Common Standards Monitoring Guidance

for

Birds

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1. INTRODUCTION

1.1 This chapter deals with Common Standards Monitoring (CSM) for birds on designated sites, including SSSIs, Special Protection Areas (SPAs) and Ramsar sites. It provides guidance on the identification of attributes, targets and methods of assessment for birds where these are notified or qualifying interest features.

2. CONSERVATION OBJECTIVES

2.1 The conservation objectives for birds in designated sites are determined by the legislative background to the designations in place. They are effectively aimed at maintaining bird populations, or the diversity of species within defined assemblages, both through the protection of the habitats supporting them and management against the negative impacts of disturbance. The **attribute tables** in this guidance list **targets** that should be used to aid in **monitoring** whether conservation objectives are being met for each of the interest features on a site.

3. THE BIRDS CSM GUIDANCE

3.1 Identifying Interest Features on Sites and Establishing Baseline Values

3.1.1 Notification or designation documents (citations and supporting documents) for all sites should provide a clear indication of the interest features. In most cases the criteria under which the site was selected for a feature should also be documented, although this may not always be the case, especially for sites designated some time ago. However, it is useful to establish the selection criteria for each feature so that you can more readily link this to the attribute tables. In some cases the link between the feature and the appropriate attribute tables will be clear without the need to establish the selection criterion. Any doubt about which attribute tables to use should be referred to your Site Designations teams.

3.1.2 For example, an SSSI citation may state that the site was notified for supporting a 'nationally' important breeding population of red-throated divers. The supporting notification papers should state the size of the population and the SSSI selection criteria met, in this case the latter should be criterion 3.1, which means that the site supports more than 1% of the British population of breeding red-throated divers (= 'nationally' important).

3.1.3 Once you have identified the interest features and their selection criteria, you should check the **attribute tables in Part 1** to establish the appropriate **interest feature category** and set of attributes to measure for that feature.

3.1.4 Designation documents should also provide a clear indication of the **baseline values** for all attributes related to a feature, for example the number of pairs of a species or an assemblage score, or area of habitat. However, there may be cases where a baseline value is not well documented – please refer to section 4.1 for more information. Baseline values, however

they are chosen, will then form the basis for establishing the target values to be met at each assessment.

3.2 Interest Features and Reporting Categories

3.2.1 The *Guidelines for the Selection of Biological SSSIs* allow for the notification of SSSIs according to a variety of criteria for birds, including the site's international status (as a Ramsar site or Special Protection Area). Guidelines and criteria for selecting international sites are also varied. However, selection criteria can be broadly described under three **interest feature categories**:

- **Aggregations of breeding birds**
- **Assemblages of breeding birds**
- **Aggregations of non-breeding birds**

3.2.2 The interest feature categories listed above and in the guidance tables are also the agreed **reporting categories** for birds.

3.2.3 In the example of a nationally important breeding population of red-throated divers the appropriate attribute table is 1.1 (feature qualifying under criteria 3.1 of the SSSI Guidelines) and the feature interest category is ‘aggregations of breeding birds’.

3.3 Attributes of Bird Features

3.3.1 The designation of sites for birds relies on several basic attributes:

- Population size of individual species or groups of species
- Density of breeding pairs for a key species of wader
- The number of species present that are within a defined assemblage (but not the populations of those species)
- The extent of habitats used by the birds in the site for nesting, roosting, feeding or a combination of these behaviours dependant upon the season

3.3.2 In addition to these, attributes relating to habitat quality and disturbance are important considerations for effective site management.

3.3.3 Monitoring of both bird populations (size or diversity) and the extent of habitats are fundamental to assessing the condition of bird features, and are therefore mandatory attributes. However, detailed monitoring of habitat quality and disturbance have not been included as mandatory needs in this guidance largely because the influences of each on bird features is poorly understood, so meaningful targets cannot be set. The guidance relies on using an **indirect** way of assessing habitat condition and disturbance by the direct monitoring of bird population size or diversity; both typically respond relatively quickly to deterioration in habitats or living conditions and so provide an effective means of early detection of problems in a site.

3.4 Using the Attributes Tables

3.4.1 This guidance has two sets of attribute tables: Part 1 and Part 2 (Table 2; which is available as a separate document on the JNCC website).

3.4.2 For each interest feature the guidance will allow you to identify those attributes that must be measured, known as **mandatory attributes**, in order to gather the necessary information for judging the condition of the feature – **mandatory attributes are detailed in Part 1**. Against each attribute will be details of **targets** to be met. Part 2 (available on JNCC website) provides essential information for individual species, including recommended methods of assessment and potential sources of existing data, and should be used as a reference companion to Part 1.

3.4.3 The measurement, or assessment, of other characteristics of a feature or a site may be useful for guiding appropriate management actions; these characteristics are termed **discretionary attributes**. Discretionary attributes **must not** be used to judge the overall condition of the feature. Examples that may be worth recording on sites are given in Part 2 (available on JNCC website), along with recommended methods. In particular, food availability and disturbance are important discretionary attributes for birds and further information on how to monitor these may be available from your own Agency (see also Kirby *et al*. 2000).

3.5 Targets

3.5.1 Targets for bird attributes have been set to allow for **natural fluctuation,** effectively acceptable change, or for **margins of error in measurement**, in part due to technological advances. Different attributes will have different targets depending upon their nature.

3.5.2 For example, the **population size** of a species will fluctuate naturally, and for some species relatively widely, from one season to the next. So that these normal fluctuations are not misinterpreted as real declines or increases in a population the targets for population size are set to take account of the way in which a population is likely to change naturally. The targets for bird population size are set according to two approaches: **known natural fluctuation** at the site level for a species, and a **generic threshold** system. Wherever possible, **known natural fluctuation** should be adopted as the means for target setting as it will provide a more appropriate level of sensitivity for rarer species.

- **Known natural fluctuation** – to derive population size targets from known fluctuation a minimum of five counts, each from a different relevant season, is required - these do not need to be from consecutive seasons, but should be from within a period of no more than 7 years. Ideally the counts should be from the time of designation of the feature - when the feature was known to be in favourable condition. If data are not available from the time of designation the first suitable series of good quality data should be used, or the generic threshold approach should be adopted. The minimum population size recorded during the five counts can be taken as the target for maintaining the population – if the population at assessment (taken from either a single count or a mean of counts) falls below this size then it is in unfavourable condition. When data from five years are not available to set the target the generic threshold approach must be used. Care should be taken in using natural fluctuation, as there may be cases where the fluctuation seen in a population is the result of non-natural phenomena, for example the effects of human disturbance. In cases where there is some doubt as to whether observed fluctuation is natural then the generic threshold approach should be used.

- The **generic threshold** approach is widely used to assess the conservation status of individual bird species at the national level and to guide the setting of conservation priorities. The adoption of this system at the site level is a robust way of defining a common and easily used standard. A simple threshold system works by comparing population sizes at different times and deriving the change (expressed as a proportion of the initial population). If this change represents an absolute loss of 25%, or more, of a breeding population or 50%, or more, of a non-breeding population then the feature will

be in unfavourable condition. These changes are the generic targets (thresholds) in CSM for the simple generic threshold approach. A worked example of how to apply this approach is given in **Box 1** (over page).
It is important to note that the WeBS (Wetland Bird Survey) Partnership (BTO/WWT/RSPB/ JNCC) is currently developing a threshold system, known as **WeBS Alerts**, for non-breeding waterbirds throughout the UK, which will use a modelled approach to determining population change. Many of the sites covered by WeBS are designated and the WeBS Alerts will become an invaluable tool in CSM (Guidance on using WeBS Alerts to meet the needs of CSM will be published separately).

Box 1. Using a simple generic threshold approach to assessing population change

The simple generic threshold approach works by comparing population size at time intervals and deriving the change using a simple formula. This change is expressed as a proportion of the initial population.

Change = [(Nc – Nb)/Nb] x 100

Where Nc is the population estimate from current reporting cycle and Nb is the baseline value of the population (at designation).

Example: Shelduck numbers in Fishermans' Harbour SSSI/SPA/Ramsar (a fictional site):

Fishermans' Harbour was designated in 1991 for supporting important populations of various non-breeding waterbirds, including an internationally important population of shelduck (see Table 1.3). The shelduck population estimate used for designation was from a single count of 11,400 individuals in 1990 (limits of natural fluctuation are therefore not known). An assessment of condition of the shelduck population was necessary in 1999. Using WeBS counts the mean population in 1999 was calculated as 8,230 (using annual counts for the five-year period 1995-99).

So the baseline value for determining change in the population is 11,400 and the population after a period of nine years (1990-1999) was 8,230. Hence, the change in population size is [(8,230 - 11,400)/11,400] x 100 = -27.8%.

The generic target (threshold) for non-breeding waterbirds is set according to whether there is a loss of 50%, or more, of a non-breeding population (see Table 1.3). If this is the case then the feature will be in unfavourable condition.

In this example, the loss in size of the population since the baseline measurement is 28% (rounded). Hence, the shelduck population is in favourable condition on the basis of this attribute (habitat extent would also need to be assessed).

At the next assessment (which was scheduled for 2005 to allow enough time to have passed since the previous assessment) the mean population size was recorded as 4,680. Again using the baseline count of 11,400 the change is now -59%. Clearly, this decline exceeds that set as the target and the feature is now in unfavourable condition.

Although this example uses population estimates for the condition assessment based on the mean of a number of annual counts it applies equally to means derived from fewer than five counts or individual counts. However, there is a risk that in using a single count the condition may be judged erroneously.

3.5.3 **Population density** is a criterion for selecting SSSIs, based on the site population density for any key breeding wader species exceeding a specified threshold density for a specific region, although **its use has been very rare**. The target for this attribute is set according to a loss of 25% in the density measure for the relevant key species in the site. (More information on this attribute is given in table 1.1).

3.5.4 **Bird assemblages** are defined according to characteristic species that can be found in a particular habitat. Typically, they comprise a variety of common and rarer species. However, very rare species may not be present within an assemblage in all years, and to take account of this the targets for assemblages have been set to allow for some natural fluctuation in the number of species present in an assemblage. The target is set according to a loss of 25% of points in the assemblage score or number of species (depending on the type of assemblage – see Table 1). For example, if an assemblage was designated with a score of 35 points, then the loss of 9 or more points will be unacceptable and the assemblage will be in unfavourable condition.

3.5.5 Targets for **habitat attributes** have been set at 5% change. This allows for:

- A degree of error in measurement generally for habitat extent (due to the differing accuracy of measurement techniques adopted over time), and
- For a degree of natural fluctuation in the extent of specific habitats within a site (see Part 1).

3.6 Frequency of Surveys for Birds – Collecting Sufficient Data for CSM Purposes

3.6.1 Birds are highly mobile species, some are migrants that are present on a site for only a short period of the year, and populations typically fluctuate at the site level, nationally and internationally.

3.6.2 In recognition of natural fluctuation, the designation of sites (under national and international legislation) takes into account variation in population level as a background for evaluation. In practice, designations based on **population size** are usually based on several annual counts - typically at least three counts for SSSIs/ASSIs and five for SPAs. The feature population size appearing on the citation will most often be an average count taken from counts in several seasons, and only rarely be a single count. This effectively ensures that a site selected for designation regularly supports an important population.

3.6.3 When a feature is based on bird population size, because of natural population fluctuation the assessment of feature condition on the basis of a single count may not be appropriate (although see comment below about species difficult to survey). A single count is not fully representative of the population in a site and because of this there is a risk that using a single count will result in an error in judgement of the condition of the feature. A single count taken when the population is at a peak may result in a favourable assessment when the average population is actually unfavourable, and *vice versa*. There are serious implications to making erroneous judgements in the condition of features – unnecessary and even inappropriate management may be implemented or management may be needed but none is implemented.

3.6.4 **The minimum data requirement for CSM is to have a single assessment (survey) of each feature in each 6-year reporting cycle**. However, when a feature is based on bird population size, in order to have confidence in an assessment of feature condition it is recommended that population counts from a **minimum of three relevant seasons within the 6-year reporting cycle** are obtained. In some cases annual data may be available and as much data as are available should always be used. Data can be used from years in the previous reporting cycle as long as the data were collected after the previous assessment was

made. The **average of the three (or more) counts should then be used to assess the attribute against the targets set**. This will also allow a confident judgement of the trend in condition of the feature (recovering, unchanged [maintained] or declining) – see Section 4.

3.6.5 However, there may be species for which this is not practically possible due to difficulty in monitoring them, such as seabirds on remote islands or nightjars, and in these cases the minimum **single** measure of the population size in a 6-year reporting cycle may be all that it is feasible to collect. In such cases, the determination of feature condition will be reliant on a single count and there is a risk of making an error in judgement. Determination of the trend in condition of the feature should be cautious and should take into account the long-term trends in numbers at that site (utilising all historical data). Notification documents should provide an indication of those species and sites for which regular assessments will be difficult (reflected in the count period for the population at designation), but these should always be confirmed by Agency Ornithologists.

3.6.6 For features where a **single count** alone is going to be collected within each reporting cycle, **each assessment must be suitably spaced** to prevent extremely short or extremely long periods of elapsed time between assessments. So, where a species is measured on a site in year 1 of the current cycle it should be measured early in the next cycle, and *vice versa*. This will increase the utility of CSM as a condition 'warning' tool.

3.6.7 For features that are based on **scored assemblages or the number of species within an assemblage**, rather than assemblages determined by population estimates, surveys will be required in just one year within the 6-year reporting cycle. This will be adequate to determine whether a species is still breeding or present in the site at the time of assessment (population size data are not needed).

3.6.8 For features that are notified under the SSSI selection criterion **(14) 3.6 (density)**, surveys will be required in just one year within the 6-year reporting cycle.

3.6.9 **Habitat extent** should be monitored once within the 6-year reporting cycle.

3.7 National Bird Survey Schemes and General Data Availability

3.7.1 There are significant amounts of bird data being collected annually in the UK – CSM must make as much use of these as possible. In particular, data from **national schemes should be used as fully as possible**, unless local data are more suitable.

3.7.2 There are a number of national survey schemes in operation, collecting data on bird numbers both annually or on a regular cycle. In addition, many ornithologists collect data at a local scale for their own interest. Table 3 presents a comprehensive overview of regular surveys throughout the UK and should be consulted prior to organising additional survey on sites. While some of these are site-based surveys others are not, but these may be of value for gathering data on birds in assemblages (e.g. Breeding Bird Survey). **Please consult your Agency Site Designation team or Ornithological Advisors for details of how to access data from these schemes and how to interpret it for use in CSM.** Not all of these schemes will be able to supply data free of charge, depending on how they are funded.

3.7.3 Sites that are also nature reserves under the management of non-governmental organisations (e.g. RSPB or National Trust) may have additional bird data collected by these organisations, and it would be worthwhile developing a link to the organisation and discussing data availability, access and use with them.

3.7.4 Data may also be available from local volunteer ornithologists and County Bird Reports (CBR) may contain suitable data, especially for assemblage species. Establishing links with local recorders could be advantageous, as could encouraging volunteers to record birds on statutory sites. In this context, County Recorders could be encouraged to use electronic means of collating data (e.g. Recorder 2000) and this may be an effective way of establishing regular access to local data.

3.7.5 Finally, special surveys may have been conducted by your Agency on a site during the reporting cycle that you may not be aware of, and it may be worthwhile checking internal reports for such information.

3.7.6 In future, on-line access to some of the data shown above will be possible, in particular via the National Biodiversity Network Gateway (NBN Gateway) (http://www.searchnbn.net/).

Table 3. National Bird Survey Schemes

Scheme	Organiser	Data	Geographical Scope
Statutory Conservation Agency/RSPB Annual Breeding Bird Survey (SCARABBS)	Royal Society for the Protection of Birds (RSPB) Consult Agency Ornithologists	Counts of rare birds and birds not well covered by other schemes; annual or varying periodicity	National coverage, usually by sampling 1-km grid squares or tetrads randomly selected, but for some species complete
Rare Breeding Birds Panel	Consult JNCC	Presence of rare birds are collated annually	Throughout UK
Raptor Working Groups	Consult Agency Ornithologists	Surveys of breeding raptors and owls; annual	Many areas covered, but effort variable
Seabird Colony Register (SCR)	JNCC Aberdeen	Counts of breeding seabirds; annual	Seabird colonies in some locations – some sample data only
Seabird 2000	JNCC Aberdeen	Counts of breeding seabirds (1999-2002)	All seabird colonies around UK
Breeding Bird Survey (BBS)	British Trust for Ornithology (BTO)	Counts of common breeding birds; annual	Around 2000 1-km grid squares throughout UK
Waterways Bird Survey (WBS)	BTO	Counts of selected breeding birds along entire waterways; annual	100 sites surveyed
Waterways Breeding Bird Survey (WBBS)	BTO	Counts of breeding birds along stretches of waterways; annual	Sample of 2-km stretches of waterways throughout GB
Heronries Census	BTO	Counts of breeding herons; annual	465 heronries surveyed
National Ringing Scheme	BTO	Special projects capturing birds - presence/absence data and some counts; annual	Constant Effort Sites, and locations with RAS studies - not a large number of sites.
Nest Record Scheme (NRS)	BTO	Records of breeding of many species; annual	No formal areas - scattered locations

Table 3 continued over.

Scheme	Organiser	Data	Geographical Scope
Breeding Waders of Wet Meadows (England & Wales) (BWWM)	BTO	Counts of breeding birds in selected wet meadows; 10 year cycle (2002)	Many areas of wet meadows alongside rivers
Repeat Upland Bird Surveys (RUBS)	RSPB	Counts of breeding birds in selected upland areas; 10 year cycle (2002)	Few upland areas, some of which overlap with designated sites
Wetland Bird Survey (WeBS) - core counts	Wildfowl & Wetlands Trust (WWT)	Counts of waterbirds during the non-breeding period (at high tide at coast); annual	Around 2000 wetlands (freshwater and estuarine) in UK
WeBS - low tide counts	BTO	Counts of waterbirds at low tide in Nov-Feb; 7 year cycle of site coverage	62 coastal wetland sites around UK
Goose Roost surveys (data managed by WeBS)	WWT	Counts of geese and swans during non-breeding period at roost; annual	Large number of wetlands throughout the UK
Winter Farmland Bird Survey (WFBS)	BTO	Counts of farmland birds in winter (1999-2002)	Sample of 1-km squares throughout the UK
Winter Gull Roost Survey	BTO	Counts of gulls roosting on wetlands in Jan; 10 year cycle (1993, 2003/4)	Extensive national coverage

3.8 CSM data and National Bird Survey Schemes

3.8.1 In the same way that CSM will rely to a degree on data collected through national schemes there is also a link back to these schemes from the CSM process. Wherever CSM fieldwork involves using standard national scheme methods then the data collected may be of value to the organisers of that scheme. CSM fieldworkers may benefit from using the national scheme forms to record data. In such cases, all data collected on standard forms should be copied to the national organiser for incorporation into national data sets. Particularly valuable data are those collected from site-based schemes, such as the Wetland Bird Survey, rather than random sample schemes such as the Breeding Bird Survey.

