The Winston Churchill Memorial Trust of Australia

Report by: Nicholas Carlile 2000 Churchill Fellow

Project: To study the recovery of critically endangered seabirds – Bermuda, Hawai'i and Portugal.

INDEX

INTRODUCTION

In the last 200 hundred years Australia has created the worst record for animal extinctions of any country in the world. To stop this disastrous record there is an urgent need for the application of management techniques using 'best practices' for endangered species. Seabirds have been particularly hard hit by a lack of action due to their specialised nature.

This Churchill Fellowship has enabled the author to visit conservation programs involving some of the most endangered seabirds in the world. The information gained and shared has already led to changes in research practices in some of the countries visited and given new understandings for conservation initiatives here in Australia.

This Fellowship was made possible by the Winston Churchill Memorial Trust of Australia, its board and employees. Significant support was provided by Dr David Priddel, Senior Research Scientist, Biodiversity Research and Management Division, NSW National Parks and Wildlife Service. Advice and initial guidance was generously provided by Dr Peter Fullagar, Research Scientist (Retired), Division of Wildlife Ecology, CSIRO. Mr Alan Morris of the NSW Field Ornithologists Club encouraged and supported the venture.

The destinations reached would not have been possible without considerable efforts by the following people. Dr David Wingate, Department of Parks, Bermuda; Ms Cathleen Natividad Hodges, Wildlife Biologist, Resources Management Division, National Parks Service, Hawai'i; Dr Francis Zino (MD), Freira Conservation Project Coordinator, Madeira, Portugal. Additional assistance was provided by Jeremy Madeiros, Helge Wingate and Leila Madeiros (Bermuda); Dr Fern Duvall II, Thomas Telfer, Dr Beth Flint and Kate Swift (Hawai'i); Joao Miguel Nunes, Elizabeth Zino, Dr Paulo Oliveira, Dr Henrique Costa Neves, Dr Duarte Camara and the wardens of the Parque Natural da Madeira (Portugal).

The NSW National Parks and Wildlife Service granted Special Leave to enable the Churchill Fellowship to be carried out. Finally the author wishes to acknowledge his partner, Lisa O'Neill, who provided support back in Australia during the duration of the Fellowship by way of managing his personal affairs and encouraging him during the months away from home and for this he sincerely thanks her.

EXECUTIVE SUMMARY

This 2000 Churchill Fellowship was undertaken by Nicholas Carlile, Project Officer Seabirds, Threatened Fauna Ecology, Biodiversity Research and Management Division, NSW National Parks and Wildlife Service.

Work address: 8th Floor 43 Bridge Street Hurstville, NSW 2220. Phone: 02 95856554
Email address: nicholas.carlile@npws.nsw.gov.au

Home address: 5 Robsons Road, Keiraville, NSW 2500. Phone: 02 42283070
Email address: petrel.head@yahoo.com.uk

Project Title: To study the recovery of critically endangered seabirds -- Bermuda, Hawai'i and Portugal.

The study of endangered seabirds is a very specific field of research and a number of seabird specialists were of particular assistance in the information gathered as part of this Fellowship. For the study of the Cahow (Bermudan Petrel), *Pterodroma cahow*, in Bermuda, Dr David Wingate of the Department of Parks having been the sole researcher on the species provided significant information. Ms Cathleen Natividad Hodges of the National Parks Service, Hawai'i, has worked on the 'Ua'u (Hawaiian Dark-rumped Petrel), *Pterodroma phaeopygia*, for the last decade when most of the ecological information on the species has been gathered. The Zino's Petrel (Freira da Madeira), *Pterodroma madeira*, has been the personal study of Dr Francis Zino in Madeira, Portugal since the 1960s and he is the principal force behind the Freira Conservation Project.

Conservation of endangered seabirds is a complex problem. Remote monitoring techniques are essential tools for management of many species. These techniques have been applied to all the species of this study and form the major lessons learned from the Fellowship. A great deal of additional information on seabird and island conservation has also been gathered during the three-month study. This covers topics as diverse as island restoration and fauna reintroductions. Much of the information collected is being disseminated through radio interviews, scientific seminars and talks to community interest groups. A draft scientific paper is being prepared for publication in an international journal to be co-authored by all the major researchers involved in this study. The working title of the paper is:

Carlile, N., Priddel, D., Hodges, C.N., Wingate, D. and Zino, F. (in draft) A comparative review of four endangered subtropical nesting petrels *Pterodroma cahow, Pterodroma leucoptera leucoptera, Pterodroma madeira, Pterodroma phaeopygia sandwichensis*.

