

**Watchtree Nature Reserve
Odonata Monitoring 2006**



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1. INTRODUCTION

2006 was the fourth year in which full odonata surveys took place at Watchtree. There were no major operational works affecting any of the wetland areas in 2006. Some remaining small quantities of erosion matting were removed during winter 2005/2006. Construction work to create an observation platform was carried out on the western edge of the ponds in the woodlands (Watchtree map area 8a). Habitat management work which was likely to affect odonata was the removal of significant amounts of scrub and trees from the southern edge of the ponds and the central spit of land between the two ponds in the woodlands (Watchtree map area 8a). Some scrub removal had already occurred in 2005 but only in limited amounts. The removal of scrub and trees was designed to open up the pond area, allowing more light to reach the waterbodies.

2. METHODS

Odonata surveys were carried out monthly from May to September. Along with these specific surveys, additional casual records were kept while carrying out other monitoring work. These incidental records were mainly used to give an indication of any migratory or visiting species that would probably not have been recorded during the monthly odonata surveys.

Surveys concentrated on the water bodies, wetland areas and their surrounds. The areas surveyed were the mature ponds in Watchtree Map area 8a, the open ditch located in Watchtree Map area 9a, the lake (Watchtree Map area 6) and associated outflow ditch, the reedbed system, constructed wetland/lagoon and the "southern lagoon" (Watchtree Map area 7a). It was generally not feasible to count individuals (particularly of damselflies) during surveys; rather an index of abundance was created.

The margin of each wetland area was walked slowly and data collected on the numbers of each species and their behaviour. The most important behaviour to note during odonata surveys was whether there was evidence of breeding or possible breeding attempts (territorial behaviour was included in this). The presence of mating pairs and ovipositing females was therefore recorded. For larger species such as darter and hawk species and attempt was made to count total numbers present over the waterbodies and within a one metre margin of the waterbody. The males of species such as darters and hawkers will come to waterbodies and hold territories, patrolling for newly emerged females. Males will usually stay close to the water's edge when territorial, which makes it possible, while walking around the water margin, to get a relatively accurate count of these males.

The abundance of each species was estimated in each of the target survey areas and recorded in one of four categories below.

1. Abundant (over 50 individuals)
2. Common (between 20 and 50)
3. Scarce (between 5 and 19)
4. Rare (between 1 and 4)

Behaviour categories recorded were;

1. Breeding (ovipositing and mating)
2. Territorial behaviour (seen exhibiting territorial behaviour but not seen ovipositing or mating)
3. Present (no evidence of breeding i.e. present but only seen hunting, resting)

3. RESULTS

Tables 1 (a-g) show the results of the monthly odonata surveys in the target areas at Watchtree Nature Reserve. A total of 11 species were recorded at Watchtree during 2006. Two species (Migrant Hawker, *Aeshna mixta* and Southern Hawker, *Aeshna cyanea*) which had been recorded previously in 2004 were not recorded in 2006. Two new odonata species were added to the Watchtree species list in 2006; Emperor Dragonfly (*Anax imperator*) and Ruddy Darter (*Sympetrum sanguineum*). Emperor Dragonflies were recorded at the ponds in Watchtree map area 8a (single territorial male on 1/07/2006 and 5/07/2006) and at the constructed wetlands on several occasions in late July (casual records of at least two males present). One territorial male Ruddy Darter was recorded at the ponds in Watchtree map area 8a on 3/08/2006. A probable female Ruddy Darter was also seen on the same day but a definite identification was not possible.

Table 1(a) Mature ponds in Watchtree map area 8a.

As in previous years the mature ponds in Watchtree map area 8a held a wide range of species of breeding odonata, often in very high numbers. The only species of odonata which regularly breeds at Watchtree which is not found at this location is the Black Darter. Larger numbers of Common Darter, Four-spotted Chaser, Common Hawker, Common Blue Damselfly and Emerald Damselfly were recorded in 2006 compared to previous years. Not only were numbers higher than in previous years but odonata used the ponds for longer into the season than in previous years. This is probably a combination of the exceptional weather in the summer and autumn extending the flight period, and, more significantly, the clearance of scrub and trees allowing more sunlight to reach the ponds later in the year.

