



# Wyre Forest Study Group

## Review of Herpetofauna Behaviour Correlated with Weather 2007

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Daily weather records have been taken at Knowles Mill, in the Dowles Valley, Wyre Forest since 1981, at approximately 9 a.m. Greenwich Mean Time. The Dowles Valley at this point lies 31metres above sea level. Below average temperatures tend to be recorded as the valley acts as a frost pocket, with a limited amount of sunshine. During reptile surveys a digital thermometer is used on site.

Weather conditions play a vital role in the life of reptiles, as being cold blooded/poikilothermic, they require sunshine to warm up and maintain body temperature at optimum levels. Morning is often the best time to find adders as they are more inclined to bask in the open whilst warming up and are less active, allowing a close approach for individual recognition and photography. Later in the day, direct sunshine may prove too hot for them and they invariably retreat into cover and are difficult to locate.

2007 was the warmest and wettest year in the Midlands since records began over 350 years ago.

**JANUARY** was warmer than average being mild and wet during the first three weeks, the warmest days occurred when air temperature reached a maximum of 13°C on the 8th, 9th and 12th. The wettest day, on the 9th, gave a total of 14mm of rain. Rain fell on 21 days of the month. The Atlantic air stream gave way to a northerly one on the 21st bringing a flurry of snow on the 23rd, with sharp night frosts to the end of the month giving temperatures of -3°C in the air and -7°C on the ground on the 23rd, 24th and 25th respectively.

Mean Monthly Maximum 8.3°C  
Mean Monthly Minimum -1.4°C  
Total Rainfall 71.9mm  
Mean Humidity (9am) 81%  
Air Frosts 5  
Ground Frosts 20  
Snow on 1 day  
Fog on one day  
Lowest Barometric Pressure:  
982/29.00 on the 18th January  
Highest Barometric Pressure:  
1038/30.66 on the 27th January

**FEBRUARY** began with 6 days of settled, sunny weather with cold days and nights. The coldest night fell on the 7th giving an air frost of -9°C and a ground frost of -11°C. On the 8th and 9th heavy snowfalls brought chaos to the Midlands roads, giving 30cm / 12 inches of precipitation over the two days. The winds veered from the north and east to the south-west bringing milder days from

the 11th. Frogs were reported croaking on the 12th and on the 14th the first adder was seen basking, in an air temperature of 11.3°C, with a ground reading of 19°C. Frogspawn was recorded on the 15th. The latter half of the month was mild, with rain every day but bright sunny spells in-between the showers, which tempted more adders out of hibernation. Rain fell on 19 days of the month.

Mean Monthly Maximum 7.1°C  
Mean Monthly Minimum 1.5°C  
Total Rainfall 91.9mm  
Mean Humidity 83%  
Air Frosts 3  
Ground Frosts 19  
Snow on 2 days  
Fog on 3 days  
Lowest Barometric Pressure:  
978/28.88 on the 12th February  
Highest Barometric Pressure:  
1046/30.90 on the 3rd February

**MARCH** was warmer than the longterm average, with rainfall totals also about average. It began with unsettled weather, heavy rain setting in at dusk on the 2nd to give the wettest 24 hours of the month with 22mm of rain, this was closely followed by 20.8mm on the 4th, with yet more rain on the 5th and 6th, giving a total of 53.3mm during the first 6 days. There was a bright, dry day on the 7th with sunny spells when all four species of reptile were observed basking. The remainder of the month was dominated by High Pressure, with sharp night frosts and warm sunny days. The warmest days were on the 17th and 31st air temperatures of 14.5°C, and a ground reading of 23°C. The coldest night was on the 21st with an air minimum of -3.8°C and ground reading of -7°C. Female adders in breeding condition were evident from mid-month onwards. Some male adders were observed with cloudy eyes on the 26th. Cool north winds dominated the last days of the month but were accompanied by bright sunshine. There were 14 rainy days.

