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## THE SUBFOSSIL DISTRIBUTION OF EXTINCT NEW ZEALAND COOTS *Fulica chathamensis* subsp. (Aves: Rallidae)

By P. R. MILLENER

### ABSTRACT

The mainland form of the Extinct New Zealand Coot, *Fulica chathamensis prisca* (Hamilton), is recorded from 11 North Island and 21 South Island localities. Two published North Island records are shown to be invalid.

It is noted that the Chatham Island form, *Fulica c. chathamensis* (Forbes), has been recorded from 18 named localities on Chatham Island and is also present in many collections for which no more detailed locality record than "Chatham Island(s)" is available.

Olson (1975), in a recent review of the extinct rails of the New Zealand region, reported that, apart from H. O. Forbes' type series held in the British Museum (Dawson 1958), abundant material of the Chatham Island form of the Extinct Coot, *Fulica c. chathamensis* (Forbes, 1892) was available in New Zealand museums.

Most of the early collectors (e.g. F. W. Hutton c. 1890, H. O. Forbes 1892, A. Clough 1903, J. J. Fougere c. 1919) gave no more detailed locality description for their material than simply "Chatham Island(s)." However, the remarkable quality of preservation and completeness of many of the skeletons they collected indicates that most came from natural dunes rather than from midden deposits.

At least a dozen subsequent collectors, most notably R. J. Scarlett between 1972 and 1975, have obtained material from predominantly Holocene dunes and occupation middens at many localities, especially

on the northern and western coasts of Chatham Island (Wharekauri) itself (Fig. 1: 33-50).

A detailed listing of this Chatham Island material is not attempted here. Almost all of it is held by the Canterbury Museum, Christchurch, where the many hundreds of bones are listed under some 284 catalogue numbers. The National Museum, Wellington, holds a single almost complete skeleton (DM 384: "Chatham Islands" — A. Clough 1903) and four tibiotarsi (DM 385: "Chatham Islands" — collector unknown). Sutton (1979) records a single bone from each of two midden sites (Te Ngaio, NZAA Site C240/277 and CHB, NZAA Site C240/680) in the Point Durham area, south-west Chatham Island. A single radiocarbon date has been obtained for the Te Ngaio site (NZ 3363C,  $380 \pm 50$  years BP; Sutton 1977) and two for the CHB site (NZ 4655C,  $250 \pm 90$  years BP and NZ 4654C,  $440 \pm 70$  years BP; Sutton 1979a).

