

# THE BUTTERFLIES & DRAGONFLIES OF KNOLL GARDENS 2018

## INTRODUCTION

Changes to the layout of the Gardens are still ongoing and so the modified map used for 2017 was used again this year. The route established in previous years for monitoring remained the same, along with the formats for recording and reporting for ease and reliability of comparison. As in previous years, all results have been entered onto the 'Living Record' database.

## TABLES & RECORD SHEETS

### TABLES

Table 1. is a list of the possible butterfly, damselfly and dragonfly species that could appear within the Gardens, along with their abbreviations used on the record sheets. It shows those species that have appeared within the Gardens over the seasons. (28 species of Butterfly & 20 of Odonata.)

They are highlighted in shades of red, amber and green.

- Red = Seen for the 1<sup>st</sup> time or the return of an infrequent visitor.
- Amber = Seen in previous years and 2018
- Green = Seen in previous years but not 2018

Tables 2., 3. and 4. compare the performances of the species, showing those that made an improvement and those that have fared less well for: butterflies, damselflies and dragonflies respectively.

### RECORD SHEETS

The modified map of the Gardens was once again used to record the weekly sightings of the butterflies and odonata, with their abbreviations positioned where they were seen, with butterflies in black and odonata in red. (Annex (iv) 1 - 18).

Charts were produced from these figures, showing the number of species and their abundance for each week of the season.

These weekly count results were entered on to a spreadsheet, showing the flight period and abundance for each species throughout the season.

Annex (i) - butterflies

Annex (ia) - a spreadsheet of the average count for each of the butterfly species for each week of the count period

Annex (ii) - odonata week by week

Annex (iii) - showing which dragonflies favour the various ponds and areas of the Gardens.

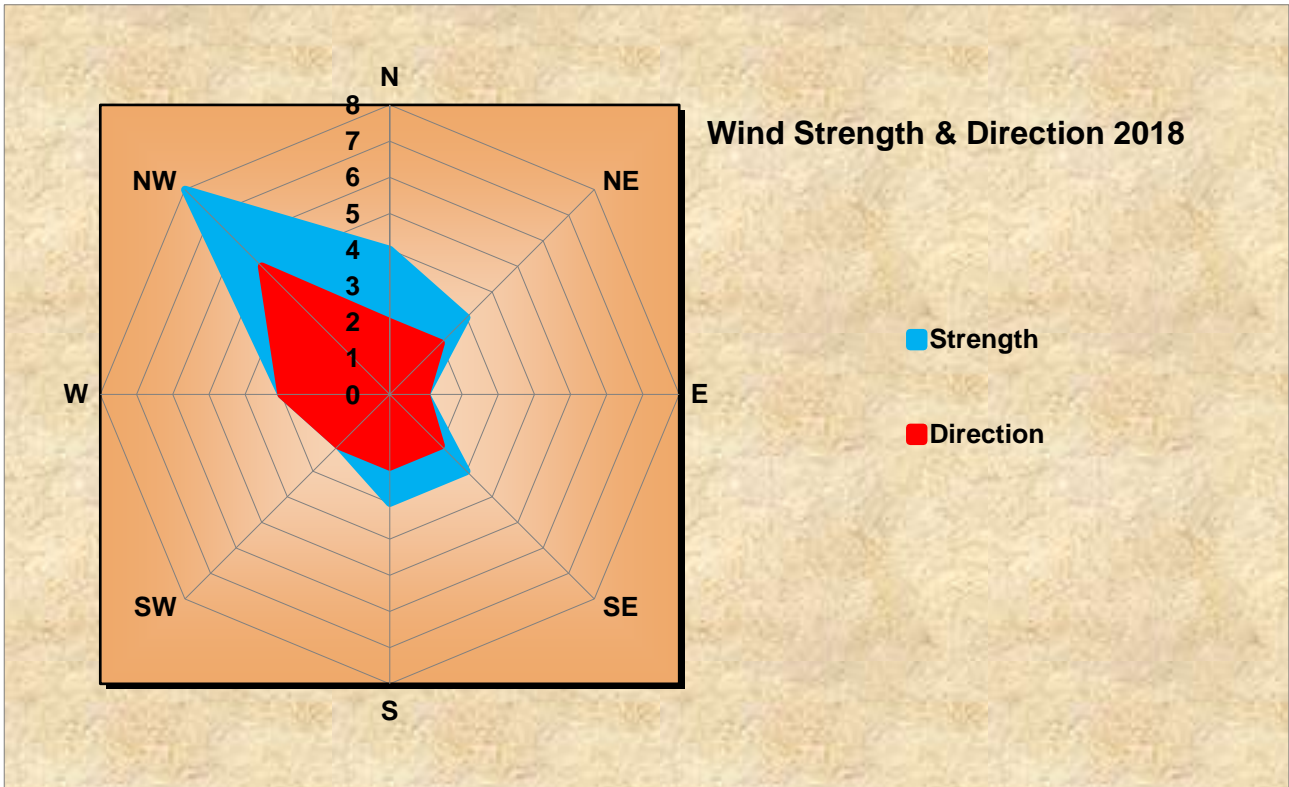
As before the figures for missed weeks were estimated by taking the mean of the counts before and after the missed weeks and entering these in red.

