Capture Methods for Musk Ducks

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Musk Ducks *Biziura lobata* are endemic to wetlands, river systems and coastal oceanic waters of temperate Australia. Individuals of this species are difficult to capture because of their excellent swimming and diving abilities and frequent use of deep-water habitats. Night-lighting, baited clover-leaf traps and walk-in-nest-traps were used to capture Musk Ducks at Murray Lagoon, Cape Gantheaume Conservation Park, Kangaroo Island, South Australia. These techniques should be useful for capturing Musk Ducks at other locations in Australia.

Key Words: Musk Duck, *Biziura lobata*, night-lighting, baited clover-leaf traps, walk-in-nest-traps

Musk Ducks *Biziura lobata* are large-bodied (2-3kg) diving ducks endemic to deep-water wetlands, river systems and coastal oceanic waters of temperate Australia (Frith 1967; Marchant & Higgins 1990). Among waterfowl, Musk Ducks are one of the most anatomically specialised for underwater swimming (Raikow 1970; McCracken *et al.* 1999). Consequently, their expert diving abilities and frequent use of deep-water habitats make them difficult to capture for ringing and marking studies. Moreover, few studies of Musk Ducks have been conducted, and Musk Ducks have not been live-captured routinely prior to 1995 (McCracken 1999; McCracken *et al.* 2000a, b).

Forty-six adult Musk Ducks (29 males, 17 females) were captured, measured, ringed and released at

Murray Lagoon, Cape Gantheaume Conservation Park, Kangaroo Island, South Australia (35°55'S, 137°25'E), between 11 September 1995 and 19 October 1997 using three methods: night-lighting (29 captures; Bishop & Barratt 1969), baited clover-leaf traps (14 captures; Addy 1956), and walk-in-nest-traps (3 captures; Dietz *et al.* 1994). Trapping methods are described in detail, and advantages and shortcomings of using these methods to capture Musk Ducks are discussed.

Night-lighting

Twenty-nine Musk Ducks (17 males, 12 females) were captured on 12 different nights between 11 September and 27 October 1995. The mean (±S.D.) capture rate for this time period was 2.4±1.5 (range = 1 to 5) Musk Ducks per night. Early in the season (11 to 26 September), weather and water conditions generally were ideal (no wind, clear water), and 2-5 Musk Ducks were captured each of seven nights with a mean interval (±S.D.) between captures equal to 67.7±38.4 minutes, including 20-30 minutes' processing time to measure, ring and collect blood from each duck. Thus, on a good night, the average capture rate was one Musk Duck approximately every 30-40 minutes. Weather and water conditions deteriorated (frequent wind, increased turbidity, falling water levels, increased aquatic vegetation) as the season progressed, and only one Musk Duck was caught on each of the remaining five nights (27 September to 27 October); night-lighting was not done from 28 September to 22 October because field assistants were not available.

Successful night-lighting of Musk Ducks required two people and depended upon a combination of equipment, meteorological and experience-related factors. Equipment included: (1) one helmet-mounted 1,000,000 candlepower halogen spotlight; (2) one long-handled (3m) wide-mesh 1m diameter net; and (3) a 3.7m v-bottom aluminium boat, propelled by a 10-horsepower outboard motor. Most Musk Ducks were caught on windless, moonless nights in clear water, 1-3m deep. A full moon low on the horizon also offered good opportunities for night-lighting because Musk Ducks generally appeared to be more active than on moonless nights.

The most effective night-lighting method was as follows: Musk Ducks were spotlighted at a distance (50-100 m) or at close range (typically after emerging from vegetation that obscured the boat from Musk Ducks). Distances between ducks and boat were gradually reduced over a period of successive dives, until the birds could be seen underwater at a distance of 10m or less. At this point, the boat operator closed the distance to 2-3m, and Musk Ducks were tracked visually underwater. Maintaining a 2-3m distance through the termination of at least one dive was the key to successful netting. Musk Ducks were captured with a rearward jerk of the net upon resurfacing for air. Despite numerous

attempts, Musk Ducks could not be netted underwater or on the surface of the water prior to diving. Spotlights had no substantial mesmerising effects on Musk Ducks. However, maintaining ducks in the periphery of the spotlight beam did decrease their tendency to dive, which usually allowed for closer manoeuvring before they initiated evasive dives. Musk Ducks never attempted to fly when night-lighted. However, they typically swam underwater for such great distances (50-100m) before resurfacing that it was impossible to capture them without tracking them at close range through a series of dives and positioning the net before they resurfaced.

Baited clover-leaf traps

Fourteen Musk Ducks (12 males, 2 females) were captured using baited clover-leaf traps (Addy 1956) placed in shallow water. Tops were not installed on the traps, making them specific to Musk Ducks and Australian Blue-billed Ducks *Oxyura australis*, but allowing Eurasian Coots *Fulica atra* and dabbling ducks *Anas* spp. to climb or fly out. Traps were baited with barley or wheat, and most captures occurred within one or two days after setting. Routine escapes from traps might explain why only two females were captured out of 14 birds. Male and female Musk Ducks exhibit a two- to three-fold difference in body mass (McCracken *et al.* 2000b). Thus, trap entrances large enough for most male Musk Ducks to enter probably enable most females to escape. Future investigators might consider deploying clover-leaf traps with two different size entrances, ie large entrances for males and smaller entrances for females.

Walk-in-nest-traps

Three Musk Ducks (all females) were captured using walk-in-nest-traps (Dietz *et al.* 1994) placed on incubated nests built over water in flooded *Gahnia trifida* (McCracken *et al.* 2000a). However, nest abandonment resulted in all three instances. Stress caused by time spent in the trap, the fact that no sedatives were used, and stage of incubation probably factored importantly in causing nest abandonment.

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