

Nine-Banded Armadillo

Dasybus novemcinctus

Class: Mammalia **Order:** Cingulata **Suborder:** none

Family: Dasypodidae

Other names: Common Long-nosed Armadillo

Other subspecies:

Other Relatives: Approximately 20 species of armadillo exist [1]



Zoo Armadillo 0.1

'Magnolia' 0.1 - female

Born: 3/31/2012 Aq: 8/29/2012

About Magnolia:

Born at the San Antonio Zoo. Magnolia was wild conceived, her parents are both wild, and mother is tagged with a transponder.

Status Least Concern [2]

Geographic Region

Nine-banded armadillos are found in South, Central, and North America, and have the largest range of any extant species of armadillo, from Argentina and Uruguay into the southern United States [3]. Since 1850, they have gradually expanded their range from only Texas to as far east as Florida and as far north as Missouri [3]. Increasing human populations and development of transportation routes are thought to help rather than hinder the geographic expansion of nine-banded armadillos [3].

Habitat

They make burrows in tropical and temperate forest and scrub-brush areas as well as grasslands and savanna around forests, rainforests, riparian (near rivers), suburban, and agricultural areas. They prefer the forested areas to the open grasslands because of the high invertebrate life found in forest litter [3]. Armadillos especially thrive in riparian habitats [3]. Nine-banded armadillos are not often found in arid regions [3]. It occurs from sea level to 2,000 m [2]

Characteristics

Size: *Weight range:* 5.5 – 25 lbs [4]; *Length range:* 25–42" (head to tail); *Height range:* 5.9–9.8" (ground to top of shell)

Longevity: **Wild** 12-15 years [5]

Captivity: No data found

Physical Description

- Nine-banded armadillos are covered in an outer body armor made up of bony, skin-covered plates made of keratin, called a **carapace** [3].
- Their carapace is covered with scales (**osteoderms**), which provides a hard but flexible covering [3]. Scales grow continuously and wear, but are never fully shed.
- The underside of the armadillo lacks any armored protection and is of a paler color, generally appearing slightly yellow [3].
- There is no armor on the face or ears, either. The face, neck, and underside are covered in hair. The tail is also covered in rings of scales. The head is small and tapers to a pig-like snout adapted for rooting.
- The armor comprises about 16% of body weight and is divided into three main areas of coverage on the body: a pelvic shield, a shield on the shoulder region, and the characteristic bands of the back [3].
- Nine-banded armadillos have short legs with 4 toes on the forefoot and 5 toes on the hindfoot; all digits have strong claws, and the middle claws are largest of all [3].
- Their teeth are v-shaped, and they typically have between 28 to 32. Teeth are simple, small and cylindrical (peg-like). They lack enamel and continue to grow throughout the animal's lifetime [3].
- Nine-banded armadillos possess long, sticky tongues, which they use in foraging for insects [3].
- Despite their name, nine-banded armadillos can have 7 to 11 bands on their armor [1].
- Nine-banded armadillos maintain a low body temperature, usually ranging from 30° to 35° C (86-95°F) [3].



The current (*circa* 2009–2010) range (shaded red), and predicted future range (shaded pink) of the nine-banded armadillo in the USA

Dimorphism

Sexual dimorphism in nine-banded armadillos is minor [3]

Males: males weighing slightly more than females (the average male weighs 5.5 to 7.7 kg (12-17lbs) [3]

Females: average female weighs 3.6 to 6.0 kg (8-13lbs) [3]

Diet: Omnivore, Insectivore

Diet in the Wild: Nine-banded armadillos are generalist, opportunistic feeders. Though the bulk of their diet is insects and other terrestrial invertebrates, they have also been known to eat small reptiles and amphibians, and occasionally baby mammals, bird eggs, and carrion. A small portion of their diet consists of plant matter, including fruit, seeds, and nuts, as well as fungi. Their long nose is good for digging in soil and leaf litter.

Diet in the Zoo: insectivore diet pellets, hard boiled eggs, mealworms and crickets

Behavior

- *Nocturnal*, night active
- May be *Cathemeral*, dependent upon temperatures and region

Environmental Adaptations

- Armadillos thrive in riparian areas because the softer soils are ideal for digging invertebrates, as well as for burrowing [3].
- Temperature is an important factor in choice of habitat. Nine-banded armadillos begin to shiver at temperatures below 22°C, but the warmth of the burrow allows an armadillo to inhabit temperate areas during milder winters [3]. A large adult male can survive no longer than 10 days at 0° C without starving [3]. Nine-banded armadillos are not common in any regions in which more than 24 freeze-over days occur annually or the average January temperature drops below -2°C [3].
- They do not hibernate, but in the northern part of their distribution, nine-banded armadillos are more active during summer months [3].

Feeding Behavior

- Nine-banded armadillos rely primarily on their sense of smell to find food and communicate with other armadillos, as well as to recognize familiar places.
- They can also stand upright, using their tails for balance, to sniff for food. Their big ears allow them to hear and evade predators.
- They have terrible eyesight, however, and are thought to have poor senses of touch and taste.
- They cross streams or rivers by swimming or simply walking across the bottom. An armadillo can hold its breath for up to 6 minutes. By swallowing air, the animal can also regulate its buoyancy to some degree to help it float. Armadillos tire quickly, however, and cannot cross wide bodies of water [3].
- Scent is the primary sense, and is essential while foraging. Nine-banded armadillos travel with their nose just above the ground and can smell invertebrates up to 20 cm below the surface.

