Review of Herpetofauna Behaviour Correlated with Weather 2006

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Daily weather records have been taken at Knowles Mill, in the Dowles Valley, Wyre Forest, since 1981, at approximately 10a.m. Greenwich Mean Time. The Dowles Valley at this point lies at 31 metres 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 adder's life, as being cold blooded 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.

2006 was officially declared by meteorologists to be the warmest year since records began over 350 years ago.

JANUARY was drier than average, large areas of the country receiving less than 40% of average rainfall. In Wyre Forest, just over half an inch, 14.5mm of rain fell. Rain fell on 11 days, but only 5 produced more than 1mm. The wettest day was on the 27th with 3.1mm, which fell as snow. The warmest day was on the 18th with an air temperature of 11°C. It was also when frogs were reported croaking in a garden pond near Bewdley. High Pressure moved over Britain on the 22nd causing day and night temperatures to fall giving a cold end to the month. The lowest night temperatures were recorded on the 29th, with an air temperature of –3°C and a ground frost of –6.5°C.

Mean Monthly Maximum 5.5°C
Mean Monthly Minimum 0.6°C
Rainfall 14.5mm
Mean Humidity 82%
Air Frosts 16
Ground Frosts 25
2 Days with Snow / 2 with Sleet

FEBRUARY was also drier than average and the coldest since 1996. The first week was gloomy, dry and cold under High Pressure with winds from the north. The coldest night fell on the 10th with an air frost of –6°C and a ground frost of –8°C. It was less cold from the 13th onwards when winds veered to the south-west. The warmest day fell on the 15th with an air temperature of 10°C, and a ground reading of 17.3°C, which tempted the first male adders from their winter dens to bask in the pleasant sunshine. The mild spell was, however short-lived as the winds went round to the north-east, producing hail, sleet and snow. The wettest day occurred on the 23rd with 9.8mm of rain. The first frogspawn was reported in the garden pond near Bewdley on the 26th, but none was seen in the forest ponds until March.

Mean Monthly Maximum 5.2°C
Mean Monthly Minimum 0.7°C
Rainfall 38.9mm
Mean Humidity 77%
Air Frosts 9
Ground Frosts 21
4 Days with Snow / 2 with Sleet / 1 Hail

MARCH began cold with snow showers on the 1st and 2nd and sharp night frosts. The coldest night of the month was on the 4th with an air frost of –6.5°C and a ground frost of –8°C. It was reported to be the coldest March night in the Midlands since 1964! Temperatures gradually climbed during the second week when southerly winds brought rain in off the Atlantic, changeable weather throughout the month, alternating between wet, mild and windy and short cold spells. The first slow worm was seen on the 25th and the first female adder on the 26th when air temperatures rose to 14°C and ground temperatures registered 16.3°C. The wettest day fell on the 29th with a total of 7.3mm of rain. The warmest was on the 30th with an air temperature of 15°C and a ground reading of 25°C. During brief respites from the cloud, rain and snow, reptile surveys were undertaken on 11 days, but on only 7 of these were reptiles recorded.

Mean Monthly Maximum 7.7°C
Mean Monthly Minimum 1.7°C
Rainfall 65.5mm
Mean Humidity 77%
Air Frosts 11
Ground Frosts 18
4 Days with Snow / 2 with Hail

APRIL was beset with north-westerly winds which kept temperatures down. However, High Pressure dominated with clear night skies and sharp night frosts which quickly dissolved in early sun giving ideal conditions for reptiles to bask in sites sheltered from the cold winds. Surveys were undertaken on 24 days of the month. The first male adder sloughed on the 18th on a sunny morning with an air temperature 13.5°C and ground reading of 26°C. There were 13 days with rain, the wettest on the 19th when 9.2mm fell. The warmest day was on the 25th with an air temperature of 17.5°C and ground readings of 30°C, adder courtship was observed, copulation followed the next day and was observed daily until the end of the month. Although mean temperatures for the

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month were near to average, it was the first April since 1986 when no air maximum above 20°C was recorded.