3.9 Methods of Assessment – Collecting Data on Birds

3.9.1 This section relates to instances where data in a form suitable for CSM use do not already exist and new surveys will be needed. **The availability of existing data should always be checked before time is spent on planning novel surveys at individual sites**. It is designed to help plan surveys, especially where these may be carried out by consultants, and should be used along with Table 2 (available on the JNCC website), which gives details on recommended methods.

3.9.2 Birds are some of the easiest animal species to identify in the field by sight, especially the commoner species. There are many excellent field guides, and most offices should have

access to at least one[1]. However there are some major caveats to this general presumption. Some species are easily confused with others, for example closely related species like marsh and willow tits. Some are cryptic or difficult to see (nightjar and many woodland passerines in summer), others have markedly different plumage phases (juvenile birds and waterbirds in eclipse plumage), and some are simply hard to identify under 'difficult' conditions (such as bad weather, poor light or sheer distance away from the observer). For some species the most efficient surveillance method may be identifying and recording song - a difficult task requiring specialist observer skills.

3.9.3 In addition to the above, some surveys may be complex to organise and also require a licence, especially those requiring efficient sampling strategies and specialist input or specialist techniques (such as tape luring or tape play-back methods). Other techniques may require specialist training, such as some catching techniques – mist netting of some seabirds such as storm petrels. Other skills required for bird surveys may include navigation in upland and/or remote areas with changeable weather patterns. Finally, many surveys are time-limited both during the day and within a season, and as such may require a large staff resource over a relatively short period.

3.9.4 For these reasons, there are likely to be many situations where it is advisable to rely on skilled personnel who have experience of observing and counting birds under a variety of field conditions. Such personnel may be available within your Agency or experienced contractors may need to be employed.

3.9.5 **Part 2 (available on JNCC website) of this guidance provides recommended methods of assessment for individual species and, when combined, for assemblages of species**. Because of the long history of monitoring of bird populations in the UK and elsewhere, these methods are tried and tested, and should be used wherever possible. Some may require more than one visit to a site in one season and this should be borne in mind when planning and costing fieldwork. Whether conducting surveys in-house or contracting out surveys, accepted methods should be used and preferably those detailed in Part 2.

3.9.6 Bird surveys are resource 'hungry', in terms of staff time and cost (especially if contractors are involved). It is difficult to generalise what resources may be needed for surveys as different surveys will require very different numbers of staff and time commitment. A further consideration is that sufficient time must be allocated to planning and preparation for the survey, and for the transcription, analysis and writing-up of the survey. As a general rule-of-thumb, for every day spent in the field, a further 1-1.5 days should be added for planning & preparation; transcription, analysis & writing-up. A simple woodland bird survey may require only one person for 2-3 'half-days' (a very early start is needed), combined with 1-1.5 days for the preparation and analysis of the data. A large survey such as the recent hen harrier survey required 3 months fieldwork (with a number of paid and volunteer staff) and about 1.5 man-years time for the other tasks described above. In many situations it is advisable to have two staff undertaking survey work: one to gather data and one to record that data. This has obvious advantages in health and safety terms, and in many situations lone working (for contractors as well as Agency staff) must be discouraged. This is especially true in some mountainous areas and in most coastal situations[2].

3.9.7 For contractors, standard Agency staff costs are a good means of identifying how much a survey will cost. Choosing the appropriate (or equivalent) daily rate for the nominal grading of survey staff multiplied by the number of days and number of staff will give the staff costs.

[1] The Collins *Bird Guide* (by Mullarney, Svensson, Zetterstrom and Grant), *Field Guide to the Birds of Britain and Europe* (by Peterson, Mountfort and Hollom) and *The Birds of Britain and Europe* (by Heinzel, Fitter and Parslow) are all very good field guides.

[2] Boat work requires special considerations outside the scope of this section. Staff using boats should already be aware of the health and safety aspects of such work.

On top of these, allowance may have to be made for T&S; materials and equipment; as well as miscellaneous expenditure. For most commercial organisations and consultants overheads are generally payable, which may vary considerably according to the nature of the organisation being asked to undertake the work.

3.9.8 While equipment needed is generally minimal, a good pair of binoculars (8 or 10 x 40 are ideal) is essential and for many surveys a telescope (preferably with a zoom eyepiece e.g. 20x – 60x) and tripod is highly desirable, or in some cases, essential. Both items are expensive. Other equipment required will depend on the nature of the survey, but may include camera(s), tape recorders, night-vision equipment, mist-nets or other catching apparatus. Notebooks (preferably waterproof) are essential though some surveyors use small Dictaphones. Boat and aerial surveys are both commonly used and while they may incur significant additional costs, may be very cost-effective in terms of data gathered per 'unit of effort', especially where large areas have to be surveyed within limited time periods.

3.9.9 **A note on licences and monitoring of rare species**: Our rarest and most vulnerable breeding birds are listed in Schedule 1 of the Wildlife & Countryside Act (1981) and Schedule 1 of the Wildlife (Northern Ireland) Order 1985. Any activity that may cause disturbance to these birds during the breeding season must be appropriately licensed – this includes monitoring. You must ensure that where these species are being monitored for CSM purposes, and monitoring is likely to cause disturbance, that those conducting the monitoring (either Agency staff or consultants) hold a relevant licence (seek advice of your Licensing teams). In all cases where additional monitoring of Schedule 1 species is required, whoever is conducting this monitoring must liaise with local ornithologists to ensure that disturbance is not unduly increased. However, if relying on summary data collected by local ornithologists for CSM you must have their permission for using these data.

3.10 Methods of Assessment for Habitats

3.10.1 **Habitat extent** is the only habitat attribute that is mandatory for assessing condition of bird features, and relates to the broad habitat type used by the species (see Table 2; available on the JNCC website). In some cases the habitat extent to be assessed will represent only a small part of a larger site, especially if the species habitat needs are quite specific, but in others it will effectively be the whole site as some species are more generalist in habitat use and require a mosaic of different habitats.

3.10.2 The total area of the relevant habitat should be mapped using one of or a combination of the following techniques (Table 2 (available on JNCC website), section 23.3 in the main introduction to the guidance, the SSSI guidelines, and Phase 1 descriptions may be helpful for categorising broad habitat types):

- In the field - mapping of habitat extent at a scale of 1:25,000 using boundary features to distinguish between areas of different habitats. Coverage of entire site will be needed, but estimations made from viewing points can be used.
- In the field – mapping of habitat extent at a scale of 1:25,000 using GPS to distinguish between areas of different habitats. Coverage of entire site will be needed.
- In the office – use of up-to-date aerial maps made at an appropriate scale may allow production of habitat extent maps, but care should be taken to verify any inadequacies by doing field checks.
- In the office – use of recent NVC, Phase 1 or other habitat surveys may allow a map of extent of broader habitat types to be made (this is especially so if detailed habitat measurements have been made for designated habitat features in a site).

3.10.3 The timing of field work for measuring habitat extent will in most cases not be seasonally sensitive, but for some habitats there may be a better time of the year to measure than others. For example, measuring the extent of marginal vegetation in a wetland will be best done during the summer. As a guide, the bird feature will relate to either breeding or non-breeding populations and habitat extent assessments should be made to take account of that when the identification of habitat extent is significantly affected by season.

3.10.4 Many of the methods of assessing discretionary habitat attributes will be covered elsewhere in the CSM Guidance, and for many sites the overall assessment of designated habitat features will provide adequate information for any assessments of discretionary habitat attributes that may be chosen. Timing of assessments should follow that recommended in the habitat guidance. Where methods of assessment for discretionary attributes are not covered elsewhere in the guidance, then advice should be sought from either the Agency Ornithologists or the relevant LCN Officer.

4. ASSESSING FEATURE CONDITION

4.1 Determining Favourable/Unfavourable Condition

4.1.1 Once all of the data for each of the feature attributes has been collected and analysed/interpreted, the comparison with the **baseline values** for each attribute can be made to establish whether targets have been met.

4.1.2 The baseline values of attributes against which to assess feature condition will normally be those at designation. They are **not** those values recorded at the previous CSM assessment, unless that assessment was the first time that the attributes had been measured. In a few cases, baselines may have been reset[3] as a result of the availability of better data – if in doubt about baseline values consult you Site Designation teams.

4.1.3 The assessment of feature condition is based on all mandatory attributes measured for that feature. **For bird features the general rule is that all mandatory attributes must meet their targets for the feature to be in favourable condition**. This means that any one attribute failing to meet its target will result in an unfavourable condition judgement.

4.1.4 So, for example, even if the population of the species is being maintained in a site, if the extent of habitats essential for supporting that species are not meeting targets then the feature will be in unfavourable condition. Making this judgement allows for a precautionary approach to predicting what may happen to the species population in future if the extent of habitat on which it relies is currently declining. This allows for the identification and implementation of actions necessary to rectify habitat change, which should result in the maintenance of the species population into the future.

4.1.5 If a feature was in favourable condition in the previous assessment and has been judged as favourable in the current assessment then it will be reported as **favourable –maintained**. If a feature was unfavourable in the previous assessment (irrespective of trend), but in the current assessment is favourable (all targets are met) then it will be reported as **favourable – recovered**.

[3] Species scores for breeding bird assemblages are a special case. These scores may be revised periodically, due to changing population status of birds in the UK. In this eventuality the original notification score will need to be recalculated for CSM purposes, and the recalculated score will then be used as the baseline value.

4.2 Assessing the Trend in Condition of a Feature in Unfavourable Condition

4.2.1 **The following ways of assessing trends relate only to those features that have been assessed as in unfavourable condition**. If a feature was in unfavourable condition at a previous assessment but is now favourable then it should simply be reported as favourable – recovered (there are no additional thresholds for making this trend assessment).

4.2.2 Being able to judge changes (or trends) in the condition of features in designated sites is fundamental to conservation. While it is often difficult to determine the causative factors of population change, CSM has been developed to provide a way of assessing trends in feature condition and potential reasons for change at the site level across entire designated site networks. When combined with existing knowledge of best management practice for given species, and an understanding of national and international population changes, CSM will provide a way to identify the most appropriate management actions required at the individual site level to return a feature on that site to favourable condition.

4.2.3 Natural fluctuations in bird populations make assessment of trends difficult, and for this reason, as previously indicated, it is necessary to have sufficient data to be able to confidently judge trend in condition of a feature.

4.2.4 For features based on **species populations** (individual species and assemblages) a minimum data requirement of three annual measures of the population in a reporting cycle will allow for the calculation of the average population in the site. The trend in condition of a feature that is in **unfavourable** condition should be judged in the following ways:

- If the average population is **within 25%** of the previous assessment population the feature condition should be reported as **unchanged**
- If the average population is **25%, or more, greater** than the previous assessment population the feature condition should be reported as **recovering**
- If the average population is **25%, or more, less** than the previous assessment population the feature condition should be reported as **declining**

In the absence of three counts within a reporting cycle judging trend in condition requires careful assessment, using historical trend information where available. The same approach to defining trends can be made using single counts, but there is a very high likelihood of an erroneous judgement. Trend assessments made on the basis of fewer than three counts within a reporting cycle are likely to be of poor quality.

4.2.5 For features based on **population density**, the trend in condition of the feature is determined from the change in the density measure from one assessment to the next:

- If the population density of the relevant species is **within 25%** of that at the previous assessment then the feature condition is **unchanged**
- If the population density of the relevant species has **increased by 25%, or more,** of that at the previous assessment then the feature condition is **recovering**
- If the population density of the relevant species has **declined by 25%, or more,** of that at the previous assessment then the feature condition is **declining**

4.2.6 For features based on **scored assemblages**, the trend in the condition of the feature is determined from the change in the assemblage score from one assessment to the next:

- If the score is **within 25%** of that at the previous assessment then the feature condition is **unchanged**
- If the score has **increased by 25%, or more,** of that at the previous assessment then the feature condition is **recovering**

- If the score has **declined by 25%, or more,** of that at the previous assessment then the feature condition is **declining**

4.2.7 For features based on **assemblages determined from the number of species present** (SSSI criterion 3.7), the trend in condition of the feature is determined by the change in number of species in the assemblage from one assessment to the next:

- If the number of species has changed by **less than ± 25%** since the previous assessment the condition of the feature is **unchanged**
- If the number of species has **increased by 25%, or more**, since the previous assessment the condition of the feature is **recovering**
- If the number of species has **decreased by 25%, or more**, since the previous assessment the condition of the feature is **declining**

4.3 The 'Partially destroyed' condition category and birds

4.3.1 Bird features will be affected by changes in the habitats that support them. When a significant part of this habitat is lost and the bird population or assemblage responds negatively, although this could be judged as unfavourable there may be rare circumstances where the recovery of the habitat (and hence feature) is regarded as impossible and a better condition assessment would be partially destroyed. There may also be an occasional use for this condition assessment in a similar way to that of the destroyed category: if long-term processes reduce the feature in such a way that site-based management will not allow recovery, but the feature is still present in significant numbers or at a significant level of diversity then a partially destroyed assessment may be appropriate. In both of these circumstances, such a condition assessment could lead to re-evaluation of the baseline values so that monitoring and management of the remaining feature is still possible. Careful auditing of the decision process leading to the use of this category will be necessary. [See also the main introduction to the CSM guidance].

4.4 The 'Destroyed' condition category and birds

4.4.1 The destroyed condition category can be used to report the condition of bird features in accordance with the definition of this category. If a bird population or assemblage has been severely reduced or is completely absent from a site and there is no hope of recovery due to a long-term change in the processes that affect it then the reporting of the feature as destroyed should be considered. In this respect CSM can assist in identifying features that may no longer qualify for designation due to factors unrelated to site quality and management. An example of where this category might be appropriate is where the population of a non-breeding waterbird in a site has declined to a very low level as a consequence of a change in migratory behaviour brought on in response to climate change. Careful auditing of the decision process leading to the use of this category will be necessary. [See also the main introduction to the CSM guidance].

5. UNDERSTANDING FEATURE CONDITION MONITORING WITHIN A NETWORK OF SITES AND IN THE WIDER COUNTRYSIDE

5.1 Placing designated sites into a wider context

5.1.1 Interpreting bird monitoring and surveillance data presents many challenges that are not so apparent for other taxa. Birds are highly mobile and many are international migrants

travelling thousands of miles between breeding and non-breeding areas. The UK is of importance as a breeding area for species that over-winter to the south in Europe and Africa, as a wintering area for arctic breeding birds, and for short periods when birds are on migration between breeding and wintering areas in other countries.

5.1.2 Understanding the significance of changes in numbers at one site depends crucially on the understanding of wider contexts. For example, changes in annual numbers of waders on a South African estuary depend on conditions on breeding grounds in the very northern parts of Russia. Major changes in bird numbers can occur on sites in Britain that are entirely the consequence of factors operating in other countries. Thus the trend of progressively milder winters has lead to a change in winter distribution of some waterbirds at European scales. As an example, European White-fronted Geese appear to be 'short-stopping' further east in their winter range than they did in the 1970s and 1980s. This has caused an apparent decline in both national totals and in numbers at key sites in southern England. However, international population monitoring has shown that whilst numbers in the UK are declining, the international population overall has been increasing. Knowledge of the wider distributional changes in Europe allows the correct emphasis to be placed on changes in numbers at sites in the UK.

5.1.3 Numbers of birds occurring on designated sites are also influenced by wider changes in populations occurring in the UK. Important factors influencing local population sizes are wider patterns of land-use change (such as agricultural intensification, upland over-grazing, afforestation, *etc*.) or more recent distribution shifts within the country that seem to be the early consequences of changing climate.

5.1.4 **CSM results will be interpreted in the context of wider national and international frameworks of bird monitoring that the UK statutory agencies have developed, funded and sought to influence**. In particular, JNCC-supported programmes such as Wetlands International's International Waterbird Census provide essential context for appropriate decision making and interpretation. **The interpretation of CSM results at the national and international level will be made after feature assessments have been submitted to JNCC for national collation**. This interpretation will be reported back to the Agencies to facilitate site management decisions and will be included in reports to Government, the European Commission and the Ramsar Bureau.

5.1.5 As the process of Common Standards Monitoring aims to provide information to guide site management at the site level, it is essential that correct interpretation is made of changing numbers of birds on designated sites. Expensive and entirely inappropriate management actions may result from incorrect interpretation of changes. The advice of Agency Ornithologists should be sought prior to changing site management in response to an unfavourable condition assessment of a bird feature.

5.2 Developing the role of existing monitoring schemes

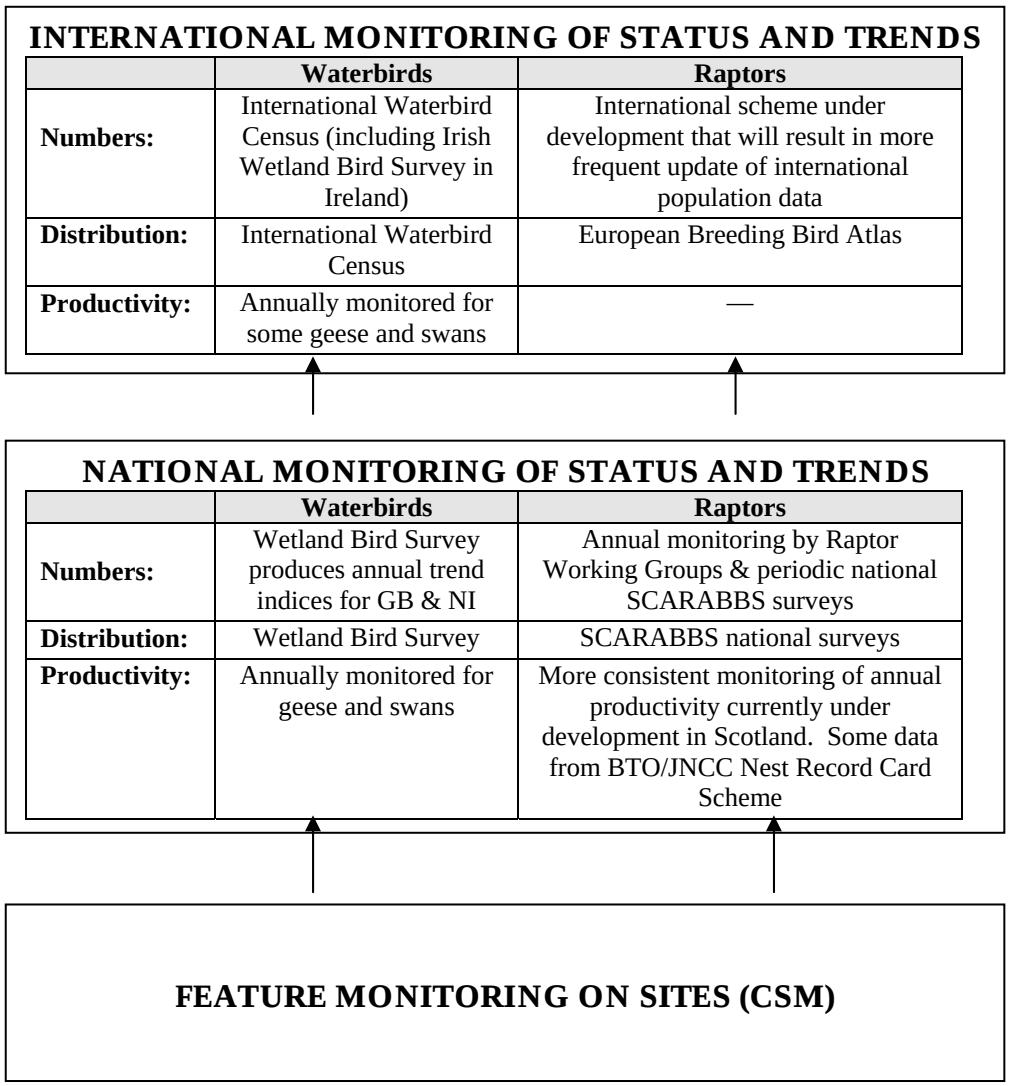
5.2.1 JNCC and the country agencies (and before them the NCC and NC) have invested heavily in the development of national ornithological monitoring schemes. As a result, the UK probably has more active ornithologists contributing to monitoring programmes than any other European country. This gives considerable understanding of status and trends of birds in the UK.

