

the poorly dispersing *Dasyornis* and *Pycnoptilus* amongst the warbler, and the pachycephaline *Pachycephala olivacea*. The high level of seasonal mobility and exaggerated sexual dichromatism of the open forest dwelling *P. pectoralis* and *P. rufiventris* shows these to be later-evolved types adapted to contemporary Australian conditions.

LITERATURE CITED

- FALLA, R. A.; SIBSON, R. B.; TURBOTT, E. G. 1970. A Field Guide to the Birds of New Zealand. 2nd ed. London: Collins.
 KEAST, A. 1976. Adaptive morphology and biogeography relative to the evolution and classification of the Australian and Pacific Island warblers. Proc. 13 Intern. Ornithological Congress, Canberra. In press.
 MAYR, E. and AMADON, D. 1951. A classification of recent birds. Am. Mus. Novit., No. 1602: 1-17.
 OLIVER, W. R. B. 1955. New Zealand Birds. 2nd ed. Wellington: A. H. & A. W. Reed.
 OSNZ 1970. Annotated checklist of the birds of New Zealand. The Checklist Committee (F. C. Kinsky, Conv.). Ornithological Society of N.Z. Inc. 99 pp. Wellington: A. H. & A. W. Reed.

ALLEN KEAST, *Department of Biology, Queen's University, Kingston, Ontario, Canada K7L 3N6.*



BRIEF OBSERVATIONS ON THE KAKAPO

During the period 12 February to 2 April 1974, a Wildlife Service Expedition in search of the Kakapo, *Strigops habroptilus*, in the Cleddau watershed, south-west Fiordland, located two birds c. 700 m apart in the Esperance Valley. Both Kakapo were transferred to Maud Island (Merton 1976, *Forest and Bird* 199: 2-10).

The first of these two birds was captured on 6 March 1974 and held in a large temporary aviary erected within the bird's presumed "territory." This Kakapo was watched over a period of 18 days while it was in the aviary. Due to the bird's nocturnal habit, observations were brief, lasting 15-90 minutes each evening, usually until dark.

Preening was observed once. The bird preened its facial disc, using its foot much like a cat would wash its face with a paw. The Kakapo balanced on its right foot and, with the left, proceeded to comb the hair-like feathers about the face and chin. The two front claws of the left foot were brought upwards, combing the chin feathers forwards. The upper surface of these two toes was then drawn down over the chin feathers, settling them back into place. This movement was repeated many times on both sides of the chin with the one foot.

Occasionally, the foot was moved in a circular motion around the face and bill. Thus the two front claws were brought up through the chin feathers to a point where the upper surface of these two toes brushed across the cheek and lores at the side of the bill and cere, before brushing across the feathers of the forehead, down the other side of the face and back under the chin. Sometimes the bird would

pause to nibble the scales on the upper surface of the toes before repeating the movement. It is likely that this preening was to remove food particles from about the bill.

When threatened, the Kakapo sometimes drew itself into a fully erect, stiff posture. The legs were fully extended and straight, and the bird "glared" down at the disturbing object. If the object came closer, the bird slowly raised and pushed one foot forward with the toes spread and held in a vertical plane so that the claws were directed at the object. On two such occasions, the Kakapo actually grasped the edge of the food dish, when it was held too close, and pushed it to the ground.

In Fiordland the Kea, *Nestor notabilis*, behaves in a similar fashion when threatened or disturbed (pers. obs.). Individual Keas sometimes extended an opened foot towards other Keas (and on one occasion a weka) to ward them off when they attempted to drive the "owner" from carrion upon which it was feeding.

Kakapo make extensive use of their bills whilst climbing. Once the bird climbed up a branch and, in typical parrot fashion, used both bill and feet to reach the end, where he balanced, bobbed his head several times and then leapt to another branch c. 0.6 m distant, landing clumsily on both feet as well as grasping the branch with his bill. The bird occasionally pulled itself through dense vegetation with its bill where leg movements were restricted. When climbing through Snow Totara, *Podocarpus nivalis*, the Kakapo was able to reach almost 0.2 m from one branch to the next with its bill.

Subsequent to the birds' liberation on the island on 3 April 1974, one Kakapo was observed in the coastal forest where they were released. A small compound has been erected to hold the birds prior to liberation. After their release, at least one Kakapo returned to this compound on most nights to take food left for it. At 7.15 p.m. on 22 April 1974, a Kakapo came downhill to the compound, then climbed a gently-sloping log which was leaning against a nearby tree. The bird perched approximately half-way up the log c. 1.6 m from me. It sat very still for some time with back toward me, occasionally stretching a leg or wing, and preening the feathers on its back. Then it walked very carefully up the log, using its head in the manner of an old man with a walking stick — head and neck out — stretched and lowered with the whiskers beneath its chin brushing against the log. Its head was moved from side to side, occasionally knocking the log with its bill, apparently feeling its way. On reaching the end of the log, 2.3 m above the ground, it sat quietly for about 3 minutes "gazing" around, then turned and came slowly back down with head lowered but no longer touching the log. At the bottom, it jumped off the log and moved out of sight across the forest floor. At about 11.30 p.m., I again saw the bird, perched above the ground on the trunk of a leaning Kohekohe, *Dysoxylum spectabile*, c. 10 m from where I first observed it. As I passed the tree, the Kakapo cautiously

moved higher until it was 3 m from the ground. When I examined this tree the following morning, I found that it was leaning at an angle of about 35° to the ground. There were two or three small Kakapo chews on the climbing fern *Arthropteris tenella* found growing on the trunk.

This brief night observation was made with the use of a dim red light which enabled me to see c. 4 m. On several occasions I had moved while the light was switched on. The Kakapo appeared to have excellent hearing and would quickly look in my direction at such times. Its subsequent actions indicated that it could not actually "see" me (or the light) unless I moved.

Prior to my arrival in the Esperance Valley, Mr D. V. Merton and Mr J. L. Kendrick (N.Z. Wildlife Service) had tape-recorded a variety of calls made by a Kakapo before it was captured. These calls were used to locate a second bird in the Esperance Valley. On one occasion, a taped call was played to this second bird, with no response. However, about three minutes later, an avalanche fell in the Donne Valley 1.6 km distant. The bird immediately responded with two long, wailing calls.

The variety of calls heard by the party cannot be easily described. They fall into two basic forms — croaks and wails. Croaks were similar to the "kraak" made by kakas, usually short and, frequently, repeated only once although occasionally more often when they were followed by a wail. The wail has been likened to a pig or opossum squeal, usually fairly long and occasionally continuing until the bird sounded as if it was out of breath. No "booming," for which the bird is noted, was heard.

Although the Kakapo each occupied areas some 700 m apart, their calls carried easily over this distance and it is, therefore, probable that the birds were in vocal contact.

R. B. MORRIS, *Wildlife Service, Department of Internal Affairs, Private Bag, Wellington.*



OBSERVATIONS OF TAKAHE NESTING BEHAVIOUR AT MOUNT BRUCE

Hide observations were carried out on a captive pair of Takahe (*Notornis mantelli*) at Mt Bruce, over the period 3 September to 26 September 1975.

These birds were watched on 15 days, and during this time several aspects of behaviour, mainly related to nesting, were noted. Observations commenced while the birds were still engaged in nest-building activities, and by the end of the observation period one egg had been laid and incubation was into its 14th day.