Vanishing Viper 2016

Wide-area, Long-term Reptile Surveillance

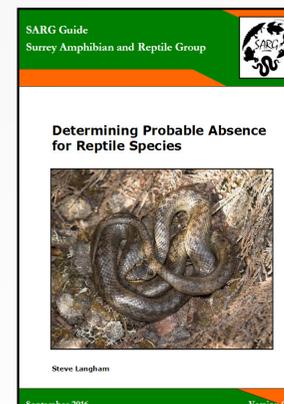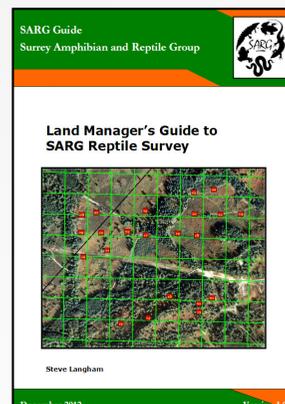*Care and Preservation of the amphibians and reptiles of Surrey*

SARG Survey Priorities

- Conservation Status assessment for reptile species
- Indicators and warnings of status change
- Informing habitat management plans
- Presence/absence appraisal (re-introductions)
- Generating evidence-based conservation data
- Minimising statistical bias
- Facilitate volunteer surveyor effort
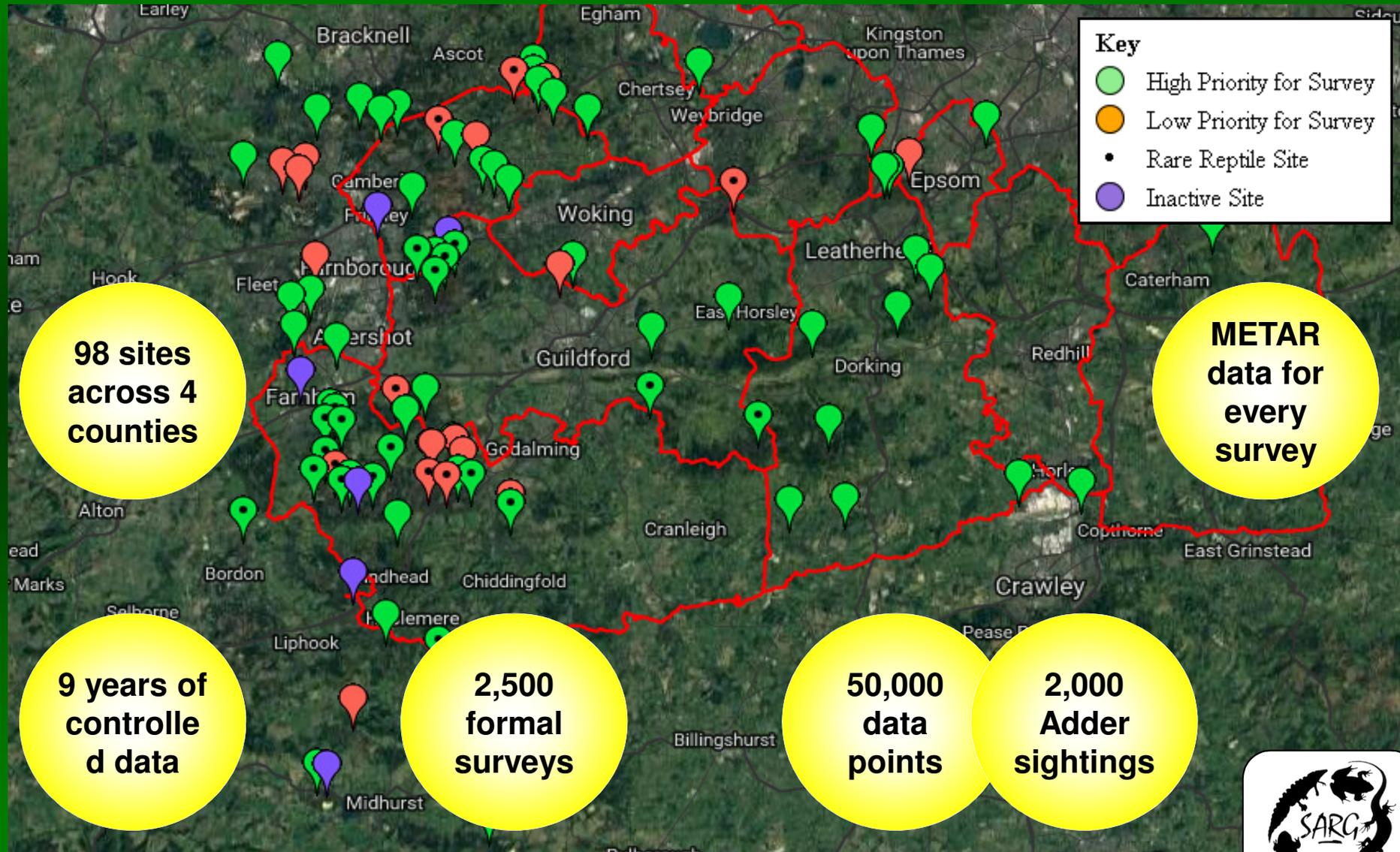- Minimise risk to people and animals