**TABLE 1.**

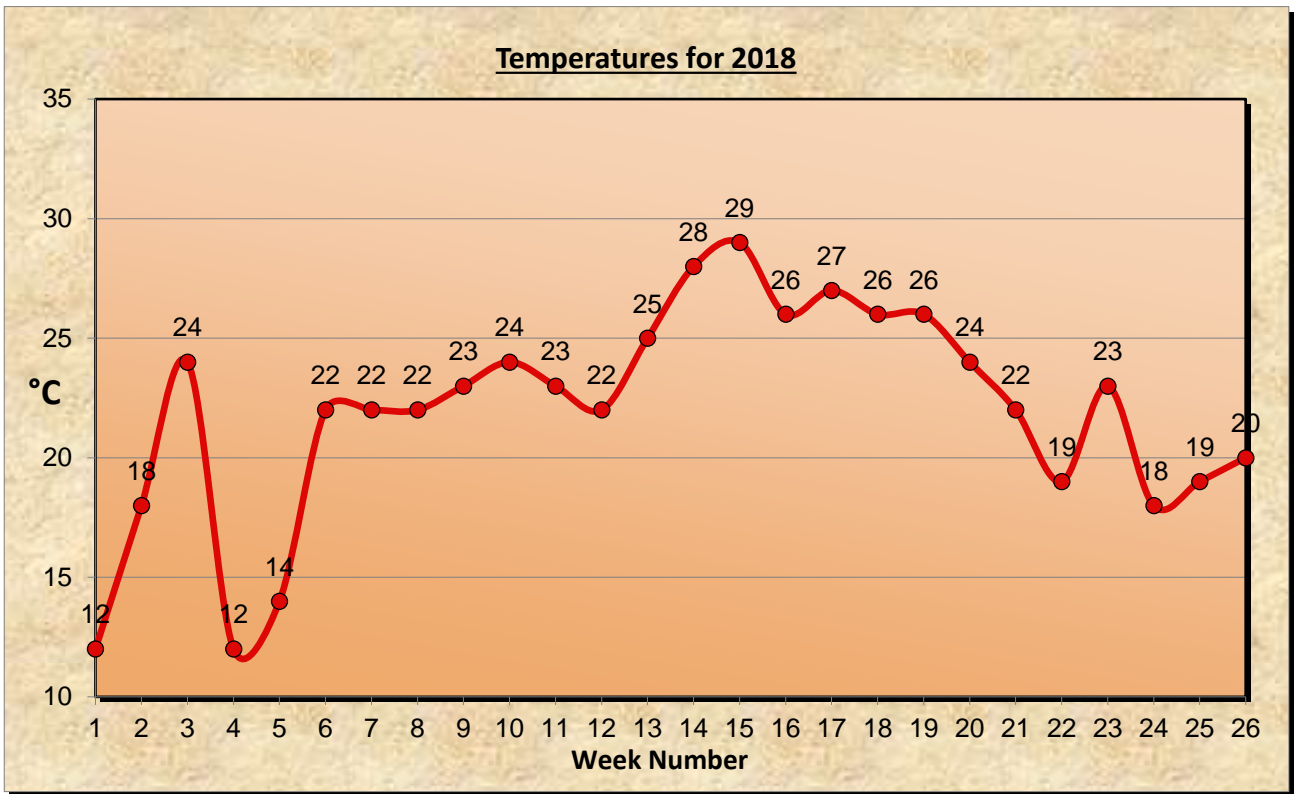
BUTTERFLIES		CODE	DRAGONFLIES		CODE
Brimstone	<i>Gonopteryx rhamni</i>	B	Southern Hawker	<i>Aeschna cyanea</i>	A. cya
Brown Argus	<i>Arcia agestis</i>	BA	Brown Hawker	<i>Aeschna grandis</i>	A. gra
Clouded Yellow	<i>Colias crocea</i>	CY	Common Hawker	<i>Aeschna juncea</i>	A. jun
Comma	<i>Polygonia c-album</i>	CM	Migrant Hawker	<i>Aeschna mixta</i>	A. mix
Common Blue	<i>Polyommatus icarus</i>	CB	Emperor	<i>Anax imperator</i>	A. imp
Dark Green Fritillary	<i>Mesoacidalia aglaja</i>	DF	Hairy Dragonfly	<i>Brachytron pratense</i>	B. pra
Gatekeeper	<i>Pyronia tithonus</i>	GK	Downy Emerald	<i>Cordulia aenea</i>	C. aen
Grayling	<i>Hypparchia semele</i>	GY	Golden-ringed Dragonfly	<i>Cordulegaster boltonii</i>	C. bol
Green Hairstreak	<i>Callophrys rubi</i>	GH	Broad-bodied Chaser	<i>Libellula depressa</i>	L. dep
Green-veined White	<i>Pieris napi</i>	GV	Scarce Chaser	<i>Libellula fulva</i>	L. ful
Holly Blue	<i>Celastina argiolus</i>	HB	Four-spotted Chaser	<i>Libellula quadrimaculata</i>	L. qua
Large Skipper	<i>Ochlodes venatus</i>	LS	Black-tailed Skimmer	<i>Orthetrum cancellatum</i>	O. can
Large White	<i>Pieris brassicae</i>	LW	Keeled Skimmer	<i>Orthetrum coerulescens</i>	O. coe
