

Date and time: Thursday September 1 2016 2:15 - 5:15 pm

Weather: Pr 34 mm; RH 79%; BP 101.7 kPa; cloud/sun; N 10-15 kmh; T 20°C

Contents: The bee protocol and a global decline of insects.



Riverbank Grape (*Vitis riparia*) is now producing fruit among these young trees in the Regeneration Zone.

It was time for the Annual Bee Protocol, a fixed method for counting Honeybees in the vegetation of the Regeneration Zone. We started the protocol in the late summer of 2009 and have continued annually, with one or two omissions, ever since. The numbers have shown an overall decline thanks, we thought, to the neonicotinoid insecticides used on agricultural crops. But now we face a newer, wider problem, a worldwide decline not just in Honeybees, but seemingly all insects. Readers will find a special report on the subject in the Readers Write section of the *Bulletin*.

On first entering the property we paused in the Upper Meadow so that Pat could clip away all the vegetation, from dead Teasels to Goldenrod, obscuring the property plaque. She spotted a healthy-looking Monarch Caterpillar among the Milkweed over there, while I photographed a cryptic-looking wasp and a Crescent butterfly. “What’s this beautiful plant with the yellowish flowers?” “That’s an Evening Primrose.” “It looks like it’s in the Rose family.” She didn’t think so.

Proceeding to the Lower Meadow, we set up camp and, while Pat went scouting around, I spotted some butterflies, including an Eastern Tailed Blue, but did no sweeping. Instead I walked the old “watering trail” though the Regeneration Zone.

Some 17 years ago, when we first visited Newport Forest, the Lower Meadow was simple oldfield, with no invading trees or shrubs. In the late summer, several species of goldenrod and aster would throw a white and yellow blanket over the meadow and bees would abound. We started off by counting all pollinators in the following categories: Honeybees (HB); Bumblebees (BB); Other Bees (OB); Large Wasps (LW); Small Wasps (SW); Large Flies (LF); and Small Flies (SF). That’s it. The area of interest also included a one-hectare patch called the Regeneration Zone (RZ) where we had also begun a tree-planting project. Over the next few years, over 200 trees were planted as young saplings, most of which still survive — and thrive. Early on, the project was complicated by a three-year drought or severe dry spell which meant the installation of a water tank in the Upper Meadow and endless trips between tank and RZ with our young assistant of the day. We established a watering trail in order to access all the young trees and this trail (to make a long story short) has become our counting trail. However, as the new forest has developed, more and more of the herbaceous vegetation has become shaded out, making it necessary to reduce the number of counting stations.

Before carrying out the day’s protocol, we went along the trail, with Pat cutting away overhang and me measuring out stations and planting surveyor’s flags to mark positions. Pat then accompanied me part way to the river. We spotted a magnificent Marbled Orb Weaver along the way, dazzled by its huge web in the afternoon sun, then trying to tease it out of its retreat in a folded leaf nearby — for a picture. Gray Tree Frogs made short burbling trills from time to time. Pat stayed at the Elbow while I headed out to the river, walkie-talkie in hand. “Guess what. I’m looking at a Spiny Shoftshell right now.” “Great! Get a picture.” “I will.”

I walked to the tripod with Trail Cam #2 on it and took both to a new location, higher up and right beside the River Landing for convenience. The new direction of view is downstream (southwest), now taking the whole beach into its field.

A break in the Nook brought a visit by some five Chipmunks, as well as a Red Squirrel. Although we had plenty of birdseed in the tray, the only overhead visitor was a Blue Jay! As well, we heard none of the usual birds, except for a huge conclave of American Crows making an enormous racket out by the river.

The Bee Protocol went well. At each flag I counted all pollinators I could see

within three metres of the flag, with stations at least six metres apart and always placed within a denser patch of flowering plants. The raw counts appear in a brief report below. Overall, they were well below counts taken in 2009.

Phenology: Milkweed senescing; New England Asters starting to bloom; River Grapes mostly ripe.

New Species: (18% new records.)

Black-barred Brown	<i>Plagiomimicus pityochromus</i>	GF kd/MG Au14/16
'Four-striped Sawfly'	<i>Macrophya succincta</i>	LM KD Sp01/16

Species Notes:

To Mary Gartshore goes the credit for making a positive ID of the Mystery Moth featured in the August 14 issue of *The Bulletin*. (The identifier gets capital initials in our code, while the finder gets lower case ones..) Mary remarks that the species is uncommon and that the larva feeds on Giant Ragweed, with plenty on site.

The Pollinator Protocol: In the summer of 2009 we made some 10 counts of pollinators along the same trail, tracking the rise and fall of numbers from July 4 to September 27. The best of these counts, taken on September 10 is listed below, expressed in insects per square metre, a natural basis for comparison.

