Great Crested Newts (Triturus cristatus)- Westfield Pasture Nature Reserve

REPORT ON A SPECIFIC CONSERVATION MANAGEMENT ASPECT

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1.0 SUMMARY

This report documents the results of a Habitat Suitability Index Assessment (HSI) for great crested newts at Westfield Pasture Nature Reserve. This assessment was required to offer some support of suitable management practices that should be applied to the site.

To create suitable management options, it was essential to look at previous records of great crested newts on site and assess the site using the correct method (HSI).

The ponds have been assessed and currently achieve an average and below average suitability, which although may be suitable for great crested newts at Clara vale, the permanent pond in Westfield Pasture could be improved.

There should be some clearance of scrub from the surrounding areas and also clearance of some dead submerged plants to allow for new plants to grown. There should also be the addition of other plant species to encourage a more favourable habitat. Any work that is to take place should be during the months of November to January to avoid disturbance of GCN and other wildlife.

2.0 SITE OVERVIEW

Westfield Pasture nature reserve compromises of the land at Clara Vale Pond and Westfield Pasture. The wide variety of habitats on site makes it especially important as a component of the Tyne valley wildlife corridor, which follows the River Tyne from Wylam to Bill Quay. The habitats of Westfield Pasture vary in terms of wet and dry acid grassland, deciduous woodland, a large covering of scrubland and small ponds. The lower slopes of Westfield Pasture and Clara Vale provide the grassland with flush communities whilst the upper parts of the slopes are home to the drier communities. Within Westfield pasture and Clara Vale there are two permeant ponds which if managed could be a haven for wildlife and great crested newts.

