



SB Rice Ltd

# Claydon Marina

Biodiversity Impact Assessment

856968

FEBRUARY 2019

**RSK**



## RSK GENERAL NOTES

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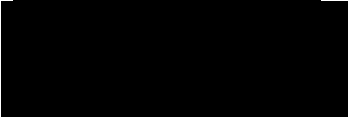

**Title:** Claydon Marina – Biodiversity Impact Assessment

**Client:** SB Rice Ltd

**Date:** February 2019

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK Environment Ltd.

## EXECUTIVE SUMMARY

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1. This report presents an assessment of effects on biodiversity in connection with the proposed development of a marina at Glebe Farm, Oxfordshire.
2. The assessment calculates 'biodiversity units' based on the area (or length), condition and distinctiveness of habitats found on the site. The change in the biodiversity value of the site is identified.
3. The study is based on ecology surveys carried out by RSK in March 2017. Post development habitats have been identified using a proposed landscape plan provided by the client.
4. The site includes 4 habitat types with a total baseline of 40.39 area biodiversity units and 7.10 linear biodiversity units. Post-development plans include 8 habitat types with a total of 84.78 biodiversity area units and 7.38 linear units.
5. The report concludes that the current proposed development will result in a positive gain of + 44.39 biodiversity area units and + 0.28 linear biodiversity units.
6. Assumptions have been made regarding the condition of the proposed habitats which are listed in Appendix B.

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# 1 INTRODUCTION

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## 1.1 Purpose of this Report

This report presents an assessment of effects on biodiversity in connection with the proposed development of a marina at Glebe Farm, Boddington Road, near Claydon in Banbury, Oxfordshire (Ordnance Survey Grid Reference SP 4641 5098). The site is 17.74 ha and *Figure 1* shows the site location. This report calculates 'biodiversity units' based on the area (or length), condition and distinctiveness of habitats found on the site. Pre-development and post-development biodiversity values are calculated and compared to identify any change in the biodiversity value of the site.

## 1.2 Context

The site is rural in character; it is a single arable field bordered by hedges. Adjacent to the northern boundary are wet woodland and trees, while a stream borders the eastern side of the site for c.170 m. Areas of grassland are situated at the field margins. There are also parcels of un-harvested, fertiliser-free conservation headland (Higher Level Stewardship agreement HF14) in the agricultural field. The site is surrounded by other agricultural fields which are bordered by hedgerows and small parcels of woodland. Further afield is predominantly arable land with scattered villages, streams and reservoirs.

Ecological interest is primarily around the edges of the site, and these areas are largely being retained by the 250 berth inland waterways marina development.



## 2 METHODS

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### 2.1 Introduction

This study was a desk-based exercise, using the results of field surveys carried out at the site by RSK in 2017 (RSK, 2018), and a proposed landscape plan provided by the client: A05-020B\_Pro site plan 1\_1250-1.dwg (SB Rice Ltd, Jan 2019).

A map of the baseline habitats from the ecological appraisal is presented in *Figure 2*.

### 2.2 Biodiversity Baseline Methods

To calculate a baseline biodiversity value this study used methods similar to those of the Defra Biodiversity Offsetting pilot scheme and guidance set out by Defra (2013a).

Initially habitats were digitised in GIS using field notes. Areas were measured in hectares and linear features in kilometres. The biodiversity unit value for each habitat was then calculated by multiplying the habitat area (or length) by its distinctiveness score and then by its condition score, both described below. The unit values for each habitat were then totalled to produce the biodiversity baseline. Linear habitats were assessed separately to areas.

#### 2.2.1 Habitat Distinctiveness

Habitats were classified using the Integrated Habitat System (IHS) codes developed by Somerset Environmental Records Centre (SERC). A distinctiveness score was then assigned using a value pre-determined by the Warwickshire, Coventry and Solihull biodiversity impact assessment calculator (this being the most up-to-date tool available). Habitat distinctiveness is a collective measure of biodiversity and includes parameters such as species-richness, diversity, rarity and the degree to which a habitat supports species rarely found in other habitats (Defra 2012b).

