In recent years, RPS has worked on a wide range of linear projects, including proposals for new roads and cable route corridors for onshore and offshore wind farms and for interconnector projects. This article considers several areas in which the linear nature of such projects may affect the EIA process. The following aspects are considered:

- Effects arising from the number of crossings of existing features required for a linear route, with selected examples relating to:
  - Hedgerows; and
  - Surface water features.

- Survey and reporting of effects for linear schemes.

**Multiple Crossings - The Creation of Gaps**

As a result of their linear nature, routes across rural areas within the UK will often require multiple crossings of existing boundary features, such as hedgerows. The degree to which effects arising from the creation of gaps in hedgerows will be significant depends on a number of factors, including for example:

- The value of the hedgerows affected, including their landscape, historic and ecological value;
- The size of the gaps required;
- The duration of the effect, including whether it is likely to be temporary or permanent; and
- The potential for effective restoration or appropriate mitigation, for example through compensation or offsetting.

For cable route alignments, such effects are generally temporary as land can be restored following cable installation. In areas where hedgerows are a key feature of the local area and/or where they are of considerable ecological value, consideration will be needed to manage any temporary effects.

An example mitigation strategy for a cable route project is provided in Box 1 below:

**Box 1: Example Mitigation Strategy for Temporary Effects on Hedgerows**

- Selection of the route in order to avoid existing features, where possible, to minimise the number of hedgerow crossings.
- Reduction in the width of the construction corridor where the route would cross a hedgerow defined as ‘important’ under the Hedgerow Regulations (or where the hedgerow has been identified as being of particular value to protected species).
- Development of a mitigation strategy to address remaining effects in consultation with statutory consultees and local stakeholders.
- Use of temporary structures to replicate the lines of hedgerows known to be used by high numbers of bats or by rarer bat species. Such structures could be left in place overnight during the construction period.
- Following completion of construction, provision of like for like replacement to match the structure and species composition of the existing hedgerow.
- Consideration may also be given to options to compensate for the time taken for hedgerows to fully re-establish. This may be in the form of improvements to existing hedgerows or creation of hedgerows elsewhere.

For other projects, such as new roads, hedgerow crossings may be permanent. In such cases, there will be a greater emphasis on the avoidance of effects on hedgerows of particular importance, creation of new hedgerows or other planting through a permanent landscape planting scheme and on the creation of alternative linkages where required to maintain connectivity e.g. through the provision of crossings under the road.

**Multiple Crossings - Hydrological Effects**

The presence of existing hydrological features can be a key factor in the development of route alignments. This may include major rivers or local networks of smaller surface water features, including streams and ditches.

For cable routes, effects on surface water features are generally temporary and, as set out above for hedgerows, the emphasis will be on reducing effects as far as possible and on effective restoration following construction.
For other projects, such as new road projects, detailed consideration will be necessary to develop a strategy to ensure the ongoing functionality of the hydrological network. This may include bridges over major features (and their floodplains) and culverts of smaller features, where appropriate.

An example mitigation strategy for a new road project is provided in Box 2 below:

**Box 2: Example Mitigation Strategy for Permanent Effects on Watercourses**

- Selection of the route in order to avoid existing features, where possible, including rivers and areas with extensive networks of smaller water features.
- Development of mitigation strategy for unavoidable effects in consultation with statutory consultees and local stakeholders.
- Use of bridge crossings over major features, such as rivers, to avoid effects on the river and its floodplain. For particularly sensitive watercourses, avoidance of any activity in the river itself.
- Use of temporary structures to accommodate continued flow of smaller watercourses during construction.
- Use of culverts and bridge structures to accommodate the continued flow of smaller watercourses during operation.
- Creation of new features along the length of the road corridor to maintain connectivity and divert to suitable crossing points.
- Water treatment strategy to ensure pollution control prior to discharge to surface water features.
- Consideration of provision of overall net gain in terms of length of streams and smaller watercourses, where appropriate.

**Other Considerations**

**Scope of Survey Work**

A key consideration for linear projects is the scope of survey work required. For large projects, detailed survey of every area for every potential receptor may not be appropriate. In some cases, the availability of access to the land may also constrain the approach to survey work. Therefore, the development of a bespoke approach to survey, based on targeting key or representative areas, is likely to be suitable.

Such a strategy should be agreed with key stakeholders during the EIA process and may need to be adapted during the EIA process in response to the results of work undertaken.

**Reporting**

In many cases, the route alignments for linear projects are divided into sections for assessment and reporting purposes. This approach is useful in ensuring that all topic authors consider all key elements of the route. However, this approach can also lead to the potential for effects to be under-recorded if the effects of the route as a whole are not also considered. It is therefore recommended that the following are considered:

- Identification of the effects of the route as a whole for each topic area; and
- Potential for inter-relationships between topics.

**Conclusion**

In many cases, the broad principles of EIA apply to linear projects in the same way as for any other project type. However, there are some key aspects that may differ, particularly where the linear nature of the route results in multiple effects on the same type of receptor. Some examples are provided within this article, which illustrates that such effects may be most effectively addressed by careful route selection and the development of bespoke mitigation solutions.

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