SARG Survey Process

- Combined visual and refugia transects
- Corrugated iron refugia to SARG specification
- Tin density of 1 per Ha (in 'suitable' habitat – tool assisted)
- Maximum of 30 tins per site/sub-site
- Pool of trained surveyors using SARGWEB direction
- On-line survey reporting – Time 'on' and 'off' recorded
- Goal of 10 surveys per site per annum

SARG Guide
Surrey Amphibian and Reptile Group

SARG Specification for Reptile Survey Refugia

Steve Langham

March 2011 — Version 1.0

SARG Guide
Surrey Amphibian and Reptile Group

SARG Reptile Surveyor's Guide
Using SARGWEB

Steve Langham

April 2012 — Version 1.0

SARG Guide
Surrey Amphibian and Reptile Group

Land Manager's Guide to SARG Reptile Survey

Steve Langham

December 2012 — Version 1.0

SARG Guide
Surrey Amphibian and Reptile Group

Determining Probable Absence for Reptile Species

Steve Langham

September 2016 — Version 0.2

SARG Guide
Surrey Amphibian and Reptile Group

SARG GPS User's Guide

Steve Langham

December 2012

Care and Preservation of the amphibians and reptiles of Surrey

SARG Reptile Surveillance Programme

Key
- High Priority for Survey
- Low Priority for Survey
- Rare Reptile Site
- Inactive Site

98 sites across 4 counties

METAR data for every survey

9 years of controlled data

2,500 formal surveys

50,000 data points

2,000 Adder sightings

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SARG Reptile Site Maps

Map Layers

☐	🟢	Slow worm
☐	⚫	Common lizard
☐	🟡	Grass snake
☐	🔴	Adder
☐	🟠	Sand lizard
☐	🔵	Smooth snake
☑	🟥0	Refugia
	⬛0	Missing Refugia?
☑	🅿	Parking

Site Information   GPX   Labels   Site Report   Submit Survey Report   Change Site

