

FEEDING INTERACTIONS BETWEEN JUVENILE AND ADULT FLIGHTLESS CORMORANTS

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We report observations on chick feedings by adult Flightless Cormorants *Phalacrocorax harrisi*, indicating that, contrary to the literature, the sequence of interaction is similar to that of other Pelecaniformes. This species is among the rarest of seabirds, breeding in scattered colonies along the coastlines of Isla Fernandina and Isla Isabela, Galápagos, Ecuador (Harris 1974; Rosenberg *et al.* 1990). It is listed as vulnerable on the IUCN Red List of Threatened Species (IUCN 2013), and is the only flightless species of its 27-member genus (Livezey 1992, Johnsgard 1993). Flightless Cormorants exhibit more than twice the mass of other cormorants (Wilson 2008). Despite their large size and locally conspicuous presence, they were overlooked by Darwin (1845) during his celebrated visit to the Galápagos Islands in 1835. The first published descriptions of Flightless Cormorants were provided over a half century later by Rothschild (1898) and Rothschild & Hartert (1899, 1902).

Snodgrass & Heller (1904) reported on feeding interactions between juvenile and adult Flightless Cormorants: “A large, immature bird may often be seen pursuing an adult through the surf with loud cries and savage thrusts of the beak, until the latter comes to terms, thrusts its beak into the open mouth of the young and disgorges into it a mass of partially digested food.” Such an occurrence would be surprising, however: a young cormorant, like other juvenile Pelecaniformes, typically feeds by reaching “directly into its parent’s mouth for food” (Johnsgard 1993, p. 116; see drawings pp. 116–119).

We studied environmental factors influencing the behavior of Flightless Cormorants at a colony of over 30 individuals at Cabo Douglas, Isla Fernandina, from 28 April to 17 May 2011 (Hayward *et al.* 2013). Several times each day, we observed feeding events involving adults and large juveniles. When an adult cormorant caught prey, a juvenile swam rapidly toward the adult, flapping its wings and screaming loudly. Upon reaching the adult, the smaller and darker juvenile (see Snow 1966 for descriptions of plumage differences between adults and juveniles) thrust its head and upper

neck down the throat of the forager (Fig. 1), but not *vice versa* as reported by Snodgrass & Heller (1904). Often two pursuers, perhaps siblings, competed to accomplish this feat. Magnificent Frigatebirds *Fregata magnificens* and Brown Pelicans *Pelecanus occidentalis*, attracted by these frenzied events, often pinched the head or neck of the adult from overhead while the head and neck of the juvenile were down the throat of the adult (Fig. 1C). Sometimes these piracy attempts were successful.

Our observations and photographs clearly demonstrate that it was the juveniles that thrust their bills down the throats of the larger adults. We have found only two references to juvenile feeding published since Snodgrass & Heller’s (1904) description, both of which are uninformative on this point: Snow (1966) noted that the young she observed were “fed by a parent.” She described food-begging by juveniles, but did not indicate whether the juvenile thrust its head down the adult’s throat or *vice versa*. Harris (1979) noted only that juveniles up to at least nine months of age are fed by adults, although juveniles are capable of feeding themselves by that age.

Snodgrass & Heller’s (1904) mistaken interpretation is not surprising, given that much splashing accompanies these frenzied feedings. Only digital photographs and repeated observations enabled us to determine that adult-to-juvenile feeding behavior by these rarest of all cormorants is consistent with that of other Pelecaniformes.

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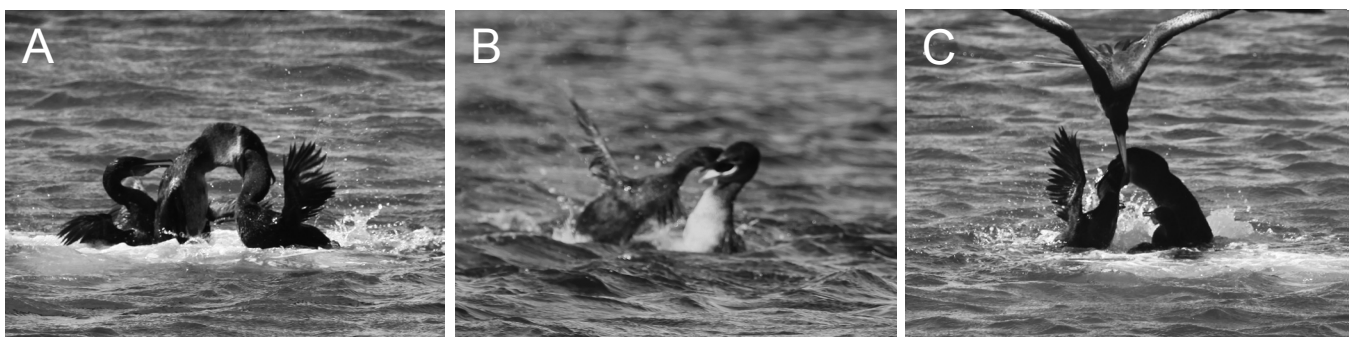


Fig. 1. Three feeding events between adult and juvenile Flightless Cormorants. A) A juvenile (right) thrusts its head and neck down the throat of adult (middle), and a second juvenile (left) looks on. B) Note the light-colored ventral surface of the adult (right) visible during this second event. C) A Magnificent Frigatebird pinches the united heads of juvenile (left) and adult (right) during a third event.

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