Managing Offshore Island Reserves for Nature Conservation in Tasmania

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Abstract

Tasmania has an oceanic island, subantarctic Macquarie Island, and approximately 200 continental islands of more than a few hectares in area. Nearly half of them are reserved for nature conservation mainly to protect seabird or seal breeding colonies and approximately one quarter of the remainder, mainly in Bass Strait, are used for sheep grazing.
This paper discusses the issues of islands as biological reservoirs, translocation of fauna, feral animals and man-induced changes in a Tasmanian context. Four examples of island nature reserves, Pedra Branca, Macquarie, Maria and Chappel Islands are chosen to provide detailed examples of some of the successes and frustrations of island managers.

INTRODUCTION

Around the Tasmanian coast there are approximately 600 named islands, rocks or reefs extending south from 39°12'S in Bass Strait to 43°52'S, at Pedra Branca Rock, the southernmost exposed land on the Australian continental shelf. Some 1 500 km further south at 54°30'S is the subantarctic zone in Macquarie Island, also a Tasmanian island proclaimed jointly with Van Diemans Land in 1825.

Most of the islands are quite small but over 220 are more than just a few hectares in area. They are grouped together in three geographical regions; the eastern and western ends of Bass Strait and around the southern coast. Nearly half of them are reserved for nature conservation.

Tasmanian islands are superficially similar to New Zealand's because of the influence of climate at similar latitudes. They currently play a very limited role in the conservation of endemic mammals. Only one species, the red-necked pademelon, occurs naturally on offshore islands but it is also very abundant on mainland Tasmania. High annual rainfall from the westerly weather circulating around the Southern Ocean has maintained temperate rainforests on some islands and their presence has provided secure breeding grounds for millions of pelagic seabirds living in that ocean. The similarity disappears when the biota are compared more closely.

Tasmanian continental islands share most species of plants and animals with Tasmania or the Australian mainland because they were part of these land masses until quite recently (15 000 years B.P. ago). Over 50% of the vertebrate animal and vascular plant species which are endemic to the state occur on Tasmanian islands but less than 1% of them are confined to the islands, principally those off the south coast. There has been insufficient time for endemic species to evolve on Tasmanian islands and those present are remnants of formerly much more widely distributed populations in the south eastern part of the continent.

BIOLOGICAL RESERVOIRS

The islands support living resources of high conservation value. They are the principal breeding locations for many species of seals and seabirds and contain a variety of important plant and animal communities.

Over three million penguins of four species breed in approximately 100 colonies on Macquarie Island, a nature reserve of some 12 700 ha in area. Nine million pairs of short-tailed shearwaters (muttonbirds) breed in large colonies on offshore islands in eastern and western Bass Strait and around the southern coast of Tasmania. They are exploited for food, feathers and oil. Taking of muttonbirds is regulated and the industry is subject to a management plan. Sixty of the one hundred islands with muttonbird colonies are reserved and the greatest problem in management is the need to control physical damage and over-exploitation by non-commercial birders.

Reptiles on some islands also depend exclusively upon these seabirds, eating chicks or scavenging spilt

food. Such dependence has produced rapid morphological changes in some recently isolated populations in Bass Strait. Chappell Island tiger snakes may grow to 2 m in length and eat muttonbird chicks which weigh up to 750 g at 9 weeks of age.

The islands are increasingly important as a breeding refuge for resident beach birds that suffer excessive disturbance from people on adjacent mainland beaches in summer.

Seasonal migration of birds across Bass Strait involves a significant portion of the Tasmanian avifauna including many species of waterfowl, waders, small passerines and others. Some fly directly but others island hop using good or shelter available on the islands (e.g. the Orange-bellied Parrot).

Until recently the Furneaux Group supported the main breeding population of the Cape Barren goose. Management of these islands for breeding geese has increased the range and abundance of the species whilst maintaining the breeding population and reducing some conflict with pastoralists.

Islands off the south coast contain relic populations of two of Tasmania's rarest endemic vertebrate species the Forty-spotted pardalote and the Pedra Branca Skink. The skink reaches a maximum length of approximately 200 mm, occurs only on Pedra Branca Island, a 2.5 ha sandstone outcrop 26 km south of Tasmania covered by nesting gannets and albatrosses. It lives under rocks or in crevices and eats regurgitated fish accidentally dropped by the birds whilst feeding their chicks from September to March (Rounsevell, *et al.* 1985).

There are only an estimated 200 to 300 skinks in the population and the species is regarded as rare and endangered. The size in the population and the species is regarded as rare and endangered. The size of the population is limited by the amount of available shelter (and possibly food) on the island and could be increased by artificially increasing the amount of available shelter, but they would remain totally dependent upon the breeding of gannets or albatrosses on the island every year.

