Review of Herpetofauna Behaviour correlated with Weather 2011

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Daily weather records have been taken at Knowles Mill, approximately 31 metres above sea level, since 1981, at 9 am, G.M.T. Below average temperatures are frequently recorded, as the Dowles Valley acts as a frost pocket, with only limited amounts of sunshine. While December 2010 proved to be one of the coldest on record, after the drama of the ice and snow, 2011 began with a much more familiar weather pattern.

JANUARY was comparatively mild, with Atlantic fronts bringing mainly wet and windy conditions. Just one day with snow, which turned to rain on the 6th/7th, resulting in the wettest 24 hours, with 16.2mm measured. The weather turned noticeably milder mid-month, with the warmest day the 16th, when a temperature of 12°C was recorded. The coldest night was on the 31st, with an air temperature of –9°C and ground frost of –11°C.

Mean Monthly Maximum 4.7°C
Mean Monthly Minimum –0.2°C
Total Rainfall 47.2mm
Air Frosts = 21, Ground Frosts = 26
Snow on 1 day, 3 Foggy days
Highest Barometric Pressure 1038/30.66 on the 21st
Lowest Barometric Pressure 989/29.20 on the 6th

FEBRUARY began with the coldest night of the month, producing an air temperature of –8°C and ground temperature of –6°C. However, overall, this was the mildest February since 2002, with only eight warmer in the last 100 years, with below average rainfall. The mildest days were the 4th, 5th, 6th, 7th and 8th, when air temperatures reached 13°C and ground readings 15°C. On the Malvern Hills, the first MALE ADDER was recorded on the 7th, basking on a south facing slope, and on the 12th two male adders and a LIZARD were seen in Wyre Forest. Rainy conditions on the 18th encouraged FROGS to move to their spawning ponds, with the first SPAWN seen on the 22nd. The wettest day was on the 25th, with 12.5mm of rain, although the monthly total was somewhat below average.

Mean Monthly Maximum 8.6°C
Mean Monthly Minimum 2.4°C
Total Rainfall 47.3mm
Air Frosts = 11, Ground Frosts = 15
No Snow, Fog on 2 days
Highest Barometric Pressure 1027/30.33 was the 28th
Lowest Barometric Pressure 983/29.04 was the 15th

MARCH was dominated by High Pressure which blocked the usual transition of Atlantic fronts, producing dry, settled, mild weather from the 13th to the 30th. The warmest day, was the 30th, when an exceptional temperature for March of 17.5°C was recorded. The first FEMALE ADDER and also a GRASS SNAKE were seen on the 12th in an air temperature of 12.5°C and ground reading of 26°C, in the warm March sun. The first SLOW WORM was seen on the 17th in similar temperatures to the 12th. The coldest night was on the 8th, with an air frost of -5°C and a ground frost of –8°C. With below average rainfall, the wettest day, on the 12th gave only 5.3mm.

Mean Monthly Maximum 10.4°C
Mean Monthly Minimum 4.4°C
Total Rainfall 12.mm
Air Frosts = 15, Ground Frosts = 21
Highest Barometric Pressure 1037/30.63 on the 23rd
Lowest Barometric Pressure 994/29.35 on the 13th

APRIL was also dominated by High Pressure and was the warmest for 350 years. It was also the driest since 1910, with less than 1mm of rain recorded during the entire month and only 4 days with light showers. The wettest day, the 13th, giving only 0.3mm of rain. Male adders, already basking with females, began SLOUGHING on the 8th, and thereafter, almost immediately, were engaged in combat, courtship and copulation. The warmest days were the 21st, 22nd and 23rd, with air temperatures of 23.5°C and ground readings registering 46°C to 50°C. The coldest night was on the 28th, with an air frost of –1.0°C, and ground frost of –1.5°C.

Mean Monthly Maximum 17.4°C
Mean Monthly Minimum 4.4°C
Total Rainfall 0.9mm
Air Frosts = 3, Ground Frosts = 9
Thunder on 22nd – no rain, Fog on 1 day
Highest Barometric Pressure 1026/30.30 on the 12th
Lowest Barometric Pressure 1000/2953 on the 2nd

MAY commenced with 6 days of fine settled weather and cold clear nights. The warmest day of the month occurred on the 6th, with an air temperature of 20.5°C. FEMALES in breeding condition were found to be alone on the 1st, and on the 3rd a MALE was observed displaying a noticeable PREY BULGE. Female adders began SLOUGHING exceptionally early, from the 13th onwards, (in previous years it was early June). The coldest night was on the 4th, with an air minimum of –1.0°C, and ground minimum of –4.0°C. The weather broke during the evening of the 6th, with violent thunderstorms continuing into the 7th, giving the wettest 24 hours of the month, when 23mm of rain was recorded. The unsettled weather continued for the remainder of the month, with MALE adders SLOUGHING for the 2nd time by the end (in previous years it was late June/early July).