Mean Monthly Maximum 12.5°C
Mean Monthly Minimum 3.7°C
Rainfall 31.2mm
Mean Humidity 76%
Air Frosts 8
Ground Frosts 11
1 Day with Hail

MAY was the wettest month of the year with 107.7mm (over 4 inches) of rain, the wettest May since 1983. The wettest day fell on the 21st with 16.3mm of rain. However, the month began with warm weather, the warmest day on the 4th, with an air temperature of 26°C. Adder courtship and mating continued until the 7th, after that date females were found alone, males having departed for their feeding areas. Strong winds and heavy showers were a feature of the weather as Low Pressure moved in. The second half of the month was cool and unsettled.

Mean Monthly Maximum 16.5°C
Mean Monthly Minimum 7.9°C
Rainfall 107.7mm
Humidity 77%
Air Frosts 0
Ground Frosts 1
Hail on 22nd. Thunder on 12th and 22nd

JUNE was dry with below average rainfall with only 10.3mm, the wettest day was on the 13th with 2.8mm. There were only 8 days with showers or light rain. There were some pleasant warm spells, the warmest day on the 10th, with an air temperature of 28°C. Pregnant females were observed looking very dull approaching a slough, and difficult to locate in the lush vegetation. The weather during the latter half of the month was variable, but mainly dry and warm.

Mean Monthly Maximum 22.5°C
Mean Monthly Minimum 9.5°C
Rainfall 10.3mm
Humidity 75%

JULY was the hottest ever recorded in Britain with the temperature for England and Wales being 3.6°C above long term average. It was also the sunniest on record for England and Wales. The month began with warm, humid south-easterly winds and thundery showers on the 4th, 5th and 6th, the latter the wettest day of the month with 8.6mm of rain. By the middle of the month High Pressure dominated giving hot dry days, the temperature peaking on the 19th with 32.2mm. (Wisley, Surrey, recorded 36.5°C, a record July temperature.) Thunderstorms on the 22nd passed by to give fresher, less humid conditions and hot sunny weather until the 28th. The month ended with sunshine and showers.

Mean Monthly Maximum 25°C
Mean Monthly Minimum 12.1°C
Rainfall 33.9mm
Humidity 77%
4 Days with Thunderstorms

AUGUST began showery with blustery winds. The month was rather unsettled with rain on 23 days although mostly light. The wettest day fell on the 17th with thunderstorms, giving 12.7mm of rain. In between these rainy, cloudy spells, there were some hot sunny periods, the warmest day being on the 6th with an air temperature of 27°C. During the last week there were three cool nights and the month ended as it began with showers and blustery winds.

Mean Monthly Maximum 19.4°C
Mean Monthly Minimum 11.5°C
Rainfall 50.3mm
Humidity 79%
4 Days with Thunderstorms
2 Foggy Mornings

SEPTEMBER continued mild with blustery winds and temperatures above average. Adders were seen returning to their hibernation areas and pregnant females moving from their summer basking sites to birthing areas. The first baby adder was seen on the 9th and six baby slow worms were seen under felt refugia on the same day. The wettest day fell on the 14th with 11.4mm of rain. The warmest day occurred on the 21st with an air temperature of 23°C. Despite rain on 16 days, thunderstorms during the early hours of the 24th and torrential rain on the last day of the month, rainfall was still below average. Adders, grass snakes, slow worms and lizards were all seen regularly during the month.

Mean Monthly Maximum 19.1°C
Mean Monthly Minimum 11°C
Rainfall 55.3mm
Humidity 83%
1 Night with Thunderstorms
4 Misty/Foggy Mornings

OCTOBER continued mild, wet and windy, rain fell on 24 days. In between times there were some pleasant warm sunny days when reptiles were found basking. The last adder, a female who had given birth in September, was seen on the 20th in an air temperature of 14°C, 20°C on


Adder Alonza Garbett

the ground. Slow worms continued to use the refugia until the 22nd. The warmest day of the month fell on the 11th and 28th, with a maximum air temperature of 16.5°C. The wettest day was on the 25th with 13mm of rain.

