri *Scomberesox saurus/Nanicthys simulans* and Lanternfish (mostly Mictophids) accounted for 81% of 1468 deliveries from adults to chicks in 1995 (Ramos *et al* 1998), while in 1996 Mackerel *Trachurus picturatus* and Sauri accounted for 62% of 931 deliveries (Pereira 1997).

Some food may be stolen from other tern species.

Habitat requirements

Predation: As a colonial ground-nesting species, the Roseate Tern is very vulnerable to predation, and the vast majority of colonies are on small islands free from native or introduced ground predators such as Brown Rats *Rattus norvegicus*. Predation apparently prevents Roseate Terns from establishing colonies on the mainland and may make them shift periodically from one island site to another. In some parts of Europe, site protection by wardens during the breeding season can reduce predation, even where predators are present, to a level at which successful breeding is possible. There is a considerable list of avian predators, including gulls and Common Buzzards *Buteo buteo*. In the Azores, the only recent cases of predation have been the taking of eggs, presumed to be by Turnstones *Arenaria interpres* (L Monteiro *pers comm*).

Substrates: Colonies are almost always on small offshore islands, occasionally on islands in brackish lagoons. The nest site is usually sheltered, often overhung by rocks or in the entrance to a disused Puffin *Fratercula arctica* burrow. The nest itself is often surrounded by stones or amongst and below vegetation such as Tree Mallow *Lavatera arborea* or Stinging Nettle *Urtica dioica*. In the USA and sites in Europe, Roseate Terns readily use artificial nest sites under planks or in custom-made boxes, and birds using artificial sites often have very high breeding success.

Threats And Limiting Factors

Breeding season

Poor breeding success

Factors affecting breeding success are likely to be as follows:

i) Uncontrolled disturbance: Nesting Roseate Terns are particularly sensitive to human disturbance, which can result in desertion by whole colonies or shifts in subsequent seasons. Disturbance and egg-collecting have been largely eliminated at most UK and Irish colonies by wardening during the breeding season, but it is important that protection measures remain in force. Disturbance is also considered to be a threat in the Isles of Scilly, where breeding is no longer regular. The existing French colonies and potential new breeding sites in Brittany, a popular tourist area, would suffer severe disturbance without wardening. In the Azores, disturbance affects some sites, including some large colonies, and some wardening is undertaken by the regional government. Marine police/guards provide some protection at a few sites. Disturbance from low-flying military aircraft has been identified as a potential problem at Coquet Island and the Ile aux Dames.

Importance: high

ii) **Predation:** At the former main Welsh colony, on Anglesey, predation by Foxes *Vulpes vulpes*, Brown Rats and Peregrine Falcons *Falco peregrinus* has occurred in the past decade. Predation by Peregrine Falcons has been severe in some years and involved the killing of both incubating adults and unfledged chicks. This same colony is joined to the mainland at low tide which makes excluding ground predators difficult. Low-tide night patrolling by wardens is carried out in order to exclude Foxes. Predation by Brown Rats has been severe at Lady's Island in some years, and Foxes, Badgers *Meles meles*, Mink *Mustela vison* and Otters *Lutra lutra* have also caused problems at this colony; rats are also believed to be a problem for seabirds on some of the islands in the Isles of Scilly, but have now been cleared from Samson. Occasional visits by other predators such as Magpies *Pica pica* can be damaging to individual sites in some years.

At French colonies, an immature Peregrine Falcon caused disturbance during the summer of 1988, suggesting that predation by this species might occur in future. Gull predation has been a problem for several years and in 1991 a mammalian predator may have been the cause of death of 52 incubating adults in France. Mink have recently arrived on the Ile aux Dames in the Baie de Morlaix, Brittany (IBA 012) and have been responsible for severe predation on many species present on the island. Predation on adult terns in 1997 totalled 49 Roseate, 24 Common and 19 Sandwich Terns. Breeding success was not quantified, but appeared to be low. This problem is now being addressed through LIFE-funding. One of the adult Roseate Terns had been ringed in Anglesey (UK) in 1993. It should be noted that adult Roseate Terns are more likely to be killed by nocturnal predators than other species, because they are tenacious to the nest (I Nisbet *pers comm*). Nocturnal predation of breeding adults could be a significant factor in population declines at some colonies.

On the Azores, predation by introduced mammals (Rats, Polecats and Ferrets *Mustela putorius*) may occur at some colonies in some years, and Common Buzzards are known to take fledglings from a colony on Vila.

Predation apparently prevents Roseate Terns from establishing colonies on the mainland and may make them desert or shift from one island site to another.

Importance: high

iii) Reduced food availability in summer: Food shortage is not thought to have been an important factor in the decline of the Roseate Tern witnessed during the 1970s in the north Atlantic. The quality of information collected on breeding numbers and nesting success has not been high until fairly recently but there has been little evidence of small clutches or chick starvation in the UK or France. However, on Rockabill in 1997 and 1998 almost all the second-hatched chicks died within days of hatching, almost certainly due to reduced availability of food because of bad weather at hatching time (though the bad weather caused some direct mortality). There is also some evidence that reduced food availability may affect some colonies in the Azores. Further information and analysis is required from this area. Food shortage can affect the growth rate of chicks.

Importance: unknown

Competition for nest sites

Roseate Terns often breed in association with other tern species, particularly Common and Arctic Terns, and there is little evidence of any interspecific competition. At some sites, it is possible that tern nesting areas could become overrun by gulls *Larus spp* if these are not controlled (e.g. at Rockabill), and colonisation of Samson in the Isles of Scilly, UK, by gulls could be preventing re-colonisation by Roseate Terns. Black-headed Gulls are increasing at some colonies and causing some losses of eggs and chicks, as well as local displacement. Loss of habitat to Herring Gulls *Larus argentatus* was a major factor in the decline of this species in the USA.

