

**HERPETOFAUNA SURVEY OF BROADWATER WARREN,
TUNBRIDGE WELLS, KENT (TQ 555 368)**

JUNE 2008



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CONTENTS

- 1.0 Introduction**
- 2.0 Legal Protection of Native Reptiles & Amphibians**
- 3.0 Location of site**
- 4.0 Existing records**
- 5.0 Terrestrial Habitats**
- 6.0 Aquatic habitats**
- 7.0 Field surveys**
- 8.0 Survey constraints**
- 9.0 Survey results**
- 10.0 Interpreting the results**
- 11.0 Overview of mitigation measures**
- 12.0 References**
- 13.0 Maps**

1.0 Introduction

This report was commissioned by the *Royal Society for the Protection of Birds (RSPB)* to ascertain the presence or absence of protected herpetofauna (reptiles and amphibians) at Broadwater Warren, in regard to proposals for deforestation and heathland restoration in order to enhance the site as a heathland habitat for birds. These proposals constitute a relevant project under the Environmental Impact Regulations (Forestry) Regulations 1999 and therefore a submission is required to the Forestry Commission for consent.

2.0 Legal Protection of Native Reptiles & Amphibians

The Wildlife & Countryside Act 1981 protects Grass snake (*Natrix natrix*), Adder (*Vipera berus*) Slow-worm (*Anguis fragilis*) and Common lizard (*Zootoca vivipara*) against deliberate killing and injuring (subsection 9.1)

In addition the Sand lizard (*Lacerta agilis*), Smooth snake (*Coronella austriaca*), Natterjack toad (*Bufo calamita*) and Great crested newt (*Triturus cristatus*) receive full protection under the Act and are also protected under the Conservation Regulations of 1994 (Natural Habitats).

Legal protection of the Great crested newt (GCN) makes it an offence to kill, injure, capture or disturb them or obstruct their access to areas where they live and breed. The law applies to eggs, tadpoles, juveniles and adults.

The Countryside & Rights of Way Act (CRoW) 2000 amends the existing Wildlife & Countryside Act by making it an offence to cause reckless damage, destruction or disturbance to GCN or their habitat. This protection covers an area a distance of 500m from the breeding site.

The common amphibians, i.e., Common frog (*Rana temporaria*), Common toad (*Bufo bufo*), Palmate newt (*Triturus helveticus*) and Smooth newt (*Triturus vulgaris*) have no legal protection other than that provided by subsection 9.5. of the Wildlife & Countryside Act which makes it an offence to sell them. General animal welfare guidelines do still apply to these species.

3.0 Location of site (see Fig.1)

Broadwater Warren is part of the larger Broadwater Forest located to the south west of Tunbridge Wells between Groombridge and Eridge in East Sussex. It lies within the High Weald Area of Outstanding Natural Beauty. Eridge Rocks SSSI borders the southern boundary of the site. The area currently owned by RSPB covers some 180 Ha. The central NGR for the site is TQ 555 368.

4.0 Existing records

Data supplied by the Sussex Biodiversity Record Centre revealed only one record for herpetofauna within the site, that of a Common lizard (1995).

SxBRC also identifies GCN within a redundant sewage works at Broom Lane some 1000m from Broadwater Warren (Kemp, 2005). However, other records for all species of herpetofauna are held at SxBRC (although not shown in the data compiled for this report) for the extensive herpetofauna populations at this site (Kemp 2005-8), plus records for GCN some 800m from Broadwater Warren (Kemp 2008).

5.0 Terrestrial habitats (see Figs. 2 & 4)

Broadwater Warren consists of a mosaic of habitats with predominately coniferous woodland planted 50 years ago as a timber crop. Extensive areas of self seeded conifer also exist as do areas of broadleaf woodland. Parts of Broadwater Warren are designated Ancient woodland by Wealden District Council.

Areas of rough grassland, scrub, wet woodland, remnant wet and dry heathland and valley mire are also present. This mosaic of habitats provides ideal habitat for herpetofauna.

5.1 Area A (TQ 55856 36429 & TQ 55900 36431)

Area A can be split into 2 habitat types :

Area A¹ lies within compartment 13 and consists largely of conifer plantation. Area A² lies within compartment 7 and consists of broadleaf woodland with areas of Rhododendron (*Rhododendron ponticum*). Both parts of Area A tended to be consistently damp throughout the survey period and were fairly shaded. Area A¹ is situated within compartment 13 and A² compartment 7. Area A² was subject to scrub clearance during the 2008 survey period.

5.2 Area B (TQ 5584 36727)

Area B lies within compartment 1 and is adjacent to a conifer plantation and a footpath within compartment 1 and consists of edge habitats of the type often favoured by reptiles including of bracken (*Pteridium aquilinum*), heather and rough grassland. Situated in compartment 1.

5.3 Area C (TQ 55730 36859)

Similar to Area B but adjacent to a less used footpath. Includes an area of open coniferous woodland. Situated in compartment 1.

5.4 Area D (TQ 55019 36909)

An area of rough grassland and bracken on the corner of a conifer plantation and broadleaved woodland within compartment 31.

5.5 Area E (TQ 54767 36916)

Tussocky wet grassland adjacent to area of mire and surrounded by mixed woodland within compartment 28/29. Subject to scrub clearance during the 2008 survey period.

5.6 Area F (TQ 54569 36707)

An area of tussocky dry grassland with heathland remnant, scrub and secondary Birch. Provides very good reptile habitat. Within compartment 30. Subject to scrub clearance during the survey 2008 period.