5.2.2 Some schemes are designed solely to provide information on wide-scale population trends. Thus the Breeding Bird Survey has a stratified sampling basis and the results are of limited value in providing site-related information. Other schemes, such as the Wetland Bird Survey, are aimed at monitoring numbers on sites, with wider contexts developed from the

agglomeration of the many individual site totals. In developing CSM for designated sites, it is important that the process builds upon existing schemes, working with volunteers and the partner organisation who co-fund these schemes. Figure 1 provides an illustration of how CSM relates to broader ornithological monitoring schemes in place. Where the need for specific information is not currently being met, in the first instance JNCC and the country agencies should seek to develop the role of existing schemes. Clearly, however, there will be some instances where fully professional surveys are required (*e.g.* in remote areas where few amateur birdwatchers reside). However, the funding of additional surveys needs to be sensitively handled given the very considerable personal resources currently being expended on existing site monitoring by volunteers.

5.2.3 The JNCC (which co-funds much existing national scale monitoring) needs to work closely with country agencies to develop relevant schemes to meet CSM requirements as well as national needs.

Figure 1. The conceptual relationship of CSM with ornithological monitoring already occurring at wider scales, with examples for waterbirds and raptors.



6. ATTRIBUTES TABLES FOR BIRDS

6.1 This section contains the mandatory attribute tables for each interest feature category (Part 1). Complementary species-specific information and selected discretionary attributes are in Part 2, which is available only on the JNCC website.

6.2 PART 1: GUIDANCE ON MANDATORY ATTRIBUTES FOR BIRDS

UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

BIRDS

The guidance for birds is presented in two parts: Part 1 provides guidance on assessing mandatory attributes for birds. Part 2 (available on JNCC website) provides species-specific recommended methods of assessment, possible sources of existing data, habitat information and selected discretionary attributes.

PART 1: GUIDANCE ON MANDATORY ATTRIBUTES FOR BIRDS

Table 1.1 Interest feature: Aggregations of breeding species

Features qualifying under criteria 3.1, 3.2 (productivity need not be assessed), 3.6, and 3.8 (density need not be assessed) of the *Guidelines for Selection of Biological SSSIs* apply.
Features qualifying under any stage of the *Selection Guidelines for Special Protection Areas* can apply when the features are cited as breeding. This includes features qualifying under stage 1.3: 20,000 individual breeding seabirds (seabird assemblage). Within the breeding seabird assemblage individual species may be separately listed as qualifying features if their populations exceed 1% of the national population or 2000 individuals.
Features qualifying under criteria 5 and 6 (formerly 3a and 3c) of the Ramsar Convention can apply when the features are cited as breeding.

A full list of species that may be features in this category is in Part 2 of this guidance (available on JNCC website).

Reporting category
Aggregations of breeding species

Attributes	Targets	Method of assessment	Comments
Bird population size	Maintain population within acceptable limits (in this context population can be that of an individual species or the total population of an assemblage): ♦ Based on the known natural fluctuations of the population in the site, maintain the population at or above the minimum for the site (see 3.5). ♦ Where the limits of natural fluctuations are not known, maintain the population above 75% of that at designation (see 3.5) - loss of 25% or more unacceptable. The target setting method that is adopted must be recorded.	Counts or estimates of numbers of breeding individuals, pairs or calling males, occupied breeding sites or occupied territories. Standard monitoring methods are widely published and recommended species-specific surveys are listed in Part 2 (available on JNCC website).	Existing survey data may be available for some species (see Part 2; available on JNCC website).
Population density [features notified under SSSI guideline 3.6 only]	Maintain density of breeding birds within acceptable limits: ♦ A decline in the breeding density of the relevant species of 25% or more is unacceptable.	To enable direct comparison of density estimates the same methods that were used at designation must be followed – these should be fully documented. Also see Part 2 (available on JNCC website) for survey methods for upland birds. If in doubt consult Agency Ornithologists.	SSSI guideline 3.6 also allows for notification using the Moorland Bird Index. This is a specialist tool and the advice of Agency Ornithologists should be sought if monitoring against this selection guideline is required.
Habitat extent	Maintain the area of habitats that are used by the feature in the site within acceptable limits: ♦ Extent of all habitats used by the feature should be maintained - losses of 5% or more of any relevant habitat type unacceptable.	Record the extent of all habitat types used by the feature (the habitat reporting categories are a useful guide to categorising habitat types for birds). See recommended methods in section 3.10. Methods could include aerial photographs to assess extent of broad habitat types, mapping of broad habitat types, Phase 1 habitat survey, NVC.	When sites have designated habitat features the data for assessing this attribute may need to be collected according to the relevant habitat guidance. In these cases additional data may not be needed for this attribute. Habitat requirements for birds are described in Part 2 (available on JNCC website).

Table 1.2 Interest feature: Assemblages of breeding birds

Features qualifying under criteria 3.5 and 3.7 of the *Guidelines for Selection of Biological SSSIs* apply when the features are cited as breeding. There are no equivalent features for Special Protection Areas or Ramsar sites.

Reporting category
Assemblages of breeding birds

Attributes	Targets	Methods of assessment	Comments
Assemblage score (BTO index) [features qualifying under criterion 3.5 only]	Maintain assemblage diversity: ♦ If the total score calculated for a breeding bird assemblage falls by the equivalent of 25% or more in points then the assemblage is in unfavourable condition.	Record presence/absence of breeding species within the assemblage. Methods of survey will be a combination of those given in Part 2 depending on the species within the assemblage. Breeding must be confirmed as proven or probable according to generic proof of breeding codes (Appendix 1). A count of the numbers of breeding pairs/units in a site is not needed. On the basis of presence/absence recalculate the assemblage score using the *SSSI Guidelines* for the relevant habitat. The species present at designation and each monitoring event do not need to be the same as this is a score-based assessment only.	Data on rare and common species will be needed. Many data may already be available - see Section 5 and Part 2 (available on JNCC website).
Variety of Species [features qualifying under criterion 3.7 only]	Maintain assemblage diversity: ♦ If the number of breeding species falls by 25% or more then the feature is in unfavourable condition.	Record presence/absence of breeding species within the site. Methods of survey will be a combination of those given in Part 2 (available on JNCC website) depending on the species within the assemblage. Breeding must be confirmed as proven or probable according to generic proof of breeding codes (Appendix 1). A count of the numbers of breeding pairs/units in a site is	Data on rare and common species will be needed. Many data may already be available - see Section 5 and Part 2 (available on JNCC website).

		not needed.	
Attributes	**Targets**	**Methods of assessment**	**Comments**
Habitat extent	Maintain the area of habitats that are used by the feature in the site within acceptable limits: ♦ Extent of all habitats used by the feature should be maintained - losses of 5% or more of any relevant habitat type unacceptable.	Record the extent of all habitat types used by the feature (the habitat reporting categories are a useful guide to categorising habitat types for birds). See recommended methods in section 3.10. Methods could include aerial photographs to assess extent of broad habitat types, mapping of broad habitat types, Phase 1 habitat survey, NVC.	When sites have designated habitat features the data for assessing this attribute may need to be collected according to the relevant habitat guidance. In these cases additional data may not be needed for this attribute. Habitat requirements for birds are described in Part 2 (available on JNCC website).

Table 1.3 Interest feature: Aggregations of non-breeding species

Features qualifying under criteria 3.3, 3.4 and 3.7 of the *Guidelines for Selection of Biological SSSIs* apply when the features are cited as non-breeding, wintering or passage.
Features qualifying under any stage of the *Selection Guidelines for Special Protection Areas* may apply when the features are cited as non-breeding, wintering or passage. This includes features qualifying under stage 1.3: 20,000 individual non-breeding waterbirds. Within the non-breeding waterbird assemblage individual species may be separately listed as qualifying features if their populations exceed 1% of the national population or 2000 individuals.
Features qualifying under criteria 5 and 6 (formerly 3a and 3c) of the Ramsar Convention apply when the features are cited as non-breeding, wintering or passage.

A full list of species that may be features in this category is in Part 2 (available on JNCC website) of this guidance.

Reporting category
Aggregations of non-breeding birds

Attributes	Targets	Method of Assessment	Comments
Bird population size	Maintain population within acceptable limits (in this context population can be that of an individual species or the total population of an assemblage): ♦ Based on the known natural fluctuations of the population in the site, maintain the population at or above the minimum for the site (see 3.5). ♦ Where the limits of natural fluctuations are not known, maintain the population above 50% of that at designation (see 3.5) - loss of 50% or more unacceptable. The target setting method that is adopted must be recorded.	Counts or estimates of numbers of individuals. Standard monitoring methods are widely published and appropriate species-specific surveys are listed in Part 2 (available on JNCC website).	Existing survey data, e.g. from WeBS, may be available for species on many sites (see Section 5 and Part 2 (available on JNCC website)).

Attributes	Targets	Method of Assessment	Comments
Variety of Species [features qualifying under SSSI criterion 3.7 only]	Maintain assemblage diversity: ♦ If the number of wintering species falls by 25% or more then the feature is in unfavourable condition (winter is November to February). ♦ If the number of passage species falls by 25% or more then the feature is in unfavourable condition (passage periods are August to October and March to April).	Record presence/absence of all species (not just waterbirds) within the site during the relevant periods. Methods of survey will be a combination of those given in Part 2 (available on JNCC website) depending on the species within the assemblage.	Many data may already be available - see Section 5 and Part 2 (available on JNCC website).
Habitat extent	Maintain the area of habitats that are used by the feature in the site within acceptable limits: ♦ Extent of all habitats used by the feature should be maintained - losses of 5% or more of any relevant habitat type unacceptable.	Record the extent of all habitat types used by the feature (the habitat reporting categories are a useful guide to categorising habitat types for birds). See recommended methods in section 3.10. Methods could include aerial photographs to assess extent of broad habitat types, mapping of broad habitat types, Phase 1 habitat survey, NVC.	When sites have designated habitat features the data for assessing this attribute may need to be collected according to the relevant habitat guidance. In these cases additional data may not be needed for this attribute. Habitat requirements for birds are described in Part 2 (available on JNCC website).

7. EXAMPLES OF HOW TO USE THE GUIDANCE

All sites are fictional.

7.1 Aggregations of breeding birds

Site name: Blud Moss SSSI and SPA
Notified features: hen harrier

The site was notified in 2000 with a hen harrier population of 10 breeding females (a mean taken from annual counts over the period 1995-99).
Part of the site is also an RSPB reserve.

As the bird feature was selected under SSSI criterion (14)3.1 it represents an aggregation of a breeding species and Table 1.1 of the CSM guidance is the appropriate one to use. The attributes to measure are population size and habitat extent (Table 1.1).

It is clear from the notification documents that the local Raptor Study Group and the RSPB supplied the data used to support the designation. As these data include counts to 1999, it was decided to delay assessment of the feature until 2004, at which time a further five annual counts may be available. In 2004, local staff approach the RSG and RSPB and request data from them. Unfortunately, data were not collected for the whole site in two of these years and so only three counts from the last three years are available. The mean count during this period was calculated as 6 breeding females. Full habitat assessments were made for the site during a single visit in February 2001.

From discussions with the RSG and RSPB it seems that the hen harrier population on the site fluctuates naturally from year to year. The annual counts used for designation were 13,6,9,12, and 10, hence the lower limit of natural fluctuation was 6 breeding females. This was then used as the target against which to compare the current population estimate.

As the population at assessment was 6 females and the target is to maintain the population at or above this then the attribute is favourable.

The habitat assessments show that the extent of habitats meet the targets of 95% of that at designation. Hence, all attributes are in favourable condition and so the overall assessment for the feature is one of favourable condition.

[In this example, if there had been doubt about whether the population fluctuated naturally, then the appropriate target would have been set using the generic threshold approach. In this case, the change from 10 to 6 breeding females would have represented a 40% decline and the attribute of population size (and so feature condition) would have been unfavourable (exceeded 25% loss).]

7.2 Assemblages of breeding birds

Site name: Lapwing Meadows SSSI
Notified features: assemblage of breeding birds (Lowland damp grasslands), and lowland grassland habitat

The site was notified in 1993 for its rich assemblage of birds characteristic of lowland damp grasslands (under SSSI selection criterion (14)3.5). The score for the site at notification was 32 and the list of species present in the site is in the supporting papers for notification.
The site was also notified for its lowland grassland interest and extends to 232 ha, although not all of this is of the notified grassland type.
Apart from its SSSI designation the site has no other protection and is not a nature reserve.

As the assemblage is the only bird feature the appropriate table in the guidance is Table 1.2. The attributes to measure are assemblage score and the extent of habitats supporting the species within the assemblage at notification.

A check on data availability shows that the site is not covered by the Waterways BBS or Waterways Bird Survey, or by the Breeding Bird Survey. It was however, included in the Breeding Waders of Wet Meadows survey in 2002. A check of the data from this survey and its methods shows that some of the assemblage species are not covered. However, this is a popular area for local birdwatching and the County Bird Reports for 2001 and 2002 contain much valuable information. The combined data from the BWWM and the CBR show that the site has lost curlew, redshank and grasshopper warbler, but gained yellow wagtail. The lost score is 6, but the gain is 1, giving a net loss of 5 points. The target for the site is derived by calculating 25% of 32, which is 8 points. If the score falls by 8 or more points then the attribute will be unfavourable, so to be favourable it must score 25 or more points (refer back to Table 1.2). At this assessment the score is 32-5=27, thus within the target.

The notified habitats are monitored according the habitat guidance, but this does not cover the whole site. In addition, the local staff decide to map the extent of each broad habitat in the site – they do this on one day in April 2003 by walking over the site and estimating the coverage of each habitat. They discover that an area of about 45 ha has been patchily encroached by scrub, although this doesn't impact on the notified habitats. This area is no longer suitable for some of the species in the assemblage (in time if left unchecked it would become unsuitable for all of the species) and it represents 19% of the area of the site. On this basis they conclude that the attribute does not meet the target of 95% extent of suitable wet grassland habitats (220 ha), and so report that the feature is in unfavourable condition (despite the assemblage meeting the target).

[In the next reporting cycle there are insufficient data from County Bird Reports alone to make the assessment and a survey is made according to WBBS methods (to suit all species) on two days in 2006, one of which coincided with the habitat assessment. This survey shows that the site has subsequently lost snipe and garganey, and so the additional loss is 7 points. This brings the total loss since notification to 7+5=13 points. So, 32-13=19 and the attribute no longer meets the target of 25 or more points and is unfavourable. The scrubby area has been appropriately managed since the previous assessment and so the habitat attribute is considered to now meet its target. However, overall, on the basis of the bird assemblage being unfavourable, the feature remains unfavourable. The trend in the feature is taken from the assemblage scores at the previous and present assessment: 27 and 19. The latter is 70% of the former so the change exceeds a loss of 25%, and so the feature is unfavourable and declining.]

7.3 Aggregations of non-breeding birds

Site name: Whistling Marshes SSSI, SPA and Ramsar site
Notified features: Wigeon, waterbird assemblage

The site, an estuary, was designated in 1986 for supporting an important population of wintering (= non-breeding) wigeon (a mean of 17,880 individuals for the period 1981/82-1985/86) and more than 20,000 individual wintering waterfowl (= waterbirds) (a mean of 45,730 for the period 1981/82-1985/86).

As both of these features are non-breeding then Table 1.3 of the guidance is the appropriate one to use. For both features population size and habitat extent need to be measured.

Monitoring of non-breeding birds in the site is covered through WeBS Core counts, and so data are readily available from the WeBS Secretariat at the WWT (requiring a formal request).

The assessment for bird features on this site was planned for 2003, so data were requested in summer 2003 for the five-year period 1998/99-2002/03. The wigeon population was now a mean of 10,430, and the waterbird assemblage totalled a mean of 39,100 individuals.

The minimum population for wigeon during 1981/82-1985/86 was 11,000 birds, and for that of the assemblage was 38,420. Using these known natural fluctuations it is immediately clear that the number of wigeon has declined to below the natural lower limit for the site, and so this feature is unfavourable. However, the total population of the assemblage has remained above the lower natural limit and on this attribute remains favourable (the habitat attribute will determine whether this feature is favourable).

[A check of these features using the generic threshold approach produces the following levels of change: wigeon = [(10,430-17,880)/17,880]*100 = -41.7%; assemblage = [(39,100-45,730)/45,730]*100 = -14.5%. On the basis of the 50% loss target, both attributes are favourable. However, natural fluctuation is known for these features and should be used.]

The extent of the estuary habitats described at designation meet the targets of 95% and so the features are reported as wigeon – unfavourable, waterbird assemblage – favourable-maintained (as it was favourable at the previous assessment).

[The next assessment of the bird features was made in January 2009 using data for the period 2003/4-2007/08 (which although overlapping with the previous reporting cycle were data collected since the last assessment). The mean wigeon population was now 10,850 and the assemblage totalled 38,650. Using natural fluctuation targets it is clear that the wigeon remain unfavourable, while the assemblage size attribute remains favourable. Again, habitat extent is favourable. The trend in condition of the wigeon population was determined by comparing the 2009 figure (10,430) with the one at the last assessment in 2003 (10,850). The difference between them is just 4%, and so the feature is reported as unfavourable-no change as the two figures are within 25% of each other.]

8. REFERENCES

General monitoring methods

[Codes in Table 2; available on the JNCC website]

BCT Bibby, D.J., Burgess, N.D., Hill, D.A. & Mustoe, S.H. (2000): *Bird Census Techniques, 2nd Edition*. Academic Press, London

UBW Brown, A.F. & Shepherd, K.B. (1993): A method for censusing upland breeding waders. *Bird Study* 40: 189-195 [described in BMM]

BBS BTO. Breeding Bird Survey instructions.

WBBS BTO. Waterways Breeding Bird Survey instructions.

BMM Gilbert, G., Gibbons, D.W. & Evans J. (1998): *Bird Monitoring Methods – a manual of techniques for key UK species*. RSPB, BTO, WWT, JNCC, ITE & The Seabird Group, Sandy, Bedfordshire.