Mean Monthly Maximum 14.1°C
Mean Monthly Minimum 7.9°C
Rainfall 85.8mm
Humidity 84%
No Frosts
3 Days with Thunderstorms
6 Misty/Foggy Mornings

NOVEMBER was yet another mild, damp month, making it the warmest Autumn ever recorded. The month started with 6 dry, cold days and night frosts as High Pressure came in from the north. On the 7th the wind veered to the south-west where it remained until the end of the month, giving rain on all but 5 days. The warmest days occurred on the 8th and 16th with an air temperature of 13°C. The coldest nights fell on the 2nd, 3rd and 4th with air frosts of –3°C and ground frosts of –5°C. The wettest day was on the 24th with 20.1mm of rain. No reptile sightings were reported.

Mean Monthly Maximum 9.5°C
Mean Monthly Minimum 1.8°C
Rainfall 66.4mm
Humidity 84%
Air Frosts 10
Ground Frosts 19
1 Misty/Foggy Morning

DECEMBER. The first 15 days were wild, stormy, wet and windy as Low Pressure dominated. The warmest day fell was the 14th with an air temperature of 13°C. The wettest day was on the 15th with 12.3mm of rain. From the 18th onwards pressure slowly rose as High Pressure settled in the Atlantic, giving dry, but cloudy days, several foggy mornings and evenings with no wind to disperse this until the 23rd. The last few days of the year were wet and windy.

Mean Monthly Maximum 7.8°C
Mean Monthly Minimum 2.2°C
Rainfall 92.7mm
Humidity 82%
Air Frosts 10
Ground Frosts 15
5 Days with Fog

2006 WEATHER SUMMARY

Total Rainfall
652.5mm (25.68")

Wettest Month
May 107.7mm

Wettest Day
24th November 2006 With 20.1mm

Hottest Day
19th July 2006 ~ An Air Maximum Of 32.2°C

Coldest Night
4th March 2006
an air frost of -6.5°C
ground frost of -8°C

Ground frosts of -8°C were also recorded
on 10th and 23rd March 2006

Barometric Pressure
Highest was 1048/30.94 ~ 22nd and 23rd December
Lowest was 976/28.82 ~ 16th February

WEATHER - TABULATED DATA

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

Table 1: Rainfall at Knowles Mill

	Rainy days (0.2mm or more)		Sunny days (5 hours or more)		No. of Survey Days	
Year	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

Table 2: Weather Conditions Relating to Adder Surveying

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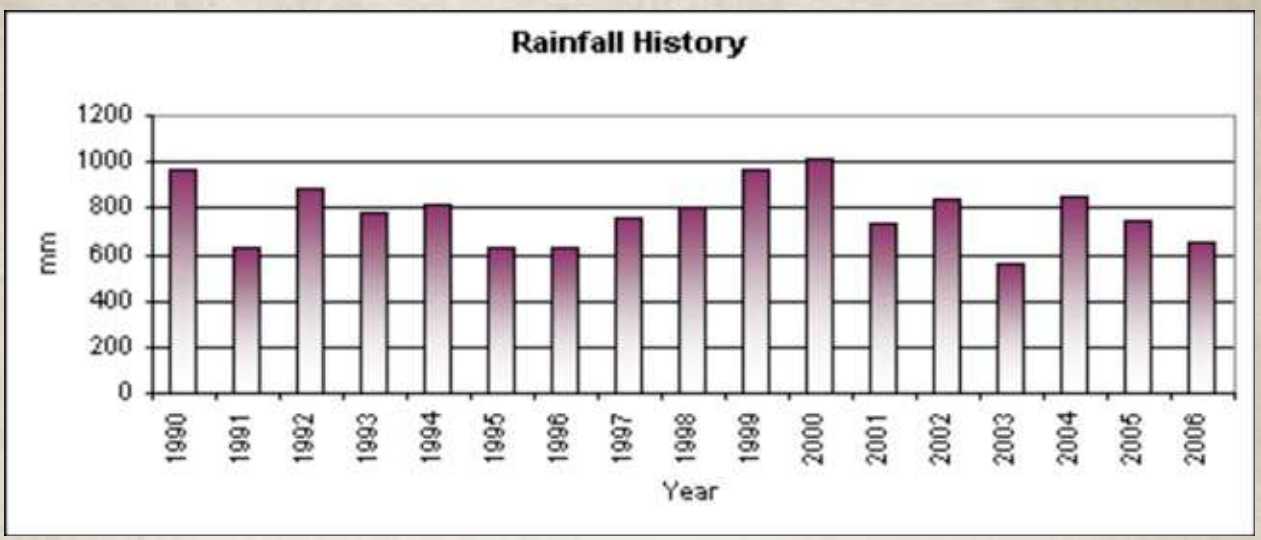