The loss of the seabirds or the introduction of rats could signal the demise of the species. It has been isolated on Pedra Branca Island for approximately 15 000 years and no other suitable island free of competitors, to which the species could be readily translocated, exists. Fortunately Pedra Branca Island is remote, difficult of access and rarely visited, but boats have been wrecked on its shore and management of the island should include periodic monitoring of the seabird colony and the skink population. In the event of a catastrophe such as the loss of the birds or the introduction of rats the species would be in a real difficulty and quick action would be needed to prolong the survival of the species.

TRANSLOCATION AND RE-ESTABLISHMENT

Magpies, kookaburras, pheasants, quail, peacock, rabbits and fallow deer are amongst those fauna to have been deliberately established on Tasmanian islands for the short-term convenience of man. Native fauna have also been introduced to enhance short-term appreciation of an island or under the misapprehension that long term survival of the species would result. Most such introduced species are destined to extinction on islands where habitat is not actively managed for them.

A major official program of translocation of native fauna was carried out twenty years ago on Maria Island. In the late 1960s Maria Island off the central east coast of Tasmania was offered for sale because grazing sheep, which had occupied the owners for the past 50 years, became uneconomical. The Government purchased it for a national park because the island was once a whaling and convict settlement. It also happens to contain the largest area (nearly 10 000 ha) of mixed dry sclerophyll plant communities to be reserved any where in the State. But as far as animals were concerned it was seen as something of a poor deal. The original native mammal fauna known to be on the island at the time included the Tasmanian pademelon, southern potoroo, ring tailed possum, eastern pigmy possum, common wombat, echidna, velvet furred rat, water rat and some bats of the genus *Eptesicus*. Brushtail possums and Tasmanian native-hen were also well established having been taken to the island by a grazier a decade or so prior. Exotic feral and pest species present at the time were fallow deer, sheep, feral cat, rabbit, ship rat and house mouse. The sheep and rabbits were subsequently removed, exterminated or died out.

In the period between 1969 and 1971 when the island was being declared a national park the wildlife authorities set about to "restock" the island with native mammals and birds considered to be appropriate for such a park. Reasons advanced for doing this were biologically unsound and seem now to have been an over reaction to the initial issue of woodchip licences to private companies throughout the state at that time. The result is a series of population explosions the effects of which are continuing to unfold and a major management cost to monitor, interpret and counter those effects.

Mammals and birds introduced for the first time were forester or grey kangaroos, Bennetts wallaby, eastern bettong, brown and barred bandicoot, emu, Cape Barren goose and eastern rosella. Populations of species already on the island were supplemented by importing individuals from elsewhere. These argumented species included 9 other species of birds (mainly large waterfowl) for which there was little available habitat, and all species of mammals previously known to be on the island except bats, eastern pygmy possum, velvet furred rat and water rat. The result of this zoo approach has destroyed any previous genetic integrity of most of the islands original mammal populations which had probably been isolated from populations elsewhere for 3 000 years.

Fortunately *Phytophthora cinnamomi*, which is now common in many areas the introduced animals were taken from, was not taken to the island at the same time. This episode has produced some interesting experimental population data. One side issue which should be recorded is that the swamp antechinus was also introduced to the island from Maatsuyker Island even though prior searches failed to find the species on Maria Island and because of the mistaken belief that the Baudin Expedition had collected this type specimen material from Maria Island. Though the expedition visited Maria Island the type specimens of swamp antechinus were collected several days later from Waterhouse Island in Bass Strait. No swamp antechinus have been found on Maria Island either prior to or since the releases in 1971. Nevertheless they and several other small mammals which have yet to be found probably do occur naturally on the island.

After the introductions most of the birds left the island when their feathers had grown, except the emus. Those birds that stayed apparently of their own choice included the eastern rosella which successfully bred for several years, quickly declined within five years and is now extinct. Eastern rosellas do not occur on Bruny Island, another apparently even more suitable and slightly larger island than Maria Island. The reasons for this are unclear.

Cape Barren geese and emus immediately adopted the island and bred successfully. The goslings argumented the local population which grew until food became scarce and birds began to move to the mainland where they are occasionally shot. The goose population reached a plateau of approximately 40 breeding pairs and a standing population of 150 to 250 geese by 1981. They are an attractive bird but breeding pairs raising goslings in an historic site or visitor centre can give it the appearance of a fowl run. Emu hatching success was high but so also was chick mortality and only an annual increase of two to four juveniles were recruited. Bold or aggressive males cause problems in public areas and troublesome birds began to be removed from the park after the adult population reached approximately 25-30 birds in 1982.

Perhaps the most instructive result has been the changes in introduced native mammal populations. The abundance of all species present before the introduction program remained apparently unchanged. Common wombats are still uncommon despite the introduction of the Flinders Island variety which is smaller than the mainland form. All the mammal species introduced for the first time, except possibly the swamp antechinus, are still present. The eastern bettong population expanded into available woodland habitat apparently without difficulties and the forester kangaroo and Bennetts wallaby did likewise, initially.

The first signs that something was amiss began to appear in 1973 when both species of bandicoots had reached an apparent peak abundance.

