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# 8. Appendices

## 8.1 FIELD SURVEY FORM

**DEPARTMENT OF CONSERVATION**
**PROTECTED NATURAL AREAS PROGRAMME**

**NAME OF HABITAT:** ..... **DATE:**.....
**GRID REF.:** ..... **SSBI NO.:** ..... **PNA NO.:** .....
**HABITAT TYPE(S):** .....
.....
**GEOMORPHOLOGICAL TYPE(S):**.....
.....
.....
.....
.....
**VEGETATION TYPE(S):**

| Vegetation Type | % of Total Habitat | Percentage of Cover Value (canopy) | | | |
|---|---|---|---|---|---|
| | | Abundant (50-100) | Common (20-50) | Uncommon (5-20) | Rare (0-5) |
| | | | | | |

| Vegetation Type | % of Total Habitat | Percentage of Cover Value (canopy) | | | |
|---|---|---|---|---|---|
| | | Abundant (50-100) | Common (20-50) | Uncommon (5-20) | Rare (0-5) |
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Department of Conservation
*Te Papa Atawhai*

Dear Landowner,

Department of Conservation officers are currently surveying significant natural areas, e.g. bush, wetlands, gumland etc within the Far North District. This has involved mapping natural areas from roadsides or (with the permission of landowners) from other viewpoints, and recording information on their type and condition.

You may well have already talked to staff working in your area. If not, at a later stage departmental staff may ask for permission to enter your land and gather more detailed information on your properties natural areas.

**Why are we doing this survey?** Northland's natural areas, especially bush pockets, contribute significantly to the character and quality of the region. Many of these areas are habitat for some of our increasingly rare native wildlife.

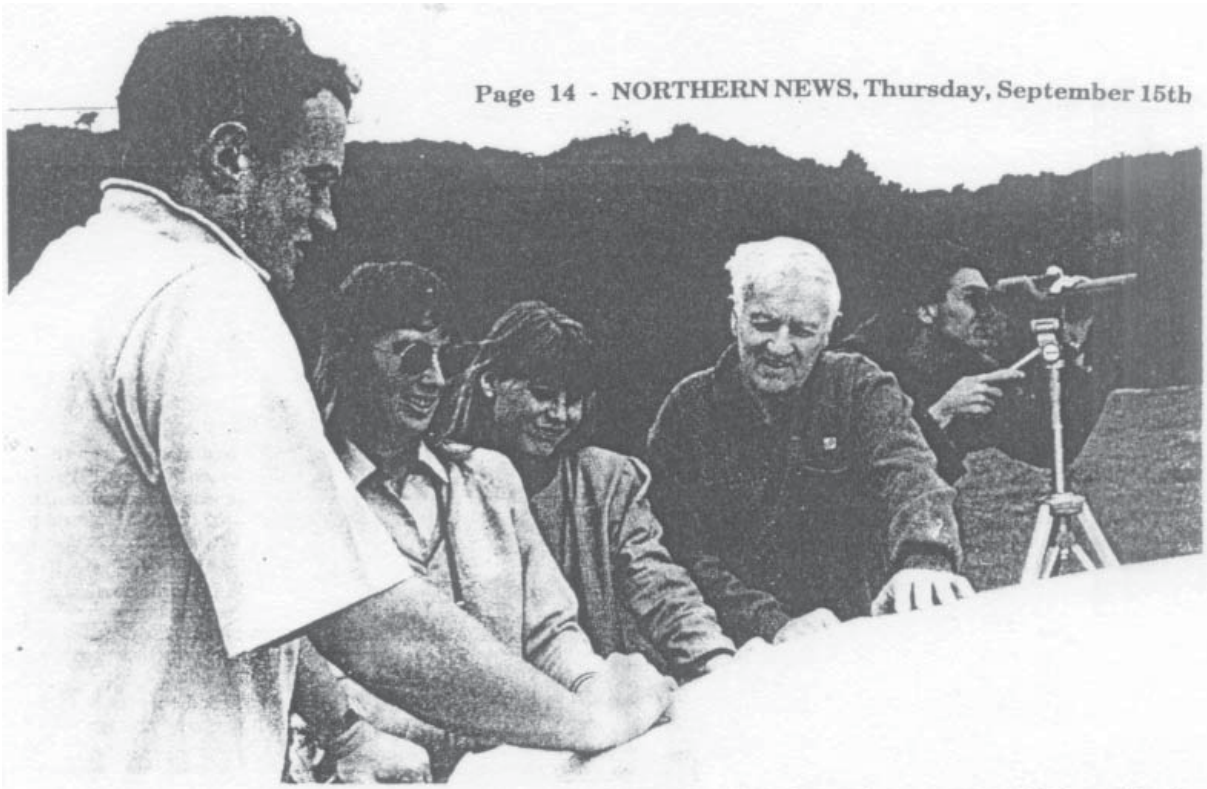
The Resource Management Act 1991 requires District Councils to consider the natural areas they administer when preparing the District Plan. The information compiled from this survey will be given to the Far North District Council to provide them with a "snapshot" of the distribution and condition of natural areas in the various parts of Northland at a single point in time. The information will be valuable as a reference point for assessing habitat changes over time.