Many former Roseate Tern breeding sites in Britain still hold Common Terns, or other tern species, and would presumably be able to accommodate large numbers of Roseate Terns if the population were to increase.

Importance: low/medium

Loss of breeding habitat

The loss of breeding habitat has not been a major problem in most of north-western Europe in recent years, but a major Irish site has been lost through natural causes. Tern Island in Wexford Harbour (which formerly held up to 1,600 pairs) was a sand bar washed away in winter storms in the mid 1970s. Another site, Green Island in Carlingford Lough, Northern Ireland (which has held over 400 pairs), is being eroded and may disappear within the next 10 years. It is possible that sea level rise may increase the scale of this problem in the future. In France, it is more likely that sites are made unsuitable for nesting because of disturbance,

rather than actual habitat loss. In the Azores, some former colonies have been lost to human development and natural causes, but the total impact on the population is thought to be small. Evidence from Ireland suggests that, once colony sites are lost, some birds are not relocated elsewhere and the overall population is therefore reduced. Habitat shortage is not thought to be a limiting factor but the loss of key sites may exclude birds from good feeding areas and is a potential major problem.

Importance: low-medium

Non-breeding season

Poor survival of full-grown birds

Several factors have been suggested that may be reducing the survival rate of adult and juvenile Roseate Terns, two of which are of particular concern:

i) Persecution on the wintering grounds: The trapping of terns for sport, food or income in West Africa has been suggested as the major recorded cause of death of several species of terns outside the breeding season. Various methods are used, including snares, traps and 'fishing' for terns using baited hooks on nylon lines. The terns dive for the fish bait and become caught on the hooks. More first year birds than adults are taken - scavenging may be normal behaviour for young birds, or a result of food shortage.

Trapping is known to occur throughout West Africa, but ringing returns suggest that the major problem for Roseate Terns lies in Ghana/Senegal. In 1991-1992 a survey was undertaken along the coast of Ghana, to try to quantify the scale of the problem. Six species of terns were involved, with Roseate and Common Terns appearing to be more susceptible to snaring on the beaches than other species. Only 1% of the terns present were estimated to have been Roseates, but 9 captured Roseate terns were found (9% of the 99 trapped terns found). Interviews with the boys involved in setting snares suggested that on some days each could catch 12-15 terns, but unfortunately little other quantitative data were obtained (Ntiamoa-Baidu 1992).

In Senegal, searches of the coast between November 1995 and December 1997 discovered large numbers of rings from terns and other seabirds (often being used as jewellery), most of which were from Sandwich Terns ringed in 1994-97 at breeding colonies in the British Isles, Belgium and the Netherlands (Stienen *et al* 1998). It is unclear why rings from earlier years were not found. Only 4 rings (3%) were from Roseate Terns - 123 (81%) came from Sandwich Terns and 22 (15%) from Common Terns- but this study shows that unfortunately the trapping of terns, mainly by small boys, is still a common practice in Senegal. It is certain that the rings which were found represented only a small proportion of the terns which were caught, and Stienen *et al* judged that almost 10,000 terns may have been trapped during the 1990s, mostly Sandwich Terns but including perhaps 500 terns of other species.

Importance: unknown, potentially high

- ii) Food shortage in winter: Fishery statistics for Ghana indicate that *Sardinella* fish stocks have declined, although it is not known to what extent fish have become unavailable to terns. As the winter progresses *Sardinella* become less available to terns in this region and the whereabouts of Roseate Terns and the composition of their diet in the period December-May remains unknown. Fishing may also be reducing the number and distribution of predatory fish, which are important in driving smaller fish to the surface, where they become available to Roseate Terns.

Importance: unknown, possibly locally high

- iii) Disturbance at, or loss of, roosts: The large size and number of suitable sites along the Ghanaian coast, and the current low level of development around these, indicate that disturbance or loss of roosts is unlikely to be a limiting factor.

Importance: low

Climatic change

Long-term changes in sea-surface temperature may be partly responsible for the consistent and continued decline of fish stocks, e.g. *Sardinella*, in coastal west Africa and the Gulf of Guinea, though evidence is lacking. A gradual warming of the sea, resulting in less marked oceanographic up-wellings, has been associated with sub-optimal conditions for spawning fish. It is not known whether this change is a result of global climatic change.

Other possible long-term effects of climate change include changes in the number and distribution of predatory fish (which are important in driving smaller fish to the surface where they become available to roseate terns); a greater frequency of strong winds reducing the availability of prey fish; cooler/wetter weather (increasing direct chick mortality).

Importance: unknown

Conservation status and recent conservation measures

Europe

In 1987 an action plan for the recovery of the European populations of Roseate Tern was launched (Avery 1987). Most of its recommendations have been implemented (Avery *et al* 1995), and a number are also included in this plan.

A project carried out under 'Action by the Community relating to the Environment' (ACE) by BirdWatch Ireland and the RSPB, ran from 1989 to 1991. The main results arising from the work undertaken through this project were as follows:

- the decline in the total population of the UK and Ireland apparently halted
- intensive wardening of many colonies enabled better control of predators and a reduction in human disturbance
- survey and monitoring work in the Azores increased substantially
- the Roseate Tern was added to Appendix II of the Bonn Convention
- the Irish Republic colonies were designated as SPAs - full-time wardening, management and research work commenced
- understanding of some of the factors influencing the population has greatly improved
- breeding productivity of the species at a number of colonies appeared to have significantly improved
- an EU 'INTERREG' project was set up covering the Welsh and Irish colonies
- an RSPB Species Action Plan was drawn up, focusing on UK action but addressing problems elsewhere, particularly in Ghana
- a conservation network was established, with regular workshops.