Mean Monthly Maximum 10.8°C  
Mean Monthly Minimum 1.5°C  
Total Rainfall 66mm  
Mean Humidity 78%  
Air Frosts 14  
Ground Frosts 23  
Fog on three days  
Lowest Barometric Pressure:  
995/29.38 on 6th March  
Highest Barometric Pressure:  
1041/30.74 on 14th March

**APRIL** was exceptionally warm and sunny. High Pressure dominated throughout the month with above average temperatures, the highest, 22.5°C was recorded on the 15th,, (Herstmonceux, East Sussex recorded 26.5°C.). Rain was recorded on only 5 days, the wettest day, the 23rd gave just 4.8mm of rain. Warm sunny days hastened new skin development in male adders, the first sloughed male was seen on the 6th and several more on the following days. Courtship and mating was observed on the 12th, when air temperatures reached 17.5°C, ground readings registering 29.5°C. Some females were found alone after the 14th, the males having dispersed earlier than usual. However, due to the exceptionally warm conditions males and females could have been courting and mating under cover. Temperatures remained above average, making it the warmest April since records began over 350 years ago.

Mean Monthly Maximum 16.5°C  
 Mean Monthly Minimum 4.2°C  
 Total Rainfall 12.4mm  
 Mean Humidity 75%  
 Air Frosts 4  
 Ground Frosts 14  
 Lowest Barometric Pressure:  
 1018/30.08 on 24th April  
 Highest Barometric Pressure:  
 1036/30.60 on 1st April

**MAY** began with settled weather on the first 5 days, followed by a Depression which moved in on the 6th, heralding a succession of Atlantic fronts. The wettest day occurred on the 13th when 48.3mm of rain fell. A brief period of drier warmer weather occurred on the 20th with the warmest day of the month on the 24th, which gave an air maximum of 21°C. A return to strong N.W. winds brought cool, showery conditions, with more persistent rain for over 30 hours, from the evening of the 26th through to the early hours of the 28th and thunderstorms on the 31st resulting in a very wet month. A foretaste of things to come!!!

Mean Monthly Maximum 15.6°C  
 Mean Monthly Minimum 6.6°C  
 Total Rainfall 124.0mm  
 Mean Humidity 78%  
 Air Frosts 1  
 Ground Frosts 1  
 Thunder 1  
 Lowest Barometric Pressure:  
 998/29.48 on 27th May  
 Highest Barometric Pressure:  
 1025/30.28 on 23rd May

**JUNE** began with a ridge of High Pressure producing fine, warm, settled weather up to the 12th. The warmest day of the month was on the 9th with an air temperature of 24.5°C. From the 13th, onwards, an exceptional series of deep depressions moved in with thunderstorms on the 14th and 15th, giving 62.8mm of rain over the two days. On the 19th another storm moved up the Severn Valley, west of the river, releasing a phenomenal amount of rain which caused extensive, unprecedented flooding along the Dowles Valley, with 74mm of rain recorded between the 18th to the 20th. On the 24th and 25th yet more storms produced another 47mm of rain. June was the wettest month ever recorded in the Wyre Forest.

Mean Monthly Maximum 18.4°C  
 Mean Monthly Minimum 10.7°C  
 Total Rainfall 231.6mm  
 Mean Humidity 78%  
 Thunderstorms on 4 Days  
 15 days with rain  
 Lowest Barometric Pressure:  
 948/27. 90 on 28th June  
 Highest Barometric Pressure:  
 1031/30.44 on 5th June

**JULY** was dominated by an almost constant succession of depressions running in off the Atlantic bringing cool, wet weather to all regions. The warmest day was the 19th registering 21.5°C, prior to yet another intense period of slow-moving thunderstorms from 8.15pm. Heavy rain persisted during the following 24 hours, which resulted in severe flooding in the Dowles Valley and also a large area of the Midlands, Gloucestershire, Berkshire and Oxfordshire as well as further north. Further flooding occurred along the lower Severn and upper Thames, as flood water made its way down the rivers. During the 19th and 20th, 95.7mm of rain was recorded at Knowles Mill. It was the wettest July since 1936 and the wettest 3 consecutive months ever recorded.