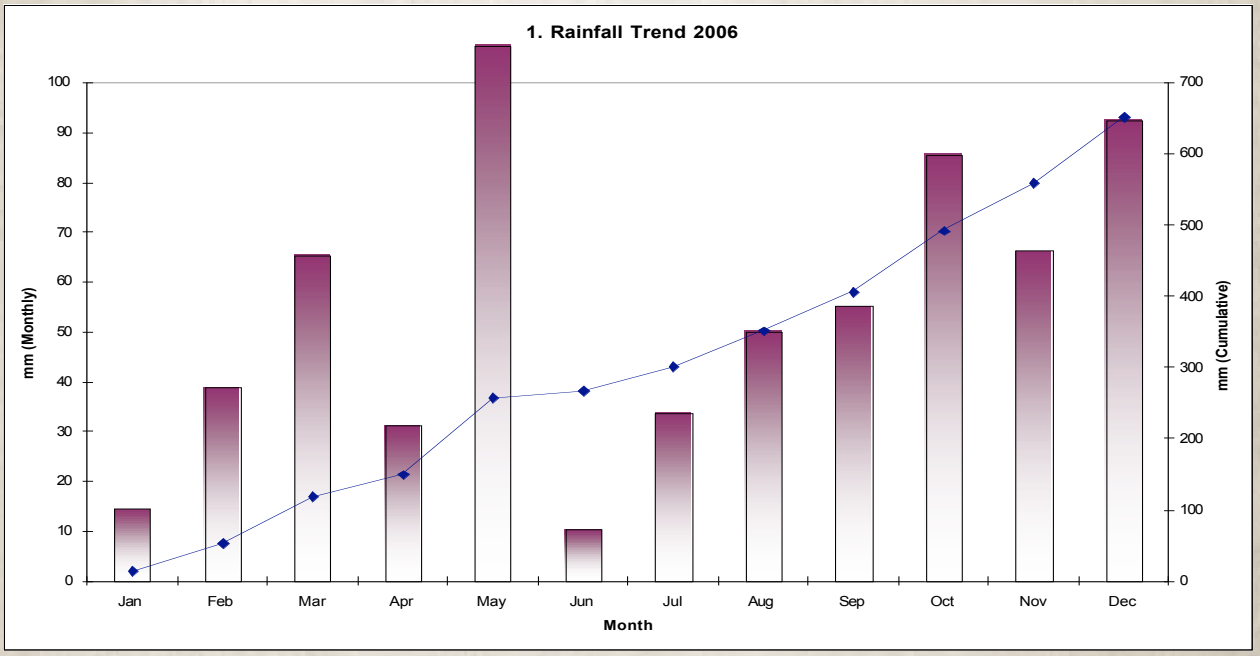

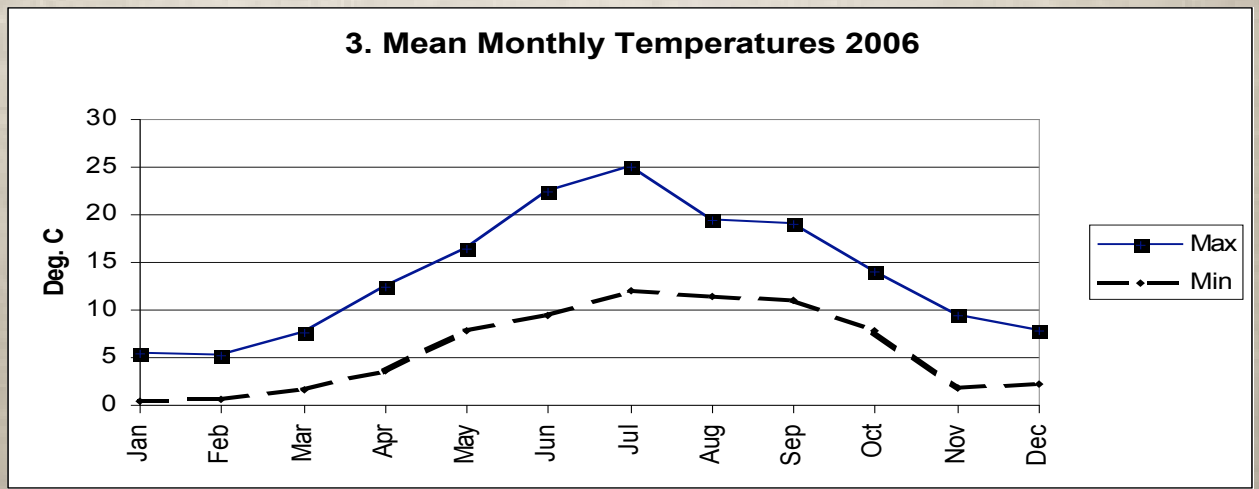

HERPETOFAUNA DATA –PHENOLOGY

	2001	2002	2003	2004	2005	2006
Frogs Croaking		30-Jan	31-Jan	23-jan	31-Jan	18-Jan
First Frogspawn	21-Feb	06-Feb	09-Feb	16-Feb	09-Feb	26-Feb
First Male adder	07-Feb	11-Feb	15-Feb	4-Mar	15-Feb	15-Feb
First common lizard	13-Mar	07-Mar	15-Feb	25-Mar	15-Feb	22-Feb
First Slow-Worm	13-Mar	12-Mar	18-Mar	16-Mar	18-Mar	25-Mar
First female adder	31-Mar	12-Mar	18-Mar	16-Mar	18-Mar	26-Mar
First grass snake	01-Apr	22-Mar	21-Mar	2-Apr	21-Mar	12-Apr
First grass snake copulation	N/S	03-Apr	21-Mar	N/S	04-Apr	N/S
First male adder slough	17-Apr	09-Apr	16-Apr	19-Apr	16-Apr	19-Apr
First adder courtship and combat	30-Apr	15-Apr	27-Apr	24-Apr	27-Apr	25-Apr
First adder mating	07-May	21-Apr	27-Apr	25-Apr	27-Apr	26-Apr
Last adder courtship	12-May	03-May	06-May	7-May	06-May	07-May
Last adder	17-Sep	24-Sep	10-Oct	5-Oct	16-Oct	20-Oct

Table 3: 2006 Phenological Data

WYRE FOREST ONLY

Year	First Sighting	Air Temp. (°C)	Grass Temp. (°C)	First Slough
1990	05-February	13	14	08-April
1991	23-February	14	17	19-April
1992	23-February	13	15	22-April
1993	17-February	10.7	12.5	16-April
1994	10-February	10	15	18-April
1995	12-February	11.4	11	10-April
1996	16-February	12.2	15	24-April
1997	15-February	8.6	11	08-April
1998	11-February	13.6	12.5	17-April
1999	16-February	8	9	16-April
2000	19-February	6.3	12.5	07-April
2001	07-February	10	11.5	17-April
2002	11-February	13.5	16	09-April
2003	23-February	11	23.8	31-March
2004	04-March	11	17.5	19-April
2005	15-February	10	14	16-April
2006	15-February	10	17.3	19-April