#### 2.2.2 Habitat Condition

Habitat condition is assessed using the *Farm Environment Plan (FEP) Manual* produced by Natural England (2010). The condition assessments in this manual involve checking features against a list of criteria for habitat in 'good' condition with a multiplier of three. If the area under assessment fails to meet one of the criteria, the condition is 'moderate' with a multiplier of two. If it fails to meet two or more criteria, the condition is 'poor' with a multiplier of one. Some habitats do not fit into the condition assessment guidance set out in the FEP manual and are assessed instead against a generic condition assessment. This has been developed by RSK and includes simplified conditions from the FEP manual that are frequently used for other habitats. In some cases, the criteria may appear inapplicable. This approach ensures that low quality habitats that are not covered in the FEP manual are in poor condition and do not score a multiplier greater than one, while allowing higher quality habitats to achieve greater multipliers.

Where habitats do not meet the criteria set out in the FEP manual, they are assessed instead against a simplified condition assessment developed by RSK. This uses surveyor experience and the approach ensures that low quality habitats in poor

condition do not score a multiplier greater than one, while allowing higher quality habitats to achieve greater multipliers.

### **2.2.3 Ecological Function and Adjustments**

On occasions, the habitat distinctiveness and condition can be altered up or down from the pre- determined value, particularly when considering ecological function. Any alterations are fully explained within the condition assessment using evidence relevant to the site, e.g. an increase in distinctiveness because of rare flora or fauna or a decrease if there has been artificial modification of the habitat.

## **2.3 Quantifying Impacts**

The biodiversity units were then calculated for both the baseline and the post-development site, loosely following the Defra Biodiversity Offsetting pilot scheme methods and guidance set out by Defra (2013a). Habitats were digitised in GIS using field notes. Areas were measured in hectares and linear features in kilometres. The biodiversity unit value for each habitat was then calculated by multiplying the habitat area (or length) by its distinctiveness score and then by its condition score. The unit values for each habitat were then totalled to produce the biodiversity baseline. Linear habitats were assessed separately to areas.

The baseline biodiversity units were then subtracted from the post-development units to determine any change in biodiversity value of the site as a result of the development.

## **2.4 Assumptions and Limitations**

It has been assumed that there will be no changes to habitats beyond the development boundary resulting from the proposed works.

This report seeks to identify any change in biodiversity value and does not discuss the avoidance, mitigation and compensation hierarchy.

### 3 BIODIVERSITY BASELINE

The phase 1 habitat survey map has been used to identify two habitat area types and two linear habitat types (*Figure 2*). Habitat areas, distinctiveness and condition scores have been calculated and assessed and are displayed in *Table 1*. Linear habitat lengths, distinctiveness and condition scores for linear features are displayed in *Table 1*. All calculations have been rounded to two decimal places. Full details of the condition assessments can be found in *Appendix A*.

**Table 1. Baseline Habitat Areas Biodiversity Calculation**

Target Note	Phase 1 Habitat	Total Area (ha)	Distinctiveness	Condition	Biodiversity score
1	Arable field	16.51	Low	Poor	33.02
2	Rough grassland	1.23	Medium - Low	Poor	7.37
	<b>Total Site Area (ha)</b>	<b>17.74</b>	<b>Habitat Areas Biodiversity Units</b>		<b>40.39</b>

**Table 2. Baseline Linear Habitats Biodiversity Calculation**

Target Note	Phase 1 Habitat	Total Length (km)	Distinctiveness	Condition	Biodiversity score
3	Intact hedgerows	0.11	Medium	Poor	0.44
4	Species rich hedgerows	0.37	High	Good	6.66
	<b>Total Length (km)</b>	<b>0.48</b>	<b>Linear Habitats Biodiversity Units</b>		<b>7.10</b>

#### 3.1 Ecological Function and Adjustments

The primary ecological functions of the habitats were:

- Nesting habitat for bird species  
The hedgerows and mature trees provide nesting habitat for various bird species.
- Providing key foraging resources  
The arable fields provide some foraging opportunities for Badgers and the field margins and rough grassland provide habitat for reptiles.
- Providing commuting routes  
The canal and hedgerows provide commuting routes for bats.

Overall, the site is considered to have low value for its ecological functions, and the biodiversity units allocated to each habitat should remain unchanged.



## 4 IMPACTS ON BIODIVERSITY

This section calculates the biodiversity value of the proposed development based on the proposed landscape plan (Jan 2019). The condition assessments of proposed habitats have been based on assumed conditions 5 years after development to allow habitats to develop and become natural, some habitats will require ecological management to ensure the assumed condition is achieved.