Mean Monthly Maximum 17.7°C  
 Mean Monthly Minimum 10.8°C  
 Total Rainfall 195.3mm  
 Mean Humidity 81%  
 Thunderstorms on 4 days  
 23 days with rain  
 Lowest Barometric Pressure:  
 977/29.44 on 1st and 3rd July  
 Highest Barometric Pressure:  
 1023/30.20 on 31st July

**AUGUST** was cool with some regions having their coldest August since 1993. The month began with a period of relatively settled weather, providing a few warm days. The



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warmest day of the month was on the 5th with a temperature of 25°C in the Dowles Valley (30°C was recorded in the south and east of England). Depressions returned by mid-month, with periods of rain, the wettest day occurring on the 14th when 10mm of rain fell. Conditions became cooler with NW winds from the 18th, followed by a dry warmer spell from the 22nd, which continued to the end of the month. Pregnant female adders were now looking fat and approaching parturition. Slow worms and juvenile toads were observed under refugia.

Mean Monthly Maximum 19.1°C

Mean Monthly Minimum 10.5°C

Total Rainfall 34.3mm

Mean Humidity 79%

Thunder on 7th

10 days with rain

Hail on 15th

Fog on 25th

Lowest Barometric Pressure:

997/29.44 on 14th

Highest Barometric Pressure:

1032/30.48 on 26th

**SEPTEMBER** was dominated by High Pressure, giving warm, mostly dry, settled weather up to the 15th. The warmest day of the month occurred on the 6th with an air temperature of 20.5°C. (Eastbourne recorded the highest temperature of 25.1°C). Ideal conditions for female adders to give birth, however, on the 16th south-westerly winds brought rain to most areas. Clear skies during the night of the 18th gave the first ground frost of the autumn. Light rain fell on most days towards the end of the month. The wettest day was on the 23rd with 9.7mm of rain. On the 24th a vigorous cold front created a spate of tornadoes across England. Colder north-west winds had lowered temperatures by the end of the month. Despite rain falling on 14 days of the month, it was mainly light and the month was drier than average. Adders were still basking on the 29th.

Mean Monthly Maximum 16.3°C

Mean Monthly Minimum 8.9°C

Total Rainfall 24.7mm

Mean Humidity 81%

Air Frosts 0

Ground Frosts 1

Lowest Barometric Pressure:

1002/29.60 on 24th September

Highest Barometric Pressure:

1035/30.56 on 6th September

**OCTOBER** was also dominated by long periods of High Pressure. Slow worms and juvenile toads were seen

under refugia until the 8th. The warmest day of the month occurred on the 12th, with an air temperature of 17.5°C. The month was relatively dry with only 8 days giving light rain. The wettest day of the month was on the 16th producing 14.3mm of rain. Winds veered to easterly on the 18th, with light frosts and dry sunny days until the 26th, when the winds veered to the south and west bringing light rain. On the 30th grass snakes were observed, coiled together, basking in an air temperature of 13.5°C, it was 20°C on the ground. Rainfall was below average, with 10 days of rain with temperatures above average.

Mean Maximum 12.8°C

Mean Monthly Minimum 6.4°C

Total Rainfall 35mm

Mean Humidity 83%

Air Frosts 3

Ground Frosts 3

Fog on one Day

**NOVEMBER** began mild with above average temperatures. Last reptiles seen, a male adder and also a grass snake were observed in Mortimer Forest, Shropshire on the 2nd in an air temperature of 14°C, with 18°C recorded on the ground. The warmest day of the month was on the 3rd, with an air temperature of 16°C. The weather remained dry until the 6th although light rain was recorded on the following 7 days. On the 12th, cold north-westerly winds brought a sharp drop in temperatures with night frosts and cold days. The High Pressure moved away to the south-west on the 18th, giving heavy rain during the day, which turned to snow after dark, as the winds veered to south-easterly. This produced a total of 37mm of precipitation, the wettest 24 hours of the month. Unsettled, changeable weather from the 19th onwards gave a mixture of dull damp days, sunny spells and sharp night frosts, the coldest night of the month was on the 24th with -8°C. This was followed by milder, rainy days, making a total of 17 during the month.

Mean Monthly Maximum 9.1°C

Mean Monthly Minimum 1.8°C

Total Rainfall 79.7mm

Mean Humidity 83%

Air Frosts 9

Ground Frosts 16

Fog on 4 days

Sleet/Snow on 1 day

**DECEMBER** began with 9 rainy days. The warmest day of the month fell on the 4th with an air temperature of 12.5°C. On the 10th, High Pressure with an easterly air flow heralded a spell of 12 dry, cold days and frosty

nights. The two coldest nights were on the 18th and 29th, respectively, with air frosts of  $-5.5^{\circ}\text{C}$  and ground frosts of  $-9^{\circ}\text{C}$ . There were 4 days when temperatures didn't rise above freezing point with frost lying all day. The last 10 days of the month were influenced by a south-westerly air flow, less cold and with several rainy days. The wettest day of the month was on the 24th with 18mm of rain. The last days of the year were cloudy, cold and showery. There was a total of 15 rain days.

