Fig. 63 **Fernland.** Taia, Chatham Island; blanket peat on almost flat land bounded by sand dunes and the coastal lagoon of Te Whanga: bracken fern (*Pteridium esculentum*) bog (with restiads, lichens, mosses; modified by fire and livestock); palustrine.

Fig. 64 **Reedland.** Pukepuke Lagoon, Manawatu; a small lake among lowland sand plains, with marginal vegetation of raupo (*Typha orientalis*) reedland, shallow water; lacustrine (right), and in the foreground Mercer grass (*Paspalum distichum*) grassland.

Fig. 65 **Reedland.** Lake Ngatu, Northland; a dune lake with erect, emergent-aquatic sedges (*Baumea juncea* in foreground; *Eleocharis sphacelata* in deeper water beyond). These can be classified as reedlands in the wetland class of shallow water; lacustrine.

Fig. 66 **Reedland.** Tom Bowling Bay, Northland; a tidal creek: *Schoenoplectus validus* reedland, shallow water; estuarine.

Fig. 67 **Rushland.** Tongariro River delta, Volcanic Plateau (see Fig. 106); a moist valley floor with mineral soil that receives fresh silt deposits with floods (see Fig. 135): *Juncus effusus - J. edgariae* (centre of photo) rush marsh; riverine.

Fig. 68 **Rushland.** Kumara, Westland; a lowland terrace where forest has been felled for podocarp timber, the induced wetter ground favouring growth of *Sphagnum* moss, which is harvested from such sites: *Juncus canadensis* / *Sphagnum cristatum* rush fen; palustrine.

Fig. 69 **Restiad rushland.** Dismal Swamp, south Westland; part of a large lowland mire on a coastal plain, where frequent fire erodes the scrub and forest margins. The flexuose and bristly stems of wire rush scramble among and cling to each other, forming self-supporting tufts: *Empodisma minus* restiad rush bog; palustrine.

Fig. 70 **Restiad rushland.** Kopuatai Peat Dome, Hauraki Plain, Waikato (see also Figs 140 and 141). Kopuatai is the largest of the remaining northern New Zealand peat domes dominated by the tallest native restiad, cane rush (*Sporadanthus ferrugineus*). The dome crest receives water only from rain and is therefore bog. The photo shows vegetation dominated by *Sporadanthus* 2.2 m tall and about 30% cover, over wire rush (1 m tall, 50% cover), tangle fern (10%), and the sedge *Schoenus brevifolius* (10%). This can be classified as *Sporadanthus* / *Empodisma* restiad rush bog; palustrine.

Fig. 71 **Sedgeland.** Red Lagoon, near Lake Ohau, Canterbury; a broad depression in a valley floor of glacial outwash gravels where peat has accumulated beside a tarn. The water table is mostly above the ground surface, and the presence of raupo (middle distance) is an indicator of relatively high nutrient status, so this is a swamp. In foreground: *Carex sinclairii - C. diandra* sedge swamp; palustrine.

Fig. 72 **Sedgeland.** Lake Waikaremoana, Hawkes Bay; a sheltered bay with deep inorganic sediment on a gentle slope of moderate drainage that is inundated when the lake level is high: a *Carex* spp. sedge marsh; lacustrine. The marsh is dominated by *Carex geminata* (left distance), *C. virgata* tussocks (centre), and *C. sinclairii* (right foreground).

Fig. 73 **Grassland.** Kopuatai, Hauraki Plain, Waikato; a fen, modified by drainage, increased fertility, and weed invasion, for example by grey willow (*Salix cinerea*; background), and in foreground: Yorkshire fog (*Holcus lanatus*) grass fen; palustrine.

Fig. 74 **Grassland.** New River Estuary, Southland; mudflats in a large estuary invaded by one of the naturalised cord grasses (*Spartina anglica*): spartina grass saltmarsh; estuarine.

Fig. 75 **Grassland.** Maniototo basin, central Otago; a wide inland basin where former river meanders are influenced by salty mineral soils, and in this example, by increased fertility from dairy farming and its effluent. The wet (green) grassland zone is dominated by creeping bent (*Agrostis stolonifera*) and the moist zone (right) by squirrel tail grass (*Critesion jubatum*): an indicator plant of salty sites. These are grass marshes; inland saline.