Perhaps the principal value of this survey will be to provide you, the landowners, with information on the significance and makeup of the natural areas that you have preserved on your property so you can better plan the way you wish to manage these areas.

If you have any questions or concerns about the survey process, please contact your local Department of Conservation Field Centre or ring **Peter Anderson, Fraser Moors or John Beachman** at our Whangarei Office, telephone **(09) 438 0299, fax (09) 438 9886.**

If you wish to contact the Far North District Council about this aspect of the District Plan, please phone Peggy Kilberg at the Kaikohe office, telephone (09) **401 2101.**

Gerry Rowan
**REGIONAL CONSERVATOR**



Discussing natural habitats on Geoff Wightman's property at Waimate North are, from left, Department of Conservation officers Fraser Moors and Linda Winch, Far North District Council resource planner Kaylee Wilson, Mr Wightman and DOC officer Nigel Miller.

# Natural sites studied in the Far North

**Northland's most important natural habitats are being identified in a joint Department of Conservation and Far North District Council project.**

Conservation officers have started working on the year-long project, which aims to identify significant habitat areas outside the department's protected land area.

The study is being done for a number of reasons, including the fact that many lowland forests, gumlands, dunelands, wetlands and sea coasts are under-represented in the existing reserve system.

There is also insufficient information about the location and extent of remnant areas of native bush, wetlands, dune systems and other areas.

Conservation officers Nigel Miller, Fraser Moors and Linda Winch have begun gathering information by checking DOC's database and then looking at areas from the roadside.

## Identification

Once the team has broadly noted the natural features and habitat types which exist in the district, the more important sites will be identified and permission asked from landowners to complete a more indepth survey.

This will provide valuable information for the FNDC's district plan, which is required under the 1991 Resource Management Act to consider the environmental values of any proposed activity, and for DOC to advise and assist landowners to voluntarily manage and protect key sites.

It is the first time a Protected Natural Areas programme survey has been done in Northland. The last major Northland survey by the Wildlife Service in 1977-79 did not include observations of vegetation and landform types.

DOC officer Peter Anderson said that five years later it was found 40 per cent of all surveyed wildlife habitats had been modified in some way or totally lost through land development.

## 8.3 CATEGORIES OF THREAT

### FLORA

In this report, categories of threat are taken from "Threatened and uncommon plants of New Zealand" (de Lange et al.. 1999) which is a revision by the New Zealand Threatened Plant Committee of Cameron et al. (1995). The revised categories of threat are as proposed by de Lange & Norton (1998). These categories are as follows:

### New Zealand threatened and uncommon vascular plants list

***Presumed Extinct***

Taxa that are no longer known to exist in the wild both within New Zealand and (if applicable) their overseas range, or in cultivation after repeated searches of known or likely localities.

