

4 WILDLIFE CORRIDORS

Wildlife corridors are increasingly used to connect isolated habitats. These corridors are generally thought to allow plants and animals to disperse (or migrate) from one habitat area to another, facilitating gene flow and colonisation of suitable sites (Primack 1993). Land reserved as easements for roads, rail lines and for protection of creeks and rivers (see Figure 4.1) often provide vegetated corridors vital to fauna movement. As such, the management of road reserves is an important tool in the management of fauna sensitive roads.

4.1 WILDLIFE CORRIDORS AS HABITAT LINKAGES

Wildlife corridors have become a common land use planning and management practice to aid daily and even seasonal fauna movements. Corridors may represent linkages between larger areas of suitable habitat. Research related to population ecology, outlined in Chapter 3, has concluded that small habitats that are physically interconnected to larger source pools of organisms will support and maintain a greater species richness than comparable habitats that are not physically connected (Harris and Scheck 1991).

In general, wildlife corridors have varying degrees of ‘value’ and ‘significance’. Specifically, ‘value’ pertains to the intrinsic quality of the corridor (i.e. a combination of the size, health, ratio of edge to core habitat, etc.), where the ‘significance’ relates to the corridor’s relationship to other vegetation remnants (i.e. does it join core habitats). As such, a long narrow strip of native vegetation that is unconnected at either end and is surrounded by modified agricultural or pastoral lands may have a high intrinsic biodiversity value but a relatively low significance. This is in comparison to a smaller strip in poorer condition but which provides the only linkage between two areas of remnant vegetation and hence would have a low intrinsic biodiversity value but high connectivity significance.

Wildlife corridors, to be of high significance, must provide a link between relatively large patches of remnant vegetation and should accommodate a variety of species. For example, a narrow, densely vegetated corridor that runs along a creek will not be suitable for most macropods. However, if a wider area was provided on either side of the creek it would produce a higher quality corridor, suitable to a variety of species.

