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YELLOW-EYED PENGUINS ON BANKS PENINSULA
A preliminary report

by

Peter Dilks and Judy Grindell

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by

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ABSTRACT

The east and south-eastern bays of Banks Peninsula were surveyed for the presence of yellow-eyed penguins. Where birds were found their breeding was monitored and evening observations carried out to determine the number of birds present.

Thirty-six birds were found comprising 11 breeding pairs plus year old juveniles and non-breeding adults. Breeding pairs were present at five bays and at two of these bays six pairs successfully raised eleven chicks.

Habitat quality varied greatly between bays with some being largely grassland with scattered shrubby bushes and others having extensive areas of dense scrub. All of the successful nests were in bays with good penguin habitat.

Four Otago reared adults were identified breeding on Banks Peninsula and this migration of birds from further south may be important to keep the Banks Peninsula population viable.

1. INTRODUCTION

1.1 Background

Yellow-eyed penguins (YEP's) are the world's rarest penguin species and their distribution is confined entirely to the New Zealand region. They are classified as rare and are under threat at most of their mainland colonies due to habitat destruction and predation, especially of chicks. YEP's are solitary breeders nesting in loose colonies with each nest out of sight of its neighbours' nests. Egg laying takes place between mid September and mid October. Chicks hatch in early November and leave for sea in mid-late February. Moulting, which lasts 3-4 weeks, takes place in February & March during which the birds remain on land, often in a secluded spot.

The principle breeding areas of YEP's are the coasts of Otago and Southland and the islands south to Campbell Island. Birds were first recorded breeding on Banks Peninsula, considerably north of their previously known breeding range, during the 1960's (Harrow 1971).

1.2 Population trends

The total New Zealand population of YEP's in 1986 was estimated to be between 1500 & 2000 pairs (Darby 1986). The mainland South Island population was around 600 pairs with relatively few birds occurring north of Otago Peninsula. However, during 1987-88 South Island breeding pairs declined by 65%, probably because of a collapse in the food chain at sea, leaving only 200 - 230 (J Darby pers. comm.). Around 12 pairs breed on Banks Peninsula.

1.3 Banks Peninsula -background

Yellow-eyed penguins were first reported on Banks Peninsula in late 1967 when a pair was reported from Long (Otanerito) Bay (Harrow 1971). Harrow kept these birds under observation from 1967 -1970 when he carried out wider surveys and found "a substantial population" of YEP's at Big and Little Fishermans Bays (Red and Shell Bays on the NZMS 1 map).

A local farmer reported that these birds first arrived in 1965 and numbers had built up steadily until a "couple of dozen" could be seen at the landing at one time (Harrow 1971).

No further work was carried out on these YEP's although it was always known locally that a few pairs were resident at Long Bay. This bay has more public usage than the Fishermans Bay complex.

Between October 1984 and January 1985, Locky Carmichael carried out surveys at most of the bays along the south and southeast coasts of the Peninsula - around to Hickory Bay (Carmichael 1985). Not all bays were visited and watches to determine numbers were not carried out. He found that YEP's were present and breeding at 7 bays and estimated the population to be 34 birds.

In the 1980's YEP's started to gain a higher profile in Otago/Southland areas -especially on Otago Peninsula where John Darby was carrying out long-term studies. Concern was expressed at the continuing decline of birds there and at all mainland sites. The preparation of a species recovery plan for YEP was commenced and this required up-to-date information on YEP's from throughout their range. Partly as a response to this, and because of a general interest in penguins, we commenced a survey of YEP's on Banks Peninsula in October 1988 concentrating initially on the areas where Carmichael had found birds in 1984/85.

2. THE 1988/89 SURVEYS

This past season (1988/89) all bays from Akaroa Harbour around to Hickory Bay were visited by us during October and November (Figure 1). Landowners at bays further north were contacted but no recent records of YEP's were obtained. Breeding YEP's were found at only 5 bays with a lone bird seen regularly at another. Two bays where birds were recorded in 1984 (Titoki and Red Bays) had no birds present.

