

# Nature Week at Heritage Village - August 9th

## Dragonflies - "archetypal drones"



Lorie Axtell



Robotic dragonfly

Beautiful, delicate, fleeting dragonflies are still common this late in the season. Not to be confused with damselflies, they hold their wings horizontally when at rest; damselflies hold their wings upright. Both belong to that very small and select group of insects that people actually like. Maybe butterflies are the only others in the group.

Dragonflies have been named appropriately. They are the dragons of the air, fierce predators. When they spot a prey, they track it with their huge 360-degree eyes, then calculate a trajectory to intercept it with their large brain, and subtly adjust their path for the encounter with their malleable wings. Once successful, which is 95% of the time, they can eat in mid-air while continuing to hunt. "They'll tear up the prey and mash it into a glob, munch, munch, munch," said Michael L. May, an emeritus professor of entomology at Rutgers. "It almost looks like a wad of snuff in the mouth before they swallow it." They eat midges, butterflies, moths, damselflies and most importantly mosquitoes, between 30 and 100 mosquitoes per day.



Lorie Axtell

They achieve this precision hunting with a combination of a highly developed neuron package as a brain, the best eyesight in the insect world, and amazing flying abilities. Currently there is a large amount of research on dragonflies. "Perhaps not surprisingly, much dragonfly research both here and abroad is supported by the United States military, which sees the insect as the archetypal precision drone." Georgia Institute of Technology has developed a wing-flapping robot dragonfly with a research grant of \$1,000,000 from the US Air Force and these tiny robots can be bought for a mere \$120.

"Dragonflies are magnificent aerialists, able to hover, dive, fly backward and upside down, pivot 360 degrees with three tiny wing beats, and reach speeds of 30 miles per hour, lightning for an arthropod."\* To achieve this flight they keep their four wings warm, sitting in the sun, and have the ability to control the movement of each wing separately, even changing the shape of the wing to change its aerodynamic properties. To see a real dragonfly in slow motion flight go to <https://www.youtube.com/watch?v=YUfYiQSWJAg> To see the robot fly go to <http://www.techhive.com/article/2020222/robot-dragonfly-uav-skips-military-development-flies-directly-into-homes.html>

But dragonflies are at risk because they mate in wetlands and forage in woods. Researchers at UMBS in Pellston discovered that where the wetland is on one side of the road and the forest is on the other, there are a substantial number of dragonfly - car collisions. Researchers found between 16 and 411 kills per mile per day representing 25 species of dragonflies. Combined with wetland destruction, some dragonfly populations are at risk. Samuel Keith Riffel in the *Great Lakes Entomologist* 1999.

Enjoy the fierce ace flyer - the dragonfly!



Encyclopedia Britannica

Dragonfly nymphs live in the water for one or two years and have amazing mouth parts that spring out from under their head to capture prey.



**MACKINAW  
NATURE  
CENTER**

by Sandy Planisek 2015

Issue #19