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CONTROL OF SILVER GULLS IN TASMANIA

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A large increase in the number of Silver Gulls around Tasmania in the last thirty years has resulted in problems of motor and air traffic hazards. Discouraging breeding has been inadequate. Removal of eggs has been successful in reducing the problem at one site. Culling using alpha-chloralose baits, has provided an immediate but not long-term remedy; it has been used successfully however, to protect a long-term study area of the Short-tailed Shearwater from invasion by Silver Gulls. The elimination of additional food sources, such as garbage dumps, will probably be the only effective method of reducing gull numbers.

INTRODUCTION

Silver Gulls *Larus novaehollandiae* breed around Tasmania with the largest colonies in the north-west of the State. Eggs are laid between August and December. In the last thirty years their numbers have increased greatly because of ever increasing urbanization and proliferation of garbage dumps which provide a reliable year-round supply of food (Sharland 1956; Walker 1988). The increased numbers have brought about problems of contamination of domestic water supply, road hazard, aircraft hazard and threat to the breeding of co-nesting seabirds. Poisoning, scaring devices, erecting wires and destruction of eggs have been some of the control methods used in Tasmania. This paper details specific problems and attempted solutions at three sites in Tasmania.

STUDY AREAS AND METHODS

Sorell causeways

The causeways on which Silver Gulls breed are man-made and form part of the Tasman Highway. They are situated 17 km in a direct line from Hobart and 3 km from Hobart Airport (Fig. 1). Silver Gulls first began to breed on the embankments of the causeways in October 1975 (Fig. 2). Adults and chicks are significant hazards to road traffic.

Different methods were tried to discourage gulls from breeding between February 1976 and February 1978. These were:

(1) At one area wire netting of 5 cm mesh was placed on the grassy nature-strip of the roads and down the embankment where gulls nested.

(2) At another site hot bitumen was poured over a rocky embankment to create a smooth surface.

(3) At another site chicken wire, 30 cm high, was strung along the guide posts of the road for a distance of 120 m to keep chicks off the highway.

(4) Nylon netting was draped over the embankment at two major sites.

Beginning in November 1980, four to six visits were made during each breeding season to remove all eggs present (Table 1).

Egg Island

Egg Island is a Nature Reserve, 0.8 km offshore and 1.2 km north of Devonport airport (Fig. 1). It covers an area of 1 ha and is densely vegetated by Australian Mallow *Lavatera plebeia*. Silver Gulls first began to nest on the island in the 1950's (Van Tets 1977) and 5–8 000 gulls have bred there in recent years.

In 1965, juvenile Silver Gulls became a hazard to aircraft at Devonport airport and different mechanical methods were used to reduce their nesting on Egg Island. Wires strung less than 1 m apart prevented roosting but not breeding. The removal of all vegetation and debris including wires caused a decline in chick survival (Van Tets

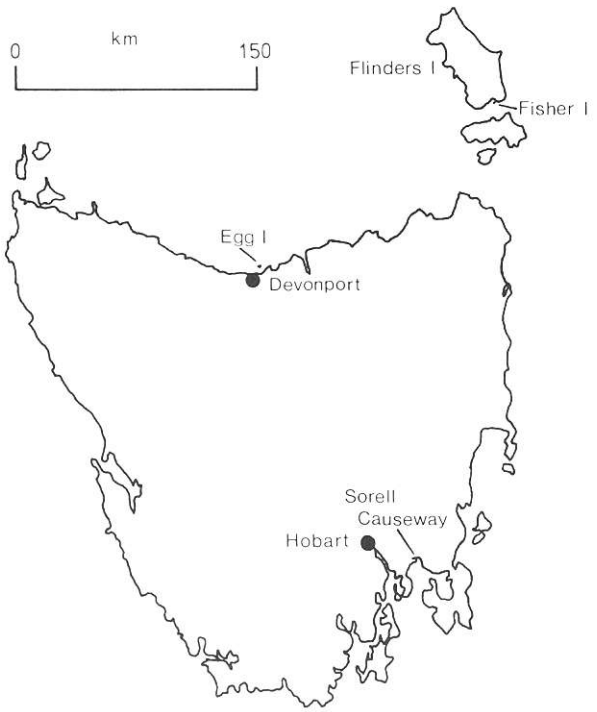

Figure 1. *Location of place names in Tasmania mentioned in the text.*

1977). These attempts were initially successful but when stopped gull numbers increased to the point that in 1985, the Port of Devonport Authority (PDA), which owns the airport, became concerned about aircraft safety. Poisoning seemed to be the only way to alleviate the problem immediately.

