

A Heron (Aves: Ardeidae) from the Early Miocene St Bathans Fauna of Southern New Zealand

R. PAUL SCOFIELD,*¹ TREVOR H. WORTHY² AND ALAN J.D. TENNYSON³

¹ Canterbury Museum, Rolleston Avenue, Christchurch 8013, New Zealand
pscofield@canterburymuseum.com

² School of Biological, Earth and Environmental Sciences,
University of New South Wales, NSW 2052, Australia

³ Museum of New Zealand Te Papa Tongarewa,
PO Box 467, Wellington 6140, New Zealand

ABSTRACT. We describe a fossil heron, based on seven fossil bones, from the Early Miocene Bannockburn Formation at Saint Bathans, Central Otago in the south of New Zealand. Based on a phylogenetic analysis of 50 morphological characters, we determine the new heron is a member of Ardeidae but, in an analysis where we retrieve three major lineages in Ardeidae: (1) bitterns, (2) egrets and true herons, and (3) night herons, there is no support for a sister group relationship with any of these clades. We discuss aspects of the higher taxonomy of the herons based on our phylogeny.

SCOFIELD, R. PAUL, TREVOR H. WORTHY & ALAN J.D. TENNYSON, 2010. A heron (Aves: Ardeidae) from the Early Miocene St Bathans Fauna of southern New Zealand. In *Proceedings of the VII International Meeting of the Society of Avian Paleontology and Evolution*, ed. W.E. Boles and T.H. Worthy. *Records of the Australian Museum* 62(1): 89–104.

The herons (Aves: Ardeidae) are a cosmopolitan group, found on all continents except Antarctica. The group's fossil record may extend back as far as the Eocene (Table 1 and references therein), however, analyses to date of the fossil taxa are not informative of their intrafamilial phylogenetic relationships. The Recent herons are currently divided into five subfamilies (Kushlan & Hancock, 2005; Table 2). Ardeinae and Botaurinae have a fossil record extending into the Miocene; the Tigrisomatinae's only fossil occurrence is in the Pleistocene of the West-Indies (see Table 1 and references therein); and there are no fossil records for Argaminae or Cochleariinae. Here we describe a fossil heron based on seven fossil bones, from the Early Miocene Saint Bathans Fauna of New Zealand.

Geological setting and St Bathans Fauna

The St Bathans Fauna, of late Early Miocene age, Altonian, 19–16 Ma, is derived from the lower Bannockburn Formation of the Manuherikia Group, in Otago, South Island, New Zealand (Worthy *et al.*, 2007). The sediments were deposited in a shallow freshwater lake, about 5600 km² in area, in a warm climate, with a surrounding vegetation including casuarinas (Casuarinaceae), eucalypts (Eucalyptus: Myrtaceae) and palms (Arecaceae), in addition to the typical New Zealand podocarps (Podocarpaceae), *Nothofagus* and araucarias (Araucariaceae) (Pole & Douglas, 1998; Pole *et al.*, 2003). The diverse fauna provides the only data on the terrestrial vertebrates existing in New Zealand during the

* author for correspondence