Action carried out in individual countries is listed below:

Portugal (Azores)

The Roseate Tern is fully protected by law in the Azores, and all but one of the past, present and potential Roseate Tern sites have been declared as Special Protection Areas (SPAs). The main colonies are found on the islands of Flores (IBA 001), and Santa Maria (IBA 005, 006), with smaller numbers scattered on other island groups, particularly Terceira, Faial, Graciosa (IBA 003, 004) Corvo (IBA 002) and Pico.

In 1995-96 a two-year conservation project on Roseate Terns and other seabirds, under the EU LIFE programme, was run by the University of the Azores, the University of Glasgow and the RSPB. Detailed studies of diet and feeding ecology have been carried out.

Roseate Tern surveys were conducted within the framework of the EU LIFE contract. In 1996, coverage included the whole coastline, whereas in 1995 and 1997 coverage included all colonies known to hold more than 5 pairs in any year from 1989 to 1996 (also 1984), using an improved method of population estimation.

Some wardening takes place, but progress with implementing a wardening programme on sensitive breeding sites has been rather slow, despite this being an objective of the LIFE project. Disturbance is a problem at a number of colonies, and wardening is an urgent requirement.

Republic of Ireland

The Roseate Tern is classified as 'Endangered' in the Irish Red Data Book (Whilde 1993). Fully protected by law in Ireland; both of the breeding colonies are SPAs, as is a sand-bar in Wexford Harbour which was a former breeding site.

The Lady's Island Lake (IBA 085) tern conservation project was set up in 1983 by the National Parks and Wildlife Service. A programme of wardening and research began in 1988 on Rockabill (IBA 094). In the same year, Rockabill was designated an SPA and a Statutory Refuge for Fauna. In 1997, an EU funded 'INTERREG' project began the co-ordination of work at the two sites, including habitat management and an increased research effort. This work is a joint National Parks and Wildlife Service/BirdWatch Ireland project.

One of the main objectives of both projects is to study the breeding biology of Roseate Terns, including ringing programmes and recording of biometric data.

Wardening in summer is intended to prevent human disturbance to nesting terns and prevent predation (which includes prevention and limitation of gull nesting numbers on both Lady's Island and Rockabill). Conservation work includes habitat management and the provision of nest boxes. Monitoring of predation, disturbance and lake water levels at Lady's Island Lake are also undertaken and the tern project is promoted locally and to visitors to the area through school activities and open days.

The summer warden carries out conservation work (such as habitat management, the provision of nest boxes and preventing disturbance) and monitoring, in addition to promoting the project

France

The Roseate Tern is fully protected by law in France. Wardening by volunteers is co-ordinated by an NGO (Bretagne Vivante - SEPNE) with financial support from the Direction Régionale de l'Environnement de Bretagne (DIREN). Some ringing was carried in 1993, nestboxes have been provided, gull control carried out and unauthorised landing by visitors prevented by seasonal wardening. There is now only one regular colony, on the Ile aux Dames (IBA 061), which is state property, protected and managed by Bretagne Vivante - SEPNE.. Following the discovery of Mink, trapping was conducted on the Ile aux Dames in 1997 and one was captured early in the season. Others were on the island throughout the nesting season but no more were trapped. Given the high rate of mortality of adults in 1997 it is essential that Mink are controlled effectively if extirpation of the colony is to be avoided - this is the objective of the current LIFE project 'Archipelagos and marine islands of Brittany' (1998-2001).

United Kingdom

The Roseate Tern is given special protection in the UK under Schedule 1 of the Wildlife and Countryside Act 1981. It is 'red-listed' in *Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man* (RSPB *et al* 1996) as a 'SPEC 3', a species which had declined by more than 50% in the previous 25 years, and a rare breeding species (with fewer than 300 UK breeding pairs).

Five of the six current regular breeding sites are nature reserves, and either warded by contract staff or visited regularly in summer. These are in Northumberland (IBA 143, 145),

North Wales (IBA 213) and Northern Ireland (IBA 248, 254). Ringing and biometric studies are carried out at some sites, and wardens also carry out habitat management, provision of nestboxes, visitor management and discouragement of predators. Rats have been eliminated from one former breeding site. In 1997 a 3-year project began in Wales (the same EU 'INTERREG' project mentioned above in the section on the Irish Republic), with the aims of employing more wardening staff, carrying out habitat management and increasing the research effort.

Spain

Action limited to periodic surveys of the tiny Canary Islands population.

Ghana

From 1985 until 1994, the RSPB and ICBP/BirdLife International funded an educational programme run by the Government of Ghana, to try to reduce the incidence of winter trapping along the coast of Ghana. This was implemented by the 'Save the Seashore Birds Project, Ghana'. In 1994, the project's activities were taken over by the Ghana Wildlife Society. Counts of roost sites were carried out, and rings recovered from trapped birds. There is currently no monitoring of the trapping of Roseate Terns, although the spread of wildlife clubs and, recently, marine turtle conservation clubs, is probably helping to maintain a high profile for conservation and discouraging killing.

Monthly monitoring of terns and other coastal birds by the GWS continues at 13 sites along the coast. This organisation is part of the Coastal Wetlands Management Project. The project is concerned with sustainable management of resources by local communities, management of the lagoons for biodiversity, and promotion of alternative uses of the lagoon such as eco-tourism. GWS takes the lead on environmental education.

