Temperature control – Wing-whirring to color-change:
Dragonflies, like all insects are cold-blooded, or ectothermic, the preferred term these days. In short, they are not able to regulate their internal body temperature in the same way that mammals and birds do, and depend in large part on sunlight and ambient air temperature. However, they do have a few temperature tricks of their own and don't always sit passively waiting for sun and clouds to dictate their body temperature.

Cooling off – dragonflies can over-heat, which can be just as serious as being too cold. To prevent this, they may get into the "**obelisk position**". Quite simply, they raise their abdomen straight into the air, thereby reducing the amount of surface area exposed to the sun, i.e. an abdomen sticking straight up absorbs less sunlight than one stretched out flat. They may also *lower* their abdomen, allowing it to **hang down as they fly** – a behavior often displayed during summer afternoons by gliders and saddlebags.

Common Whitetails perched on a dead tree bask in the setting sun of a summer evening.

Warming-up – dragonflies can do something similar to shivering when they get too cold to fly – it's called **wing-whirring**. On a cool, cloudy day, or first thing in the morning before the air has warmed up, they may vibrate their wings, presumably to warm up their wing muscles just enough to fly. Dragonflies also love to **bask** in the sun, much like sunbathing turtles, snakes, or people. Especially in the morning, you can often find dragonflies perched on a sunny branch, grass stem, rock pile or patch of bare earth, soaking up that AM sunlight. Some dragonflies have partially **translucent abdomens** (Painted Skimmers) and many others have **dark wing patches** at the base of their wings (saddlebags and pennants) – both may be anatomical adaptations to absorbing sunlight and channeling that heat to their organs and wing muscles.

Lastly, there is at least one species that actually **changes its body color**, to both cool down and heat up. It appears to be an automatic anatomical function, opposed to something under their control, but an impressive adaptation none the less. When Common Green Darners get hot, the light-colored platelets in their blood rise to the surface and their abdomens turn bright, light blue, thereby reflecting sunlight and preventing them from over-heating. When these darners get cool, those light-colored platelets sink. This causes their abdomens to turn a darker mix of rich purple, black and brick red – now their abdomens *absorb* light, allowing them to warm-up. The change from light to dark coloring appears to be much more pronounced in the *male* Common Green Darner – I'm not sure how much, if at all, it occurs in the female. Perhaps this is because males need to be more active and spend more time flying around in order to find females and defend territories. Therefor they may be in more need of warming up when it's cool, and in more danger of over-heating when it's hot.

The abdomen of male Common Green Darners changes color depending on temperature – bright blue when it's hot and purple when it's cooler. This male was photographed on a cool spring evening.