### 4.1 Post-development Biodiversity value of the Site

The proposed landscape plan (Jan 2019) has been used to identify 6 habitat area types and 1 linear habitat type. The areas, distinctiveness and condition scores have been calculated for habitat areas and are displayed in *Table 1*. Linear habitat lengths, distinctiveness and condition scores for linear features are displayed in *Table 1*. All calculations have been rounded to two decimal places. Full details of the assumptions made to determine the distinctiveness and carry out the condition assessments can be found in *Appendix B*.

**Table 3. Post-development Habitat Areas Biodiversity Calculation**

Target Note	Phase 1 Habitat	Total Area (ha)	Distinctiveness	Condition	Biodiversity score
1	Scrub and tree planting	2.06	Medium	Poor	8.24
2	Dense / continuous scrub	0.88	Medium – Low	Moderate	5.28
3	Grass, wild flowers and margins	2.53	Medium – Low	Moderate	15.18
4	Marina	3.44	High	Poor	20.64
5	Lake	2.15	High	Moderate	25.80
6	Amenity grassland	4.82	Low	Poor	6.22
7	Hardstanding	1.86	None	Poor	0
<b>Total Site Area (ha)</b>		<b>17.74</b>	<b>Habitat Areas Biodiversity Units</b>		<b>84.78</b>

**Table 4. Post-development Linear Habitats Biodiversity Calculation**

Target Note	Phase 1 Habitat	Total Length (km)	Distinctiveness	Condition	Biodiversity score
8	Species rich hedgerows	0.41	High	Good	7.38
<b>Total Length (km)</b>		<b>0.41</b>	<b>Linear Habitats Biodiversity Units</b>		<b>7.38</b>

### 4.2 Change in Biodiversity Value

Under the current proposals set out in the proposed landscape Plan (Jan 2019) there will be a positive gain of + 44.39 biodiversity area units and + 0.28 linear biodiversity units as a result of the proposed development. This is shown in *Table 1*. below.

**Table 5. Change in Biodiversity Units Calculation**

Post-development Biodiversity Area Units		Baseline Biodiversity Area Units		Change in Biodiversity Area Units
<b>84.78</b>	-	<b>40.39</b>	=	<b>+ 44.39</b>
Post-development Biodiversity Linear Units		Baseline Biodiversity Linear Units		Change in Biodiversity Linear Units
<b>7.38</b>	-	<b>7.10</b>	=	<b>+ 0.28</b>

## 5 REFERENCES

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Defra (2012a), *Biodiversity Offsetting: Guidance for Developers*. Defra, UK

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JNCC (2010), *Handbook for Phase 1 habitat survey - a technique for environmental audit*. JNCC, Peterborough