The target journal will be Biological Conservation or another international peer-reviewed publication.

PROGRAMME

Nicholas Carlile's Churchill Fellowship 2000 schedule

May 08-12	Second International Conference on the Biology and Conservation of Albatrosses and Other Petrels. Organised by Environment Hawai'i, US Fish and Wildlife Service and the University of Hawai'i. Presented research papers and participated in workshops, Oahu, Hawai'i.
May 13-20	US Fish and Wildlife Service field day on Oahu then an extended field trip to participate in research projects on albatrosses and petrels and view island restoration activities, Midway Island, Hawai'i.
May 22-June 05	David Wingate, Parks Department. Research activities on the Cahow, Nonsuch Island, Bermuda.
June 06-26	Cathleen Hodges, Resources Management Division, National Parks Service. Research activities on the 'Ua'u, Haleakala, Maui, Hawai'i.
June 26-28	Thomas Telfer, US Fish and Wildlife Service. Review conservation activities of the Newells Shearwater, Kaua'i, Hawai'i.
June 29-July 03	Meetings with seabird and wildlife conservationists in Austin, USA and in London and Norwich, UK.
July 04- August 01	Frank Zino, Freira Conservation Project. Research activities on the Zino's Petrel, Madeira, Portugal.
August 03	Return to Australia

Overview and findings of Fellowship

While Australia has many proficient conservation managers in other endangered taxa the plight of seabirds has been largely neglected. This has contributed to a range of local extinctions of seabirds from islands around Australia. The research of seabirds on islands is difficult because of logistical constraints, restricted access due to local conditions, the nocturnal habits of many seabirds when ashore and limited funding for such projects. It is advantageous to any research that the techniques applied are the most cost-effective and efficient available. To ensure the use of best practice techniques it is wise to look beyond the local research community to review all available information.

There are over 130 species within the Procellariiform family, including albatrosses, shearwaters, storm-petrels and petrels. In this latter group some 25-40 species are from the genus Pterodroma. The fact that the exact number of species is unknown and still debated, demonstrates the real lack of information we have on many of the species within this genus.

The addition of rare seabirds to the international lists of endangered species has been slow in coming. Partly, this is due to the enigmatic nature of a group of animals that spend the major part of their life at sea, far from land. Their breeding sites are often on inaccessible islands, either in remote parts of the globe or on specks of land that have little else to attract people to them.

The larger ocean-travelling birds have been more in the public eye simply because of their sheer size and ship-following habits. For the smaller Procellariiformes this lack of attention is exacerbated because they ignore passing ships at sea, and on land they have a cryptic nature, being burrow nesters and mostly nocturnal in their habits.

As part of the Fellows position as Project Officer (Seabirds) with the NSW National Parks and Wildlife Service Nicholas Carlile has worked with an endangered subtropical petrel—the Gould's petrel, *Pterodroma leucoptera*—since 1992. With this experience behind him he had much to gain from working alongside other researchers dealing with similar species in other parts of the world. Through the provisions of the Churchill Memorial Fellowship Trust he was given the opportunity to visit several researchers dealing specifically with endangered subtropical petrels.

There are 4 species of endangered petrels known to breed in the subtropics: the Bermudan petrel or Cahow, *Pterodroma cahow*; Zino's Petrel from Madeira, Portugal, locally known as Freira da Madeira, *Pterodroma madeira*; Hawaii's Dark-rumped Petrel, known locally as 'Ua'u, *Pterodroma phaeopygia;* and Gould's Petrel *Pterodroma leucoptera*, from Port Stephens on the mid-north coast of New South Wales, Australia. This document will be limited to the reporting of the three species found outside Australia. A formal review of all four species will be prepared for publication in the scientific literature.

