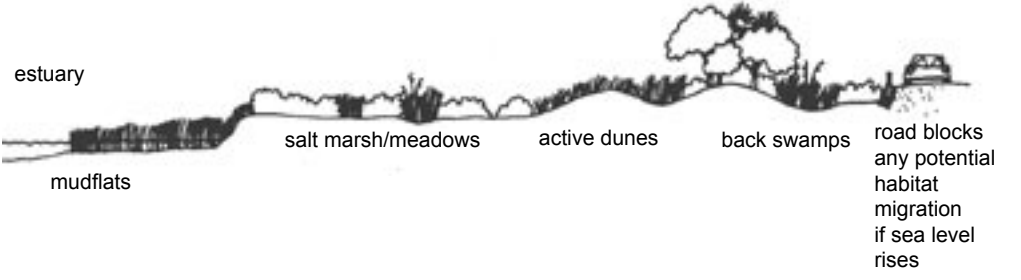
7. respect natural change

Allow for gradual changes in natural processes. A natural system cannot be protected like a museum piece, but must be allowed to evolve with time. Protecting natural areas will be more successful in the long term if their design recognises their ongoing natural processes. For example, recognise that wetlands gradually infill, that the canopy trees of evolving forest associations will eventually die and be replaced by not just new plants but often quite different species.

In a coastal location, if there is a gradual sustained rise in sea level, would the indigenous species and communities present have the space to migrate inland, up-slope?



If there is a major natural disturbance event, a protected area should be able to maintain its ecological integrity and allow for natural processes to continue. In trying to protect a floodplain forest, for example, recognise the natural flood cycle. Allow for not only physical damage from inundation, but the nutrients and silt deposits that are an essential input, and the vegetative responses to this cycle. Allow protection of an adequate area to ensure the forest system can be sustained.

8. seek self-sustaining areas

Seek to sustain the natural processes within or affecting the area as much as possible. Fencing off natural areas to prevent stock damage will protect the process of natural regeneration within the fenced area and will assist in ensuring the vegetation community survives beyond the current generation.

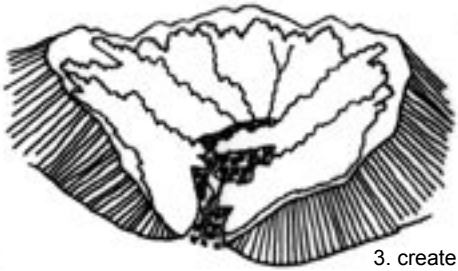
In riparian areas ensure that any existing or potential water extraction up stream (or controlled flooding) won't adversely affect the biodiversity levels present.

9. link isolated areas to enhance value

Many natural areas are small isolated remnants with limited long term viability if left unfenced. However, with adequate protection from, for example, grazing stock or animal pests, many of these may become self-sustaining in the longer term. Additionally, their value may be significantly enhanced through being linked to other natural areas (either physically or by ecological processes). Thus, small isolated remnants may be fenced to allow for gradual coalescing of the remnants and recovery of larger natural areas. These can be in a phased approach to longer term management if necessary.

1. fence out existing remnants and protect from weeds,stock,pests

2. expand & link up remnants creating some altitudinal sequences. Reduces farming operations