Mean Monthly Maximum 16.9°C
Mean Monthly Minimum 6.8°C
Total Rainfall 52.1mm

This article is an extract from the Wyre Forest Study Group annual Review 2012

Air Frosts = 1, Ground Frosts = 3
Thunder on 3 days
Highest Barometric Pressure 1021/30.15 on the 15th
Lowest Barometric Pressure 998/29.47 on the 26th

JUNE despite starting with 3 fine days, was mostly unsettled, producing 16 rainy days. The wettest day was the 12th, with 15.6mm of rain, and the warmest the 26th with an air temperature of 26.5°C. The coolest nights were the 11th and 12th, with both registering an air temperature of 1.0°C.

Mean Monthly Maximum 18.5°C
Mean Monthly Minimum 7.6°C
Total Rainfall 58.6mm
No Frosts, Thunder or Fog
Highest Barometric Pressure 1030/30.41 on the 2nd
Lowest Barometric Pressure 994/29.35 on the 18th

JULY started warm with 4 fine days, the 4th being the warmest day of the month with an air temperature of 25.0°C. However, this was followed by 4 rainy days, the 5th being the wettest of the month with 10.2mm. Nevertheless, it was still a relatively dry month with below average rainfall.

Mean Monthly Maximum 20.3°C
Mean Monthly Minimum 9.4°C
Total Rainfall 37.1mm
Thunder on the 8th
Highest Barometric Pressure 1023/30.21 on the 1st
Lowest Barometric Pressure 986/29.11 on the 17th

AUGUST was drier, cooler and cloudier than average. The warmest day was the 3rd, with 26.0°C recorded. Baby SLOW WORMS and LIZARDS were seen from the 21st onwards. There were 11 days with rain and the wettest, the 24th, logging 10.2mm.

Mean Monthly Maximum 20.1°C
Mean Monthly Minimum 10.1°C
Total Rainfall 34mm
Thunder on the 25th
Highest Barometric Pressure 1022/30.15 on the 10th
Lowest Barometric Pressure 996/29.41 on the 7th

SEPTEMBER was also drier than average, albeit there were 15 days with light rain, the wettest falling on the 5th with 5.1mm. It was a warmer than average month with High Pressure dominating. The warmest days of the month, and also the year, were the 29th and 30th, with a maximum air temperature of 28.0°C. Several ADDERS were seen during the month, having returned to their now familiar hibernation areas.

Mean Monthly Maximum 18.7°C
Mean Monthly Minimum 9.4°C
Total Rainfall 29.1mm
Highest Barometric Pressure 1025/30.27 on the 27th
Lowest Barometric Pressure 991/29.26 on the 12th

OCTOBER began with 3 exceptionally warm days, with an air temperature of 26.0°C on the 1st. (In Kent it reached 29.9°C, the highest temperature ever recorded in the UK during this month). After this brief Indian Summer, the month continued in a mild vein, indeed, becoming the warmest October on record. Below average rainfall, the wettest day, the 27th, producing 13.4mm of rain. A MALE ADDER was seen on the 16th, the last sighting of the year. There were 4 air and ground frosts recorded from mid-month, the lowest on the 19th/20th, with a minimum of –1.0°C.

Mean Monthly Maximum 15.5°C
Mean Monthly Minimum 7.7°C
Total Rainfall 52.6mm
Air Frosts = 4, Ground Frosts = 4
Fog on the 26th
Highest Barometric Pressure 1026/30.30 on the 14th
Lowest Barometric Pressure 989/29.20 on the 24th

NOVEMBER was dominated by mild southerly winds, making the month drier and warmer than average. The warmest day was on the 1st, with an air temperature of 16.0°C. The coldest night occurred on the 7th, when an air frost of –1.5°C and ground frost of –2.0°C were recorded. The wettest day was the 11th with 12.2mm of rain.

Mean Monthly Maximum 11.3°C
Mean Monthly Minimum 5.1°C
Total Rainfall 52.5mm
Air Frosts = 5, Ground Frosts = 9
Fog on 3 days
Highest Barometric Pressure 1023/30.21 on the 13th
Lowest Barometric Pressure 985/29.09 on the 3rd

DECEMBER was unsettled and milder than average. The warmest days were the 8th, 25th and 26th, with air temperatures of 12.5°C. Rainfall was slightly above average with 23 rainy days, the wettest the 12th with 14.8mm. The first snow of the winter fell in the early hours of the 16th, but had already melted by dawn. During the same day rain by mid-afternoon turned to snow for half an hour, before once again reverting back to rain. Two overcast, damp days ended the month and the year.