Senegal

A similar project to the Save the Seashore Birds Project in Ghana was run in Senegal in 1991-92 and from 1995-97 by LPO, in co-operation with the National Park Service of Senegal. This consisted of education sessions in schools along the coast in areas where terns were known to be trapped, and discussions with children seen to be wearing necklaces and bracelets made of tern rings. Fishermen and village chiefs were also involved in discussions about the problem (see section on persecution on the wintering grounds on page 6).

It has not so far been possible to find an organisation to carry on the work done by LPO in Senegal, or to find funding for this type of project, but it appears that a renewed input could help to reduce the tern trapping problem considerably (Alison Duncan *pers comm*).

Aims and Objectives

Aims

In the long term, by the year 2010 to increase the eastern Atlantic Roseate Tern population to 2,000 pairs. To maintain or increase the current distribution of Roseate Tern colonies in the eastern Atlantic. To ensure that Roseate Tern productivity in the north-west Europe population regularly exceeds 1.2 fledged young per pair and in the Azores population exceeds 1.0 fledged young per pair.

Objectives

1. Policy and Legislation

1.1 To encourage international co-operation over policy action to ensure the long-term protection of the north-east Atlantic population of the Roseate Tern outside the breeding season.

1.1.1 Legislative protection:

Roseate Terns are fully protected under national and international law but have limited legislative protection at sea outside European territorial waters or in the coastal waters of other countries. Appropriate protective legislation and enforcement should exist for the entire eastern Atlantic range of this endangered species (the African-Eurasian Waterbird Agreement, which came into effect in November 1999, should provide the necessary framework).

Priority: medium
Time-scale: ongoing

1.1.2 Global warming and climatic change

The possible adverse impact of climatic change on wintering Roseate Terns, both through direct impacts and as a result of altered food availability, should be noted and taken account of in policy work in respect of global warming. This species may provide a useful example of possible impact of climatic change.

Priority: low
Time-scale: ongoing

1.1.3 Legal reform and improved enforcement of wildlife legislation in West Africa:

This action formed one of the objectives of the 'Save the Seashore Birds Project - Ghana' which has already acquired full legal protection for all terns. There is a need for further strengthening of the enforcement authorities and for pressure to be brought for the law to be enforced. This work should also be extended to other West African States as appropriate.

The enforcement of the current legislation should be monitored to enable further comment on its effectiveness to be made.

Priority: medium

Time-scale: ongoing

1.2 *Regulation of coastal activities around breeding colonies*

1.2.1 Coastal developments near existing colonies should be regulated and resisted if considered to be potentially damaging.

Priority: medium.

Time-scale: long

1.2.2 Recreational activities and sustainable levels of fishing in coastal waters should be defined locally and enforced.

Priority: low

Time-scale: long

1.2.3 Integrated Coastal Zone Management (ICZM), which provides a strategic approach to the management of coastal activities, should be adopted by countries across Europe.

Priority: low

Time-scale: long

1.2.4 The recommendations of regional conventions, such as the Convention for the Protection of the Marine Environment of the North East Atlantic (OSPAR), the Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft (Oslo Convention) and the Convention for the Prevention of Marine Pollution from Land-based Sources (Paris Convention), should be fully implemented by the contracting parties. This will help to ensure protection of Roseate Tern habitat. Planning processes such as EIA regulations, cross-compliance etc may also be used to protect colonies.

Priority: medium.

Time-scale: long

2 Species and habitat protection

2.1 *To ensure the protection of current and former Roseate Tern breeding sites throughout the range of the north-east Atlantic population.*

2.1.1 Designation of key Roseate Tern breeding sites as Special Protection Areas:

National Governments in Europe should complete designation of the candidate sites, identified by BirdLife International in *Important Bird Areas in Europe* (Heath & Evans 2000) as holding key populations of Roseate Terns, as SPAs.

Priority: medium
Time-scale: ongoing

2.1.2 Acquisition of breeding sites and potential breeding sites

Where opportunities arise to acquire or create past, present or potential breeding sites, acquisition by way of purchase, lease or management agreement should be considered. It is important to develop criteria for site selection in order to guide proposals for acquisition.

Priority: medium
Time-scale: ongoing

2.2 *To ensure the appropriate management of current and, where appropriate, former and potential Roseate Tern breeding sites throughout the range of the north-east Atlantic population.*

2.2.1 Prevention of disturbance and persecution at breeding colonies

Action, such as wardening, is required to prevent disturbance and persecution, including egg collecting, at all colonies.

Priority: high
Time-scale: ongoing

2.2.2 Control of ground predators at breeding sites

Adequate control measures should be taken at all existing and key former/potential breeding sites to ensure that ground predators do not become established at colony sites, or are effectively excluded. Regular rat monitoring (using chew sticks) and baiting, warden patrols or electric fences may be required.

Priority: high
Time-scale: ongoing

2.2.3 Gull control at breeding sites to prevent predation and competition:

Where competition for space with gulls can be proven, gull-free areas should be maintained immediately around all Roseate Tern colonies, preferably by egg and nest removal. This

practice is now carried out routinely at many colonies in order to pre-empt competition and/or predation. The use of alphachloralose/ secondal baits should only be considered where predation is identified as a problem and where other methods of control are inappropriate.

Priority: high
Time-scale: ongoing

2.2.4 Vegetation management to provide cover for nests, incubating birds and chicks
At some colonies, the growth of adequate vegetation to provide cover from aerial predators should be encouraged. Tree Mallow, Lyme Grass *Elymus arenarius* and nettles *Urtica spp* have been used by birds but broad-leaved plants such as Potatoes *Solanum tuberosum* or Rhubarb *Rheum x cultorum* may be more appropriate at some sites. The choice of species will be determined by local conditions. Such plant growth and the response of terns should be monitored closely.

