



**The
UK Terrestrial Biodiversity Surveillance
Strategy**

**Prioritisation of surveillance for rare and scarce
species using a ‘risk-based’ approach**

This document is part of a selection of documents in the above series.

To view the full selection visit:

<http://www.jncc.gov.uk/surveillance>

Rare or scarce species pose particular problems for surveillance. Broad-based schemes are unlikely to sample them sufficiently to reach conclusions regarding their status and trends, and often will not sample them at all. Therefore, special surveys have to be commissioned, often as single-species surveys. This makes surveillance for rare or scarce species particularly costly, and without a clear and systematic framework for prioritising the surveillance, it has often remained undone. In addition to financial resource limitations, there are also problems finding a sufficient number of experts, either professional or volunteer, able to carry out the work. For some of the 'difficult' taxonomic groups, the manpower limitations are such that it is impossible to provide a full survey of rare and scarce species within any of the standard reporting timeframes. Even without financial resource limitations, the lack of sufficient manpower makes the provision of a systematic and prioritised framework crucial. The framework discussed in this paper is referred to as a 'risk-based' framework; the risk alluded to is the risk that a species will have undergone a significant negative impact that has not been identified by surveillance. The adoption of a 'risk-based' framework is intended to minimise the risk of species extinction (or other significant negative impact), whilst allowing a rational deployment of limited resources.

Within the surveillance strategy, Objective 3 includes covering the needs for surveillance of a range of rarer species (conservation 'priorities') that the UK has obligations to monitor. It is realised that many of the rarer species will not be adequately surveyed by the types of wider schemes that tend to be included within Objectives 1 and 2, so additional surveillance will be necessary to meet reporting obligations. Relevant obligations covered in Objective 3 include:

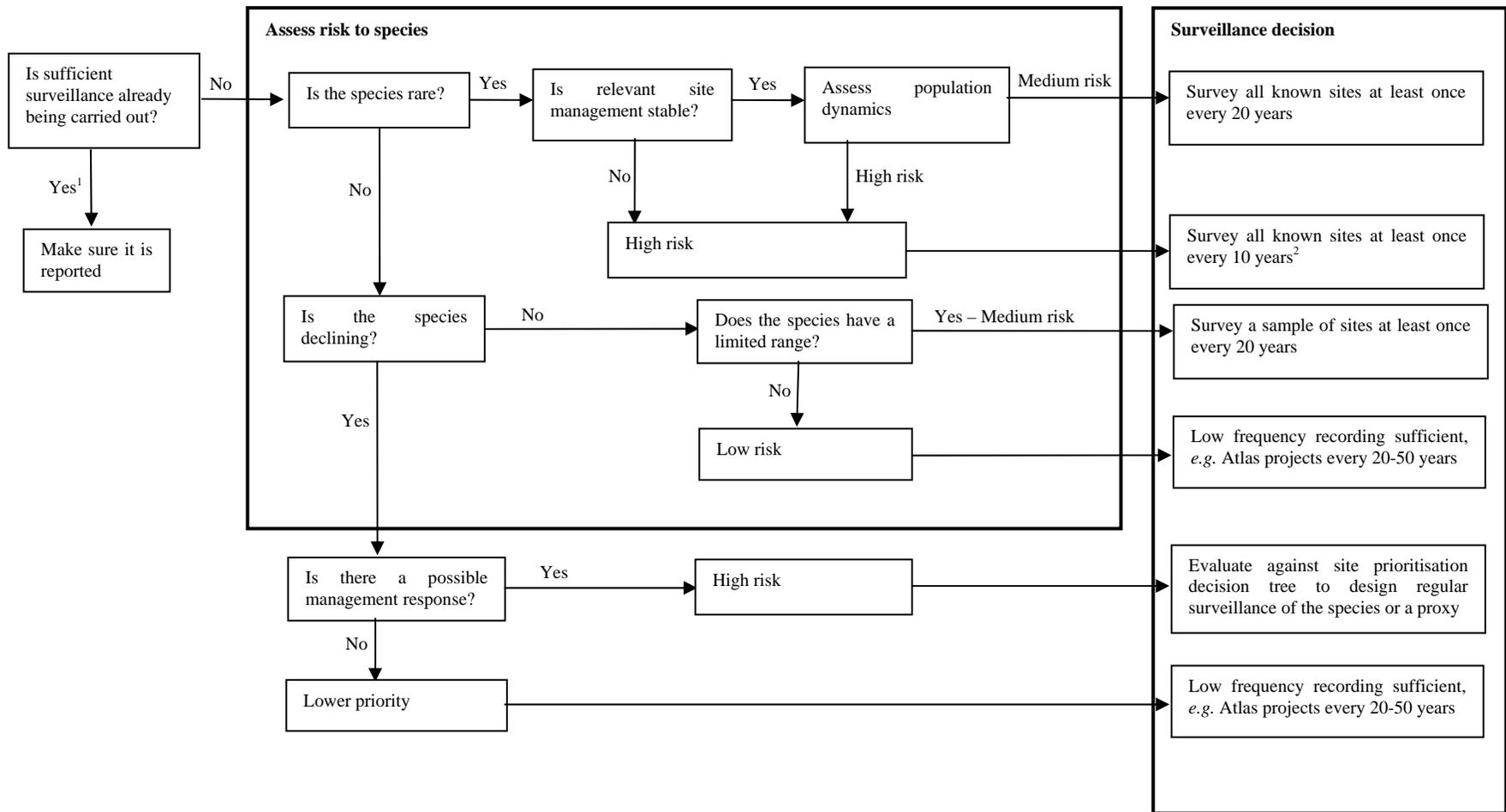
- Reporting on the status of Habitats Directive Annex species,
- Reporting on the status of Birds Directive Annex species
- Monitoring of UKBAP priority species
- Common Standards Monitoring (CSM) of interest features on protected sites