3. create protected area for entire valley. Remove all farming operations

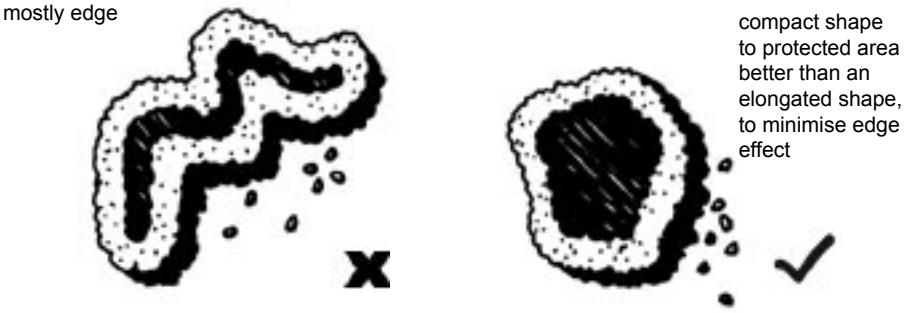
Linking existing natural areas through “corridors” can be valuable – for example to extend the range of certain types of habitat for feeding or breeding. However, first care should be taken to ensure pest plants and animals don’t acquire a convenient route to spread to other more intact areas. A pest plant and animal audit is essential to identify potential risks – what species are a problem and need cover to move? What level of commitment is needed to eliminate such threats?

Ideally, the aim will be to contribute to a greater landscape matrix adding positively to other existing protected areas through increased scale, buffering, linkages and restoration.

10. maximise the core and minimise the edge

It can be more ecologically valuable to have one large protected area than several smaller patches of the same total area. The core area should be large enough to adequately sustain the ecosystems present. A large core will enable continual self-generation and allow for the evolution of indigenous communities in the long term, including ecotones. If the protected area is too small, there will be no ‘critical mass’ to sustain complete ecosystems.

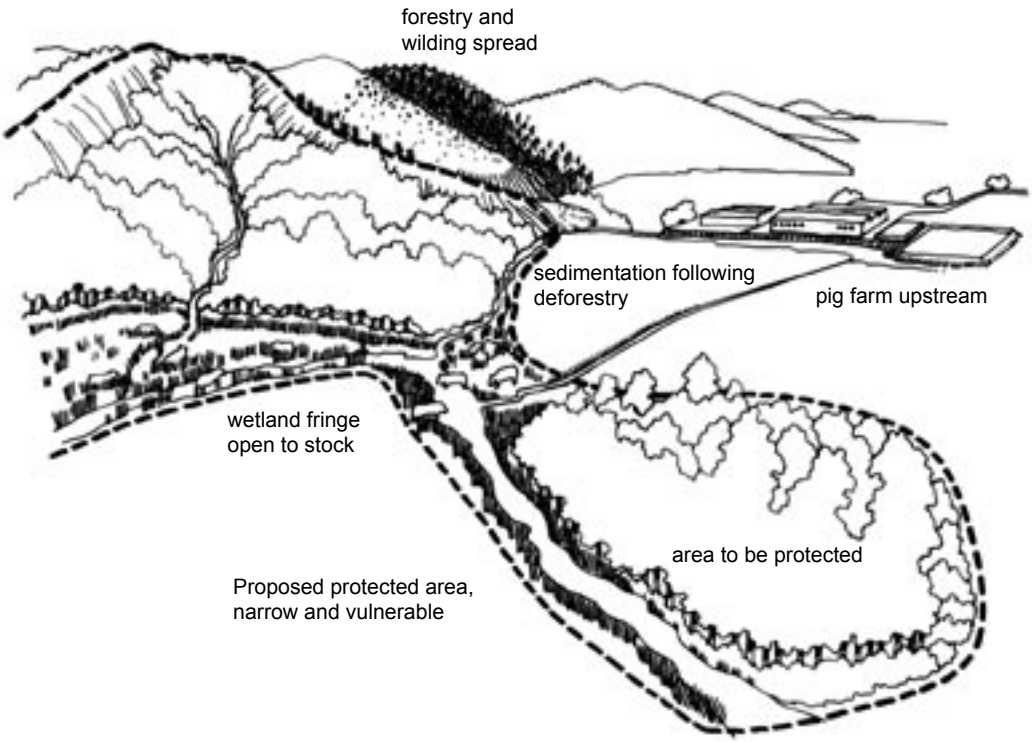
The size and shape of a protected area can have a large bearing on the ecological success of the protection. If the protected area is too small it could have a very limited opportunity to exchange genetic material. Edge effects may pervade so that the ecosystem will gradually change and lose its integrity. An abrupt and artificial change at the boundary to a protected area, such as between pasture and natural ecosystems, is the place of greatest stress on the natural system through climatic exposure, pressure from animal browse, and pest encroachment. Thus a minimal length of edge, or low perimeter to core area ratio, is usually desirable. A compact shape, with minimal unprotected enclaves, is better than an elongated one, to reduce the 'edge effect'.