SMH Walsh, P.M., Halley, D.J., Harris, M.P., del Nevo, A., Sim, I.M.W. & Tasker, M.L. (1995): *Seabird Monitoring Handbook for Britain and Ireland*. JNCC, RSPB, ITE, Seabird Group.

WeBS WWT. WeBS instructions and forms [described also in BMM]

Species specific monitoring methods

Amphlett, A. & Smith, R. (1995): *A Method for Monitoring the Snow Bunting Breeding Population in the Central Cairngorms*. Confidential report to RSPB

Anon (1996): *The Annual Partridge Count Scheme: August Brood count recording form and instructions*. Game Conservancy Trust, Fordingbridge

Bainbridge, I.P. (1995): Sea Eagle Monitoring Procedures and Recording Forms. RSPB unpubl., Edinburgh

Bainbridge, I.P., Summers, R.W. & O'Toole, L. (1995): *Red Kite Monitoring in Scotland: Annual Red Kite Monitoring Procedures*. RSPB unpubl., Edinburgh

Browne, S (1997): *BTO Survey of Breeding Skylarks: instructions and forms*. BTO, Thetford

BTO (1991): *Guidelines and Site Record Form for the Fourth BTO Peregrine Survey 1991*. BTO, Norfolk

Buckland, S.T. and Summers, R.W. (1992): *Pinewoods Birds Project: Protocol for a Sample Survey of Conifer Woods*. Unpubl

Cadbury, C.J. (1981): Nightjar census methods. *Bird Study* 28: 1-4

Etheridge, B. and Baines, D. (1995): *Instructions for the Black Grouse Survey 1995/6*: a Joint RSPB/GCT/JNCC/SNH Project. Unpublished

Hancock, M. (1991): *Common Scoter in the Flow Country, Results of the 1991 Survey: comparison with previous years and suggested monitoring method*. RSPB unpubl.

Hirons, G. and Linsley, M. (1989): Counting woodcock. *Game Conservancy Annual Review* 20: 47-48

Jackson, D. & Hancock, M. (1994): *Black-throated Diver Survey Instructions*. RSPB unpubl.

Rebecca, G. and Bainbridge, I. (1994): *Survey of Merlins in Great Britain 1993-1994: survey instructions*. RSPB unpubl.

Reed, T.M. & Fuller, R.J. (1983): Methods used to assess populations of breeding waders on machair in the Outer Hebrides. *Wader Study Group Bull*. 39: 14-16

RSPB (1992): *Second International Chough Survey: instructions and recording forms*. RSPB unpubl.

Toms, M (1995): *Project Barn Owl 1995: fieldwork instructions; information sheets and recording sheets*. A BTO/Hawk and Owl Trust Collaboration. BTO, Norfolk

Whitfield, P. (1994): *Instructions to Montane Ecology Project Surveyors*. Scottish Natural Heritage, unpubl.

National and international population estimates

National population estimates are updated regularly and published by the Avian Population Estimates Panel (APEP). The most recent publication is listed below, but the most contemporary version should be used (check with Agency Ornithologist).

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International population estimates are found in a variety of sources, listed below. As with national estimates some of these will be regularly updated and the most contemporary available should be used.

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The *UK Birds Common Standards Monitoring Guidance* has been produced by JNCC (Helen Baker) and Scottish Natural Heritage (Andy Douse) with input from the Inter-Agency Ornithology Working Group (David Stroud, Andy Brown, Sian Whitehead, Ian Enlander, Claire McSorley and Allan Drewitt) on behalf of Scottish Natural Heritage, English Nature, Countryside Council for Wales and Environment and Heritage Service (Northern Ireland).

APPENDIX 1

PROOF OF BREEDING

Records can be considered as proven or probable breeding records if one of the following observations is made:

Bird apparently holding territory (singing in suitable habitat in breeding period (April to July), singing in same area on more than one visit, singing against neighbouring birds, aggressive toward other adults)
Courtship or display behaviour seen, including copulation
Adult seen nest building or carrying nesting material
Adult seen entering or leaving a nest site
Nest found with incubating female, eggs or nestlings
Anxiety calls/agitated behaviour of adult bird indicating presence of nest or young
Distraction display or injury feigning by adult bird
Brood patch on a trapped bird
Adult carrying food or faecal sac
Adult seen with young
Recently fledged young seen or heard (begging calls)
Used nest found (with fresh signs of recent use such as presence of faecal material, eggshell fragments)

Records can be considered as possible breeding records when the following observations are made:

Adult birds using the site during the breeding period (April to July), but with no evidence of breeding (as above) should be recorded only as **seen**. Species recorded as seen (possibly breeding) must not be included in breeding assemblage assessments.

Reference:

Gibbons, D.W., Reid, J.B. & Chapman, R.A. (1993): *The New Atlas of Breeding Birds in Britain and Ireland 1988-1991*. Poyser, London

APPENDIX 2

GLOSSARY

Aggregation	A numerical concentration of birds of either one species or of a group of species in an assemblage.
All-Ireland	All-Ireland comprises the whole of Ireland - Northern Ireland and the Republic of Ireland.
Assemblage	A specific group of species that share similar habitat requirements, e.g. non-breeding waterbirds, breeding seabirds, woodland species, etc.
Baseline value	The value of an attribute that is used to establish a target and assess feature condition, such as the number of pairs of a breeding bird. The baseline value will be that at designation in most cases, but there may be a need to establish baselines where designation data are not available.
Biogeographical importance	A population that is equal to or exceeds 1% of the biogeographical population of the species.
Biogeographical population	A group of birds that breed in a particular location (or group of locations), breed freely within the group, and rarely breed or exchange individuals with other groups.
Designated site	This refers to any site designated under national, European and International statute or convention: ASSI, SSSI, SAC, SPA and Ramsar site.
European importance	For bird populations on a site this refers to a population qualifying under any of the UK SPA selection guidelines.
Great Britain	Great Britain comprises Scotland, England, and Wales (excludes Channel Islands and Isle of Man).
International importance	Equivalent to Biogeographical importance.
National	For populations, refers to either Great Britain or All-Ireland.
Nationally important	A population that is equal to or exceeds 1% of the national population of the species.
Non-breeding	A bird that is present on a site outside of the normal breeding period for that species (includes passage periods and winter).
Passage	The periods in the autumn and spring when migratory birds are moving from breeding areas to wintering areas. These periods are not strictly defined, but are generally taken to include the months of July to October and March to April respectively. See non-breeding and winter.
Seabird	In the context of the application of SPA guideline 1.3, seabirds are defined as species within the families Procellariidae, Hydrobatidae, Sulidae, Phalacrocoracidae, Stercorariidae, Laridae and Alcidae.
Waterbird	In the context of the application of SPA guideline 1.3, waterbirds are defined as migratory species within the families Gaviidae, Podicipedidae, Phalacrocroracidae, Ardeidae, Threskiornithidae, Anatidae, Gruidae, Rallidae, Haematopodidae, Recurvirostridae, Burhinidae, Charadriidae, and Scolopacidae. The term waterfowl has the same meaning.
Winter	The period typically from November to February inclusive. See non-breeding.

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for

Conservation Objectives for Monitoring Designated Sites

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UK GUIDANCE ON CONSERVATION OBJECTIVES FOR MONITORING DESIGNATED SITES

BIRDS: ADDITIONAL INFORMATION

The Birds guidance has two sets of attribute tables: Part 1, which forms the main guidance and is available elsewhere, and Part 2 (Table 2). Part 2 provides useful information for individual species, including recommended methods of assessment and potential sources of existing data, and is recommended for use as a reference companion to Part 1.

PART 2 (TABLE 2): SPECIES SPECIFIC INFORMATION AND DISCRETIONARY ATTRIBUTES FOR BIRDS

Table 2 provides species-specific information on recommended methods of assessment, habitat needs and potential sources of existing data. It also contains selected discretionary attributes that may be measured on sites, but do not form part of the condition assessment process. This list is not exhaustive and other discretionary attributes can be found in Appendix 3, and in other publications, such as Kirby *et al*. 2000. We recommend that where it is considered necessary to measure discretionary attributes to aid in making judgements about site management that you seek the advice of Agency Ornithologists to ensure that you are measuring appropriate attributes for the species concerned - our understanding of habitat needs is constantly improving. More information on species habitat preferences can be found in Fuller 1982 and Snow & Perrins 1998.

Species (Taxonomic order)	**Season**[1]	**Additional Discretionary Attributes (see Part 1)**	**Targets for additional discretionary attributes**	**Method of assessment for species population and additional attributes listed**	**Habitat requirements**	**Potential data sources (see Part 1)**
Aquatic warbler *Acrocephalus paludicola*	NB			**Co-ordinate activity with existing local monitoring.** Specialist monitoring by targeted ringing activity at known sites.	Globally endangered, the Aquatic warbler is a rare passage migrant in the UK. Nearly all are recorded in reedbeds or marshy ground with rushes.	Reserves data, CBR[2], BTO ringing data

[1] Season: B=breeding, NB=outside of breeding season, R=resident (breeding and wintering areas same), L=licence may be required for monitoring in accordance with Wildlife & Countryside Act 1981 or Wildlife (Northern Ireland) Order 1985.
[2] CBR is County Bird Report

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Arctic skua *Stercorarius parasiticus*	B			SMH: Record all Apparently Occupied Territories (AOT). Boat-based surveys for offshore areas.	Nest colonially on drier mossy vegetation on the lower slopes of coastal heathland in the extreme north and west of Scotland.	SCR, SMP, Seabird 2000, reserves data, CBR, ESAS.
Arctic tern *Sterna paradisaea*	B/L	(1) Presence of predator populations in island colonies	(1) Complete absence of signs of *Rattus* species and cats	**Co-ordinate activity with existing local breeding colony monitoring.** SMH, offshore boat-based surveys (1) Record signs of predator presence by general observation throughout colony area (fresh faecal material, evidence from predated eggs and chicks, tracks)	Nest in colonies along coastline or inland lochs or on open grazed areas. Mainly in northern and western Britain.	SCR, SMP, Seabird 2000, ESAS
Avocet *Recurvirostra avosetta*	B/L	See Kirby *et al.* 2000		BMM Consult Agency Advisors for relevant methods of assessment of attributes listed in Kirby *et al*. 2000.	Nests on sparsely vegetated islands in shallow, brackish lagoons.	RBBP, reserves data
Avocet *Recurvirostra avosetta*	NB			WeBS	Winters on estuaries with fine silt sediments.	WeBS
Barn owl *Tyto alba*	R/L			**Co-ordinate activity with existing local monitoring.** BMM: Visit potential breeding areas once in winter to search for, and record, possible nest sites. Re-visit potential nest sites once during the breeding season to look for barn owl signs, watching for bird activity at the nest site at dusk. Extreme care will be necessary when approaching nests during the breeding season.	Feed over rank tussocky grassland (with short-tailed voles) – farmland and rough grazing including: permanent grassland, hay meadows, grassy field edges, woodland edges, hedgerows, river banks and other linear features. Usually nest on ledges in buildings, cavities in isolated trees and nest boxes.	RBBP, CBR, 3-year UK Breeding survey 1994-7 (BTO & Hawk & Owl Trust).

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Barnacle goose (Greenland population - winter on the north and west coasts of Scotland and Ireland) *Branta leucopsis*	NB			WeBS, co-ordinated daytime counts	Wintering birds roost on estuaries, sandbanks and sea lochs and feed on a range of grasses, saltmarsh plants and stubble fields	WeBS, SNH annual surveys on Islay, Coll, Tiree & Hoy. National survey every 5 yrs by WWT (1998 most recent).
Barnacle goose (Svalbard population – winter on the Solway Firth) *Branta leucopsis*	NB			WeBS, co-ordinated daytime counts	Wintering birds roost on estuaries, sandbanks and sea lochs and feed on a range of grasses, saltmarsh plants and stubble fields.	WeBS, WWT annual monitoring.
Bar-tailed godwit *Limosa lapponica*	NB			WeBS	Wintering birds favour sandy estuaries, feeding on larger molluscs and worms from the middle to low shores.	WeBS
Bean goose *Anser fabalis*	NB	(1) Open landscape	(1) Maintain an open landscape in and around feeding areas – in particular limit forestry	WeBS, WWT roost count methods (BMM) (1) When assessing habitats map any forestry extent in and immediately around (within 1 km) site	Winter on coastal grazing marshes, rough pasture, stubble and other agricultural fields, roosting on lochs, rivers and moorland.	WeBS, WWT Grey goose surveys, CBR
Bearded tit *Panurus biarmicus*	R/L			**Co-ordinate activity with existing local monitoring.** BMM: Difficult and time-consuming to census due to lack of singing or territorial behaviour and impenetrable habitat.	Confined to reedbeds.	National surveys 1992, 2002. RBBP, reserves data, BTO ringing data, CBR
Bewick's swan (Tundra swan) *Cygnus columbianus*	NB			WeBS, WWT swan survey methods	Winter either close to water on permanent pasture, winter cereals, root crops or flooded meadows or on brackish lagoons at coastal sites.	WeBS, WWT National swan surveys

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Bittern *Botaurus stellaris*	B/L	(1) Salinity, (2) Standing water in reedbed, (3) Reedbed age structure	(1) Maintain salinity at <5%, (2) Maintain water depth throughout reedbed at 10-30 cm, (3) 30% of reedbed uncut with rest not more than 6 years old, but no more than 20% reed cut in any one year.	Co-ordinate activity with existing local monitoring. Listening for "booming" males: BMM. (1) Take average salinity of water samples taken from all major ditches running into reedbed. Samples to be taken in Mar, May and Jul. Repeat annually, (2) Take 30 measurements of water depth randomly throughout reedbed using a ruler. Repeat in Mar, May and Jul. Repeat annually, (3) Utilise management activity records to estimate proportion of total reedbed cut and age structure.	Occur in large reedbeds – normally >20ha. Water flow through reedbed critical for food supply and availability of shallow water throughout reedbed and frequent pools and ditches important.	Annual breeding surveys of known sites (RSPB/EN surveys)
Bittern *Botaurus stellaris*	NB			WeBS	Reedbeds, estuarine creeks, grazing marshes, streams.	RSPB reserves records, CBR
Black grouse *Tetrao tetrix*	R			BMM: surveys of potential lek sites carried out between late March and mid-May. Count unit is number of males.	Males lek on areas of short vegetation and good all-round visibility on moorland and woodland edges. Females nest close to lek areas.	National survey 1995-6, 2005-6. Black grouse study groups count leks annually.

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Black guillemot *Cepphus grylle*	R	(1) Presence of American mink, or polecat ferrets.	(1) Absence of signs of mink and polecat ferrets along breeding coastline during the breeding period April-July: target is no fresh sign detected (tracks, scats).	SMH – census method. Due to their scattered distribution, it is extremely difficult to get an accurate count of breeding black guillemots. Results are greatly influenced by the fieldworker's familiarity with the study area and with the species. (1) Walk shoreline or cliff top and search for signs of mink presence (see Sargent 1997). Repeat once per month during breeding period.	Nest in natural coastal holes, crevices, caves and boulder beaches near shallow water preferring areas with low predator numbers such as cliffs greater than 10m high (vulnerable to mink). Nest non-colonially with a scattered distribution.	SCR, SMP, Seabird 2000, CBR
Black redstart *Phoenicurus ochruros*	B/L			BMM	In UK found mainly in urban/industrial/built up habitats.	RBBP
Blackbird *Turdus merula*	R			BBS	Breeds in woodlands, parks and scrub with rich undergrowth.	BBS, CES
Blackcap *Sylvia atricapilla*	B			BBS	Breeds in woodlands and parklands with a southerly distribution.	BBS, WBBS, CES
Black-headed gull *Larus ridibundus*	B	(1) Presence of predator populations in island colonies	(1) Complete absence of signs of *Rattus* species and cats	SMH (1) Record signs of predator presence by general observation throughout colony area (fresh faecal material, evidence from predated eggs and chicks, tracks)	Breeds colonially especially at reedy lochs and on islands and coastal marshes. Commonly seen at fresh waters, seashores, on cultivated land, newly ploughed fields, in cities, harbours etc.	SCR, SMP, Seabird 2000, BBS, reserves data, CBR
Black-headed gull *Larus ridibundus*	NB			WeBS, inshore boat-based surveys	Uses a wide variety of different wetland habitats from estuaries to inland pools, farmland and where human activity increases food availability.	WeBS, DWS, BTO Gull Roost survey, WFBS, CBR, ESAS

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Black-necked grebe *Podiceps nigricollis*	B/L	(1) Extent of emergent vegetation, (2) Presence of predator populations	(1) Maintain extent of emergent vegetation, (2) Aim for absence of signs of mink around breeding lakes during the breeding period April-August: no fresh sign detected (tracks, scats).	Co-ordinate activity with existing local monitoring. BMM (1) Estimate area of all emergent vegetation in water body by eye, (2) Walk shoreline of loch and search for fresh signs of mink presence (see Sargent 1997). Repeat once per month during breeding period (April – August).	Nest in dense reeds or sedges in lowland eutrophic meres, ponds, lochs and reservoirs with extensive emergent vegetation.	Regular sites monitored annually (RSPB), RBBP
Black-necked grebe *Podiceps nigricollis*	NB			WeBS, or following instructions for generic surveys of *Inshore marine waterfowl* and *Waterfowl and seabirds at sea* in BMM	Winters in small numbers on inland and coastal waters.	WeBS, CBR
Black-tailed godwit *Limosa limosa*	B/L	See Kirby *et al.* 2000		**Co-ordinate activity with existing local monitoring.** BMM: survey by scanning or transecting all suitable breeding habitat. Consult Agency Advisors for relevant methods of assessment of attributes listed in Kirby *et al.* 2000.	Breeds in wet meadows, coastal grazing marshes and moorland bogs and is loosely colonial.	RBBP, reserves data

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Black-tailed godwit *Limosa limosa*	NB			WeBS	Wintering birds feed on wet grasslands and fine sediment inner estuary sites.	WeBS
Black-throated diver *Gavia arctica*	B/L	(1) Extent of suitable nesting habitat around loch edge, (2) Condition of artificial nesting raft if present	(1) Maintain extent of herbaceous vegetation within 10m of loch edge, including on any islands present in the loch (2) Raft apparently intact and floating freely, with covering vegetation present	Co-ordinate activity with existing local monitoring. BMM and Jackson & Hancock (1994) (1) Estimate proportion of broad habitat types (use Phase 1 categories) within 10 m strip along shore edge (2) Artificial nesting raft to be assessed by observation through binoculars	Breeds on large lochs or small pools near large lochs. Often nest on vegetated islands or sheltered and undisturbed parts of the shoreline without steeply sloping banks. Uses artificial nesting rafts. Forages in breeding loch or adjacent lochs.	SCARABBS[3]: 1985, 1994, RBBP
Black-throated diver *Gavia arctica*	NB			WeBS, aerial surveys, or following instructions for generic surveys of *Inshore marine waterfowl* and *Waterfowl and seabirds at sea* in BMM	Outside of breeding season uses open coastal waters.	WeBS, aerial surveys, ESAS, annual counts of wintering birds in the Moray Firth (RSPB/BP)
Blue tit *Parus caeruleus*	R			BBS	Breeds in open woodland.	BBS, WBBS, CES, NRS
Brambling *Fringilla montifringilla*	NB			WFBS	Winters in mixed species finch flocks on farmland and along woodland edges.	WFBS

[3] SCARABBS national surveys may also be available since 2002 and you should check with Agency Ornithologists on species coverage in more recent surveys.