During a dry summer in 1973-74 brown bandicoots were commonly found dead and in early 1974 barred bandicoots around the visitor centre began to die apparently as a result of gum infections of a kind often found in captive bandicoots fed on artificial diets. Much smaller numbers of bandicoots now persist on the islands.

Forester kangaroo abundance increased steadily until 1981 when grassland around the visitor centre first began to be fully utilized by the larger macropods. A prolonged drought the following summer (1982-83) caused the first major mortality of kangaroos. Many yearlings died but the population quickly recovered to reach an estimated 2 000 animals in 1985. In that year again many yearlings died apparently this time as a result of, or in association with, increased frequencies of lumpy jaw infections and large infestations of internal parasites.

Wildlife management on Maria Island over the past 15 years has demanded monitoring, research and culling of populations of unnecessarily introduced native fauna. This activity has diverted sparse resources from the important issues of feral cat control, monitoring and abundance of an endangered species of bird, the Forty-spotted Pardalote and other island management issues in need of attention.

FERAL ANIMALS

Rabbits, cats and rats are the exotic animals generally having the greatest effect on the original fauna and

flora of islands. Subantarctic Macquarie Island has had all three for a century or more and the history of their introduction and effect upon the island biota is well documented elsewhere.

During the late 1960s and early 1970s debate about the role of rabbits in erosion was intense and programs were initiated to study the rabbits and methods for their control. It was ultimately decided that myxomatosis was the only available method likely to provide significant control of the rabbits (Brothers *et al*. 1982). Since no natural vectors for the *myxoma* virus were available on the island rabbit fleas had to be introduced first. They took almost a decade to be widely established on the island where wet burrows often limited their breeding. This allowed time for detailed studies of the causes for the distribution and abundance of rabbits on the island. In retrospect this work paid off because information against which the long term effectiveness of the *myxoma* virus can be assessed is now available.

Prior to the introduction of *myxoma* no serious effort to eradicate cats, rats or Stewart Island wekas, another introduced predator, was made. A similar investigative approach was adopted and it was found that cats and wekas depended upon young rabbits for food during winter and the rats were not a serious threat to existing fauna. Consequently all the available resources were initially put into rabbit control.

Following the introduction of the Lausanne strain of the *myxoma* virus in November 1978 the rabbit population was substantially eradicated from the northern half of the island. The remaining population has continued to be depressed by artificial spreading of the virus by various methods including injuring rabbits with infected wads shot from air rifles. Monitoring of rabbit abundance and the recovery of flora has continued. On the rugged southern half of the island rabbits can effectively live in isolation from the natural spread of fleas and virus and a combination of artificial spread and other methods of rabbit control needs to be implemented if rabbit numbers are to be further reduced.

In 1985 the virus was still effective and occasionally spreading of its own accord. In 1986 it will be tested for any attenuation of its effects on rabbits. The Lausanne strain has been remarkably successful on Macquarie Island. it has allowed the recovery of previously overgrazed plant associations and assisted in the control of the introduced predators; cats and wekas. The cats, having fewer rabbits in winter, appear to be preying upon the wekas which are now quite rare.

The virus is actively depressing and thus controlling rabbit numbers. Before its introduction rabbit abundance increased rapidly in years of low rainfall probably because the rabbits, like the rabbit fleas, could not breed very successfully in wet burrows. The driest year since the introduction of *myxoma* virus occurred in 1984 and there was not even a hint of an increase in rabbit numbers in plots being monitored for that purpose.

MAN-INDUCED CHANGES

Some of the most difficult but satisfying land management is involved in restoring neglected islands to a more useful or acceptable form. Chappell Island, in Bass Strait, is 350 ha in area and the centre piece of the Chappell Islands Nature Reserve. The reserve was declared in 1975 to protect breeding habitat for Cape Barren geese (Eberhard and Pearse 1981). Chappell Island had a history of grazing by leasees some of whom badly neglected the pastures established for stock after the original native vegetation had been cleared. For some thirty years at least, this island has had serious infestations of slender thistle and hoarhound. These weeds seriously limit the potential of the island for geese and grazing reducing the area of useful pasture by at least 50%.

In 1958 Mary Gilham made recommendations on management of the island. In 1974 further investigations of the island by agricultural officers interested in its welfare were made in 1978 N.P.W.S. officers prepared a works program for its future management but most of the work has not been done through lack of money. Resources provided are currently exhausted on monitoring goose production on the island but the number of goslings fledged has decreased. After a peak production year of 994 goslings in 1982 the island produced only 253 goslings during a drought in 1984 because only 40% of the former number of breeding pairs remained on the island. Since the population of Cape Barren geese is expanding in Bass Strait generally there has been no need to repair the island to attract more breeding geese.

The island is leased for the grazing of sheep to utilize the pasture and help maintain it in a condition which the geese can also use. Chappell Island is one of approximately 40 islands under lease, or freehold, which is being grazed by sheep. In the Furneaux Group particularly, where the geese and sheep share pasture, its care is a common goal but for Chappell Island this goal has not been fully realised.

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