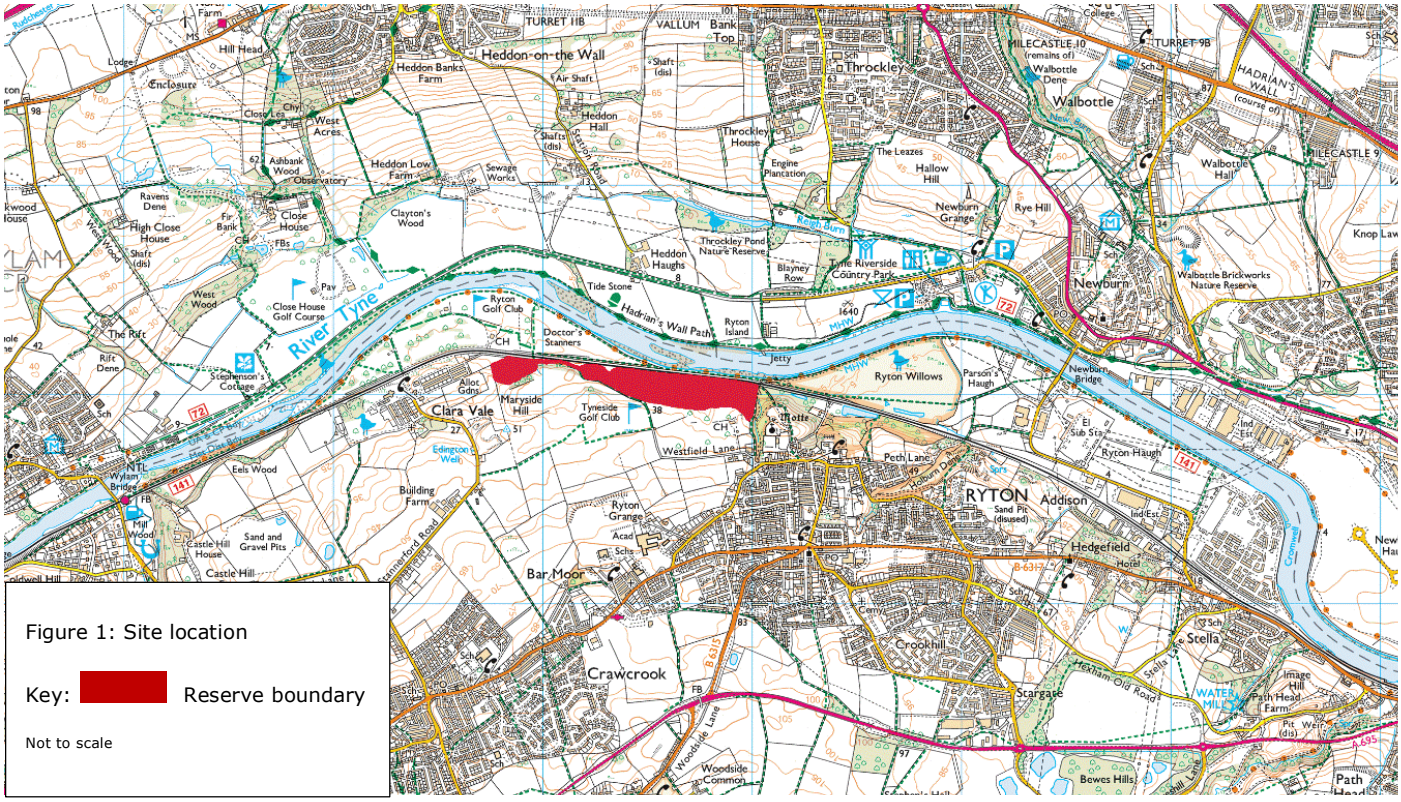

Figure 1: Location of Westfield Pasture. © Crown Copyright and Database Right 2018. Ordnance Survey (Digimap License)

After the completion of a 5-year management plan it was clear that Westfield pasture nature reserve in Gateshead, requires improved management of several areas. An area which needs to be restored and managed correctly are the ponds that lie in Westfield pasture and Clara Vale. Great crested newts (GCN) were once spotted on site in 2007, however have not been recorded

since. Management over the last 10 years has dwindled which may have resulted in the loss of suitable habitats and thus the decline in GCN population. To encourage the population to return to Westfield pasture nature reserve it is important to carry out appropriate surveying methods in order to examine what management needs to be applied in order for the habitat to return to favourable. A Phase one habitat survey that has been completed previously **(Figure 2)** allows for the habitats in Westfield pasture nature reserve to be examined as well as identifying the surrounding habitats. A phase one habitat map will be essential when providing management requirements.

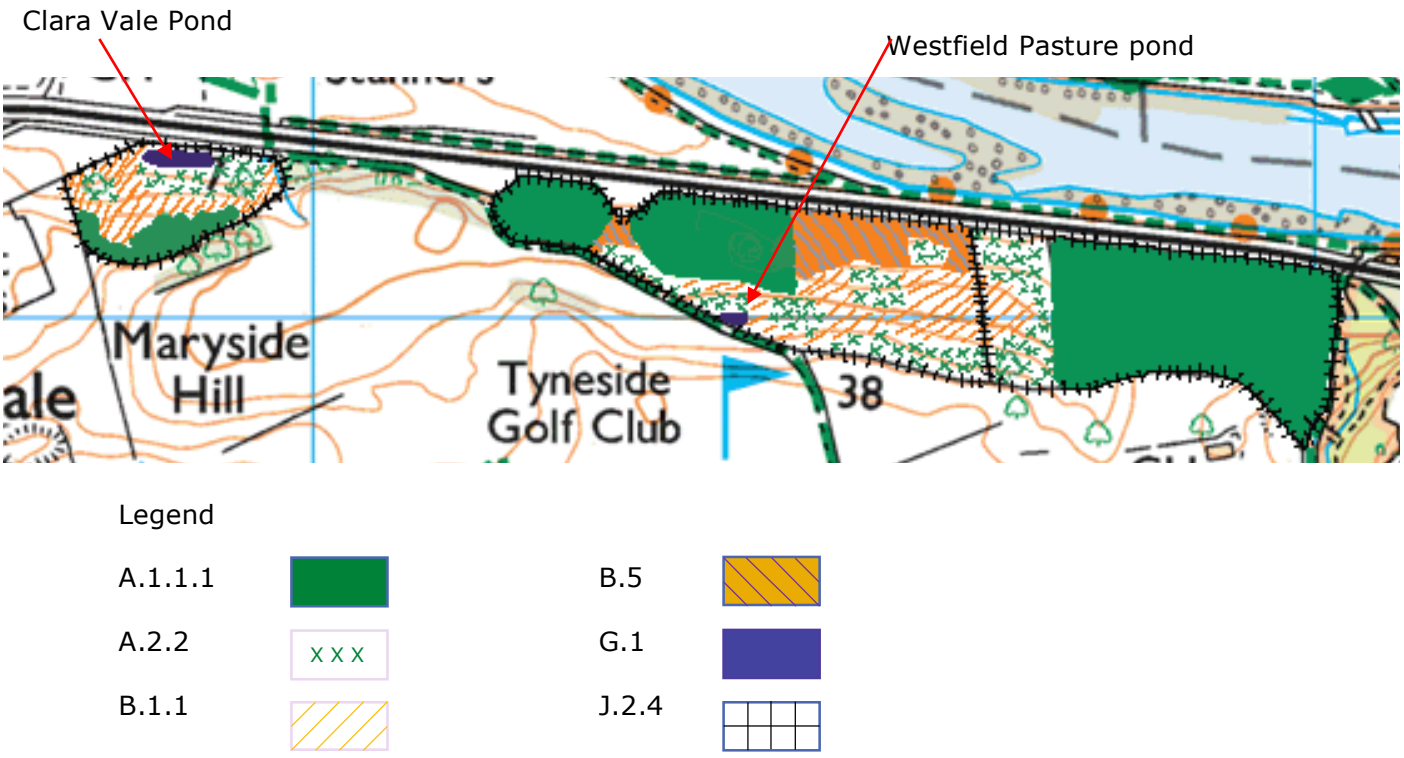

Figure 2 Phase one habitat completed for Westfield Pasture Nature reserve. The map also identifies the location of the two ponds in question.