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Breeding bird assemblages	B			Use a combination of individual species methods as each assemblage comprises both common and rare breeding birds. See SSSI guidelines for species composition.	Habitats broadly defined in SSSI Guidelines (see also Fuller 1982 and habitat reporting categories).	Much data may be available. Sites in which BBS/WBBS squares occur may require no additional data for common breeding species. Data may also be readily available for rare species.
Brent goose (Dark-bellied) *Branta bernicla bernicla*	NB	(1) Food availability	(1) Maintain cover of *Zostera* or *Enteromorpha*	WeBS (1) Estimate by eye the cover of vegetation types on intertidal habitats at low tide	Wintering Brent geese prefer large estuaries and areas of intertidal mudflat, feeding preferentially on eel-grass and saltmarsh vegetation with inland birds feeding in grasslands and cultivated crops such as barley, wheat and oilseed rape.	WeBS
Brent goose (Light-bellied, Greenland popn) *Branta bernicla hrota*	NB	(1) Food availability	(1) Maintain cover of *Zostera* or *Enteromorpha*	WeBS (1) Estimate by eye the cover of vegetation types on intertidal habitats at low tide	Wintering Brent geese prefer large estuaries and areas of intertidal mudflat, feeding preferentially on eel-grass and saltmarsh vegetation with inland birds feeding in grasslands and cultivated crops such as barley, wheat and oilseed rape.	WeBS
Brent goose (Light-bellied, Svalbard popn) *Branta bernicla hrota*	NB	(1) Food availability	(1) Maintain cover of *Zostera* or *Enteromorpha*	WeBS (1) Estimate by eye the cover of vegetation types on intertidal habitats at low tide	Wintering Brent geese prefer large estuaries and areas of intertidal mudflat, feeding preferentially on eel-grass and saltmarsh vegetation with inland birds feeding in grasslands and cultivated crops such as barley, wheat and oilseed rape.	WeBS

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Bullfinch *Pyrrhula pyrrhula*	R			BBS	Breeds in dense forest, forest edges and scrub areas, feeding on buds, berries and seeds.	BBS, WBBS, CES
Buzzard *Buteo buteo*	B/L			BMM	Prefer hunting over open tracts of land with low vegetation, but nest in trees and are linked with a wide variety of habitats.	BBS. Survey of Britain and Ireland 1983 (BTO).
Capercaillie *Tetrao urogallus*	R	(1) Deer fences (2) Presence of predators	(1) Aim for complete removal of deer fencing, but where present maintain markings on deer fences to prevent collisions - all fences should be marked with barrier tape in recommended way (seek advice from Agency Ornithologist) (2) Consider reducing density of certain predators – seek advice from Agency Ornithologists	**Co-ordinate activity with existing local monitoring.** Capercaillie are extremely vulnerable to disturbance and the species is in danger of extinction in the UK again. Specialist surveys are required and should be co-ordinated with advice from Agency Ornithologists. Breeding season surveys are made using trained dogs. Winter surveys involve co-ordinated drives and lek counts. (1) Check fence-lines annually for condition of marking, (2) Monitor crow species using a point count method (BCT), mammals by recording sightings and fresh tracks and signs along a transect through the site (see Sargent 1997).	Ground-nesters in open, mature pinewoods with heather (*Calluna vulgaris*) and blaeberry (*Vaccinium myrtillus*) ground cover and minimal disturbance.	National surveys 1992-3, 1998-9, (2003-4). Some annual monitoring: GCT, RSPB, reserves data
Carrion/hooded crow *Corvus corone (corone)*	R			BBS	Breeds in open cultivated terrain and on woodland edges.	BBS, WBBS
Cetti's warbler *Cettia cetti*	R/L			BMM	A rare sedentary species found in damp, dense scrub habitats, typically alongside reedbeds.	RBBP, reserves data, BBS (some data)

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Chaffinch *Fringilla coelebs*	R			BBS	Breeds in woodlands and parklands.	BBS, WBBS, CES
Chiffchaff *Phylloscopus collybita*	B			BBS	Breeds in woodland.	BBS, WBBS, CES
Chough *Pyrrhocorax pyrrhocorax*	B/L	(1) Habitat quality, (2) Artificial nest sites	(1) Maintain grassland areas in suitable condition to provide good foraging habitat, (2) When present and safe to do so, maintain man-made nest sites in suitable condition for nesting (refer to Bignal & Bignal 1987).	**Co-ordinate activity with existing local monitoring.** BMM (1) Use grassland habitat guidance, (2) Where man-made nest sites are known to have been used at least once in previous 5 year period, make visual examination (if safe to do so) in first week of March each year to determine condition.	Require a mix of suitable nest-sites on cliffs, in caves, quarries or old buildings and feeding areas on pasture and low-intensity grazed land.	National surveys 1992, 2002. RBBP, Chough study groups, reserves data
Chough *Pyrrhocorax pyrrhocorax*	NB			Seek advice of agency ornithologist or local Chough study groups.	Most Chough remain close to breeding areas during the winter, foraging in coastal grasslands, pastures and in fields with cereal stubbles, but some, especially juveniles and those breeding inland, utilise inland pastures.	RSPB, Chough study groups
Cirl bunting *Emberiza cirlus*	R/L	See Kirby *et al.* 2000		BMM for both breeding and winter surveys Consult Agency Advisors for relevant methods of assessment of attributes listed in Kirby *et al.* 2000.	A sedentary species occurring in lowland farmland with a mix of invertebrate rich grasslands and cereals.	RBBP, Cirl Bunting Study Group, full Devon census 1998 and 1999 (RBBP), national census due 2003
Coal tit *Parus ater*	R			BBS	Breeds in woodlands (preferably coniferous).	BBS, WBBS
Collared dove *Streptopelia decaocot*	R			BBS	Breeds and feeds in open habitat with trees or shrubs – parks, gardens, farms, villages.	BBS

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Common crossbill *Loxia curvirostra*	B/L			As Scottish crossbill	Coniferous woodlands, as Scottish crossbill, but able to open larger cones, so mainly feed on spruce seeds.	BBS (some data), CBR, RBBP
Common gull (Mew gull) *Larus canus*	B	(1) Presence of predator populations in island colonies	(1) Complete absence of signs of *Rattus* species and cats	SMH (1) Record signs of predator presence by general observation throughout colony area (fresh faecal material, evidence from predated eggs and chicks, tracks)	Nest, usually colonially, on the ground in predator-free sites such as small coastal and inland islands, moorland and bogs.	SCR, SMP, Seabird 2000, BBS.
Common gull (Mew gull) *Larus canus*	NB			WeBS, inshore boat-based surveys	Widely distributed except in the uplands, showing preference for foraging in grasslands. Roosts on open water bodies and inshore waters. Often associates with Black-headed gulls.	WeBS, DWS, BTO Gull Roost survey, WFBS, CBR, ESAS
Common sandpiper *Actitis hypoleucos*	B			WBBS methods	A mainly upland species that nests near inland waters and on sheltered stony shores with sheltering vegetation.	WBS, WBBS, BBS, CBR
Common sandpiper *Actitis hypoleucos*	NB			WeBS	Use a wide variety of wetland habitats, but favour lakes and reservoirs, or the upper reaches of estuaries.	WeBS
Common scoter (Black scoter) *Melanitta nigra*	B/L	(1) Presence of American mink.	(1) Absence of signs of mink around breeding lochs during the breeding period April-August: no fresh sign detected (tracks, scats).	Hancock (1991), BMM (1) Walk shoreline of loch and search for fresh signs of mink presence (see Sargent 1997). Repeat once per month during breeding period (April – August).	Nest in dense vegetation on scrub-covered islands or uninhabited shorelines of lochs.	National Surveys: 1995 & 2005, RSPB data, RBBP

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Common scoter (Black scoter) *Melanitta nigra*	NB			WeBS, aerial surveys, boat-based surveys	Winter flocks occur on open coastal waters, particularly favouring shallow bays with large bivalve populations.	WeBS, special aerial surveys, ESAS
Common tern *Sterna hirundo*	B/L	(1) Presence of predator populations in island colonies	(1) Complete absence of signs of *Rattus* species and cats	**Co-ordinate activity with existing local breeding colony monitoring.** SMH, offshore boat-based surveys (1) Record signs of predator presence by general observation throughout colony area (fresh faecal material, evidence from predated eggs and chicks, tracks)	Breeds colonially on shingle coasts, and in coastal and inland wetlands.	SCR, SMP, Seabird 2000, WBS, WBBS, BBS, CBR, ESAS
Coot *Fulica atra*	B			BBS or WBBS	Nests in reedbeds and waterside vegetation on lakes, ponds and waterways.	BBS, WBS, WBBS
Coot *Fulica atra*	NB			WeBS	Winters mainly close to breeding areas, but may gather in large concentrations on large freshwater bodies. May also use coastal waters in winter.	WeBS, DWS
Cormorant *Phalacrocorax carbo*	B			SMH, BMM Boat-based surveys for offshore waters.	Breed colonially on coastal cliffs, stacks and offshore islands or inland in trees on islands or along lake edges.	Breeding colony survey (Sellers 1997), SCR, SMP, Seabird 2000, CBR, ESAS
Cormorant *Phalacrocorax carbo*	NB			WeBS Boat-based surveys for offshore waters.	Estuaries, lakes, reservoirs, and large rivers.	Christmas week survey (WWT), National winter roost survey, WeBS, DWS, ESAS
Corn bunting *Miliaria calandra*	R/L			BMM	Open habitats usually associated with arable land (i.e. open farmland, grassland or machair) with perches overlooking the territory.	BBS, reserves data. National Breeding survey 1993.

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Corncrake *Crex crex*	B/L	(1) Habitat structure	(1) Maintain relative proportions of tall grass (20-60 cm) and marsh vegetation (Iris, etc) in mosaic throughout area	**Co-ordinate activity with existing local monitoring.** BMM: surveys of calling males are carried out between midnight and 3.00am (1) Estimate relative proportions of vegetation types by eye or by sampling with quadrats.	Typically breed in hay meadows and silage fields with vegetation cover.	Annual censuses of main UK areas since 1991 (RSPB). National surveys: 1988, 1993, 1998, 2003. RBBP
Crane *Grus grus*	B			**Co-ordinate activity with existing local monitoring.** (seek advice of agency ornithologist)	Breeds on open or semi-open bog or marshland.	Annual counts
Crested tit *Parus cristatus*	R/L	(1) Forest structure	(1) Maintain dead standing wood	BBS style transect approach across whole area, or use BMM in winter to determine breeding population. (1) Ensure forest managed appropriately to maintain dead standing wood.	Keeps small, year-round territories in pinewoods – both semi-natural and plantation with standing dead trees in which they can excavate the nest.	National survey 1993-1994, due 2003-2004. RBBP, reserves data, local bird groups
Cuckoo *Cuculus canorus*	B			BBS	Occurs in most open habitats with some trees, scrub or shrubs.	BBS
Curlew *Numenius arquata*	B			BMM: Breeding bird survey following UBW methods for upland habitats and O'Brien and Smith for lowland habitats.	Breed on moist upland moors, heaths and rough grassland.	BBS, WBBS, RUBS (2002), BWWM (2002), CBR
Curlew *Numenius arquata*	NB			WeBS (wetlands) and WFBS (farmland) methods	Wintering birds are concentrated in coastal areas, particularly estuarine mudflats, but also occur inland.	WeBS and WFBS
Curlew sandpiper *Calidris ferruginea*	NB			WeBS	Principally a passage species in the UK that is found in estuaries and to a lesser extent inland waterbodies.	WeBS

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Dartford warbler *Sylvia undata*	R/L	(1) Presence of gorse	(1) Maintain a mixture of >50% heather and 5-25% gorse	BMM (1) Follow lowland heath habitat guidance for recording habitat components.	Occurs in dry heaths with abundant gorse. Mainly sedentary.	RBBP, reserves data. National survey due 2005.
Dipper *Cinclus cinclus*	R			WBBS	Resident by fast-flowing rivers and streams, feeding on invertebrates on the bed of the waterway. Nests on riverbanks and under bridges.	WBS, WBBS, BBS, NRS, BTO ringing data, CBR
Dotterel *Charadrius morinellus*	B/L			**Co-ordinate activity with existing local monitoring.** BMM: survey of single males in suitable montane habitat.	Breeds in montane areas (above the former treeline) characterised by heaths of prostrate dwarf-shrubs, small herbs, mosses and lichens, preferring open areas of at least 25ha at or above the altitude where heather *Calluna vulgaris* becomes stunted or prostrate due to exposure (about 800m above sea-level); heaths of *Racomitrium lanuginosum*, reindeer moss *Cladonia* and *Cetraria* lichens; open fell-fields especially with *Juncus trifidus*; and flat or gently sloping ground.	National surveys 1987-8, 1997-8 (SNH). RBBP
Dunlin *Calidris alpina*	B/L			BMM: use UBW for upland habitats and Reed and Fuller (1983) for breeding at high density on machair.	Breed on wet moorland with pools and patches of very short vegetation and also in coastal zones, particularly wet areas of machair.	CBR, RUBS (2002)
Dunlin *Calidris alpina*	NB			WeBS	Winter coastally, feeding in muddy areas.	WeBS
Dunnock (Hedge accentor) *Prunella modularis*	R			BBS	Breeds in woodland, scrub and parkland nesting especially in dense thickets.	BBS, CES

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Eider *Somateria mollissima*	B			BMM	Nest either colonially or separately in the shelter of vegetation or rocks usually on islands or near-shore areas but sometimes up to 3km inland.	Local special surveys may be available, CBR
Eider *Somateria mollissima*	NB			WeBS, BMM Boat-based surveys for offshore waters.	Eiders winter in nearshore areas, mainly around northern coasts, including along rocky shores and in estuaries.	WeBS, WeBS special surveys, local surveys, CBR, ESAS
Fieldfare *Turdus pilaris*	NB			WFBS	Winter visitor to the UK in large numbers. Feeds on a variety of fruits so associated with hedgerows, orchards, gardens.	WFBS, CBR
Firecrest *Regulus ignicapillus*	B/L			BBS, song recognition important.	A rare breeding bird in the UK, found in a variety of different woodlands but currently restricted largely to S England.	RBBP
Fulmar *Fulmarus glacialis*	B			SMH, Offshore boat-based surveys.	Nests in exposed site on ledges on bird cliffs and on near-inaccessible cliff faces near coast, feeding on animals floating on the sea's surface.	SCR, SMP, Seabird 2000, ESAS
Fulmar *Fulmarus glacialis*	NB			Offshore boat-based surveys.	Remain on breeding sites all through the year, foraging out to sea.	ESAS
Gadwall *Anas strepera*	B/L			BMM: breeding season surveys are carried out using generic methods for Dabbling and diving ducks.	Nests in emergent vegetation or low scrub on edged of shallow, eutrophic waterbodies.	RBBP, WBS, WBBS, reserve data, CBR
Gadwall *Anas strepera*	NB			WeBS	Generally associated with inland fresh water feeding on the leaves and stems of aquatic plants.	WeBS, DWS

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Gannet *Morus bassanus*	B			SMH, BMM Boat-based surveys for offshore waters.	Breed colonially on cliff ledges or cliff-top slopes on stacks, headlands and islands.	SCR, SMP, 1994-5 North Atlantic gannet survey (Murray & Wanless 1997), Seabird 2000, ESAS
Gannet *Morus bassanus*	NB			Offshore boat-based surveys.	Some birds winter around UK coasts occurring at low densities.	ESAS
Garden warbler *Sylvia borin*	B/L			BBS	Breeds in woodlands with scrub and dense undergrowth.	BBS, WBBS, CES
Garganey *Anas querguedula*	B/L			BMM: breeding season surveys are carried out using generic methods for Dabbling and diving ducks.	Breed in lowland wet grassland, marsh, fen or grassland with intersecting ditches often edged with *Phragmites* reed.	RBBP
Garganey *Anas querguedula*	NB			WeBS	Small numbers of birds may be present on small waterbodies during migration periods.	WeBS
Glaucous gull *Larus hyperboreus*	NB			WeBS	A rare winter visitor to the UK that associates with other gulls both along coasts and at a few inland locations.	WeBS, CBR
Goldcrest *Regulus regulus*	R			BBS	Breeds in woodland.	BBS
Golden eagle *Aquila chrysaetos*	R/L	(1) Disturbance	(1) Limit disturbance affecting breeding success	**Co-ordinate activity with existing local monitoring.** Breeding season survey follows methods by Green (1996). (1) Maintain records of signs of human disturbance	Nest in mountainous upland with rock faces with ledges or hollows between 16 and 900m above sea level. Feed over open areas with rough grass moors and smooth grassland, especially slopes or plateaux with open views of home ranges of between 30 and 120 km^2 (according to prey density).	National surveys 1982, 1992, 2002 (RSPB/SNH). Raptor study groups generally co-ordinate monitoring.
Golden oriole *Oriolus oriolus*	B/L			**Co-ordinate activity with existing local monitoring.** BMM	Woods and belts of planted poplars.	National surveys in 1994 & 1995. RBBP, Golden Oriole Group

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Golden plover *Pluvialis apricaria*	B/L			UBW (see BMM)	Nest on moorland 300-610m above sea-level with vegetation varying from complete dominance by ling heather Calluna vulgaris on dry ground to co-dominance with cotton-grass Eriophorum vaginatum on wet ground where blanket bog has developed. Occasionally on barer patches in areas of full moor vegetation (>15 cm tall).	National survey 1996-7. Special upland surveys (e.g. RUBS 2002), BBS, CBR
Golden plover *Pluvialis apricaria*	NB			WeBS (wetlands) and WFBS (farmland) methods	Winter on lowland agricultural land including permanent pasture, ploughed fields and winter cereals.	WeBS and WFBS, DWS, CBR
Goldeneye *Bucephala clangula*	B/L	(1) Condition of artificial nest sites (boxes)	(1) Where present aim to maintain nest boxes in good conditions	BMM: breeding season surveys are carried out using generic methods for Dabbling and diving ducks. Goldeneyes nest in boxes and checks of these may also provide breeding data – **this must be done in co-operation with those responsible for maintaining these boxes**. (1) Inspect nest boxes in late February/early March	Goldeneye nest in natural tree-holes, woodpecker holes, nesting boxes and under rocks or logs in coniferous forests up to 1km from water.	RBBP, RSPB, reserves data, local bird group data, CBR
Goldeneye *Bucephala clangula*	NB			WeBS	Goldeneyes use a wide range of wetlands during the winter.	WeBS, DWS, CBR
Goldfinch *Carduelis carduelis*	R			BBS	Breeds in open cultivated areas with wooded areas or on woodland edges.	BBS, WBBS, CES
Goosander *Mergus merganser*	B/L			BMM	Breed preferably on wider stretches of upland rivers with shallow gradients, occasionally on lowland reaches or upland lochs.	National breeding survey (sawbills on rivers) 1987 & 1997, special local surveys, WBS

