CONTROL OF KANGAROO HARVESTING

The 1970 Australian Fauna Authorities' Conference meeting at Darwin in May discussed reports from various States on current measures being taken to deal with the highly important issues of conservation, control and harvesting of kangaroos. It was revealed that real limitations have already been placed, or are about to be imposed, on the harvesting of kangaroos by all States in which the kangaroo industry exists. These limitations differ within the several States but they include the reduction in the number of chillers or freezers by more than half; a reduction in the number of licenses for the commercial taking of kangaroos;

continued on page 20

from page 18

a reduction in the number of kangaroos to be taken under permit, the zoning of large areas together with an upper limit on the number of kangaroos that may be taken within those zones in any one year. These severe restrictions are being supported by a stepping up of enforcement activities.

The Conference accepted that the controlled taking of kangaroos is a legitimate utilization of a natural resource which does not conflict with conservation. However, Conference recognised that the conservation of kangaroos is a complicated problem involving a number of species of widely divergent habits. Kangaroos occupy a vast land area and the regional demands for conservation differ greatly.

Management research has been expanded and the Conference anticipates further progress in kangaroo conservation.

Members of Conference discussed the widespread public concern that the exploited species are in danger of extinction and expressed their confidence that there is no such threat.

Much of the concern about the conservation of kangaroos is based on the situation existing in some parts of Australia in the early 1960's but this has changed greatly since then. The interstate nature of the industry is fully recognised and there is consultation and co-operation between the authorities.

INTRODUCTION

A study of various aspects of the aircraft-bird collision problem in Australia was started during 1963-64. In the first half of 1964, diurnal movement patterns of the silver gull, *Larus novaehollandiae* Stephens, were recorded at Sydney Aairport, Mascot, N.S.W., in an attempt to understand why the airport area was attractive to gulls.

This paper reports and discusses the effect of some man-made and natural environmental changes on the movement patterns during the first half of 1964.

STUDY AREA

The study area (Fig. 1), consisting of the airfield and adjacent open areas, was formerly part of the tidal estuary of Cook's River. This area was bordered on the north, east and west by the built-up urban and industrial areas of Rockdale, Marrickville, Mascot and Botany. To the south lay the sandy beaches of Botany Bay.

Most of the airfield and other fully reclaimed areas were covered by grass which was mowed regularly. When rain fell, large amounts of water ran off paved runways, taxi-ways, aprons, and roads. Since the area was only a few feet above sea level at high tide, this water was held temporarily in shallow drainage ponds (S) which drained at low tide through flat valves into Alexandra Canal, Cook's River, and Botany Bay. When the grass-covered area became waterlogged by heavy rain some of the soil fauna, which included mice, insects and worms, were forced to the surface and exposed to predation by gulls and other birds.

The main methods being used for reclamation were tipping of garbage, piping of sand dredged from Botany Bay and Cook's River, and dumping of fly-ash.

The tipping of garbage provided food for large numbers of gulls and when dredging was in progress gulls gathered at the dumping site and fed on animals that were sucked up with the sand.

To prevent fly-ash (a fine grey powder produced from coal-burning) being blown around it was tipped under a sprinkling system. This process produced wide expanses of level silt covered by shallow water. The fly-ash settling ponds (F) and the shallow drainage ponds (S) were used by gulls for roosting at night. Near the lagoon at the former mouth of Cook's River were two deep-water ponds (D) where gulls bathed but did not roost.

At low tide gulls fed on intertidal animals along Botany Beach, while the general public fed gulls along the Rockdale and Mascot beaches.

Gulls also fed occasionally on live fish in Cook's River and Alexandra Canal and on scraps from fish cleaned by owners of small craft in the lagoon and Cook's River.

METHODS

At fortnightly intervals from February to July, 1964, gulls flying up and down the river across line AB and flying north and south over the airfield across line AC were counted to provide a measure of the flow of gulls per hour.

RESULTS—

(a) *Movements at Dawn and Dusk*

Before the middle of May 1964, gulls would roost at night in large numbers in the shallow drainage and fly-ash settling ponds situated north of the lines AB and AC. In May these ponds were drained or wires were strung at 6 ft intervals over undrainable portions and fly-ash sluicing was discontinued. Before the changes most gulls tended to fly north up the river at dusk and south down the river at dawn.

After the changes the gulls flew up the river at sunset and, on finding their roosts either dry or wired, departed south across the airfield towards Botany Bay. At dawn they retraced the previous evening's flight pattern by flying north across the airfield and then turning south down the river.

(b) *Movements before and after Low Tide*

Except for before and after low tide, the movement of gulls during the day was very slight compared to that at dawn and dusk. The timing and extent of beach exposed by low tide depend in part on the phase of the moon, and differ from day to day. From February to May 1964, there was a peak in the net flow of gulls moving south across the airfield 87 minutes before low tide and a peak in the net flow of gulls moving north up the river 151 minutes after low tide. The one-hour difference between the timing of the before and after low tide movement peaks is presumably due to the gulls taking time to digest their food and lighten their load before flying elsewhere.

DISCUSSION

This study concerned an aspect of group behaviour in the silver gull—indicating how the majority of gulls were utilizing the environs of Sydney Airport.

Gulls tend to forage near water, and this habit was reflected in the preference they showed for flying over the river when the airfield was dry. The river may have been a guide to food at the Marrickville tip and shelter on the airfield ponds. By congregating at localised sources of food and shelter they presumably improved their utilisation of the environment, and there may also have been safety in numbers. Changes in the location and availability of food and shelter were followed by corresponding changes in the movement patterns of the gulls. Hence, by changing quantity, quality, and location of resources, gulls may be discouraged from frequenting areas where they are considered a pest and encouraged to go where they might be an asset.