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BATS AND ONSHORE WIND TURBINES: SURVEY ASSESSMENT AND MITIGATION

The new guidance document 'Bats and Onshore Wind Turbines: Survey Assessment and Mitigation' was published at the start of 2019[1].

What you need to know

- The document replaces the previous guidance related to the subject; namely Natural England (TIN051) and chapter 10 of the Bat Conservation Trust '*Bat Surveys*: *Good Practice Guidelines*' (2nd edition) (Hundt, 2012).
- The document tailors the generic Eurobats guidance (Rodrigues *et al*., 2014) to the UK.
- It focusses on onshore wind developments, and is not intended for single wind turbines, micro installations (under 50 kW) or for offshore wind farms, although some aspects may be relevant.
- Repower and Life Extension: Survey requirements are the same for new sites to assess the risk to bats. At height monitoring and casualty searches on/at existing turbines is recommended.

Surveying

- **Roost surveys**: These should be undertaken within 200m plus rotor radius of the boundary of the proposed development.
- **Bat activity surveys:**
  - The minimum level of pre-application survey required using static detectors is **10 nights in each of: spring (April-May), summer (June-mid August), and autumn (mid-August to October)**;
  - Surveys should be undertaken with appropriate weather conditions for bat activity (i.e. temperatures of 10°C or above (8°C in Scotland) at dusk, maximum ground level wind speed of 5m/s and no, or very light rainfall, to fulfil the minimum requirements.
  - Detectors may need to be operational for considerably longer than the minimum period (10 nights per season – spring, summer autumn) to account for these constraints;
  - Automated detector surveys should commence half and hour before sunset and finish half an hour after sunrise;
  - Survey effort should be focussed in those areas where turbines are most likely to be located. **Detectors should be placed at all known turbine locations** at wind farms containing **less than 10 proposed turbines**. Where developments have **more than 10 proposed turbines**, detectors should be placed at **10 potential turbine locations plus a third of additional potential turbine sites,** up to a maximum of 40 detectors for the largest developments;
  - Automated static surveys at height should be considered where: other supporting evidence suggests a high level of bat activity within the height of the rotor-swept area; existing infrastructure is present and is relevant of the proposed changes (e.g. proposal for site extension and static detectors can be fixed to existing turbine nacelles is they are of a similar size to the proposed turbines); and/or a meteorological mast is present or will be erected;

[1] https://www.nature.scot/sites/default/files/2019-01/Bats%20and%20onshore%20wind%20turbines%20-%20survey%2C%20assessment%20and%20mitigation.pdf

  - Walked transect and vantage point surveys can be used in addition to the static detectors to identify flight lines and to help understand the numbers of bats present.
  - Microphone height and orientation: the detector will usually be placed on a tripod, pole or other structure approximately 2m above ground level.

- **Weather data:**
  - including wind speed, temperature and rainfall are important for the interpretation of bat data, and should be **recorded nightly for all types of bat survey**.
  - The use of automated weather meters is encouraged and suggested that more than one unit is deployed per site to allow for equipment failure. Wind speeds from existing turbines or met masts should be requested at the start of the project. These can be extremely valuable but often only stored on a temporary basis.

Quantifying Activity and Species Vulnerability

- Data should be presented as **total number of bat passes per night, per species (or species group)** for all survey nights, and the criteria by which a bat pass was defined and species were identified.
- Developers and consultants are encouraged to make use of the **Ecobat** online tool because it is currently the most objective method of assessing bat activity.
- A table of categorised levels of bat activity has now been provided, and reports should contain the percentile level as well as how this activity should be interpreted.
- **Common and soprano pipistelles** are now considered to be at **high collision risk** in Scotland, England and Wales (these species have been added in addition to Noctule, Leisler and Nathusius as high risk).

Assessing Risk and Applying Mitigation

- The guidance outlines factors to consider when assessing potential risk to bats and present a two-stage process to enable this. This includes an initial site risk assessment, which accounts for the project size and habitat risk, and an overall risk assessment which considers this site risk assessment with the ecobat activity category.
- Bat casualties at wind farms are reduced by pitching blades out of the wind ('feathering'). Reduction in speed resulting from feathering compared with normal idling may reduce fatality rates by up to 50%. It is recommended that feathering of the blades, which does not result in any loss of output, should be applied **as best practice, wherever practically possible and where there remains uncertainty over the risk posed to bats**. It can be applied to any site with a blade pitch control system which can be automated using SCADA data.
- A 50m buffer from turbine tip to the tip height of important bat habitat (woodland or wetland area for example) should be applied.
- The document provides an overview of the **curtailment** that can be adopted at sites which are considered to have a high risk to bat species.
- Determination of high-risk sites which are likely to require curtailment is informed by a two-stage risk assessment process. Bat activity and the presence of high-risk species are not the only factors determining the need for curtailment - site-based risk factors are also important and must be incorporated within the decision-making process.
- Threshold values for curtailment are likely to be in the range of 5.0 to 6.5m/s and at temperatures above 10 or 11°C measured at the nacelle. In order to minimise down time, the threshold values should be site-specific and informed by bat activity peaks at the location.

- Significant savings can be achieved by so-called “smart” curtailment over the other less sophisticated alternatives.
- The effectiveness of the curtailment needs to be monitored to determine whether it is effective, and whether it can be refined to minimise turbine down-time, whilst remaining effective at preventing casualties.
- Curtailment regimes should be developed and presented within the Environmental Statement for the project, considering the data collected during the pre-application monitoring.

Post-Construction Monitoring

- **Post-construction monitoring** is usually only required at developments where mitigation involves turbine curtailment. It should aim to assess changes in bat activity patterns and the efficacy of mitigation to inform changes to curtailment.
- Monitoring should take place **for at least three years after construction**. This should be undertaken to monitor the success of the curtailment regime and should include casualty searches and acoustic monitoring.
- **Activity surveys** can be used to continue to assess bat activity and behaviour following construction and assess the ongoing need for curtailment mitigation. These surveys should utilise full spectrum automatic detectors, for the same duration and at the same density as pre-construction surveys.
- **Carcass searching** can be undertaken to look for bat casualties, focussed around the turbine hardstanding. This can be done as a search underneath the turbine blades and should be undertaken by appropriately trained operational staff. These are not a substitute for the more intensive method, designed to quantify casualty rates should an issue with bat fatalities be identified.
- Suitably trained dogs with handlers are significantly more efficient and faster at locating carcasses and should preferably be used to achieve more robust results. These are resource-demanding and may not always be necessary to identify if a problem exists.