Mean Monthly Maximum  $5.9^{\circ}\text{C}$

Mean Monthly Minimum  $0.5^{\circ}\text{C}$

Total Rainfall 79.2mm

Mean Humidity 82%

Air Frosts 16

Ground Frosts 27

Fog on 2 days

Lowest Barometric Pressure:

974/28.76 on 9th

Highest Barometric Pressure:

1044/30.82 on 13th

## 2007 WEATHER SUMMARY

Total rainfall

1046mm (41.25")

Wettest Month

June 231.6mm

Wettest Day

20th July 74.7mm

Hottest Day

5th August  $25^{\circ}\text{C}$

Coldest Night

7th February = Air  $-9^{\circ}\text{C}$ /Ground  $-11^{\circ}\text{C}$

Barometric pressure

Lowest – 948/27.9 on 28th June

Highest – 1046/30.90 on 3rd February

## DISCUSSION

The unusual weather conditions prevalent during the Spring and Summer of 2007, didn't allow for efficient surveys of all adder sites in Wyre Forest. The warmer than average March enabled the adders to bask regularly for long periods, which accelerated the metabolism of the males, and they developed their new skin earlier than normal. This trend continued into April, which

was exceptionally warm and sunny. Male adders were sloughing from the 6th onwards, which led to the earliest combat, courtship and mating ever recorded in the Wyre Forest. Thus, surveys had to be curtailed prematurely due to the male adders dispersing to feed much earlier than usual. The very warm spring was followed by an extremely wet summer, meaning summer surveys were out of the question in flooded areas. Despite weather conditions, the number of adders recorded was comparable to 2006.

The Tables reveal interesting trends. In Table 5, although 28 sites were surveyed, only 19 held adders. The number of adders in 8 sites was stable, indicating these are still viable, but 11 sites are extremely vulnerable with only 1 or 2 adders holding on and no young adders seen in recent years.

The viable sites are all in conifer or scrub/heathy areas, which are not used by the general public for recreation. The conifer plantations and scrub/heath are being managed sensitively by the Forestry Commission, Natural England and some private landowners, which will, hopefully, allow the present adder populations to thrive.