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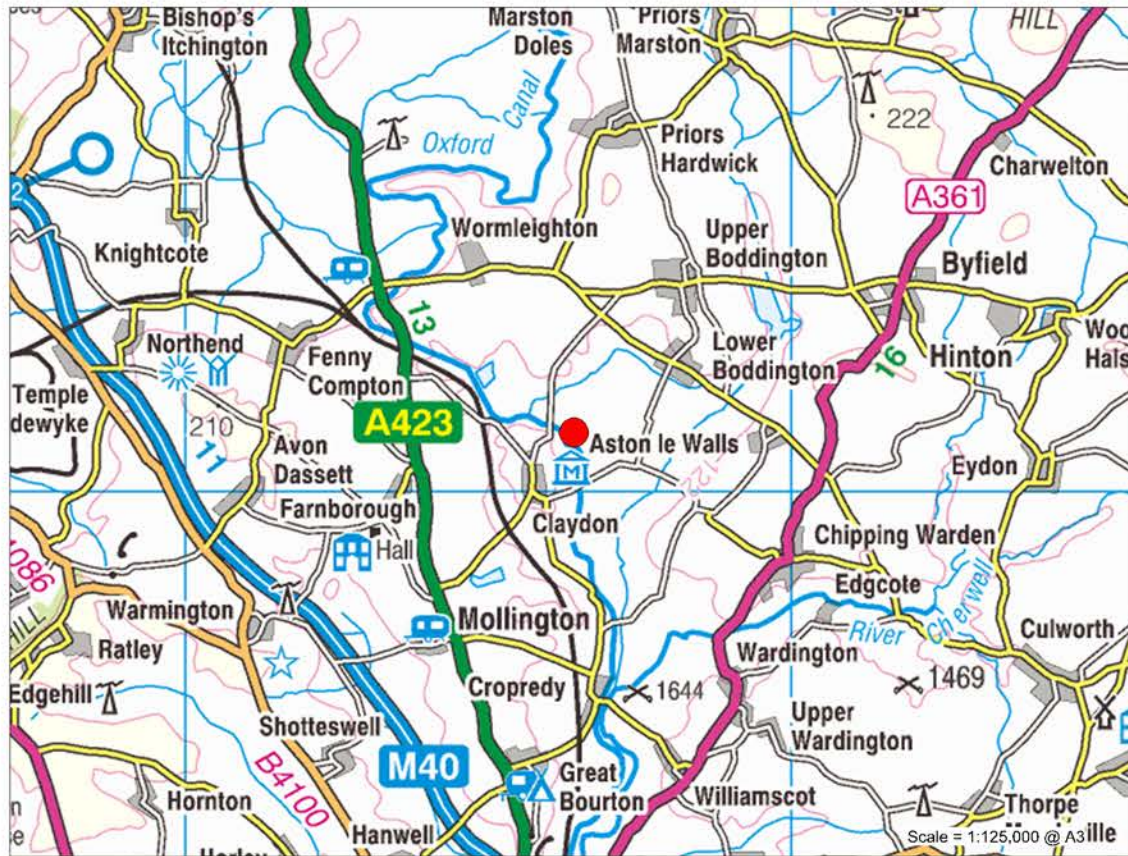
RSK (2018), *Claydon Marina Preliminary Ecological Appraisal Report*. Project No. 856968. April 2018. RSK, unpublished.

## 6 FIGURES AND PLATES

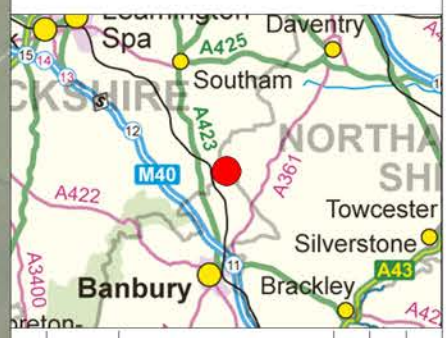
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Figure 1. Site location .....	9
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Site Boundary

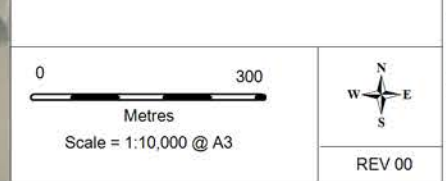


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00	24.01.19	856968	SP	RG	AC

Claydon Marina



Figure 1  
Site Location Plan

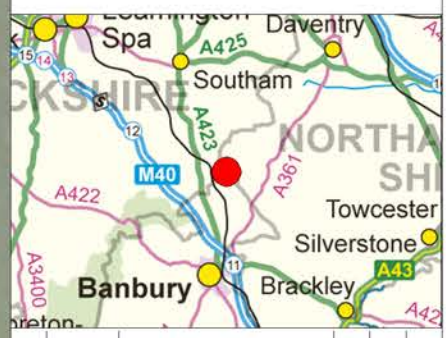


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- Site boundary (Jan 2019)
- Rough grassland
- A Arable field
- Hedge
- Target note



Rev	Date	Description	Drn	Chk	App
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**Claydon Marina**



Figure 2  
Phase 1 Habitat Survey

0 90

metres

Scale = 1:3,000 @ A3

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# APPENDIX A – BASELINE DETAILED CONDITION ASSESSMENTS

This appendix presents the assessment of the baseline habitats against the relevant habitat condition criteria given in the Farm Environment Plan (FEP) manual (Natural England 2010). Following the guidelines, the condition is judged to be 'good', if all assessment criteria are met. Where one criterion is failed, the condition is reduced to 'moderate' and if two or more are failed, the condition is given as 'poor'. Some habitats that are not listed in the FEP manual, and therefore a generic condition assessment has been used. The generic condition assessment has been developed by RSK and includes simplified conditions from the FEP manual that are frequently used for other habitats. In some cases, the criteria may appear not applicable, however this ensures that poor habitats don't exceed a multiplier greater than one and enables higher quality habitats to score more units through increased multipliers.