Like all Procellariiformes all three species of petrels lay only a single egg each season. They are strongly imprinted on their nesting sites, returning year after year to the same burrow. The petrels generally mate for life and they all feed principally on small squid and fish. The location of their feeding grounds during the non-breeding season is largely unknown. The birds range in size from 200 g for the Freira da Madeira (Zino's Petrel) to 434 g for the 'Ua'u (Dark-rumped Petrel) of Hawai'i.

The Cahow of Bermuda

The rarest species of subtropical petrels is the Cahow or Bermudan Petrel. This bird has only ever been known from the Atlantic islands of Bermuda, isolated 1200 km north-east of the Caribbean and 900 km east of the US coastal area of North Carolina. The species was thought to be extinct for 300 years. By the time it was rediscovered in the 1950s the Cahow was reduced to only 18 breeding pairs from all sites where it

could possibly breed. The threatening processes affecting the petrel have been identified and management action implemented to improve the situation. Intensive management efforts over the last 45 years have enabled the species to begin to recover from what can only be described as the precipice of extinction.

Historical activities associated with colonisation of the islands of Bermuda in 1610 led to the rapid decline in the Cahow population; a species that was once widespread. The strategic position of Bermuda saw it become a garrison island, where the British prevented the Spanish from gaining a foothold in the newly discovered lands of North America. Early settlers as a source of food exploited the petrels. These ground-nesting birds also fell prey to rats, dogs and cats, and their native forest habitat where they bred was soon destroyed. By 1630 the birds no longer bred on the inhabited parts of the island.

Upon rediscovery, they were found to be restricted to a number of small rocky islets, that together comprised a total area of only approximately 1 ha. Historical records of the bird from the 1600s showed that it burrowed into soil to make its nest. The islets that now form their breeding range support only pockets of skeletal soils. The soil depth on these last refuges precludes their natural burrowing activities, and it appears that the petrel has been forced to use natural rock cavities for nesting purposes.

The major cavity nesting species in Bermuda is the White-tailed Tropicbird. This species has a breeding season offset from the petrels such that when these birds first return to colonise the nest cavities the petrels have already hatched their young and are in the process of feeding chicks. The larger, more aggressive tropicbird kills the petrel chicks and prevents any petrel adults from re-entering the burrows. With no burrow or chick to keep the petrels at the island, the adults leave, abandoning their attempts to nest. Every season the adult petrels survive this encounter and so return year-after-year to begin their breeding cycle without ever being successful.

Initial management action involved fitting the nest sites with a timber baffle that restricted the tropicbirds but gave the slightly smaller petrels access. Additionally, creating artificial burrows from surrounding rock and cement provided new nest sites. These artificial burrows are constructed at a rate that allows for an excess of 10-15 units above current requirements. The artificial burrows require a high level of maintenance to ensure their proper functioning and to maintain the high levels of breeding success.

The research approach applied to the study of the Cahow is that based on non-intervention. Using sand traps at the burrow entrances and night-time observations all data collected on the petrel has been obtained without handling the birds. This monitoring technique has allowed the following data to be collected:

- Date of first return of birds to their burrows each season
- Pairing and copulation in burrows
- Date of pre-breeding exodus
- First return of birds to burrows for laying and incubation
- Date of egg laying for each burrow
- Date of hatching of chick in each burrow
- Condition of fledglings during exercise periods outside burrows

- Date of fledging of chicks from each burrow

The number of nesting pairs has increased from 18 in 1957 to 56 in 2000. Breeding success has improved from 20% to 55%. Total population size, however, is unknown due to the policy of not handling the birds. No banding has been carried out on the species. Over the last 40 years about 600 fledglings have successfully left the islands so a crude estimate of the total population would be in the order of 150-200 individuals. David Wingate has completed the great majority of this conservation work with support from the Bermudan Government.

Current limitations on successful breeding of this species are numerous:
- Destruction of artificial burrow sites due to winter storms
- Loss of island habitat due to erosion from winter storms
- Inundation of burrows from high seas
- Nest-site competition leading to the injury or death of Cahow chicks from tropicbirds
- Possibility of the breeding colonies being raided by egg collectors
- Colonisation of burrows by swarming bees
- Occasional invasion of islands by rats
- Occasional predation of adults due to migrant owls

Occasionally, older chicks are removed from their nest site if it appears that they are no longer receiving food from their parents. This lack of provisioning is often due to early abandonment of the nest by the adults. Abandonment of the chick is a normal occurrence at the conclusion of the breeding season but occasionally, for reasons not fully understood, the abandonment occurs earlier than usual. This situation can leave the developing chick vulnerable and jeopardise its chances of fledging successfully. Artificial feeding is a way of remedying this situation. Techniques to feed these birds have involved a complicated process of food preparation and long hours at night to administer the food. On advice given from the experience gained working with Gould's Petrel, a new process was applied this season. It proved successful in improving the condition of two Cahow chicks and led to their successful fledging. The new technique will continue to be used in the future.