Bays along the south coast of the Peninsula, west of Akaroa Harbour mouth were not visited. YEP's have not been recorded breeding there in the past. These areas will be investigated this spring.

Initially, landowners were contacted and then each bay was visited. A search was made for a YEP "landing" (i.e. the area where birds leave the sea) which usually has much penguin sign - droppings. Birds always land at the same place each night. If there was sign of a "landing" wider searches were made for nesting YEP's. In all cases where YEP's were found, the landowners were aware of their presence and the landing site.

Any birds found were checked for tags. Nests found were monitored by visiting once during incubation, again around hatching and then in late January to weigh and tag the chicks and adults.

Evening watches were carried out at each of the main penguin bays to determine the number of birds present. Observations were made from a point overlooking the landing from 1600 hrs approx until dark. During the incubation period all birds coming in from the sea were recorded to determine the number of possible nests. Such counts are carried out throughout the YEP's mainland range each year to monitor population changes in each breeding area.

3. RESULTS FROM SURVEYS

3.1 Grasshills Bay on east side of Akaroa harbour

A steep sided bay with one side forested down to the rocky beach. There are areas of flax immediately above the beach and the bay is flanked by steep, grazed hillsides with scattered scrub.

YEP's were recorded here during last year's breeding season. However during the year several set nets were put out in the small bay where the penguins land and the landowner thought the birds may have been caught when landing.

7/10/88 There was no sign of a landing area or any fresh sign. However about 30 metres north of the bush edge and 15 m above the sea, there was an area of old roost sign - possibly months old.

3.2 Dan Rogers Creek

9/10/88 We checked the shore line from the 'Canterbury Cat' which carries out cruises on Akaroa Harbour. Ron Bingham (skipper/owner) pointed out where he had seen YEP's. He often saw a bird on the rocks at the mouth of Dan Rogers Creek though not for a couple of weeks. When these hill slopes were mustered recently, YEP calls were heard from this area. The lower slopes near the creek mouth have large areas of flax and scrub. We did not visit the area as there was not enough time but Geoff Speirs (DOC Akaroa) visited this area at a later date. Although the area looked suitable for penguins he found no YEP sign. A large black-backed gull colony was present.

3.3 Lucas Bay

Viewed from 'Canterbury Cat'. This area is mostly grassed hill slopes with small patches of scrub. Three birds have been seen in the Lucas Bay area this season. There was a YEP nest just north of the salmon farm and below the farm road.

Nest 1 an adult incubating eggs? (The bird stood up and carried out egg turning motions.) The nest is in a very exposed position on a grassy ledge and against a small bank, approx. 5 metres above the beach. The bird seemed quite unperturbed by the presence of the catamaran and people. Ron Bingham was concerned about feral cats in the area and intended setting cage traps nearby.

This nest was kept under observation by Ron Bingham on his daily harbour cruises. One or more chicks hatched and moved to the small rock overhang slightly to the north. However, the nest failed in the early chick phase.

Last year a pair of YEP's nested successfully in a small patch of scrub uphill from the above site.

3.4 Damons Bay

A steep sided south facing bay with much scattered scrub on the slopes either side. The scrub becomes more continuous further up the valley. Heaps of "storm stacked driftwood can be found on the exposed stony beach.

9/10/88 Two patches of very old roost sign were found immediately above the landing at the mouth of a small creek along with some fresh penguin sign, but many white-flipped penguins use this area. We searched an area where a nest had been located previously but found no sign away from the landing. However, penguin calls have been heard from this bay recently. It would be worth an evening watch especially as the ridgetop off the Flea Bay road gives a good view of the landing and beach.

3.5 Flea Bay

Flea Bay is a long curved bay with two beaches -one sand, one stones. The slopes on the south side are mostly cleared grassland but on the north side there are large areas of scrub. There is easy penguin access to/from the sea along this coast.