Priority: medium
Time-scale: ongoing

2.2.5 Provision of nest boxes or other structures to provide cover for nests, incubating birds and chicks:

An adequate number of nest boxes based on designs provided by RSPB, based on a pattern from the USA, should be sited at colonies where there is little cover and where aerial predators such as Peregrine Falcons or gulls cause problems. Such boxes should be regularly maintained and their usage monitored closely. Alternatives such as discarded tyres may be appropriate in some situations.

Priority: medium
Time-scale: ongoing

2.2.6 Provision of advice and assistance to conservation bodies over implementation of this plan:

The relevant conservation bodies in countries with breeding Roseate Terns of the north-east Atlantic population should be encouraged to implement all relevant actions outlined in this plan. Assistance should be given, as appropriate, to conservation bodies to press for the designation as Special Protection Areas of all major sites that are currently unprotected. Action such as wardening is required to prevent disturbance and persecution at all major colonies in the north-eastern Atlantic. At all sites where there is little cover and where aerial predators such as Peregrine Falcons or gulls cause problems, dense vegetation should be encouraged and an adequate number of nest boxes should be installed (see 2.2.4 and 2.2.5 above).

Priority: high
Time-scale: ongoing

2.3 *To ensure the protection of important sites for Roseate Terns in West Africa*

2.3.1 Protection of wetland sites of importance to roosting Roseate Terns in West Africa.

This action formed one of the objectives of the ‘Save the Seashore Birds Project - Ghana’ which pressed successfully for the establishment of a series of Ramsar sites along the Ghanaian Coast. There are as yet no key sites for Roseate Terns alone but for a number for coastal birds generally. These include Sakumo, Panbros/Densu and Mini Lagoon. This work should be extended to other West African states as appropriate. Money from the Global Environmental Facility (GEF) has been secured by the Ghanaian Government for site survey and wardening of five designated Ramsar sites.

Priority: medium

Time-scale: ongoing

3 Monitoring and research

3.1 *To support further research to determine the major factors limiting Roseate Tern numbers in the north-eastern Atlantic.*

3.1.1 Further research to examine the demography of the Roseate Tern and to monitor the two north-east Atlantic populations

The population dynamics of the Roseate Tern in the north-eastern Atlantic have not yet been thoroughly investigated. Further research and ongoing monitoring are required as follows:

- Continue annual monitoring of productivity of breeding colonies
- At least 50% of chicks produced each year should be ringed for the foreseeable future, using the newly developed ring which can be easily read in the field by telescope, to enable study of recruitment of young into the breeding population and chick growth rates.
- Trap adult terns on the nest for the purpose of ringing and ring examination to enable long-term systematic study of adult survival, and collection of biometric data.
- Integrate these ringing studies with feeding/foraging studies - location of important foraging areas and roosting sites while on migration should lead to measures to ensure their protection.

Priority: medium

Time-scale: ongoing

3.1.2 Further work to examine the effect of winter tern trapping specifically and to examine the biology of Roseate Terns generally in West Africa

The effect of tern trapping on the Roseate Tern population is unknown and, if discovered, will assist in targeting conservation action more effectively. Monitoring of wintering terns,

particularly ringed birds, should continue annually for the foreseeable future, at least one count of the whole Ghanaian coast during the period September-November should be undertaken. This should involve counts of adults, juveniles and ringed birds. Surveys of tern trapping along the coast to measure the amount, location, seasonal and annual changes in intensity should be implemented.

Priority: high
Time-scale: ongoing

3.1.3 Identification of the whereabouts of Roseate Terns during the period December-May.

The identification of adult and juvenile survival rates under Action 3.1.2 above will take some time to determine. If winter mortality is a problem, it is imperative that the whereabouts of Roseate Terns during the period December-May are identified.

Priority: medium
Time-scale: medium

3.2 *To ensure the regular monitoring of all established Roseate Tern colonies in Europe, to enable population trends to be assessed on an annual basis*

3.2.1 Annual survey of breeding colonies.

All of the main colonies in Europe were surveyed in 1997, enabling an accurate population estimate to be made. It is important that this survey is repeated regularly, preferably annually, so that any significant changes in numbers will be identified quickly.

Priority: high
Time-scale: ongoing

3.3 *To ensure the regular assessment of gull control methods at Roseate Tern colonies in Europe*

3.3.1 Assess the effectiveness and methodology of gull control.

Gull control has been conducted at several Roseate Tern islands, as well as other tern nesting localities, over a number of years. It is important that the current assessment of the effectiveness of gull control and analysis of control techniques is published, so that any changes necessary to management practice can be made at the earliest opportunity.

Priority: medium
Time-scale: ongoing

4 Public awareness and training

4.1 *To increase awareness of the problems facing the Roseate Tern and possible solutions, amongst workers in countries along the Atlantic seaboard, and amongst the general public.*

4.1.1 Facilitation of information exchange by the organisation of annual meetings and the production of a regular newsletter.

To maintain the communication and information exchange between different European, West African and North American workers, liaison meetings should be continued and a regular newsletter should continue to be produced. In addition to information exchange, the liaison meetings should be used to encourage activity under actions listed above.

Priority: medium

Time-scale: ongoing

4.1.2 Promotion of public awareness.

This could take a number of forms. Education projects in West Africa should be continued, as an important means of raising interest among the local population and thus helping to reduce the scale of trapping. In the breeding areas, problems of disturbance could be reduced by suitable publicity, and predation problems could possibly be reduced by the involvement of local people.