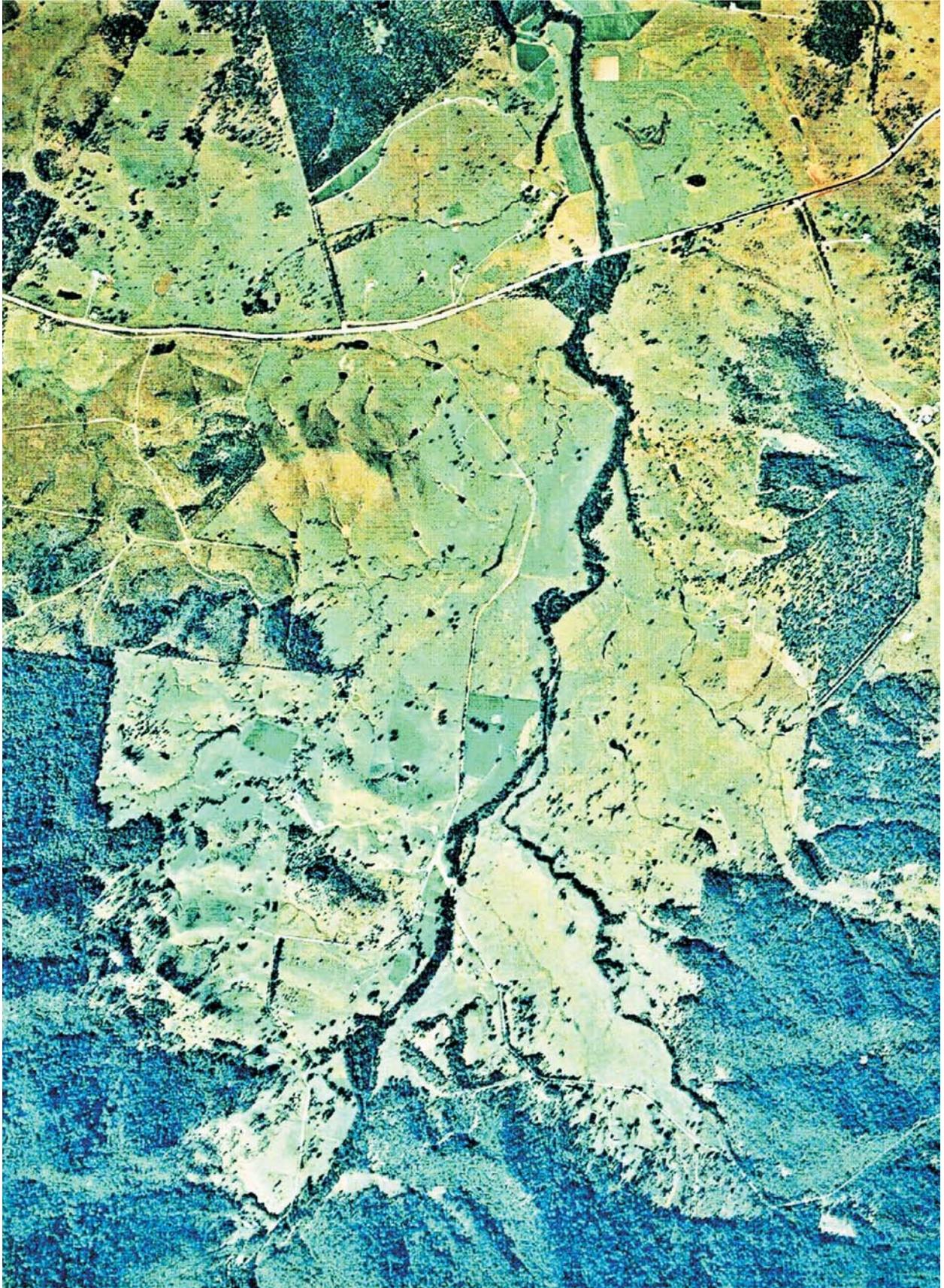


Figure 4.1 A corridor provided by riparian vegetation (Stony Creek, south-east Queensland)

Source of Image: Department of Natural Resources

4.2 CORRIDORS ALONG ROADSIDES

Little work has been undertaken in Queensland regarding the importance of roadside corridors to fauna species. However, roadside corridors and stock routes have been identified as important conservation reserves for threatened flora species (Allworth 1998). It is highly probable that these corridors are also of high conservation significance for fauna, especially in highly altered landscapes. An example of the importance of roadside corridors is illustrated by Figure 4.2 where the road reserve provides the only native habitat within a highly modified landscape.

Roadside vegetation and its importance to native fauna has been examined in Victoria and Western Australia. Most studies undertaken in these states are comparable to the species and corridors found in Queensland.

Roadside vegetation is important for the conservation of Carnaby's Cockatoo (*Calyptorhynchus latirostris*) in Western Australia. This Cockatoo covers large distances to fulfil its requirements of tree hollow nesting in woodlands, and foraging in mallee and heathland. Extensive areas of nesting habitat for this species have been cleared for agriculture, and salinisation threatens much of the remaining habitat. In a monitoring program conducted by the Western Australian Department of Conservation and Land Management (CALM), 56% of nest sites of Carnaby's Cockatoo were found on road and rail reserves (Lamont 1998). It is, therefore, considered that the retention of these nest trees in road and rail reserves is critical for the survival of this species.

Saunders and Ingram (1987) showed that breeding success of birds was higher in landscapes with broad vegetated roadsides that provide clear links between remnants of heathland and woodlands. At one study site, where roadside linkages were narrow and incomplete, several native populations had a low breeding success and some subsequently declined to extinction.

In south-western Victoria, Bennett (1987, 1990) recorded the mammals in forested roadside corridors (5 - 40 m wide), that form a network of linkages through a forest-farmland mosaic. Eighteen species, 78% of the local terrestrial and arboreal mammalian fauna, were recorded using the roadside as a refuge, foraging area, movement corridor, or as resident habitat. Studies of the population dynamics and movements of six species of small terrestrial mammals showed that roadside corridors facilitate continuity between forest patches for these species. This occurs by the movement of single animals within the corridor, and the gene flow resulting from the movement of animals to and from populations outside the corridor.

Dispersal of the arboreal Sugar Glider (*Petaurus breviceps*) (see Figure 4.3) along a forested roadside in eastern Victoria was documented by Suckling (1984). He studied populations of gliders living in several forest fragments and a roadside corridor, and found that all known dispersal movements, of up to 1.9 km, involved movement along the roadside corridor. Four other arboreal marsupials, the Common Ringtail Possum (*Pseudocheirus peregrinus*), Common Brushtail Possum (*Trichosurus*

vulpecula), Koala (*Phascolarctos cinereus*), and the Feathertail Glider (*Acrobates pygmaeus*), were also recorded in the roadside corridor. Suckling concluded that, other than incidental use by the Koala, the remaining three species probably use the corridor as a regular movement pathway.



Figure 4.2 *Remnant habitat corridor preserved within road reserve (West Australian wheat belt)*

Source: Breckwoldt and others, 1990



Figure 4.3 *Sugar Glider*

Source: Queensland Museum

4.3 SUITABILITY OF VEGETATED CORRIDORS

It is important when developing plans for the management of corridor systems, that careful attention is given to measures that will maximise the value of the corridor to suit a variety of species and increase overall landscape connectivity and function. This will require recognition of those factors that are important for both structural and functional connectivity.

Management of the structural connectivity of a corridor system is the simplest objective to understand and achieve. It is relatively simple to assess and map the continuity of vegetation, to identify gaps and, where appropriate, to target these for revegetation (refer Figure 4.4 for an illustration of variations in movement rates in response to different corridor types). While structural connectivity is important, it does not necessarily mean that a corridor will be used by a particular species. Understanding the functional aspects of connectivity, including those factors that determine whether or not a species will use a corridor, are more difficult. Bennett (1992) has reviewed several factors that are considered important to gain an understanding of connectivity. These factors are:

- *The type and quality of the habitat:* Does the corridor vegetation provide the habitat and particular resources required by the species concerned? For example, some species may require thick patches of scrubby ground cover, others may require logs and litter for foraging and shelter,

and others still may require tree hollows for refuge and nesting. The topography of the landscape may lead to considerable variation in vegetation composition and structure along the roadside, and revegetation programs should reflect these variations.