Future directions for the Cahow Project are to begin life history studies by banding individuals. More importantly, it is intended to translocate fledglings from the smaller offshore islets to a nearby 6-hectare island using artificial nest boxes. It is likely that techniques developed in Australia, as part of research on Gould's petrel will be used to carry out this important next step in the survival of the Cahow. To assist this proposed translocation, David Wingate's successor to the position of Chief Wildlife Biologist—Jeremy Madeiros—will visit Australia to view the techniques being used on Gould's Petrel by the NSW National Parks and Wildlife Service. Mr Madeiros will review the techniques successfully practiced here and will be then able to apply these to the Cahow in coming years.

The 'Ua'u of Hawai'i

The Hawaiian Dark-rumped Petrel or ‘Ua’u, was formerly widespread in Hawai’i prior to the island’s discovery by Polynesians 1500 years ago. This began a period of direct harvesting and the introduction of alien mammals such as Asian pig, Pacific rat and Asian dog. The introduced predators had a significant effect on the lowland populations of the petrel. By the time Europeans discovered the islands the birds were becoming scarce with harvesting of the petrels prohibited by all except Hawaiian Royalty. Following European colonisation in 1771, the petrel’s breeding habitat was further constricted by the introduction of European rats, pigs and dogs as well as cats, goats and cattle. By the early 1900s the number of locations where the petrel was known to breed declined until eventually the species disappeared, having presumably become extinct. By this time the Indian Mongoose had also been introduced in a futile attempt to control rat numbers. The mongoose would eventually become a major problem for the long-term survival of the ‘Ua’u.

In spite of all these predators a small colony of petrels was found surviving on the second largest island in the Hawaiian Group, Maui, in the mid-1950s. Its location was at an altitude of 3000 metres within the inner rim of the island’s dormant shield volcano, Haleakala. The remoteness of the location and the harshness of the environment probably explain why the petrels had survived here while everywhere else they had disappeared. The petrels cope with the harsh conditions by having deep burrows and venturing above ground only under the cover of darkness. For predators the high day temperatures and lack of surface water would make survival at this location very difficult.

Since the early 1980s intensive efforts have been made to safeguard this breeding population and identify the threatening processes. A second small breeding population on the main island of Hawai’i has also been located and similar management actions have been implemented there. In more recent times, a further four possible sites have been identified on other islands from the nocturnal aerial calling of birds during the breeding period. These potential sites are on the islands of Kahoolawe, Kauai’i, Lani and Molokai. On all these islands except Kahoolawe the actual breeding sites of the petrel have yet to be located.

The main threats for the ‘Ua’u are loss of habitat and predation. At Haleakala the entire crater valley has been enclosed in a 20 km fence to restrict goats, cattle and dogs. The introduced Indian Mongoose, the most serious predator of petrel adults, is trapped at the fence line and within the colony. The cage traps used to capture mongooses also remove feral cats and rats. Rats are also baited through a series of poison-filled feed stations.

Much of the data collected on the ‘Ua’u is from remote techniques. The information gathered can determine several features of a nest:

- Active or inactive status
- Presence of breeding or non-breeding birds
- Failed breeding attempts
- Presence of developed chick
- Successful fledging of chick

The breeding population at this main colony is thought to be between 450 and 600 breeding pairs. The determination of a figure for breeding success is not possible but a closely related figure, that of the number of active burrows producing young, has stabilised at 43%. The depth of the burrows, dug in loose volcanic cinder, precludes a more accurate estimation of breeding success. The total population of petrels across all the Hawaiian Islands is thought to range between several thousand and 34,000 birds. These estimates are based on observations of birds at sea and the numbers of birds seen flying inland at dusk.