Priority: medium

Time-scale: ongoing

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ANNEX: Recommended conservation action by country

France

- 1.1.1 Legislative protection - ensure protection remains in place.
- 1.1.2 Global warming and climatic change
- 1.2.1 Regulation of coastal developments around breeding colonies - ensure protection remains in place
- 1.2.2 Control of recreational activities and sustainable levels of fishing in coastal waters (coastal activities are prohibited within 80m of the Ile aux Dames during the breeding season)
- 1.2.3 Adoption of Integrated Coastal Zone Management
- 1.2.4 Implement recommendations of regional conventions
- 2.1.1 Designation of key Roseate Tern breeding sites as SPAs - the Ile aux Dames is already designated
- 2.1.2 Acquisition of breeding sites and potential breeding sites - NB the Ile aux Dames is state property
- 2.2.1 Prevention of disturbance and persecution at breeding colonies - maintain wardening presence throughout the breeding season
- 2.2.2 Control of ground predators at breeding sites - continue control of rats and mink
- 2.2.3 Gull control at breeding sites to prevent predation and competition - continue control where required
- 2.2.4 Vegetation management to provide cover for nests, incubating birds and chicks - continue as necessary
- 2.2.5 Provision of nest boxes to provide cover for nests, incubating birds and chicks - continue as necessary, removing boxes each autumn and replacing in spring
- 3.1.1 Further research to examine the demography of the Roseate Tern and to monitor the two north-east Atlantic populations - if possible, re-start ringing of chicks and try to read rings of adults on the Ile aux Dames
- 3.2.1 Annual survey of breeding colonies - continue annual surveys on the Ile aux Dames and other localities which are only occupied occasionally
- 3.3.1 Assess the effectiveness and methodology of gull control
- 4.1.1 Facilitation of information exchange by the organisation of annual meetings and the production of a regular newsletter - continue contributing to the newsletter
- 4.1.2 Promotion of public awareness - continue existing initiatives, especially with free leaflets on tern conservation

Portugal

- 1.1.1 Legislative protection - ensure the Roseate Tern will be included as of high priority in potential future Wildlife Protection legislation
- 1.1.2 Global warming and climatic change - increase knowledge of the species feeding ecology and monitor food provisioning to chicks
- 1.2.1 Regulation of coastal developments around breeding colonies - urgent need for publication of regulations to Azores SPAs
- 1.2.2 Control of recreational activities and sustainable levels of fishing in coastal waters - urgent need for publication of regulations to Azores SPAs
- 1.2.3 Adoption of Integrated Coastal Zone Management
- 1.2.4 Implement recommendations of regional conventions

- 2.1.1 Designation of key Roseate Tern breeding sites as SPAs - needed for Lagoínhas islets (Santa Maria); other sites all currently SPAs
- 2.1.2 Acquisition of breeding sites and potential breeding sites - conclude acquisition of Vila Islet (Santa Maria)
- 2.2.1 Prevention of disturbance and persecution at breeding colonies - maintain wardening presence at sites within SPAs
- 2.2.2 Control of ground predators at breeding sites - maintain monitoring (most colonies are offshore and predator-free)
- 2.2.4 Vegetation management to provide cover for nests, incubating birds and chicks - continue the habitat restoration programme at Praia Islet (Graciosa)
- 2.2.5 Provision of nest boxes to provide cover for nests, incubating birds and chicks - continue on Praia Islet; remove nests after the breeding season and re-place in spring
- 3.1.1 Further research to examine the demography of the Roseate Tern and to monitor the two north-east Atlantic populations - a priority, dependent on raising funding
- 3.1.3 Identification of the whereabouts of Roseate Terns during the wintering period - increase ringing effort in Azores colonies for both adults and chicks
- 3.2.1 Annual survey of breeding colonies - maintain annual census of Flores, Faial, Pico, Graciosa, Terceira and Santa Maria islands.
- 4.1.1 Facilitation of information exchange by the organisation of annual meetings and the production of a regular newsletter - maintain the Azores participation
- 4.1.2 Promotion of public awareness - maintain the Azores participation

Republic of Ireland

- 1.1.1 Legislative protection - update the wildlife legislation to bring in more realistic penalties for interference to Annex I species such as the Roseate Tern
- 1.1.2 Global warming and climatic change
- 1.2.1 Regulation of coastal developments around breeding colonies
- 1.2.2 Control of recreational activities and sustainable levels of fishing in coastal waters - monitor stocks of prey fish species
- 1.2.3 Adoption of Integrated Coastal Zone Management - implement recent Government policy on Coastal Zone Management
- 1.2.4 Implement recommendations of regional conventions
- 2.1.1 Designation of key Roseate Tern breeding sites as SPAs - both sites already designated, but it may be possible to extend their boundaries to cover important feeding areas
- 2.1.2 Acquisition of breeding sites and potential breeding sites - conclude negotiations for the purchase of the main nesting island at Lady's Island Lake
- 2.2.1 Prevention of disturbance and persecution at breeding colonies - continue wardening at current levels; monitor increasing use of jet-skis, especially at Lady's Island Lake and take action if required; identify and protect post-breeding/pre-migration roosting sites
- 2.2.2 Control of ground predators at breeding sites - exclude goats from the nesting islet on the Dalkey Islands; continue control of Rats, Mink and Foxes at Lady's Island Lake
- 2.2.3 Gull control at breeding sites to prevent predation and competition - prevent gulls from nesting on Rockabill; keep tern nesting areas at Lady's Island Lake free of nesting Black-headed Gulls and Greylag Geese *Anser anser*; prevent predation by Hooded Crows and Magpies

