selected indicator taxon (or taxa) should correlate with the diversity of other taxa (Goldstein 1999). Every species has a unique evolutionary history that influences its distribution. Higher taxonomic levels, such as genera and families, may be influenced by factors that are not necessarily the same as those that affect other genera and families, even within the same habitat. Different organisms have distinct ecological requirements and are unlikely to respond to environmental change in similar ways (Lawton et al. 1998).

Studies of the relationships between the species richness of a variety of taxa have found similar patterns. Kremen (1992) found butterflies to be poor predictors of plant species richness in Madagascar; Wilcox et al. (1986) found marginal correlations between the richness of butterflies, birds, and mammals in the western United States; Prendergast et al. (1993) found low overlap in hotspots of species richness for butterflies, dragonflies, liverworts, aquatic plants, and breeding birds in England; and Pharo et al. (1999) found no correlation between vascular plant diversity and bryophyte and lichen diversity in Australia. Of the studies reported here, Abensperg-Traun et al. (1996), Oliver and Beattie (1996a), Cranston and Trueman (1997), and Oliver et al. (1998) did not find any correlations between the richness of other taxonomic groups.

Knowledge of the biology of the species under investigation is an essential aspect of biodiversity studies if a biologically meaningful interpretation of the data and understanding of the relationships between taxa are to be developed (see Chapters 2 and 8). Such knowledge is not possible unless the species names are known. Furthermore, conservation and management plans should not be made based solely on the number of species present in an area, but also on the identity and biology of the species present (Goldstein 1999).

Potential Use of the Indicator Approach

It is possible that the species richness of different taxa may be related in some areas. In undisturbed habitats, historical evolutionary factors may have produced similar levels of species richness in unrelated taxa (Cranston and Trueman 1997). This is possible in areas of high stability, such as refugia, where high speciation rates, low extinction rates, and close co-evolved mutualistic associations could occur. In areas that have been subject to some type of disturbance, whether it be natural or anthropogenic, corresponding levels of species richness may be expected for taxa that have similar habitat or microclimate needs. For example, soil-dwelling arthropods and reptiles may both increase in species richness in an area as the plant species richness—and thus the availability of nesting sites and more appropriate soil moisture conditions—changes. Taxa with similar dispersal or colonizing abilities may also display correlated patterns of species richness in disturbed areas. In addition, partners involved in tight mutualistic interactions may display similar patterns of species richness.

Potential Use of Ants as Indicators

Patterns in ant species richness and diversity might be correlated with patterns in taxa that have similar nesting or feeding needs, taxa that are affected by similar environmental factors, or taxa with which ants have significant interactions. Such taxa could include invertebrates that also live in the litter or soil, such as spiders, collembolans, or mites; invertebrates that have similar but restricted diets; and organisms that may serve as specialized prey items for some ant species. Although ants are regarded as generalist feeders and nesters, many species