Mean Monthly Maximum 7.8°C
Mean Monthly Minimum 0.7°C
Total Rainfall 75.3mm
Air Frosts = 16, Ground Frosts = 25
Snow on 1 day
Highest Barometric Pressure 1027/30.33 on the 27th
Lowest Barometric Pressure 980/28.94 on the 13th

2011 Weather Summary

The 2nd Warmest year on record. The Driest since 1964.
Total Rainfall/Precipitation 498.8mm (19.66 inches)
(25.54mm = 1" of rain).
Rain Days with +0.2mm - 166
Rain Days with +1.0mm - 109
Wettest Day, with 18.7mm - 7th May
Wettest Month, with 75.3mm - December
Hottest Day with 28°C - 28th and 30th September
Coldest Night –9°C in air - 31st January

BAROMETRIC PRESSURE
Highest Barometric Pressure 1030/30.44 on 2nd June
Lowest Barometric Pressure 980/28.94 on 13th December

Discussion

The RESULTS of the 2011 visual census, gives further cause for concern regarding adder populations in Wyre Forest.

TABLE 5, illustrates both the decline in the number of sites supporting adders, and also in the number of individuals observed during the active season, where the total of 86 mature adders, was the lowest since 2005, since then, more intensive volunteer surveys have been undertaken across the forest. These figures also indicate that one of the previous strongholds for the adder in Wyre Forest, on Wimperhill, (Sites 23A, B, and C) are undergoing a serious decline. In 2009, 19 males and 1 female were seen, but in 2011 only 2 males and 3 females were recorded. While the 2012 survey is obviously not discussed in this Report, it is worth mentioning that in 2012 only 1 male, and no females or juveniles were seen on Wimperhill. While this dramatic decline may be due in part to the shading out of site 23C,

Table 1: Rainfall at Knowles Mill

	Total Rainfall				
Year	mm	inches	Days with minimum 0.2mm rainfall	Maximum daily rainfall (mm)	Date of maximum 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	74.7	Jul-20
2008	930	36.67	197	37.2	Sep-05
2009	724.5	28.6	184	25	Jun-06
2010	659.2	25.99	168	27	Aug-25
2011	498.6	19.66	166	18.7	May-07

Table 2: Weather Conditions Relating to Adder Surveying

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
2008	19	23	15	11	16	23
2009	12	14	19	20	22	19
2010	12	9	15	22	19	25
2011	7	4	20	22	16	25

HERPETOFAUNA DATA – PHENOLOGY 2011

Table 3: 2011 Phenological Data

	2004	2005	2006	2007	2008	2009
Frogs Croaking	23-Jan	31-Jan	18-Jan	12-Jan	16-Jan	13-Feb
First Frogspawn	16-Feb	09-Feb	26-Feb	15-Feb	09-Feb	18-Feb
First Male adder	04-Mar	15-Feb	15-Feb	14-Feb	12-Feb	16-Feb
First common lizard	25-Mar	15-Feb	22-Feb	07-Mar	12-Feb	02-Mar
First Slow-Worm	16-Mar	18-Mar	25-Mar	07-Mar	01-Mar	25-Feb
First female adder	16-Mar	18-Mar	26-Mar	14-Feb	21-Mar	02-Mar
First grass snake	02-Apr	21-Mar	12-Apr	07-Mar	27-Mar	06-Mar
First grass snake copulation	N/S	04-Apr	N/S	N/S	01-Apr	21-Mar
First male adder slough	19-Apr	16-Apr	19-Apr	06-Apr	02-Apr	26-Mar
First adder courtship and combat	24-Apr	27-Apr	25-Apr	12-Apr	22-Apr	03-Apr
First adder mating	25-Apr	27-Apr	26-Apr	12-Apr	23-Apr	11-Apr
Last adder courtship	07-May	06-May	07-May	27-Apr	03-May	29-Apr
Last adder	05-Oct	16-Oct	20-Oct	02-Nov	21-Oct	26-Sep