Decisions have to be made regarding the level of surveillance it is appropriate, or possible, to provide, since the text of the obligations is not explicit in determining this. For instance, although the Habitats Directive requires Member States to provide a report on conservation status every 6 years, this does not require Member States to have updated all of the surveillance data available within that timeframe (although the European Court Judgement does state that the surveillance should be systematic). BAP reporting occurs every 3 years, but it is not possible (and may not be appropriate) to survey a valid sample of all of the species within that timeframe. BAP monitoring and CSM use surveillance as part of adaptive management feedback loops, which generally requires a greater frequency of visits than is required for just status surveillance. Decisions on surveillance activity should be made using a rational framework, and it is suggested in this paper that the framework should include both elements of risk and the potential value of surveillance.

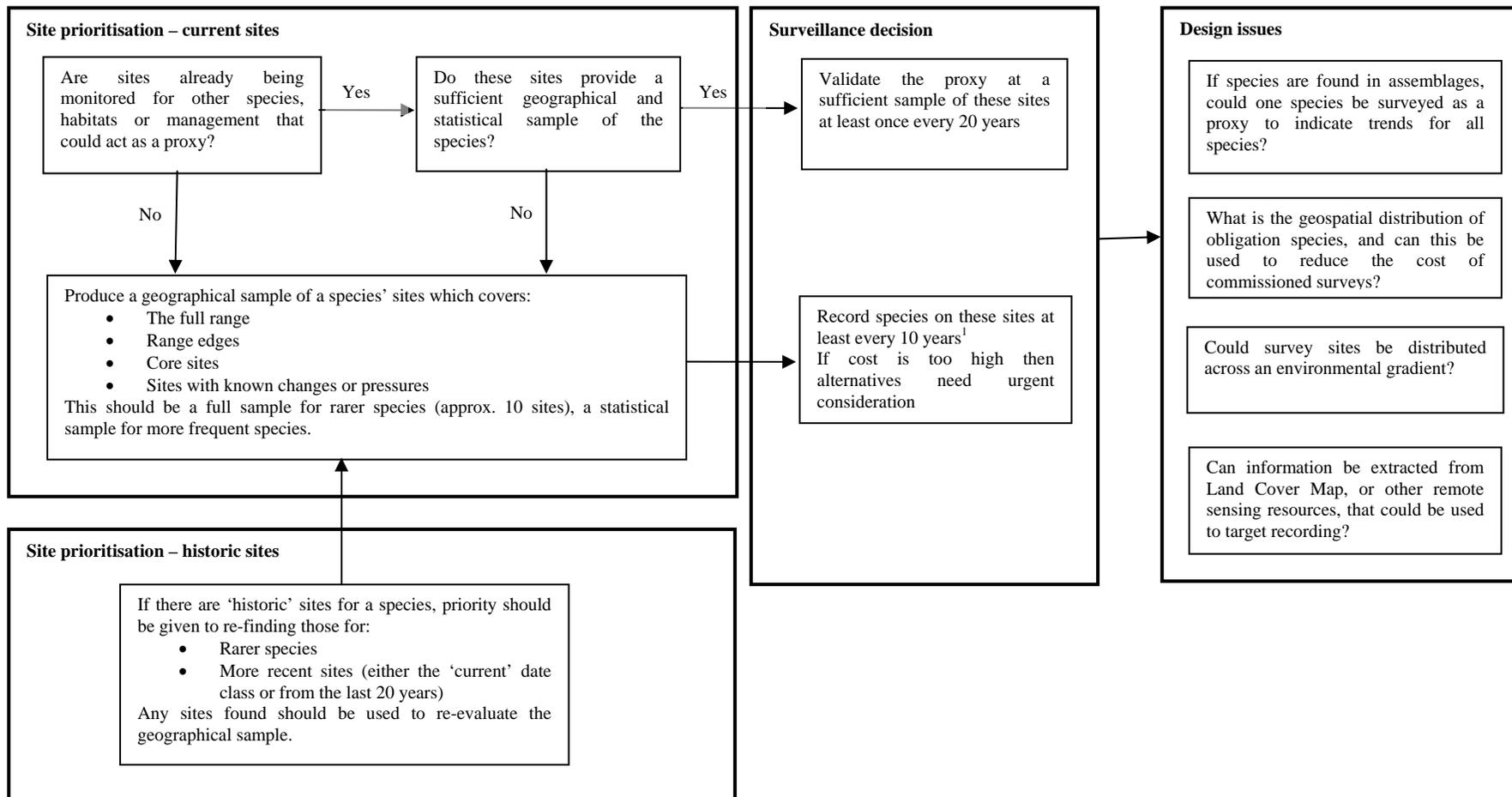
Before considering a logical framework for prioritising surveillance for rare and scarce species, it is essential that we optimise the data capture of the current level of surveillance, much of which goes on in an *ad hoc* manner outside of organised schemes. Some taxonomic groups, such as birds, have such a large body of volunteer recorders that achieving good coverage of most rare birds is relatively simple, and it is cost-effective to fund a specific co-ordination mechanism (Rare Breeding Birds Panel). This is not true for most other taxonomic groups, and volunteer recording is patchy and infrequent for many species. However, the true level of volunteer recording of rare and scarce species is unknown, since most of this information is not captured by any databases. For instance, many Nature Reserve managers