6.0 Aquatic habitats (see Figs. 3 & 4)

6.1 Wb1 & Wb2 (TQ 54720 37156)

These two ponds lie within an area of broadleaf wet woodland in compartments 27 and 28 known as 'The Peatty ponds'. At times of high rainfall the area is a network of shallow standing water creating many pools. Wb1 and Wb2 would appear to be permanent ponds. Maximum depth was approximately 300mm. The ponds are typical of most woodland ponds in that they are heavily overshadowed by trees and as a result have high levels of leaf litter with very little aquatic vegetation.

A fast flowing stream runs through the area. The stream is not suitable for amphibians due to the excessive flow, which would prevent newt courtship displays and egg laying activities. A Brown trout (*Salmo trutta*), which are a highly predatory species was recorded in the stream on several occasions.

6.2 Wb3 (TQ 55019 36909)

Wb3 lies between compartments 29 and 31 and is a drainage ditch of varying width and of a maximum depth of 300mm. It is situated adjacent to an area of rough grassland and bracken.

It was noted to hold water for the entire survey period and in places was vegetated with Starwort (*Callitriche stagnalis*).

6.3 Wb4 (TQ 55022 36904)

Wb4 is a stream fed pond amongst broad leaved woodland in compartment 29. It measures approximately 3m x 5m. Maximum depth recorded was approximately 200mm. It contained no aquatic or vegetation although moss is abundant around its margins. The pond is probably ephemeral but contained water throughout the survey period. 90% of the shoreline is shaded by trees.

6.4 Wb5 (TQ 55180 37022)

A small depression of approximately 3m in diameter and 600mm deep within an area of coniferous woodland situated in compartment 21. The pond was 100% shaded by trees and dry towards the end of the survey period. Lies within compartment 21.

6.5 Wb6 (TQ 55046 36774)

A narrow ditch on the edge of coniferous woodland. Maximum depth of 200mm. Wb6 dried out for part of the survey period. Lies within compartment 22.

6.6 Wb7 (TQ 55086 36618)

A pool formed by the meander of the stream. No aquatic vegetation was present. Maximum depth of 400mm. Lies within compartment 18.

6.7 Wb8 (TQ 55699 36890)

A 1m wide ditch of approximately 300mm deep. Contained some Starwort and Soft rush (*Juncus effusus*) but dry towards the end of the survey period.

6.8 Wb9 (TQ 55508 36724)

A fairly large pond of approximately 12m x 10m with a depth of 500mm. It contained water throughout the survey period, being fed by a stream. 95% shaded with no aquatic vegetation. Lies within compartment 1.

6.9 Wb10 (TQ 55555 36692)

A number of small shallow ephemeral pools formed during periods of heavy rainfall. Situated in compartment 1 around the 'Butts'. These pools contain no aquatic or marginal plants and are likely to be fairly acidic. All pools were dry towards the end of the survey period.

6.10 Wb11 (TQ 55940 36501)

A woodland pond of approximately 6m in diameter with a depth of 400mm set in an area of wet woodland. Some Broad-leaved pondweed (*Potamogeton natans*) developed towards the end of the survey period. Identified late in the survey period the pond held water throughout. Lies within compartment 14.

6.11 Wb12 (TQ 55859 36434)

A large pond of approximately 75m x 16m and thought to be created as a decoy pond. Set within an area of wet woodland in compartment 37. Permanently holds water being fed by the stream and subject to constant inflow/outflow of water. Contains a large area of open water and extensive shallow water with aquatic and marginal vegetation including Starwort, Broad-leaved pondweed, Yellow flag (*Iris pseudacorus*), and Gypsywort (*Lycopus europaeus*). 40% shaded by trees. 10% of the shoreline was accessible for survey.

6.12 Wb13 (TQ 55900 36431)

A shallow 's' shaped stream fed pool with an outflow to Wb 12. 70% shaded by trees there was no aquatic vegetation throughout the survey period. Contained water throughout the survey period. Lies within compartment 7.

7.0 Field surveys

7.1 Objectives of the surveys

These surveys were undertaken to establish the presence or absence of legally protected reptiles and GCN and also, as part of the EIA, to comment on the amphibian assemblages within the site in order to provide a better insight into the nature conservation value of the area.

7.2 Reptile survey (see Fig.2)

English Nature Best Practice guidelines recommend surveying for reptiles during suitable weather between March and October with April, May and September being the optimum periods.

A total of 60 refugia sheets (1m squares of heavy duty roofing felt and corrugated iron) were placed in 6 areas (Areas A-F) on 13th September 2007. These refugia and other appropriate materials already on site were checked on 7 occasions during suitable weather between 24th September 2007 and 1st May 2008.

Survey areas were selected to represent a mixture of areas with varying potential for reptiles with some areas being targeted which were the site of proposed deforestation and other areas which were targeted because they represented prime reptile habitat.

Survey stopped on 5th October 2007 when conditions became unsuitable for reptiles. Survey restarted on 3rd April 2008 following the emergence of reptiles from hibernation recorded at other sites in Sussex and Kent.

7.3 Amphibian survey (see Fig.3)

English Nature Best Practice guidelines for presence/absence survey of GCN require four site visits using torching, bottle-trapping and egg searching between mid-March and mid-June with at least two visits during mid-April to mid-May.

Best Practice guidelines for population size assessment of GCN populations recommends six site visits using torching and bottle-trapping between mid-March and mid-June with at least three visits during mid-April to mid-May.

A daytime walkover of the Warren was conducted during July 2007 to identify possible amphibian breeding sites. 13 waterbodies (ponds and sections of ditch) were identified for further study.