- *The potential for edge effects:* With increasing width, roadside corridors encroach upon greater areas of natural habitat for animals, and these then become more vulnerable to disturbance along edges. Edge effects will influence the diversity and type of fauna that will live in the corridor. Some species thrive with disturbance, while other more specialist species will be affected by change.
- *Animal mobility:* The relative mobility of animals will influence the type and length of corridor that they can use. For example, many birds will be able to fly over gaps in suitable vegetation communities and move substantial distances, whereas for small lizards, effective connectivity may require continuous suitable habitat.
- *Predation and competition:* The presence of predators or competitors in a corridor may inhibit movement, or impose an increased risk on mortality. Movement of introduced predators such as the Fox (*Vulpes vulpes*) or Cat (*Felis catus*) is often facilitated through the clearing of natural vegetation. Other native fauna species able to adapt to disturbed environments, such as the Noisy Minor (*Manorina melanocephala*), often dominate road reserves, discouraging other species from using them.

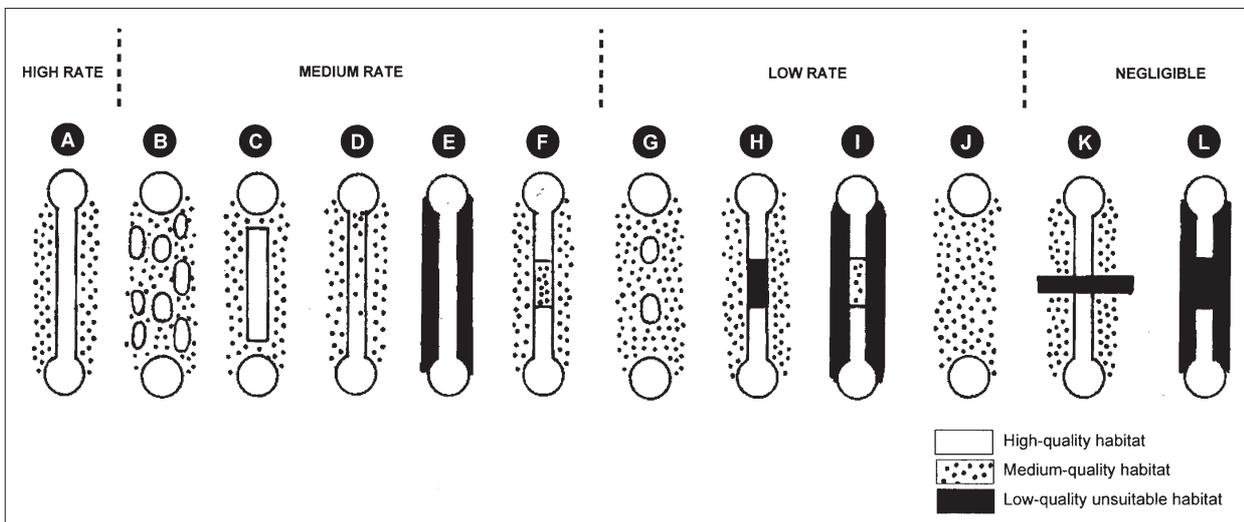


Figure 4.4 Expected movement rates of animals in corridors as a consequence of variations in the quality and type of connectivity

- (A) High rate of movement in connected corridor
- (B-F) Medium rate of movement in corridors of predominantly medium quality habitat or with small gaps
- (C-J) Low rate of movement in corridors with large gaps
- (K-L) Negligible rate of movement in corridors severed by a barrier to movement.

Figure redrawn from Forman, 1995

4.4 CORRIDOR WIDTH

The necessary width of a useful corridor varies greatly among wildlife species. For example, small reptiles may utilise narrow corridors whereas larger macropods require wider areas for daily movement. In addition, the habitat retained within the corridor may not be suitable for all wildlife species, and therefore wider corridors are required to include several vegetation types. For example, a densely vegetated riparian corridor would be unlikely to support the dispersal of Koalas, which prefer a corridor of readily accessible trees. Conversely, sparsely vegetated woodland corridors would not be preferred by species such as the Swamp Wallaby (*Wallabia bicolor*), which prefers thick undergrowth.

A general recommendation for south-east Queensland was to ‘... avoid having (corridors) less than 100 m in width, and the wider the better’ (Catterall et al. 1993). However, Harris and Scheck (1991) suggest that generalities regarding dimensions of corridors, such as a certain number of metres, are inadequate unless in a homogeneous landscape. They suggest that a more effective approach would be to take into account landform, topography, and the native vegetation present including composition, structure and significance. For example, dryland corridors that link habitat remnants generally need to be wider than riparian corridors, because they have a lower vegetation diversity and provide less cover. Also, corridors connecting areas of high conservation significance should be wider, to preserve the diversity and abundance of native species in ‘core’ habitat areas.

Therefore, it is important to determine the appropriate corridor width based on local and regional environmental factors, rather than by selecting a standard width for all situations.