***Critically Endangered***

Taxa whose extinction is considered inevitable within a stated time period (10 years) unless there is direct conservation intervention, or which persist as individuals or populations reduced to sufficiently critically low levels that extinction through stochastic events is a distinct possibility. Some critical taxa are now only known from cultivation.

***Endangered***

Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included are taxa whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

***Vulnerable***

Taxa believed likely to move into the Endangered category in the near future if the causal factors continue operating. Included are taxa of which most or all populations are decreasing because of over-exploitation, extensive destruction of habitat, or other environmental disturbance; and taxa with populations that continue to be seriously depleted and whose ultimate security is not yet assured.

***Declining***

Taxa that are numerically abundant but which are either under threat from serious adverse factors throughout their range, or occur as widely scattered, typically small populations of which are undergoing declines through loss of reproductive ability, recruitment failure, predation, or through other processes of often subtle habitat change. Declining taxa are listed to highlight their plight, for without some level of management they are destined to become the future threatened plants of New Zealand.

***Recovering***

Taxa whose populations are either: (1) naturally restricted to susceptible habitats (e.g. offshore islands), where their survival is utterly dependent on continual rigid conservation measures (e.g. rodent control), or (2) taxa whose populations were once under serious threat and, as a result of past conservation

intervention (e.g. goat eradication), have shown the capacity to recover naturally without further management measures.

(1) Conservation Dependent
Taxa whose survival is now dependent on the continuation of existing conservation measures.

(2) Natural Population Recovery
Taxa whose populations were once reduced to precariously low levels and still occur as small populations. As a result of past conservation intervention, the candidate taxa have demonstrated the ability to recover their former range through natural means, to such an extent that further conservation assistance is no longer required.

***Naturally uncommon***
Taxa that are not considered under immediate or obvious threat but which, for varying reasons, have the potential to become threatened. Three subheadings are recognised to accommodate the different situations whereby taxa can be naturally uncommon.

- Sparse

Taxa that, for largely undetermined reasons, occur within typically small and widely scattered populations. This distribution appears wholly natural and is not considered the result of past or recent anthropogenic disturbance. However, as the candidate taxa usually occur in small numbers at any given site, they are naturally susceptible to extirpations within parts of their range.

- Vagrant

Taxa whose presence within the New Zealand botanical region is naturally transitory. These are invariable taxa that have failed to establish themselves significantly beyond their point of introduction through reproductive failure or for quite specific ecological reasons. Many vagrants are able to reproduce only by vegetative means and, in such instance, when in suitable habitats, they can form extensive clonal populations.

- Range Restricted

Taxa whose distribution is naturally confined to specific substrates (e.g. ultramafic rock), habitats (e.g. high alpine fell field), or geographic areas (e.g. subantarctic islands). Typically Range Restricted taxa are under no obvious or immediate anthropogenic threat.

***Insufficiently known***
Taxa that are suspected but not definitely known to belong to any of the above categories because of a lack of information. It is hoped that listing a taxon as "Insufficiently Known" will stimulate studies to find out its true category of threat.

***Taxonomically Indeterminate Taxa***
This category includes described taxa about which there is doubt regarding taxonomic status and which require further investigation, and those recently discovered taxa whose taxonomic status has yet to be determined. In both instances, available information suggests that candidate taxa could be under some level of threat. A total of 92 taxa are included.

## Molloy & Davis (1994) Categories of Threat

The Molloy & Davis categories were developed for the Department of Conservation to identify species which should be assessed for conservation action. It includes taxonomic groups not ranked under IUCN categories such as bryophytes and invertebrates.