Adder, Wyre Forest

Alonza Garbett

## ACKNOWLEDGEMENTS

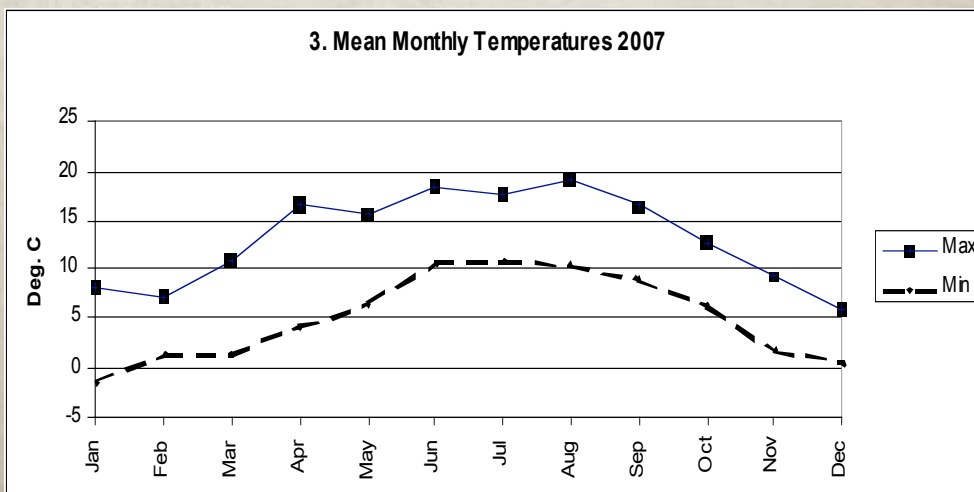
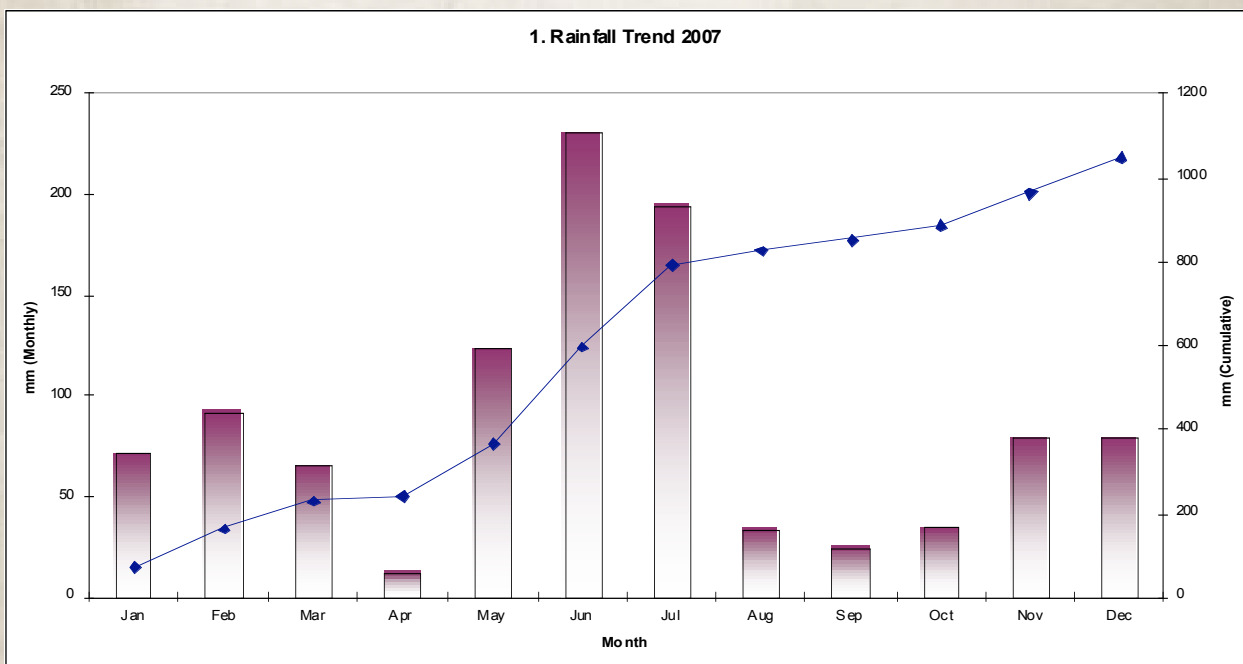
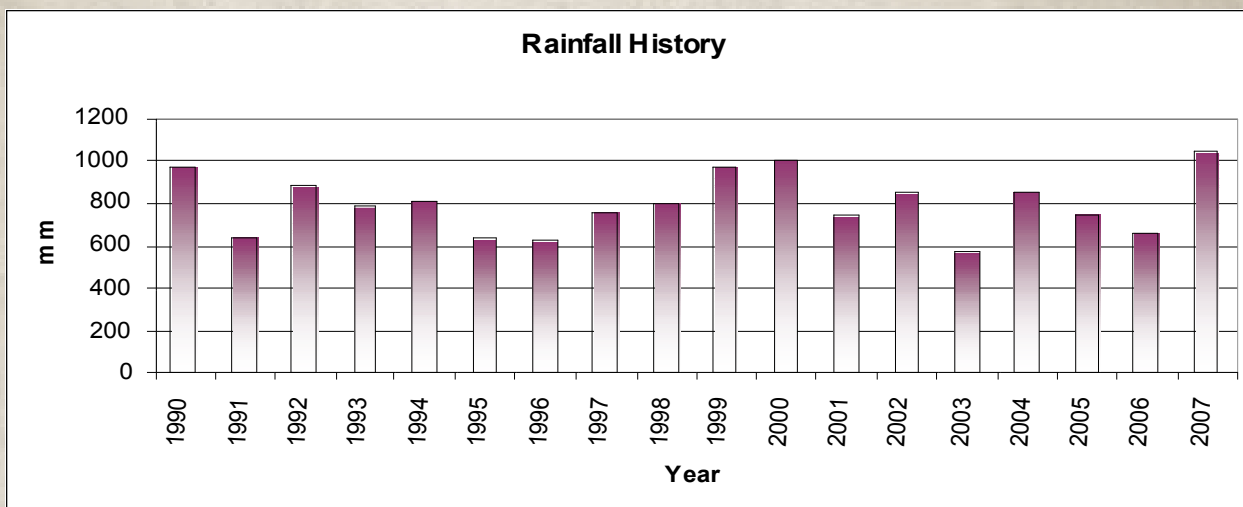
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Year	Total Rainfall		Days with Minimum	Maximum Daily	Date of Maximum
	mm	Inches	Of 0.2mm Rainfall	Rainfall (mm)	Rainfall
1990	964.3	38	167	42.5	Jan-28
1991	633.5	24.9	158	33	Apr-30
1992	880.4	34.7	196	42.9	May-28
1993	785.9	30.9	177	38	Jun-10
1994	814	32	198	54.8	Aug-14
1995	625.9	24.6	164	41.3	Jul-10
1996	624.8	24.6	169	17.4	Apr-12
1997	753.7	29.7	161	32	Jun-25
1998	805.4	31.7	195	27.2	Jun-01
1999	968.6	38.1	212	45.6	Sep-19
2000	1011.6	39.9	223	36.8	Oct-29
2001	738.1	29.1	187	40.2	Jul-17
2002	843.7	33.3	191	22.8	Dec-20
2003	560.2	22.1	155	27.3	Oct-30
2004	849.6	33.4	209	46.3	Aug-03
2005	748.8	29.5	183	35.3	Jul-24
2006	652.5	25.7	191	20.1	Nov-24
2007	1046	41.25	184	14.7	Jul-20