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Goosander *Mergus merganser*	NB			WeBS	Winter on lower reaches of rivers or on reservoirs or estuaries usually feeding on rivers and roosting on standing water.	WeBS, DWS
Goshawk *Accipiter gentilis*	B/L	(1) Disturbance	(1) Limit disturbance affecting breeding success	**Co-ordinate activity with existing local monitoring.** Specialist survey required: signs of territory occupancy (kills, display), location of nests. (1) Maintain records of signs of human disturbance.	Breeds in large woodlands and can also hunt over open fields and meadows.	RBBP, raptor study groups, local bird groups
Grasshopper warbler *Locustella naevia*	B			BBS	Breeds in rank meadows, marsh fringes and along ditches feeding on insects.	BBS, WBBS
Great black-backed gull *Larus marinus*	B	(1) Presence of predator populations in island colonies	(1) Complete absence of signs of *Rattus* species and cats	SMH (1) Record signs of predator presence by general observation throughout colony area (fresh faecal material, evidence from predated eggs and chicks, tracks)	Breeds on rocky coasts and at some larger inland waters, usually solitarily but locally in colonies, feeding on fish, eggs and young of other birds in the colony.	SCR, SMP, Seabird 2000, BBS, CBR
Great black-backed gull *Larus marinus*	NB			WeBS, offshore boat-based surveys	A mainly coastal species, but also found in inland areas where human activity increases food availability. Roosts on open waters, including some inland lakes and reservoirs.	WeBS, DWS, BTO Gull Roost survey, ESAS
Great crested grebe *Podiceps cristatus*	B	(1) Extent of emergent and overhanging vegetation	(1) Maintain presence of emergent vegetation and overhanging vegetation	Hughes et al (1979) (1) Estimate area of all emergent vegetation in water body by eye. Map occurrence of overhanging shrubs along shoreline	Common on shallow ponds and lakes where they nest in reedbeds or other aquatic vegetation next to the open water and feed on fish and small aquatic animals.	WBS, WBBS, BBS, CBR

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Great crested grebe *Podiceps cristatus*	NB			WeBS, or following instructions for generic surveys of *Inshore marine waterfowl* and *Waterfowl and seabirds at sea* in BMM	Winter on larger lakes, reservoirs and sheltered coastal bays.	WeBS, DWS, CBR
Great northern diver *Gavia immer*	NB			WeBS, aerial surveys, or following instructions for generic surveys of *Inshore marine waterfowl* and *Waterfowl and seabirds at sea* in BMM	Deep marine waters further offshore than other diver species.	WeBS, aerial surveys, ESAS
Great skua *Catharacta skua*	B			SMH: Record all Apparently Occupied Territories (AOT). Boat-based surveys for offshore areas.	Nest in loose colonies on wetter ground within coastal grassy moors in extreme north and west of Scotland.	SCR, SMP, Seabird 2000, reserves data, CBR, ESAS.
Great spotted woodpecker *Dendrocopos major*	R			BMM	Breed in mature woodland (preferring deciduous woodland) with trees sufficiently large to accommodate nest-holes.	BBS
Great tit *Parus major*	R			BBS	Breeds in all types of woodland.	BBS, WBBS, CES, NRS
Green sandpiper *Tringa ochropus*	NB			WeBS	Prefers shallow freshwater habitats including streams, ditches, pools and muddy margins of lakes and reservoirs.	WeBS, DWS, CBR
Green woodpecker *Picus viridis*	R			BBS or BMM.	Feed in woodland, parkland and farmland with food supplies (ants) usually nesting in old (preferably deciduous) trees.	BBS
Greenfinch *Carduelis chloris*	R			BBS	Breeds in open habitats such as farmland with hedgerows.	BBS, WBBS, CES
Greenshank *Tringa nebularia*	B/L			**Co-ordinate activity with existing local monitoring.** BMM: survey of all waterbodies walking within 500m of all suitable habitat	Breed on open wet moorland and flow country of the north.	Reserves data, CBR, National surveys 1995-6, due 2004/5.

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Greenshank *Tringa nebularia*	NB			WeBS	Utilises a wide range of different wetland habitats outside of the breeding season. Feeds on small fish and invertebrates.	WeBS, CBR
Grey heron *Ardea cinerea*	B/L			BTO Heronries census method, BCT	Uses all types of watercourse and in agricultural lands nesting in colonies in trees, in reedbeds and occasionally on cliffs dispersing to winter by fish-rich waters.	BTO Heronry Census, CBR
Grey heron *Ardea cinerea*	NB			WeBS	Uses all types of wetlands, including coastal waters.	WeBS, DWS
Grey partridge *Perdix perdix*	R			BMM: breeding season survey of all habitats except woodland over 5 years old follows the methods used in the GCT Annual Partridge Count Scheme. Or, BBS method	Nest on the ground, often at the bottom of a hedge on field edges usually by cereal crops or pasture but also in habitats such as fringes of rush-covered moorland.	BBS, Annual March pair counts and August brood counts (GCT)
Grey plover *Pluvialis squatarola*	NB			WeBS	Favour large muddy estuaries, often sharing high tide roosts with knot and dunlin. Usually a southern and eastern distribution.	WeBS
Grey wagtail *Motacilla alba*	B			WBBS	Breed near running water, also winter by lochs and coast.	WBS, WBBS, BBS
Greylag goose (Icelandic population) *Anser anser*	NB			WeBS, WWT roost count methods (BMM)	Wintering greylags feed on estuaries, on farmland with cereals or root crops and on grass, roosting on estuaries, lochs, rivers or reservoirs.	WeBS, WWT Grey goose surveys, CBR
Greylag goose (N. Scottish popn) *Anser anser*	B			Systematic search for pairs in suitable nesting habitat in first two weeks of May.	Native greylags nest in heather, low scrub and rush habitats close to small waterbodies on islands or in moorland areas.	SNH/JNCC special surveys, CBR

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Greylag goose (N. Scottish popn) *Anser anser*	NB			WeBS, co-ordinated daytime counts	Wintering greylags feed on estuaries, on farmland with cereals or root crops and on grass, roosting on estuaries, lochs, rivers or reservoirs.	WeBS, North Scottish populations survey 1999.
Greylag goose (re-established popn) *Anser anser*	NB			WeBS, WWT roost count methods (BMM)	Wintering greylags feed on estuaries, on farmland with cereals or root crops and on grass, roosting on estuaries, lochs, rivers or reservoirs.	WeBS, DWS, special WWT surveys.
Guillemot *Uria aalge*	B			SMH, offshore boat-based surveys	Nest in colonies on coastal cliffs and rock stacks near suitable fishing grounds.	SCR, SMP, Seabird 2000, ESAS
Guillemot *Uria aalge*	NB			Offshore boat-based surveys.	Pelagic in winter, although some seen along coasts.	ESAS
Hawfinch *Coccothraustes coccothraustes*	R			BMM: difficult to survey due to sparse distribution and difficulty of locating birds.	Range of habitats with tall trees including broad-leaved and mixed woodlands with fruit-bearing trees such as beech, ash, sycamore, ample, cherry and apple.	CBR

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Hen harrier *Circus cyaneus*	B/L	(1) Extent of mature heather (2) Disturbance	(1) Maintain patches of heather of at least 40 cm deep on flat or gently sloping ground (2) Limit disturbance affecting breeding success	Co-ordinate activity with existing local monitoring. BMM (1) Divide site into blocks of around 9 km^2, locate and measure areas of mature heather. To measure height take 20 randomly positioned measurements within area of mature heather using ruler – use mean of these measures to record height. Estimate area of mature heather by pacing. Map locations of mature heather – code for cross-reference back to measures. This can be done at the same time as habitat monitoring, but should be done once in March or April annually, (2) Maintain records of signs of human disturbance.	Nest on moorland with old, deep heather or in heather within young conifer plantations.	National breeding surveys: 1988-9, 1998. Raptor study groups, local bird groups, RBBP.
Hen harrier *Circus cyaneus*	NB	(1) Disturbance	(1) Limit disturbance affecting use of roost site by birds	Co-ordinate activity with existing local monitoring. BMM: winter roost counts (1) Maintain records of signs of human disturbance.	While some hen harriers remain in the uplands during winter others move to coastal areas and are often associated with wetlands. They gather in communal roosts.	Annual national winter roost survey, raptor study groups, RSPB, reserves data
Herring gull *Larus argentatus*	B	(1) Presence of predator populations in island colonies	(1) Complete absence of signs of *Rattus* species and cats	SMH (1) Record signs of predator presence by general observation throughout colony area (fresh faecal material, evidence from predated eggs and chicks, tracks)	Breeds colonially, often on islands or cliffs.	SCR, SMP, Seabird 2000, BBS, CBR

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Herring gull *Larus argentatus*	NB			WeBS, offshore boat-based surveys	Closely associated with areas where human activity increases food availability, both inland and along coasts. Roost on open inland and coastal waters.	WeBS, DWS, BTO Gull Roost survey, ESAS
Hobby *Falco subbuteo*	B/L			**Co-ordinate activity with existing local monitoring.** Specialist survey required: signs of territory occupancy (display, alarm calls by adults, fledged young).	Tree nesting, migrant raptor using variety of woodland habitats from those associated with heaths to parkland.	National survey: 1996-7. RBBP, raptor study groups, local bird groups
Honey buzzard *Pernis apivorus*	B/L			Co-ordinate activity with existing local monitoring. Observe woodland areas from vantage points on at least four early morning visits during late May and early June when the conspicuous sky-dance display will indicate presence of bird on territory. Record presence as numbers of occupied territories.	Rare migrant breeder in UK woodlands from May-August. Has large territories and feeds mainly on wasps and bees.	RBBP, including national census in 2000. Local raptor workers (seek advice of your licensing team).
House martin *Delichon urbica*	B			BBS	Nests colonially on buildings and cliff faces in open/semi-open terrain often near water.	BBS, CBR
House sparrow *Passer domesticus*	R			BBS	Breeds in most habitats, nesting in holes, usually beneath roof tiles or, occasionally on open branches in bushes or trees.	BBS
Iceland gull *Larus glaucoides*	NB			WeBS	A rare winter visitor to the UK that associates with other gulls both along coasts and at a few inland locations.	WeBS, CBR

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Jack snipe *Lymnocryptes minimus*	NB			BMM: Winter survey by transect counts of suitable habitat (Jack snipe tend to remain hidden and are usually only detected once flushed).	Jack snipe winter in shallow, wet and muddy freshwater habitats, foraging (usually nocturnally) among dense grass and rushes for insects, molluscs, worms and plant material.	CBR, WeBS (under-represented), DWS
Jackdaw *Corvus monedula*	R			BBS	Breeds colonially in towns, villages and mature woodlands.	BBS
Jay *Garrulus glandarius*	R			BBS	Breeds in woodlands, favouring stands of young trees.	BBS, WBBS
Kestrel *Falco tinnunculus*	B/L			BBS, or total of two visits in April to May under method 2 of BMM	Nest in a wide variety of habitats and situations including old stick nests, crags, holes in trees and buildings with minimal disturbance.	BBS
Kingfisher *Alcedo atthis*	B/L			WBBS methods	Nest in sand/earth banks near clear-flowing rivers or waterbodies preferably with perches overhanging the water.	WBS, WBBS, reserves data,
Kingfisher *Alcedo atthis*	NB			WeBS	In winter moves away from uplands and responds to freezing by moving to coasts.	WeBS, reserves data, DWS
Kittiwake *Rissa tridactyla*	B			SMH	Breeds in large colonies on cliff precipices.	SCR, SMP, Seabird 2000
Kittiwake *Rissa tridactyla*	NB			WeBS, offshore boat-based surveys	Mainly a pelagic species, roosting on the sea, but also occurs along coasts.	WeBS, ESAS
Knot (Red knot) *Calidris canutus*	NB			WeBS	Wintering birds concentrate on large estuaries where they feed on marine bivalve molluscs on open mudflats and form large tightly packed flocks at high tide.	WeBS

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Lapland bunting (longspur) *Calcarius lapponicus*	NB			WFBS – winter walks method (transect along salt-marsh edge)	Winter on east coast stubble fields, coastal meadows and pastures. Often associated with other finches or buntings in flocks.	CBR
Lapwing *Vanellus vanellus*	B			BMM: use UBW for upland habitats, O'Brien and Smith for lowland habitats and Reed and Fuller (1983) for breeding specifically at high density on machair.	Breed mostly on agricultural land, feeding on organisms in moist soil. Important (for successful breeding) that intensive management is not undertaken during nesting.	BBS, WBBS, BWWM (2002), RUBS (2002), NRS, CBR
Lapwing *Vanellus vanellus*	NB			WeBS (wetlands) and WFBS (farmland) methods	Winter on lowland agricultural land including permanent pasture, ploughed fields and winter cereals.	WeBS and WFBS, DWS, CBR
Leach's petrel *Oceanodroma leucorhoa*	B/L	(1) Presence of predator populations in offshore habitats	(1) Complete absence of signs of *Rattus* species and cats in offshore breeding habitats	Seabird 2000 methods should be followed with stringent regard for Health and Safety guidelines, SMH, BMM. Boat-based surveys for offshore waters. (1) Record signs of predator presence by general observation throughout colony area (fresh faecal material, evidence from predated eggs and chicks, tracks)	Breed in burrows or under boulders or scree on undisturbed offshore islands.	SCR, SMP, Seabird 2000, ESAS, special surveys
Lesser black-backed gull *Larus fuscus*	B	(1) Presence of predator populations in island colonies	(1) Complete absence of signs of *Rattus* species and cats	SMH (1) Record signs of predator presence by general observation throughout colony area (fresh faecal material, evidence from predated eggs and chicks, tracks)	Breeds colonially, often on islands or cliffs.	SCR, SMP, Seabird 2000, BBS, CBR

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Lesser black-backed gull *Larus fuscus*	NB			WeBS, offshore boat-based surveys	Closely associated with areas where human activity increases food availability, so mostly found inland. Roost on open inland waters, and to lesser extent on coastal waters.	WeBS, DWS, BTO Gull Roost survey, ESAS
Lesser redpoll *Carduelis cabaret*	B			BBS	Breeds in birchwoods or scrubby areas.	BBS, WBBS
Lesser spotted woodpecker *Dendrocopos minor*	R			BMM	Broad-leaved woodland.	CBR, BBS, WBBS
Lesser whitethroat *Sylvia curruca*	B			BBS	Breeds in semi-open terrain with bushy vegetation, such as hedgerows in arable areas.	BBS, WBBS, CES
Linnet *Carduelis cannabina*	R			BMM: Difficult to survey due to patchy distribution and wide-ranging foraging behaviour. Nest singly or semi-colonially.	Nest in scrub and hedgerows feeding on seeds often on agricultural “weeds” or rape-seed up to 1km from nest site.	BBS, WBBS
Little auk *Alle alle*	NB			Offshore boat-based surveys.	Pelagic in winter, although some seen along coasts.	ESAS, CBR
Little egret *Egretta garzetta*	B			BTO Heronries census method	Found in marshes, irrigated land, lakes and rivers, and some coastal areas. Nests in tall trees or scrub with dense understory.	RBBP
Little egret *Egretta garzetta*	NB			WeBS	As breeding habitat.	WeBS, CBR
Little grebe *Tachybaptus ruficollis*	B	(1) Extent of emergent vegetation	(1) Maintain presence of emergent vegetation in water body	BCT (1) Estimate area of all emergent vegetation in water body by eye	Breeds on well-vegetated lakes, rivers and ponds feeding on insects, small fish and molluscs.	WBS, WBBS, BBS, CBR
Little grebe *Tachybaptus ruficollis*	NB			WeBS	Mainly sedentary but also winters along sheltered coasts.	WeBS, DWS, CBR

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Little gull *Larus minutus*	NB			WeBS, boat-based surveys in inshore waters	Winter along coasts, especially east coast of Britain, but also in offshore waters.	WeBS, ESAS
Little owl *Athene noctua*	R			BBS	Occurs in open, often cultivated areas, nesting in cavities in trees or buildings. Often diurnal.	BBS
Little ringed plover (Little plover) *Charadrius dubius*	B/L			**Co-ordinate activity with existing local monitoring.** Observation of suitable areas from vantage points in May and June. Do not attempt to locate nests.	Nests inland on open ground in gravel or sand substrates, typically by water. Many man-made sites are used, such as active gravel workings, but natural sites along rivers are also used.	RBBP, WBS, local bird groups, CBR
Little stint *Calidris minuta*	NB			WeBS	Principally a passage species in the UK that is found in estuaries and to a lesser extent inland waterbodies.	WeBS
Little tern *Sterna albifrons*	B/L	(1) Presence of predator populations	(1) Significantly reduce effects of predators on nesting birds	**Co-ordinate activity with existing local monitoring.** SMH (1) Record signs of predator presence by general observation throughout colony area (fresh faecal material, evidence from predated eggs and chicks, observation)	Nest in small colonies on sand or shingle beaches. Susceptible to disturbance, tidal flooding and predation.	SCR, SMP, Seabird 2000, reserves data, RBBP
Long-eared owl *Asio otus*	B/L			By detection of male display calls while walking tansect through woodland in first few hours of darkness, during at least two visits in early March. Male call is slow, evenly spaced series of low ‘oo’ or ‘hu’ sounds.	Breeds in woodland, hunts over open moors, marshland and meadows, feeding on voles, mice and small birds.	CBR

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Long-eared owl *Asio otus*	NB			No recommended methods. Extremely difficult to census and observations are typically incidental while carrying out other surveys. During daylight most sightings are of roosting birds.	Associated with woodland throughout the year, although will roost in open woodland and scrub. Largely nocturnal, but may be seen hunting at dawn and dusk.	CBR
Long-tailed duck *Clangula hyemalis*	NB			WeBS Boat-based surveys for offshore waters.	Wintering long-tailed ducks flock on open coastal waters such as shallow, sandy areas within the Moray Firth or off rocky coasts, within smaller estuaries or on brackish, coastal lochs. They often associate with eiders and scoters.	WeBS, ESAS
Long-tailed tit *Aegithalos caudatus*	R			BBS	Breeds in bushy, deciduous or mixed woods or more open terrain with bushes and hedges, building large elaborate nests with side entrances.	BBS, WBBS, CES
Magpie *Pica pica*	R			BBS	Breeds in many different habitats – usually in association with man. Builds large stick nest with side entrance, usually in trees.	BBS, WBBS
Mallard *Anas platyrhynchos*	B			BMM: breeding season surveys are carried out using generic methods for Dabbling and diving ducks.	Breed in most types of freshwater wetland, from narrow drainage ditches to large lakes.	WBS, WBBS, BBS, reserve data, CBR
Mallard *Anas platyrhynchos*	NB			WeBS	Utilises a wide range of wetlands.	WeBS, DWS