3.0 LEGISLATION & POLICY

There are several different policies and legislations that apply to GCN and their habitats as seen in **Table 1**.

Legislation/ Policy	Description of relevant legislation
Wildlife and countryside Act 1981 (As amended) and Conservation of habitats and species regulations 2010 (Rees et al. 2017)	Due to the legislation and protection of GCN it is an offence to: • Capture, kill, disturb or injure great crested newts deliberately • Damage or destroy a breeding or resting place • Obstruct access to their resting or sheltering places • Possess, sell, control or transport live or dead newts, or parts of them • Take the eggs of great crested newts
UK Biodiversity action Plan (UK BAP)	Aims at conserving the UK's biodiversity. UK BAP priority list -1,150 species and 65 habitats meeting the BAP criteria. The GCN is amongst the species that are identified as being the most threatened and therefore require conservation action.
National planning policy framework (NPPF)	Aims to minimize impact on biodiversity and provide nets gains to biodiversity where possible. For impacts to minimized on biodiversity across the UK any planning policy should (DCLG, 2012): • Plan for biodiversity at a landscape- scale across local authority boundaries • Identify and map components of the local ecological networks. This includes the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and any stepping stones that connect habitats to the areas surrounding. • Promote the preservation, restoration and the re-creation of priority habitats and ecological networks, whilst also protecting any priority specie populations.

Table 1 Legislation and policies relevant to great crested newts and their habitats

4.0 METHODOLOGY

4.1 DESK AUDIT

A desk audit was completed to allow for previous records to be collected from ERIC (Education resources information centre). By collecting such data, it allows for the site to be reviewed in terms of whether there are GCN present or have been present.

4.2 HABITAT SUITABILITY INDEX

The habitat suitability index which is to be followed was created by Oldham et al. (2000) and follows a scoring system that evaluates the quality and quantity of a habitat. The HIS score that is produced once desk, map and site surveys are conducted allows for us to observe whether the current habitat at Westfield Pasture nature reserve is suitable for GCN.

The HIS follows a numerical index between 0 and 1. The closer to one the value is the more suitable the habitat is, thus a 1 represents an optimal habitat (ARG UK, 2010).

For a HSI score to be achieved ten separate attributes are assessed for each pond surveyed. The score from these attributes calculates the suitability of each pond. The ten attributes are displayed in **Table 2**. For a more detailed description of each attribute see **Appendix 1**. Several of the HSI scores are conducted using suitability index charts (**See Appendix 2**).

Attribute	Description
Geographic Location	Sites are scored according to zone **(See Appendix 3).**
Pond Area	Surface area of the pond when it is at its highest level.
Pond Permanence	Based on how many times a pond dries out in a ten year period.
Water quality	Based upon invertebrate diversity, the presence of submerged water plants and water sources feeding the pond.

Shade	Percentage of pond perimeter that's shaded. Measured up to 1m from the shore.
Number of Fowl	Number of water fowl seen per pond. Moorhens are excluded because most ponds have a couple.
Number of Fish	The less fish in a pond the higher the SI score
Number of ponds within 1000km	The number of ponds occurring within 1km not including itself. The more ponds within an area the higher the SI score.
Terrestrial habitat	Good terrestrial habitat offers cover and foraging opportunities
Macrophyte cover	The estimated percentage of pond surface cover by macrophyte. (**See Appendix 4** for examples of macrophyte percentages).

Table 2 Brief description of the 10 attributes measured to assess HSI (Source: ARG UK, 2010).

When the HSI score is produced from the 10 attributes the suitability of the pond for GCN habitats will be determined using the scale shown in **Table 3**.

HSI SCORE	POND SUITABILITY
<0.5	Poor
0.5-0.59	Below average
0.6-0.69	Average
0.7-0.79	Good
>0.8	Excellent

Table 3 Categorical scale to define HSI for Great Crested Newts (Source: ARG UK, 2010)

5.0 RESULTS

Several different data sets have been collected. Firstly, historic data was collected to allow for possible sightings of great crested newts to be acknowledged and then the HSI data and scores which represent the habitat suitability of Westfield Pasture and Clara vale pond.