The Categories are as follows:

| | |
|---|---|
| Category A | Highest priority threatened species (score >47 out of a possible 83) |
| Category B | Second priority threatened species (score 39-47 inclusive) |
| Category C | Third priority threatened species (score 30-38 inclusive) |
| Category X | Species which have not been sighted for a number of years but which may still exist |
| Category I | Species about which little information exists, but based on existing evidence, are considered to be threatened |
| Category O | Species which are threatened in New Zealand, but which are known to be secure in other parts of their range outside New Zealand |
| Category M | Species that are rare or localised, and of cultural importance to Maori. |

## SOIL SITES

Ranking criteria for New Zealand soil sites of international, national, and regional significance, from Arand et al. (1993).

### *International*

- Contains the best example of a soil (generally a soil group) or soil vegetation or soil-landform association that is unique to New Zealand (or these latitudes).
- Contains a soil that is naturally uncommon or greatly reduced in extent in other parts of the world.
- Contains a wide range of extensive soils with a relatively unmodified vegetation cover.
- Has been studied in detail and is known internationally.

### *National*

- Contains the best or a "classic" example of a soil (either a soil group or a mapping unit) or a soil-vegetation or a soil-landform association in New Zealand.
- Contains a soil or a soil-vegetation or soil-landform association that is nationally uncommon or reduced in extent.
- Contains a moderate range of extensive soils with a relatively unmodified vegetation cover.
- Has been studied in detail and is known nationally.

### *Regional*

- Contains the best regional examples of a soil (generally a mapping unit) or a soil-vegetation or soil-landform association.
- Contains a limited range of soils under vegetation that is relatively unmodified.

# 8.4 FAUNA

## A. CHECKLIST OF BIRDS

| | |
|---|---|
| NI brown kiwi | *Apteryx australis mantelli* |
| NZ dabchick | *Poliocephalus rufopectus* |
| Australasian little grebe | *Tachybaptus novaehollandiae* |
| Black shag | *Phalacrocorax carbo novaehollandiae* |
| Pied shag | *P. varius varius* |
| Little shag | *P. melanoleucos brevirostris* |
| White-faced heron | *Ardea novaehollandiae novaehollandiae* |
| Cattle egret | *Bubulcus ibis coromandus* |
| Australasian bittern | *Botaurus poiciloptilus* |
| *Black swan | *Cygnus atratus* |
| *Canada goose | *Branta canadensis* |
| Paradise shelduck | *Tadorna variegata* |
| *Mallard | *Anas platyrhynchos platyrhynchos* |
| Grey duck | *A. superciliosa superciliosa* |
| Grey teal | *A. gibberifrons* |
| Brown teal | *A. aucklandica chlorotis* |
| NZ shoveler | *A. rhynchotis variegata* |
| Australasian harrier | *Circus approximans* |
| *Californian quail | *Callipela californica brunnescens* |
| *Brown quail | *Synoicus ypsilophorus* |
| *Pheasant | *Phasianus colchicus* |
| Banded rail | *Rallus philippensis assimilis* |
| Spotless crake | *Porazana tabuensis plumbea* |
| Pukeko | *Porphyrio porphyrio melanotus* |
| Australian coot | *Fulica atra* |
| Kukupa (NZ pigeon) | *Hemiphaga novaeseelandiae novaeseelandiae* |
| *Eastern rosella | *Platycercus eximius* |
| Shining cuckoo | *Chrysococcyx lucidus lucidus* |
| Morepork | *Ninox novaeseelandiae novaeseelandiae* |
| Kingfisher | *Halcyon sancta vagans* |
| *Skylark | *Alauda arvensis arvensis* |
| Welcome swallow | *Hirundo tahitica neoxena* |
| NZ pipit | *Anthus novaeseelandiae* |
| *Blackbird | *Turdus merula merula* |
| *Song thrush | *T. philomelos clarkei* |
| NI fernbird | *Bowdleria punctata vealeae* |
| NI fantail | *Rhipidura fuliginosa placabilis* |
| Grey warbler | *Gerygone igata* |
| Silvereye | *Zosterops lateralis lateralis* |
| Tui | *Prosthemadera novaeseelandiae novaeseelandiae* |
| *Yellowhammer | *Emberiza cintrinella caliginosa* |
| *Chaffinch | *Fringilla coelebs gengleri* |
| *Goldfinch | *Carduelis carduelis britannica* |
| Greenfinch | *C. chloris* |
| Redpoll | *C. flammea* |
| *House sparrow | *Passer domesticus domesticus* |
| *Starling | *Sturnus vulgaris vulgaris* |
| *Myna | *Acridotheres tristis* |