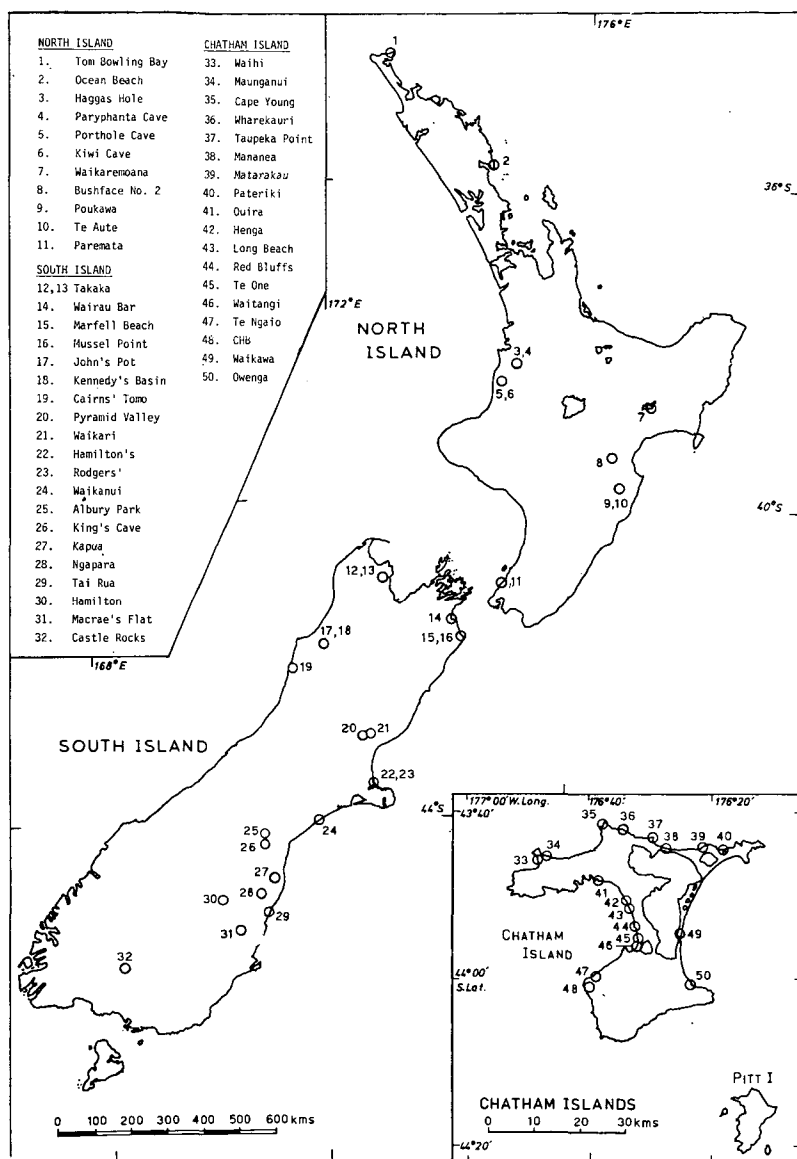
Olson (1975) also noted that the mainland form, *Fulica c. prisca* (Hamilton, 1893), had been recorded from at least 16 localities in the South Island (Brodkorb & Dawson 1962, Trotter 1965) but from only one in the North Island (Dawson 1962).

A search for material in museum, university and private collections, personal collecting in the course of PhD research, and a perusal of recent literature have resulted in bones of the Extinct Coot becoming known from a further ten North Island and five South Island localities.

The 32 currently known mainland and 18 named Chatham Island localities are shown in Figure 1: 1-50. Details for each of the mainland collections are given below. Abbreviations preceding catalogue numbers are as follows: AM (Auckland Museum); AU (Auckland University, Geology Department); Av (Canterbury Museum); BM (British Museum of Natural History); DM and NMNZ (Dominion, now National Museum, Wellington).

#### NORTH ISLAND: Figure 1: 1-11

1. Dunes; Tom Bowling Bay, Northland (Scarlett 1979; but see also Millener, in press).  
Radiocarbon dates for moa and landsnail remains in the vicinity of roughly the same age range from  $2130 \pm 130$  years BP (NZ 4671C) to  $3750 \pm 100$  years BP (NZ 4687C).  
AU 4040.9: R. coracoid. J. A. Grant-Mackie 1969.
2. Dunes (possibly occupation midden); Ocean Beach, Whangarei.  
Av 19125: L. tarsometatarsus. C. W. Devonshire & R. J. Scarlett 1963.  
Av 20584: distal L. tibiotarsus. C. W. Devonshire & R. J. Scarlett 1965.  
Both specimens may have been collected from the same site and therefore possibly be from the one individual.

FIGURE 1 — Distribution of *Fulica chathamensis* subsp.

