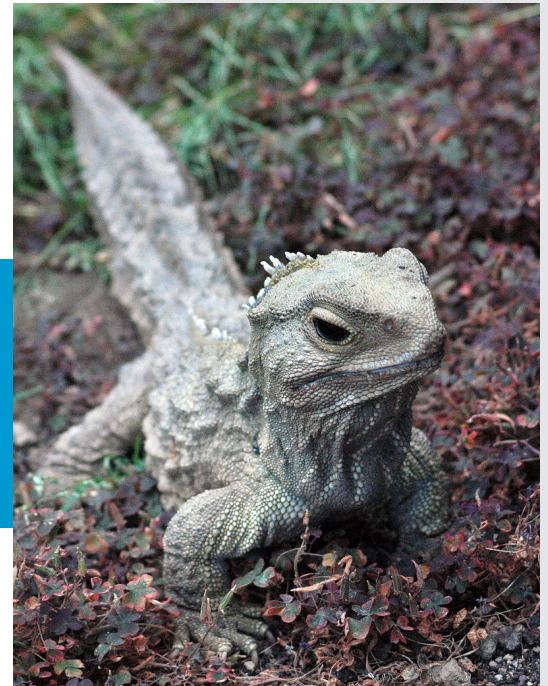


# Earth's Loneliest Species



On another episode, we talked about species that are the last of their family tree. Well, here's one that's the last in its genus, in its family, even in its order.

The tuatara is a 2-ft-long resident of New Zealand. It may look like a lizard, but it diverged from modern lizards and snakes 250 million years ago, and it's quite a different animal.

To start, it's adapted to cold weather. The tuatara can thrive when its body temperature is just 40 degrees Fahrenheit.

It hibernates through winter, breathing as seldom as once per hour.

And it does everything else slowly, as well. The tuatara doesn't reach sexual maturity till the ripe age of 35. Females produce eggs only once every 4 years.

Their babies hatch with a third eye on top of their heads, able to register light but not images. Its exact purpose is unknown, and after 5 years, the tuatara's skin grows over it.

Its teeth are unusual, too. Two top rows overlap a single bottom row and saw together to eat their food. However, they're not really teeth but bony projections from the jaw.

When the tuatara reaches old age, which could be well over 100 years, its teeth have completely worn off. And it has to switch to a soft food diet of worms and larvae.

The tuatara, sometimes called a living fossil, has even appeared on New Zealand's money.

In nearly every way, this remarkably persistent animal is a "one of a kind."

A male tuatara named Henry, who lives at the Southland Museum and Art Gallery in Invercargill, New Zealand, is still reproductively active at 111 years of age.

Credit: KeresH (CC BY 3.0  
[<https://creativecommons.org/licenses/by/3.0/>])



**BUREAU OF  
ECONOMIC  
GEOLOGY**

# Background: Earth's Loneliest Species

**Synopsis:** The loneliest species around today is New Zealand's tuatara. This "living fossil" looks like a lizard but is the only surviving species of the reptilian order Rhynchocephalia.

- Tuatara ancestors first appeared on Earth about 220 million years ago (Middle Triassic) and flourished throughout the age of dinosaurs. Tuatara's closest living relatives—lizards and snakes—are very distant cousins from more than 250 million years ago.
- Zealandia separated from Australia during the breakup of Gondwana about 80 million years ago (Late Cretaceous); since then, these creatures have had little environmental pressure to evolve new characteristics.
- After seafaring humans arrived on the scene, tuataras were threatened by invasive species that traveled on ships (including Polynesian rats) on the larger islands but survived on some of New Zealand's smaller offshore islands, where there were fewer rats.
  - Recent rat eradication by humans enabled the protected tuatara to thrive again on the smaller islands. They were reintroduced to the larger islands in preserves in 2005.
- The tuatara's heart is the most primitive of any reptile, but its genome is twice the size of the human genome.
- Nocturnal tuataras eat insects, spiders, small invertebrates, lizards, frogs, and birds. Their mouths are unique because they have two rows of upper teeth that close over a single row of lower teeth.
- Male tuataras range from green-brown to gray and are about 2 ft long (61 cm), weighing about 2.2 pounds (1 kg); females are about half that size. Tuataras shed their skin each year as adults.
- Tuataras take 10–20 years to reach sexual maturity and continue to get bigger until they are 35 years old. They may live more than 100 years, but their average lifespan is 60 years.
  - Henry, a tuatara in a preserve in New Zealand, became a father at the age of 111 (see photo in the first section).
- Tuatara females take 2–3 years to produce an egg with yolk and up to 7 months to form a shell of calcite and fiber.
  - After fertilization, the egg takes 12–15 months to hatch, resulting in a 2–5 year reproductive cycle, the slowest of all reptiles.
- Confined to the islands of New Zealand, tuataras adapted to withstand colder temperatures than the range of most reptiles and remain active at just 41°F (5°C). They may hibernate and will bask in the sun to regulate their body temperature, but temperatures over 82°F (28°C) can be fatal for them.
- Our planet might seem crowded, but there are some lonely species—like humans, koalas, aardvarks, and tuataras—that are at the end of their branch on the tree of life.
  - Many of these lonely species have limited ranges and are specialized to take advantage of their environmental niches.
    - In contrast, the specialization of humans is generalization—which has enabled us to thrive and spread across almost all of Earth's niches.

