# A pilot survey for the grass snake *Natrix natrix helvetica* on the Island of Jersey (Channel Islands)


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## Summary

In late September 2006 we conducted a survey over 4 days on the Island of Jersey to preliminary investigate areas containing the rare and elusive grass snake (*Natrix natrix helvetica*).

The aim of the survey was to inspect the major known habitats for the grass snake on Jersey in order to provide recommendations for future surveying and to conduct Visual Encounter Surveys (VES) at sites that would help determine an enhanced protocol for future surveys anticipated for 2007.

We investigated several habitats on the island believed to contain grass snakes. We encountered 2 specimens from 2 separate areas and discovered habitats likely to contain grass snakes.

This report summarises the above findings and provides commentary on the effectiveness of survey methods for grass snakes on the Island.

The survey was approved and permitted by Nina Hall of the Jersey State Environment Division based at Howard Davis Farm, Route de la Trinite, Trinity.

## Introduction

The grass snake is a large (up to 200cm) non-venomous species of water snake belonging to the Colubridae family. The species typically inhabits moist fields, meadows, riparian habitats, hedgerows and sea coasts where it freely swims and forages for a range of aquatic prey including amphibians, fish, large invertebrates, small mammals and occasional nesting birds (Beebee & Griffiths 2000; Arnold & Ovenden 2002). Grass snakes are mostly diurnal although they are also crepuscular in summer months and where they exist in hotter climates.

This species occurs from sea level up to 2400m naturally throughout most of Europe. Its range extends from southern Norway and Sweden, through middle Europe to parts of southwest Russia, the Balearics, various Greek islands and sporadically in northwest Africa (Arnold & Ovenden 2002).

Where they do occur grass snakes are a fairly common snake across their range and habitat (Beebee & Griffiths 2000). However, on Jersey the species is reportedly the rarest reptile found on the Island (Hall 2002; McMillan 2003). On Jersey it occurs patchily in the northwest and southwest of the island where it thrives in a range of natural and secondary habitats (Sinel 1908; Le Sueur 1976). Recent analyses have shown grass snakes to be in their strongest hold on the west southwest of the Island (Hall 2002).

### Previous Surveys

Survey work carried out in 2002 across 5 different locations revealed some important sites for the grass snake (Hall 2002). The most important site was found to be the Les Blanches Banques. At this site the majority of grass snakes were found using survey transects and artificial refugia or cover objects.

Hall (2002) describes the varied habitat types at Les Blanches Banques that include blocks of gorse/heath, short-turf sand dunes, unrefined grassland, bogs, sporadic secondary semi-mature woodland and numerous permanent and ephemeral pools.

Hall's (2002) study also incorporated a leaflet survey supplied to the local agricultural communities asking for records of known sightings of grass snakes. The results showed a wider diversity of habitats potentially existing for grass snakes.

A detailed survey at Ouaisné Common by McMillan (2003) detected a number of grass snakes at Ouaisné and details 5 large adults encountered at the site, 3 of which received PIT tags for further mark-recapture studies.

This survey mentioned herein describes a visit to the main popular areas where grass snakes have been noted on Jersey and describes the habitat condition and specimens observed.

## Methods

### Survey Methods

There are essentially two fundamental methods for surveying wild diurnal snakes; visual encounter surveys (VES) and the use of artificial cover objects (ACO). The former method involves walking linear and non-linear lines carefully through potential habitat and visually scanning for snakes. The latter method involves placing natural and man-made refugia within suitable basking areas for reptiles and searching under them to find sheltering snakes (see English Nature 1996; Seigel *et al.* 2002).

Surveying for reptiles can be thwarted with environmental and stochastic variables that can render efforts and results biased or incomplete if they are not conducted appropriately (English Nature 1996).