The farmer reported that YEP's are occasionally seen at the point on the north side of the bay but they only stay for a day or so.

11/10/88 We searched along the north side to roughly half-way out to the heads and found large numbers of white-flipped penguin (WFP) nests or burrows, under every bush and rock in places. Large numbers of WFP's land in a small inlet where the rocks are coated with white droppings. It is not possible to distinguish any YEP sign. However, it would be worth an evening watch as there is easy access and good vantage points from the Flea Bay road.

3.6 Stony Bay

Stony Bay has ideal YEP breeding habitat with large areas of scrub on the north side of the bay and good YEP landing areas on rocks.

6/10/88 The main YEP landing is just along (east) from the boat cable but one pair land at the end of the stony beach (Nest 2). Three occupied nests were found and at least one other pair nested at an unknown site.

- | | |
|--------|--|
| Nest 1 | 6/10/88 We found a YEP incubating two eggs on the lower slopes by the well formed track running around the hill. Nest 2 |
| Nest 2 | 29/10/88 An adult J-3006 incubating two eggs. The nest was against a rock in open understorey of thick scrub approx. 3 metres tall. |
| Nest 3 | 19/11/88 20 metres east of Nest 1 and just above the track. In 2-3 metre tall scrub with open understorey. An adult bird guarding 2 young chicks. |
| Nest 4 | 19/11/88 The nest site was not located but a YEP chick was found on the track below Nest 3. It looked healthy and had been fed recently so we left it where it was. Two chicks fledged from this nest (see below). |

All four nests hatched two chicks each and the eight chicks fledged successfully.

Chicks tagged.

- | | |
|---------|--|
| 28/1/89 | Tagging chicks. |
| Nest 1 | 2 chicks just uphill from nest site J-5667 weighed 5.1 kilos J-5668 weighed 5.35 kilos |
| Nest 2 | 2 chicks near nest site J-5665 weighed 5.9 kilos J-5666 weighed 5.6 kilos |
| Nest 3 | 2 chicks at nest J-5669 weighed 5.35 kilos J-5670 weighed 5.4 kilos |

The seventh chick seen on 19/11/88 was not found again but the dense scrub could have easily hidden it. Also an adult was observed on several occasions heading up above the scrub belt. Despite careful searching which revealed scattered sign, the nest or roost was not found. The local farmer reported seeing two untagged chicks after we had tagged the other six.

3.7 Long Bay (Otanarito Bay on the map)

Open grassy hill slopes on either side of the bay. Birds nest in open habitat on the south side of the bay although there seems to be suitable areas of scrub on the north side. In the past YEP's nested in a large cave, but in 1988 they nested above the cave on very open, closely grazed grassy slopes with scattered *Coprosma* bushes. These nests were in very open sites.

7/10/88 The cave where the YEP's have bred in the past and the hill slopes around the landing have been fenced and some planting carried out. Last winter, four dead YEP's were found in this area.

This season two nests were found, both outside (above) the fenced area.

Nest 1 An adult incubating two eggs.

Nest 2 An adult at the nest with one egg which had rolled out of the nest bowl and was imbedded in the surrounding straw. Although it appeared to have been there for some time it was replaced in the nest.

The sites were very exposed to the sun being on north facing slopes (YEP's can suffer badly from heat stress). Both of these nests failed at the late egg or early chick stage.

3.8 Red Bay/Shell Bay (Locally called Big Fishermans/Little Fishermans Bays)

Red Bay appears to be very suitable with extensive areas of scrub down to the water's edge. Shell Bay has more open grassland but there are some suitable areas of scrub and nettles. In the 1960's these two bays and Long Bay were the centre of the YEP population on the Peninsula.

The only YEP's seen here recently were a dead bird at Red Bay about four years ago and a moulting juvenile 18 months ago.

8/10/88 Red Bay -We found no evidence of YEP's nor any obvious sign of a landing. At the north side of the bay is a large rock overhang which had some old sign, (probably YEP) but many white flippered penguins use this bay. Locky Carmichael found roost sign and a nesting YEP at this bay in 1984.

