Hesperornithiformes

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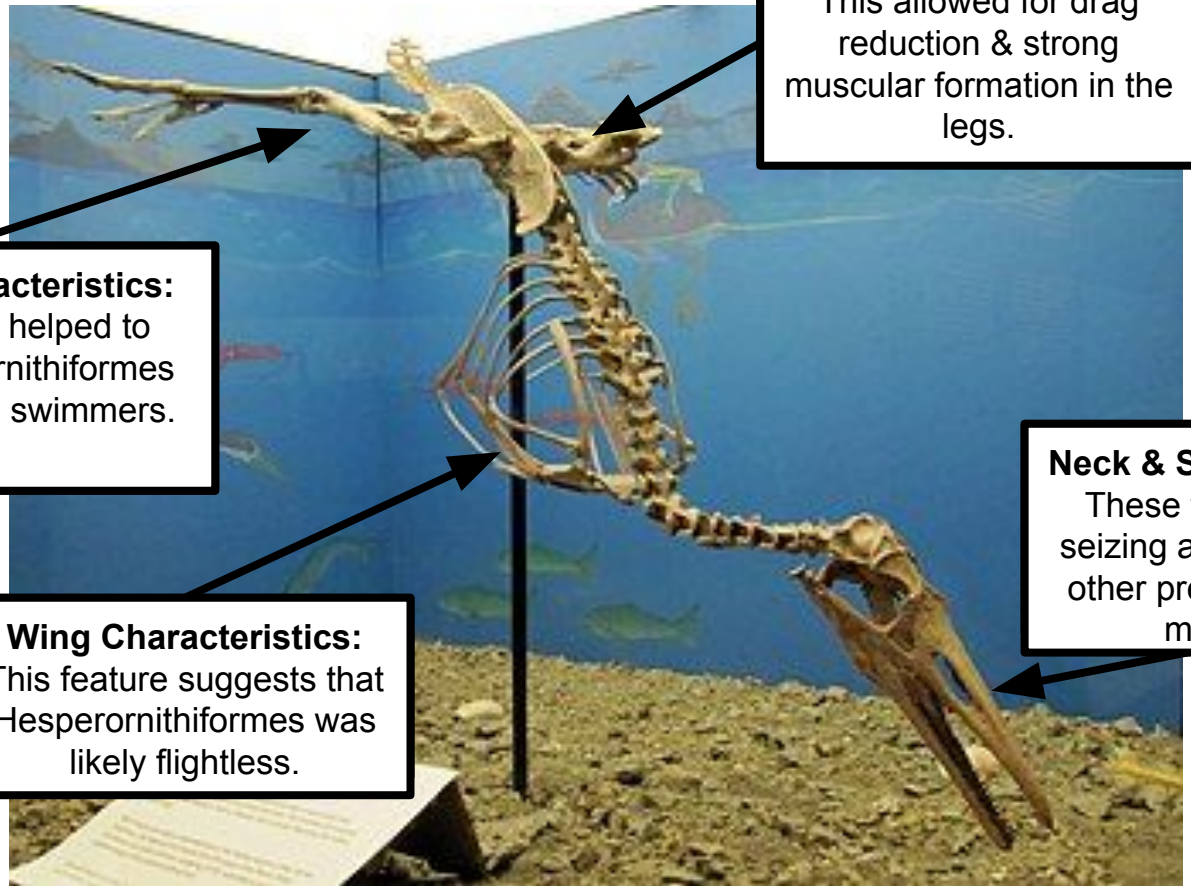
What are Hesperornithiformes?

A Mesozoic group of aquatic birds. These were the group of toothed birds closest to modern birds. Later members of this group were entirely flightless and quite large.

