

## Getting to Know the Groundhog

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Punxsutawney Phil and his handler. (Photo credit: Corbis)

On February 2nd, all eyes turn to Punxsutawney, Pennsylvania, home of the groundhog, Punxsutawney Phil. Local lore has it that this groundhog can predict the following six weeks of weather. If he sees his shadow, then six more weeks of winter are in order. If he does not see his shadow, then an early spring is on the way.

### Origins of Groundhog Day

So, where exactly did this tradition of a weather-predicting groundhog come from, anyway? The Pennsylvania Dutch brought the tradition with them when they emigrated to America from their native Germany. The legend itself originates in medieval Europe, where people reputedly watched hedgehogs or badgers to see if they saw their shadows on Candlemas Day, celebrated each February 2nd. When they arrived in America, the early German settlers replaced the hedgehog with the local groundhog.

February 2nd is also a cross-quarter day, which means that it is located about halfway between the winter solstice (December 21) and the vernal equinox (March 20). Some cultures celebrate this date as the mid-point of winter and as a time to look forward to the

return of warm spring temperatures and longer day lengths.

### Groundhog Natural History

The groundhog (*Marmota monax*), also referred to as a woodchuck, belongs to one of 14 species of marmots. Groundhogs are the largest members of the squirrel family. Groundhogs typically grow to between 40 and 65 centimeters in length, which includes a 15-cm long tail. An adult groundhog typically weighs around 6 kilograms. These rodents can be identified by their flattened head shape, brownish body fur, yellowish belly fur, and black feet. They also have strong claws and powerful legs and feet that they use to dig their underground burrows. In addition to their burrowing abilities, they can also swim and climb trees.

Most groundhogs spend the majority of the summer season gorging on green plants such as alfalfa and clover to build up their fat reserves. Following the first frost in the fall, most groundhogs retreat to their underground burrows and hibernate through the winter season. Given the wide geographic range of groundhogs, not all members of this species hibernate. In one study, scientists reported that groundhog hibernation differs by latitude. For example, populations of groundhogs in Quebec, Canada hibernate from mid-September through late March, a period of 167 days. Groundhog populations in southeastern Pennsylvania typically hibernate from early November through late February, a period of 114 days. In contrast, evidence suggests that groundhog populations in the southern United States, where winters are milder, do not hibernate at all.

### Groundhog Hibernation

Hibernation is an adaptation that allows animals to survive periods of harsh weather and scarce resources. During hibernation, the groundhog's heart rate decreases significantly, from 80 beats per minute (bpm) to 4 to 5 bpm, and its body temperature drops to not much higher than the ambient temperature in its burrow, from 36 °C to 3 °C. Hibernation does not mean that the animals are asleep for five to seven months. Instead, the animals do rouse themselves from time to time, though doing so can use up a significant amount of their energy reserves. In addition, groundhogs routinely exit their underground burrows a number of times several weeks before their final arousal from hibernation. Coincidentally, most of these first arousals occur around the first week of February, or right around Groundhog Day.

The groundhogs do not feed during these early arousals, as the ground is often still covered by snow and fresh, green vegetation is not available for them to eat. Instead, scientists think that these early emergences are a way for groundhogs to resynchronize their biological clocks. Another hypothesis is that the groundhogs use these early awakenings to check on the locations of potential mates, in preparation for the mating season, which begins soon after the groundhogs emerge completely from their underground burrows.

Because the groundhogs must spend the majority of the summer months feeding in preparation for hibernation, it is key that they reproduce early in the season. Research in the field indicates that doing so allows their cubs to wean before food availability is at its highest and lets the cubs have plenty of time fatten up for winter.

Recent research indicates that groundhog torpor is not only dependent on day length. Instead, hibernation is related to a year-long internal cycle. A laboratory experiment which maintained temperature at 70 °C year-round and provided groundhogs with access to plenty of food and water recorded that some individuals still began to enter a state of torpor. Scientists hope that continued studies of groundhogs will lead to an enhanced understanding of the changes in brain chemistry, metabolism, and hormone secretion that occur when the animal goes into hibernation. These studies may even have implications for human health, as many functions in the human body occur on a seasonal or year-long cycle, too. Some scientists even think understanding hibernation could aid in medical procedures, such as surgery. Understanding how to decrease someone's metabolic and breathing rates (which occurs during hibernation) could help to reduce tissue damage during such intensive procedures.

### Facts about Groundhogs and Groundhog Day

- Groundhogs can be found across much of North America, including parts of northwestern, central, and eastern Canada and throughout the Great Plains, Midwest, and eastern regions of the United States.
- Females give birth to four to six cubs in the early spring. The young, helpless at birth, remain with their mother for several months.
- Groundhogs are commonly found in fields, meadows, and along woodland edges.
- Groundhogs typically live between three and six years in the wild.
- Punxsutawney Phil's first official prediction at Gobbler's Knob occurred February 2, 1887.

### More to Explore

- [Groundhog Day](#)
- [Groundhog \(\*Marmota monax\*\)](#)
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- [Latitudinal Differences in the Hibernation Characteristics of Woodchucks \(\*Marmota monax\*\) \[pdf\]](#)
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### Comments

**Austin Smith says**

February 8, 2011 at 8:03 pm



This was a very interesting article. First of all I didn't even know that there was an actual groundhog that they let see its shadow. I thought they just flipped a coin or something like that. I don't think that whether the groundhog really sees its shadow means anything because it called for an early spring but we're out for snow almost every week.

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