Table 4: Cumulative Data for Adders

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

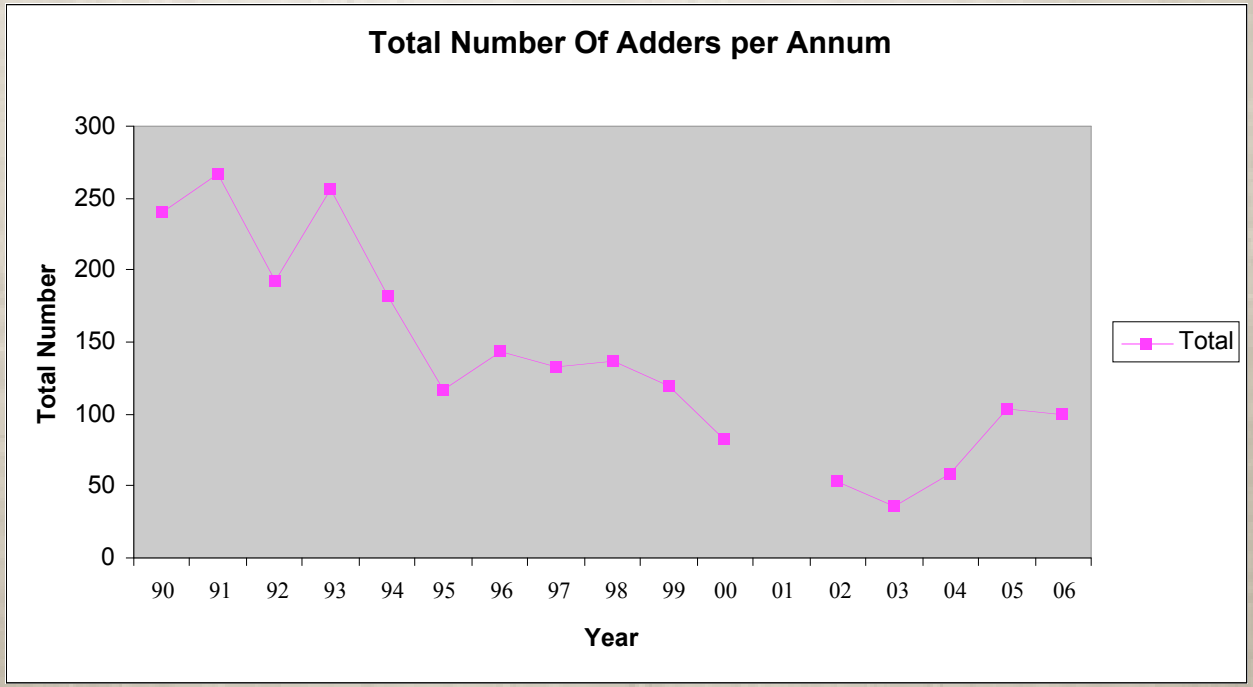
Table 5: Adder Numbers

*Selected sites

**Usual Sites without three new sites added

*** Total when three new sites were added

FDM – Foot & Mouth Disease



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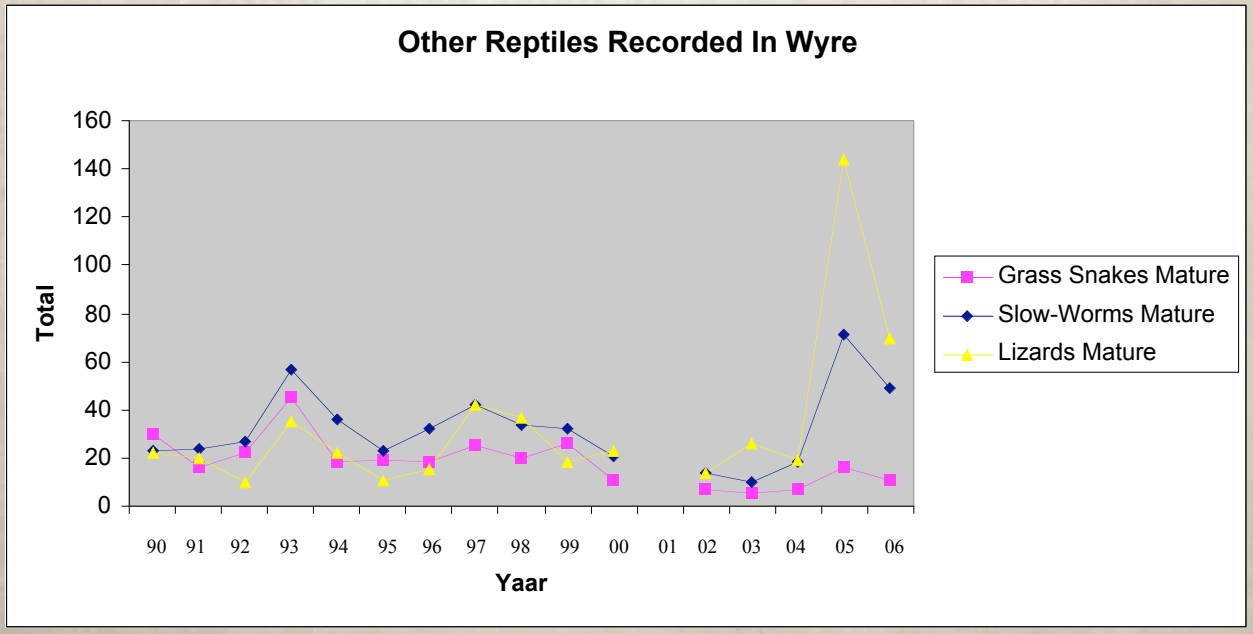
Year	Grass Snakes		Slow-Worms		Lizards	
	Mature	Juvenile	Mature	Juvenile	Mature	Juvenile
1990	30	6	23	3	22	2
1991	16	4	24	11	20	0
1992	22	8	27	8	10	3
1993	45	4	57	5	35	3
1994	18	2	36	10	22	1
1995	19	4	23	13	11	0
1996	18	4	32	16	15	0
1997	25	3	42	11	42	0
1998	20	1	34	8	37	0
1999	26	8	32	9	18	1
2000	11	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	

Table 6: Other Reptiles Recorded in Wyre During Adder Census

* the total minus three new sites

** the total with the three new sites added

FDM – Foot & Mouth Disease



Common Lizard male, Wimperhill, 29th May 2005 Rosemary Winnall

DISCUSSION

TABLE 5 provides an insight into the plight of the adder in Wyre Forest. Although fewer sites (37) were surveyed in 2006, compared to 54 in 2005, this was entirely due to the very inclement weather in March. The main sites were surveyed several times during late March, April and early May, which included all sites which supported adders in recent years. In 2005, 3 new sites were identified in young conifer, near to declining or extinct sites. In 2006, 3 other sites were lost, all had been declining previously, with 1 or 2 adders surviving in unsuitable conditions. Despite 20 sites still supporting adders in 2006, many are now vulnerable with very small ISLAND POPULATIONS.

These remaining sites can be grouped together within 6 distinct geographical areas, each containing 2 – 4 sites, whose close proximity permits movement of individual adders between sites. Crucially, however, these 6 areas are all completely isolated from each other, with no possibility of any natural migration of populations from one to another. This could be interpreted as just 6 viable populations within the Wyre Forest, although comprising 20 sites and approximately 100 adders. In stark contrast, only 15 years ago (1991), there were 32 such areas all interlinked/overlapping, across the Wyre Forest, consisting of 61 active sites, with 267 counted.

Shading out, forestry operations, conservation management, persecution and public pressure, have all contributed to the demise of adder populations in some areas and at some sites.

Acknowledgments

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Grass Snakes, Willow Bank, Bliss Gate, 21st April 2006 Rosemary Winnall