Both of the species new to Watchtree, (Emperor Dragonfly and Ruddy Darter), were recorded at this location.

Table 1(b) Open drain in Watchtree map area 9.

The open drain area in Watchtree map area 9 is a short open drain flowing from the fields to the north into a small area of shaded standing water at the edge of the mature woodland (Watchtree map area 8b). Large Red, Azure, Common Blue and Four-spotted Chasers were observed ovipositing here. Although Common Darter and Common Hawker were also recorded in the vicinity of the drain there were no observations of breeding behaviour. Due to the long hot, dry period during the summer, this location dried up rapidly and only the early flight-period species such as Large Red and Azure Damselfly were observed either ovipositing or "in-cop" at this location. One territorial Four-spotted Chaser was observed but no obvious breeding behaviour was recorded. Later in the season Common Darter were recorded but as there was no suitable breeding site due to lack of water, these individuals would have been foraging individuals.

Table 1(c) Reedbed system in Watchtree map area 7a.

Emerald, Large Red, Azure and Blue-tailed Damselflies were recorded at this location along with both Common and Black Darter. Azure Damselflies were recorded at the reedbeds for the first time although on only one occasion and with no evidence of breeding. Although Four-spotted Chasers and Common Hawkers were also recorded at the reedbeds there was no evidence of breeding attempts or territoriality in these species. No odonata were observed breeding at the reedbeds, probably due to a lack of standing water for most of the breeding season.

Table 1(d) Constructed wetland/lagoons in Watchtree map area 7a.

Five species of damselfly – Emerald, Large Red, Azure, Common Blue and Blue-tailed were recorded at the constructed wetlands to the south of the reedbed system (Watchtree map area 7a). Both Azure and Emerald damselfly were recorded here for the first time in 2006 although neither species was recorded breeding. Common and Black Darters were also recorded, with Common Darter present in good numbers. Common Darters were regularly seen ovipositing but Black Darters were not. Numbers of breeding/territorial Four-spotted Chasers were recorded in higher numbers than in previous years and territorial Common Hawker was recorded for the first time.

Table 1(e) The southern lagoon in Watchtree map area 7a.

This location held good numbers of Common Blue Damselflies and Common Darter. Blue-tailed Damselflies and Black Darter were also present in smaller numbers. Large Red and Azure Damselflies were recorded here for the first time although not observed breeding. In 2005 no Common Blue Damselflies were seen ovipositing due to the lack of emergent vegetation caused by smothering from significant algal growth. In 2006 this species was once again recorded breeding although in relatively small numbers. The only other damselfly species recorded here was Emerald Damselfly which was less abundant than in 2005. Of the larger species of odonata, Four-spotted Chasers were recorded breeding for the first time in 2006 and one territorial Common Hawker was recorded.

Table 1(f) The lake (Watchtree map area 6).

Emerald, Common Blue and Blue-tailed Damselflies were recorded breeding here, along with Common and Black Darter and Common Hawker. Azure Damselflies were recorded here for the first time in 2006 although only in small numbers and not recorded breeding. Large Red Damselflies were not recorded on the lake although they were present close by around the outflow ditch. Four-Spotted Chasers were also recorded here with several males holding territory. Ovipositing females were also recorded. Common Hawkers were recorded ovipositing in August and September.

Table 1(g) Outflow ditch from the lake (Watchtree map area 6)

This location held all species of odonata which are regularly recorded breeding at Watchtree and therefore the most diverse site for odonata at Watchtree. Azure Damselfly was the most abundant species, as in previous years. The only species which was recorded present but not observed breeding was Common Hawker.

4. DISCUSSION

The most noticeable result of the 2006 odonata monitoring was the increase in the number of locations at which Azure, Large Red and Emerald Damselflies were recorded. Azure Damselfly was recorded in four new locations (reedbeds, constructed wetland/lagoons, southern lagoon and the lake). This species was only recorded at these new locations in small numbers and not recorded breeding. Large Red Damselfly was recorded for the first time in the southern lagoon although in small numbers and not recorded breeding. Emerald Damselfly was recorded in the constructed wetland/lagoons for the first time.