* Introduced

## B. OTHER FAUNA IN THE ECOLOGICAL DISTRICT

| | |
|---|---|
| **Lizards/geckos** | |
| Forest gecko | *Hoplodactylus granulatus* |
| | |
| **Aquatic fauna** | * Introduced |
| Freshwater crayfish | *Paranephrops planifrons* |
| Freshwater mussel | *Hyridella menziesii* |
| | |
| Longfinned eel | *Anguilla dieffenbachii* |
| Shortfinned eel | *A. australis* |
| Torrentfish | *Cheimarrichthys fosteri* |
| Banded kokopu | *Galaxias fasciatus* |
| Inanga | *G. maculatus* |
| Common smelt | *Retropinna retropinna* |
| Red finned bully | *Gobiomorphus huttoni* |
| Common bully | *G. cotidianus* |
| Northland mudfish | *Neochanna heleios* |
| | |
| *Goldfish | *Carassius auratus* |
| *Perch | *Perca fluviatilis* |
| | |
| **Introduced mammals** | |
| mouse | *Mus musculus* |
| ship rat | *Rattus rattus rattus* |
| Norway rat | *R. norvegicus* |
| weasel | *Mustela nivalis* |
| stoat | *M. erminea* |
| ferret | *M. furro* |
| feral cat | *Felis catus* |
| feral dog | *Canis familaris* |
| cattle | *Bos taurus* |
| goat | *Capra hircus* |
| possum | *Trichosurus vulpecula* |
| pig | *Sus scrofa* |
| hedgehog | *Erinaceus europeus occidentalis* |

## 8.5 COMMON AND SCIENTIFIC PLANT NAMES USED IN THE TEXT

This is not a definitive list of common names used for plants from the Ecological District. Rather it is a guide to the reader as to exactly which species is referred to when the common name is used in the text.