**Table 1: Rainfall at Knowles Mill**

Year	Rainy days (0.2mm or more)		Sunny days (5 hours or more)		No. of Survey Days	
	March	April	March	April	March	April
1990	6	12	15	20	21	22
1991	17	14	5	11	18	19
1992	24	18	2	9	18	20
1993	7	17	9	7	21	20
1994	22	15	12	12	22	23
1995	19	5	14	15	18	24
1996	15	15	1	8	9	25
1997	6	6	8	13	22	22
1998	13	25	6	10	20	20
1999	20	23	10	12	18	23
2000	12	21	14	12	22	19
2001	Data incomplete due to FMD					
2002	10	12	14	18	13	20
2003	9	9	21	17	23	24
2004	20	17	9	15	17	20
2005	18	16	8	12	15	25
2006	20	13	7	20	11	24
2007	14	5	15	25	21	23

**Table 2: Weather Conditions Relating to Adder Surveying**





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	2002	2003	2004	2005	2006	2007
<b>Frogs Croaking</b>	30-Jan	31-Jan	23-Jan	31-Jan	18-Jan	12-Jan
<b>First Frogspawn</b>	6-Feb	9-Feb	16-Feb	9-Feb	26-Feb	15-Feb
<b>First Male adder</b>	11-Feb	15-Feb	4-Mar	15-Feb	15-Feb	14-Feb
<b>First common lizard</b>	7-Mar	15-Feb	25-Mar	15-Feb	22-Feb	7-Mar
<b>First Slow-Worm</b>	12-Mar	18-Mar	16-Mar	18-Mar	25-Mar	7-Mar
<b>First female adder</b>	12-Mar	18-Mar	16-Mar	18-Mar	26-Mar	14-Feb
<b>First grass snake</b>	22-Mar	21-Mar	2-Apr	21-Mar	12-Apr	7-Mar
<b>First grass snake copulation</b>	3-Apr	21-Mar	N/S	4-Apr	N/S	N/S
<b>First male adder slough</b>	9-Apr	16-Apr	19-Apr	16-Apr	19-Apr	6-Apr
<b>First adder courtship and combat</b>	15-Apr	27-Apr	24-Apr	27-Apr	25-Apr	12-Apr
<b>First adder mating</b>	21-Apr	27-Apr	25-Apr	27-Apr	26-Apr	12-Apr
<b>Last adder courtship</b>	3-May	6-May	7-May	6-May	7-May	27-Apr
<b>Last adder</b>	24-Sep	10-Oct	5-Oct	16-Oct	20-Oct	2-Nov
<b>Table 3: 2007 Phenological Data</b>						
<b>WYRE FOREST ONLY</b>						