Marbled White	<i>Melanargia galathea</i>	M	Black Darter	<i>Sympetrum danae</i>	S. dan
Meadow Brown	<i>Maniola jurtina</i>	MB	Ruddy Darter	<i>Sympetrum sanguineum</i>	S. san
Orange Tip	<i>Anthocharis cardamines</i>	OT	Common Darter	<i>Sympetrum striolatum</i>	S. str
Painted Lady	<i>Vanessa cardui</i>	PL			
Peacock	<i>Anachis io</i>	PK			
Purple Hairstreak	<i>Quercusia quercus</i>	PH	<b>DAMSELFLIES</b>		
Red Admiral	<i>Vanessa atalanta</i>	RA	Banded Demoiselle	<i>Calopteryx splendens</i>	C. vir
Ringlet	<i>Aphantopus hyperantus</i>	RT	Beautiful Demoiselle	<i>Calopteryx virgo</i>	C. spl
Silver-washed Fritillary	<i>Argynnis paphia</i>	SF	Azure Damselfly	<i>Coenagrion puella</i>	C. pue
Small Copper	<i>Lycaena phlaeas</i>	SC	Common Blue Damselfly	<i>Enallagma cyathigerum</i>	E. cya
Small Heath	<i>Coenymphula pamphilus</i>	SH	Common Bluetail	<i>Ishnura elegans</i>	I. ele
Small Skipper	<i>Thymelicus sylvestris</i>	SS	Emerald Damselfly	<i>Lestes sponsa</i>	L. spo
Small Tortoiseshell	<i>Aglais urticae</i>	ST	Large-Red Damselfly	<i>Pyrrhosoma nymphula</i>	P. nym
Small White	<i>Pieris rapae</i>	SW			
Speckled Wood	<i>Parage aegeria</i>	SP			
White Admiral	<i>Limenitis camilla</i>	WA			