This survey was intended as a preliminary investigation, and therefore with respect to the limited amount of time that we had on the Island, we could not adequately survey using a range of techniques in a replicated manner. Therefore we chose to adopt a scoping survey approach to investigate areas. Visual encounter surveys (VES) were considered to be the most appropriate survey technique due to our time constraints (4 days in September).

We chose not to construct an artificial cover objects (ACOs) regime as part of the study as this technique would not have allowed sufficient time for ACOs to create the correct climatic conditions to be most affectively used by resident grass snakes.

Instead of abandoning ACOs as a method we chose to search underneath naturally occurring refugia found at sites. This included debris, wooden boards and discarded waste.

### Data Collected

The habitat type at each site was noted from each survey visit, along with the length of time surveying, weather conditions, on site temperatures and humidity.

Specific habitat features such as suitable aestivation, foraging and breeding sites for grass snakes were also noted during survey visits. This information shall assist in determining site choices for further surveys in 2007.

**Morphometric Analysis**

Morphometric measurements of specimens encountered were also taken during the survey. Morphometric measurements are useful to help understand the size, health and dynamics of grass snake populations.

Grass snakes encountered were captured by hand and where necessary by use of a herpetologists hook. Specimens were placed into a cloth bag to calm the animals prior to further handling whilst measuring and weighing.

The following measurements (Table 1) were taken from each individual animal found during the survey:

**Table 1. Summary of measurements taken from captured grass snakes.**

| **Measurement** | **How? (units)** |
|---|---|
| Snout to vent length | Using a metre rule or tape (mm) |
| Vent to Tail Length | Using a metre rule tape (mm) |
| Head Width | Using a rule (mm) |
| Head length | Using a rule (mm) |
| Weight | Using suitable vessel on Tanita Super mini 1220 scale/Giros PG 500 scale or cloth bag and pesola scale (g) |
| Sub caudal scale counts | Visual count of paired scales on the tail from the vent to tip |
| Ventral pattern of the snake | Digital photograph of approx 15 to 20 scales from the head |
| Other notes | Scars and other marks on the body |

## Results

### Site Visits and Locations

Over the trip we visited 6 sites for the grass snake survey. The majority of the visits were to Ouaisne Common (5 in total) and Les Blanches Banques/Creepy Valley (7) (see Table 2.). Brief visits were also made to Noirmount, Les Landes de Quest and St Ouens Pond.

The sites visited corresponded with the previously identified hot spots where grass snakes were encountered in Jersey (Hall, 2002).

**Table 2. Summary of site visits over 21st to 26th September 2006.**

| Site Name | Number of visits |
|---|---|
| Ouaisne Common | 5 |
| Creepy Valley | 4 |
| Les Blanches Banques | 3 |
| Noirmount | 1 |
| Les Landes de Quest | 1 |
| St Ouens Pond | 1 |

### Grass Snake Encounters

Two individual grass snakes were located during the survey at two different locations. An adult grass snake was found on Les Blanches Banques (24th September) and a hatchling found at Ouaisne (22nd September).

**Table 3. Summary of snake captured at Ouaisné Common on the 22nd September 2006.**

| **Survey method** | **Time** | **Temp (air)** | **Humidity** | **Cloud** | **Wind** |
|---|---|---|---|---|---|
| Visual Encounter Ssurvey | 13.25pm | 24.5C | 58% | 7/8 | Light |
| **Age** | **Snout Vent Length** | **Vent Tail Length** | **Total Length** | **Weight** | **Head Length** |
| Hatchling | 141mm +/- 0.5mm | 42mm +/- 0.5mm | 183mm +/- 0.5mm | 2.5g | 11mm |
| **Head Width** | **Habitat** | | | | |
| 6mm | Edge of gorse near habitat pile | | | | |