Artificial egg strips were placed in ponds with no aquatic vegetation and were checked on all subsequent visits for evidence of egg laying.

Evening surveys commenced on 2nd April 2008 when GCN and other amphibians had been recorded at other sites in Sussex and Kent.

The survey method employed used standard 1 million candlepower torches. It was possible to torch all the waterbodies throughout the survey period as water quality was good. Torching is accepted to be the most efficient survey method providing that the water is reasonably clear and the pond is not overly vegetated with aquatic plants. Torching was also favoured as a survey method as it is much less invasive than bottle trapping which interrupts egg laying activities of newts and has the potential to cause the death of amphibians and Water shrews, particularly where there are large populations of these species.

Egg searching of aquatic and marginal plants and artificial egg strips was also conducted on each occasion.

GCN survey was conducted by Barry Kemp under licence to Natural England (licence number 20080708).

8.0 Survey constraints

8.1 Reptiles

The reptile survey was constrained by a number of factors. Funding restrictions resulted in only a tiny proportion of the total area (some 180 Ha) of Broadwater Warren being surveyed. In addition, the number of survey visits was restricted to seven which is generally accepted to be sufficient only for presence/absence assessment for reptiles. Suitable survey effort for a population estimate for reptiles is given to be in the region of 20-30 survey visits. (*Froglife, 1999 : Reptile survey, an introduction to planning, conducting and interpreting surveys for snake & lizard conservation.*)

Surveying for reptiles involves the use of artificial refugia and also the observation of animals in the surrounding habitat. The efficiency of surveying can be increased by careful identification of reptile foci such as south facing banks, interface between different vegetation types or structure and hibernation areas etc.

The abundance of optimum habitat within the site will have resulted in the likelihood of reptiles using artificial refugia being greatly reduced. However some reptiles, particularly Common lizard, tend not to use refugia as much other species (Slow worms for example), so similarly this species can also be under recorded across large areas of optimal habitat.

Clearance of scrub and birch surrounding some of the survey areas (particularly E and F) resulted in a marked increase in good quality reptile habitat which, conversely, made sightings more difficult in these areas after the clearance.

8.2 Amphibians

There were no constraining factors regarding amphibian surveys.

Bottle trapping was not employed for the reasons outlined in section 7.3, however the clear water present in all the waterbodies made torch survey the most efficient survey method.

9.0 Survey results

9.1 Reptile survey

Date	Area	Slow worm			Common lizard			Adder			Grass snake
		Male	Female	Juvenile	Male	Female	Juvenile	Male	Female	Juvenile	
24/09/07	A	-	-	-	-	-	-	-	-	-	-
	B	-	-	-	1	-	-	-	-	-	-
	C	-	-	-	1	-	-	-	-	-	-
	D	-	1	-	-	-	-	-	-	-	-
	E	-	-	-	-	1	-	-	-	-	-
	F	-	-	-	1	2	-	-	-	-	-
	c2	-	-	-	2	2	-	-	-	-	-
	c9	-	-	-	1	-	-	-	-	-	-
	c11	-	-	-	1	-	-	-	-	-	-
c31	-	-	-	-	1	-	-	-	-	-	
05/10/07	A	-	-	-	-	-	-	-	-	-	-
	B	-	-	1	-	1	-	-	-	-	-
	C	-	-	-	-	-	-	-	-	-	-
	D	-	-	-	2	-	3	-	-	-	-
	E	-	-	-	1	-	-	-	-	-	-
	F	-	-	-	1	3	1	-	-	-	-
	c2	-	-	-	1	-	-	-	-	-	-
	c7	-	-	-	1	1	-	-	-	-	-
	c17	-	-	-	1	2	-	-	-	-	-
	c22	-	-	-	-	1	-	-	-	-	-
c28	-	-	-	-	1	-	-	-	-	-	
03/04/08	A	-	-	-	-	-	-	-	-	-	-
	B	2	1	2	-	-	-	-	-	-	-
	C	1	-	-	1	-	-	-	-	-	-
	D	-	-	2	-	1	-	-	-	-	-
	E	-	1	-	-	-	-	-	-	-	-
	F	-	-	-	-	2	-	-	-	-	-
	c9	-	-	-	1	-	-	-	-	-	-
	c10	-	-	1	2	-	-	-	-	-	-
	c11	-	-	-	-	1	-	-	-	-	-
10/04/08	A	-	-	-	-	-	-	-	-	-	-
	B	2	-	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-	-	-	-
	D	-	1	-	-	1	-	-	-	-	-
	E	-	-	-	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-	-	-	-
	c11	-	-	-	1	-	-	-	-	-	-
	c19	-	-	-	2	3	-	-	-	-	-
15/04/08	A	-	-	-	-	-	-	-	-	-	-
	B	-	-	-	-	-	-	-	-	-	-
	C	-	1	1	-	-	-	-	-	-	-
	D	-	-	-	1	-	-	-	-	-	-
	E	-	-	-	1	2	-	-	-	-	-
	F	-	-	-	-	-	-	-	-	-	-
	c9	-	-	-	-	1	-	-	-	-	-
	c19	-	-	-	-	1	-	-	-	-	-
	c20	-	-	-	2	-	-	-	-	-	-