Care and Preservation of the amphibians and reptiles of Surrey

SARG Automated Reptile Site Reports

BNG	Reporting Period	Number of Refugia
SU 83146 58865	2008 to 2016	17 tins

County	Number of Surveys	Survey Area
Hampshire	64	24.4 Ha

District	Survey Hours	Refugia Density
Hart	86.7	0.70 tins/Ha

Reptile Species Summary

European Protected Species							
Common name	Scientific name	Occurrence	Total Recorded	Detection probability per hour			Trend	Confidence of Probable absence
				At site	In region	Comparative		
Smooth snake	*Coronella austriaca*	Not Recorded	0	0.000	0.147	N/a	N/a	85%
Sand lizard	*Lacerta agilis*	Not Recorded	0	0.000	0.100	N/a	N/a	**98%**
Other UK BAP Priority Species							
Common name	Scientific name	Occurrence	Total Recorded	Detection probability per hour			Trend	Confidence of Probable absence
				At site	In region	Comparative		
Adder	*Vipera berus*	PRESENT	82	0.575	0.317	Good (181%)	Decline	0%
Grass snake	*Natrix natrix*	PRESENT	13	0.126	0.201	Poor (63%)	Increasing	8%
Common lizard	*Zootoca vivipara*	PRESENT	104	0.408	0.389	OK (105%)	Increasing	0%
Slow worm	*Anguis fragilis*	PRESENT	97	0.610	0.512	OK (119%)	Increasing	0%

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SARG Automated Reptile Site Reports

Adder (Vipera berus)

Detectability Metrics

Year:	2008	2009	2010	2011	2012	2013	2014	2015	2016	5yr Linear Trend
Major habitat events:	None	None	None	None	None	None	None	None	Controlled Burn	
Total hours [number] of survey:	19.8 [15]	18.6 [15]	8.3 [9]	6.8 [5]	6.7 [5]	3.3 [3]	4.5 [4]	7.8 [4]	11.0 [4]	**Decline** -3.36 %
Total animals [peak] observed:	12 [3]	17 [4]	6 [2]	10 [4]	8 [2]	5 [3]	3 [1]	4 [2]	17 [7]	
Occupied hectares:	8	6	4	5	4	2	3	3	12	
Detectability per hour:	0.489	0.459	0.444	0.700	0.800	1.000	0.667	0.430	0.917	
5yr Trend chart:										

● Detectability
● Trendline

Population Fitness

Gender structure:	Number observed	Site ratio	Regional mean	Status
Males:	33	42%	41%	OK
Females:	44	57%	58%	OK

Age structure:	Number observed	Site ratio	Regional mean	Status
Adults:	62	84%	78%	OK
Sub-adults:	10	13%	14%	OK
Juveniles:	1	1%	8%	OK

Distribution for Vipera berus

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SARG Automated Reptile Site Reports

Site L

Adder (Vipera berus)

Detectability Metrics

Year:	2008	2009	2010	2011	2012	2013	2014	2015	2016	5yr Linear Trend
Major habitat events:	None	None	Wildfire	None	None	None	None	None	None	
Total hours [number] of survey:	0.0 [0]	37.6 [15]	32.7 [14]	3.0 [1]	9.8 [4]	5.2 [2]	17.8 [7]	14.5 [5]	7.9 [3]	**Stable -** -0.92 %
Total animals [peak] observed:	0 [0]	15 [5]	21 [5]	0 [0]	4 [3]	5 [4]	18 [6]	11 [4]	5 [5]	
Occupied hectares:	0	9	14	0	3	2	9	7	3	
Detectability per hour:	0.000	0.344	0.559	0.000	0.350	0.658	0.686	0.600	0.333	

5yr Trend chart:

● Detectability
● Trendline

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SARG Automated Reptile Site Reports

Site Y

Adder (Vipera berus)

Detectability Metrics

Year:	2008	2009	2010	2011	2012	2013	2014	2015	2016	5yr Linear Trend
Major habitat events:	None	None	None	None	None	None	None	None	Controlled Burn	**Decline** -3.36 %
Total hours [number] of survey:	19.8 [15]	18.6 [15]	8.3 [9]	6.8 [5]	6.7 [5]	3.3 [3]	4.5 [4]	7.8 [4]	11.0 [4]	
Total animals [peak] observed:	12 [3]	17 [4]	6 [2]	10 [4]	8 [2]	5 [3]	3 [1]	4 [2]	17 [7]	
Occupied hectares:	8	6	4	5	4	2	3	3	12	
Detectability per hour:	0.489	0.459	0.444	0.700	0.800	1.000	0.667	0.430	0.917	
5yr Trend chart:										● Detectability ● Trendline
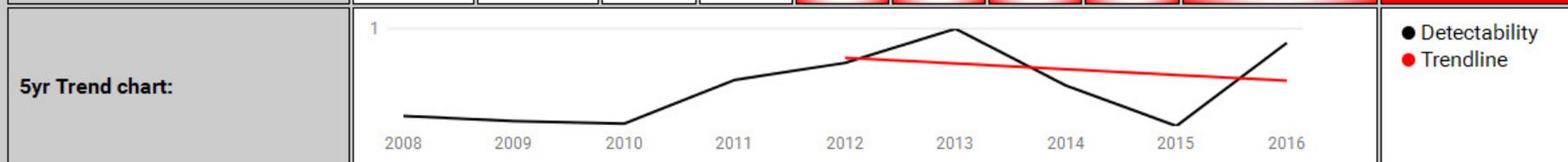
Site C