Fisher Island

Fisher Island, which is part of the Badger Corner Conservation Area on Flinders Island (Fig. 1), has been an important research station for Short-tailed Shearwaters *Puffinus tenuirostris*, since 1947 (Serventy 1977). Approximately 75 pairs of shearwaters breed annually in three discrete colonies.

Prior to 1980 about ten pairs of Silver Gulls bred on Fisher Island each season, but since 1980 between 200 and 300 pairs have nested annually. The sudden increase in numbers was probably due to a fish processing factory commencing operations only 400 m away in the latter part of the 1970's and thus providing a source of food. The gulls bred in an area approximately 50 × 50 m which included part of the main colony of 40 pairs of shearwaters, and shearwaters abandoned burrows where seagulls were present. In most years the gulls were already breeding when Short-tailed Shearwaters returned from their trans-equatorial migration in the third week of September.

Figure 2. *Nesting site of Silver Gull on embankment of causeway.* Photo: J. E. Wapstra

Preparation and method of use of baits

The narcotic alpha-chloralose was chosen because of its selectivity, low probability of secondary poisoning and its world-wide use in control of gulls (Caithness 1968; Thomas 1972; Wanless and Langslow 1983). It acts by anaesthetising the brain, of which an important side-effect is hypothermia (Lees 1972). The toxicity is highest therefore in the cool of the day, such as late afternoon and during incubation when birds are sitting and inactive.

Baits were prepared to deliver an appropriate dose of 200 mg per bird. This was calculated on a rate of 5 g of alpha-chloralose per 30 g butter spread on three slices of bread. Two slices were then sandwiched together and cut into 16 pieces. In making 4 000 baits, 800 g of alpha-chloralose, 5 kg of butter and 25 loaves of bread (20 slices per loaf) were used. The baits were prepared and frozen prior to the culls.

Baits were laid on Egg Island in the morning or afternoon between 8–15 September 1986 and on 12 October 1987, when Silver Gulls were incubating. Baiting was not possible in the late afternoon because the boat transport used, the PDA 30 m-dredge *Port Fredrick*, had to return to port by 5 p.m. and also advantage had to be taken of good weather. Free-baiting, that is bread spread with butter but without the alpha-chloralose, was planned but had to be cancelled due to inclement weather. On the first day baits were placed near nests but it took too long to cover the whole island and gulls took baits as quickly as they were placed. This delay caused problems because dying gulls frightened away other birds. Also, gulls that die on the water can normally be recovered only when washed onto beaches which can cause public relations problems if birds come ashore on popular beaches. On subsequent days, handfuls of baits were thrown over the areas where gulls nested. This method took less than 20 minutes for three or four people to accomplish. The day following the cull, Egg Island and beaches on the mainland opposite the island were searched for dead gulls.

Poisoned baits were laid initially by each nest on Fisher Island but later were thrown by hand. Baiting was done 15–30 minutes before sunset between 29 October and 8 November 1985 and on 10 September 1986.

RESULTS

Sorell causeways

Between 1975 and 1977 breeding began at similar times each season, beginning in September and peaking in October. On 25 October 1976 there were 458 nests and 1 075 eggs and on 27 October 1977, 427 nests and 880 eggs. Once breeding began eggs were laid quickly.

Methods to discourage breeding had varied success. Wire netting was effective but two adults were caught underneath and perished. Hot bitumen was limited in extent and not feasible for both causeways but gull nesting was prevented where applied. Chicken wire had limited success and did not reduce the traffic hazard. Chicks that strayed onto the road usually ran the whole length of fence guarded by a parent that hovered overhead before going down the embankment. Chicks and adults became entangled in the net and died. Nylon netting prevented nesting for only one season. Gulls subsequently nested where the net touched rocks and ground cover vegetation such as Pigface *Tetragonia implexicoma* grew through it. In October 1979, large boulders were placed on the net at one area to stabilize the embankment against wave action. The boulders provided an ideal nesting site for gulls.

TABLE 1

Number of Silver Gull eggs removed from Sorell causeways 1980–89.