Home Life

- Nine-banded armadillos dig burrows by loosening soil with their noses and forelimbs and then kick the soil away with their hind limbs. A burrow may have several entrances, but there is a main entrance that the animal preferentially uses [3].
- They carry nesting materials, such as twigs and leaves, by clutching items to themselves with their forelimbs and hopping **bipedally** [3].
- Other than mothers and their young, nine-banded armadillos typically do not share burrows. However, incidences of non-related adults sharing a nest have been documented in cold weather, and it is speculated that this may be a way for these armadillos to **thermoregulate** at the northern limits of their distribution [3].

Defense Mechanisms

- While nine-banded armadillos curl up, they are not capable of curling itself into a perfect ball like other species, such as three-banded armadillos [3].
- Nine-banded armadillos are rarely aggressive toward one another [3]

Reproduction

- It has a high rate of reproduction, and commonly produces quadruplets [2].
- Though 9-banded armadillos are typically solitary, they may pair together when it's time to breed (in the summer according to their hemisphere), even sharing burrows together [3].
- Some observational studies have shown that within a given breeding season, nine-banded armadillos are **polygynous** with respect to pairing, however, pairing may not lead to copulation [3].
- The female reproductive tract includes a simplex uterus and paired ovaries and oviducts [3].
- During conception, only a single **ovum** is fertilized. The fertilized egg stays in the uterus for about 14 weeks prior to implantation (**delayed implantation**). Nine-banded armadillo reproduction involves **monozygotic polyembryony**. That is, when a egg finally implants in the wall of the uterus, it buds into 4 identical embryos. Every embryo develops its own amniotic cavity. This embryonic process almost always results in the birth of four identical quadruplets [3].
- Quadruplets are often born in early spring, after about a 4 month gestation period. **Delayed implantation** allows birthing to happen during the spring, when temperatures are much warmer and food is abundant [3].

- Females can have one litter a year. The babies open their eyes quickly, but their armor is soft and will take a few weeks to harden. They are ready to forage as soon as they leave the burrow. They are weaned after 2-3 months, and usually share burrows and foraging areas with their siblings during their first months away from home [3].
- Young of both sexes may begin breeding as early as the summer following their birth, but they may not reach full sexual maturity until the age of 2 years. Full development and maturity is attained by the age of 3 or 4 years [3].

Conservation

- **Use & Trade:** This armadillo is used as a protein source and to make handicrafts. It also has medicinal use in some range countries [2]
- **Threats:** There are no major threats to this species; it is hunted throughout its range, but given its high rate of reproduction it seems able to withstand a reasonably high degree of offtake. In North America, it is subject to culling as it is often considered a nuisance [2]. They are often considered pests by gardeners, fall victim to car tires, or are eaten and harvested for their shells [4].
- **Predators:** cougars, wolves, coyotes, bears, jaguars, alligators, bobcats, and raptors. Humans may pose the greatest threat, though. In addition to automobile accidents, armadillos are poached for their meat and shell. They are also hunted because they steal eggs of poultry.

Did You Know?/Fun Facts

- Can smell an insect through 6" of soil [4]
- Armor is made of keratin, the same thing as our fingernails
- Like turtles, their vertebrae are attached to their carapace (top plates)
- Armadillos are one of the few mammals able to carry leprosy, others include some species of lagomorphs and primates.
- Can jump 3-4 feet straight up into the air if scared, using its tail as a 'spring' [4]
- Cannot roll into a full ball like 3-banded armadillos. Instead, they must run, dig or press themselves into the soil to prevent from being flipped over when threatened [4].
- The nine-banded is the only one found in the United States [1].
- The term "armadillo" means "little armored one," and refers to the presence of their armor-like plated **carapace** [1].

Glossary: List of definitions of the most important recurrent technical terms used in the text.

Bipedal - using only two legs for walking.

Carapace - A hard outer covering or shell made of bone, chitin, or keratin on the back of animals such as turtles, armadillos, lobsters, and crabs.

Cathemeral- The activity of an organism may be regarded as cathemeral when it is distributed approximately evenly throughout the 24 h of the daily cycle, or when significant amounts of activity, particularly feeding and/or traveling, occur within both the light and dark portions of that cycle.

Delayed implantation – also known as *Embryonic Diapause*, is a reproductive strategy where the fertilized embryo does not immediately implant in the uterus, but is maintained in a state of dormancy where little to no development takes place during the time that embryo remains unattached to the uterine wall. As a result, the normal gestation period is extended for a species-specific period of time.

Monozygotic polyembryony - is the phenomenon of two or more embryos developing from a single fertilized egg (i.e. identical twins)

Osteoderms - bony deposits forming scales, plates or other structures in the dermal layers of the skin

Ovum - In animals, egg cells are also known as ova (singular ovum, from the Latin word ovum meaning *egg* or *egg cell*)

Polygynous - the state or practice of having more than one female mate at a time

Thermoregulate - the ability of an organism to keep its body temperature within certain boundaries, even when the surrounding temperature is very different.

References

- [1] National Wildlife Federation, "Nine-banded armadillo," National Wildlife Federation, 2014. [Online]. Available: <http://www.nwf.org/wildlife/wildlife-library/mammals/nine-banded-armadillo.aspx>. [Accessed October 2014].
- [2] IUCN, "Dasypus novemcinctus," IUCN, 2014. [Online]. Available: <http://www.iucnredlist.org/details/6290/0>. [Accessed October 2014].
- [3] Animal Diversity Web, "Dasypus novemcinctus-Nine banded armadillo," Animal Diversity Web, 2014. [Online]. Available: http://animaldiversity.ummz.umich.edu/accounts/Dasypus_novemcinctus/. [Accessed October 2014].
- [4] Utah's Hogle Zoo, "Nine Banded Armadillo," Utah's Hogle Zoo, 2014. [Online]. Available: http://www.hoglezoo.org/meet_our_animals/animal_finder/nine-banded_armadillo/. [Accessed November 2014].