



## Bush Blitz vouchering policy

Bush Blitz is Australia's largest species discovery project to document the plants and animals across the continent. To meet our objectives, accurate and verifiable identifications are essential. In many cases this will require collecting voucher specimens and depositing them in permanent museum and herbarium collections.

- A voucher specimen is a stored dead plant or animal (including fish, birds and invertebrates such as insects and spiders) that is used to identify each species known to science.
- Vouchering is important to conservation. If vouchering is not done, species cannot be properly identified and appropriate steps taken to conserve them. Vouchering is important to our scientific understanding of all plants and animals.
- A very small number of plants and some animals may need to be killed for vouchering. The number will always be minimised by the survey team and methods are as humane as possible, and consistent with animal care and ethics legislation in the relevant State or Territory. Where possible, other methods of identification such as taking small samples of skin or blood will be used. It is rare that voucher specimens of large animals will be needed.

### Reasons for vouchering

Australia is home to around 570,000 species, most of which are yet to be described formally. Approximately 92% of Australian plants, 87% of mammals, 93% of reptiles and 45% of birds are endemic, making Australia one of only seventeen biologically megadiverse countries on the planet. Australia has three globally significant biodiversity hotspots, areas where there is a concentration of species that are found nowhere else and are under threat from human activities. Within Australia, fifteen nationally significant biodiversity hotspots have been identified.

Australia's biodiversity is in serious jeopardy from the threats of climate change, habitat fragmentation and invasive species. However, only about 150,000 of an estimated 570,000 Australian species have been named. Australia's biodiversity needs to be comprehensively identified, described and catalogued. This inventory of our natural wealth is basic information needed to enable any response to climate change.

**Taxonomy** is a necessary and major component of assessing Australia's biodiversity. Taxonomy is the science of discovering, identifying, and describing, naming and classifying species. It is fundamental to decision-making for the conservation, management and sustainable use of our biodiversity. It provides crucial data for ecological and evolutionary studies and enhances accuracy in biodiversity survey work. It also provides answers in times of crisis or biological threat, by correctly identifying agents of indigenous or exotic disease. Taxonomy relies on biological collections for biodiversity documentation and research.

**Biological collections** provide a genetic bank and storehouse of information that underpin taxonomic research and knowledge. Biological collections held by herbaria, museums and government departments include DNA banks and preserved specimens. Biological collections are essential to compare specimens (including extinct species) for the study of evolutionary changes and species distribution. Many universities also hold and maintain significant biological collections, especially botanical, microbiological and entomological collections.

**DNA Barcoding** is a method of rapid and accurate species identification that utilises DNA technology. It requires an active and vibrant research and collections community to underpin it. Taxonomists are increasingly engaged in, and dependent on, cutting edge molecular techniques such as barcoding. A barcode reference library linked to specimen vouchers allows the development of an efficient DNA-based system for the identification of organisms and will assist in the discovery of new species.

### **Groups likely to be vouchered**

Voucher specimens are only taken in particular circumstances – where a new species is suspected, where uncertainty about a species exists, or to provide a new record in a previously unsampled region. Groups in which vouchering is likely to occur include plants, invertebrates, freshwater fish, many reptiles and frogs, and some small to medium sized mammals.

**Plant** taxonomy is in a state of flux in many parts of Australia. Many widespread species may in fact be several species, and conversely, several closely related (and often rare) species may actually be local variants of a single species. Vouchering of plant specimens requires taking representative material to allow comparison and identification of key characters (e.g. leaf, stem, flower and seed). This is not problematic for trees and shrubs but for some small plants such as orchids, this may constitute the entire plant.

**Invertebrate** surveys can require a range of destructive (lethal) survey methods (pitfall traps, light traps, malaise traps, bark spraying, beating, fogging, sweep nets and dip nets). There is some risk that small vertebrates (most likely small lizards and frogs) may inadvertently fall into pitfall traps and be killed.

In many parts of Australia, the freshwater **fish** fauna is poorly surveyed and increased survey effort is likely to reveal undescribed species. The standard survey technique for fish (electrofishing) results in a small number of fish deaths.

The taxonomy of many **reptile and frog** groups is poorly resolved. It is likely that many taxa currently classified as a single widespread species are actually a complex of several closely related species or subspecies. Where possible tissue samples are taken from animals, which are also photographed and released. Molecular analysis is required to confirm taxonomy. Vouchers may also be required to confirm species.

The taxonomy of some **mammal** groups, such as rodents, native mice and cats (e.g. quolls, antechinuses and dunnarts) and bats, remains poorly resolved. Molecular analysis is required to clarify taxonomic relationships within these groups. Blood or tissue samples can be taken to confirm identification but voucher specimens may sometimes be required.

It is most unlikely that voucher specimens of **birds** would be required under any circumstances, but if so, non-lethal methods for collection of tissue samples for molecular analysis (e.g. feather samples, blood from toe pricks) where taxonomic issues remain unresolved can be used. Similar non-lethal methods are used for rare or endangered animals.