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### THOSE AMAZING FROGS \*

by Lanny and Marilyn Johnson

Early this spring, I saw several of our “pet frogs” sitting by our irrigation pond that had recently filled with water. They had survived another cold winter. Have you ever asked yourself, where frogs go in the winter? As we look into how they survive harsh, freezing conditions, we see how God has provided for the needs of His creatures.

Because frogs don’t make their own body heat, they are considered cold-blooded. They depend on other sources of heat to keep warm – the heat of the water or air around them and the heat of the sun. As winter approaches and the temperatures begin to cool, a frog’s blood begins to get thicker and its body starts to slow down.

The start of cooler weather also causes the frog to begin looking for a place to sleep (hibernate) during the coming winter. This place of rest is carefully chosen for warmth. If the frog’s body temperature drops more than two degrees below the freezing point of water, ice crystals will begin to build in its blood, and the frog will die. Some frogs may dig down and burrow beneath the leaves on a forest floor or

crawl into rotting logs, using the heat from the decaying plant material to help keep warm. Others may bury themselves deep in mud to get away from the freezing winter temperatures.

In some climates, the winters are so cold that even frogs that are covered by plant material or mud will freeze. Yet some northern tree frogs are able to survive these cold temperatures. Scientists have experimented with some tree frogs by cooling them down several degrees below freezing. The scientists discovered that up to 35 percent of the frogs’ body fluids froze. When the frogs were thawed out they were alive and well! The experimenters discovered that the frogs’ bodies produced *glycerol*, which not only acts as antifreeze, but it also keeps ice crystals from forming in frogs’ cells. This is important, because ice crystals’ sharp edges can tear up and destroy cells.

The Wood Frog lives where it gets so cold that its body makes an even more powerful antifreeze than glycerol ... it makes *glucose*. The amount of glucose Wood Frogs make is powerful enough that it would cause cell damage in other frogs; however, the Wood Frog has another special design to help it survive. It is able to keep its cells from being destroyed by slowing its body down so much that they actually become brain-dead. Surprisingly, if the Wood Frog’s cells are damaged by ice crystals, its blood has special proteins called *fibrinogens* that fix the cell walls by sealing any leaks.

God provided frogs with another design

to help them survive. Sometimes it can be very cool during the spring or summer. Conditions like this can kill a lot of frogs. Amazingly, the surviving frogs lay eggs that have more females than males! Having more females means having more eggs, which means having more

frogs, which means the frog population has a better chance of quickly returning to normal.

Could frogs have come up with any of these survival skills and designs on their own? Could chance and accidents (evolution) ever make wonderful abilities such as these? Think about this ... how many times would a frog have to die before it

developed all of these ways to survive? Once you are dead you don’t get a chance to go back and fix your mistakes! Only an intelligent Creator could provide for wonderful designs such as these.

Wow! Now think - if God cares this much for frogs, just think of how much more He cares us!



GREY TREE FROG



WOOD FROG

\*Much of this information was derived from different Creation Moments programs <http://www.creationmoments.com>.

