

# Waterbirds' hunt aided by specialized tail

26 February 2014



This is a contrast of the typical elongate pygostyle of a diving bird (A), the Adélie Penguin (*Pygoscelis adeliae*, specimen AMNH 623439) to the typical short, dorsally deflected pygostyle of a non-diving bird (B), the Northern Fulmar (*Fulmarus glacialis*, specimen AMNH 20697).  
Credit: Ryan Felice

The convergent evolution of tail shapes in diving birds may be driven by foraging style, according to a paper published in *PLOS ONE* on February 26, 2014 by Ryan Felice and Patrick O'Connor from Ohio University.

Birds use their wings and specialized [tail](#) to maneuver through the air while flying. It turns out that the purpose of a bird's tail may have also aided in their diversification by allowing them to use a greater variety of [foraging](#) strategies. To better understand the relationship between bird tail shape and foraging strategy, researchers examined the tail skeletal structure of over 50 species of waterbirds, like storks, pelicans, and penguins, and shorebirds, like gulls and puffins. They first categorized each species by foraging strategy, such as aerial, terrestrial, and pursuit diving, and then compared the shape and structure of different tails.

Scientists found that foraging style groups differed significantly in tail skeletal shape, and that shape could accurately "predict" foraging style with only a small amount of mismatch. In particular, underwater foraging [birds](#), such as cormorants, penguins, puffins, gannets, and tropicbirds, have separately evolved a similarly specialized elongated tail structure, whereas aerial and

terrestrial birds have a short, dorsally deflected tail structure. Moreover, each underwater foraging group, such as foot propelled, wing propelled, or plunge diving, had a distinctive tail-supporting vertebrae shape. According to the authors, the probable separate evolution of the specialized tail in underwater-diving birds may suggest that body structure adapted to the demand, or the need to move the tail as a rudder during underwater foraging. In contrast, the authors found no conclusive results when looking at the relationship between tail shape and flight style.

Mr. Felice adds, "Previous research has shown that diving birds evolve specializations in wing and leg morphology to facilitate underwater locomotion. This study puts a necessary focus on the tail, finding that this region of the body also evolves in response to the demands of underwater movement."

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