In high fire risk areas however, it is worth noting that fire risk can be greater in one large protected area rather than several smaller protected areas with firebreaks between.

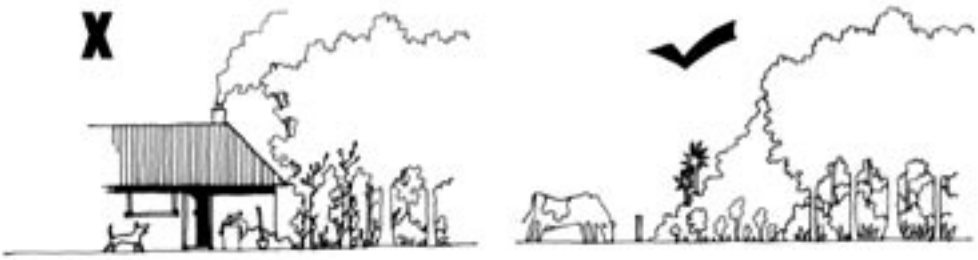
11. consider buffers at the same time as boundaries

In protecting a natural area it is important to consider what buffering may be necessary in establishing the boundary. Good buffering from adjacent land use activities may be essential - especially at the protected area's narrowest points, and, upstream and upwind.

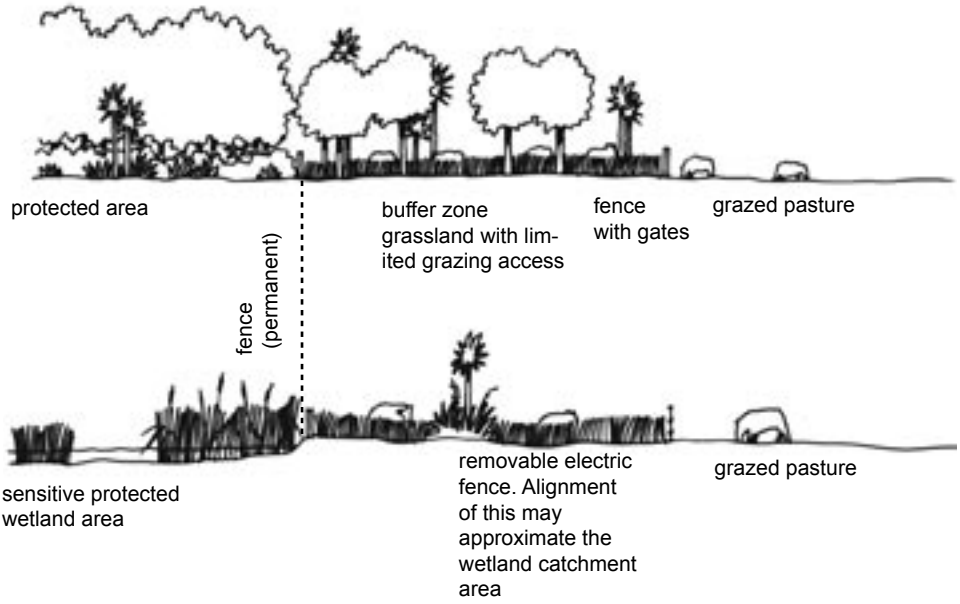


Boundaries are needed to adequately protect the area's values and to visually separate the area from other management activities. For example, stock will trample and compact the soil, causing damage to root systems, soil erosion and pugging. They can eat smaller or palatable plants and ring bark trees.