Future directions for the project will centre on continuation of current management. It is hoped that in the near future aerial baiting for rats will be instigated, increasing the effectiveness of predator control. When time permits further surveys will be carried out to identify new breeding sites both on Maui and on other islands within the archipelago.

The Freira da Madeira of Portugal

Zino's Petrel or Freira da Madeira is Europe's rarest breeding seabird. This petrel is only found on the heavily populated north Atlantic island of Madeira, off the coast of North Africa, about 900 km from Portugal, to which the island belongs. This story is complicated by the fact that Zino's Petrel was only recently split from a second closely related petrel, Fea's Petrel. While superficially similar, the two species have a number of important morphological differences. They also have different habitat preferences on different, but neighbouring, islands and have breeding seasons that, while they over-lap, begin four months apart.

Zino's Petrel was originally described in 1903 as the same species as Fea's petrel. The differences were not recognised until much later, However, even at this early stage it was already rare. Although it is presumed that breeding originally occurred over all of the main island, human colonisation in 1419 and the introduction of mammals, led to the species becoming restricted to inaccessible ledges high in the mountains of the island's interior. By the 1940s the species (at that time considered only a population of the more expansive Fea's petrel) was presumed extinct. The rediscovery of the species in late 1969 by local Maderian, Alec Zino, followed a number of years of careful detective work. These efforts had been spurred on by the occasional recovery of a live petrel at various locations around the main island during previous decades. No successful breeding was confirmed until after management action had been instigated in the mid-1980s.

Several threatening processes affect Zino's petrel:

- Destruction of habitat by feral and domestic goats
- Predation of eggs and small chicks by introduced rats
- Predation of adults by feral cats
- Capture and consumption of petrels by humans
- Illegal removal of eggs by collectors
- Damage to the petrel's nest sites by recreation activities

Management action was instigated by the Freira Conservation Project, a joint initiative led by Alec Zino's son, Frank, the Madeiran Government's parks department, Parque Natural de Madeira and Museu Municipal do Funchal.

Baiting of rats on all know breeding ledges and the trapping of cats is a year-round management program. The purchase of private lands that contain the petrel's habitat is ongoing. Subsequent management of these lands includes the removal of stock and fencing. Raiding of the breeding ledges by egg collectors has, in the past, been threat but the sites are now considered safe from such activities.

Breeding success has never been accurately determined because the depth of the petrel's burrows precludes adequate examination. The difficulty of just catching the adult birds and the sheer logistical complications of the steeply mountainous environment at an altitude of 1600 metres further complicates any intensive study. In total, 25-30 breeding pairs have been recorded across the five known nesting sites. Reproductive output peaked in 1999 when 15 young successfully fledged; a breeding success of just over 50%. Total population size for the species is unknown. Only 52 adult birds have been banded in the last 13 years following their capture principally by the use of mist-nets set at night, high on the mountain ridges.

It would appear that there is potential for other, as yet undiscovered, breeding colonies on ledges within the island's central mountains. This belief is based upon the large number of ledges that are free of goats but where access is extremely difficult. Based on the probability of more, as yet undiscovered breeding sites, and the number of calls heard at night, the total population of Zino's Petrel could be as high as a hundred individuals. Further intensive surveys within the central mountains of the island will help to clarify this.

Future directions for the project are numerous, and include:

- Continued purchase of the land currently containing ledges with known breeding colonies.
- Nocturnal audio surveys of other parts of the island's mountains to locate other breeding birds.
- Study of burrow usage by breeding adults using remote electronic techniques.
- Use of artificial burrows to enlarge the current breeding areas and improve access to nest sites.

Over the period that the Freira Conservation Project has been active a technique using audio surveys to determine nocturnal numbers has been developed. While this is only at the experimental stage, it has wider implications for other threatened seabird species. For many species it is difficult to obtain an accurate estimate of the size of the population, particularly if the species under study is nocturnal and access to their breeding burrows is not possible. The application of this technique may prove to be beneficial in overcoming problems in estimating the number of seabirds in difficult environments.

CONCLUSIONS

In reviewing the status of these three endangered, subtropical petrels a number of similarities can be identified.

All species are highly sensitive to changes in their breeding habitat, particularly the introduction of predators. In the most part they are capable of some degree of recovery when the pressures of habitat loss and predation are reduced.