will produce yearly counts of species that they consider important on their reserve, for example great crested newts or orchid species, but not feed results into a national database since there is a perception that if certain species are 'known' from a site or an area, repeat recording serves no useful purpose. Nature Reserve managers clearly derive some benefit from their annual counts: they may wish to have some form of index for how their site is performing, or they may plan to make management changes and wish to monitor the impacts of these changes *via* impacts on 'important' species. However, they may not consider that there is a national benefit if they were to submit their annual recording to a national database. To change this culture we need to ensure those recorders who do make regular records and counts perceive a clear benefit from submitting their information. Benefits could include: improved prioritisation by conservation agencies, the ability to access other counts for the species and so set site performance into a larger context, and the opportunity to participate in a national project. We need to ensure that there is capacity within the system to handle annual recording, and that organisations holding databases support and understand the need to provide this information *via* the National Biodiversity Network (NBN). Both Local Record Centres (LRCs) and national recording schemes can play an important role, since recorders will vary in their allegiances. Natural England has funded LRCs to encourage similar approaches and data standards across them, and some Wildlife Trusts ask their reserve managers to report on status (often annually) of county priorities which normally include country / UK priority species. To further raise awareness of the need for reporting, it would be helpful to produce a prioritised list of species for which records are wanted. Hopefully this would promote further submission of volunteer records from people who have recorded the species but not submitted their data to a national scheme.

Where true gaps in the surveillance of rare and scarce species exist, the logical risk-based framework presented here can be used to help prioritise surveillance activity. The questions asked in the decision tree are discussed in more detail below. Prioritisation should normally result in a variation in the *frequency* of surveillance for obligation species. Prioritisation is also likely to have *site* priorities as well as *species* priorities. Low surveillance priorities will still need some degree of surveillance to occur. This may be achievable through irregular atlas projects, with a time period of approximately 20 to 50 years. Medium priority species may have particular sites that are higher priorities for surveillance, but probably need some surveillance with a time period of approximately 10 to 20 years. High priority surveillance may need to be as frequent as annual, but definitely needs to occur within every 5 to 10 years. Note however that in designing efficient surveillance for high priorities, the use of proxies is suggested which will then transfer a number of the high priorities to medium priority status.



1. The main difficulty is to determine whether sufficient surveillance is taking place. It may be safer to assume that it is not, and work through the remainder of the decision framework.
2. The exact periodicity should be determined after further consideration of population dynamics. In many cases, a higher periodicity will be indicated.



1. The exact periodicity should be determined after further consideration of population dynamics. In many cases, a higher periodicity will be indicated.

Notes to accompany the decision tree

Assessing risk to species

When there is a high risk of extinction, species require a higher frequency of surveillance, to ensure that management is sufficient to retain the species. There are a number of different components to risk which further affect the necessary frequency of surveillance. This risk-based framework is less quantitative than the criteria of Red List categories, and is designed to provide guidance and raise awareness of important issues to decision-makers. Obviously, there will be a range of risk levels and the final decision of what proportion on frequency of surveillance may depend on other factors such as available resources or public interest.

