

## APPENDIX D. EXAMPLES OF OTHER FORMATION-LEVEL CLASSIFICATIONS

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*Main World Terrestrial Biome Types (Box and Fujiwara 2005, Table 4.4,)*

The authors provide 18 major biome types recognized by most modern treatments of world vegetation. For example, they recognize the following forest biomes:

Tropical rain forest (including montane and cloud forests)
Tropical deciduous forest, woodland, and thorn scrub
Temperate forests
Deciduous broad-leaved forest
Evergreen broad-leaved forest (incl. laurel forest, warm-temperate mixed forest)
Temperate rain forest
Conifer forests
Boreal (including deciduous)
Montane conifer forest (temperate montane and subalpine)

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From. Box, E. O., and K. Fujiwara. 2005. Vegetation types and their broad-scale distribution. Pp. 106–128 in van der Maarel, E. Vegetation ecology. Blackwell Publishing. Malden, Massachussets, USA.

*World Wildlife Fund Major Habitat Types (Olson 2001)*

<b>MAJOR HABITAT TYPES</b>
<b>Tropical &amp; Subtropical Moist Broadleaf Forests</b>
<b>Tropical &amp; Subtropical Dry Broadleaf Forests</b>
<b>Tropical &amp; Subtropical Coniferous Forests</b>
<b>Temperate Broadleaf &amp; Mixed Forests</b>
<b>Temperate Coniferous Forests</b>
<b>Boreal Forests/Taiga</b>
<b>Tropical &amp; Subtropical Grasslands, Savannas, &amp; Shrublands</b>
<b>Temperate Grasslands, Savannas, &amp; Shrublands</b>
<b>Flooded Grassland and Savannas [temperate and tropical]</b>
<b>Montane Grassland and Savannas [temperate and tropical]</b>
<b>Polar</b>
<b>Mediterranean Forests, Woodlands, &amp; Shrub</b>
<b>Deserts &amp; Xeric Shrublands</b>
<b>Mangroves</b>
<b>Lake</b>
<b>Rock and Ice</b>

David M. Olson, Eric Dinerstein, Eric D. Wikramanayake, et al. 2001. Terrestrial ecoregions of the world: a new map of life on earth. *BioScience* 51(11):933–938.

*Formations (Biomes) - (Whittaker 1975)*

<b>FORMATIONS (BIOMES)</b>	
<b>FORESTS AND WOODLANDS</b>	
1.	Tropical rain forest
2.	Tropical seasonal forest
3.	Temperate rain forest
4.	Temperate deciduous forest
5a.	Temperate evergreen forest --broadleaf
5b.	Temp. evergreen forest--needleleaf
5c.	Temperate evergreen forest--sclerophyll [Mediterranean]
6	Taiga & subarctic-subalpine needle-leaved forest
7.	Elfin woodland
8.	Tropical broadleaf woodland
9a.	Thornwood--woodland
9b.	Thornwood--scrub
10a.	Temperate woodland --needleleaf
10b.	Temperate woodland--sclerophyll
10c.	Temperate woodland--deciduous broadleaf
<b>SHRUBLANDS</b>	
11a.	Temperate shrubland--deciduous
11b.	Temperate shrubland--heath
11c.	Temperate shrubland--sclerophyll [Mediterranean]
11d.	Temperate shrubland--subalpine, needleleaf
11e.	Temperate shrubland--subalpine, broadleaf
<b>GRASSLANDS AND ALPINE VEGETATION</b>	
12.	Savanna [tropical grassland]
13.	Temperate grassland
14.	Alpine shrubland
15.	Alpine grassland
<b>COLD AND WARM DESERTS and TUNDRA</b>	
16.	Tundra
17.	Warm semidesert scrub
18a.	Cool semidesert--open scrub
18b.	Cool semidesert--dry grassland
19.	Arctic-alpine semidesert

20. True desert
21. Arctic-alpine desert
<b>SWAMPS, MARSHES AND BOGS</b>
22. Cool temperate bog
23. Tropical freshwater swamp forest
24. Temperate freshwater swamp forest
25. Mangrove swamp
25. Saltmarsh
<b>MARINE AND AQUATIC</b>
[26-29 are aquatic]
29. Marine rocky shores
30. Marine sandy beaches
31. Marine mudflats

Whittaker, R. H. 1975. Communities and ecosystems. Second edition. MacMillan, New York. (pp. 135–161).