All species require intensive management action for their survival. This necessitates not only the commitment of individual people, but also recognition by governments of the problem and the allocation of resources to ameliorate some of these problems.

When a species is restricted to small islands, as is the case with the Cahow in Bermuda, the threatening processes are more easily managed and ameliorated. For the Hawaian 'Ua'u and Zino's Petrel the problems of predation will be ongoing, but intensive management of the breeding areas and their surrounding habitat will hold the key to their future survival. The island-wide eradication of alien pests on such large and densely populated landmasses may never be possible.

While these species have been saved from extinction by careful management of their breeding sites, the activities of all seabirds can easily be affected by reckless exploitation of the marine resources on which they depend. It is important that all fisheries be conducted on an ecologically sustainable basis lest they unintentionally wipe out the hard-won gains that have been made to protect these endangered petrels on land.

The Fellowship project was concerned principally with seabirds. However, a number of other issues pertaining to island conservation and restoration were explored. These themes are of great value in demonstrating that seabird conservation should be considered in a holistic framework involving the conservation of entire island ecosystems. While not reported in this document some of the techniques that were used in Bermuda, Hawai'i and Madeira will have implications for island management in Australia.

Restoration of degraded island habitats is an international problem and techniques used in Bermuda have had startling results. There are several islands within NSW that would benefit from the application of the principles involved in the restoration of Nonsuch Island in Bermuda. Likewise the techniques applied to the reintroduction of locally extinct fauna in Bermuda have also been very successful. The application of these techniques to Australian islands, such as Lord Howe Island, would be extremely useful for restoring the original fauna assemblages to these islands. These and other ancillary themes have been discussed in seminars and radio interviews given since the Fellowship began and will be taken up with the relevant people within Government and Community bodies associated with island management.

Dissemination of results.

The information contained in this report has already been disseminated to a range of people within the community (see Appendices I and II). At the time of writing this report, information regarding the plight of seabirds internationally, as well as the role and function of the Churchill Memorial Trust has been disseminated in the following ways:

Radio interviews: 186 minutes on both Regional and National ABC stations

Seminars: 9 seminars and 3 general talks given to scientists, academics, university students, and community groups. Many of these fora have been open to the general public.

It is expected that at least a further 5 seminars will be given and further radio interviews will be possible.

The Churchill Fellowship Memorial Trust was also the subject of a report in a national magazine and a regional TV news item prior to the Fellows departure (see Appendix I).

A draft scientific paper is being prepared for publication in an international journal co-authored by all the major researchers involved in this study. The working title of the paper is:

Carlile, N., Priddel, D., Hodges, C.N., Wingate, D. and Zino, F. (in draft) A comparative review of four endangered subtropical nesting petrels *Pterodroma cahow, Pterodroma leucoptera leucoptera, Pterodroma madeira and Pterodroma phaeopygia sandwichensis*.

The target journal will be Biological Conservation or another internationally peer-reviewed publication. It will be submitted for publication in 2001.

RECOMMENDATIONS

- **Regular surveys should by made of all islands containing breeding seabirds to monitor the impacts of adverse activities whether 'natural' or human induced.**

- **Funding should be made available from Government and non-government sources, to ensure that islands are managed to preserve and enhance seabird populations and to conserve island biodiversity and ecosystems.**

- **For the long-term survival of seabird breeding populations, eradication of alien pest species, both plant and animal should be carried out on all islands so affected. This would not only benefit the seabird populations but also ensure the protection and conservation of entire island ecosystems.**

- **Consideration is given to all new techniques of intensive fishery activities prior to their practical application to ensure they do not adversely impact seabirds or other non-target species.**

- **All species of breeding seabirds should have a representative sample surveyed yearly to monitor breeding success. This procedure would provide an early warning system to identify detrimental impacts on fish stocks from over-harvesting and from incidents of severe ocean pollution.**

- **Consideration is given to the re-introduction of locally extinct island species on offshore islands in an attempt to restore these limited and unique ecosystems. Such activities should be government funded as a commitment to restoring biodiversity.**

APPENDIX I

Media Coverage

Television

Newcastle Broadcasting Network (NBN) NEWS - Churchill Fellowship Award.
Three minute news piece September 21 1999