8/10/88 Shell Bay we found no sign of a landing or of roost areas above the beach.

3.9 Paua Bay

Paua Bay is mainly grass with small areas of scrub. In the past birds crossed open grassland to reach the small patch of bush on the southern slopes.

YEP's are occasionally seen on the north side of the bay. These are probably roosting or moulting birds.

10/10/88 There was no indication of a YEP landing on the beach nor any sign of activity around two potential nesting areas. An old YEP roost was found on rocks against cliffs on the north side of the bay, but there is no access from there to the nesting areas. A number of fur seals haul out on the rocks under the cliff and over 50 feral geese frequent the rocks as well as the main beach area.

3.10 Goughs Bay

Goughs Bay has extensive areas of suitable YEP habitat. At the north end of the beach is a mostly scrub covered peninsula. Other suitable patches of scrub are scattered behind the north end of the beach.

Five YEP's were recently seen landing at the north end of the beach. Also there was a dead YEP on the beach recently.

8/10/88 YEP footprints crossed the sandy beach near the stream mouth at the north end of the beach. There were large areas of YEP roost sign in the nearby scrub. Tracks and small amounts of sign were followed well up the slopes to the cliffs but no nests were found there. Two empty nests were found on the first visit and another with two eggs on the next visit. On the third visit a fourth pair of YEP's with one chick were found.

- | | |
|--------|--|
| Nest 1 | on the lower edge of the scrub was a well formed and lined nest with much sign (droppings) around. This nest was not laid in. |
| Nest 2 | an empty nest, well lined with fresh grass. This was under small trees and scrub on a ledge against a small cliff. This nest was also not laid in this season. There was also an old (a year or so) nest 20 metres further around at the same level. |
| Nest 3 | was under a <i>Fuschia</i> tree covered with <i>Muehlenbeckia</i> vines in the area between the old boiler and the stream. 2 eggs with the adult incubating, sitting tight. |
| Nest 4 | 27/1/89 This nest site was not found but was somewhere in the scrub patch where we followed sign on the first visit. Two adults and a chick were found on an open grassy patch approximately halfway up to the cliff top. |

Of the four nests 1 & 2 were not laid in. Both pairs seen attending these nests comprised an adult and a juvenile too young to breed. The nest 3 pair laid two eggs and fledged two chicks. The nest 4 pair laid either 1 or 2 eggs and fledged 1 chick. Hopefully pairs 1 & 2 will breed this coming season as they were still present on 27/1/89.

Chicks tagged

27/1/89 Tagging chicks.

- Nest 3 2 chicks in a tree nettle patch near an old boiler.
 J-5658 weighed 5.75 kilos
 J-5663 weighed 5.5 kilos
- Nest 4 1 chick
 J-5662 weighed 5.2 kilos

3.11 Hickory Bay

Hickory Bay has a long sandy beach and YEP's land towards the northern end. The landing area is backed by steep, open grassy slopes with scattered areas of scrub well up the hill slopes. An area behind the beach near where the YEP's land has been fenced and the planting of suitable nesting shelter begun. The track from the landing up the small beach cliff is also fenced.

- Nest 1 A YEP tagged J-2263 was found incubating three eggs approx 90-100 metres up the steep hillside immediately above the landing and near where the birds had nested in other years. The bird had been by John Darby as a chick on 31/1/84 at Boulder Bay, Otago Peninsula. It had also been seen last year on the track immediately above the beach.

We were given a tag from a dead YEP (J-2401) that had been found on the beach on 10/3/85. This bird had also been banded at Boulder Bay, Otago.

On a subsequent visit two untagged birds were located at the nest. Thus three or four birds were involved with the nest. This nest, which contained 3 eggs, was unusual as YEP's only lay two eggs hence two females must have been using the same nest site. This has been reported elsewhere when there is a shortage of males. The nest failed at the late incubation stage, one infertile egg was still in the nest but the other two had rolled down the steep hillside and broken. This was probably caused by birds fighting at the site. Two chicks were successfully reared at this nest last season.