## Target Note 1

Arable field is not listed in the FEP manual therefore a generic condition assessment has been used.

<b>Phase 1 Habitat</b>	Arable field		
<b>Distinctiveness</b>	Low (2)	<b>Area / Length</b>	16.51 ha
<b>Condition Assessment</b>	A diverse age range.		Fail
	A diverse species mix.		Fail
	Diverse structural variety / diverse form.		Fail
	Presence of protected species.		Fail
	None or a limited presence of invasive species.		Pass
	No or limited damage for example by machinery.		Fail
	CONDITION RESULT		Poor (1)
<b>Justification</b>	The arable fields are species poor and harvested regularly.		

## Target Note 2

Rough grassland is not listed in the FEP manual therefore a generic condition assessment has been used.

<b>Phase 1 Habitat</b>	Rough grassland		
<b>Distinctiveness</b>	Medium - Low (3)	<b>Area / Length</b>	0.97 ha
<b>Condition Assessment</b>	A diverse age range.		Pass
	A diverse species mix.		Pass
	Diverse structural variety / diverse form.		Pass
	Presence of protected species.		Fail
	None or a limited presence of invasive species.		Pass
	No or limited damage for example by machinery.		Pass
	CONDITION RESULT		Poor (1)
<b>Justification</b>	The areas of rough grassland are moderately species rich and un managed. No evidence of protected or invasive species was recorded.		

### Target Note 3

Intact hedge has been assessed against the criteria for Fo2 – High Environmental Value Boundaries, Hedges of High Environmental Value in the FEP manual.

<b>Phase 1 Habitat</b>	Intact hedge		
<b>Distinctiveness</b>	Medium (4)	<b>Area / Length</b>	0.11 km
<b>Condition Assessment</b>	Height: The hedgerow must meet a minimum threshold of 2 m in height. Assess the height of the woody component of the hedgerow from the base of the stems to the top of the shoots of the woody species. This should be assessed along the whole length of the hedgerow and the most common height used. Gaps are not included, nor are hedgerow trees. Where a bank is present, the height of the bank must be excluded.	Fail	
	Width: The hedgerow must meet a minimum threshold of 1.5 m in width. Assess the width of the woody component between the shoot tips at the widest point. This should be assessed along the whole length of the hedgerow and the most common width used. Gaps are not included.	Fail	
	Gappiness: Assess the horizontal gappiness of the woody component. Gaps are complete breaks in the woody canopy of the hedgerow. No more than 10% of the hedgerow length should be occupied by gaps and no one gap should be greater than 5 m wide (this excludes access points and gates). Where dormice or target species of bat are present in the hedgerow there must be no gaps.	Pass	
	CONDITION RESULT		Poor (1)
<b>Justification</b>	The intact hedgerow is regularly flailed to c.1.5 x 1.5 m and has a few gaps but less than 10% gaps.		

### Target Note 3

Species rich hedge has been assessed against the criteria for Fo2 – High Environmental Value Boundaries, Hedges of High Environmental Value in the FEP manual.

<b>Phase 1 Habitat</b>	Species rich hedge		
<b>Distinctiveness</b>	Medium (4)	<b>Area / Length</b>	0.37 km
<b>Condition Assessment</b>	Height: The hedgerow must meet a minimum threshold of 2 m in height. Assess the height of the woody component of the hedgerow from the base of the stems to the top of the shoots of the woody species. This should be assessed along the whole length of the hedgerow and the most common height used. Gaps are not included, nor are hedgerow trees. Where a bank is present, the height of the bank must be excluded.	Pass	
	Width: The hedgerow must meet a minimum threshold of 1.5 m in width. Assess the width of the woody component between the shoot tips at the widest point. This should be assessed along the whole length of the hedgerow and the most common width used. Gaps are not included.	Pass	
	Gappiness: Assess the horizontal gappiness of the woody component. Gaps are complete breaks in the woody canopy of the hedgerow. No more than 10% of the hedgerow length should be occupied by gaps and no one gap should be greater than 5 m wide (this excludes access points and gates). Where dormice or target species of bat are present in the hedgerow there must be no gaps.	Pass	
	CONDITION RESULT		Poor (1)
<b>Justification</b>	The species rich hedgerow is unmanaged and outgrown up to 8 m tall and over 2 m wide with less than 10% gaps.		