9.1 Reptile survey results (cont)

Date	Area	Slow worm			Common lizard			Adder			Grass snake
		Male	Female	Juvenile	Male	Female	Juvenile	Male	Female	Juvenile	
24/04/08	A	-	-	-	-	-	-	-	-	-	-
	B	1	1	1	-	2	-	1	-	-	-
	C	-	-	-	-	-	-	-	-	-	-
	D	3	1	-	-	-	-	-	-	-	-
	E	-	1	-	-	-	-	-	-	-	-
	F	-	-	1	-	-	-	-	-	-	-
	c2	-	-	-	3	1	-	-	-	-	-
	c7	-	-	-	-	3	-	-	-	-	-
	c15	-	-	-	1	-	-	-	-	-	-
c16	-	-	2	1	1	-	-	-	-	-	
28/04/08	A	-	-	-	-	-	-	-	-	-	-
	B	-	2	-	2	1	-	-	-	-	-
	C	1	3	-	2	-	-	-	-	-	-
	D	-	2	-	2	-	-	-	-	-	-
	E	1	2	-	-	2	-	-	-	-	-
	F	-	-	-	-	-	-	-	-	-	-
	c32	-	-	-	2	-	-	-	-	-	-
c30	-	-	-	-	1	-	-	-	-	-	
01/05/08	c23	-	-	-	1	-	-	-	-	1	-
	c29	-	-	-	-	-	-	-	-	-	1
	c33	2	1	-	-	-	-	-	-	-	-

Weather conditions :

24/09/07 – 16°C, sunny, dry, 10% cloud cover
 05/10/07 – 17°C, sunny spells, dry, 30% cloud cover
 03/04/08 – 13°C, sunny, damp, 10% cloud cover
 10/04/08 – 14°C, damp, sunny, 60% cloud cover
 15/04/08 – 11°C, sunny spells, dry, 1% cloud cover
 24/04/08 – 17°C, light rain, 40% cloud cover
 28/04/08 – 14°C, damp, sunny spells, 75% cloud cover
 01/05/08 - 17°C, sunny spells, dry, 50% cloud cover

9.2 Amphibian survey results

	Date	Weather conditions			Survey method	
		Average Temperature		Cloud cover (%)	Torch	Egg search
		Air (°C)	Water (°C)			
Wb1/Wb2	02/04/08	11	13	10	4x Th	nil
	10/04/08	11	10	20	3x Th	nil
	02/05/08	15	15	30	1x Th Rt tadpoles	nil
	18/05/08	11	14	40	nil	nil
Wb3	02/04/08	11	13	10	nil	nil
	10/04/08	11	10	20	nil	nil
	22/04/08	11	11	25	nil	nil
	02/05/08	15	15	30	nil	nil
Wb4	02/04/08	11	13	10	nil	nil
	10/04/08	11	10	20	nil	nil
	22/04/08	11	11	25	nil	nil
	02/05/08	15	15	30	nil	nil
Wb5	02/04/08	11	13	10	nil	nil
	10/04/08	11	10	20	nil	nil
	22/04/08	11	11	25	nil	nil
	02/05/08	DRY			DRY	
Wb6	02/04/08	11	13	10	nil	nil
	07/05/08	DRY			DRY	
Wb7	02/04/08	11	13	10	nil	nil
	07/05/08	13	10	0	nil	nil
	18/05/08	11	14	40	1x Th/Tv	nil
	05/06/08	11	14	40	nil	nil
Wb8	10/04/08	10	14	75	nil	nil
	02/05/08	15	15	30	nil	nil
	18/05/08	DRY			DRY	
Wb9	10/04/08	11	10	20	nil	nil
	22/04/08	11	11	25	4x Th/Tv	nil
	02/05/08	15	15	30	1x Th 3x Th/Tv	nil
	18/05/08	11	14	40	Rt tadpoles	nil
Wb10	10/04/08	11	10	20	nil	nil
	22/04/08	11	11	25	nil	nil
	02/05/08	DRY			DRY	
Wb11	18/05/08	11	14	40	Rt tadpoles	nil
	25/05/08	16	18	20	Rt tadpoles	nil
	05/06/08	11	14	40	2x Th Rt tadpoles	nil
Wb12	02/04/08	11	13	10	nil	nil
	22/04/08	11	11	25	5x Th	nil
	07/05/08	13	10	0	17x Th 1x Rt	nil
	18/05/08	11	14	40	11x Th	nil
Wb13	02/04/08	11	13	10	2x Th/Tv	nil
	22/04/08	11	11	25	nil	nil
	07/05/08	13	10	0	8x Th	nil
	18/05/08	11	14	40	4x Th	nil

Th – Palmate newt Tv – Smooth newt Rt – Common frog

10.0 Interpreting the results

10.1 Reptiles

There are various criteria available that attempt to define reptile population sizes based on numbers of adults observed within 1Ha of habitat.

Since the survey effort does not match any of these criteria it is very difficult to provide an accurate estimate of the reptile population present.

It is however reasonable to conclude, based on the quality, quantity and variety of habitat, the confirmed presence of all four species and their abundance in the surrounding area, that Broadwater represents a very important site for reptiles within the county.

10.2 Amphibians

It would appear that amphibian populations within Broadwater Warren are limited, despite amphibians being widespread in the surrounding area.

This is likely to be due to three main factors. Amphibians need reasonably still water in which to lay their eggs, either as strings or clumps of spawn (toads and frogs) or as individual eggs folded in the leaves of aquatic or marginal plants (newts). In addition newts need areas of still water in which to display during courtship.

The majority of water bodies within Broadwater Warren were noted to have a significant flow throughout the survey period.

Those that had little or no flow tended to dry out too early in the season for their young to develop. Those water bodies that held water throughout the survey period and had little or no flow tended to be rather acidic and therefore largely unfavourable to all but Palmate newts, or were relatively small and therefore not generally favoured by species such as GCN or Common toad.