5.1 HISTORIC

A desk audit was completed allowing for past survey data collected. As shown in **Table 4** Westfield Pasture Nature reserve once was home to GCN with a confirmed sighting in 2004. Although there have been sightings of great crested newts in 2009 and 2014 they are unconfirmed, so are not reliable when it comes to assessing the habitat. The lack of sightings may be a result of a lack of surveys, however it could also be a result of the habitat being unfavorable to GCN.

Date	Abundance	Determination type	Location	Comments
1986	N/A	Unconfirmed	Clara Vale	N/A
1999	N/A	Unconfirmed	Clara Vale Pond	N/A
2003	N/A	Unconfirmed	Drovers pond, Ryton	Eggs present
2004	N/A	Confirmed	Clara Vale pond	N/A
2009	5	Unconfirmed	Tyneside Golf Course	N/A
2014	1	Unconfirmed	Clara Vale	Terrestrial adult female

Table 4 Previous survey of Great crested newts in and around Westfield Pasture Nature Reserve

5.2 CURRENT FINDINGS

As there are two ponds in Westfield Pasture Nature Reserve, resulting in two HSI's being conducted.

5.2.1 WESTFIELD PASTURE POND

The pond located in Westfield pasture showed no signs of fish, however it received a score of 0.67 as local conditions and past surveys show that they could be present. The pond also showed no signs of waterfowl resulting in an SI score of 1. Terrestrial is the attribute with the lowest SI score, which suggests management needs to take place in this area to make a more suitable on land habitat. Macrophyte had a reasonable SI score, however there is room for improvements through suitable management. The SI scores that were achieved for each attribute are displayed in **Table 5**. The over all score for the pond in Westfield pasture was 0.52. thus making the site below average, which presents room for management improvements

SI	Factor	Suitability score
1	Location	1
2	Pond area	0.01
3	Pond Permanence	0.9
4	Water quality	0.67
5	Shade	1
6	Fowl	1
7	Fish	0.67
8	Number of ponds in 1000km	0.65
9	Terrestrial	0.95
10	Macrophyte	0.6

Table 5 HSI scores from Westfield Pasture pond

5.2.2 CLARA VALE POND

The pond located in Clara vale is slightly larger than that in Westfield pasture, so received a slightly higher SI score of 0.2. The SI scores for water fowl and fish have been applied to this pond, as the local conditions of this pond also suggest that fish could be present within the pond. Water quality was average in Clara vale due to the large presence of submerged plants, however could not be given an SI score of 1, as no surveys of invertebrates have been completed. The SI scores for each attribute at Clara vale can be seen in **table 6**. Unlike the pond in Westfield pasture, the pond in Clara vale received an average HSI score of 0.68, which suggests there is room for improvements but is suitable for GCN in its current condition.

SI	Factor	Suitability score
1	Location	1
2	Pond area	0.2
3	Pond Permanence	0.9
4	Water quality	0.67
5	Shade	0.9
6	Fowl	1
7	Fish	0.67
8	Number of ponds in 100km	0.7
9	Terrestrial	0.55
10	Macrophyte	0.8

Table 6 HSI scores from Clara Vale pond

6.0 MANAGEMENT RECCOMENDATIONS

The ideal habitat for GCN is a relatively large pond that does not support fish life. The typical pond is ideally isolated from activity and has a large support of submerged vegetation, however they can be found in a large variety of ponds (Baker et al. 2011).

Before any management should take place it would suitable for a survey to be conducted to check for GCN and other protected species which would affect some management practices going ahead (Baker et al. 2011). Monitoring and surveying newts before and after management takes place, also gives indication of the effectiveness of management (Langton et al. 2001). There are several different methods to survey GCN which can be seen in **Table 7**.

Survey Techniques	Description
Refuge searching	Best used as an additional technique, as it requires looking underneath rocks and logs. Newts may be present at the site but not under refuges.
Egg searching	Speedy and effective way by examining submerged vegetation for newt eggs.
Netting	Useful for detecting adult great crested newts, but is not suitable fro detecting presence.
Torching	Used during dusk and midnight and is effective in detecting adult newts. Suitable for measuring relative abundance.
Bottle trapping	Effective in detecting and assessing but can cause harm to newts and small aquatic animals
Drift fence and pitfall traps	Used to show direction of arrival and departure at a pond, or detect occurrence and movements on land

Table 7 Different surveying methods for great crested newts that can be used before management takes place (Source: Langton et al. 2001).

