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**Method for assessing the diversity of native animal species**

A Bayesian formula (see below) was used to assess the probability that each faunal species known to have occurred in the region at the time of European settlement in 1835 was still persisting in the region at the time of the analysis in 2008.  The probability of persistence calculation required a minimum of three independent observations of any species per Reporting Area.  The number of species calculated as likely to persist is an expression of species diversity.  
  
Records of vertebrate fauna were obtained from the Atlas of Victorian Wildlife.  The Atlas is a database of animal sightings and museum records within Victoria and administered by the Government of Victoria’s Department of Sustainability and Environment.   
  
Sightings are submitted to the Atlas by people with varying expertise; by qualified biologists during systematic fauna surveys and members of the general public who make incidental sightings.  The amount of data contained in each record varies but must include species, date and location.  The location of each sighting is recorded to within 100 m where possible.  All records are expert-reviewed prior to entry in the Atlas.   
  
To assess the diversity of native animal species, data from the Atlas was supplemented with records from:

* Melbourne Water Frog Census,
* Melbourne Water Fish Census, and
* the Atlas of Australian Birds (co-ordinated by Birds Australia).

These records were collected by trained volunteers and/or qualified biologists.   
  
The Australian Research Centre for Urban Ecology extracted these records from their respective data sources in August 2008.  Because some areas had incomplete data for certain taxa in more recent years, cut-off dates were determined to standardise the reporting period for each taxonomic group in all parts of the region: 2005 for amphibians and reptiles and 2006 for fish, birds and mammals.   
  
Records were deleted from the dataset before analysis where species identification was tentative (eg. identified only to genus level) or the observation date was missing.  Duplicate records were also deleted.  Multiple sightings of a species at a single site on the same day were recorded as a single sighting in order to eliminate non-independence in the dataset.  Other records omitted from the analysis were those where the location was obviously incorrect (eg. terrestrial species occurring in marine environments) and those of non-native species that were introduced after initial European settlement.  Dingoes were also excluded from the analyses as the potential for hybridisation with domestic dogs makes it difficult to distinguish between the two.  Records where subspecies were identified were grouped as a single species.  In marine areas, only information about birds was included.   
  
Finally, all records were assigned to a particular Reporting Area after their location co-ordinates had been mapped.

The probability that a species is persisting is calculated with the formula:

http://www.ppwrcs.vic.gov.au/media/page/Probability_of_persistence_formula.png

Where N is the number of times the species was recorded between time 0 and time T, and t is the time when the species was last recorded.   
  
Species with fewer than 3 records were assigned to the category “inadequate records”. Inadequate records may result from a species having a cryptic nature, making it difficult to survey, or because the species was transiently passing through the area and not normally resident within the area.   
  
However, in a large number of cases, inadequate records were likely to have occurred because the species is now locally extinct or become so rare as to make detection unlikely.  It is assumed that species that have inadequate records to run the analysis are more likely to be locally extinct than persisting.