- 2.2.4 Vegetation management to provide cover for nests, incubating birds and chicks - control/ manage introduced plant species at Rockabill to maintain suitability of tern nesting areas; remove bramble *Rubus fruticosus* thickets at Lady's Island Lake
- 2.2.5 Provision of nest boxes to provide cover for nests, incubating birds and chicks - continue to provide boxes at Rockabill, Lady's Island Lake and Dalkey Islands
- 3.1.1 Further research to examine the demography of the Roseate Tern and to monitor the two north-east Atlantic populations - continue ringing and reading of rings; continue monitoring of survival and productivity at breeding colonies to assess population trends; identify key feeding areas
- 3.2.1 Annual survey of breeding colonies - continue annual monitoring at Rockabill and Lady's Island Lake; update status of Roseate Tern at former breeding sites on the west coast (where numbers have always been very small) as part of the 'Seabird 2000' survey
- 3.3.1 Assess the effectiveness and methodology of gull control - continue to monitor
- 4.1.1 Facilitation of information exchange by the organisation of annual meetings and the production of a regular newsletter - BirdWatch Ireland and Dúchas to contribute to the annual newsletter. Follow up offer to host the next international workshop (in 2000)
- 4.1.2 Promotion of public awareness - continue existing initiatives: staff and local branches of BirdWatch Ireland promote Roseate Tern conservation, include education work and providing viewing facilities

United Kingdom

- 1.1.1 Legislative protection - ensure the Roseate Tern remains on Schedule 1 of the 1981 Wildlife & Countryside Act, and the Wildlife (Northern Ireland) Order 1985.
- 1.1.2 Global warming and climatic change
- 1.1.3 Legal reform and improved enforcement of wildlife legislation in West Africa - improvements are only likely to be made with the assistance of agencies in other countries
- 1.2.1 Regulation of coastal developments around breeding colonies
- 1.2.2 Control of recreational activities and sustainable levels of fishing in coastal waters
- 1.2.3 Adoption of Integrated Coastal Zone Management
- 1.2.4 Implement recommendations of regional conventions
- 2.1.1 Designation of key Roseate Tern breeding sites as SPAs - all current sites designated
- 2.1.2 Acquisition of breeding sites and potential breeding sites - not required for current breeding sites
- 2.2.1 Prevention of disturbance and persecution at breeding colonies - maintain wardening presence at sites which are nature reserves
- 2.2.2 Control of ground predators at breeding sites - maintain warden patrols. Most colonies are offshore and predator-free
- 2.2.3 Gull control at breeding sites to prevent predation and competition - continue annual raking of nests of large gulls
- 2.2.4 Vegetation management to provide cover for nests, incubating birds and chicks - ensure there is both adequate cover and sufficient open areas at breeding colonies
- 2.2.5 Provision of nest boxes to provide cover for nests, incubating birds and chicks - remove nests after the breeding season and re-place in spring
- 2.2.6 Provision of advice and assistance to conservation bodies - advice from RSPB particularly over research aspects

- 2.3.1 Protection of wetland sites of importance to roosting Roseate Terns in West Africa - this action is only likely to take place with the assistance of agencies in other countries
- 3.1.1 Further research to examine the demography of the Roseate Tern and to monitor the two north-east Atlantic populations - RSPB is drawing up proposals for funding
- 3.1.2 Further work to examine the effect of winter tern trapping specifically and to examine the biology of Roseate Terns generally in West Africa - RSPB is drawing up proposals for funding
- 3.1.3 Identification of the whereabouts of Roseate Terns during the period December-May - analyse available information to target new search areas
- 3.2.1 Annual survey of breeding colonies - continue annual surveys
- 3.3.1 Assess the effectiveness and methodology of gull control
- 4.1.1 Facilitation of information exchange by the organisation of biennial meetings and the production of a regular newsletter - RSPB to co-ordinate
- 4.1.2 Promotion of public awareness

Spain

- 1.2.1 Regulation of coastal developments around breeding colonies
- 1.2.2 Control of recreational activities and sustainable levels of fishing in coastal waters
- 1.2.3 Adoption of Integrated Coastal Zone Management
- 1.2.4 Implement recommendations of regional conventions
- 2.1.2 Acquisition of breeding sites and potential breeding sites
- 2.2.1 Prevention of disturbance and persecution at breeding colonies
- 2.2.2 Control of ground predators at breeding sites
- 2.2.3 Gull control at breeding sites to prevent predation and competition
- 3.2.1 Annual survey of breeding colonies
- 4.1.1 Facilitation of information exchange by the organisation of annual meetings and the production of a regular newsletter
- 4.1.2 Promotion of public awareness

Ghana

- 1.1.1 Legislative protection
- 1.1.2 Global warming and climatic change
- 1.1.3 Legal reform and improved enforcement of wildlife legislation in West Africa
- 2.3.1 Protection of wetland sites of importance to roosting Roseate Terns in West Africa - ensure continuation of the Coastal Wetlands Management Project
- 3.1.2 Further work to examine the effect of winter tern trapping specifically and to examine the biology of Roseate Terns generally in West Africa
- 3.1.3 Identification of the whereabouts of Roseate Terns during the period December-May
- 4.1.1 Facilitation of information exchange by the organisation of annual meetings and the production of a regular newsletter
- 4.1.2 Promotion of public awareness - ensure continuation of environmental education

Senegal

- 1.1.1 Legislative protection
- 1.1.2 Global warming and climatic change

- 1.1.3 Legal reform and improved enforcement of wildlife legislation in West Africa
- 2.3.1 Protection of wetland sites of importance to roosting Roseate Terns in West Africa - funding required
- 3.1.2 Further work to examine the effect of winter tern trapping specifically and to examine the biology of Roseate Terns generally in West Africa - resume contact with local coastal communities, especially in urban areas
- 3.1.3 Identification of the whereabouts of Roseate Terns during the period December-May
- 4.1.1 Facilitation of information exchange by the organisation of annual meetings and the production of a regular newsletter
- 4.1.2 Promotion of public awareness - continue to support educational input along the coast