11.0 Overview of mitigation measures

As all native reptile species are protected under the Wildlife & Countryside Act a mitigation plan which enables the heathland regeneration whilst protecting reptiles from harm is essential.

In a development context, when vegetation clearance or deforestation is undertaken in areas where reptiles are present Natural England require that the first phase of any mitigation programme is to remove all protected species from the site prior to any works commencing. This is necessary because protected species are likely to be harmed as a result. Although the proposed methodology at Broadwater falls short of a topsoil strip (which would be undertaken as part of any development works), there is clearly a significant risk to reptiles from the proposed works.

Reptiles will inevitably be the group of protected animals that are most directly at risk from killing or injuring as a result of the works. With the exception perhaps of Dormice, reptiles are also the species that will suffer most by the loss of existing habitat, as a result of these works.

The term 'mitigation' is frequently used to refer to all works required to comply with the legislation when undertaking works on areas occupied by protected species. Strictly speaking, there are two elements to this process :

- Mitigation - refers to procedures that prevent reptiles from being killed or injured.
- Compensation –refers to works which offset the damage caused by the works (eg creation of new habitat).

11.1 Mitigation

11.1.1 Deforestation (see Fig.5)

At the time of writing no detailed methodology for the deforestation of the site was available. However, it is thought that this will be undertaken by a combination of both hand clearance and heavy machinery, with the stumps being left in situ (*Pers comm. Fitzgerald, RSPB*).

Hand clearance of trees would be the safest method of removal, in terms of harm to reptiles, small mammals and other wildlife and should be undertaken wherever possible. However, clearance on the scale proposed is likely to necessitate use of heavy machinery (presumably forest mulchers) within the larger areas with the densest tree cover.

In these cases great care should be taken to ensure that contractors do not disturb any sensitive areas such as scrub or edge habitats. For this reason it is very important that contractors (and volunteers) are briefed very specifically and fully understand their responsibilities. If contractors need to gain access for their machinery through any sensitive habitats these areas should be cleared by hand first and this should be approved or overseen by an experienced ecologist with knowledge of protected species. All clearance should be subject to the Dormouse licence for the site issued by Natural England. Any sensitive areas adjacent to the working areas should be marked by high visibility tape.

No machinery should be tracked over the stumps as these often provide areas of shelter and hibernation for reptiles and small mammals.

It is understood that any deforestation will be undertaken during the winter months (*Pers comm. Fitzgerald, RSPB*). Clearance through the winter months avoids the risk of harming most of the species likely to use the woodland provided that hibernation sites of reptiles and Dormice are not disturbed.

11.1.2 Scrub reduction

It is likely that clearance of scrub, bracken and other vegetation will be required in some areas as part of the deforestation process and also as part of any ongoing management scheme.

If mechanical (hand or machine) clearance of vegetation is to be undertaken this ideally be carried out during the winter months or, alternatively, on a warm day when reptiles are active and more likely to escape from danger.

Hand held brushcutters, pedestrian powered shears or a tractor and flail should be used to cut vegetation back in stages, starting with a 'high' cut followed by a lower second cut which reduces the vegetation to 100mm above ground level.

Cutting should proceed from the middle of the plot towards the boundaries to prevent reptiles from becoming stranded.

11.1.3 Hibernation areas

Reptiles will use various structures as hibernation sites including scrub covered banks (particularly south facing), rotting timber, small mammal and rabbit burrows, tree stumps or voids around root systems.

It is therefore important to avoid disturbance to hibernation areas whether as a result of scrub control or deforestation. Adder numbers in the UK are in serious decline and this is partly as a result of the destruction of their hibernaculum, often as a result of conservation work undertaken for other species (*Phelps, BBC Wildlife Magazine, March 2007*).

The importance of woodland as hibernation sites for reptiles is generally overlooked. Most woodland, whether it be broadleaved or coniferous will provide a range of hibernating features. However, it is often very difficult to assess the true value of

woodland for reptiles , as reptiles only use these areas during the winter months when survey is not possible.

Since less than a third of existing woodland will be retained it is very important that areas of scrub and other features likely to be used by reptiles are identified prior to each phase of clearance and this should be undertaken in the early spring before excessive growth obscures them.

11.2 Habitat compensation

Clearly one may argue that habitat compensation in this case is the creation, reinstatement and ongoing management of heathland, particularly as heathland is of major conservation importance, not least for reptiles.

However, heathland regeneration will inevitably result in the loss of existing habitats (both temporarily and permanently) currently used by reptiles. Indeed it is likely that however carefully undertaken reptiles will be killed or injured as a direct result of some of the proposed works.

There is therefore a need to offset this damage with some form of enhancements designed to benefit reptiles (and other species).

Enhancements for reptiles are easily achieved by the construction of log and vegetation piles from any spoil created from clearance work. Hibernation sites can be formed by piling cut trees into south facing banks and covering in soil . This has the added benefit of reducing the cost of removing spoil from site.

It is apparent from the survey that Broadwater Warren would appear to offer limited potential for amphibians and this is mainly due to the lack of permanent ponds without flow. Whilst flowing ponds and streams are an important part of the site, the creation of 'stagnant' ponds would provide more opportunities for amphibians and increase the biodiversity of the site generally .

Pond creation could also be undertaken cheaply and easily whilst machinery is on site undertaking other works.

As well as providing opportunities for a wide range of wildlife, ponds located near heathland areas can provide emergency water supply for fire control (*RSPB , 2003 : Restoration and management of Heathland*).