WYRE FOREST ONLY

Table 4: Cumulative Data for Adders

Temperature readings taken from an electrical pocket thermometer

Year	First Sighting	Air Temp. (°C)	Grass Temp. (°C)	First Slough
1990	05-Feb	13	14	08-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	08-Apr
1998	11-Feb	13.6	12.5	17-Apr
1999	16-Feb	8	9	16-Apr
2000	19-Feb	6.3	12.5	07-Apr
2001	07-Feb	10	11.5	17-Apr
2002	11-Feb	13.5	16	09-Apr
2003	23-Feb	11	23.8	31-Mar
2004	04-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	06-Apr
2008	12-Feb	7	27	02-Apr
2009	16-Feb	11.7	13.7	26-Mar
2010	20-Feb	4	20	13-Apr
2011	12-Feb	11.5	15.6	08-Apr

Table 5: Adder Numbers

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
2008	51	24	120	35	155	6.5
2009	55	22	96	30	126	5.7
2010	55	24	83	23	106	4.4
2011	44	20	59	27	86	4.3

*Usual Sites without three new sites added
* Total when three new sites were added
FDM – Foot & Mouth Disease

Table 6: Other Reptiles Recorded in Wyre During Adder Census 2011

Year	Grass Snakes		Slow-Worms	
	Mature	Juvenile	Mature	Juvenile
1990	30	6	23	3
1991	16	4	24	11
1992	22	8	27	8
1993	45	4	57	5
1994	18	2	36	10
1995	19	4	23	13
1996	18	4	32	16
1997	25	3	42	11
1998	20	1	34	8
1999	26	8	32	9
2000	11	1	21	3
2001	Data incomplete due to FMD			
2002	7	2	14	3
2003	5	0	10	0

	Grass Snakes	Slow-worms
2004	7	18
2005	12/16*	53/71*
2006	11	49
2007	12	45
2008	34	129
2009	18	156
2010	28	124
2011	26	59

** the total with the three new sites added
FDM – Foot & Mouth Disease

sites 23A and B, have undoubtedly suffered as a result of insensitive ride and bay management. The valuable micro-habitat of heather, bracken, and coarse grasses, have been largely destroyed by harsh inapropriate mowing practices undertaken by the woodland managers.

In addition, no adders were recorded on Site 7 which once held a thriving population. This is believed to be due to the annual cattle grazing, as other meadow sites have suffered similarly under such grazing regimes. Unfortunately the sward has been reduced too low and the vegetation structure, which adders require for cover, has been destroyed. While adders will tolerate cattle in very low numbers/densities for a short period, and can benefit from extensive grazing to maintain the habitat mosaic, any increase in numbers or in the length of time they are left on site, will seriously deplete the vegetation structure and cover adders depend on for their security. There is also almost inevitably a marked increase in disturbance around basking sites, by way of heavy footfall and animal movements. In addition, the removal of the majority of scrub from the meadow in a single large scale management operation, to open up more meadow habitat, has removed the essential cover relied upon by the adders. Scrub management can be undertaken without harming reptiles by not managing all scrub at the same time, instead undertaking a staged programme, managing small areas of scrub at a time as recommended by the national Reptile Habitat Management Handbook.

While the telemetry project, undertaken in 2010, proved most enlightening, the research was limited to some extent by the battery life of the micro transmitters, which although expensive, lasted only some 6 weeks. It was felt that even more might be revealed concerning their seasonal movements, if adders could be tracked throughout the summer months. Fortunately Grow with Wyre provided the necessary funding, which enabled additional transmitters to be purchased, and this much needed research to continue.

During 2011 particular emphasis was placed on tracking the breeding females, which, after sloughing, appear to move away from the mating arena and congregate together in traditional basking spots to spend the summer months incubating their young within. It was hoped to follow several of these pregnant females through to parturition. This was only partly successful, as rather unfortunately, most of the females were to slough their skins, and consequently the tiny transmitters, at the end of August, prior to giving birth. Thereafter, given an abundance of dense bracken cover, they proved difficult to locate with any certainty. Once again, several males were also tagged in the Spring, yet, even with the aid of radio tracking, they could still prove quite elusive, especially in hot weather, when they frequented the damp humus layer, at times, even retreating underground, into existing vole and mouse burrows, where it is believed they may be waiting for, or indeed, actively seeking out their prey. Perhaps predictably, due to the intrinsic nature of this activity, many of the males lost their transmitters prematurely, usually beneath, or else within, the ground litter. While most of the tags were eventually recovered, invariably after a signal was received repeatedly from the exact same spot, and subsequently re-attached, almost inevitably, these did not usually stay in situ for too long.

However, this information, indicating that the majority of males were still present, and indeed feeding, 'on site', rather than moving away, as had previously been suspected, reinforces the requirement for sensitive woodland management around major adder sites.

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