3.12 Population status

Thirty-six yellow eyed penguins were found on Bank's Peninsula this season. This includes 11-13 breeding pairs plus year old juveniles and non-breeding adults, but not chicks fledged this season. There were likely to be more nests than those found during these initial surveys. The total population is probably around 40 -50 adults and juveniles.

Yellow Eyed Penguin Distribution Banks Peninsula

| Bay | Breeding Pairs | Juv's | "Spare" adults | Chicks Reared | Total Birds |
|-------------|----------------|-------|----------------|---------------|-------------|
| Lucas Bay | 1 | - | 1 | - | 3 |
| Stony Bay | 4 | 1 | ? | 8 | 17 |
| Otanarito | 2 | ? | 1 | - | 5 |
| Goughs Bay | 2 (4)* | 3 | 2 | 3 | 14 |
| Hickory Bay | 2# | 3 | ? | - | 7 |
| Dan Rogers | - | - | 1 | - | 1 |
| | 11 (13) | 7 | 5 | 11 | 47 |

* 4 pairs built nests but 2 of these comprised an adult and juvenile and did not lay eggs.

2 females laid in the same nest (3 eggs) - at least 3 different individuals were identified. This has been reported elsewhere when there is a shortage of males.

3.13 Marked birds

The four birds that were tagged already, were from Boulder Beach (Otago); 3 fledged in 1983 and 1 in 1984. We tagged 23 birds (8 adults, 6 juveniles and 9 near-fledged chicks). Further effort will be made to mark untagged birds as this is important for determining breeding success and movements between bays on the Peninsula, and to/from the Otago population. It is also important to determining survival of adults from year to year and whether their young return to breed.

3.14 Population trends

In the 1960's, 30+ YEP's used the Long-Red-Shell Bays complex. Now only two pairs breed (unsuccessfully last year) in very poor, open habitat at Long Bay. There are extensive areas of what appears to be suitable breeding habitat at Shell and particularly Red Bay. Shell and Red Bays also receive far fewer visitors than Long Bay. Hence it seems unlikely that habitat destruction or disturbances are responsible for the population decline in these bays. It is also unlikely that YEP's present there in the 1960's dispersed to other bays as birds usually remain faithful to the bay where they bred first.

Predation and food shortages are known to seriously affect mainland populations. In certain areas John Darby (pers. comm.) found that most chicks are killed by cats and ferrets in some seasons. Yolanda van Heezik (pers. comm.) found that on average about 25% of chicks that go to sea return next summer. In a bad year i.e. when food is short, only 1% of chicks return, but in a good year about 50% return. Also when food is short, large numbers of adults can die especially if they have not built up sufficient food reserves

to carry them through the moult.

YEP's are breeding at five bays on Banks Peninsula and 11 chicks were successfully reared this year. The recruitment of chicks raised on the peninsula to the breeding population is not known but there are indications that the population may not be self-sustaining. Although YEP's have bred on the Peninsula since the 1960's, their numbers have not increased greatly in that time and the birds have gone from some bays i.e. Red, Shell, Titoki. Of the 13 pairs found this season, 4 birds were tagged at Boulder Beach in Otago. On the other hand, all 11 chicks that were reared weighed over 4.5kg, the critical weight for survival (van Heezik pers. comm.), and there was little sign of predators at the two most important bays Stony and Goughs.

It is important to continue monitoring numbers and breeding success of YEP's on Banks Peninsula to discover more about what is happening to the population at the northern-most extent of it's breeding range.