3. Haggas Hole cave, Waitomo area (Barrett 1961, Rickard 1966, Hobson 1976).  
 Av 30690: part pelvis, and Av 19148 (p.p.): part sternum, R. femur. J. Hobson, D. Hobson, & R. J. Scarlett 1963.  
 Av 19148 (p.p.): L., R. scapulae, L., R. coracoids. L. humerus, L., R. carpometacarpi, manal phalanx (R 1 II), L. femur, L., R. tarsometatarsi, 8 pedal phalanges, 8 vertebrae, collection of rib fragments. C. J. Templer 1973.  
 All bones from this site are from the one individual.
4. Paryphanta (Mac's Quarry) Cave, Waitomo area (Millener & Templer, in press).  
 AU 6394.A: cranium, premaxilla, part mandible, sternum, R. coracoid, R. humerus, L., R. ulnae, distal R. radius, L., R. carpometacarpi, two manal phalanges (L. pollex, L 1 II), L., R. femora, L., R. tibiotarsi, L., R. fibulae, proximal L., R. tarsometatarsi, 14 pedal (including 2 ungual) phalanges, pelvis, 3 ribs. (one individual). C. J. Templer & P. R. Millener 1978.
5. Porthole Cave, Mahoenui area (Medway 1967).  
 Av 27174: L. humerus, part pelvis (one individual). C. Paulin & Taranaki Caving Club 1972.
6. Kiwi Cave, Taumatamairae area (Guild *et al.* 1972).  
 AU 7105.2: R. humerus. P. R. Millener, D. Peryer *et al.* 1979.
7. Caves; Waikaremoana area (Archey 1941).
  - (a) Cave A. AM56:4.3: R. tarsometatarsus, AM85:8.7: pedal phalanx (L 1 III). W. H. Gregory 1930.
  - (b) Cave D. AM80:2.4: mandible. No collection data.
  - (c) Cave XG. AM75:1.28: R. ulna, 2 pedal phalanges (R 2 II, R 1 III). F. Mappin 1931.
 These specimens are all unregistered bones found amongst moa bone collections in the Auckland Museum. The catalogue numbers given are those of the moa collections with which they were associated. There appear to be no records of the exact localities for, nor relative positions of, the caves designated A, D, XG etc.
8. Bushface No. 2 cave, near Patoka, Hawke Bay district (Hartree 1960).  
 Av 18584: proximal L. tibiotarsus. W. H. Hartree & R. J. Scarlett 1960.
9. Poukawa swamp, Hawke Bay district (Price 1963, 1965; Pullar 1970; McFadgen 1978; McGlone 1978; Horn, in prep.).
  - (a) NZAA Site N141/12; 2 coracoids, 9 humeri, 3 ulnae, 2 carpometacarpi, 11 femora, 9 tibiotarsi, 2 tarsometatarsi, 3 pelves (41 bones from a minimum of 12 individuals). R. Price, P. Horn *et al.* 1963-1976.
  - (b) NZAA Sites N141/1, 2: bones (unspecified) noted as "more numerous . . . than in Site N141/12" (P. Horn, pers. comm. October, 1979). Collectors as above.

10. Te Aute swamp, Hawke Bay district (Hamilton 1889, Kingma 1971).  
NMNZ unregistered material: proximal L. humerus, subadult L. ulna (two individuals). A. Hamilton 1888.
11. Dunes (probably occupation midden); Paremata, Wellington (Dawson 1962, 1979; Davidson 1978).  
BM. R6346: tarsometatarsus, BM. R6404: coracoid. A. Hamilton 1888.  
These bones constituted the first record of the Extinct Coot from the North Island (Dawson 1962). The exact location of "Rauparaha's kitchen middens" (Forbes 1892) from which they came is not known. Davidson (1978) regarded the most probable site as being the "Paremata *pa*" (? = "Porirua" *pa*), close to what is now called the Ngati Toa Domain. Dawson (1979), independently, concluded that this was a possibility but also suggested that "Rauparaha's middens" may have been at the "Taupo" *pa* on the present site of Plimmerton.

Extinct Coot bones have also been reported from two midden sites in the Coromandel region: Hot Water Beach (NZAA Site N44/69); proximal R. femur, A. Leahy 1974 (Leahy 1974; Davidson 1979); and Port Jackson (NZAA Site N35-36/88); L. coracoid, J. Davidson & A. Fransham 1976 (Davidson 1979).

Both records however are in error; the Hot Water Beach bone is of *Gallirallus australis greyi* (N.I. Weka) whilst that from Port Jackson is of *Porphyrio p. melanotus* (Pukeko) — det. P. R. Millener, R. J. Scarlett, May 1980.