In some situations, such as in remnants where stock like to shelter and graze and there is no under-storey or natural regeneration occurring, it is essential to remove and keep stock out. Effective stock boundaries may comprise a physical stock-proof fence around a bush remnant or may be an extensive water management buffer regime around a sensitive wetland area. Particularly where the "core" of the remnant is small, fence far enough back to prevent stock from eating or damaging existing plants and if possible allow sufficient "buffer" space for outward regeneration (or restoration) into the open newly-fenced area. (However, in areas prone to vigorous weed growth consider the management commitment required for this to be feasible.)



In other situations, the buffer margin may involve a programmed level of management and monitoring grading from normal farming operations through to stock exclusion in the protected area. For example, stock may be allowed to graze in the buffer zone, but for limited periods and under strict supervision, and the class of stock may be defined. Grazing of buffers might avoid wet periods and seeding times, eg, in wetlands and tussock grasslands.



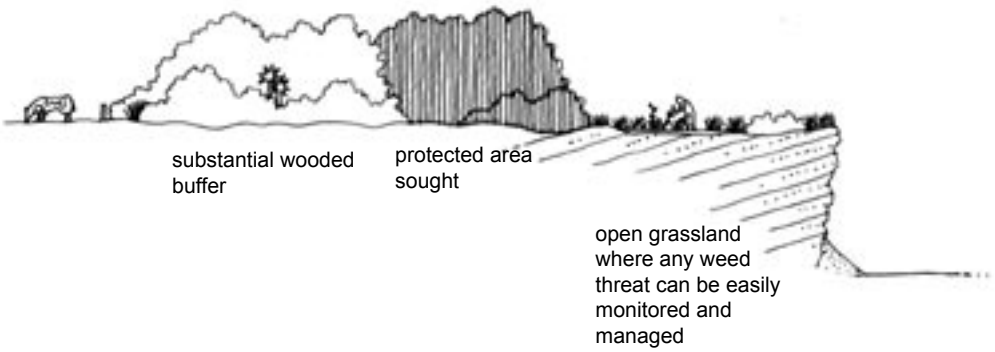
The buffer may involve a different level or more flexible management than exclusive fencing off. People and animals may be excluded at certain times (e.g. during nesting). It implies protection through agreement, and allows for some measure of flexible land use that may allow the farmer to maintain a certain level of operation.

Where a flexible buffer is defined, it needs to be determined to be mutually beneficial to both the farming and natural values being protected. An inflexible and ill-considered arbitrary buffer may serve no really meaningful purpose but may create management problems. In the case of a wetland for example, it may be better to look at its ecological context and protect the local catchment or water source e.g. spring, rather than merely remnant wetland vegetation.

12. access requirements for management and maintenance

All natural areas need to be checked routinely and the frequency will depend on the potential and degree of threat to the area's values (e.g., a rare plant species may need to be monitored for vigour and recovery or a bird nesting colony monitored for animal pest invasions). Access routes for carrying out routine management and maintenance tasks therefore need to be practical and suit the necessary tasks whilst minimising negative impacts on any values being protected.

If the protected area's ecological values can be threatened by nearby landuse activities (e.g., spread of plant pests along the track edges), or if some parts/ boundaries are naturally inaccessible, additional care needs to be taken in planning track use and maintenance, and track alignments.



Stock-routes and fire control access routes through protected areas may be desirable for the landowner. If unavoidable, incorporate in a way that will minimise any risks and negative impacts on the area's natural values (e.g., located to minimise erosional rates and pugging, to avoid stock effluent finding its way directly into nearby waterways). Any access route should be kept to the minimum width necessary and sturdily fenced off or, where only for short distances, planted with appropriate unpalatable species (e.g. flax).

In native grassland areas it may be necessary to allow stock access from time to time to control exotic pasture grasses and other non-woody and woody weed species. Responsible stock management is essential in this case.