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Note

Northern Pintail (*Anas acuta*) hens exhibit irrational behaviour, returning to their nests after apparent loss of their broods

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Abstract

Two Northern Pintail (*Anas acuta*) hens were observed returning alone to their upland nest sites after hatching their broods and taking them to water. Both instances were the result of apparent loss of their broods shortly after reaching water. The hens' behaviour was irrational and demonstrates that there is an attachment to nest sites that does not immediately cease after hatch and taking their broods to water.

Key words: Northern Pintail; *Anas acuta*; duck; nest site; brood loss; behaviour

Diving duck hens and broods often return to their overwater nests within a few days of hatching (Evans *et al.* 1952; Mendall 1958; Weller 1959), but dabbling duck hens do not (Weller 1964). Post-hatch use of overwater nests by diving ducks is not surprising because these sites would provide safe, familiar locations for brooding or roosting. However, use of terrestrial nest sites by dabbling duck hens and broods would require additional time and travel on land where there is an increased risk of predation to both hen and ducklings compared to water (Afton and Paulus 1992; Chouinard and Arnold 2007; Arnold *et al.* 2012). Gates (1958) reported an anomalous instance of a Gadwall (*Anas strepera*) hen returning to its nest after taking its brood to water; in that case, the nest was close (~5 m) to water, and the hen returned to incubate some nonviable eggs after losing her brood.

In this note, I report two instances of Northern Pintail (*Anas acuta*) hens returning to their upland nest sites located hundreds of metres from water after the apparent loss of their broods. These observations were made during a study of dabbling duck brood survival in southern Alberta using radio-marked hens captured on their nests (see Duncan 1986 for methods and study area).

The first instance involved a hen that nested ~300 m from water. She and her brood left their nest the day after hatching and were observed that evening on a wetland. Early the next morning, the hen was located standing alone beside her empty nest in the upland. Later that day and on subsequent days, the hen was observed alone on the wetland, apparently having lost her brood sometime during the first evening after reaching water.

The second instance involved a hen that had taken her ducklings ~400 m from the nest to a wetland the day after they hatched. In an ill-fated attempt to count the ducklings in very dense emergent vegetation that same day, another observer and I disturbed the hen and dispersed the brood. Our presence resulted in numerous nearby nesting Black Tern (*Childonas niger*) mobbing us vociferously. There was also a brisk wind at that time, which, combined with noise from the terns, made it extremely difficult to hear the vocalizations of the ducklings. The hen performed distraction displays for several minutes and then flew away from the wetland in the direction of her nest. After a few minutes, the hen returned to the wetland, flew low over the area where she and her ducklings had been disturbed, and then again flew away into the uplands toward her nest site. Shortly thereafter, we observed the hen standing beside her nest, which contained one nonviable egg. After less than a minute, the hen flew back to the water of her own volition. The following day and on subsequent days, the hen was

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found in the company of ducklings, having apparently reunited with her brood.

The return of both pintail hens to their nests was a response to the apparent "loss" of their broods, albeit only temporarily in the second case. In that instance, the noise from the agitated terns and wind would have precluded the hen from hearing her ducklings. Because chick vocalizations and visual cues are known to change or elicit parental behaviour in birds (e.g., Conover *et al.* 1980; Evans 1992; Rumpf and Tzschentke 2010), the hens' behaviour was likely a response to the absence of such stimuli from ducklings. These observations and that of Gates (1958) demonstrate that dabbling duck hens maintain an attachment to the nest site for at least one or two days after hatching their eggs and taking their broods to water. In response to the loss of their broods, the hens acted on this continuing, residual attachment to their nest sites.

The return of dabbling duck hens to their upland nest sites following brood loss might be rational and adaptive if viable eggs or young remained in the nest. However, viable eggs or ducklings seldom remain in a nest after the hen and brood have departed, because ducks exhibit strong hatch synchronicity (Afton and Paulus 1992) and brood cohesion (Collias and Collias 1956). In the first instance I report, there were no eggs or ducklings remaining in the nest after the hen and brood had departed, demonstrating a lack of rational awareness by the hen. In the second incident, the hen prematurely abandoned her ducklings and temporarily returned alone to her nest, thereby leaving her ducklings at a higher risk of predation. In both of these instances, the hens exhibited irrational behaviour as opposed to conscious, logical thought.

Residual nest-site attachment of hens after they have departed from the nest with their broods could be maladaptive if it prompts premature abandonment of broods. For example, in the second instance reported here, the hen temporarily abandoned her brood but they ultimately reunited; however, in other cases it is reasonable to assume that such abandonment could result in brood loss. Duncan (1986) noted that duck broods were most susceptible to human disturbance within three days of hatch. The first few days after hatch are when duckling mortality in pintails and other ducks is highest (Grand and Flint 1996; Guyn and Clark 1999; Sedinger *et al.* 2018 and references therein), with the primary causes of early duckling mortality being predation and inclement weather (e.g., Grand and Flint 1996; Chouinard and Arnold 2007). This residual attachment to the nest site, combined with an imperfect hen–brood bond shortly after hatch (Weller 1964), could well exacerbate the risk of duckling mortality in the first few days after hatch.

Why might hens behave in such an illogical manner? Incubation drive and nest-site attachment of birds does not come to an abrupt halt after hatch, but rather gradually wanes, with a transitory period when both incubation and brooding behaviours may be expressed (Beer 1966; Richard-Yris *et al.* 1998). Because hormones have a strong influence on parental breeding behaviour in birds (e.g., Eisner 1960; Boos *et al.* 2007), the irrational actions I observed could be a result of the time it takes for hormones to attain certain levels and shift birds to new behavioural states (Henschke *et al.* 2016). It is unlikely that the occasional short flights of dabbling duck hens to their nests after brood loss incurs a large selective cost; irrational behaviour in birds presumably only occurs in the absence of strong pressures against such behaviours (Leniowski *et al.* 2013; Henscke *et al.* 2016; Turzańska and Chachulska 2017). The more frequent return of diving duck hens and broods to their nests within a few days of hatch could well be another manifestation of the slow waning of the incubation drive.

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