- = Butterfly / Dragonfly species seen for the first time or return of an uncommon species.
- = Butterfly / Dragonfly species seen previously and in 2018.
- = Butterfly / Dragonfly species seen previously but not in 2018.
- = Butterfly / Dragonfly species never seen at all in the Gardens

## WEATHER CONDITIONS

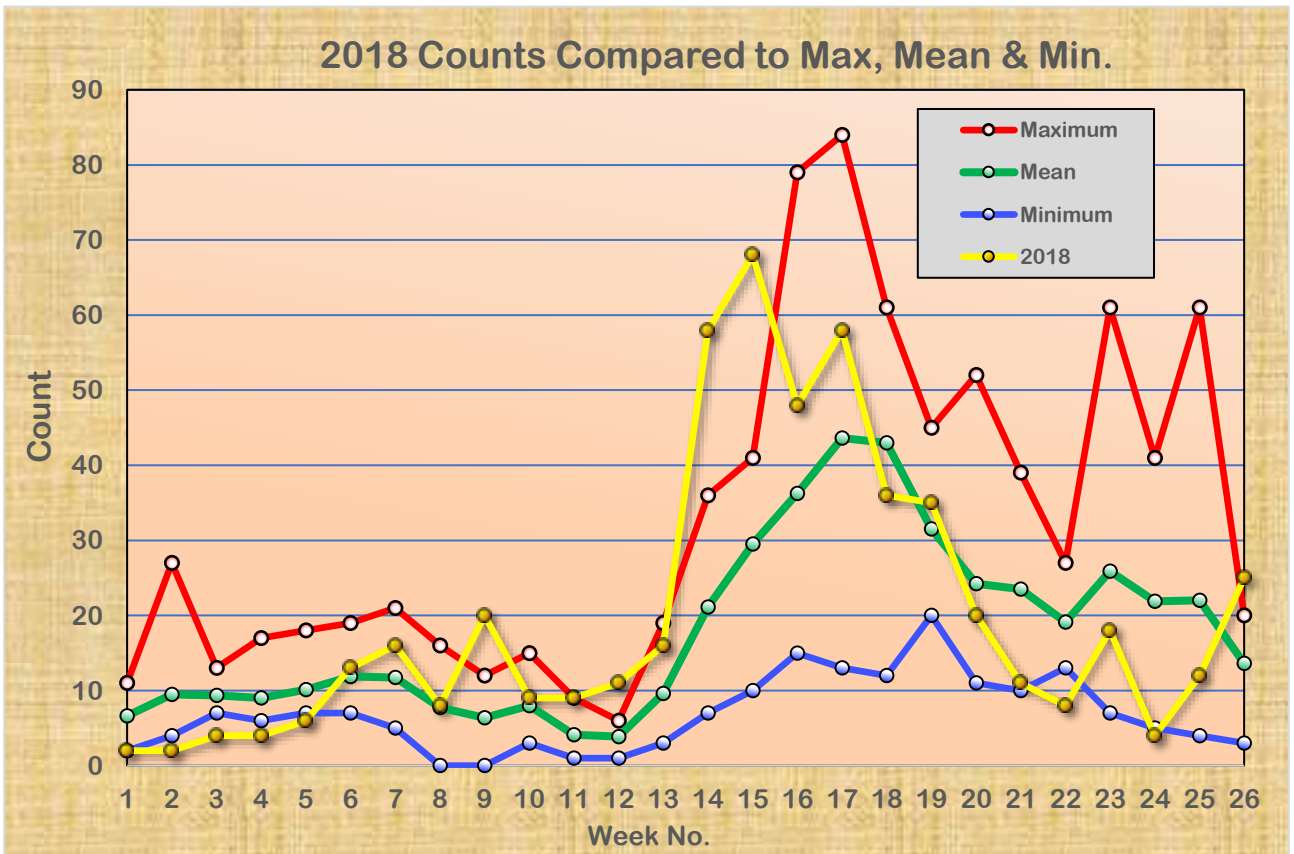


The wind chart shows that the prevailing winds during 2018 came mainly from the West and North. This discouraged migrants from the continent until the last few weeks when the winds became more southerly.



The start of Spring was cool, with a short-lived hot spell. After having reverted to a couple of weeks of cold weather, things suddenly picked up and we were treated to a long period of warm sunny weeks. By early August, temperatures began to steadily decrease, with a couple of warm weeks (23 & 26).

## BUTTERFLIES



The above chart compares butterfly numbers for 2018, to the maximum, minimum and average for each week since 2010.

The early portion of the plot for 2018 shows that the cold weather kept numbers below the previous minima and many species were late to emerge. As there were very few species about, few were able to take advantage of the short warm spell early on.

As summer approached the temperatures soared and new maxima were established during several weeks. The temperatures plummeted again, and then several new minima were reached.

Many species were able to take advantage of the prolonged warm spell and produced their highest counts. These included; Green-veined White, the most numerous butterfly, again, with a count of 86; Orange Tip (13); Purple Hairstreak (7), with 2 being seen at ground level on the 'Butterfly Walk'; Small Copper (6) with an explosive 3<sup>rd</sup> brood in the last 2 weeks; and Common Blue (9) equalling the previous max in 2010.

The second most common butterfly was the Speckled Wood, with a count of 67. This was down on last year's count of 87 but up on the running average. Third place went to the Brimstone (56), which was up on both last year and the average.

But the stars of the show were Brown Argus with an astounding second brood of 30 and Silver-washed Fritillary (13). Last year a female was seen around a patch of Violas, their caterpillar foodplant. She obviously found a mate, as her offspring were all around the Gardens this year – even appearing on the 'Butterfly Walk'. This may well mean that these large, attractive butterflies will become a regular feature in the Gardens.

There were disappointing results from Small Skippers. Skippers prefer it when the winters are cold but dry as they over-winter as crysalids. Wet conditions during their hibernating tend to kill them off. Having said that, the Large Skipper seemed to have bucked the trend.