The spread of the species mentioned above is probably due to an improvement in the wetland habitats with an increase in the amount of waterside vegetation providing sheltered conditions which these species, particularly Azure Damselflies prefer. An increase in the availability of emergent and floating vegetation will also play a part in the spread of species to new locations, providing suitable ovipositing sites. Although none of the species was recorded breeding it is hoped that this increase in locations at which these species were recorded is the first stage in their successful colonisation of these wetland areas.

As in previous years, the reedbeds proved to be relatively unattractive to odonata. Changes in water levels and long periods where most of the reedbed system held little or no available surface water meant that they were not suitable as breeding locations. Although this may not be a suitable breeding site for odonata, it provides a good feeding site and sheltered overnight roosting site for odonata using the other wetland sites close by.

The most significant habitat management work to benefit odonata was the removal of significant amounts of scrub and trees from the southern edge of the ponds and the central spit of land between the two ponds in the woodlands (Watchtree map area 8a). Numbers of odonata, particularly Common Darter, had decreased between 2003 and 2004 due to the scrub and trees shading out of the waterbody. A slight improvement in odonata fauna occurred in 2005 when the first stage of scrub removal occurred. The result of the more widespread scrub removal in late 2005/early 2006 resulted in a large increase in both numbers of odonata and length of their flight/breeding season. Larger species, in particular Four-spotted Chaser also benefited with a large increase in numbers present. A minimum count of 14 Four-spotted Chasers was made in July. Previous years' counts were in low single figures (maximum of 2 on any single visit). Common Hawker was also seen regularly and a minimum of 3 territories were recorded. No Common Hawkers were recorded in 2005, one exuvia found in 2004 and only recorded once in 2003.

A significant number of records of continental odonata species in the UK and the northerly expansion in range of several native species in 2006 were the result of the exceptionally warm summer this year. The records of Ruddy Darter and Emperor Dragonfly follow this pattern of increase in range. The Emperor Dragonfly record was of a single male with no female/s seen. The discovery of a territorial male Ruddy Darter and a probable female means that there is potential for colonisation of Watchtree by this species. Ruddy Darters breed on the Solway Plain with several populations relatively close to Watchtree therefore colonisation is entirely possible.

The 2006 monitoring of odonata at Watchtree has shown a very encouraging pattern of increase in the distribution and numbers of odonata at Watchtree. It has been encouraging to see effects that a small amount of positive, targeted habitat management can have within a year of being carried out. The natural development of the waterbodies, particularly the lake and the constructed wetlands has also been seen to have a benefit to the developing odonata population. As a final word of caution it has to be stressed that one of the major threats to the odonata fauna at Watchtree is the potential for severe algal blanket growth to develop, smothering and killing-off both emergent and submerged vegetation and reducing dissolved oxygen concentrations. Effective and proactive control of algal blanket growth in the wetlands is strongly recommended, not only for the health of the odonata population but to ensure the future health and development of the waterbodies and their entire fauna.

TABLES 1(a) – 1(g)

Key

B - Breeding (ovipositing and mating)

T - Territorial behaviour

✓ - Present (no evidence of breeding)

A - Abundant (over 50 individuals)

C - Common (between 20 and 50)

S - Scarce (between 5 and 19)

R - Rare (between 1 and 4)

Table 1(a). The relative abundance and behaviour of odonata species around the **mature ponds in Watchtree map area 8a.**