*Formations of Australia (Specht and Specht 2001)*

<b>FORMATIONS<sup>1,2</sup></b>
Closed forests (rainforests) - tropical north-eastern Australia
Closed forests (rainforests) - subtropical eastern Australia
Closed forests (rainforests) - temperate south-eastern Australia
Semi-deciduous closed forests - monsoonal northern Australia
Semi-deciduous closed forests - subtropical eastern Australia
Eucalypt open forests and woodlands - monsoonal northern Australia
Eucalypt open forests and woodlands - subtropical eastern Australia
Eucalypt open forests and woodlands - temperate south-eastern Australia
Eucalypt open forests and woodlands - montane south-eastern Australia
Eucalypt open forests and woodlands - temperate south-western Australia
Eucalypt open forests and woodlands - Australia wetland forests
Mallee eucalypt open-scrubs - monsoonal northern Australia
Mallee eucalypt open-scrubs - subtropical eastern Australia
Mallee eucalypt open-scrubs - temperate south-eastern Australia
Mallee eucalypt open-scrubs - temperate south-western Australia
Heathlands and related shrublands - monsoonal northern Australia
Heathlands and related shrublands - subtropical eastern Australia
Heathlands and related shrublands - temperate south-eastern Australia
Heathlands and related shrublands - montane south-eastern Australia
Heathlands and related shrublands - temperate south-western Australia
Tussock grasslands
Acacia vegetation - subhumid, subtropical eastern Australia
Acacia vegetation - Australian Arid Zone
Hummock grasslands - Australian Arid Zone
Chenopod low shrublands - southern Australia Arid Zone

Aquatic vegetation - tropical and subtropical northern Australia
Aquatic vegetation - temperate southern Australia
Coastal dune vegetation
Coastal wetland vegetation (mangroves, salt marshes, and brackish wetlands)

1. Specht, R. L., and A. Specht. 2001. Australia, ecosystems of. Pp. 307–324, *in* S. A. Levin, editor. Encyclopedia of Biodiversity, Vol. 1. Academic Press, New York, New York, USA.
2. Within each formation, Specht and Specht (2001) also provide a set of Floristic Groups.

*Australian Native Vegetation (NWLRA 2001)*

Vegetation profile fact sheets were developed for each type listed below:

MAJOR VEGETATION GROUP
Rain forest and vine thickets
Eucalypt and tall open forests
Eucalypt open forests
Eucalypt low open forests
Eucalypt woodlands
<i>Acacia</i> forests and woodlands
<i>Callitris</i> forests and woodlands
<i>Casuarina</i> forests and woodlands
<i>Melaleuca</i> forests and woodlands
Other forests and woodlands
Eucalypt open woodlands
Tropical Eucalypt woodlands/grasslands
<i>Acacia</i> open woodlands
Mallee woodlands and shrublands
Low closed forests and closed shrublands
<i>Acacia</i> shrublands
Other shrublands
Heath
Tussock grasslands
Hummock grasslands
Other grasslands, herblands, sedgelands and rushlands
Chenopod shrublands, samphire shrubs and forblands
Mangroves, tidal mudflats, samphires, claypans, sand, rock, salt lakes, lagoons and freshwater lakes

NWLRA (National Land and Water Resources Audit). 2001. Australian Native Vegetation Assessment 2001. National Land And Water Resources Audit. Canberra, Australia.

*EUROPEAN VEGETATION SURVEY (2002)*

**FORMATIONS**

A. Coastal mud-flats and brackish waters
B. Saltmarsh, sand-dune and sea-cliff vegetation
C. Rock crevice, scree and boulderfield vegetation
D. Freshwater aquatic vegetation
E. Springs, shoreline, and swamp [marsh] vegetation
F. Bogs and fens
G. Temperate grasslands, heaths, and fringe vegetation
H. Dry grasslands and semi-deserts
I. Oromediterranean grasslands and scrub
J. Montane tall-herb, grassland, fell-field and snowbed vegetation
K. Mediterranean garrigue, maquis, matorral, tomillar and phrygna
L. Temperate broadleaved forests and scrub
M. Montane heaths and coniferous forests
N. Weed communities

Rodwell, J. S., J. H. J. Schamineé, L. Mucian, S. Pignatti, J. Dring, and D. Moss. 2002. The diversity of European vegetation. An overview of phytosociological alliances and their relationships to EUNIS habitats. Wageningen, NL. EC-LNV. Report EC-LNV nr. 2002/054. 168 p.