**Table 4. Summary of snake captured at Les Blanches Banques 24th September 2006.**

| **Survey method** | **Time** | **Temp (air)** | **Humidity** | **Cloud** | **Wind** |
|---|---|---|---|---|---|
| Visual Encounter Ssurvey | 16.30pm | 24.5C | 56.5 to 55% | 3/8 | up to 6mph |
| **Age** | **Snout Vent Length** | **Vent Tail Length** | **Total Length** | **Weight** | **Head Length** |
| Adult male | 572mm +/- 0.5mm | 147mm +/- 0.5mm | 719mm +/- 0.5mm | 91g | 21mm |
| **Head Width** | **Ventral Scale count** | **Sub Caudal Scale count** | **Dorsal Scale Count** | **Habitat** | |
| 16.0mm | 169 | 63 | 17 | Sandy rough grassland | |

## Discussion

### Reptiles Encountered

We located 2 individual grass snakes at two individual sites during the 4 days of survey. The first was a hatchling which was found on Ouaisné Common. The second was an adult male snake found at Les Blanches Banques.

The hatchling individual found at Ouaisné was located toward the rear of the reserve in a small open area of semi-natural grassland bordered by Gorse (*Ulex europaeus*). The individual was found basking in a small grass tussock next to a pile of previously cut and decomposing Gorse on the periphery of the grassland area.

The adult found at Les Blanches Banques was encountered on sand dune habitat in the open, moving across a sunlit patch of dune tussock. Sand dune habitat at Les Blanches Banques was previously reported as good habitat by Hall (2002). The exact location where we found our specimen on Les Blanches Banques was a result of advice offered from Alasdair McMillan. Alasdair had previously visited the area and had found grass snakes amongst this particular area of dune habitat during the summer.

An additional sighting was reported at Ouaisné by Tim Liddard, the site warden when we had met up again at the States of Jersey Environment Department on the 25th September. He had spotted an adult grass snake when he had returned to the site after our first site meeting on the 22nd September. Over the survey period in total three grass snakes were spotted.

Creepy Valley was one of the main hot spots for finding grass snakes in the survey undertaken by Hall (2002). Our survey at Creepy Valley failed to detect the presence of grass snakes despite repeated attempts to find them in suitable basking areas. However, this does not imply that grass snakes do not exist at the site. Poorer weather, regular human presence and/or stochastic reasons may have negated locating specimens.

Slow-worms (*Angius fragilis*) were spotted amongst the woodland habitat surveyed at Creepy Valley. A local dog walker also explained that the woodland area had many grass snakes during the spring and mentioned that snakes were also found on the golf course nearby (Anon *pers. comm.*).

**Survey Methodology**

Previous survey work at Ouaisné Common by McMillan (2003) used artificial cover objects and detected 5 grass snakes. This was achieved over 30 visits from March to October and utilised 60 artificial cover objects (felt tiles).

The low encounters of grass snakes found during McMillan's (2003) survey are not easily concluded and may simply be attributable to the grass snake's low natural abundance on the Island. This feature is a common occurrence among other patchily distributed snake species (Seigel *et al.* 2002).

It is also arguably possible that the methods used relied heavily upon the use of ACOs or naturally occurring refugia cover objects. Use of such a method solely can have a variable success rate when trying to detect presence of snakes (English Nature 1996). It would therefore potentially be expected that further results could be obtained by using a stratified VES and further ACO survey method over an entire reptile survey season.

Our preliminary survey was more targeted at detecting snakes via visual disturbance in a relatively short amount of time due to the strong use of VES. The use of VES has been reported by some field workers to be the best way to sample snakes (Pat Gregory *pers. comm*). When considering the rarity of the grass snake on Jersey with the 6.3 hour/ snake survey success of McMillan's (2003) survey, it is possible that use of a stronger preference for VES over ACO may allow a wider area to be surveyed in a single morning over several sites.

Also, considering the fairly wide habitat territory and feeding range of grass snakes (3-120ha) and their renowned nomadic movements (10-300m/day) (Arnold & Ovenden 2004), it would seem logically preferable to use VES throughout the active season as a preferred choice of survey and perhaps use ACO surveying more strategically in identified hotspots to reduce core man hours spent surveying.