	HB	BB	OB	LW	SW	LF	SF	
2009 Raw count:	271	13	1	4	0	40	16	(17 stations)
Density:	0.56 bees/ha							
2016 Raw counts:	77	2		2	3	4	4	(10 stations)
Density:	0.27 bees/ha							

Total areas counted were 490.7 and 282.7 sq m, respectively. But even taking the differing areas into account, we seem to have a decline of the HB category by 50%. Other groups fared worse, according to the numbers. More counts to come shortly.

Readers Write: The Decline in Insect Populations.

Daniel J. Bickel, Australian National Museum
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Many readers have heard about the decline in honeybee populations, termed “colony collapse disorder”, in North America and Europe, and the threat it poses to food production. (See: https://en.wikipedia.org/wiki/Colony_collapse_disorder and a popular summary <http://sos-bees.org/>).

Researchers trying to understand this global die-off have suggested the use of agrichemicals such as neonicotinoid pesticides as well as the stress in colonies when they are trucked long distances for pollination services as possible factors. In addition, a widespread decline in insect numbers is being recognized more generally, but this is difficult to verify with hard evidence (at least with commercial honey bee hives, the crisis can be documented). There have been a few general articles about this phenomenon.

(See: <http://www.wakingtimes.com/2016/07/23/not-just-bees-insects-decline-heading-extinction/> & http://e360.yale.edu/feature/insect_numbers_declining_why_it_matters/3012)

Some insect populations can have enormous fluctuations, some resulting from human impact. For example, in late May- early June in Detroit near Lake St Clair where I grew up, there were enormous emergences of the mayfly *Hexagenia limbata* from the shallow muddy waters of the lake. They would hang in their thousands on store fronts and be crunched underfoot. There were so many that the piles of dead bodies would start to smell. This was an annual event which had the effect of recycling aquatic nutrients back to land. Then in the 1970s the phenomenon died back dramatically and disappeared altogether in some places because the nymphs were killed off by water pollution. However, with pollution abatement and water quality protocols, their numbers have gradually increased since the 1990s and now they are back to their original strength in many areas (much to the horror of people who can't stand bugs) (See: <https://entomologytoday.org/2015/06/01/how-to-survive-a-massive-mayfly-swarm/>).

What about the more gradual changes in both species numbers and richness? Butterflies are among the best documented and there is strong evidence of decline in many parts of the world due to habitat degradation and fragmentation (Google "butterfly decline"). (See also <http://www.hngn.com/articles/190501/20160318/researchers-found-steady-decline-of-butterflies-even-in-conservation-areas.htm>)

Even smaller insects are declining in abundance. My colleague Adrian Plant from the National Museum of Wales, Cardiff sent these reports:

Crashes in insect numbers seem to be very general. Two years back, a group of Dipterists [specialists in flies] were in North Wales for a week on our annual field trip. At the end of a week, we all concluded that species diversity was at least 20% less than would have been

expected in the past. This sort of anecdotal observation is commonplace amongst people studying most groups of invertebrates in the UK. The crash continues still. This year seems to be poorer still; I am finding very little at all; last week the Dipterists Forum in Kent found well below expectations; local moth trappers are recording a poor year in Wales etc. etc. It's not a happy story I'm afraid. Yesterday I walked along a path through abundant flowering thistles and other nectar-bearing flowers that 'ought' to have been smothered in butterflies... they weren't of course. Personally I think we are seeing a highly accelerated mass extinction even over the last 10 years or so in the UK. No idea if this is happening elsewhere though.

Mostly you have to rely on your experiences and the general "feel" of things. And the decline maybe is something only you sense because you have taken the time to observe.

The ecologist Aldo Leopold, who among other things rewilded a degraded farm in Wisconsin (not unlike the rewilding at Newport Forest), said in his well-known book *A Sand County Almanac*:

One of the penalties of an ecological education is that one lives alone in a world of wounds. Much of the damage inflicted on land is quite invisible to laymen. An ecologist must either harden his shell and make believe that the consequences of science are none of his business, or he must be the doctor who sees the marks of death in a community that believes itself well and does not want to be told otherwise.

The importance of insects in the global ecosystems cannot be overstated, as ecological collapse starts from the bottom up. One can't ignore it.

IMAGES:



I spotted this Spiny Softshell Turtle basking peacefully in the sun by the riverbank. As soon as I moved forward, it stretched out its neck a good 10 cm and launched itself into the water with a big splash. Note the characteristic pointed nose and smooth carapace with no obvious scutes



Two Japanese Beetles munch away on the leaf of a Sassafras tree. This one happens to be Jane Bowles' memorial tree, so we really should try to protect it. One of our readers assures us that there is no easy control method and the beetles will remain endemic, even as the tree lives on.

(All we have to do is wait as the Japanese Beetles decline, as well.)

Reappearing Species:

Marbled Orb Weaver (*Araneus marmoreus*); Japanese Beetle (); Cabbage White (*Pieris rapae*); Eastern Comma (*Polygonia comma*); Eastern Tailed Blue (*Cupido comyntas*); Monarch (*Danaus plexippus*); Northern Crescent (*Phyciodes cocyta*); Honey Bee (*Apis mellifera*).

Holdovers: white micro-moth; cryptic wasp.