#### SOUTH ISLAND: Figure 1: 12-32

12. Cave; Takaka district (no more precise locality given):  
Av 5311: ulna, femur, L., R. tibiotarsi, L., R. tarsometatarsi (one individual). Collector unknown, 1899.
13. Cave; Takaka district (no more precise locality given):  
Av 8271: L. tarsometatarsus. F. W. Hutton c. 1890.
14. Occupation midden; Wairau Bar, Marlborough. NZAA Site S29/7 (Duff 1956).  
Radiocarbon dates for this site range from  $590 \pm 60$  years BP (NZ 1838A) to  $935 \pm 110$  years BP (Y204) (McCulloch & Trotter 1975; Trotter 1975a; Moore & Tiller 1975).  
Material listed under 35 Canterbury Museum (Av) catalogue numbers: 2 scapulae, 3 coracoids, 15 humeri, 2 femora, 14 tibiotarsi, 7 tarsometatarsi, 5 part pelves (48 bones from a minimum of 11 individuals). J. R. Eyles 1952-1958, R. S. Duff *et al.* 1955, 1959.  
Av 7194: distal L. tibiotarsus labelled only "midden, N.Z." was "probably collected from Wairau Bar by J. R. Eyles prior to July 1952" (R. J. Scarlett, pers. comm.).

15. Dunes and middens; Lake Grassmere spit, Marlborough. NZAA Site S29/8 (Dawson 1949, Scarlett 1979).  
DM 383: L. humerus. E. W. Dawson & R. F. Moginie, August 1948.  
Material listed under 152 Canterbury Museum (Av) catalogue numbers: 6 part sterna, 8 scapulae, 19 coracoids, 53 humeri, 2 carpometacarpi, 26 femora, 102 tibiotarsi, 2 fibulae, 44 tarsometatarsi, 7 pedal phalanges, 28 part pelves (297 bones from a minimum of 73 individuals). J. R. Eyles, R. S. Duff, L. Gurr, R. J. Scarlett, 1952; J. Britton *et al.* 1952-1961.
16. Occupation midden; Mussel Point, Marlborough.  
Av 17124: L. tarsometatarsus. J. & R. Britton 1959.
17. John's Pot cave, Inangahua.  
Av 25897: R. tibiotarsus and Av 25902: L. tibiotarsus (one individual). Canterbury Caving Club 1971.
18. Cave; Kennedy's Basin, Inangahua (Wilkinson 1973).  
Av 28260: R. humerus. B. Chapman *et al.* 1973.
19. Cairns' Tomo cave, Punakaiki (Rogers, 1972).  
Av 23129: L. femur, part pelvis, rib, pedal phalanx (one individual). R. J. Scarlett & Canterbury Caving Club 1961.
20. Pyramid Valley swamp, North Canterbury (Falla *et al.* 1941, Scarlett 1955).  
Radiocarbon dates for this site range from  $2620 \pm 49$  years BP (NZ 619A) to  $4280 \pm 62$  years BP (NZ 622A), with dates on faunal remains (moa-bone collagen) between  $3450 \pm 71$  years BP (NZ 623A) and  $3740 \pm 72$  years BP (NZ 625A) (Gregg 1972; McCulloch & Trotter 1979).  
Material listed under 29 Canterbury Museum (Av) catalogue numbers: 1 mandible, 1 sternum, 2 coracoids, 6 humeri, 1 ulna, 4 femora, 8 tibiotarsi, 4 tarsometatarsi, 1 pedal phalanx, 2 part pelves, 3 ribs, 2 vertebrae (35 bones from a minimum of 10 individuals). Canterbury Museum expeditions 1939-40, 1955; J. R. Eyles & R. J. Scarlett 1949, A. Evans 1965, R. J. Scarlett 1965.
21. Cave; Waikari, North Canterbury (McCulloch 1975).  
Radiocarbon dates for this site are  $1080 \pm 70$  years BP (NZ 4166A) and  $1920 \pm 90$  years BP (NZ 1723A) (McCulloch & Trotter 1979).  
Unregistered material: 3 mandibles, 3 coracoids, 4 humeri, 4 femora, 5 tibiotarsi, 5 tarsometatarsi, 4 pedal phalanges (28 bones from a minimum of 3 individuals). B. McCulloch *et al.* 1971, 1975.
22. Occupation midden; Hamilton's, Redcliffs: NZAA Site S84/76 (Trotter 1967, 1975b).  
Radiocarbon dates for this site range from "recent" (NZ 1112A) to  $1170 \pm 65$  years BP (NZ 438A). Trotter (1975) considers

