

APPENDIX TO ANNUAL REPORT 1987

PRIORITIES FOR FUTURE ECOLOGICAL RESEARCH IN NEW ZEALAND. MARCH 1987

Introduction

This statement lists priority topics for ecological research in New Zealand. The statement summarises and represents the views of the New Zealand Ecological Society. The society's membership ranges widely in ecological interests and this is reflected in the list. No distinction is made between basic and applied ecological research since the two activities form a continuum.

An emphasis is placed on natural environments in the list, reflecting a majority view of members that protection of what is uniquely New Zealand is in the national interest.

Notwithstanding this emphasis, there is still an urgent need for ecological research that is linked to specific management questions associated with many kinds of managed ecosystems in rural and urban environments. There is also a need in New Zealand for greater emphasis on theoretical ecology involving modelling and the use of systems techniques, to enhance understanding of ecosystem processes in different types of environment.

The assumptions implicit in this priority list are:

- (i) That ecological research can contribute significantly to the wellbeing of New Zealand society.
- (ii) That knowledge of a natural resource is required before either sustainable use, or effective protection, of that resource can be achieved.
- (iii) Because this is a national priorities list, the research needed is seen as primarily the responsibility of public-funded organisations, either government departments or universities.
- (iv) The priorities identified relate mainly to terrestrial environments. We hope that priorities for ecological research in marine and freshwater environments will be listed by the appropriate Societies.
- (v) The list is *not* a checklist of all the worthwhile ecological studies that could or should be carried out in New Zealand. The list is the 10 topics we consider most urgent. An order of priority is implied by the numbering within sections, but there is little difference in urgency between many of the studies listed.

The Priority List

(A) *Natural and Semi-Natural Areas*

1. *Basic inventory* of remaining natural and semi-natural areas in all ecological districts for which comprehensive inventories or surveys do not already exist.

The inventory must include preparation of a register of important plant and wildlife habitats, designed to allow quick and site-specific assessment of the impact of proposed developments.

2. *Dynamics*. Understanding the instability of biological systems in natural and semi-natural areas.

This will involve long-term research into ecosystem processes. Without this understanding, it will be difficult or impossible to manage and protect natural or semi-natural areas on a scientific basis. The work would include studies of:

- (a) relative influence of climatic, edaphic and biotic effects on system function and stability; (see also C3, pg. 6)
- (b) long-term effects of browsing animals and human-related effects such as trampling, fertiliser drift, and drainage;
- (c) edge effects, and the functioning of buffer zones and biological corridors associated with isolated natural areas.

It is only with an understanding of the dynamics of natural systems that *realistic management objectives* can be identified for protected areas. Management should aim to be pre-emptive rather than a response to crisis.

3. Developing *management techniques* to maintain or enhance biological values in protected natural areas, and elsewhere to better provide for defined levels of compromise between maintaining indigenous biological values on the one hand, and sustaining yields or specific resources (e.g. timber) on the other.

Associated with this priority is a need for ecological/economic studies of the predicted effects of excluding certain natural and semi-natural areas from commercial development.

4. Study of *erosion processes* as they affect landscape stability, including the relative impact of climate and introduced animals on erosion.

(B) Urban and Rural Areas

1. *Ecological effects in New Zealand of a 'limited' nuclear war in the northern hemisphere.*
2. *Impact of agriculture, mining, industrial processing, horticulture and forestry on soil and water properties:*
These impacts require studies of:
 - (a) erosion effects
 - (b) nitrate pollution of ground-water
 - (c) eutrophication of streams and lakes
 - (d) effects of particular poisons, insecticides and herbicides.
3. *Restoration ecology:* restoration of degraded communities and habitats; mitigation of the impacts of recreational, agricultural and industrial developments; identification of indigenous species potentially useful for restoration.

This topic should be associated with the identification of distinctive and desirable elements in our various rural landscapes, and the development of

management techniques to retain these distinctive landscapes.

(C) Species

Long term population studies are required of:

- I. *Threatened and potentially threatened species*, including those of little-known groups such as invertebrates, with particular emphasis on:
 - (a) habitat requirements
 - (b) minimum viable population size
2. *Species of economic or conservation importance*, either problem plants and animals (e.g. certain weeds, introduced animals as disease vectors) or plants and animals that can be managed on a sustainable basis for recreational or economic reasons.
3. *Major species:* those plants and animals perceived to have the greatest influence on successional trends in ecological communities.