<b>Year</b>	<b>First Sighting</b>	<b>Air Temp. (°C)</b>	<b>Grass Temp. (°C)</b>	<b>First Slough</b>
1990	5-Feb	13	14	8-Apr
1991	23-Feb	14	17	19-Apr
1992	23-Feb	13	15	22-Apr
1993	17-Feb	10.7	12.5	16-Apr
1994	10-Feb	10	15	18-Apr
1995	12-Feb	11.4	11	10-Apr
1996	16-Feb	12.2	15	24-Apr
1997	15-Feb	8.6	11	8-Apr
1998	11-Feb	13.6	12.5	17-Apr
1999	16-Feb	8	9	16-Apr
2000	19-Feb	6.3	12.5	7-Apr
2001	7-Feb	10	11.5	17-Apr
2002	11-Feb	13.5	16	9-Apr
2003	23-Feb	11	23.8	31-Mar
2004	4-Mar	11	17.5	19-Apr
2005	15-Feb	10	14	16-Apr
2006	15-Feb	10	17.3	19-Apr
2007	14-Feb	11.3	19	6-Apr
<b>Table 4: Cumulative Data for Adders</b>				
Readings taken from an electrical pocket thermometer				

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Year	Sites Surveyed	Sites with Adders	Mature Males	Mature Females	Total	Average per Site
1990	56	50	185	55	240	4.8
1991	76	61	211	56	267	4.4
1992	78	55	159	33	192	3.5
1993	80	59	186	70	256	4.3
1994	76	50	153	29	182	3.6
1995	76	44	103	14	117	2.6
1996	80	41	112	32	144	3.5
1997	84	44	102	31	133	3
1998	85	42	103	34	137	3.3
1999	67	35	100	20	120	3.4
2000	87	24	69	13	82	3.4
2001	Data incomplete due to FMD					
2002	20 *	13	36	17	53	4
2003	20 *	9	26	10	36	4
2004	47	20	40	19	59	3.6
2005	54	25	40** 65***	16** 38***	56**103***	4.1** 2.4***
2006	38	21	74	26	100	2.1
2007	28	19	67	24	101	5.3