## APPENDIX B – POST-DEVELOPMENT DETAILED CONDITION ASSESSMENTS

This appendix presents the assessment of the post-development habitats against the relevant habitat condition criteria given in the Farm Environment Plan (FEP) manual (Natural England 2010). To allow time for habitats to develop and become natural the condition assessments are based on an assumed condition 5 years after the development has been completed.

### Target Note 1

Scrub and tree planting has been assessed against the criteria for Vo5 – Scrub of High Environmental Importance.

<b>Phase 1 Habitat</b>	Scrub and tree planting		
<b>Distinctiveness</b>	Medium (4)	<b>Area / Length</b>	2.06 ha
<b>Condition Assessment</b>	There are at least three woody species, with no one species comprising more than 75% of the cover (except common juniper, sea buckthorn or box, which can be 100% cover)		Pass
	There is a good age range – a mixture of seedlings, saplings, young shrubs and mature shrubs.		Fail
	Pernicious weeds and invasive species make up less than 5% of the ground cover.		Pass
	The scrub has a well-developed edge with ungrazed tall herbs		Pass
	There are many clearings and glades within the scrub.		Fail
	CONDITION RESULT		Poor (1)
<b>Justification</b>	It has been assumed that there will be at least three woody species and no weeds or invasive species will be introduced. It will likely take more than 5 years for the trees to mature and for clearing / glades to develop.		

### Target Note 2

Scrub planting has been assessed against the criteria for Vo5 – Scrub of High Environmental Importance.

<b>Phase 1 Habitat</b>	Scrub planting		
<b>Distinctiveness</b>	Medium - Low (3)	<b>Area / Length</b>	0.88 ha
<b>Condition Assessment</b>	There are at least three woody species, with no one species comprising more than 75% of the cover (except common juniper, sea buckthorn or box, which can be 100% cover)		Pass
	There is a good age range – a mixture of seedlings, saplings, young shrubs and mature shrubs.		Pass
	Pernicious weeds and invasive species make up less than 5% of the ground cover.		Pass
	The scrub has a well-developed edge with ungrazed tall herbs		Pass
	There are many clearings and glades within the scrub.		Fail
	CONDITION RESULT		Moderate (2)
<b>Justification</b>	It has been assumed that there will be at least three woody species and no weeds or invasive species will be introduced. It has been assumed that there will be a good age range and a well-developed edge to the areas scrub. It will likely take more than 5 years for clearing / glades to develop.		



### Target Note 3

Grass, wild flowers and margins is not listed in the FEP manual therefore a generic condition assessment has been used.

<b>Phase 1 Habitat</b>	Grass, wild flowers and margins		
<b>Distinctiveness</b>	Medium - Low (3)	<b>Area / Length</b>	2.53 ha
<b>Condition Assessment</b>	A diverse age range.		Pass
	A diverse species mix.		Pass
	Diverse structural variety / diverse form.		Pass
	Presence of protected species.		Fail
	None or a limited presence of invasive species.		Pass
	No or limited damage for example by machinery.		Pass
	CONDITION RESULT		Moderate (2)
<b>Justification</b>	It has been assumed that areas of grass, wild flowers and margins will be species rich with diverse ages ranges and structure. No invasive species will be introduced and there will be no inappropriate management or damage. The habitat may have the potential to support protected species but their presence cannot be guaranteed.		

### Target Note 4

Marina has been assessed against the criteria for W07 – Ponds.

<b>Phase 1 Habitat</b>	Marina		
<b>Distinctiveness</b>	High (6)	<b>Area / Length</b>	3.44 ha
<b>Condition Assessment</b>	The pond should be set within a semi-natural habitat.		Fail
	It should be within 500 m of another wetland feature (such as a pond, river or fen).		Pass
	There should be no obvious sign of pollution or of inappropriate quality of the water supply.		Fail
	There should be an absence of damaging non-native plant or animal species. Damaging plants include water fern, Australian swamp stonecrop, parrot's feather, floating pennywort and Japanese knotweed (on the bank). Damaging animals include non-native crayfish, reptiles and amphibians.		Pass
	The pond should not be stocked with fish or support damaging numbers of wildfowl		Fail
	It should experience only natural fluctuations in water levels.		Pass
	CONDITION RESULT		Poor (1)
<b>Justification</b>	The marina will be within 500 m of other wetland features. It has been assumed that no invasive species will be introduced. As the marina is likely to contain boats there is a risk of pollution and water levels will need to be maintained. Although the marina might not be stocked with fish there will be access via the canal.		