The prevailing north/north-westerly winds held back the migratory species and very few Nymphalids were seen. No Painted Lady nor Clouded Yellow were found and it was not until the winds changed to southerly in the last couple of weeks that Red Admirals were seen and then only a few.

**TABLE 2.**

**BUTTERFLY SPECIES PERFORMANCE**

	2018		2017			2018		2017	
	Brood		Brood			Brood		Brood	
<b>Species up on 2017</b>	1st	2nd	1st	2nd	<b>Species down on 2017</b>	1st	2nd	1st	2nd
Brimstone	15	41	15	34	Small Skipper	0		1	
Small White	0	6	1	2	Large White	0	30	2	36
Green-veined White	20	66	10	36	Red Admiral	0	9	3	70
Orange Tip	13		9		Painted Lady	0	0	2	1
Purple Hairstreak	7		6		Comma	3	15	5	50
Small Copper	0	6	1	1	Speckled Wood	7	60	16	71
Brown Argus	0	30	0	1	Gatekeeper	15		19	
Common Blue	0	9	0	0	Meadow Brown	57		61	
Holly Blue	12	27	14	6					

White Admiral	1		0		<b>No Change</b>				
Small Tortoiseshell	4	0	0	1	Large Skipper	14		14	
Peacock	7	26	5	26	Clouded Yellow	0	0	0	0
Silver-washed Frit.	13		6		Green Hairstreak	0		0	
Marbled White	1	0	0	0	Small Heath	0	0	0	0
Ringlet	5		4						

Table 2. shows that many species benefitted from the warm summer and improved upon their 2017 counts.

The prolonged hot spell dried up many of the grasses that are the food-plants for the 'browns'. As a result, Gatekeeper and Meadow Brown numbers were down. However, they were only slightly lower than 2017, probably because the Gardens were watered and the grasses there, still green, which attracted outsiders.

The warm weeks, early in the year, brought numbers up for several species and the second broods for a number of species also fared well.

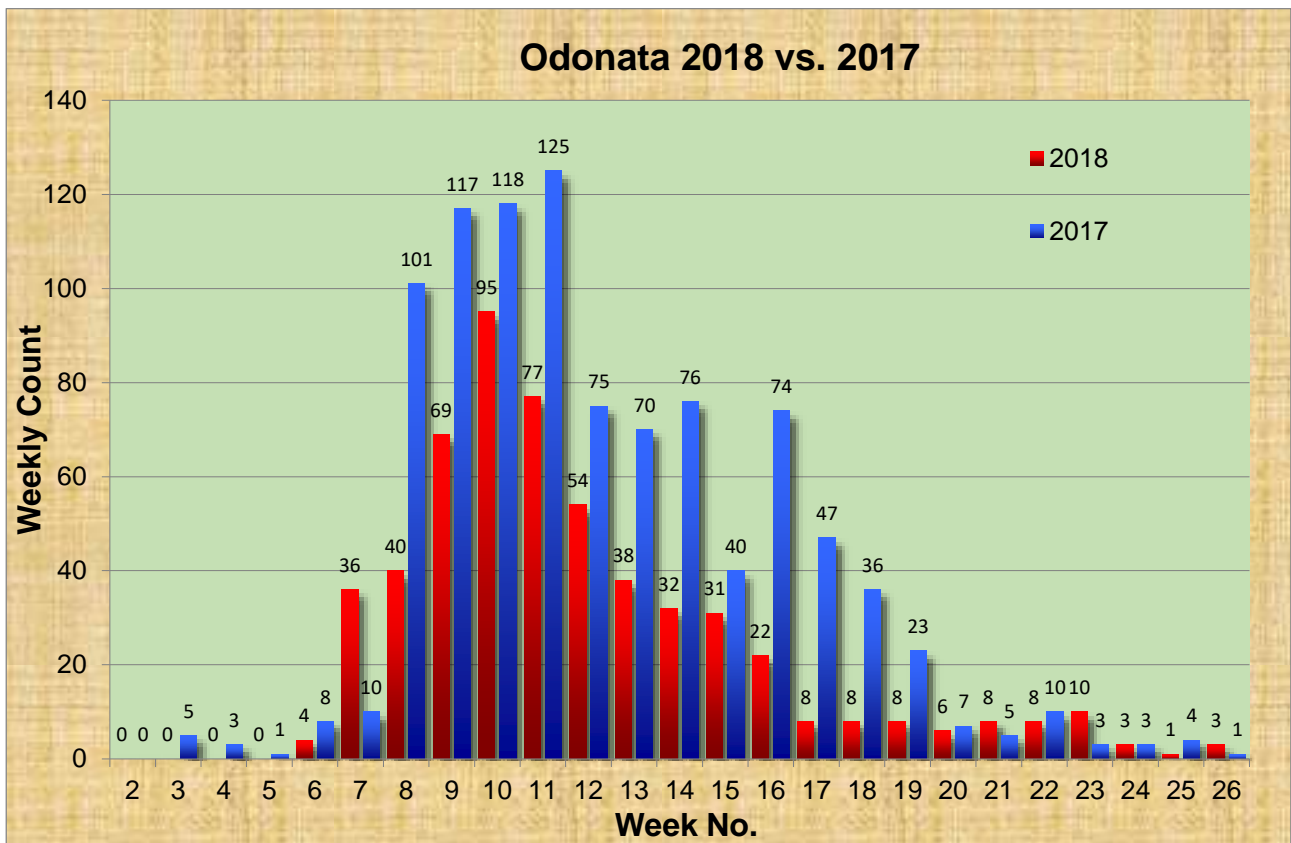
Two new species were added to the Knoll Gardens' Butterfly List this year.