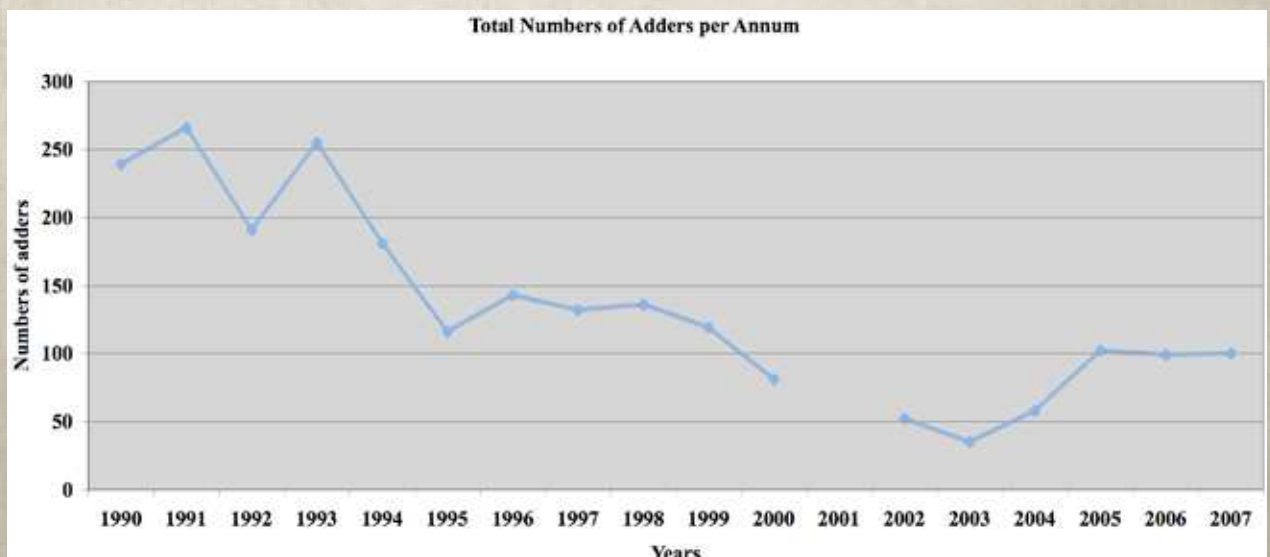
**Table 5: Adder Numbers**

\*Selected sites

\*\*Usual Sites without three new sites added

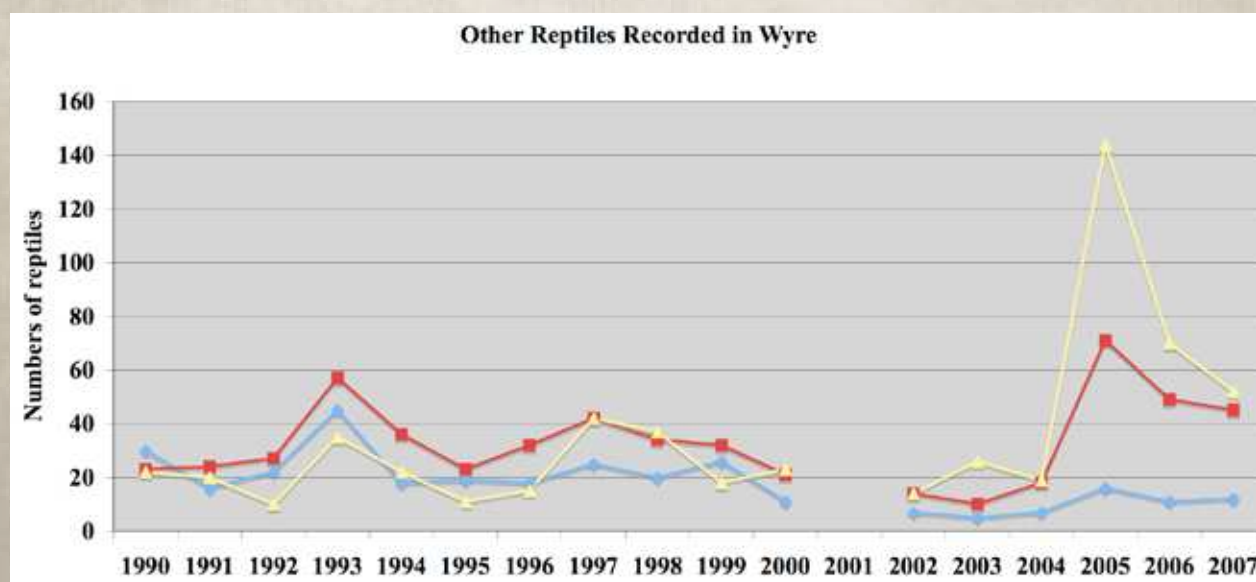
\*\*\* Total when three new sites were added

FMD – Foot & Mouth Disease



Year	Grass Snakes		Slow-Worms		Lizards	
	Mature	Juvenile	Mature	Juvenile	Mature	Juvenile
1990	30	6	23	3	22	2
1991	16	4	24	11	20	0
1992	22	8	27	8	10	3
1993	45	4	57	5	35	3
1994	18	2	36	10	22	1
1995	19	4	23	13	11	0
1996	18	4	32	16	15	0
1997	25	3	42	11	42	0
1998	20	1	34	8	37	0
1999	26	8	32	9	18	1
2000	11	1	21	3	23	0
2001	Data incomplete due to FMD					
2002	7	2	14	3	14	0
2003	5	0	10	0	26	0
	Grass Snakes		Slow-worms		Lizards	
2004	7		18		19	
2005	12* 16**		53* 71**		58* 144**	
2006	11		49		70	
2007	12		45		52	

**Table 6: Other Reptiles Recorded in Wyre During Adder Census**  
 \* the total minus three new sites  
 \*\* the total with the three new sites added  
 FMD – Foot & Mouth Disease





Common Lizard (*Lacerta vivipara*) Cleobury Coppice, 20 September 2008

© John Bingham



Slowworm, Shelheld Coppice 2 June 2005

*This article is an extract from the Wyre Forest Study Group annual Review 2008*

Rosemary Winnall