Buffers – An Overview

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It is inevitable that when a development takes place it will cause disturbance to both the natural and the built environment. Some of this disturbance will be temporary, such as construction noise, but some will be permanent, such as destruction of wildlife habitat, changes in visual amenity and ongoing noise.

Developers will propose a range of mitigation measures to reduce the impact of the disturbance both during and after the construction period (See HS2 Factsheet Compensation and Mitigation for Biodiversity Loss for further details).

One such method would be to provide buffer zones that will protect the natural environment from harmful effects arising from the development.

However, buffers do not just protect the natural environment, they can also be used to mitigate impacts of development on the built environment by providing screens to improve views and reduce noise.

This factsheet provides an overview of what buffers are and how they can be used within a landscape affected by development. A buffer design factsheet is available that gives more detailed examples of design for different situations.

What is a buffer?

A buffer is a landscape feature used to protect a sensitive area from the impacts of development (or other harmful neighbouring land use). A buffer may go around the whole area to be protected, or just along one edge.

The buffer could be planted with trees or shrubs or it could be an area of land that the development is not allowed to encroach upon (e.g. a grassy strip). Buffers may also contain man-made structures such as fences, walls and earthworks.

Buffers can range in size from a few metres to protect individual trees to kilometres wide to protect large nature reserves. There is no 'one size fits all' with buffer design. Each one should be designed to fulfil the specific requirements of its location.

Understanding the landscape

When considering the use of buffers the whole landscape must be considered, not just the area where the buffer will go or where the development is taking place. A landscape can be broadly divided into three elements:

1. The matrix – this is the background landscape i.e. urban, rural, industrial, farmland.
2. Patches – small areas of landscape very different in structure to the matrix i.e. natural habitats such as ancient woodland, wetlands, meadows.
3. Corridors – best described as linear patches e.g. rivers, hedgerows. They can function as connections between patches in a landscape, or if they are open corridors such as railways or roads, they can increase fragmentation within a landscape.

Buffers and corridors are intrinsically linked; corridors can be used in conjunction with buffers to create higher connectivity between patches in the landscape.

Like buffers, corridors can be used to mitigate impacts from development but they need to be properly designed to function effectively. For example, a badly designed corridor may increase edge effects, connect areas that are dissimilar, or facilitate the movement of pests and diseases, weeds and/or invasive non-native plant species.

Increasing connectivity across a landscape helps nature thrive. Isolated species cannot adapt to change quickly and local extinctions occur, leading to a decrease in biodiversity.

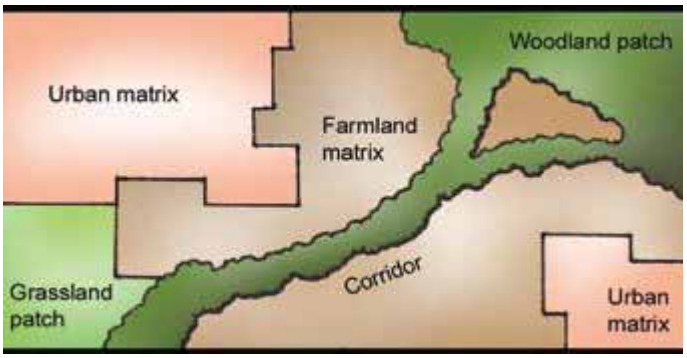
The Lawton Review (see fact sheet) concluded that we need to reduce isolation and improve the quality of ecological networks. Buffers linked with corridors are just one way this can be achieved.

WTML: Richard Becker

Buffer functions

Properly designed buffers can perform multiple functions. These can be broken down into seven types:

1. Enhancing/protecting biodiversity
2. Aesthetic functions i.e. noise reduction, improve visual quality
3. Improving/protecting water and air quality
4. Protection of soils
5. Provide recreation opportunities
6. Economic opportunities
7. Hazard reduction



Not all buffers will perform all seven functions, but most will provide more than one. For HS2, the primary function of a buffer may be to protect biodiversity and provide aesthetic improvements, such as noise reduction and visual screening.

Secondary functions should not be dismissed however.
For example, economic improvements to house prices might be achieved if visual amenity is enhanced. Buffers might provide habitat beneficial to pollinators, which in turn will provide economic benefits to farmers, and a buffer could provide recreational opportunities in the form of footpaths and other greenways.

Buffer design

A good understanding of what needs to be protected and/or mitigated for is essential before any buffer construction takes place.

Potential impacts of the proposed development might range from complete destruction or isolation of habitats, to increased noise and decreased visual amenity. Once all potential impacts have been determined, all affected parties should be consulted on the design and placement of the buffer.

Multiple landowners will be affected by HS2 and it's important to understand that one person's idea of an appropriate buffer might differ significantly from another's. For example, one landowner may not want a buffer on prime agricultural land since it will represent an economic loss, but another may want the buffer there for visual screening. Unless all affected parties are consulted during the design process the resulting buffers will not be effective.

Once a buffer is constructed its effectiveness needs to be monitored and the results made available. This is so that subsequent buffer designs can be amended and improved.

The United States Department of Agriculture National Agroforesty Center has published a Design Guide for Conservation Buffers[1], which is a good resource for anyone considering the design and placement of a buffer. The Trust is extremely grateful to its author Gary Bentrup for permission to reproduce part of this work here.

References

Bentrup, G. 208. *Conservation buffers: design guidelines for buffers, corridors, and greenways.* Gen. Tech. Rep. SRS-109. Asheville, NC: USDA, Forest Service, Southern Research Station. www.bufferguidelines.net

WTML: Rebecca Good

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