Breeding season	1980–81	81–82	82–83	83–84	84–85	85–86	86–87	87–88	88–89
Eggs	2 325	1 574	901	2 491	2 686	2 417	982	159	446
Number of visits	5	6	4	6	4	5	4	4	4

The collecting of eggs has led to very few chicks fledging (Table 1) and a reduction in the road traffic hazard. The four to six visits made each season were at intervals of two to eight weeks with visits being more frequent at the peak of breeding in October to December. The total number of eggs laid each season is not known and it is not known how many eggs were removed in relation to the total number of eggs. However, due to the frequency of visits it is likely that the majority were collected.

TABLE 2

Number of dead Silver Gulls recovered on Egg Island and from nearby beaches 1986–87 after poisoning bait with alpha-chloralose.

Date	Number of baits	Number adult gulls recovered		
		Egg Island	Beaches	Total
8 Sept. 1986	4 000	1 907	260	2 167
12 Sept. 1986	4 000	1 270	1 050	2 320
15 Sept. 1986	4 000	1 170	320	1 490
12 Oct. 1987	4 500	900	395	1 295
Totals	16 500	5 247	2 025	7 272

TABLE 3

Number of Silver Gulls recovered from a small colony at Fisher Island in 1985 and 1986 after poisoning bait with alpha-chloralose.

	Date	Number of baits	Number gulls recovered		
			Adults	Chicks	Total
1985	29 Oct.	48	15	0	15
	30 Oct.	192	50	6	56
	31 Oct.	96	15	43	58
	1 Nov.	192	34	26	60
	2 Nov.	192	41	37	78
	6 Nov.	192	34	37	71
	8 Nov.	384	92	62	154
	Totals	1 336	281	211	492
1986	10 Sept.*	480	105	0	105

*Birds departed and nested elsewhere after first baiting before egg-laying.

Egg Island

In 1986 and 1987, 7 272 Silver Gulls were collected from four culls (Table 2). Only one cull was done in 1987 because few gulls were killed relative to the size of the breeding population and a large number of baits would have been needed. Public concerns were also expressed over the large number of gulls washed up on local beaches. The PDA decided therefore to cease culling.

The culls reduced dramatically the number of gulls seen at the airport and Devonport tip (PDA pers. comm.), but it takes only a few gulls to become an aircraft hazard and in 1988 the number of Silver Gulls seen at the airport began to increase again. A visit to Egg Island on 10 August 1988 revealed that there were about 5 000 gulls present, and that laying had begun. The birds may have come from nearby colonies of which there are three with 500 to 1 000 pairs each within 40 km of Egg Island.

Fisher Island

The cull in 1985 was carried out when chicks were fledging (Table 3). Baits were readily taken by adults and chicks, and some birds died on the water due to the small size of the island. The 1986 cull was done when the majority of nests had been prepared but no eggs had been laid. Few birds were killed but interestingly the rest of the birds did not land on the island after the cull. They flew overhead emitting alarm calls. The following day the Silver Gulls abandoned Fisher Island and its vicinity and in December were found breeding on Briggs Islet 2 km away. In the spring of 1987 to 1989 gulls still kept away from Fisher Island and made no attempt to breed on it.

DISCUSSION

Culling provides an immediate but not a long-term solution to the reduction of gulls in Tasmania, exemplified by the return of gulls to Devonport airport in 1988 and the dispersal of gulls from Fisher Island to Briggs Islet. In Scotland, culling of the Herring Gull *L. argentatus* indicated that high recruitment rates from other colonies over-shadowed any success attained in removing breeding adults (Duncan 1978). When culling was halted there was a consequent increase in the breeding population. These observations dispel

any hope that the low numbers of gulls present on Egg Island achieved after culling can be maintained indefinitely. This is shown by the large number of gulls in 1988. Therefore culling has to be continuous or as Duncan (1978) states, 'long-term success may depend on applying control measures over a large area rather than just one locality'. To hold the size of the colony at a reduced level at least 30 per cent of the breeding populations must be removed annually (Wanless and Langslow 1983). However, the major disturbance caused by baiting gulls before eggs were laid at Fisher Island, which led them to nest elsewhere, may be a method for protecting a special area from gull invasion.

Alpha-chloralose is considered to be a humane method of control and despite much media publicity by authorities to explain the issues, problems arose at Devonport. In 1986 birds were washed up on beaches up to 30 km away. The public expressed concern at gulls being found on beaches and in future, authorities may be forced to seek non-lethal ways of dealing with gull problems. No matter how much effort is put into publicity it is unlikely that it will overcome opposition to control methods which kill birds.