Fig. 76 **Cushionfield.** Mararoa Valley, northern Southland; a montane valley floor where bog peat has accumulated on an almost level terrace, and where the hummock-and-pool topography has been created by the dense cushions – or bolsters – of comb sedge: *Oreobolus pectinatus* cushion bog; palustrine.

Fig. 77 **Herbfield.** Lower Waikato Valley, Waikato; a lowland floodplain, sometimes flooded and afterwards ponded, where agriculture has raised fertility of the mineral soil. Many naturalised plants are co-dominant; this could be described as willow weed - buttercup - dock herb marsh; riverine. In the background is treeland of crack willow (*Salix fragilis*) and alder (*Alnus glutinosa*) upon the levee adjoining a river channel.

Fig. 78 **Herbfield.** Taupo Swamp, Wellington; a roadside ditch stream of high nutrient status: water celery (*Apium nodiflorum*) - starwort (*Callitriche stagnalis*) herbfield, shallow water; riverine.

Fig. 79 **Herbfield.** Aramoana, Otago Harbour; an estuary where mudflats of the low intertidal zone have a 'meadow' of seagrass (*Zostera novazelandica*): this can be classified as seagrass herb saltmarsh; estuarine.

Fig. 80 **Herbfield.** Aramoana, Otago Harbour; estuary sandfields of the upper intertidal zones: glasswort (*Sarcocornia quinqueflora*) herb saltmarsh, grading (at left) to saltgrass (*Puccinellia*) grass saltmarsh, then knobby clubrush (*Isolepis nodosa*) rush saltmarsh on higher ground; estuarine.

Fig. 81 **Herbfield.** Garvie Mountains, northern Southland; the mid-summer remnant of an alpine snowbank. Stony mineral soils, revealed by the sheep tracks, are flushed with seasonal snow melt yet well drained and dry at other times. The brighter green stripes are seepages that are permanently wet and more peaty. Numerous plant species are co-dominant in the various communities, but they are all basically herbfield; palustrine.

Fig. 82 **Herbfield.** Old Man Range, Otago; an alpine seepage which can be regarded as a flush, seen here in early summer being inundated by a shallow, flowing sheet of snow-melt water. This community could be named from the characteristic presence of white caltha (*Psychrophila obtusa*), which bears conspicuous flowers immediately after the complete melt of its winter snow blanket: caltha herb seepage; palustrine.

Fig. 83 **Turf.** Awarua Bay, Southland; upper intertidal zones in the sheltered part of an estuary where the herbfield is of such low stature that it can be referred to as turf: *Selliera radicans - Samolus repens* turf saltmarsh; estuarine.

Fig. 84 **Turf.** Glenmore, Lake Tekapo, Canterbury; a depression with mineral soil in undulating moraines, lacking any inflowing stream or surface outlet, which ponds in winter and spring when groundwater input is high, then dries in summer. Different periods of inundation produce concentric zones of plant communities of numerous plant species, where composition varies over very short distances: turf ephemeral wetland; palustrine.

Fig. 85 **Mossfield.** Lammermoor Range, Otago; rolling land in the montane zone with snow tussock grassland. Peat accumulation in gully heads can vary in character between bog and fen: the red-brown patch in this small wetland is *Sphagnum cristatum* moss fen; palustrine.

Fig. 86 **Mossfield.** Tuku, Chatham Island; a very poorly drained hill crest on the blanket peat of the southern table-land, with low *Dracophyllum arboreum* forest beyond, and in foreground: *Sphagnum falcatulum* moss bog; palustrine.

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Fig. 87 **Mossfield.** Hollyford Valley, Fiordland; a temporary stream channel with a silty base on a forested valley floor; ponded during and after rain storms, and sufficiently wet at other times to exclude woody plants but encourage tussocks of *Carex virgata* among *Hypnodendron marginatum* moss ephemeral wetland; palustrine.

Fig. 88 **Lichenfield.** Lammerlaw Range, Otago; an upland mire where upward growth of herb and moss cushions has raised their surface sufficiently above the water table for lichen dominance to be favoured by the frequent alternation of drying and wetting by rain and mist: *Alectoria - Cetraria* lichen bog; palustrine.