For each surveying method there is different times of year at which they are most effective. Some surveying methods also require a license, so this would need to be acquired first before any surveys take place **(Figure 3).**

Method	Time of year (months)									Licence recommended?*
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	
Refuge searching										Yes
Egg searching										Yes, in Scotland and Wales No in England
Netting						L	L	L		Yes
Torching						L	L	L		Yes (see licensing text)
Bottle trapping										Yes

Figure 3 Summary of survey methods for great crested newts. Peak season= Dark shading, Other months when surveying may be effective = Light shading, Time when they are less likely= Blank. L= technique is likely to find larvae. (Source: Langton et al. 2001).

It is essential that correct management and conservation actions are put in place, with such management options taking into consideration multiple factors that allow for the protection and encouragement of GCN. Several different suitability pond features including the water quality and area of the pond, the absence of fish species and the connectivity among sites, all of which provide provide important habitats for the Great crested newt (Denoel et al. 2013). As such factors are influenced by anthropogenic activities it is essential for action plans to be put in place, as without such plans GCN will not return to Westfield Pasture Nature Reserve, especially when current anthropogenic activities or lack of are creating an unfavorable habitat (Denoel et al. 2013). Any management that takes place should be avoided during certain times of the year, with the ideal time for work to be carried out being between November and January as this is when newt presence is low **(See Figure 4).** All management should be avoided during April to may as this is peak breeding season (Langton et al. 2001)

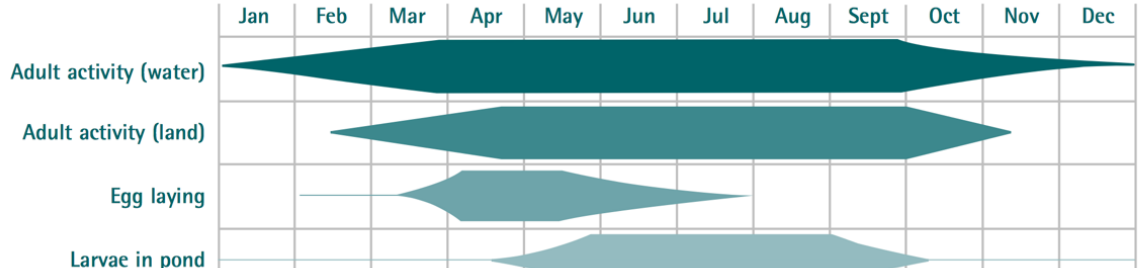

Figure 4 General timing and level of great crested newt activities over a calendar year (Source: Langton et al. 2001).

It would be ideal for more ponds within 1000m of Westfield pasture nature reserve to be managed correctly as GCN favours a high density of ponds (Deneol et al. 2013). However, the creation of new ponds without effecting other wildlife in the nature reserve is difficult, so management in this area should be avoided, with efforts being focused elsewhere.

Fish in ponds have been shown to have detrimental effects on GCN (Joly et al. 2001; Denoel et al. 2005; Skei et al. 2006; Leu et al. 2009), as although GCN have been found to coexist with fish (Hartel et al. 2007; Denoel et al. 2009; Rannap et al. 2009), fish can eat the eggs and larvae thus effecting the future population (Monello & Wright, 2001). It would therefore be best avoiding the introduction of fish into the nature reserves ponds.

Other management that should take place includes the upkeep of aquatic vegetation. There is plenty of vegetation present within the ponds, however levels should be maintained as too much vegetation could lead to ecological succession a thus the disappearance of the pond (Hartel et al. 2010). It is important to maintain the aquatic vegetation as it provides the necessary support and protection needed for eggs whilst also acting as shelter (Miaud, 1993; Miaud, 1994; Sztatecsny et al. 2004, Skei et al. 2006; Maletzky et al. 2007). As macrophyte is an important attribute of great crested newts it may be beneficial to remove some of the dead submerged plants **(See Figure 5)**, and add some additional plants that are suitable to for GCN habitats **(Appendix 5).** It is also important to leave some are that is free of aquatic plants so counter ship behavior can be facilitated (English Nature, 2001).

Figure 5 Clara vale pond and the dead submerged aquatic plants that should be removed.

There is also the issue of trampling from grazing animals on site **(See Figures 6 & 7)**. This has damaged the aquatic plant around both ponds, but may also be detrimental to any GCN that may inhabit there. It would therefore be suitable for a fence to be erected around the pond so that grazing animals do not have access. If this management is put in place an alternative source of water will need to be provided for grazing animals.