### Target Note 5

Lake has been assessed against the criteria for W07 – Ponds.

<b>Phase 1 Habitat</b>	Lake	
<b>Distinctiveness</b>	High (6)	<b>Area / Length</b> 2.15 ha
<b>Condition Assessment</b>	The pond should be set within a semi-natural habitat.	Fail
	It should be within 500 m of another wetland feature (such as a pond, river or fen).	Pass
	There should be no obvious sign of pollution or of inappropriate quality of the water supply.	Pass
	There should be an absence of damaging non-native plant or animal species. Damaging plants include water fern, Australian swamp stonecrop, parrot's feather, floating pennywort and Japanese knotweed (on the bank). Damaging animals include non-native crayfish, reptiles and amphibians.	Pass
	The pond should not be stocked with fish or support damaging numbers of wildfowl	Pass
	It should experience only natural fluctuations in water levels.	Pass
	CONDITION RESULT	
<b>Justification</b>	The lake will be artificial and adjacent to the marina. It has been assumed that no invasive species or pollution will be introduced and that it will not be stocked with fish. Water levels will only experience natural fluctuation.	

### Target Note 6

Amenity grassland is not listed in the FEP manual therefore a generic condition assessment has been used.

<b>Phase 1 Habitat</b>	Amenity grassland	
<b>Distinctiveness</b>	Medium - Low (3)	<b>Area / Length</b> 4.82 ha
<b>Condition Assessment</b>	A diverse age range.	Fail
	A diverse species mix.	Fail
	Diverse structural variety / diverse form.	Fail
	Presence of protected species.	Fail
	None or a limited presence of invasive species.	Pass
	No or limited damage for example by machinery.	Pass
	CONDITION RESULT	
<b>Justification</b>	It has been assumed that the areas of amenity grassland will be species poor and regularly cut.	

### Target Note 7

Buildings and hardstanding is not listed in the FEP manual therefore a generic condition assessment has been used.

<b>Phase 1 Habitat</b>	Buildings and hardstanding		
<b>Distinctiveness</b>	None (0)	<b>Area / Length</b>	1.86 ha
<b>Condition Assessment</b>	A diverse age range.		Fail
	A diverse species mix.		Fail
	Diverse structural variety / diverse form.		Fail
	Presence of protected species.		Fail
	None or a limited presence of invasive species.		Pass
	No or limited damage for example by machinery.		Fail
	CONDITION RESULT		Poor (1)
<b>Justification</b>	It has been assumed that the buildings and areas of hardstanding are unlikely to support many species.		

### Target Note 8

Species rich hedge has been assessed against the criteria for Fo2 – High Environmental Value Boundaries, Hedges of High Environmental Value in the FEP manual.

<b>Phase 1 Habitat</b>	Species rich hedge		
<b>Distinctiveness</b>	Medium (4)	<b>Area / Length</b>	0.37 km
<b>Condition Assessment</b>	Height: The hedgerow must meet a minimum threshold of 2 m in height. Assess the height of the woody component of the hedgerow from the base of the stems to the top of the shoots of the woody species. This should be assessed along the whole length of the hedgerow and the most common height used. Gaps are not included, nor are hedgerow trees. Where a bank is present, the height of the bank must be excluded.		Pass
	Width: The hedgerow must meet a minimum threshold of 1.5 m in width. Assess the width of the woody component between the shoot tips at the widest point. This should be assessed along the whole length of the hedgerow and the most common width used. Gaps are not included.		Pass
	Gappiness: Assess the horizontal gappiness of the woody component. Gaps are complete breaks in the woody canopy of the hedgerow. No more than 10% of the hedgerow length should be occupied by gaps and no one gap should be greater than 5 m wide (this excludes access points and gates). Where dormice or target species of bat are present in the hedgerow there must be no gaps.		Pass
	CONDITION RESULT		Good (3)
<b>Justification</b>	It has been assumed that the sections of retained intact hedge will be enhanced to become species rich and allowed to grow at least 2 m high and 1.5 m wide with less than 10% gaps.		