- a moa-bone collagen date of  $735 \pm 56$  years BP (NZ 1113A) to be most reliable.  
Av 16276: R. humerus. S. Hovell 1957.
23. Occupation midden; Rodgers', Redcliffs. NZAA Site S84/76 (Trotter 1975b).  
Av 16047: R. coracoid. R. J. Scarlett & S. Hovell 1957.
24. Occupation midden; Waikanui, Ashburton River mouth.  
Av 14134: L. femur. T. A. D. Wilson 1955.
25. Swamp; Albury Park, Canterbury (Smith 1891).  
A single radiocarbon date ( $7390 \pm 160$  years BP, NZ 1726A) has been obtained from this site (McCulloch & Trotter 1979).  
Av 21298: R. humerus, R. tibiotarsus, R., L. tarsometatarsi (one individual). A. W. Hope 1945.
26. King's Cave, Canterbury (Granger 1959, Wilson 1969a, b).  
Av 22480: L. tibiotarsus. G. Wilson 1968.
27. Kapua swamp, Waimate. (Hutton 1896).  
Av 5312: distal end and shaft L., R. tibiotarsi (one individual).  
F. W. Hutton *et al.* 1895.
28. Cave; Ngapara, Oamaru (Hamilton 1904).  
DM 380: L. tarsometatarsus. A. Hamilton 1903.
29. Occupation midden; Tai Rua, North Otago. NZAA Site S136/1 (Trotter 1965, 1979).  
Radiocarbon dates for this site, all from the main occupation layer, range from "recent" (NZ 558A, NZ 751A, NZ 765A) to  $831 \pm 33$  years BP (NZ 750A). Trotter (1979) considers that a shell date (NZ 749A,  $485 \pm 32$  years BP) and those for bone collagen (ranging from NZ 766A,  $393 \pm 37$  years BP to NZ 752A,  $543 \pm 32$  years BP) are the most reliable.  
Field Number 24 (M. M. Trotter, pers. comm.): L. femur. M. M. Trotter *et al.* 1958. This specimen is recorded in the Canterbury Museum files as "*Halophalaris chathamensis* — in Otago Museum."
30. Hamilton swamp, Otago (Booth 1875, 1877).  
Av 5126: R. coracoid, R. humerus, proximal L. ulna (possibly one individual). B. S. Booth & A. Hamilton 1875.
31. Cave?; Macrae's Flat, Otago.  
DM 381: L. femur, L. tibiotarsus, L. tarsometatarsus (possibly one individual). No collection data.
32. Cave; Castle Rocks, Southland (Hamilton 1893, 1894): type locality for *Fulica prisca*.  
DM 379: 4 crania, 1 premaxilla, 3 mandibles, 3 furculae, 5 sterna, 5 coracoids, 12 humeri (one of which, Hamilton No. 411/29, has been re-registered as NMNZ S990, the type of *F. chathamensis prisca* — Olson 1975), 12 femora, 19 tibiotarsi, 17 tarsometatarsi, 5 pelves, 2 vertebrae (88 bones from a minimum of 10 individuals). A. Hamilton 1892.

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## SHORT NOTE

### NOTES AND MEASUREMENTS OF HUTTON'S AND FLUTTERING SHEARWATERS FOUND DROWNED AT KAIKOURA PENINSULA

On 28 August 1980, an 11-cm mesh nylon fishing net, which had been set in about 4 metres of water for 22 hours, was lifted. Besides fish, the net contained 38 small shearwaters, which I later retrieved from the local tip.

Nine of the birds were Hutton's Shearwaters (*Puffinus huttoni*) and 29 were Fluttering Shearwaters (*P. gavia*). This ratio is interesting in that beach patrols in the area over four years have produced 11 *huttoni* and no *gavia* (G. Harrow, 1976. Some observations of Hutton's Shearwater. *Notornis* 23: 286). More recent beach patrols (1976-1978) in North Canterbury have found 18 *gavia* and 5 *huttoni*, which may indicate a southward extension of *gavia* in recent years.