Ponds should be created away from any rivers or streams and could be positioned in less acidic areas such as on the edges of broadleaved woodland and scrub, or on the edge of mire . Ponds have recently been included as a UK BAP habitat.

12.0 References

RSPB (2003) : A practical guide to the restoration and management of Lowland Heathland.

Phelps (2007) : BBC Wildlife Magazine March 2007(extract)

English Nature (2004) Reptiles : guidelines for developers.

Gent, T. & Howarth, W. : Amphibians & Reptiles & the Law (1998). Herpetofauna Workers' Manual.

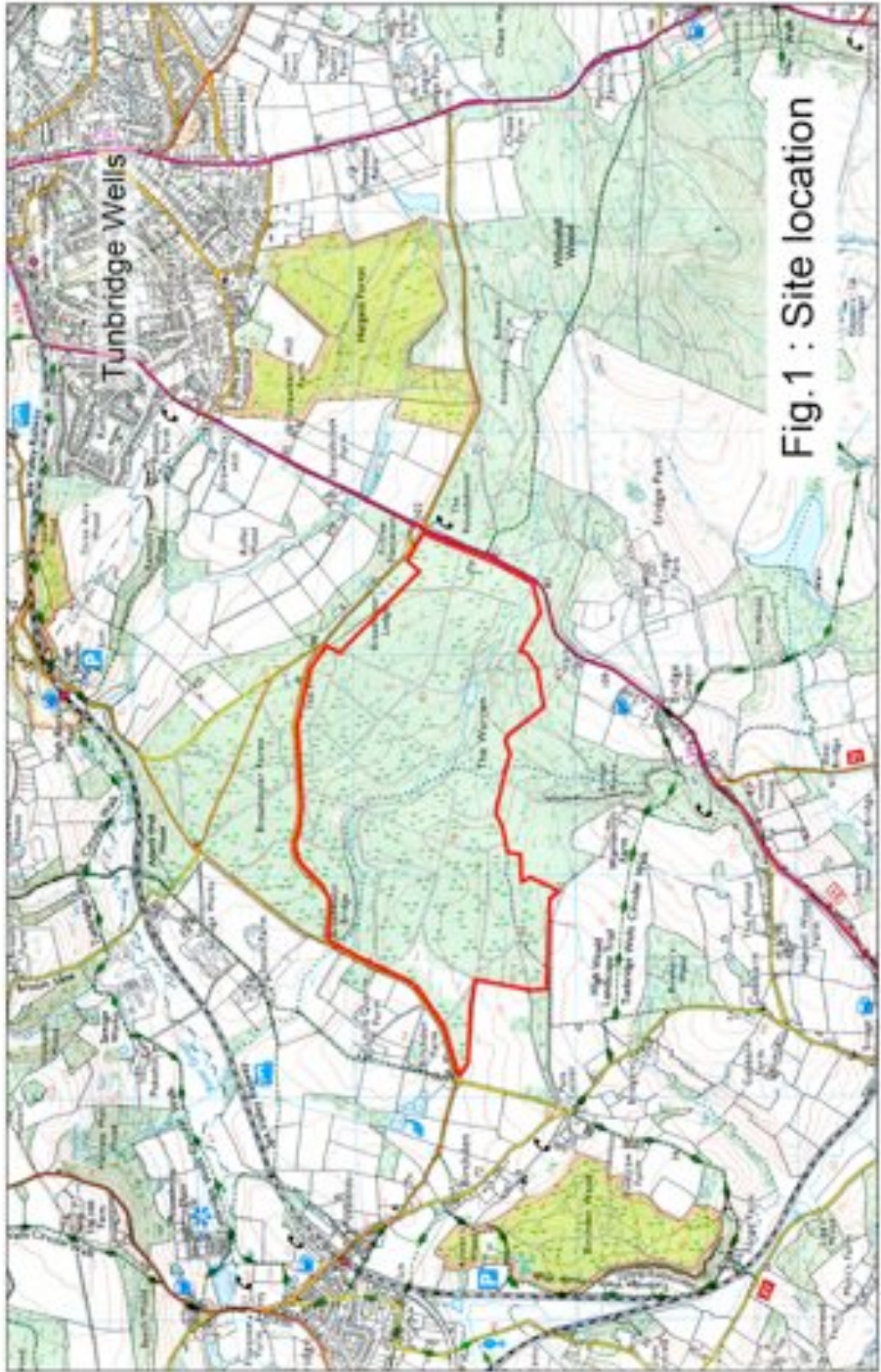
Froglife (1999) : Reptile survey, an introduction to planning, conducting a interpreting surveys for snake & lizard conservation.

Froglife (1998) : Evaluating local mitigation/translocation programmes : Maintaining best practice and lawful standards.

English Nature (2001) : Great crested newt mitigation guidelines.

Froglife (2001) : Great crested newt conservation handbook.