Hesperornithiformes regalis by Tobo Tamura; Spinops

Image from Canadian Fossil Discovery Centre- Manitoba

Anatomy- Key Features



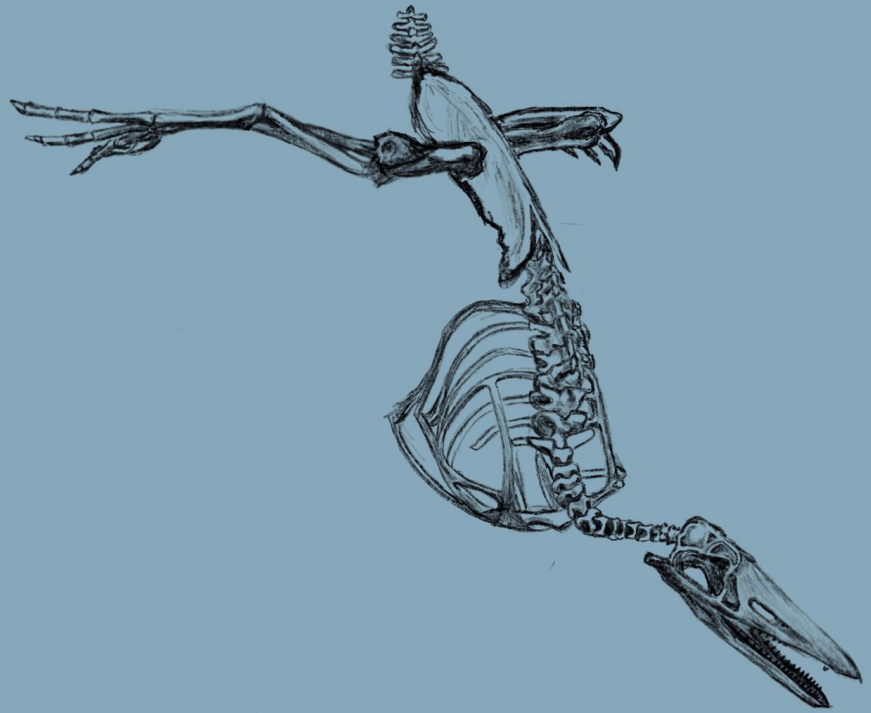
Pelvis Characteristics: This allowed for drag reduction & strong muscular formation in the legs.

Hind-limb Characteristics: These features helped to identify Hesperornithiformes as foot-propelled swimmers.

Neck & Skull Characteristics: These features allowed for seizing and capturing fish and other prey through increased maneuverability.

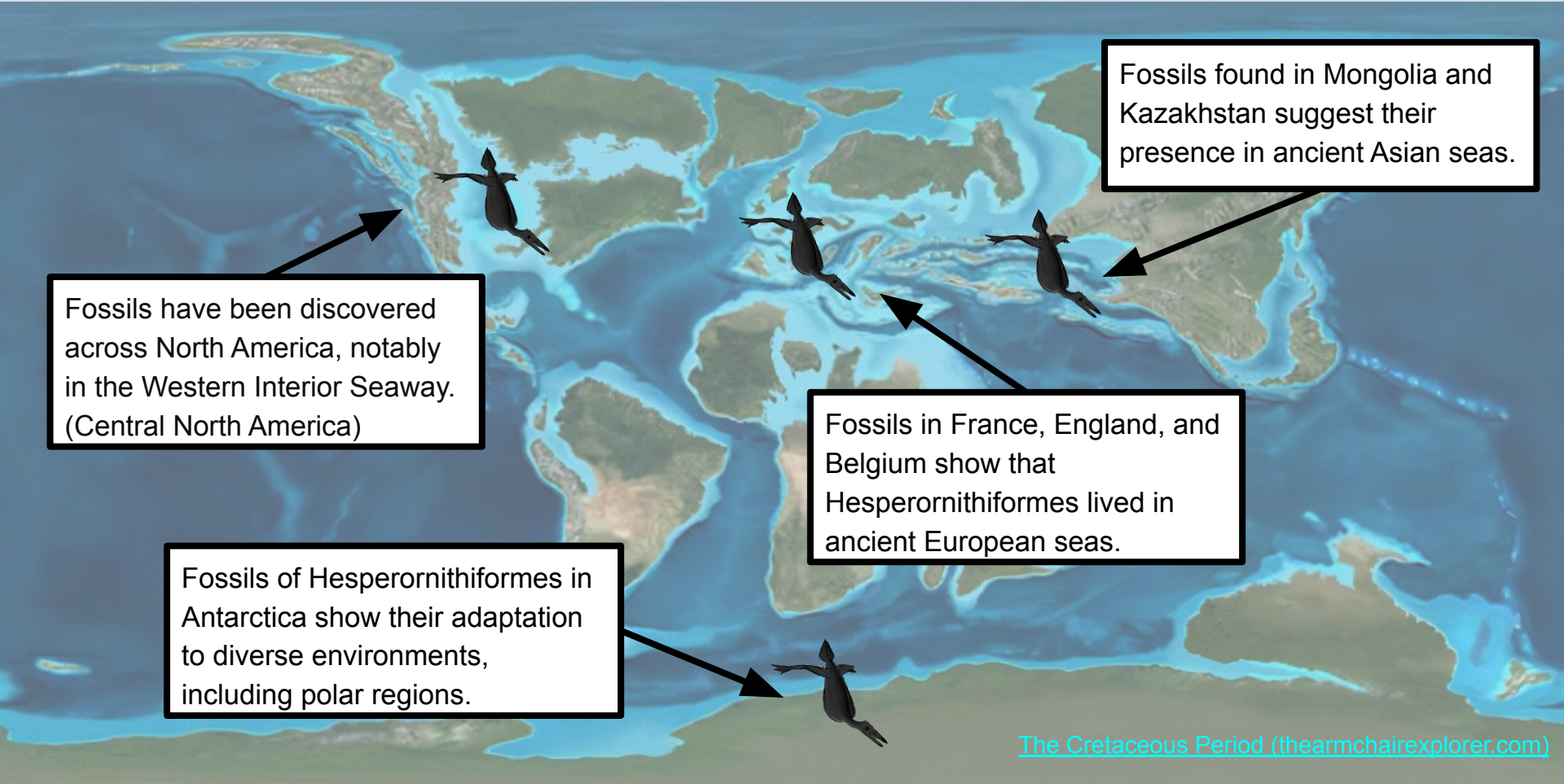
Wing Characteristics: This feature suggests that Hesperornithiformes was likely flightless.

