



TREE HOLLOW AND URBAN DEVELOPMENT

Most trees with hollows have developed in a natural forest environment where they are an integral part of the forest ecology. The presence of retained hollow bearing trees within developing urban areas is generally not compatible with the increased human activity levels within urban areas. Retained hollow bearing trees are susceptible to increased damage and destruction by wind, lightning, changed soil moisture levels and ground disturbances as a result of urban development.

The ecological value of a retained hollow bearing tree in an urbanised area may be greatly decreased due to the other ecological changes occurring within the area, invasion of exotic pest species (e.g. bees, Indian Mynas).

If hollow bearing trees are to be retained careful consideration is needed in relation to how these trees will be retained and the area managed (e.g. riparian reserve, buffer zone, building line setbacks etc).

A risk assessment of hollow bearing trees by an arborist should be undertaken along with an ecological value assessment of the trees to determine the value/risk of retention or removal.

The Loss of Hollow Bearing Trees and Removal of Dead Wood and Dead Trees are listed as Key Threatening Processes within Schedule 3 of the Threatened Species Conservation Act. Any proposal to remove hollow bearing trees and dead trees as part of a development project needs to be assessed in relation to Section 5A of the Environmental Planning and Assessment Act through the completion of a 7 part assessment test.

Assessment of tree hollows is included in the Property Vegetation Plan Developer (Native Vegetation Act) and as a site attribute in the Draft Biobanking Assessment Methodology under Part 7A of the Threatened Species Conservation Act.

Assessment and consideration of hollow bearing trees in relation to layout of urban development areas should be undertaken early in the project evaluation/assessment stages as the presence of hollow bearing trees could be a significant issue in determining development or offset areas.

HABITAT ENHANCEMENT

Habitat enhancement involves the improvement and/or management of residual bushland or habitat areas outside of the main development area to improve the biodiversity fauna habitat value of the site. These areas often contain remnant or degraded vegetation with decreased fauna habitat values and are sometimes contained within riparian setback zones, bushland reserves or bushfire asset protection zones.

Habitat enhancement projects undertaken by Conacher Environmental Group have covered diverse projects such as:

- Design and creation of frog refuge habitat around stormwater detention basins;
- Collection and relocation of tree hollows to adjoining bushland areas for ground fauna;
- Planting of native tree, shrub and groundcover species for foraging and shelter habitat;
- Erection of artificial nest boxes to replace tree hollows removed from development sites;
- Relocation of logs and rocks into riparian corridors to enhance cover and foraging habitat for ground fauna, including amphibians and reptiles;
- Removal of invasive exotic plant species to enable native species to re-establish.

Ongoing monitoring surveys are being completed on several of these projects to determine the success of these measures and to record the species benefiting from habitat enhancement. Habitat enhancement projects are an on-going facet of ecological management programs and need to be dynamic and adaptive to the requirements of each site and group of species being considered.



BIODIVERSITY SURVEYS

Recent shifts and changes towards biodiversity planning and protection have highlighted the importance of the successful completion suitable, high quality field surveys. Conacher Environmental Group staff have many years experience in flora and fauna field survey throughout New South Wales. We have extensive knowledge and experience with relevant State and Local survey guidelines thereby ensuring that surveys are completed in accordance with those guidelines. We are also aware of the specific biodiversity values and issues of particular local government areas and complete surveys so as to satisfy relevant specific local requirements. Conacher Environmental Group are committed to the safe and successful completion of field survey programs.

With the increasing importance placed on threatened species as a biodiversity indicator by statutory authorities, the completion of field surveys to adequately address threatened species issues is vitally important to the biodiversity assessment and land development process.

Apart from the standard flora and fauna surveys types Conacher Environmental Group offer the following specialist surveys:

- Threatened flora searches and counts
- Seasonal flora surveys (orchids/cryptic flowering plants)
- Hollow tree identification and assessment
- Radio tracking
- Nest box/hollow monitoring

BIODIVERSITY MANAGEMENT PLANS AND STRATEGIES

Biodiversity Management Planning is completed to minimise the ecological impact of a proposed development through the identification of potential threats and provision of ameliorative strategies. Conacher Environmental Group has staff experienced in the development of effective, relevant and site-specific management plans, and who are familiar with issues associated with the protection of threatened species, endangered ecological communities and other ecologically sensitive environments. Areas of expertise include:

- Ecological Site Management Plans;
- Vegetation Management Plans;
- Wildlife and Habitat Management Plans;
- Koala Plans of Management.

Management Plans are developed based on results from ecological field surveys and supplemented by local area information. Biodiversity Management Plans have the capacity to protect and enhance the ecological values of a site in accordance with current requirements for addressing improve or maintain standards.

Conacher Environmental Group have completed a number of biodiversity management planning documents along coastal NSW to accompany rezoning and development applications for small and large scale residential areas. This includes the management planning for large native bushland and corridor areas that have provided for the long term protection and restoration of these areas.



ECOLOGICAL MONITORING

The implementation of ecological monitoring programs is becoming more common as conditions of development consent or as measures recommended in ecological assessment reports to reduce ecological impacts. Ecological monitoring can cover a diverse range of parameters depending on the species/habitat being monitored and the specific requirements of the monitoring program.

Conacher Environmental Group has prepared, and is implementing, ecological monitoring programs in a range of habitats and for a variety of species. These programs include the following types of monitoring:

- Water quality in Wallum Froglet occupied water quality control ponds and retained habitat areas;
- Nest Box occupation by Squirrel Gliders;
- Colonisation of a stormwater treatment basin and use of enhanced habitat by frog species;
- Persistence of *Rutodosis heterogama* in small retained habitat patches;
- Changes in bird species diversity in retained urban bushland reserve;
- Persistence of a Squirrel Glider population in reduced bushland reserve;
- Edge effects within riparian corridors surrounded by recent urban development;
- Increasing in canopy cover and decrease in weed cover for development off-set areas;
- Changes in bird species occurrences in areas subject to reduced vegetation cover for a bushfire asset protection zone.

Ecological monitoring programs generally involve repeated surveys on a seasonal basis over several years. The initial results of these surveys can be used to develop more appropriate development control and environmental protection measures to reduce the overall impact of a development on areas of habitat, bushland or riparian zones.

CORRIDORS LINKAGES AND BUFFER ZONES

Some of the most widely debated ecological issues relating to land development projects involve the concepts of Corridors, Linkages and Buffer Zones.

The use and understanding of these terms are highly varied. Likewise the requirement to retain areas as corridors, linkages or buffer zones is not always based on the ecological or habitat requirements of species or areas proposed to be protected or designed for.

The buffer zone requirements to a wetland area may vary considerably to a remnant gully rainforest or an area of open forest containing threatened plant species. The management requirements of buffer zones are also highly variable and are dependant on the types of habitats proposed to be buffered against and the type of development proposed. The level of activities (bushfire asset protection, water quality treatment areas, recreation etc) that are suitable for buffer zone areas are also of interest.

Corridors or linkages are also highly variable in length, width, complexity, connectivity, fragmentation and size. The establishment of corridors or linkages may result in other site development constraints (bushfire hazard, drainage, lighting, access etc) arising which may impact on the viability of proposed corridors.

Staff at Conacher Environmental Group are undertaking detailed research and investigations on these issues affecting corridors, linkages and buffer zones. A five year research program has been established to identify specific ecological aspects of integrating and managing corridors linkages and buffer zones into urban development/urban bushland areas.

The progressive results of these investigations will provide valuable information for use in determine off-sets, corridor requirements or management requirements for retained vegetation at the urban/bushland interface.