**Indigenous**

| | |
|---|---|
| black maire | *Nestegis cunninghamii* |
| bracken | *Pteridium esculentum* |
| broom | *Carmichaelia australis* |
| cabbage tree | *Cordyline australis* |
| flax | *Phormium tenax* |
| Hall's totara | *Podocarpus hallii* |
| hangehange | *Geniostoma rupestre* var. *ligustrifolium* |
| hen and chicken fern | *Asplenium bulbiferum* |
| hinau | *Elaeocarpus dentatus* |
| kaikomako | *Pennantia corymbosa* |
| kahikatea | *Dacrycarpus dacrydioides* |
| kanono | *Coprosma grandifolia* |
| kanuka | *Kunzea ericoides* s.l. |
| karaka | *Corynocarpus laevigatus* |
| kauri | *Agathis australis* |
| kauri grass | *Astelia trinervia* |
| kawaka | *Libocedrus plumosa* |
| kidney fern | *Trichomanes reniforme* |
| kiekie | *Freycinetia banksii* |
| kiokio | *Blechnum novae-zelandiae* |
| kohekohe | *Dysoxylum spectabile* |
| kohuhu | *Pittosporum tenuifolium* var. *tenuifolium* |
| kotukutuku | *Fuchsia excorticata* |
| kowhai | *Sophora microphylla* |
| kumerahou | *Pomaderris kumerahou* |
| lacebark | *Hoheria populnea* |
| mahoe | *Melicytus ramiflorus* |
| mamaku | *Cyathea medullaris* |
| mamangi | *Coprosma arborea* |
| mangeao | *Litsea calicaris* |
| manuka | *Leptospermum scoparium* |
| mapou | *Myrsine australis* |
| matai | *Prumnopitys taxifolia* |
| small-leaved milk tree | *Streblus heterophyllus* |
| mingimingi | *Leucopogon fasciculatus* |
| miro | *Prumnopitys ferruginea* |
| monoao | *Halocarpus kirkii* |
| nikau | *Rhopalostylis sapida* |
| northern rata | *Metrosideros robusta* |
| NZ passion flower | *Passiflora tetrandra* |
| pate | *Schefflera digitata* |
| pigeonwood | *Hedycarya arborea* |
| ponga | *Cyathea dealbata* |
| pukatea | *Laurelia novae-zelandiae* |
| puriri | *Vitex lucens* |
| putaputaweta | *Carpodetus serratus* |
| raupo | *Typha orientalis* |
| rewarewa | *Knightia excelsa* |
| rimu | *Dacrydium cupressinum* |
| Smith's tree fern | *Cyathea smithii* |
| sundew | *Drosera* sp. |
| supplejack | *Ripogonum scandens* |
| swamp maire | *Syzygium maire* |
| tanekaha | *Phyllocladus trichomanoides* |
| tangle fern | *Gleichenia dicarpa* |
| taraire | *Beilschmiedia tarairi* |
| tarata | *Pittosporum eugenioides* |
| tawa | *Beilschmiedia tawa* |
| titoki | *Alectryon excelsus* |
| toetoe | *Cortaderia fulvida* |
| totara | *Podocarpus totara* |
| towai | *Weinmannia silvicola* |
| umbrella fern | *Sticherus cunninghamii* or *S. flabellatus* |
| umbrella sedge | *Cyperus ustulatus* |
| wharangi | *Melicope ternata* |
| whau | *Entelea arborescens* |
| wheki | *Dicksonia squarrosa* |

**Adventives**

| | |
|---|---|
| boxthorn | *Lycium ferocissimum* |
| Chinese privet | *Ligustrum sinense* |
| crack willow | *Salix fragilis* |
| gorse | *Ulex europaeus* |
| hakea | *H. sericea* or *H. salicifolia* |
| pampas | *Cortaderia selloana* |
| pine | *Pinus radiata* |
| prickly hakea | *Hakea sericea* |
| tobacco weed | *Solanum mauritianum* |
| watercress | *Rorippa nasturtium-aquaticum* |
| wattle (black) | *Acacia mearnsii* |
| willow | *Salix* sp. |

## 8.6 GLOSSARY

***Allochthonous***
Geologic units that have been transported to their present position.

***Biodiversity***
The variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. (IUCN 1993)

***Bog***
Infertile/acid wetland. Usually characterised by a peat substrate, sedges, manuka and *Gleichenia* fern. Water arrives via rainfall rather than by streams and other run-off.

***Buffer***
A zone surrounding a natural area which reduces the effects of external influences on the natural area. For example shrubland, scrub and exotic trees around native forested areas provide a gradation of habitats from fully modified to a natural state. This effect also applies to waterways - riparian vegetation and wetlands protect both water quality and habitat from influences arising from the surrounding land.

***Community***
An association of populations of plants and animals which occur naturally together in a common environment.

***Diversity and Pattern***
Diversity is the variety and range of species of biological communities, ecosystems and landforms. Pattern refers to changes in species composition, communities and ecosystems along environmental gradients.

***Ecological District***
A local part of New Zealand where geological, topographical, climatic and biological features and processes, including the broad cultural pattern, interrelate to produce a characteristic landscape and range of biological communities.

***Ecological Region***
A group of adjacent Ecological Districts which have diverse but closely related characteristics, or in some cases a single very distinctive Ecological District.