Adder (Vipera berus)

Detectability Metrics

Year:	2008	2009	2010	2011	2012	2013	2014	2015	2016	5yr Linear Trend
Major habitat events:	None	None	None	None	None	None	None	None	None	**Decline** -3.96 %
Total hours [number] of survey:	18.0 [10]	8.8 [6]	21.7 [14]	21.9 [12]	18.6 [11]	15.3 [9]	20.8 [11]	16.2 [9]	11.2 [7]	
Total animals [peak] observed:	2 [2]	0 [0]	5 [1]	0 [0]	2 [1]	13 [4]	4 [2]	4 [2]	1 [1]	
Occupied hectares:	1	0	3	0	2	6	3	3	1	
Detectability per hour:	0.067	0.000	0.228	0.000	0.138	0.515	0.184	0.181	0.107	
5yr Trend chart:										● Detectability ● Trendline

Care and Preservation of the amphibians and reptiles of Surrey

SARG Automated Reptile Site Reports

All Sites Supporting Adder

Adder *(Vipera berus)*

Detectability Metrics

Year:	2008	2009	2010	2011	2012	2013	2014	2015	2016	5yr Linear Trend
Major habitat events:	None	None	None	None	None	None	None	None	None	
Total hours [number] of survey:	147.3 [100]	372.3 [210]	515.3 [261]	460.6 [286]	484.2 [281]	449.7 [246]	562.6 [303]	568.9 [270]	522.4 [258]	**Increasing** 1.17 %
Total animals [peak] observed:	75 [5]	112 [6]	205 [8]	213 [7]	193 [9]	222 [7]	278 [9]	345 [11]	257 [13]	
Occupied hectares:	46	55	117	116	117	135	150	177	150	
Detectability per hour:	0.328	0.243	0.304	0.317	0.269	0.351	0.335	0.400	0.303	
5yr Trend chart:										

● Detectability
● Trendline

Care and Preservation of the amphibians and reptiles of Surrey

Statistical Indications

Question	Indication	Deduction
Do the number of sightings increase with survey duration?	Yes	Detectability must be normalised by time, not by survey
Do the number of sightings increase with surveyor skill?	Yes	Use a pool of surveyors to minimise surveyor bias (averages skill levels)
Do the number of sightings increase with refugia density?	No	Wider areas can be surveyed, do not cluster tins in apparently ideal habitat
Does a grid-based laydown find animals in apparently unsuitable areas?	Yes	We need to research reptile HSIs, as we are very poor at this
Is there a good way to measure surveyor skill?	Yes	The ratio of 'open' sightings to under refugia sightings across many surveys.

Conclusions

- ## Negatives

    - **Increased detectability does not necessarily mean an increase in status (it can signal the opposite!).**

    - **The same is true for occupied area and peak counts.**

    - **Conventional field survey may not be the best way to determine conservation status.**

    - **If this isn't the way to calculate status, what are we left with?**

- ## Positives

    - **This approach seems to be a good way to determine and calculate presence & probable absence (supporting re-introduction targets).**

    - **Site distribution maps can be generated that support habitat management plans.**

    - **The automated reports can signal a change, but cannot say whether that change is for better or worse.**

End

Seeing more adders does **not** mean there **are** more adders.
It just means you've seen more.

Detectability is a poor proxy for population estimation.