13.0 Maps



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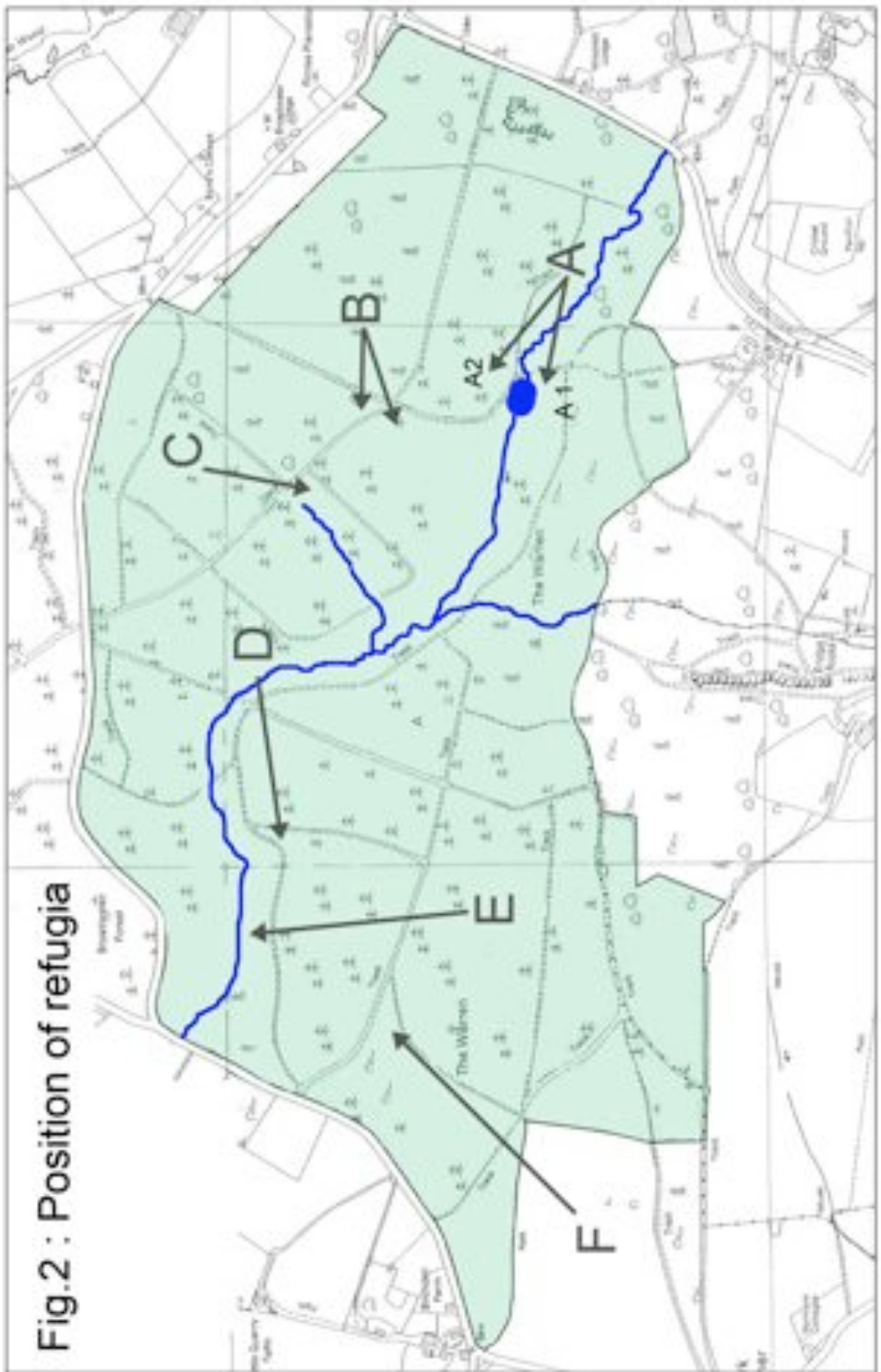
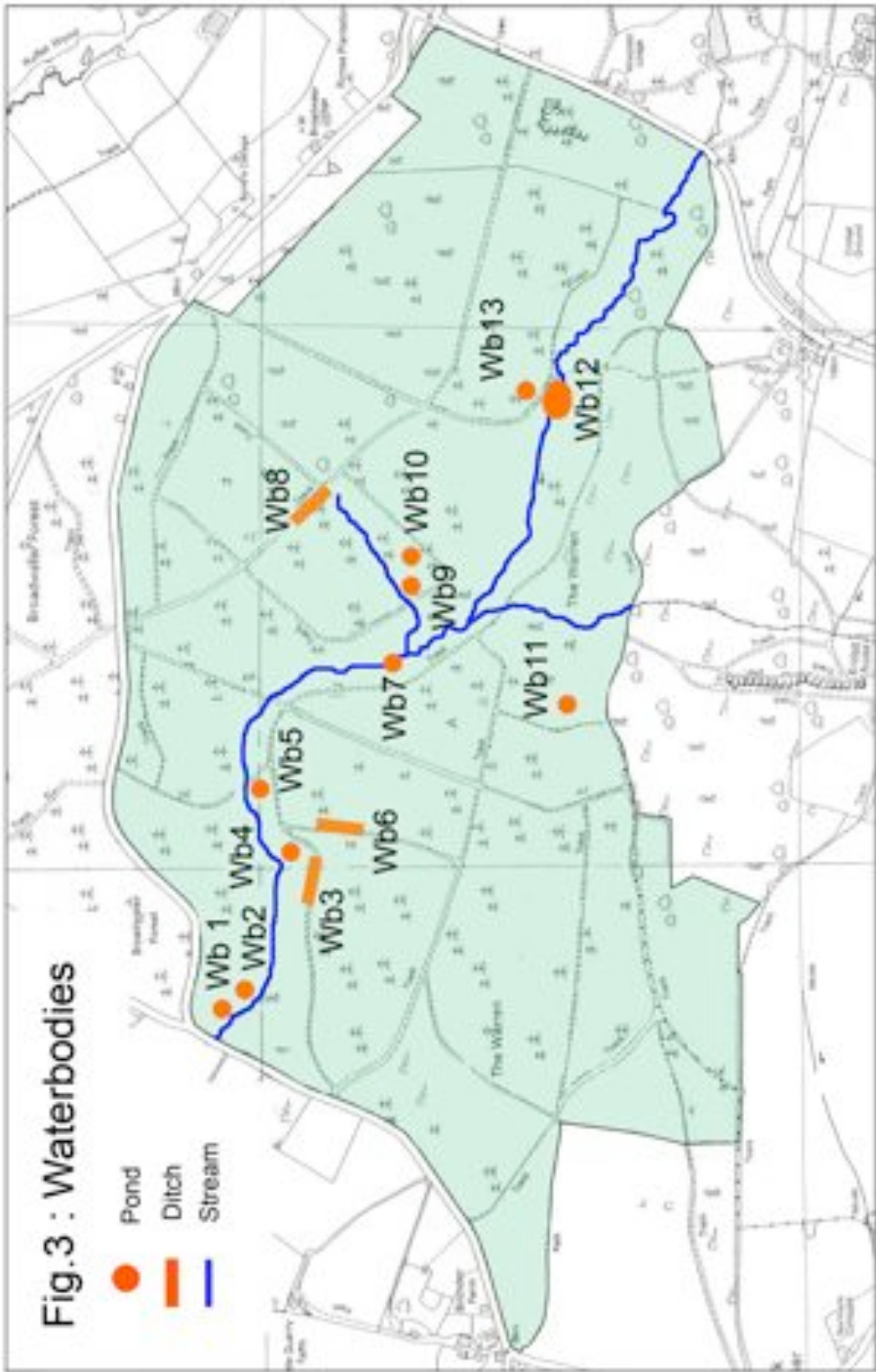