The first was a Marbled White, seen speeding across the lawn before disappearing into the trees. They are grass-loving species and it is surprising that they have not appeared in the Gardens before now.

The second was a White Admiral. A smart black & white powerful flying butterfly, which inhabits the open rides in Oak woodlands. Again, it is surprising that this species has also taken its time appearing at Knoll.

The addition of these 2 brings the butterfly species count up to 28.

## ODONATA



The cold start to spring delayed the emergence of the first damselflies until week 6 – 3 weeks later than in 2017. The short hot spell in early spring boosted damselfly numbers briefly and encouraged a few early dragonflies to emerge. This was followed by a brief return to cool days and then a long spell of hot, dry weather, which eventually deteriorated into cooler, wetter conditions once again. The chart shows the response to these changes – with counts being higher than for 2017, in the early part of the season, then dropping below after that.

Unlike butterflies, the life-cycle for odonata can vary from 1 to 5 years, in the case of some of the larger species. Consequently, comparisons from year to year are not appropriate. However, it is perplexing that, despite the really warm summer, both damselfly and dragonfly numbers were down on last year for most of the season.

There are many reasons why this may have occurred; drop in oxygen levels through water becoming too warm; an increase in floating vegetation e.g. water-lilies, duckweed etc., reducing the amount of sunlight, preventing oxygenating plants from performing efficiently; reduction in habitat due to expansion of vegetation; or even pollution.

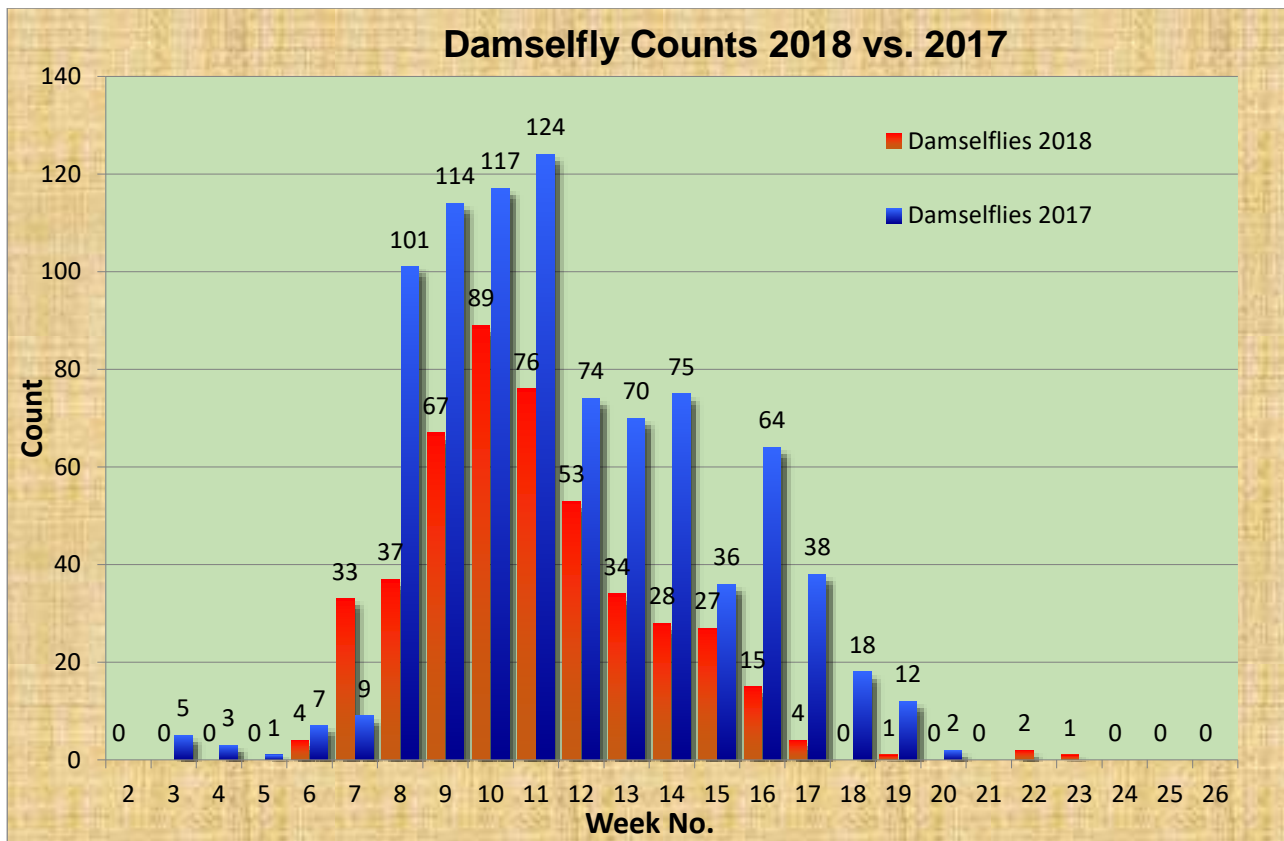
A total of 18 species were recorded in the Gardens this year, 3 more than last year, despite the non-appearance of both Hairy Hawker (*Brachytron praetense*) and Downy Emerald (*Cordulia aenea*).