Figure 6 Trampling from grazing animals at Clara vale pond, which can significantly damage ponds. Therefore, suitable management should be applied to avoid this

Figure 7 Trampling from grazing animals at Westfield Pasture. Trampling is not as extreme as in Clara Vale, however this is due to no grazing animals currently present on site

Individual newts have been known to move up to a kilometer in distance, however the majority of newts stay within 250m, with the majority of terrestrial activity taking place closer to the pond (Baker et al. 2011). It is there essential to manage and maintain the land surrounding the pond as it has been shown that wood and scrubland which is maintained near breeding ponds, allows for suitable space for activities including feeding outside the reproductive season and also for aestivation and wintering (Marnell, 1998; Jehle, 2000; Schabetsberger et al 2004). Great crested newts also prefer to emigrate to woodland and scrubland rather than open land (Malmgren, 2002), thus occupied ponds are normally only a few hundred metres away from woodland (Deneol & Ficetola, 1998; Skei et al.

2006; Hartel et al. 2010). Scrub, woodland, hedgerows, banks, ditches and rough grassland should be restored and enhanced to encourage GCN (English Nature, 2001). Due to a railway line being located on the North of Clara Vale pond it is even more important that terrestrial management takes place to the south.

The final management recommendation is for shade to be reduced at Clara Vale pond. There are several trees and scrubs that are restricting sunlight **(See figures 8 and 9)**. These should be managed appropriately by clearing any scrub that is encroaching the edges of the pond.

Figure 8 Example of the shade at Clara Vale which should be managed to create a more suitable habitat

Figure 9 Shade from scrub at Clara Vale pond which should potentially be managed to create a more suitable habitat for great crested newts

7.0 CONCLUSION

It is clear to see from the HSI's conducted that current management is causing the ponds to be of average and below average suitability for GCN. Although suitability is average there has been signs of presence of GCN at the site. It would therefore be essential to apply some form of management in order to improve the sites favourable habitats for GCN. If management does not take place it is likely that the HSI will decrease, which may not effect just GCN but also other wildlife too.

Word count:2193

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APPENDIX 1

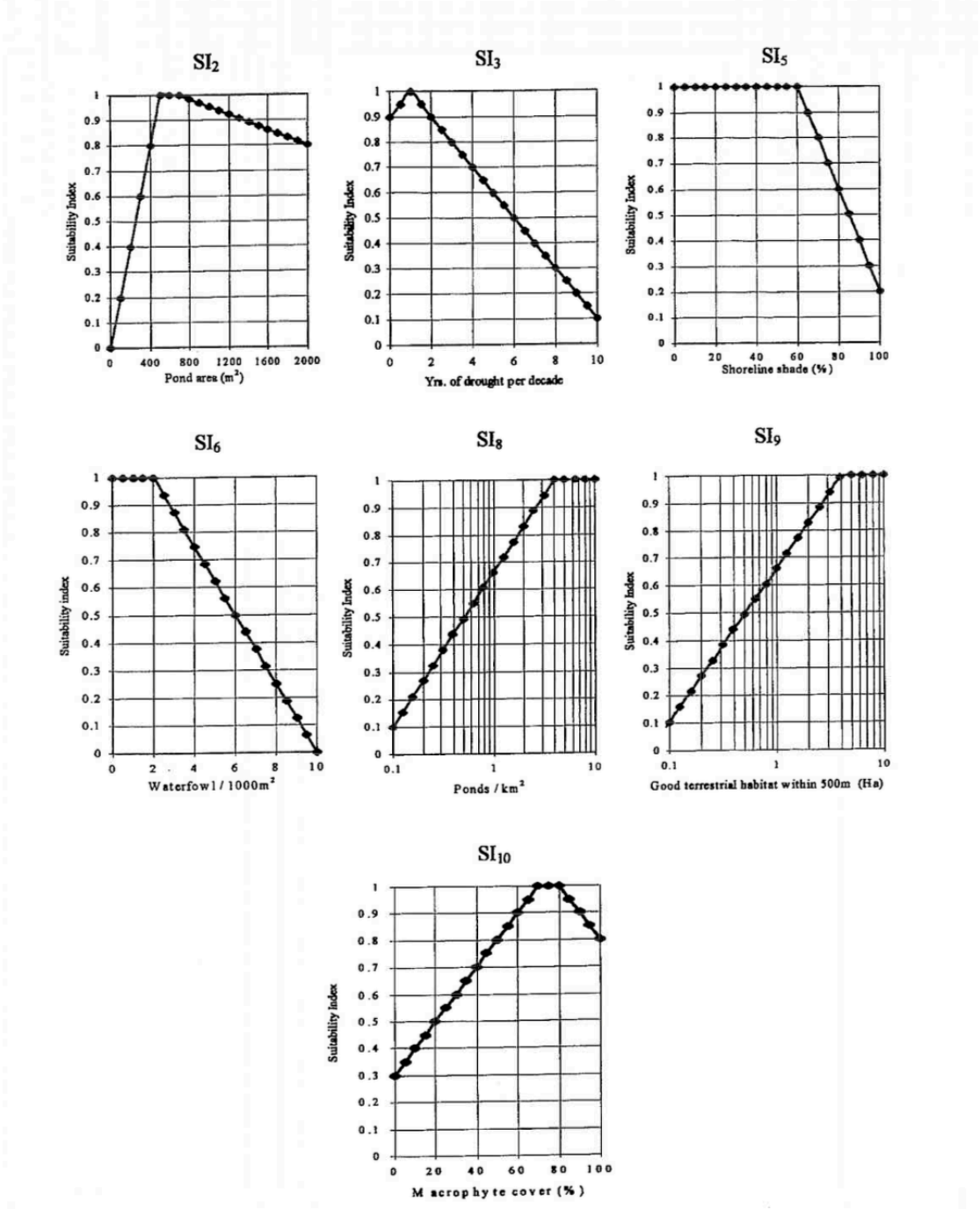
Suitability index definitions (Source: Oldham et al. 2000)