Print media

The Australian Magazine– Bird in the hand.
Three page article in the Weekend Australian June 10-11 2000

Radio

1999

2VOX-FM Environment Show – Churchill Fellowship and Gould's petrel.
5 minutes on Community Radio July 10th in Wollongong, NSW
ABC 2NC Morning Show – Churchill Fellowship and Gould's petrel.
5 minutes on Regional Radio July 16th in Newcastle, NSW
ABC 2WG Morning Show - Churchill Fellowship and Gould's petrel.
9 minutes on Regional Radio July 16th in Wollongong, NSW
ABC National Evening Show - Churchill Fellowship and Gould's petrel.
5 minutes Nation-wide July 16th in Sydney, NSW

2000

ABC 2WG Morning Show- Churchill Fellowship and Gould's petrel.
10 minutes on Regional Radio April 13th in Wollongong, NSW

[During the Fellowship tour a fortnightly link-up was organised with two regional ABC radio stations to follow the Churchill Fellows journey.]

ABC 2WG Morning Show - Churchill Fellowship: Plight of the worlds Albatross and petrels. 10 minutes on Regional Radio May 12th in Honolulu, Hawai'i.
ABC 2NC Morning Show- Churchill Fellowship: Albatross conference and Midway Island. 10 minutes on Regional Radio May 17th , Midway Island, Hawai'i.
ABC 2WG Morning Show - Churchill Fellowship: Midway Islands birds, plastics and driftnets. 10 minutes on Regional Radio May 23rd in St Georges, Bermuda.
ABC 2NC Morning Show - Churchill Fellowship: Bermuda Cahow and David Wingate. 10 minutes on Regional Radio June 1st in St Davids, Bermuda.
ABC 2NC Morning Show - Churchill Fellowship: Bermuda restoration and fauna reintroductions. 10 minutes on Regional Radio June 5th in St Davids, Bermuda.
ABC 2WG Morning Show - Churchill Fellowship: Nonsuch – 5 islands link in restoration. 10 minutes on Regional Radio June 8th on Haleakala, Maui, Hawai'i.

Media Coverage

Radio
2000 (CONTINUED)

ABC 2NC Morning Show - Churchill Fellowship: Hawaiian Islands history and ecology. 9 minutes on Regional Radio June 14th on Haleakala, Maui, Hawai'i.
ABC 2WG Morning Show - Churchill Fellowship: Maui and the 'Ua'u 8.5 minutes on Regional Radio June 26th on Haleakala, Maui, Hawai'i.
ABC 2NC Morning Show - Churchill Fellowship: The 'Ua'u and Hawaii 10 minutes on Regional Radio July 6th on Haleakala, Maui, Hawai'i.
ABC 2NC Morning Show - Churchill Fellowship: Zino's petrel and Madeira 10 minutes on Regional Radio July 18th in Funchal, Madeira.
ABC 2WG Morning Show - Churchill Fellowship: Zino's petrel and the Portuguese navy. 8.5 minutes on Regional Radio July 18th in Funchal, Madeira.
ABC 2NC Morning Show - Churchill Fellowship: Madeira's Atlantic islands 10 minutes on Regional Radio July 31st in Funchal, Madeira.

[Churchill Fellow returns to Australia.]

2VOX-FM Environment Show – Churchill Fellowship endangered seabirds. 2 minutes on Community Radio August 12th in Wollongong, NSW
ABC 2NC Morning Show – Endangered petrels and the Churchill Fellowship 10 minutes on Regional Radio August 17th in Newcastle, NSW.
 # ABC 2WG Morning Show - Endangered petrels and the Churchill Fellowship 14 minutes including listeners questions August 22nd in Wollongong, NSW.
2VOX-FM Environment Show – Churchill Fellowship endangered seabirds. 10 minutes on Community Radio September 16th in Wollongong, NSW

- A cassette copy of this interview is enclosed with this report.

Seminar Listings

*Denotes presenting author

Given during the Fellowship Tour:

Priddel, D* and Carlile, N. (2000). Decline and Recovery of the endangered Gould's petrel (Pterodroma leucoptera leucoptera).
Second International Conference on the Biology and Conservation of Albatrosses and other Petrels, Honolulu Hawai'i USA.