Returning species included Four-spotted Chaser (*Libellula quadrimaculata*) and Black-tailed Skimmer (*Orthetrum cancellatum*).

Not to be outdone by the butterflies, 2 new species of dragonfly were also recorded.

Keeled Skimmer (*Orthetrum coerulescens*) and Black Darter (*Sympetrum danae*) were added to the list, bringing the total number of species to 20.

**DAMSELFLIES**



As usual, the first to emerge was the Large Red Damselfly, but 3 weeks later than in 2017. Their counts soon soared as the cool weather gave way to a long spell of high temperatures. They were soon followed by Azure Damselflies. Their numbers were well down at most of the ponds, apart from Dragon Pond, which was only 2 below the 2017 figure. The most dramatic drop was on Mill Pond - down from 110 to just 18. This species can extend its life-cycle to 2 years if the larvae are unable to develop for some reason. The expansion of the emergent vegetation, reducing the effective size of the pond and the covering of Duckweed may have contributed to their drop in numbers.

Blue-tailed Damselfly numbers remained steady at 14 compared to last year's 13.

Banded & Beautiful Demoiselles both appeared again this year with 3 of each, compared to 8 & 1, respectively in 2017.

**TABLE 3.**

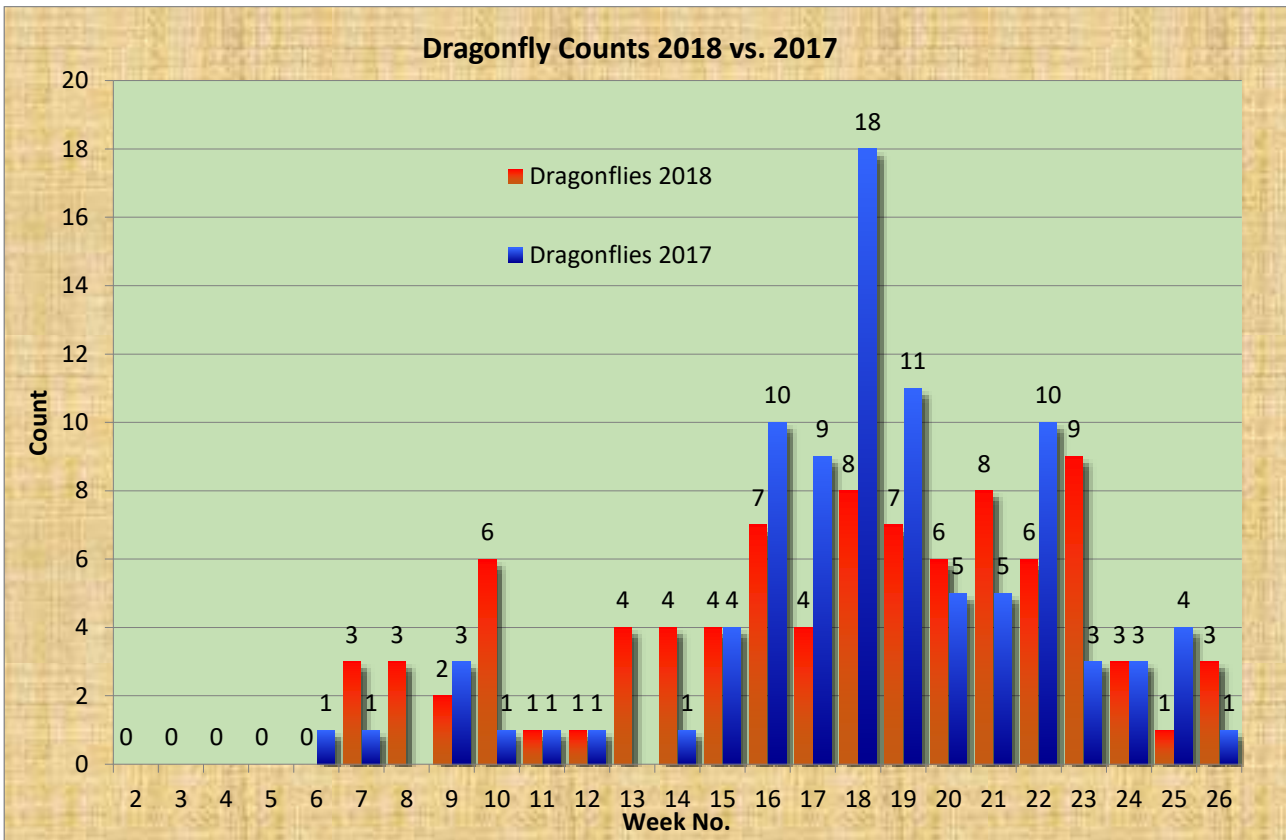
**DAMSELFLY PERFORMANCE**

	Species up on 2017				Species down on 2017			
	2018		2017		2018		2017	
	Count	Weeks	Count	Weeks	Count	Weeks	Count	Weeks
Banded Demoiselle					3	2	8	5
Beautiful Demoiselle	3	2	1	1				



Azure Damselfly					310	11	730	14
Blue-tailed Damselfly	14	9	13	7				
Large Red Damselfly	141	8	118	13				