Species	Survey month									
	May		June		July		August		September	
Emerald Damselfly <i>Lestes sponsa</i>			B	C	B	A	B	A	B	S
Large Red Damselfly <i>Pyrrhosoma nymphula</i>	B	A	B	A	✓	R				
Azure Damselfly <i>Coenagrion puella</i>	B	A	B	A	B	A				
Common Blue Damselfly <i>Coenagrion cyathigerum</i>	B	S	B	A	B	A	B	C	B	S
Blue-tailed Damselfly <i>Ischnura elegans</i>	B	S	B	C	B	A	B	S	B	R
Common Hawker <i>Aeshna juncea</i>					T	R	T	R	T	R
Emperor Dragonfly <i>Anax imperator</i>					T	R				
Four-spotted Chaser <i>Libellula quadramaculata</i>	T	S	B	S	B	S	B	S		
Common Darter <i>Sympetrum striolatum</i>					B	C	B	C	B	S
Ruddy Darter <i>Sympetrum sanguineum</i>							T	R		
Black Darter <i>Sympetrum danae</i>										

Table 1(b). The relative abundance and behaviour of odonata species around the **open drain in Watchtree map area 9.**

Species	Survey month									
	May		June		July		August		September	
Emerald Damselfly <i>Lestes sponsa</i>										
Large Red Damselfly <i>Pyrrhosoma nymphula</i>	B	S	B	R						
Azure Damselfly <i>Coenagrion puella</i>	B	S	B	R						
Common Blue Damselfly <i>Coenagrion cyathigerum</i>			✓	S						
Blue-tailed Damselfly <i>Ischnura elegans</i>			✓	S						
Common Hawker <i>Aeshna juncea</i>										
Emperor Dragonfly <i>Anax imperator</i>										
Four-spotted Chaser <i>Libellula quadramaculata</i>	T	R	✓	R						
Common Darter <i>Sympetrum striolatum</i>					✓	R	✓	R	✓	R
Ruddy Darter <i>Sympetrum sanguineum</i>										
Black Darter <i>Sympetrum danae</i>										

Table 1(c). The relative abundance and behaviour of odonata species around **the reedbed system and in Watchtree map area 7a.**

Key

B - Breeding (ovipositing and mating)

T - Territorial behaviour

✓ - Present (no evidence of breeding)

A - Abundant (over 50 individuals)

C - Common (between 20 and 50)

S - Scarce (between 5 and 19)

R - Rare (between 1 and 4)

Species	Survey month				
	May	June	July	August	September
Emerald Damselfly <i>Lestes sponsa</i>				✓ R	
Large Red Damselfly <i>Pyrrhosoma nymphula</i>	✓ S	✓ R			
Azure Damselfly <i>Coenagrion puella</i>	✓ S				
Common Blue Damselfly <i>Coenagrion cyathigerum</i>					
Blue-tailed Damselfly <i>Ischnura elegans</i>		✓ R		✓ R	
Common Hawker <i>Aeshna juncea</i>				✓ R	
Emperor Dragonfly <i>Anax imperator</i>					
Four-spotted Chaser <i>Libellula quadramaculata</i>	✓ R				
Common Darter <i>Sympetrum striolatum</i>			✓ R	✓ R	✓ R
Ruddy Darter <i>Sympetrum sanguineum</i>					
Black Darter <i>Sympetrum danae</i>			✓ R	✓ R	✓ R

Table 1(d). The relative abundance and behaviour of odonata species around **constructed wetland/lagoons in Watchtree map area 7a.**

Species	Survey month				
	May	June	July	August	September
Emerald Damselfly <i>Lestes sponsa</i>			✓ R		
Large Red Damselfly <i>Pyrrhosoma nymphula</i>	B S	✓ S			
Azure Damselfly <i>Coenagrion puella</i>	✓ S	✓ S			
Common Blue Damselfly <i>Coenagrion cyathigerum</i>	B S	B C	B C	B C	
Blue-tailed Damselfly <i>Ischnura elegans</i>	✓ R	B S	B C	B C	B S
Common Hawker <i>Aeshna juncea</i>			T R	✓ R	
Emperor Dragonfly <i>Anax imperator</i>					
Four-spotted Chaser <i>Libellula quadramaculata</i>	T R	B C	B S	✓ S	
Common Darter <i>Sympetrum striolatum</i>		✓ S	B A	B A	B C
Ruddy Darter <i>Sympetrum sanguineum</i>					
Black Darter <i>Sympetrum danae</i>			✓ R	✓ S	✓ S

Table 1(e). The relative abundance and behaviour of odonata species around the southern lagoon in Watchtree map area 7a.