## References: Earth's Loneliest Species

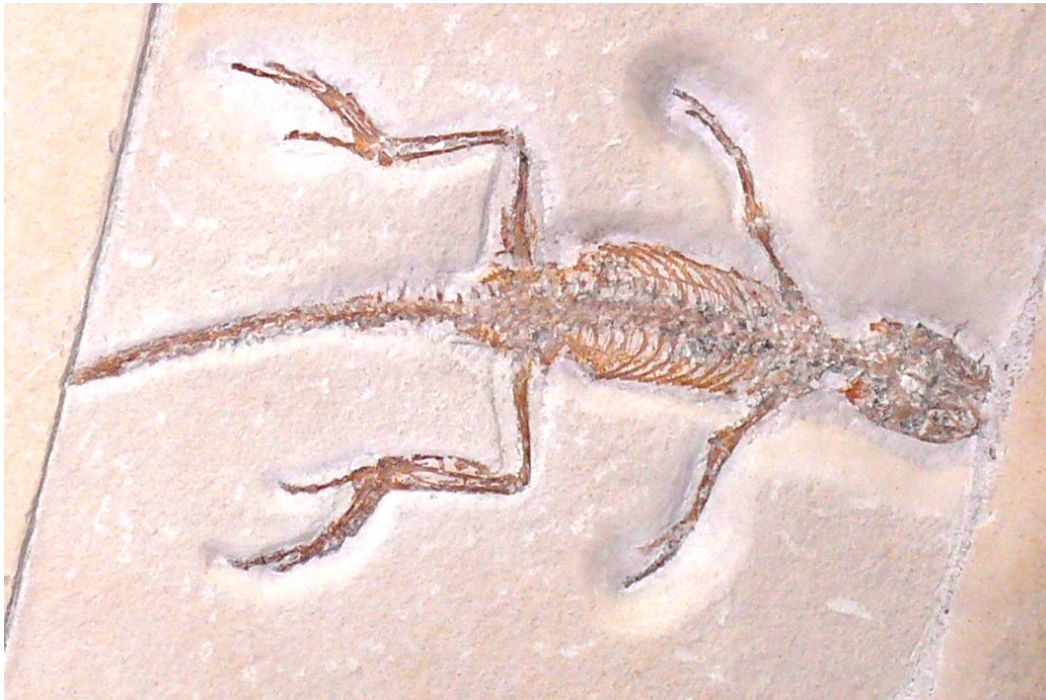
[These Animals Are Truly One of a Kind | National Geographic](#)  
[Tuatara | Wikipedia](#)  
[The Creature Feature: 10 Fun Facts About the Tuatara | Wired](#)



Contributors: Isaac Miller-Crews (UT Austin Department of Integrative Biology), Juli Hennings, Harry Lynch

EarthDate.org  
Fact Sheet:  
Episode **ED 135**

# Background: Earth's Loneliest Species



Fossil of a now-extinct *Homeosaurus*, a relative of today's tuatara that lived about 145 million years ago.

Credit: Haplochromis (CC BY-SA 3.0 [<https://creativecommons.org/licenses/by-sa/3.0/>])

## References: Earth's Loneliest Species

[These Animals Are Truly One of a Kind | National Geographic](#)  
[Tuatara | Wikipedia](#)

[The Creature Feature: 10 Fun Facts About the Tuatara | Wired](#)