

Piscivory in the Comb-crested Jacana *Irediparra gallinacea*

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Abstract. This note describes two observations of fish predation by Comb-crested Jacana(s) *Irediparra gallinacea* at the Cattai Wetlands, Coopernook, New South Wales. The fish were ~3 cm and 5–6 cm long, and one was identified as an Empire Gudgeon *Hypseleotris compressa*. These observations appear to be the first reported instances of Comb-crested Jacana(s) handling and consuming fish prey, with the only previous study reporting piscivory limited to identifying trace remains of fish in stomach contents.

Introduction

Birds are important top predators in aquatic ecosystems (Żydelis & Kontautas 2008). Piscivorous waterbirds comprise a diverse range of taxa, including cormorants, darters, pelicans, egrets, terns and mergansers (Kingsford & Norman 2002; Wood & Stillman 2014). Apart from preying upon fish, these species play an indirect role in regulating impacts of fish on invertebrate diversity and biomass by reducing fish activity through invoking their fear of predation (Green & Elmberg 2014). Waders in the order Charadriiformes generally take invertebrates rather than fish, though small fish are sometimes taken by various species including jacanas (family Jacanidae) (del Hoyo *et al.* 1996).

Jacanas are charadriiform waders distinctive for their foot anatomy, with long toes helping them walk over aquatic vegetation. There are eight extant species: three in Asia and Australia, three in Africa and two in the Americas. The Comb-crested Jacana *Irediparra gallinacea* is the sole representative of the family Jacanidae resident in Australia, distributed across the northern and eastern parts of the continent (Menkhorst *et al.* 2019; BirdLife Australia 2022) and lands north to the Philippines (Jenni 1996).

Few studies have investigated the diet of the Comb-crested Jacana (Marchant & Higgins 1993). The current scientific literature documents the diet as mainly consisting of seeds and invertebrates including aquatic insects (Favaloro 1931; Ross 1931; Bell 1985; Barker & Vestjens 1989; Marchant & Higgins 1993). In addition, Gould (1865) reported a Comb-crested Jacana consuming “vegetable matter”, presumably meaning foliage. Evidence of vertebrate prey is limited to a single study, in which trace remains of fishes were found in 13 of 57 examined stomachs, as well as a single hylid frog (Dostine & Morton 2000). To the best of our knowledge, there are no published accounts of the Comb-crested Jacana seen preying upon vertebrate prey. Furthermore, records of piscivory in other jacana species are limited to only a small number of anecdotal observations of small fish being recorded as taken by the two New World species, the Northern Jacana *Jacana spinosa* (Jenni & Collier 1972) and the Wattled Jacana *J. jacana* (Nunes & Piratelli 2005).

This note reports two observations of Comb-crested Jacana(s) handling and consuming fish up to 6 cm long.

Observations

The observations were made by MM on 16 July 2023 at the Cattai Wetlands, Coopernook, New South Wales, (31.832°S, 152.640°E). This location is significant for the Comb-crested Jacana as one of the species’ southernmost localities (Roderick & Stuart 2010; Cooper *et al.* 2016) and a breeding site (Carlson 2015). The observations were made whilst observing aquatic birds at the site between 0730 and 1030 h.

The first observation of piscivory occurred at 0751 h. A Jacana was observed re-positioning its grasp of a fish with its bill at the surface of the water (Figure 1). There were movements in the caudal fin, indicating that the fish was still alive. The re-positioning lasted 30 seconds until nearby Wandering Whistling-Ducks *Dendrocygna arcuata* took flight and startled the Jacana. This caused the Jacana to run towards the centre of the wetland and out of view whilst holding the fish in its bill. This fish was ~3 cm in



Figure 1. A Comb-crested Jacana grasps a fish, possibly an Empire Gudgeon, at the surface of the water. Photo: Matthew Mo



Figure 2. A Comb-crested Jacana handles an Empire Gudgeon. The inset image shows a clear profile of the Empire Gudgeon that enabled species identification. Photos: Matthew Mo

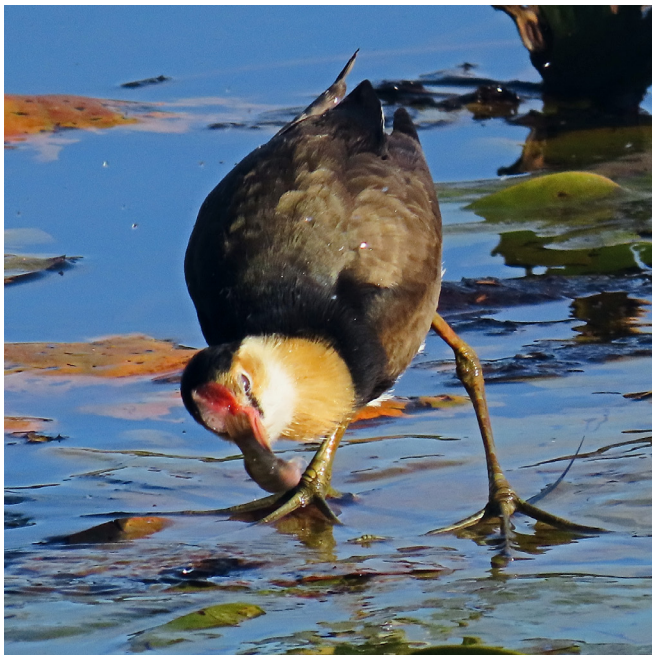


Figure 3. A Comb-crested Jacana performs a headshake to break apart a caught Empire Gudgeon. Photo: Matthew Mo