Carlile, N* and Priddel, D. (2000). Establishment of a second breeding colony of Gould's petrel (Pterodroma leucoptera leucoptera) by translocation of fledglings.
Second International Conference on the Biology and Conservation of Albatrosses and other Petrels, Honolulu Hawai'i USA.

Seminar Listings

Given during the Fellowship Tour: (CONTINUED)

Carlile, N* and Priddel, D. (2000). The decline and recovery of Gould's petrel and translocation of Gould's petrel to Boondelbah Island.
Bermuda Aquarium and Museum of Zoology, Bermuda.

Carlile, N* and Priddel, D. (2000). The decline and recovery of Australia's 'Ua'u; the Gould's petrel.
National Park Service Headquarters, Haleakala National Park, Maui, Hawai'i, USA.

Carlile, N* and Priddel, D. (2000). The decline and recovery of Australia's petrel.
Museum of Electricity, Funchal, Madeira, Portugal.

Given following the Fellowship Tour:

Carlile, N* and Priddel, D. (2000). Petrel Shortage: managing the worlds endangered Pterodromas (with examples from Hawaii, Bermuda, Madeira and Australia).
Disciplines of Geography and Environmental Science and Management, The University of Newcastle.

Carlile, N* and Priddel, D. (2000). Petrel Shortage: managing the worlds endangered Pterodromas.
Department of Biological Sciences, The University of Wollongong.

Carlile, N* and Priddel, D. (2000). Managing the world's petrel shortage: local solutions to global problems for endangered seabirds (examples from Hawaii, Madeira, Bermuda and Australia).
Policy and Science Directorate Seminar Series, NSW National Parks and Wildlife Service, Hurstville, Sydney.

Carlile, N. (2000). After the Petrel Shortage comes the Biogeography Junket – Bermuda.
An informal talk to the staff of NSW National Parks and Wildlife Service, Hurstville, Sydney.

Carlile, N. (2000). After the Petrel Shortage comes the Biogeography Junket – Hawai'i.
An informal talk to the staff of NSW National Parks and Wildlife Service, Hurstville, Sydney.

Carlile, N. (2000). After the Petrel Shortage comes the Biogeography Junket – Madeira.
An informal talk to the staff of NSW National Parks and Wildlife Service, Hurstville, Sydney.

Seminar Listings

Given following the Fellowship Tour: (CONTINUED)

Carlile, N* and Priddel, D. (2000). Petrel Shortage: managing the worlds endangered Pterodromas (with examples from Hawaii, Bermuda, Madeira and Australia).
NSW Field Ornithologists Club, Central Coast, Gosford.

Currently booked for presentation after the submission of this report:

Carlile, N and Priddel, D. (October 2000). Petrel Shortage: managing the worlds endangered Pterodromas.
Division of Science and Design, The University of Canberra.

Carlile, N. and Priddel, D. (March 2001). Managing the world's petrel shortage: local solutions to global problems for endangered seabirds (examples from Hawaii, Madeira, Bermuda and Australia).
WEA Hunter Region, Newcastle.

Carlile, N. and Priddel, D. (March 2001). Petrel Shortage: managing the worlds endangered Pterodromas (with examples from Hawaii, Bermuda, Madeira and Australia).
Cumberland Bird Obsevers Club, Sydney.

Carlile, N. and Priddel, D. (April 2001). Petrel Shortage: managing the worlds endangered Pterodromas (with examples from Hawaii, Bermuda, Madeira and Australia).
National Parks Association, Sydney.

Carlile, N. and Priddel, D. (April 2001). Petrel Shortage: managing the worlds endangered Pterodromas (with examples from Hawaii, Bermuda, Madeira and Australia).
Canberra Ornithologists Group, Canberra.

General Community Communications

During the course of the Fellowship tour e-mail updates were posted, via the internet, to over 40 people including academics, scientists, members of bird clubs and interested members of the community.

Publication of these e-mail updates will appear in an edited format in the community newsletter **Albatross Newsletter Issue No. 25** produced by the *Southern Ocean Seabird Study Association, Wollongong, NSW.*

APPENDIX II

Information sheets promoting seminars and informal talks given during the Churchill Fellowship 2000 and since returning to Australia.