Non-lethal techniques are effective in controlling gulls locally. Burger (1983) categorized such techniques into habitat manipulation, dispersal of birds and other methods such as warning aircraft pilots of potential hazards. Although some techniques may disperse the birds, at least no gulls are killed. On the Sorell causeways, netting prevented Silver Gulls from nesting for one season. However, this method and others all require continuous attention for several breeding seasons otherwise discontinuity negates previous gains. This also applied to egg-collecting, the most successful technique, which took several years to have the desired effect. Furthermore, all of these techniques were only applicable to relatively small colonies.

The elimination of garbage dumps as food sources is apparently the most effective method in reducing gull numbers (Burger 1985), but also the most difficult to achieve. Most of the dumps in Tasmania are supervised but gulls are very opportunistic at obtaining food from small sources. Burger (1983) in reviewing garbage dumps and bird control stated that no dump should be within 10 km of an airport, food should be exposed for the shortest period of time, and dumps should not be located in such a way that gulls must fly across an airport when going from roosting to foraging areas.

In north-west Tasmania where most of the gull problems occur, there are 21 garbage dumps that have been sited with little regard for bird-hazard control. For example the flight path from Egg Island to the Spreyton dump 10 km distant, crosses Devonport airport; the Ulverstone dump 18 km from the Spreyton dump is situated beside the Leven River estuary facilitating drinking and bathing for seagulls. Many of the dumps are also located on land owned by municipal councils and near urban development. Better siting, in terms of environmental factors and bird-hazard controls, will require municipal councils to purchase land and locate dumps further away from the urban development or investigate other means of waste disposal.

In Tasmania, Silver Gulls frequently breed on harbour breakwaters which are usually constructed of large boulders, sometimes in association with reclaimed land. The designers do not take into account the problems that may result in the future, and subsequent attempts to solve these problems are usually expensive. Seaport and airport managers and government environmental bodies should cooperate at the design stage to avoid the creation of attractive nesting sites.

Currently, control of Silver Gull hazards in Tasmania is approached with every problem being appraised separately. There is probably no reason to change this approach because the number of birds involved in each situation is small. If the number of problems escalates in the future, the approach will have to be one that looks at breeding colonies in the region and not just the specific problem. The problem will need to be solved on a regional basis.

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PREDATION OF LITTLE PENGUIN EGGS BY KING'S SKINKS ON PENGUIN ISLAND, WESTERN AUSTRALIA

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Egg loss of Little Penguins by King's Skink predation on Penguin Island, Western Australia, is reported over two avian breeding seasons. Predation may depress the reproductive success of penguins at this colony.

INTRODUCTION

King's Skink *Egernia kingii* is one of the largest (200 g) Australian members of the family Scincidae (Storr *et al.* 1981). Although viewed as unusual reptiles because of their viviparity and essentially herbivorous diet, they have been little studied in the field (Swanson 1976). Arena (1986), who examined the general ecology of King's Skinks on Penguin Island, Western Australia, suggested that the population densities of this species were greater on Penguin Island than on the nearby mainland, and averaged approximately 100 skinks per hectare, or 1 200 adult skinks on the entire island.

Though essentially herbivorous, King's Skinks have a varied diet of plants and insects and, reportedly, they are the consumers of seabird eggs (Swanson 1976). Reptiles may take a wide range of eggs and chicks of birds (Vestjens 1977; Kopan and Yom-Tov 1982), which are excellent sources of protein that can supplement a low nitrogen diet. On the islands off south-western Australia, King's Skinks have been implicated as the predators of some seabird eggs. Wooller and Dunlop (1990) excluded reptiles from a fenced 0.2 ha area of Carnac Island and found that Silver Gull *Larus novaehollandiae* egg loss was reduced from 60 per cent to 20 per cent, but did not clearly delineate whether King's Skinks or Tiger Snakes *Notechis scutatus* were preying upon the eggs.

Penguin Island is an important nesting area for colonial seabirds in south-western Australia. The two most abundant species, Silver Gulls and Little Penguins *Eudyptula minor*, both have protracted breeding seasons of eight and six months respectively (Wooller and Dunlop 1979; Klomp 1987), resulting in a nearly constant source of eggs for King's Skink's consumption. This paper reports egg loss of Little Penguins during the breeding seasons of 1986 and 1988.