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Manx shearwater *Puffinus puffinus*	B	(1) Presence of predator populations in offshore habitats	(1) Complete absence of signs of *Rattus* species and cats in offshore breeding habitats	SMH, BMM: counting apparently occupied sites/burrows in randomly selected quadrats. Boat-based surveys for offshore waters. (1) Record signs of predator presence by general observation throughout colony area (fresh faecal material, evidence from predated eggs and chicks, tracks)	Breed in excavated burrows on grassy islands and headlands.	SCR, SMP, Seabird 2000, ESAS, special surveys
Marsh harrier *Circus aeruginosus*	B/L			Co-ordinate activity with existing local monitoring. BMM	Nest either in reedbeds or in arable fields, feeding over adjacent and/or coastal arable fields.	National surveys: 1995, 2005, RBBP, EN & RSPB data, reserves data, raptor study group data
Marsh harrier *Circus aeruginosus*	NB			Record number of apparently different individuals (from plumage) feeding over site on two half-day morning periods in December or January. Or, from vantage point count birds entering communal roosts at dusk. Repeat on two days in December or January.	In winter, feed over wide variety of habitats, but sometimes gather in communal roosts.	Reserves data, CBR
Marsh tit *Parus palustris*	R			BBS	Breeds in deciduous/mixed woodland often near streams or lochs.	BBS, WBBS
Marsh warbler *Acrocephalus palustris*	B/L			BMM	A rare breeding species in the UK, favouring tall herb stands on rich, damp soils and with adjacent shrubs.	RBBP
Meadow pipit *Anthus pratensis*	B			BBS	Breeds in open habitats such as meadows, bogs, heaths and marsh edges.	BBS, RUBS (2002), BWWM (2002), WBBS, CBR

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Meadow pipit *Anthus pratensis*	NB			WFBS	Winter in wide variety of open habitats, but less so in the uplands and northern Britain.	WFBS, CBR
Mediterranean gull *Larus melanocephalus*	B/L			**Co-ordinate activity with existing local monitoring.** (seek advice of agency ornithologist)	A rare, but increasing, breeder in UK – nests on flat shores and islands beside seas or larger lochs, usually in colonies.	RBBP
Mediterranean gull *Larus melanocephalus*	NB			WeBS	Associates with Black-headed gull flocks in winter, and is found along coasts often where human activity increases food availability.	WeBS
Merlin *Falco columbarius*	B/L			**Co-ordinate activity with existing local monitoring.** BMM	Nest on the ground, on rocky outcrops or in old crows nests on moorland and hunt over open ground.	National surveys 1983-4, 1993-4, due 2006. Raptor study groups, RBBP
Merlin *Falco columbarius*	NB			Most likely to be found incidentally during other surveys. No specific methods. Or, where appropriate from a vantage point count birds entering communal roosts at dusk. Repeat on two days in December or January.	Merlins disperse away from upland breeding areas to winter in many different habitats, including coastal.	WeBS (to 2002), CBR
Mistle thrush *Turdus viscivorus*	B			BBS	Breeds in woodlands and parklands, wintering birds often feed in fields/ grasslands.	BBS
Montagu's harrier *Circus pygargus*	B/L			Co-ordinate activity with existing local monitoring. **(seek advice of agency ornithologists)**	Southerly distribution breeding on peatbogs, heaths and agricultural land.	RBBP
Moorhen *Gallinula chloropus*	R			BBS or WBBS for breeding survey. Winter survey as WeBS.	Nests in reedbeds, on rivers, ponds etc with sheltering vegetation of reeds, bulrushes, willow etc.	BBS, WBS, WBBS, WeBS, DWS

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Mute swan *Cygnus olor*	B			BMM	Nest within 100m of eutrophic waters – lochs, reservoirs, canals, slow-flowing rivers, ponds and burns.	National breeding surveys 1955-6, 1978, 1983, 1990, 1961 (partial), 2002. BBS, WBS, WBBS, CBR
Mute swan *Cygnus olor*	NB			WeBS		WeBS, DWS, CBR
Nightingale *Luscinia megarhynchos*	B	See Kirby *et al*. 2000		BMM Consult Agency Advisors for relevant methods of assessment of attributes listed in Kirby *et al*. 2000.	Scrub or woodland.	BBS, WBBS, national survey 1999 (BTO), reserves data, CBR
Nightjar *Caprimulgus europaeus*	B/L	(1) Forestry structure	(1) Maintain mosaic of bare ground, low vegetation and forestry (see Kirby *et al*. 2000)	BMM (1) Map areas of bare ground, trees/scrub, and low vegetation during one visit to the site.	Breed on lowland heath, clearfell and in young conifer plantations.	National surveys 1992, due 2003. CBR
Nuthatch (Wood nuthatch) *Sitta europaea*	R			BBS	Breeds in open woodland, preferably deciduous or mixed, nesting in tree-holes.	BBS
Osprey *Pandion haliaetus*	B/L	(1) Condition of nesting tree(s) or artificial platform	(1) Maintain condition of nest tree or artificial platform	All known breeding sites are currently monitored by the Scottish Osprey Study Group, RSPB and L&RWT. (1) Inspect known nest location in late February/early March each year	Nest in mature trees with open views of surrounding area. Fish in rivers, lochs and/or estuaries. In UK from March to October.	Annual monitoring by Scottish Osprey Study Group, RBBP, national survey due 2003
Oystercatcher *Haematopus ostralegus*	B			BMM: Breeding season surveys follow UBW for birds in upland habitats, O'Brien and Smith (1992) for lowland habitats and Reed and Fuller (1983) for breeding specifically at high density on machair.	Coastal oystercatchers nest on shingle beaches, dunes, saltmarshes and rocky shores whilst inland nests are mainly on riverine shingle beds, loch shores and in fields.	BBS, WBS, WBBS, BWWM (2002), RUBS (2002), CBR

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Oystercatcher *Haematopus ostralegus*	NB			WeBS	Winter on sandy estuaries, near cockle and mussel beds, on rocky shores and on coastal pastures.	WeBS
Parrot crossbill *Loxia pytyopsittacus*	B/L			As Scottish crossbill	Coniferous woodland, as Scottish crossbill, but able to open larger cones, so also feed on spruce seeds.	RBBP
Peregrine *Falco peregrinus*	B/L	(1) Disturbance	(1) Limit disturbance affecting breeding success	**Co-ordinate activity with existing local monitoring.** BMM (1) Maintain records of signs of human disturbance	Undisturbed cliffs and crags on coastal, moorland or mountain terrain.	National surveys 1961, 1971, 1981, 1991, 2002. Raptor study groups, RBBP
Peregrine *Falco peregrinus*	NB			Most likely to be found incidentally during other surveys. No specific methods.	Some peregrines remain in upland areas during winter, while others disperse to lowland habitats and coasts.	WeBS (to 2002), CBR
Pied flycatcher *Ficedula hypoleuca*	B/L			BBS	Breeds in woodlands, nesting in cavities or nestboxes. Like wood warbler, associated with upland oakwoods.	Reserves data, BBS (some data), RAS (19 registered studies), NRS, CBR
Pied wagtail (White wagtail) *Motacilla alba*	B			BBS	Often nests on buildings or near water in most habitats with open areas with invertebrates.	BBS, WBBS
Pied wagtail (White wagtail) *Motacilla alba*	NB			WFBS	Wide distribution in wide variety of habitats. Gathers in large roosts, often in urban areas.	WFBS
Pink-footed goose *Anser brachyrhynchus*	NB			WeBS, WWT roost count methods (BMM)	Wintering pink-footed geese are associated with lowland farmland where barley stubble, potato fields, winter-sown cereals and pasture provide winter food, roosting on the mudflats and sandbanks of estuaries and on inland lochs and reservoirs.	WeBS, WWT Grey goose surveys, CBR

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Pintail *Anas acuta*	B/L			BMM: breeding season surveys are carried out using generic methods for Dabbling and diving ducks.	Breed close to either shallow lowland lakes and marshes or upland lakes and moorland pools.	RBBP
Pintail *Anas acuta*	NB			WeBS	Wintering birds occur mainly on estuaries and inland floodplains.	WeBS
Pochard *Aythya ferina*	B/L			BMM: breeding season surveys are carried out using generic methods for Dabbling and diving ducks.	Breed on large pools, lochs or slow-moving lowland streams with significant emergent and submergent vegetation.	RBBP, WBS, CBR, reserve data
Pochard *Aythya ferina*	NB			WeBS	Winter on lowland freshwater reservoirs, lochs, ponds, gravel pits, usually with a good growth of submerged aquatic plants and small molluscs.	WeBS, DWS
Ptarmigan *Lagopus mutus*	R			Record birds seen during a single transect walk in early May (prior to nesting). Transect should be at least 2 km and run across montane plateaux. Alternatively can be recorded when monitoring other montane species.	Breeds in boulder zone above treeline, feeding on insects, berries, shoots and leaf buds.	Estate records, reserves records, CBR
Puffin *Fratercula arctica*	B	(1) Presence of predator populations in colonies	(1) Complete absence of signs of *Rattus* species, cats and polecat ferrets in colonies	SMH: Either count apparently occupied burrows using quadrats or transects or count individuals. Offshore boat-based surveys also. (1) Record signs of predator presence by general observation throughout colony area (fresh faecal material, evidence from predated eggs and chicks, tracks (see Sargent 1997)).	Nest in burrows usually in peaty, grass-topped soils along cliff-tops on coasts and islands in the absence of predators (e.g. rats and cats) and disturbance.	SCR, SMP, Seabird 2000, ESAS
Puffin *Fratercula arctica*	NB			Offshore boat-based surveys.	Pelagic in winter.	ESAS

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Purple sandpiper *Calidris maritima*	B/L			**Co-ordinate activity with existing local monitoring.** BMM Breeding localities are strictly confidential.	Purple sandpiper is a rare and occasional breeding species in Scotland, preferring exposed tundra-like habitats, often with wet, boggy areas and moss hummocks at altitude.	RBBP
Purple sandpiper *Calidris maritima*	NB			WeBS	A bird of rocky shorelines that forages along the tide edge in rotting seaweed or among rocky intertidal substrates.	WeBS, CBR
Quail *Coturnix coturnix*	B/L			BMM: surveys of singing males to give an index of numbers present.	Breed in cereal and hay fields, particularly winter cereals and meadow-like wild grasslands with a vegetation structure that allows good movement with protection from avian predators and with a source of insect food.	RBBP
Raven *Corvus corax*	B			BBS	Breeds in mountain districts and other habitats with suitable rock faces or solitary wooded areas for nesting.	BBS, RUBS (2002), reserves data, CBR
Razorbill *Alca torda*	B			SMH, offshore boat-based surveys	Nest in colonies using ledges and holes in coastal cliffs and rock stacks near fishing areas. Occasionally use boulder beaches.	SCR, SMP, Seabird 2000, ESAS
Razorbill *Alca torda*	NB			Offshore boat-based surveys.	Pelagic in winter, although some seen along coasts.	ESAS
Red grouse *Lagopus lagopus*	R			BCT or UBW (or BBS) Refer to the *Muirburn Code* (SNH).	Breeds and winters commonly on large treeless heather moors occasionally visiting fields in winter.	Estate records, reserves records, BBS, CBR
Red kite *Milvus milvus*	B/L			Co-ordinate activity with existing local monitoring. BMM	Nest in a variety of mature trees, high and close to or in a fork of the main trunk feeding on agricultural land up to 10km from the nest.	Agency/RSPB annual monitoring, Red Kite Study Groups, RBBP, national surveys

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Red kite *Milvus milvus*	NB			From vantage point count birds entering communal roosts at dusk. Repeat on two days in December or January.	While some kites remain on summer ranges, many will move away to alternative feeding areas, roosting communally.	Local bird group data, reserves data
Red-breasted merganser *Mergus serrator*	B			BMM	Most British red-breasted mergansers breed in sheltered sea lochs and estuaries or on the lower reaches of rivers.	National breeding survey (sawbills on rivers): 1987, 1997, WBS
Red-breasted merganser *Mergus serrator*	NB			WeBS	Winters along sandy and rocky coastlines.	WeBS
Red-necked grebe *Podiceps grisegena*	NB			WeBS, or following instructions for generic surveys of *Inshore marine waterfowl* and *Waterfowl and seabirds at sea* in BMM	UK winter visitors mainly occur in coastal waters along the east and south coasts.	WeBS, CBR
Red-necked phalarope *Phalaropus lobatus*	B/L			**Co-ordinate activity with existing local monitoring.** BMM	Breed at northern sites with open water, emergent swamp, wet and dry mire and old peat workings.	RBBP
Redshank *Tringa totanus*	B			BMM: use UBW for upland habitats, O'Brien and Smith for lowland habitats and Reed and Fuller (1983) for breeding specifically at high density on machair.	Breeds on the coast, particularly on the middle and upper parts of saltmarshes, coastal grazing marshes and damp machair.	BBS, WBBS, RUBS (2002), BBWM (2002), CBR, saltmarsh breeding bird survey 1996 (RSPB).
Redshank *Tringa totanus*	NB			WeBS	Wintering birds favour estuaries where they often feed, at high tide, on adjacent pastures.	WeBS
Redstart *Phoenicurus phoenicurus*	B/L			BBS	Breeds in open woodland and parklands nesting in tree-holes or nestboxes.	BBS, NRS, BTO ringing data, reserves data

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Red-throated diver *Gavia stellata*	B/L	(1) Extent of suitable nesting habitat around loch edge	(1) Maintain extent of herbaceous vegetation within 10m of loch edge, including on any islands present within the loch	BMM and Gibbons *et al* (1995) (1) Estimate proportion of broad habitat types (use Phase 1 categories) within 10 m strip along shore edge	Breeds on small pools or lochans in open moorland or, occasionally in forested areas. Nest on ground near water's edge, or on small islands in loch. Forages in lochs or at sea if near coast. Generally only one nesting pair per water body (although high densities possible if many small lochans).	SCARABBS: 1994, Reserves data, CBR, local recorders
Red-throated diver *Gavia stellata*	NB			WeBS, aerial surveys, or following instructions for generic surveys of *Inshore marine waterfowl* and *Waterfowl and seabirds at sea* in BMM	Outside of breeding season uses open coastal waters.	WeBS, aerial surveys, ESAS, annual counts of wintering birds in the Moray Firth (RSPB/BP)
Redwing *Turdus iliacus*	B/L			BMM	Breed in a variety of habitats, often close to water, including birchwoods, oakwood edges, scrub woodlands and mature woodland edges preferring to feed in damp patches within these habitats.	RBBP
Redwing *Turdus iliacus*	NB			WFBS	Winter visitor to the UK in large numbers. Feeds on a variety of fruits so associated with hedgerows, orchards, gardens.	WFBS, CBR
Reed bunting *Emberiza schoeniclus*	R			BBS	Breeds by wetlands with rushes and reeds and also in dryer sites such as young coniferous plantation.	BBS, WBBS, CES
Reed warbler *Acrocephalus scirpaceus*	B/L			BBS	Breed in reedbeds.	BBS, WBS, WBBS, CES
Ring ouzel *Turdus torquatus*	B/L			BMM	Breed in open country in steep-sided glens, or occasionally in young plantations, above the 250m contour line.	National breeding survey 1999. RUBS (2002), BBS (some data), CBR

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Ringed plover *Charadrius hiaticula*	B			BMM: Surveys of birds breeding at high density on machair follow methods by Reed and Fuller (1983). For other habitats use method 2.	Nest on sandy or shingle beaches and machair, and along inland waterways where suitable gravel habitats occur.	National breeding surveys 1974, 1984 (BTO). WBS, WBBS, CBR
Ringed plover *Charadrius hiaticula*	NB			WeBS	Winters mainly around coasts on all habitats.	WeBS, CBR
Robin *Erithacus rubecula*	R			BBS	Breeds in woodland, scrub and parkland.	BBS, CES
Rock dove (in Scotland & NI, difficult to separate from feral pigeon) *Columba livia*	R			BBS	Rocky coasts, nesting on sea cliffs, north westerly distribution.	CBR
Rock pipit *Anthus petrosus*	R			Record birds encountered along shoreline transects made in May or June.	Breeds on stony/rocky shores.	BBS (some data), CBR
Rook *Corvus frugilegus*	B			BBS	Breeds in open, cultivated country, usually in stands of tall trees.	BBS, WBBS
Roseate tern *Sterna dougallii*	B/L	(1) Presence of predator populations in island colonies	(1) Complete absence of signs of *Rattus* species and cats	**Co-ordinate activity with existing local monitoring.** SMH (1) Record signs of predator presence by general observation throughout colony area (fresh faecal material, evidence from predated eggs and chicks, tracks)	Nest in sheltered situations often overhung by rock or vegetation. Entrances to puffin burrows are also used. Always associated with other tern species.	SCR, SMP, Seabird 2000, RBBP
Ruff *Philomachus pugnax*	B/L			**Co-ordinate activity with existing local monitoring.** (seek advice of agency ornithologist)	Nest (in southern UK) on inland wet meadows, coastal grazing marsh and upland saltmarsh.	RBBP, reserves data
Ruff *Philomachus pugnax*	NB			WeBS	Wintering birds in or near muddy margins of lakes and pools, on seashores and tidal mudflats.	WeBS

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Sand martin *Riparia riparia*	B	(1) Nest site availability	(1) Maintain exposed areas of sand/earth banks used for nesting	BMM See advice of Agency Ornithologists for guidelines on maintaining nesting banks.	Nest by tunnelling into sandy, loamy or other workable banks, excavations, cliffs and earth mounds to form nest-chambers.	BBS, WBS, CBR
Sanderling *Calidris alba*	NB			WeBS	Winters mainly on sandy beaches.	WeBS
Sandwich tern *Sterna sandvicensis*	B/L	(1) Presence of predator populations in island colonies	(1) Complete absence of signs of *Rattus* species and cats	**Co-ordinate activity with existing local monitoring.** SMH (1) Record signs of predator presence by general observation throughout colony area (fresh faecal material, evidence from predated eggs and chicks, tracks)	Nest in colonies preferably on sand or shingle beaches and rarely inland.	SCR, SMP, Seabird 2000
Sandwich tern *Sterna sandvicensis*	NB			WeBS	A passage species in the UK outside of the breeding season, with very few over wintering. Found along coasts and on some near-coast lakes.	WeBS, CBR
Savi's warbler *Locustella luscinioides*	B/L			Located by their unusual song, known as reeling. Birds can be mapped from listening points in and around suitable habitat surveyed in late April or May.	Nests in wet reedbeds, over water.	RBBP
Scaup *Aythya marila*	NB			WeBS	Wintering scaup favour coastal or estuarine areas with a strong attraction to sewage outfalls.	WeBS

