

## Preserving biodiversity

Three Australian scientists are among a team of 25 from around the world who have embarked on the daunting task of preparing a strategy for preserving global biodiversity. The aim is to produce a detailed 'action plan' as a follow-up to the biodiversity treaty adopted at the United Nations Earth Summit last June.

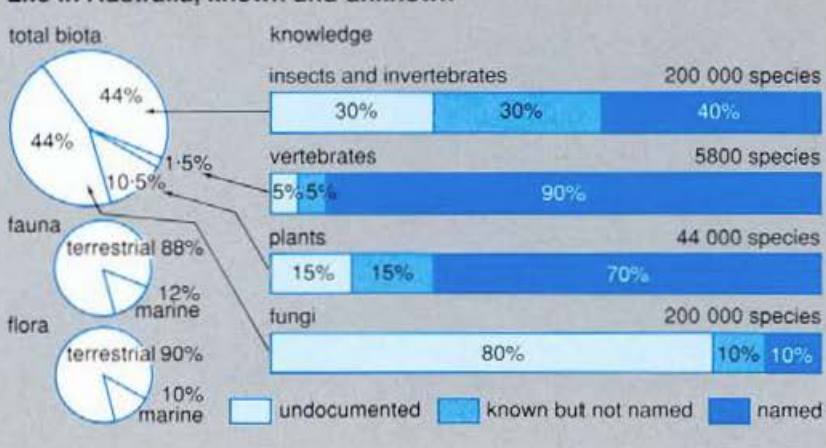
Dr Ebbe Nielsen of CSIRO's Division of Entomology, Dr Chris Margules of its Wildlife and Ecology Division and Dr Peter Bridgewater of the Australian National Parks and Wildlife Service met the other members of the group in London last August to start work on the strategy, which is being prepared under the auspices of the International Union for the Conservation of Nature (IUCN). The scientists — all world leaders in research related to biodiversity — plan to complete the project next year and present their report at the triennial IUCN general assembly in Argentina in December 1993.

According to Dr Nielsen, the strategy document will address questions ranging from what actually constitutes biodiversity to how to achieve sustainable development while protecting the diversity of plants and animals. It will spell out what needs to be done in the areas, among others, of gathering more information about what species exist where, providing access to this information and developing computer-based systems for ready assessment of the effects that proposed developments will have on species diversity.

An important starting point, in Dr Nielsen's view, is the development of a 'life list' — providing access by computer to all the information stored in taxonomic collections around the world. 'We can tap into any library; that's an astounding feat', he said. 'But there is still no list of the life in the world. A life list is highly do-able; globally we're talking small sums compared with much of science.'

Latest estimates are that the world has some 10 million species of vertebrates, insects and invertebrates, plants and fungi, and that perhaps one in a thousand of these is becoming extinct each year. That translates to some 10 000 species

Life in Australia, known and unknown



disappearing annually, a rate of extinction thought to be at least 1000 times the loss rate before human activity began influencing events.

Inevitably these estimates are extremely rough, because of the vast gaps that still exist in our knowledge of what lives with us on Earth. But they indicate the dimensions of the 'biodiversity crisis' now gaining increasing attention as a major global issue.

In Australia, the past 200 years have seen dramatic changes in the environment, including the clearing of nearly 90% of temperate woodlands and mallee and about half of the rainforest that grew before 1788. Loss of biodiversity has been an inevitable, continuing result. So far, at least 97 plant species, 17 mammals and three birds have become extinct and, fairly recently, at least three frog species seem to have disappeared. More than 10% of our plants are considered threatened, and the figure for mammals is closer to 15%.

So far, only about 15% of the world's species have gone through the processes of formal scientific naming and description. A vast amount of collection and description remains to be done if the proposed life list is to become anything like comprehensive.

Australia is home to about 7% of all species — twice as many as the combined total for North America and Europe — and more than 80% of them are found nowhere else in the world. Of our 5800 or so vertebrates, about 90% are named and another 5% are known but not yet named. Plants are the next best-known group with

70% of an estimated 44 000 named and 15% known but not named. As elsewhere in the world, the biggest gaps in knowledge affect insects and invertebrates (30% named, 35% known but not named) and fungi (just 10% named and another 10% known but not named).

However, new knowledge is accumulating rapidly. Dr Nielsen points to a project now under way in Costa Rica, a tropical country with a very rich flora and fauna, as a 'fantastic example' of what can be done. Experts from around the world are working on an inventory of the country's species, supported by foreign aid funds and by companies interested in the prospect of discovering useful new chemicals in the plant and animal life.

In Australia the inventory process goes on apace. For example, in Cape York Peninsula, a region facing development pressure for tourism, grazing, forestry, mining and the proposed spaceport, the Queensland and federal governments are funding surveys of the largely unknown flora and fauna. A major aim is to see that knowledge of the area's biodiversity is available to assist the land-use decision-making process.

Progress is also being made in the development of ways to put the collected information to good use in the cause of preserving biodiversity. For example, scientists are making substantial progress in devising computer-based 'expert systems' that can provide accurate information quickly to land-use decision-makers on the likely impact of developments on species richness.