***Ecological unit***
Vegetation type occurring on a particular landform or soil or rock type.

***Ecosystem***
Any inter-related and functioning assemblage of plants, animals and substrates (including air, water and soil) on any scale including the processes of energy flow and productivity. (Myers et al. 1987)

***Endemic***
Occurring naturally in, and restricted to, a particular country, region or locality.

***Estuary***
A sheltered embayment where streams and rivers enter tidal waters.

***Exotic***
Introduced from outside New Zealand.

***Fernland***
Dominated by ferns such as *Gleichenia*, bracken, tree ferns, with occasional woody plants.

***Forest***
A tall, predominantly closed canopy consisting mainly of tree species (a tree being a woody plant which attains a 10cm diameter at breast height - Atkinson 1985).

Much of Northland's forest consists of or includes secondary growth which has developed following disturbance or destruction of the original forest. This may include secondary manuka/kanuka forest where those species have reached tree size and may contain other canopy species.

***Glauconitic***
Containing glauconite, a green-coloured hydrous potassium-iron-alumino silicate clay mineral.

***Habitat***
The part of the environment where a plant or animal lives. It includes both the living and non-living features of the area.

***Igneous***
Rocks which have crystallized from magma.

***Indigenous***
Native to and occurring naturally within the New Zealand Biogeographic region.

***Landform***
A part of the land's surface with distinctive naturally formed physical characteristics, e.g. a hill, valley etc.

***Linkages/Corridors***
Vegetated or aquatic areas (can be forest, shrubland, wetland, streams, beach or exotic vegetation such as pine) that link up two or more habitats. With a link between habitats the gene pool for a species is greater, which enhances the viability of that population. The corridor does not have to be continuous for many species to utilise it. Small remnants can act as stepping stones between two larger habitats so that birds such as kiwi can move from remnant to remnant up to 500 m apart.

***Lithofacies***
Rock noted for a distinctive group of characteristics, e.g. composition and grain size.

***Natural Area***
A tract of land which supports natural landforms and predominantly native vegetation or provides habitat for indigenous species; identified as a unit for evaluation of ecological quality and representativeness and has potential to be ecologically significant.

### *Naturalness*
The degree to which a habitat is modified and disturbed by human activity or introduced plants and animals and what natural values are retained despite these factors, i.e. to what extent native species are functioning according to natural processes.

### *Podzol*
Soil profile formed at an advanced stage of leaching.

### *Rarity*
This is a measure of commonness and may apply to entire ecosystems through to single species. It may refer to the threatened status of a species (see Appendix 8.3) or habitat type in any one of the following ways: formerly common but now rare; rare elsewhere but common in the district; rare in the district but common elsewhere; confined to a limited geographic area; at the limit of its range; or with a contracting or fragmented range.

For example, old growth alluvial swamp forests are an extremely rare ecosystem type in Northland, and indeed nationally, even though they contain no species which are regarded as rare in themselves.

### *Reedland*
A swampy area dominated by reeds such as raupo.

### *Refuge*
Native bush enclaves in production pine forest become a refuge for some native species during the logging phase, e.g. allowing bird species, such as kiwi, a retreat from logged areas.

### *Representativeness*
The extent to which an area represents or exemplifies the components of the natural diversity of the Ecological District. This implies consideration of the full range of natural ecosystems and landscapes that were originally found in the Ecological District, how well they are represented in today's environment, and the extent to which they are included in the protected areas network.

### *Riparian functions*
Riparian vegetation performs important functions such as providing corridors linking habitats and providing shading to streams, which is important in Northland, with many streams having small catchments, the water temperature can rise depleting the available oxygen and leading to the death of aquatic life. Litter debris enters into the nutrient cycle with invertebrates like mayfly, caddisfly and stonefly feeding on it. Riparian vegetation acts as a buffer for non-point water discharges.

### *Riparian zone*
An area of land immediately adjacent to a watercourse.

### *Riverine forest*
Forest situated on a floodplain alongside a stream/river and subject to periodic inundation by floodwaters.