Modelling Based on Skeletal Anatomy



Time & Place

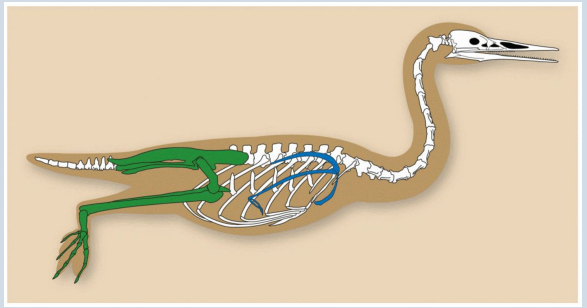
Hesperornithiformes lived during the **late Cretaceous** period: around 85 to 65 million years ago.



The Cretaceous Period (thearmchairexplorer.com)

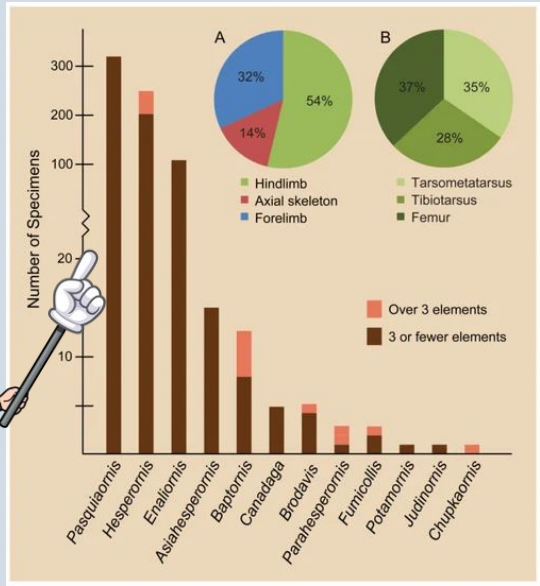
Ecology

- **Environment:** Hesperornithiformes are predominantly known from marine depositions. They were the first birds (and dinosaurs) to fully adapt to aquatic environments.
- **Feeding Habits:** Hesperornithiformes were a carnivorous species with a predominantly piscivorous diet. They hunted fish in the water by diving & capturing them in their jaws.
- **Mating Habits:** Hesperornithiformes primarily dwelt in the water, however, it is suggested that they would venture out of the water to breed and nest their eggs.



Morphological Diversity

- **Body size**
  - Significant diversity in body size; did not correlate with their depositional environments.
  - Both large and small taxa were found across continental, transitional, and marine settings.
- **Variations in morphological features**
  - Length and articulation of the femur, the size and shape of the pelvis, and the degree of neck elongation varied for different diving capabilities and ecological roles.
- **Adaptations for diving**
  - Variations in forelimb size, indicating specialized diving adaptations
- **Skull and beak differences**
  - Variability suggests adaptations to different types of prey and foraging strategies, contributing to dietary diversity.



Fun facts

Aquatic Lifestyle: Hesperornithiformes were fully marine, excellent divers, and primarily underwater hunters.

Toothed Birds: Unlike beaked modern birds, Hesperornithiformes had sharp, pointed teeth ideal for catching fish.

Large Size: Some Hesperornithiformes reached sizes up to 1.5 meters (5 feet), similar to modern penguins.

Flightless: Classified as birds, Hesperornithiformes were flightless with reduced wing bones, relying on their powerful legs and streamlined bodies for swimming.

Feathers: Their feathers provide insulation.

Extinction: Hesperornithiformes went extinct around 65 million years ago, likely due to environmental changes during the Cretaceous mass extinction event.

Current descendants

No Direct Modern Descendants: Hesperornithiformes are considered extinct without direct modern descendants.

- Early researchers identified similarities to modern foot-propelled diving birds like loons.
- Comprehensive morphometric analysis revealed hesperornithiformes rarely share morphospace with loons and grebes
- Overlap in morphospace with cormorants and diving ducks.
- May include cormorants and diving ducks rather than loons and grebes.

https://www.istockphoto.com/th/%E0%B8%A0%E0%B8%B2%E0%B8%9E%E0%B8%96%E0%B9%88%E0%B8%B2%E0%B8%A2/ducks-diving

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