Recent studies in southeast and southern England have also suggested that large refugia or cover objects are the most successful in detecting reptiles (Herpetologic Sources *pers. comm.*). With respect to snakes there are clear preferences for certain materials such as corrugated iron sheets which have been found to be more effective for species like adders (*Vipera berus*) and larger grass snakes (L D Brady *pers. comm.* 2004, Smith *pers. comm.* 2005). Owing to the large size of adult grass snakes on Jersey (with reference to McMillan 2003 data) it may also be wise to consider larger ACOs for target areas. Jon Cranfield's (*Pers. comm.*) own observations and continual seasonal

records for adders and grass snakes in England suggest that visual surveys are effective in detecting larger species of temperate snakes such as grass snakes.

Studies have shown that grass snakes tend to favour linear habitats such as walls, hedgerows, ditches and other habitats which provide cover such as bramble thickets and bracken (Madsen 1984). Such data may adequately challenge the notion of grass snakes only existing on hotspots on Jersey and coupled with Halls (2002) findings from the community questionnaire survey should open new doors to areas to visited or even surveyed.

**Recommendations**

We recommend that future surveys for grass snakes on Jersey should continue to fulfil the following aims and objectives detailed in the biodiversity grass snake action plan:-

4.1 improve our understanding of the distribution and status of the species through further survey work.

4.2 Further our understanding of the ecology and habitat needs of grass snakes.

4.4 Monitor present sites to identify possible local threats to the population in the Island.

We recommend that recent records of grass snakes made by surveyors from the Durrell Conservation Trust at Jersey Zoo, who have been regularly surveying sites in Jersey, be collated.

Future survey should be based on transects across known sites targeting the most suitable habitat for the grass snake. Habitat features such as sand dunes, hedges, ditches and structurally diverse habitats should be surveyed repeatedly throughout the active season.

The location of hibernation sites within these habitats would be key to identifying permanent homestead areas of grass snakes on the Island. This information would be useful to plan habitat management works which are sympathetic towards the grass snake as outlined in action 4.3 of the grass snake action plan (States of Jersey 2006). Surveys in the early part of the year should aim to look for suitable habitats which may be used for overwintering;

groups of snakes basking together may indicate the location of an overwintering area.

In order to maximise the effectiveness of future surveys on habitat features they should ideally comprise VES with targeted ACO placement only. The use of refugia/ACOs should ideally be considered for summer sampling of snakes in their foraging grounds and include a mixture of corrugated tin and heavy duty roofing felt. Studies in England have shown that larger sized ACOs (at least 0.5m² or larger) are more effective in detecting grass snakes than smaller ACOs (Nick Smith *pers. comm*.). A minimum size of at least 0.5m² is recommended.

From emergence the snakes will mate and disperse to foraging and breeding sites. The use of artificial refugia should be used to sample snakes within summer feeding grounds where foliage and vegetation may obscure visual surveys.

**Training sessions**

In order to help local volunteers to carry out grass snake surveys, workshops or training sessions could be organised in the earlier part of the year.

Training for local surveyors should be arranged on Jersey. This could be delivered as a workshop to encourage input from other surveyors and to help coordinate future site visits.

The workshop should ideally include a morning of theory, methods etc. and then half a day in the field to demonstrate the survey methods.

Non target reptile species (green lizards and slow-worms) should also be covered by the training course. Surveyors should be encouraged to record these species during grass snake surveys, to provide further information on local reptile populations and to provide additional interest for the local volunteers.

Todd Lewis and I have provided survey and mitigation training to members of the Institute of Ecology and Environmental Management (IEEM). Jon Cranfield has provided training events to volunteers in Essex, Hampshire and Surrey as part of his activities involved with the ARG UK (amphibian & reptile groups of the UK) www.arg-uk.org.uk

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