It is characterised by species such as cabbage tree, lowland ribbonwood (*Plagianthus regius*), kowhai (*Sophora microphylla*), kahikatea, pukatea, kaikomako (*Pennantia corymbosa*), titoki (*Alectryon excelsus*) and divaricating shrubs. On drier areas totara, taraire, kohekohe, matai and kanuka

may occur. It commonly occurs only as narrow strips due to the deforestation of flat land for pasture.

***Rush/Sedgeland***

Swampy areas dominated by rushes, sedges, rush-like sedges or restiads, e.g. *Baumea, Juncus* (rush), *Carex*, *Schoenus, Isolepis, Bolboschoenus*, *Empodisma* and *Apodasmia.*

***Scrub***

Refers to seral communities, often dominated by or with a large component of exotic species such as gorse, *Hakea,* tobacco weed etc and/or commonly lacking a closed canopy and in which an understorey is either absent or composed primarily of exotic species.

***Secondary Vegetation***

Native vegetation established after destruction or disturbance of the previous vegetation and which is essentially different from the original vegetation. (See Succession, below).

***Seral***

Describes a plant community in the process of succession.

***Shrubland***

Vegetation in which the canopy is dominated by woody plants less than 10cm diameter at breast height.

There are 2 main types:

(i) Successional vegetation dominated by seral species such as manuka, kanuka, mahoe etc or shrubs such as hangehange, bracken, kumerahou.

As used in this report it implies a closed canopy and in more advanced stages contains an understorey of indigenous species.

(ii) Seral vegetation where the rate of further succession is extremely slow, being limited by abiotic factors such as soil structure and fertility, wind shear etc., e.g. Gumland manuka shrubland, *Muehlenbeckia* shrubland on dunes.

***Site***

An area of habitat identified during the rapid field inventory phase of the PNAP.

Its boundaries may be defined by the edge of the habitat (where discrete), catchment or other geographical feature, e.g. river, vegetation type or legal title.

***Succession***

The process of change in the appearance, composition and structure of a community, usually over a period of time. Change may be due to natural or human-induced factors, or both. For example the colonisation of bare rock, or soil by algae and lichens ending with a stable climax community in equilibrium with the environment. Secondary succession occurs where the original vegetation has been destroyed, e.g. by fire.

***Survey No.***

The identifier number given to each site. The first three figures refer to the NZMS 260 topographical map sheet that the habitat is on.

***Sustainability***
The longterm ecological viability of a natural area. This is related to the size and shape of the area as well as to threats from introduced pests.

***Swamp***
Fertile or eutrophic wetland, usually dominated by raupo, *Carex*, *Baumea articulata*, flax and cabbage tree.

***Swamp forest***
A forest type containing water tolerant trees and swamp species such as kahikatea, swamp maire, and pukatea. It may occur on alluvial valley areas but also occurs on poorly drained, semi-level sites within forests at higher altitudes.

***Swamp shrubland***
A transitional type in which woody species such as *Coprosma propinqua*-manuka-*Cordyline* with putaputaweta, *Coprosma tenuicaulis*, and other divaricating shrubs are usually dominant or may be co-dominant with monocotyledonous species such as rushes and sedges. This vegetation type is often found where conditions of winter water-logging and summer drought occur.

***Toeslope***
The area at the base of a slope where debris, topsoil and nutrients have accumulated and may be more fertile than higher up the slope.

***Vegetation type***
Defined by the dominant canopy species and the structure of the vegetation e.g taraire forest, manuka shrubland

***Viability***
The ability of an area's natural communities to maintain themselves in the longterm in the absence of particular management efforts to achieve this. Regeneration and vigour of species within these communities and stability of communities and processes contribute to viability.

***Wetland***
An area of land that is permanently or intermittently waterlogged and supports flora and fauna adapted to wet conditions. Wetland is used as a broad definition for several types of aquatic systems, e.g. swamps, bogs and ephemerals.

# 9. Alphabetical index of sites