Key

B - Breeding (ovipositing and mating)

T - Territorial behaviour

✓ - Present (no evidence of breeding)

A - Abundant (over 50 individuals)

C - Common (between 20 and 50)

S - Scarce (between 5 and 19)

R - Rare (between 1 and 4)

Species	Survey month									
	May		June		July		August		September	
Emerald Damselfly <i>Lestes sponsa</i>					✓	S	B	S	✓	S
Large Red Damselfly <i>Pyrrhosoma nymphula</i>			✓	R						
Azure Damselfly <i>Coenagrion puella</i>	✓	S								
Common Blue Damselfly <i>Coenagrion cyathigerum</i>	✓	S	✓	A	B	C	✓	R	✓	R
Blue-tailed Damselfly <i>Ischnura elegans</i>	✓	R	B	S	B	S	B	R	✓	R
Common Hawker <i>Aeshna juncea</i>					T	R	✓	R		
Emperor Dragonfly <i>Anax imperator</i>										
Four-spotted Chaser <i>Libellula quadramaculata</i>	T	R	✓	S	B	R	✓	R		
Common Darter <i>Sympetrum striolatum</i>			B	S	B	A	B	A	B	S
Ruddy Darter <i>Sympetrum sanguineum</i>										
Black Darter <i>Sympetrum danae</i>					B	S	B	S	T	S

Table 1(f). The relative abundance and behaviour of odonata species around the lake (Watchtree map area 6)

Species	Survey month									
	May		June		July		August		September	
Emerald Damselfly <i>Lestes sponsa</i>					B	C	B	S	B	C
Large Red Damselfly <i>Pyrrhosoma nymphula</i>										
Azure Damselfly <i>Coenagrion puella</i>	✓	R								
Common Blue Damselfly <i>Coenagrion cyathigerum</i>	B	C	B	A	B	A	B	A	✓	C
Blue-tailed Damselfly <i>Ischnura elegans</i>	B	C	B	S	B	C	✓	S		
Common Hawker <i>Aeshna juncea</i>					✓	R	B	R	B	R
Emperor Dragonfly <i>Anax imperator</i>										
Four-spotted Chaser <i>Libellula quadramaculata</i>	T	S	B	R	B	S	B	S		
Common Darter <i>Sympetrum striolatum</i>					B	A	B	A	B	C
Ruddy Darter <i>Sympetrum sanguineum</i>										
Black Darter <i>Sympetrum danae</i>					B	C	B	C	B	S

Table 1(g). The relative abundance and behaviour of odonata species around the **outflow ditch from the lake (Watchtree map area 6)**

Key

B - Breeding (ovipositing and mating)

T - Territorial behaviour

✓ - Present (no evidence of breeding)

A - Abundant (over 50 individuals)

C - Common (between 20 and 50)

S - Scarce (between 5 and 19)

R - Rare (between 1 and 4)

Species	Survey month									
	May		June		July		August		September	
Emerald Damselfly <i>Lestes sponsa</i>					B	S	B	S	B	R
Large Red Damselfly <i>Pyrrosoma nymphula</i>	B	S	B	S						
Azure Damselfly <i>Coenagrion puella</i>	B	A	B	A	B	C				
Common Blue Damselfly <i>Coenagrion cyathigerum</i>	B	R	B	R	B	S	B	S		
Blue-tailed Damselfly <i>Ischnura elegans</i>	B	S	B	R	B	R	B	S		
Common Hawker <i>Aeshna juncea</i>							✓	R		
Four-spotted Chaser <i>Libellula quadramaculata</i>	T	S	B	S	B	R	B	R		
Common Darter <i>Sympetrum striolatum</i>					B	S	B	R	B	S
Ruddy Darter <i>Sympetrum sanguineum</i>										
Black Darter <i>Sympetrum danae</i>					B	S	B	S	B	S