## DRAGONFLIES



No Hairy Hawkers made an appearance this year, nor were there any Downy Emeralds – for the second year running. The early species that did show in week 7, a week later than in 2017 were all 3 of the Chasers. One each of Broad-bodied, Scarce and Four-spotted Chasers were seen in the Dragon Pond area. Next to join them the following week, was the return of a female Black-tailed Skimmer, also near Dragon Pond.

The warm spell kept numbers above those of last year but as the weather deteriorated, the numbers dropped and never really recovered until the final week

The most numerous was the Common Darter with a count of 34 – 4 up on last year. Second was the Southern Hawker at 20 – 1 less that in 2017. Next was the Brown Hawker with a respectable 13 – a small increase above the 10 of the previous year.

Scarce Chasers appeared as singles 4 weeks out of 5 from the middle of May to the middle of June. During a ‘Bumblebee Count’ in week 15, a male Keeled Skimmer (*Orthetrum coerulescens*) was spotted, perched in the vegetation by Dragon Pond. A ‘first’ for the Gardens.

Another ‘first’ was seen in the last week of the season, with a Black Darter (*Sympetrum danae*) patrolling the south-west corner.

These were the 19<sup>th</sup> & 20<sup>th</sup> species respectively, for the Gardens' Dragonfly List.

**Table 4.**

**DRAGONFLY PERFORMANCE**

	Species up on 2017				Species down on 2017			
	2018		2017		2018		2017	
	Count	Weeks	Count	Weeks	Count	Weeks	Count	Weeks
Southern Hawker					20	10	21	9
Brown Hawker	13	9	10	5				
Migrant Hawker					1	1	6	4
Hairy Hawker					0	0	1	1
Emperor Dragonfly	2	2	1	1				
Golden-ringed Dragonfly					1	1	5	4
Broad-bodied Chaser	5	4	4	4				
Scarce Chaser	4	4	2	2				
Four-spotted Chaser	4	3	0	0				
Black-tailed Skimmer	1	1	0	0				
Keeled Skimmer	1	1	0	0				
Black Darter	1	1	0	0				
Ruddy Darter					2	2	12	5
Common Darter	34	9	30	11				
<b>No Change</b>								
Downy Emerald	0	0	0	0				