Is it rare? What is the population size?

- IUCN considers a cut-off of 5 sites when assessing increased risk from unplanned events
- In general, extremely rare species are at higher risk, although it should be taken into account that some species are naturally rarer than others, and if the population is stable at a low level then it may not be a problem.
- Extreme rarity requires more frequent checking that 'all is well' even in stable sites

How stable is the habitat or site (related to likelihood of decline)?

- If sites are very stable, then species are much less likely to be declining, and less frequent monitoring is needed. This could be particularly helpful in prioritising CSM and BAP work. The exception is for pioneer species which require dynamic environments with new ground regularly exposed, for example *Bryum warneum* which colonises fore-dunes slacks and sand blow-outs. However, even these species require a stable habitat network with new ground regularly being exposed in the area
- If a specific pressure (*e.g.* pollution, deforestation) is known to be acting on an area then we may expect an effect on the species present, so surveillance becomes a higher priority.

What are the population dynamics? This is a complex criterion with a range of factors that need to be considered.

- Generally populations with variable population dynamics are at higher risk because the population is more likely to crash.
- Large fluctuations tend to need more frequent surveillance, not least to get some idea of whether a recorded change is a trend or a fluctuation.
- Long-lived species may need less frequent surveillance than short-lived species.
- For some rare species, understanding the dynamics can be key to understanding the status – *e.g.* population stable but no reproduction has definite conservation implications. These aspects are complex, and need to be looked at species-by-species.

Is the species declining?

- A declining species is at high risk.
- It is important for surveillance to establish why it is declining if this is not already known.

Does it have a limited range?

- Species with a limited range or distribution are at greater risk from pressures in their area and from unplanned events.
- This question should pick up species that are not as extremely rare as the question on rarity.

Assessing worth of surveillance

Limited financial resources may make it impossible to achieve in-depth surveillance of all species that have been identified as high risk. To decide where it is best to focus surveillance resources, it is necessary to assess the worth of surveillance. The following question should be considered.

Is there a possible response?

- Increased checking needs to be balanced against whether there is any possible response, *e.g.* species restricted to single sites that are managed in a stable manner, and there is no known management response to an observed change. If there is no possible response, then there is less value in recording a decline.

Site prioritisation

Once it is clear that a species requires surveillance with a greater frequency and sampling density than an Atlas project, then an appropriate site design is required. For extreme rarities, all sites should be included in the surveillance design. As species become more frequent it becomes impossible to achieve complete sampling and a subset of sites needs to be chosen. A further set of questions can help to achieve a sensible site sample.

Is it necessary to sample the species, or are other proxies already being sampled?

- Often species are found in assemblages of species with similar ecological niches. If one of these species is already being recorded then this existing surveillance may already be sufficient to give the trends of the other species in the assemblage.
- Checking of a management proxy, such as the shading or grazing levels, could be easier to achieve more frequently than monitoring of the actual species. However, it is important to be sure of the reliability of proxy – periodic validations should be made. Non-biological proxies are less likely to be monitored by volunteer schemes.

How important is a site for a species?

- Sites can be prioritised for surveillance if they are core sites, if they are edge-of-range sites, if they add significantly to the geographic coverage of the surveillance, or if they are experiencing significant pressures
- In general it is not as valuable to re-record the hundredth site for a species as the tenth site for a species.

When was it last recorded from a site?

- Greater priority should be given to re-recording from sites that have been known relatively recently, (*e.g.* last couple of decades) rather than historic records. (This may be group-specific, and dependent on overall recording frequency, *e.g.* if the

'current' date class is 1960-present, then any records in this date class might be relevant.)

Designing surveillance action to be as efficient as possible

Once the decision has been made to spend resources on the surveillance of a species, it is necessary to design the surveillance action to be as efficient as possible. The following questions could be considered to help achieve this.

What is the geospatial distribution of obligation species, and can this be used to reduce the cost of commissioned surveys?

- Information on the geospatial distribution of species may be used to make sampling more efficient by allowing species found in a similar area to be sampled at the same time.

If species are found in assemblages, could one species be surveyed as a proxy to indicate trends for all species?

- Rare species from a range of taxonomic groups are often clustered on particular sites (often protected sites), and it may be possible to use a subset of the species on site as a proxy for the population status of the other species on site. To act as a good proxy species must be found in similar habitat niches. It is necessary to periodically validate the effectiveness of the proxy

Could survey sites be distributed across an environmental gradient?

- This may indicate the cause for a decline and may also provide useful information regarding more general trends in biodiversity.

Can information be extracted from Land Cover Map, or other remote sensing resources, that could be used to target recording?

- This could be used to show specific habitats that have experienced change, *e.g.* land use change. Surveillance of species could then be usefully targeted to these areas.