Small, ground-dwelling vertebrate animals in the wheatbelt are at risk from salinity By Allan Burbidge

During 1997 to 2001, a team of biologists led by CALM's Science Division sampled more than 300 sites across the WA wheatbelt. The aim was to determine patterns of plant and animal distribution in relation to salinity, as part of the State Salinity Strategy.

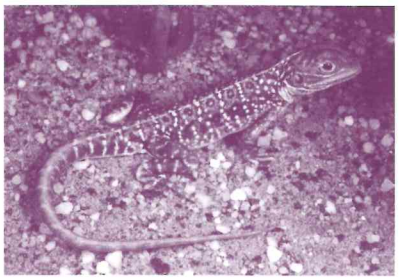
Small isolated remnants will not on their own be able to conserve wheatbelt fauna.

Using pit fall traps, we caught 144 species of vertebrate animals - 22 frogs, 106 reptiles and 15 mammals. Within the Buntine-Marchagee Catchment, we caught four frog species, three dragons, three geckoes, a legless lizard, six skinks including the strikingly patterned leopard ctenotus (*Ctenotus pantherinus*) and three native mammals, including Mitchell's hopping mouse (*Notomys mitchellii*). This list is certainly not the limit of what would be in the catchment. We only had five trapping sites in the catchment, so more extensive trapping would reveal the presence of more species. One of these is the spiny-tailed skink (*Egernia stokesii*), a declining species that is reliant on old hollow logs in woodlands. Although the spiny-tailed skink is known from the catchment, we missed them here during our trapping, but we did record them further north-east and south-east of Wubin.

A shrubland in Buntine Nature Reserve where CALM biologists caught three frogs, seven reptiles and one mammal species. Photo – Allan Burbidge

Looking at the wheatbelt data, we identifed two major groups of small vertebrates, one of which includes species with mostly southern or semi-arid distribution patterns (e.g. western pygmy possum, *Cercartetus concinnus*) and one with mostly arid or northern distributions (e.g. shoemaker frog, *Neobatrachus sutor*). The wheatbelt is, therefore, a transition zone for these two major groups.

Secondary salinisation is causing plant deaths at this site west of Wubin. Few animals were caught at such sites. Photo – Allan Burbidge



*The salt lake dragon (*Ctenophorous salinarum*) is one of the few species that prefer saline environments. Photo – Brad Maryan, WA Museum*

*This handsome skink (*Ctenotus schomburgkii*), was one of the species caught at several sites in the Buntine-Wubin area. Photo – Brad Maryan, WA Museum*

Salt lakes are a natural and ancient part of the wheatbelt environment, and a few animals prefer such areas, with the clearest examples being the fat-tailed dunnart (*Sminthopsis crassicaudata*) and the salt lake dragon (*Ctenophorous salinarum*). On the other hand, there is a diverse array of species that occur only in non-saline areas. These include the honey possum (*Tarsipes rostratus*), many skinks such as the shrubland skink (*Morethia obscura*), which is widespread in the wheatbelt, and most frogs, including the moaning frog (*Helioporous eyrei*).

We looked at a range of sites with increasing amounts of salinity, and found strong relationships with climate and substrate type. For example, higher numbers of reptile species occur at sites with high temperatures, at high, well-drained positions in the landscape, which matches well with their known biological characteristics.

In contrast, higher numbers of frog species are associated with deep, nutrient poor sands. This is because about two-thirds of our frog species use burrows for shelter or breeding. Interestingly, we found frogs throughout the landscape, not just in and near wetlands. This suggests that, to allow long-term persistence of frogs in the wheatbelt, we may need to provide good connections of native vegetation to allow for this dispersal process to proceed.

Levels of species richness in the wheatbelt seem to be low, and secondary salinisation is part of the explanation for this, but decades of fragmentation through clearing of native vegetation, and the impacts of feral predators, including foxes and cats, but possibly also hungry mice during mouse plagues, would also have had their impact. In many parts of the wheatbelt, it is difficult to see how the impacts of salinity and fragmentation can be addressed quickly enough to allow the small ground-dwelling vertebrate animals to withstand the effects of these processes. A continuing decline is likely in many species, particularly those that prefer valley floor woodlands, although in saline areas there will be a few winners, such as the salt lake dragon.

Small remnants will not, on their own, be able to conserve the fascinating wheatbelt fauna, and it seems obvious that integrated management programs over entire catchments will be necessary in order to maintain agricultural productivity as well as conservation values.

Healthy woodlands such as this one near Buntine were relatively rich in animal species. Photo – Allan Burbidge