APPENDIX 1. Suitability Index definitions.

SI	Factor	"Units"	Derivation of SI value
1	Location	Measured as map location	Refer to Fig. 2: If site occurs in zone A, location is optimal & SI = 1. If site occurs in zone B, location is marginal & SI = 0.5. If site occurs in zone C, location is unsuitable & SI = 0.01.
2	Pond area	m^2	Measure pond surface area. Measure axes in field for regularly shaped ponds or estimate from an OS map. Read off SI value from Fig. 1, chart SI_2.
3	Pond	years	Years out of ten that pond dries out during the spring or early summer. This depends upon access to long-term local knowledge of the site. Read off SI value from Fig.1, chart SI_3.
4	Water quality	subjective scale	Water quality scored on a 4-point scale where: 4 = good quality; water normally clear and with an abundant and diverse invertebrate community including relatively sensitive groups such as mayfly larvae, water shrimps, amphibians (smooth newts and frog tadpoles) and fish (other than crucian carp); SI = 1. 3 = moderate quality, moderate invertebrate diversity; SI = 0.67. 2 = poor quality; low invertebrate diversity, with emphasis on species characteristic of low oxygen tension such as midge and mosquito larvae, and worms; few submerged plants; SI = 0.33. 1 = bad water quality; clearly polluted, only pollution-tolerant invertebrates such as rat-tailed maggots; usually turbid; no submerged plants; SI = 0.01.
5	Shade	%	Estimate of the % of perimeter shaded (usually by trees). Include only trees close enough to pond to shade water to at least 1 m from shore. Read off SI value from Fig. 1, chart SI_5.
6	Fowl	count	Number of waterfowl seen per pond or per 1000 m^2 in large ponds. Read off SI value from Fig. 1, chart SI_6.
7	Fish	subjective scale	Subjective based on clues or local knowledge: 4 point scale: 4 = Absent; SI = 1. 3 = Possible; SI = 0.67. 2 = Minor (crucian carp and sticklebacks); SI = 0.33. 1 = Major (other species or carp/sticklebacks in dense populations); SI = 0.01.
8	Pond	count	Number of ponds occurring within 1 km of the target site (excluding the target site and ponds on the distal side of important barriers). Use an OS map of at least 1:25 000 scale or field survey an area previously marked on the map. Divide the number of ponds by π (=3.14). Read off SI value from Fig. 1, chart SI_8.
9	Terrestrial	map	OS map with 500 m radius around pond shaded to indicate "newt-friendly" habitat, viz.: habitat judged as woodland, scrub, long grass, meadow, or gardens. Calculate the area shaded (Ha). Also mark good hedges and ditches on the map and estimate length. Calculate total area of shaded and linear features (using 2.5 m as hedge and ditch width, unless determined otherwise). The resulting value (A, in Ha.) is multiplied by the barrier factor (B), described below. The value AB is read off as an SI value from Fig. 1, chart SI_9. Barriers subjective. Barriers scored on a 5-point scale, where: 5 = no serious barrier within 500 m; effectively none of habitat unavailable to population; factor B = 1. 4 = minor barrier (such as minor road with light night traffic); up to approx. 25% of habitat, within 500 m of pond, difficult of access by newts; B = 0.8 3 = moderate barrier (road, river, buildings) with up to 50% of available habitat difficult of access; B = 0.6. 2 = major barriers with up to 75% of habitat difficult of access; B = 0.4. 1 = almost total barrier to newt movement in vicinity of pond, so that newts are virtually confined to the pond and its immediate surroundings; B = 0.2.
10	Macrophyte	%	Estimate of the % of the pond surface-area occupied by macrophyte cover (sum of emergents, floating plants and submerged plants reaching the surface, except duckweed). Estimate with help of chart (Appendix 2) between May and the end of September. Read off SI value from Fig. 1, chart SI_{10}.