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Scottish crossbill *Loxia scotica*	R/L			BMM: use generic pinewood bird monitoring methods. However, separation of three crossbill species is very difficult and where there is geographical overlap true confirmation of each may be possible only through call analysis (seek advice of agency ornithologist).	Mostly nest in remaining fragments of native Caledonian pinewood. Local populations fluctuate with food availability – feed on pine seeds.	National survey 1993-4, due 2003-4. Reserves data, CBR
Sedge warbler *Acrocephalus schoenobaenus*	B			BBS	Breeds in rank shore vegetation by wetlands, usually reeds or sedge swamp with bushes or overgrown ditches and ponds.	BBS, WBBS, CES
Shag *Phalacrocorax aristotelis*	B			SMH, BMM Boat-based surveys for offshore waters.	Nest colonially on cliff ledges from just above the high-water mark to over 100m or on boulder beaches.	SCR, SMP, Seabird 2000, ESAS
Shag *Phalacrocorax aristotelis*	NB			Boat-based surveys.	Coastal and deep sea waters.	ESAS
Shelduck *Tadorna tadorna*	B			BMM	Shelduck nest in holes in sand dunes or light soils or in ground covered by dense prickly or thorny shrubs or other vegetation that provide shelter or concealment. They typically nest close to water.	National breeding surveys: 1992-3 (WWT). WBS, WBBS, BBS, CBR
Shelduck *Tadorna tadorna*	NB			WeBS	Shelduck forage in areas of fairly high biological productivity such as sandfltas and mudflats in estuaries and shallow coasts.	WeBS
Shore lark (Horned lark) *Eremophila alpestris*	NB			Most likely to be found incidentally during other surveys.	Winters on open heaths, shore-meadows or sandy shores.	CBR

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Short-eared owl *Asio flammeus*	B/L			BMM: Difficult to survey due to large expanses of moorland breeding habitat. Visit possible breeding sites twice during April and May searching for signs and for territorial, hunting and prey-carrying males, avoiding disturbance of nest sites.	Breeding sites (and success) vary annually reflecting prey availability. Favoured breeding sites are undisturbed areas with small mammal prey, for example moorland heath, newly afforested hillsides, extensive rough grazing, marshes, bogs, sand-dunes and inshore islands. The actual nest-site is usually in long grass, heather or rushes, often on sloping ground. They are not found in dense woodland, built-up or heavily grazed areas. Woodland fringe is sometimes occupied by pairs adjacent to young forestry or on coastal wooded strips with rough grazing or marsh.	Raptor study groups, NRS, CBR
Short-eared owl *Asio flammeus*	NB			Counts of birds at known roosts from vantage point, avoiding disturbance.	Most leave upland nesting areas to winter in a wide variety of lowland habitats, especially coastal and inland marshes. Readily observed hunting during the day, they also gather in communal roosts in scrubby vegetation.	Reserves data and CBR
Shoveler *Anas clypeata*	B/L			BMM: breeding season surveys are carried out using generic methods for Dabbling and diving ducks.	Breed in or near wetland areas and winter in shallow freshwater areas on marshes, flooded pasture, reservoirs and lochs with plentiful marginal reeds or emergent vegetation.	WBS, WBBS, reserve data, CBR
Shoveler *Anas clypeata*	NB			WeBS	Winters mainly on freshwater lakes, but also found in some coastal wetlands.	WeBS, DWS

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Siskin *Carduelis spinus*	R			BBS	Breeds in coniferous woodland, winters in more open country feeding on seeds.	BBS
Skylark *Alauda arvensis*	B			BBS	Nest on the ground in an excavated cup, preferring open habitats ranging from saltmarsh and farmland to young regenerating woodland.	BBS, RUBS (2002) National Breeding survey 1997 (BTO).
Skylark *Alauda arvensis*	NB			BMM or WFBS	Skylark leave the uplands in winter but are widely distributed across lowlands and in coastal habitats. Cereals are the most important foods for wintering skylarks, and large flocks may form.	National winter survey, 1997-8 (JNCC/BTO). WFBS, CBR
Slavonian grebe *Podiceps auritus*	B/L	(1) Extent of emergent and overhanging vegetation, (2) Presence of predator populations	(1) Maintain extent of emergent vegetation (sedge beds) and overhanging shrubs: >25% loss unacceptable, (2) Aim for absence of signs of mink around breeding lochs during the breeding period April-August: no fresh sign detected (tracks, scats).	Co-ordinate activity with existing local monitoring. BMM, Crooke *et al* (1992). (1) Estimate and map area of emergent vegetation. Map occurrence of overhanging shrubs along shoreline, (2) Walk shoreline of loch and search for fresh signs of mink presence (see Sargent 1997). Repeat once per month during breeding period (April – August). Also record presence of otter during the same walks.	Nests in sedge beds or emergent vegetation (or occasionally in loch-side bushes or overhanging branches) by mesotrophic lochs.	Annual breeding survey at known sites (RSPB), National surveys: 1992, RBBP
Slavonian grebe *Podiceps auritus*	NB			WeBS, or following instructions for generic surveys of *Inshore marine waterfowl* and *Waterfowl and seabirds at sea* in BMM	Post-breeding gathers on inland water bodies, then moves to coastal waters to winter.	WeBS, CBR

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Smew *Mergellus albellus*	NB			WeBS	Winters on lochs, reservoirs and sheltered coastal bays and estuaries.	WeBS, CBR
Snipe *Gallinago gallinago*	B			BMM: use UBW for upland habitats, O'Brien and Smith for lowland habitats and Reed and Fuller (1983) for breeding specifically at high density on machair.	Nest in tall or dense vegetation adjacent to open ground with tussocks or clumps of sedge, rushes and coarse grasses with access to shallow water (fresh or brackish). Suitable habitats include moorland bogs and marshy rough pastures.	BBS, WBBS, BWWM (2002), RUBS (2002)
Snipe *Gallinago gallinago*	NB			WeBS (wetlands) and WFBS (farmland) methods.	A widespread species using a variety of wetland habitats, but largely absent from the uplands.	WeBS and WFBS, DWS
Snow bunting *Plectrophenax nivalis*	B/L			BMM	Breed above the treeline in montane plateaux and corries, feeding on insects and their larvae and nesting under rocks or scree boulders.	National survey 1999. Reserves data
Snow bunting *Plectrophenax nivalis*	NB			WFBS: Standard survey in uplands, winter walks method at coast (transect to include sand dune/beach interface, through coastal grasslands, and along salt-marsh edge)	Snow buntings are found in the uplands during winter in heathland habitats, and also along coasts. Large flocks occur along coasts foraging in salt-marshes and coastal grasslands, and along beaches.	WeBS (some data), WFBS, reserves data, CBR
Snowy owl *Nyctea scandiaca*	B/L			Most likely to be found incidentally during other surveys.	Breeds/hunts on upland moors, feeds on rodents. Very rare in UK.	RBBP
Song thrush *Turdus philomelos*	R			BBS	Breeds in woodlands with rich undergrowth.	BBS, CES
Sooty shearwater *Puffinus griseus*	NB			Offshore boat-based surveys.		ESAS
Sparrowhawk *Accipiter nisus*	B/L			BBS	Nest in trees in most types of woodland or isolated stands or parks feeding on small birds.	BBS, CBR

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Spotted crake *Porzana porzana*	B/L			BMM: surveys of calling males are carried out between sunset and 2.00am . Breeding is difficult to detect and all singing males should be regarded as indicative of breeding.	Breed in swamps and fens with high water table.	RBBP, reserves data, National survey 1999.
Spotted flycatcher *Muscicapa striata*	B			BBS	Breeds in open woodland, nesting in sheltered ledges or crevices in trees, root piles or buildings.	BBS, WBBS, NRS
Spotted redshank *Tringa erythropus*	NB			WeBS	Winters on coasts or shallow marshes, on flooded meadows or loch margins and on estuaries.	WeBS
Starling *Sturnus vulgaris*	B			BBS	Occurs in a range of habitats, nesting in holes in trees, walls, buildings or nestboxes.	BBS, WBBS
Stock dove *Columa oenas*	B			BBS	Nests in holes such as crevices in buildings and walls, nestboxes or large woodpecker holes feeding on berries, seeds and buds in all types of open woodland or cultivated areas.	BBS
Stone curlew *Burhinus oedicnemus*	B/L	See Kirby *et al*. 2000	See Kirby *et al*. 2000	**Co-ordinate activity with existing local monitoring.** (seek advice of agency ornithologist) Consult Agency Advisors for relevant methods of assessment of attributes listed in Kirby *et al*. 2000.	Nest in short-sward grasslands over thin, stony, free-draining soils.	Key areas surveyed annually: RBBP
Stonechat *Saxicola torquata*	B			BMM	Breed on coastal and lowland heaths particularly favouring areas with gorse, scrub or young plantations.	BBS, reserves data, CBR

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Storm petrel *Hydrobates pelagicus*	B/L	(1) Presence of predator populations in offshore habitats	(1) Complete absence of signs of *Rattus* species and cats in offshore breeding habitats	SMH, BMM: complete census or sample survey in mid-July with stringent regard for Health and Safety guidelines. Boat-based surveys for offshore waters. (1) Record signs of predator presence by general observation throughout colony area (fresh faecal material, evidence from predated eggs and chicks, tracks)	Breed in cavities among boulders, buildings, cliffs, level slabs or disused or even active burrows of other seabirds and/or rabbits.	SCR, SMP, Seabird 2000, ESAS, special surveys
Swallow (Barn swallow) *Hirundo rustica*	B			BBS	Nests under ledges (e.g. eaves) of buildings, walls and bridges in most habitats, usually villages/farms.	BBS, NRS
Swift *Apus apus*	B			BBS	Spend most time in air – over most habitats, feeding on airborne invertebrates. Nest in holes/cavities in buildings, walls, hollow trees and nestboxes.	BBS
Tawny owl *Strix aluco*	R			As per Bibby *et al* (2000).	Breeds in open woodlands, nests in holes, nocturnal, feeds on small rodents and other animals.	BBS
Teal *Anas crecca*	B			BMM: breeding season surveys are carried out using generic methods for Dabbling and diving ducks.	Nest in dense cover usually near nutrient poor waterbodies, preferring undisturbed moorland pools, bogs and mires of upland areas.	WBS, WBBS, reserve data, CBR
Teal *Anas crecca*	NB			WeBS	Utilises a wide range of wetlands.	WeBS, DWS

Species (Taxonomic order)	Season[1]	Additional Discretionary Attributes (see Part 1)	Targets for additional discretionary attributes	Method of assessment for species population and additional attributes listed	Habitat requirements	Potential data sources (see Part 1)
Temminck's stint *Calidris temminckii*	B/L			**Co-ordinate activity with existing local monitoring.** Seek advice of Agency Ornithologists for methods. Breeding locations are strictly confidential and because of the breeding strategy of this species, numbers of adults are reported rather than distinct pairs.	A rare but regular breeder in Scotland preferring exposed, open ground generally at altitude, generally with wetter areas.	RBBP
Temminck's stint *Calidris temminckii*	NB			WeBS	Uncommon in non-breeding season, preferring coastal wetlands and estuaries.	WeBS
Tree pipit *Anthus trivialis*	B/L			BBS	Breeds in open woodlands.	BBS, reserves data
Tree sparrow *Passer montanus*	R			BMM: Difficult to survey due to lack of distinctive song or territorial behaviour.	Nest in tree-holes or nest-boxes in hedgerows, woodland edges or outbuildings.	BBS, reserves data, NRS, CBR
Treecreeper *Certhia familiaris*	R			BBS	Breeds in woods and parks, usually with conifers, nesting in crevices such as cavities behind the bark of standing dead trees.	BBS, WBBS, CES
Tufted duck *Aythya fuligula*	B			BMM: breeding season surveys are carried out using generic methods for Dabbling and diving ducks.	Breeds in a wide range of freshwater wetlands.	WBS, WBBS, BBS, CBR, reserve data
Tufted duck *Aythya fuligula*	NB			WeBS	Winters on open waters in large flocks and occasionally in sheltered coastal bays.	WeBS, DWS
Turnstone *Arenaria interpres*	NB			WeBS	Winter at estuaries, sandy beaches and particularly on rocky shores foraging in small groups and favouring mussel beds or strand lines where they feed on shrimps, winkles, barnacles and other invertebrates.	WeBS, CBR

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Turtle dove *Streptopelia turtur*	B/L			BBS	Southern distribution – in cultivated habitats with trees, scrub or shrubs.	BBS
Twite *Carduelis flavirostris*	B/L			BMM	Breed in upland and coastal areas nesting in sheltering vegetation such as heather, bracken or gorse and feeding on plants such as sorrel, dandelion and thistle up to 3km away on past or present agricultural land, moorland or by water.	National survey 1999. RUBS (2002), BBS (some data), reserves data, CBR
Twite *Carduelis flavirostris*	NB			Count numbers of individuals in flocks from transect through or alongside all suitable habitats in site. Make at least four counts during November to February.	Twite breeding in the uplands move to lower ground in winter, often to coastal areas where they are found in salt marshes and other habitats.	WeBS (some data), WFBS, reserves data, CBR
Velvet scoter *Melanitta fusca*	NB			WeBS, aerial surveys, boat-based surveys	Wintering Velvet scoter favour shallow, sandy areas or smaller estuaries or freshwater sites inland, feeding on molluscs, crustaceans and small fish.	WeBS, special aerial surveys, ESAS
Water rail *Rallus aquaticus*	R			BMM: breeding season surveys by playing recordings of territorial water-rail calls, WeBS methods for winter surveys	Breed in areas with tall emergent vegetation such as reeds, sedges or rushes.	CBR, WeBS, DWS
Waxwing *Bombycilla garrulus*	NB			Most likely to be found incidentally during other surveys.	Winter influxes are dependant on food availability in mainland Europe. Mainly arrive in UK in January/February to feed on berries remaining on trees and shrubs, both in wild and urban habitats.	CBR

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Wheatear *Oenanthe oenanthe*	B			BBS	Breeds in open habitats such as pastures, heaths and moors, nesting in cavities in boulder areas or walls.	BBS, RUBS (2002)
Whimbrel *Numenius phaeopus*	B/L			**Co-ordinate activity with existing local monitoring.** BMM: survey for territorial birds by transecting within 200m of all suitable habitat.	Breed on serpentine heaths, wet moorland and blanket bogs with short vegetation in northern Scotland and the Western and Northern Isles.	RBBP, reserves data, National survey 1982-6, due 2004.
Whimbrel *Numenius phaeopus*	NB			WeBS	A passage species in the UK with peak numbers recorded usually in late spring. Occurs on estuaries and coastal lagoons, salt marshes and rocky shores.	WeBS
Whinchat *Saxicola rubetra*	B			BMM	Nest on upland heaths/moors or lowland wet grasslands.	BBS, RUBS (2002), NRS, CBR
White-fronted goose (European race) *Anser albifrons albifrons*	NB			WeBS	Winter in low-lying wet pasture, either bordering coastal marshes or along river valleys. Usually winter in southern UK.	WeBS, DWS, CBR
White-fronted goose (Greenland race) *Anser albifrons flavirostris*	NB	(1) Open landscape	(1) Maintain open landscape around roosting locations – in particular limit forestry	WeBS, national census methods according to Greenland White-fronted Goose Study (GWGS). (1) When assessing habitats map any forestry extent in and immediately around (within 1 km) site	Scottish wintering grounds are mainly on the north and west coasts feeding on a variety of habitats, including unimproved grassland, arable farmland, stubbles, potatoes, mires, callows and machair.	WeBS, Annual winter counts since 1980.
White-tailed eagle *Haliaeetus albicilla*	R/L			Co-ordinate activity with existing local monitoring. BMM	Nest on ledges, cliff-tops, slopes and in trees, currently confined to coastal areas. Feed over sea, lochs and open ground.	SNH/RSPB annual monitoring, RBBP
Whitethroat *Sylvia communis*	B			BBS	Breeds in sun-exposed sites with bushes and weedy thickets, wooded pasture, ditch banks and field and wood edges.	BBS, WBBS, CES

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Whooper swan *Cygnus cygnus*	NB			WeBS, WWT swan survey methods	Wintering birds occur on arable land and permanent inland waters feeding on emergent and submergent freshwater plants, grass, farmland and intertidal plants.	WeBS, WWT National swan surveys
Wigeon *Anas penelope*	B/L			BMM: breeding season surveys are carried out using generic methods for Dabbling and diving ducks.	Nests in marginal grass or shrub cover on islands in upland lochs and bogs.	RBBP, Reserve data, CBR
Wigeon *Anas penelope*	NB			WeBS	Outside of breeding season birds graze on coastal mudflat eel-grass, stubble fields or on inland flooded grasslands.	WeBS, DWS
Willow tit *Parus montanus*	R			BBS	Breeds in damp woodlands.	BBS, WBBS
Willow warbler *Phylloscopus trochilus*	B			BBS	Breeds in woodland and scrub with some deciduous species.	BBS, WBBS, CES
Wood pigeon *Columba palumbus*	B			BBS	Nests on stick nests on branches or ledges in woodland, feeding on berries, seeds and buds in all types of woodland or fields.	BBS
Wood sandpiper *Tringa glareola*	B/L			**Co-ordinate activity with existing local monitoring.** (seek advice of agency ornithologist)	Nests in boggy areas within open woodland, in the Highlands of Scotland.	RBBP
Wood warbler *Phylloscopus sibilatrix*	B/L			BBS	Breeds in tall-stemmed woodland, especially associated with upland oakwoods in western Britain.	BBS, reserves data, CBR
Woodcock *Scolopax rusticola*	B			BMM: Breeding season count of displaying (roding) males.	Nest on the ground in moist woodlands.	Estate records, reserves data, CBR

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Woodcock *Scolopax rusticola*	NB			BMM: Winter survey of diurnal woodcock activity by transect (as for pinewood bird surveys) and of nocturnal activity, using spotlights.	Winters in a wider range of woodland types as well as scrub and hedgerow habitats.	WeBS (under-represented), DWS, estate records (shooting bags), CBR
Woodlark *Lullula arborea*	B/L	(1) Habitat structure	(1) Maintain mosaic of bare ground, short vegetation and shrub/trees	BMM. (1) Map areas of bare ground, trees/scrub, and low vegetation during one visit to the site (check habitats guidance for other methods)	Woodland clearings or open country with scattered trees, especially clear-felled forestry on former heathland and arable areas.	National breeding surveys 1986, 1997, due 2003. RBBP, BBS
Wren *Troglodytes troglodytes*	R			BBS	Breeds in many habitats including woodlands, gardens, scrub, farmland, reedbeds and seacliffs nesting in cover such as dense scrub, brash piles and crevices in walls or boulder fields.	BBS, CES
Wren (Fair Isle subspecies) *Troglodytes troglodytes fridariensis*	R			Map singing males along coastline, by walking early morning transect in early April or May.	Breeds on cliffs along the coastline of Fair Isle, Shetland, foraging amongst coastal vegetation and along tide lines. In winter makes greater use of crofting areas.	Annual survey by Fair Isle Bird Observatory.
Wryneck *Jynx torquilla*	B/L			By noting song calls – 'quee-quee-quee-quee…'- when walking through suitable woodland in early morning in late April or early May.	Breeds in woodlands in tree-holes or nestboxes feeding mainly on ants.	RBBP
Yellow wagtail *Motacilla flava*	B/L			BMM or BBS	Nest in open country such as hay meadows and cereal fields preferably near wetlands such as slow-flowing rivers, water meadows, grazed semi-marshland and cattle pastures. Southern distribution, can breed semi-colonially.	BBS, WBBS, BWWM (2002), CBR

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Yellowhammer *Emberiza citrinella*	R			BBS	Breeds in open country with hedges, juniper slopes, thorny scrub etc.	BBS, WBBS