Fig.2 : Position of refugia



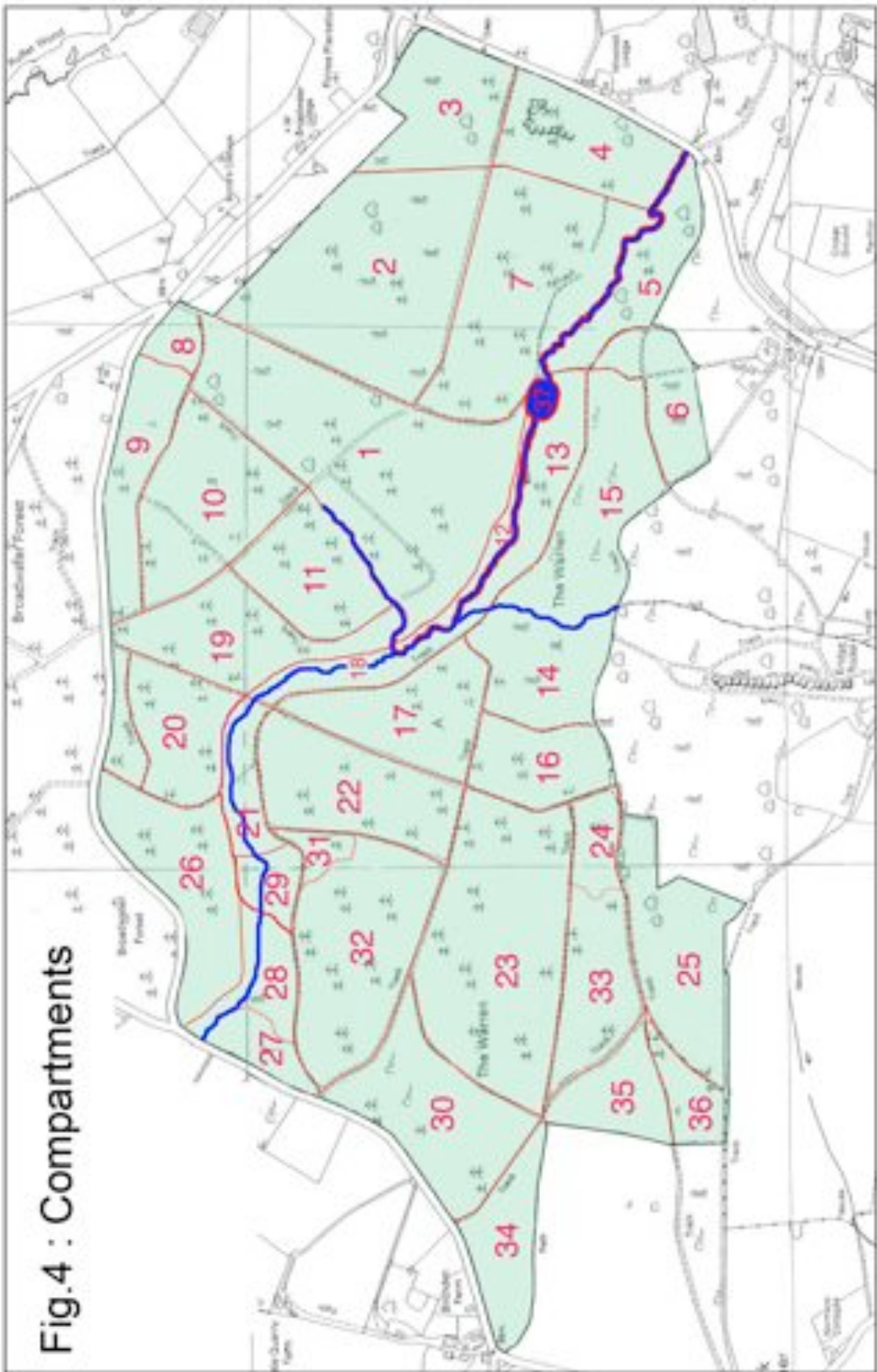


Fig.4 : Compartments