APPENDIX 2

Suitability index derivation based on seven different habitat features (Source: Oldham et al. 2000)



APPENDIX 3

Map that is used to determine the suitability index for location (SI_1). (Source: Oldham et al. 2000)

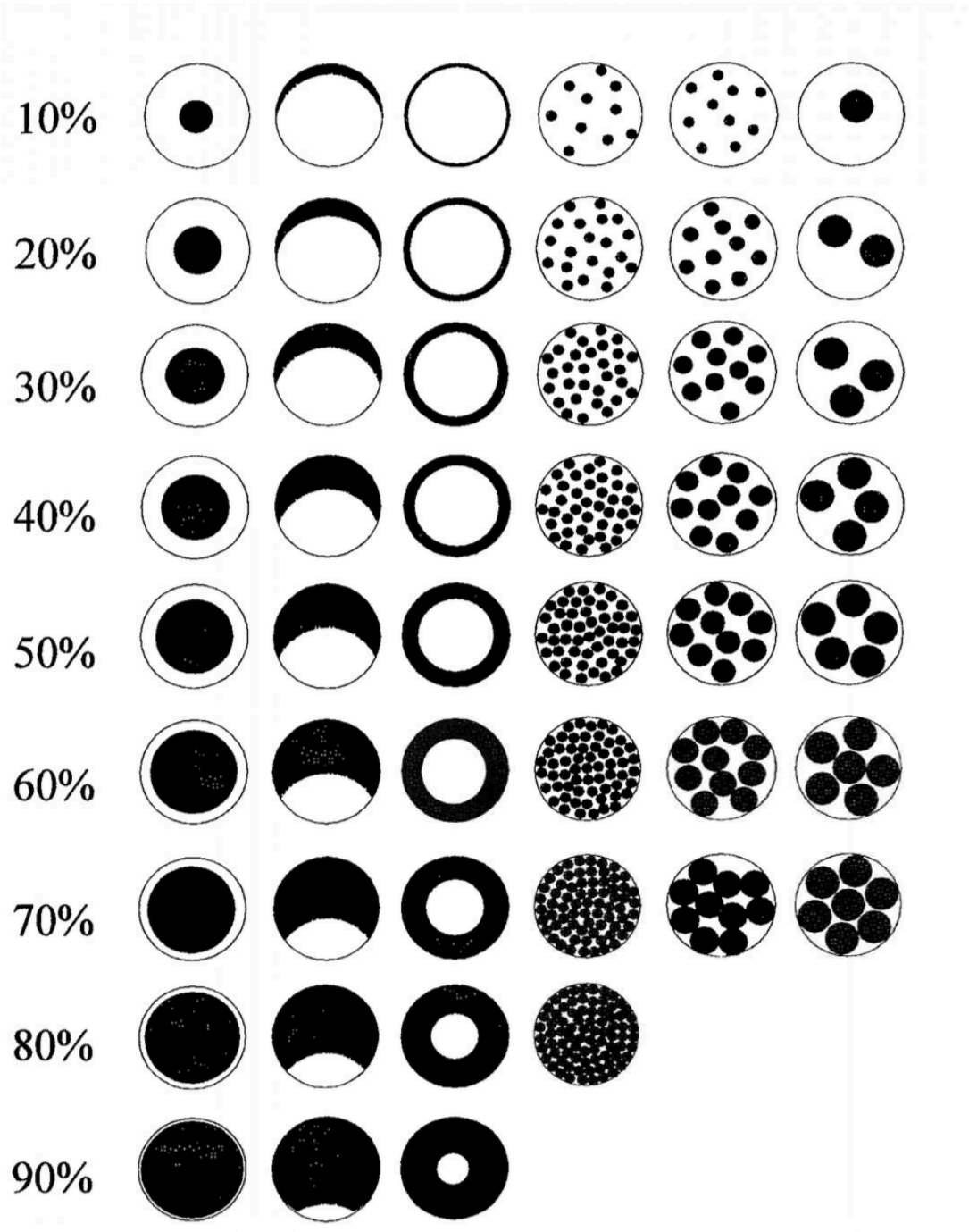
Zone A= Optimal

Zone B= Marginal

Zone C= Unsuitable

APPENDIX 4

Guide for use in assessment of proportions of vegetation cover in a pond (Source: Oldham et al. 2000)



APPENDIX 5

Plant and aquatic plant species that are suited to great crested newt habitats (Source: Langton et al. 2001)