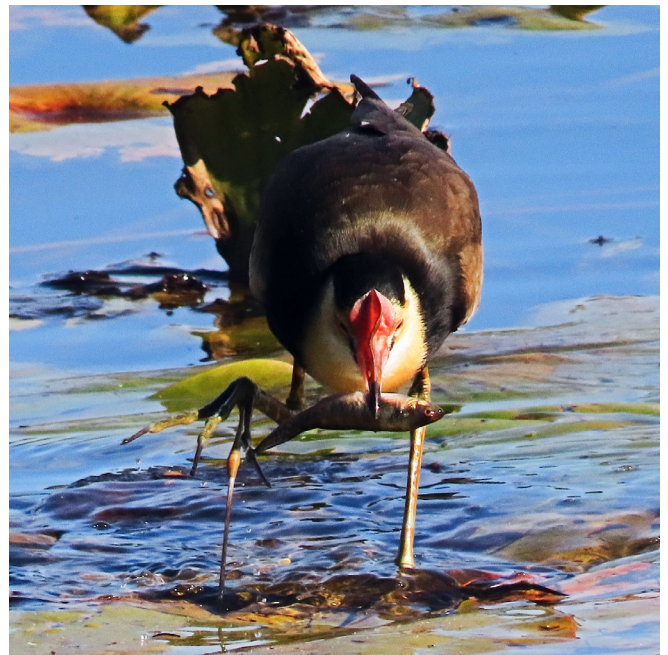


Figure 4. A Comb-crested Jacana employs a clawing technique to break apart a caught Empire Gudgeon. Photo: Matthew Mo

length, based on estimating the proportion of its size to the size of the Jacana.

A second observation of piscivory occurred at 0923 h, lasting c. 4 minutes, which allowed more detailed behavioural observations. During this period, the Jacana alternated between grasping the fish at the surface of the water and holding it at head height (Figure 2). To dispatch the fish, the Jacana performed headshakes, including some that slapped the fish against the surface of the water (Figure 3). The Jacana subsequently swallowed the small

portions of the fish that were broken off. Once the fish ceased moving, presumably dead, the Jacana was more liberal in its grasp of the fish, dropping it on the floating vegetation several times. At one point, the carcass was below the water and the Jacana spent c. 20 seconds locating it. Apart from headshakes, the Jacana also broke up the fish by holding the carcass in its bill while lifting its foot to rake at the prey item with its claws (Figure 4). This fish was ~5–6 cm in length, based on estimating the proportion of its size to the size of the Jacana.

Whether the two observations of piscivory involved the same Jacana was not known, as at least five Jacanas were present. Water levels were normal for the site on the day of the observations, such that environmental conditions did not appear to be unusually favourable for capturing fish.

AG and AH identified the fish in the second observation as an Empire Gudgeon *Hypseleotris compressa*. There was only one photograph recorded of the first observation (Figure 1) and this lacked a clear profile of the fish to enable confident identification; however, it is possible that this fish was also an Empire Gudgeon.

Discussion

These observations of piscivory affirm and strengthen the preliminary evidence presented by Dostine & Morton (2000). Specifically, our observations identified a vertebrate prey item to species level and the size of each fish was substantial in comparison with the trace remains detected by Dostine & Morton (2000). This information is significant in light of the diet of the Comb-crested Jacana being poorly studied, and the general view that piscivory is uncommon in jacanas or indeed in charadriiform waders more generally. To the best of our knowledge, there has been no work published on the diet of the Comb-crested Jacana since Dostine & Morton (2000). Future dietary studies may reveal further evidence of piscivory in the Comb-crested Jacana, and potentially in other species of jacana.

The observations were also novel for the brief insights into prey-processing behaviour for the Comb-crested Jacana. Previous dietary records for the species are mostly food items that are swallowed whole, being seeds and small insects (Barker & Vestjens 1989; Marchant & Higgins 1993; Dostine & Morton 2000), rather than larger food items that needed this degree of processing.

The Empire Gudgeon is a widespread native freshwater fish that occurs from mid Western Australia to southern New South Wales (Allen 1989), as well as southern Papua New Guinea (Keith & Mennesson 2023). Thus, there is a substantial geographical overlap between the range of the Empire Gudgeon (Allen 1989; Keith & Mennesson 2023) and the Comb-crested Jacana (Cooper *et al.* 2016). The floating vegetation integral to suitable habitat of the Comb-crested Jacana is also an important habitat feature in the ecology of the Empire Gudgeon, as this fish particularly forages for invertebrate prey, frog eggs and tadpoles and algae amongst aquatic vegetation and also shelters around aquatic vegetation (Gomon & Bray 2022).

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