Table 1 - Breeding population of the Roseate Tern in Europe in 1990, 1996, 1997 and 1998
(based on Roseate Tern Newsletters)

Country <i>Popn trend</i> (1990-1998)	Number of regular breeding localities	Number of pairs			
		1990	1996	1997	1998
Portugal (Azores) -1	12 8 islands	1051	1188	1020	895
Flores (IBA 001)		455	419	489	432
Santa Maria (IBA 005, 006)		220	380	356	198
Faial		60	138	0	0
Graciosa (IBA 003, 004)		150	30	27	34
Terceira		95	84	120	188
Corvo (IBA 002)		19	83	0	-
Sao Jorge		2	37	0	-
Pico		50	17	28	22
Republic of Ireland +2	2	381	687	650	658
Rockabill (IBA 094)		321	563	602	578
Lady's Island Lake (IBA 085)		60	124	47	80
France -1	2	100	106-111	105-110	65-70
Ile aux Dames BT12 (IBA 012)		95	105-110	105-110	65-70
Ile aux Moutons BT11 (IBA 011)		?	1	0	
United Kingdom -2	6	109	61	51	53
Firth of Forth		13	9	8	8
Northumberland (IBA 143, 145)		23	38	30	35
Southern England		0	0	0	2
North Wales (IBA 213)		48	1	3	2-3
Northern Ireland (IBA 248, 254)		25	13	9	3
European total (excluding Spain)	22	1641	2041- 2046	1827 -1832	1671-1676

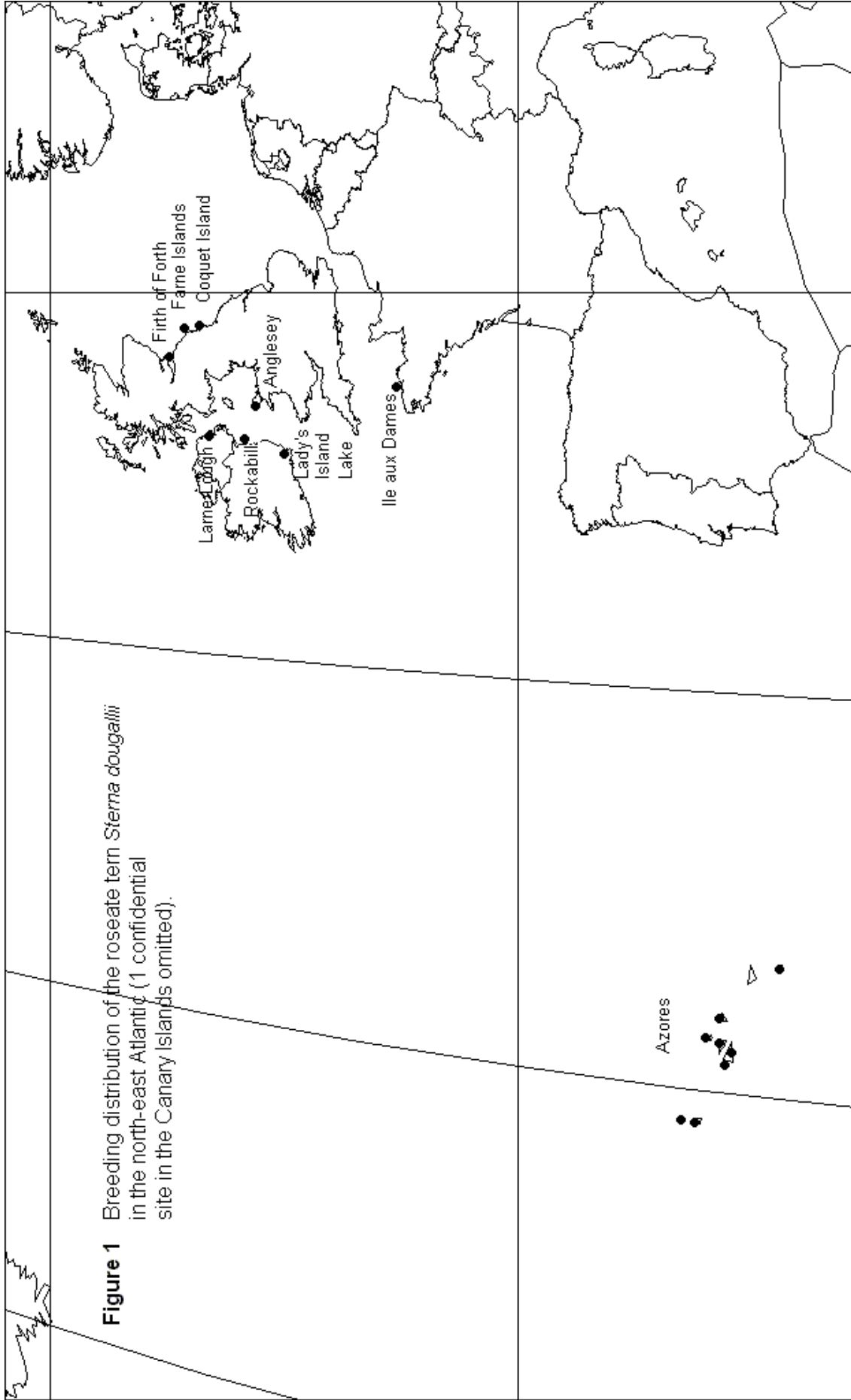


Figure 1 Breeding distribution of the roseate tern *Sterna dougallii* in the north-east Atlantic (1 confidential site in the Canary Islands omitted).

