

FEBRUARY 1 - 14, 2018 NATURAL HISTORY NOTES FOR EASTVIEW

By Dick Harlow

## HIBERNATION

For some animals living in the Northern Hemisphere there is a need to hibernate, a type of dormant sleep. It allows for normal bodily functions at a reduced rate.



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Inactivity, reduced metabolism resulting in a low body temperature which results in slow heart and breathing rate is hibernation. As we learned in high school, animals living in the desert or very hot climates undergo what is known as aestivation, inaction and movement into the shade during the hottest part of the day, which is another form of hibernation.

For survival, it is very important for a large animal, such as a bear, to build up its fat reserves, both for a male or for a female needing milk for cubs, before they go into hibernation.

Even though animals will be in a form of long semi-sleep, their body functions, although reduced, still function normally. Consequently, they need stored energy, to take them through the winter months, in the form of fat. For their survival it is extremely important that they eat enough food in the Fall so that the food will convert to fat in time for hibernation. Fat = energy!

In the case of Black Bears or any animal that goes into hibernation, when their normal food supply is unavailable, they must have enough fat to carry on with a reduced metabolism during this period. Black Bear females will bear their young while they are in hibernation. Not only does she require energy for herself, she also must produce milk for her offspring.



© North American Bear Center, internet

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When an animal reduces metabolism during hibernation it can function for weeks or months without additional food or water. This is a phenomenal conservation of energy when their normal food supply is unavailable. We are living in a time and space where living creatures have undergone limitless evolution. We are witness to this. What will a changing climate do to these Northern Hemisphere hibernators?



**Polar bear den, USFWS**

Polar Bear Den © USFWS

In the case of Polar Bears only pregnant female Polar Bears need to hibernate. Her function when hibernating is to give birth to her young. It is paramount that within the snow cave a female Polar Bear is able to provide a warm environment for her young. Consequently, a female Polar Bear loses a percentage of her weight both during hibernation and in milk production as she is nurturing her young or when food is in short supply.

**MOTHS/BUTTERFLIES DURING WINTER**

Have you ever wondered what happens to Moths and Butterflies during Winter? Even though there are some where the adult migrates, like the Monarch Butterfly, to warmer climates and returns in the spring to lay eggs and die, other individual species have strategies that vary. There are those species that will lay their eggs in late Summer or early Fall under the bark of a dead tree or in deep grooves of tree bark and will hatch the following spring.

Moths and Butterflies are insects and go through a four-part life cycle, egg, larva (caterpillar), pupa (chrysalis-butterflies, cocoon-moths), winged adult. Each stage is very different from the other. Eggs can be laid and survive winter. Larva feed until they reach a stage when they transform into pupa. Pupa are encased larva that is metamorphosing into an adult, but that transition can be delayed until spring. Even though there are some moths that fly during Winter, most adult moths and butterflies fly only during late spring to late summer.

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**Mourning-Cloak** © Cathy-Passler

Moths and butterflies have a number of strategies for surviving the winter cold. Whereas some moths transform from caterpillar to cocoon and go underground, others hibernate within vegetation, or garden debris. There are still other species whose adult form will try and find a sheltered spot to go to sleep.



**Blinded Sphinx Moth**, © Naturally Curious, Mary Holland

Some species lay eggs in late summer or autumn which do not hatch until the following spring when food is plentiful. Many moths spend the winter as caterpillars which hibernate amongst vegetation, although some are known to emerge to feed during mild spells. Other species like the hawk-moths spend the winter as pupae, tucked up in warm cocoons underground where they are sheltered from the cold.

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Evolution is the name of the game! Each species has evolved strategies to be successful. To be successful is to survive long enough to fertilize and produce offspring that will ultimately continue the next generation. Whether it is -29, 10 or 32 degrees Fahrenheit, both moths and butterflies have evolved to accomplish this end. I wish there was some way of learning how the climate will change these lives. We are only a witness today.

The wintering butterflies we see in the summer here in the Northeast are able to survive deep snow and freezing temperatures in a period called diapause. Diapause is a period of time when an organism's metabolism and transfer of oxygen are slowed to as low as is possible and still maintain cell health within the organism. Ice is the death blow to wintering insects. By lowering metabolism and breathing, the insect is lowering the water content within their blood stream. Insects have the ability to form antifreeze such as glycerol as well as other agents. As long as the insect has the time to adjust its blood water content along with finding a safe spot to spend the winter, it will survive until the following spring.

### **OBSERVATIONS MAMMALS**

Fox tracks in snow  
Coyote tracks in snow  
Eastern Cottontail tracks in snow

#### **Weather Tidbits**

#### **Month of FEBRUARY 1-14, 2018**

*All Measurements taken at solar noon (1230 EST).*

#### **PRECIPITATION**

Total Precipitation: 25.8mm or 1.0 inches.  
Overcast Days: 7