4. CONCLUSIONS

1. At present YEP's are known to breed at five bays on Banks Peninsula. Birds have also been observed at three other bays where breeding occurred in the past.
2. At Goughs Bay and especially Stony Bay, which has large areas of good YEP habitat, breeding was very successful. Eleven chicks, all over 5 kgs, were reared by six pairs. At Goughs two more pairs each consisting of an adult and juvenile, attended nests throughout the summer but did not breed.
3. At Long, Lucas and Hickory Bays, which have very limited areas of suitable habitat, all four breeding attempts failed. However, birds have been breeding at Long and Hickory Bays for 20 years. All three bays have concerned landowners who have fenced small areas around the nest sites and initiated planting of suitable nest site species, mostly flax, to improve the area for YEP's.
4. The YEP's are breeding in relatively accessible patches of habitat presently protected by lack of public access to the bays. But there is increasing pressure to open these bays to the public and uncontrolled access to people and dogs could easily result in breeding being disturbed and nests and penguins being destroyed.
5. Otago-reared birds contribute significantly to the Banks Peninsula population with at least four Otago-tagged birds present and breeding. Immigrants from Otago may be keeping this population viable.

5. PROPOSALS FOR FURTHER WORK

1. Continue monitoring breeding and population trends of YEP's on Banks Peninsula and tag chicks and adults to provide detailed information on trends and breeding success.
2. Resurvey all bays visited last year and contact landowners of the southern bays of the peninsula with a view to visiting these.
3. Continue habitat enhancement and protection where needed and monitor changes in breeding success. At Hickory and Long Bays
 - continue planting flax to provide nest sites within the fenced areas
 - provide artificial nest sites (nest boxes) of the type used successfully at Moeraki, North Otago.
 - create and enhance suitable natural nest sites by placement of rocks, logs, cut scrub, etc.
4. In October 1989 census birds arriving at all bays in line with the annual census carried out in Otago/Southland.
5. Provide information and literature to Banks Peninsula landowners to emphasise the importance of the YEP's breeding there.
6. Prepare an annual report on results of distribution surveys and breeding success. This information is to be distributed to landowners and other interested locals and contributed to the YEP database being assembled by DOC in Dunedin.

6. REFERENCES

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APPENDIX 1

Details of tagged birds

| Tag No | Status | Date Tagged |
|---------------|----------------|--|
| Stony Bay | | |
| J-3066 | Breeding adult | 27/1/1984 Boulder Beach -Otago as chick |
| J-5651 | Breeding adult | 6/10/88 |
| J-5665 | Chick | 28/1/1989 |
| J-5666 | " | " |
| J-5667 | " | " |
| J-5668 | " | " |
| J-5669 | " | " |
| J-5670 | " | " |
| Goughs Bay | | |
| J-2396 | Breeding adult | 2/2/1984 Boulder Beach - Otago as chick. |
| J-4174 | " | 24/1/1984 Boulder Beach -Otago as chick |
| J-5652 | Adult | 28/10/1988 |
| J-5653 | Breeding Adult | " |
| J-5654 | Juvenile | " |
| J-5655 | Adult | " |
| J-5656 | Juvenile | " |
| J-5658 | Chick | 27/1/1989 |
| J-5659 | Adult | " |
| J-5660 | Adult | " |
| J-5662 | Chick | " |
| J-5663 | " | " |
| J-5664 | Juvenile | " |
| Hickory Bay | | |
| J-2263 | Breeding adult | 31/1/1984 Boulder Beach -Otago as chick |
| J-5657 | Juvenile | 28/10/1988 |
| J-5672 | " | 1/2/1989 |
| J-5673 | " | " |
| J-5674 | Adult | 1/2/1989 |
| J-5675 | " | " |

Birds Recovered dead.

- J-5662 Tagged as a chick at Goughs Bay on 27/1/89. Found dead at the high tide line at Goughs Bay on 4/3/89.
- J-5665 Tagged as a chick at Stony Bay on 28/1/89. Found dead in the Avon Heathcote estuary (western shoreline) on 27/3/89.

Figure 1: Bays of Banks Peninsula surveyed for yellow-eyed penguins. The number used for each bay are the same as used in the relevant section of text.

