

# WORLD ECOSYSTEMS MAP AND IUCN TYPOLOGY

VERSION 0.2 | OCTOBER 2020

This annex contains the IUCN typology that can be used to standardize any ecosystem classification and a crosswalk between that typology and the World Ecosystems Map that LandScale recommends as the default data for metrics requiring such data. LandScale assessments are free to use any ecosystem data and classification they wish but the classifications below can aid those lacking a suitable, nationally adopted data and classification.

## IUCN Ecosystem Typology

This typology is a functional classification of the world’s ecosystems based on both functions and compositional features. This typology is the product of a top-down construction of upper levels of ecosystem classification to ensure global consistency and bottom up construction of lower levels to promote local accuracy and ownership. This typology provides indicative distribution maps and descriptive profiles of 100 ecosystem functional groups (level 3), which is being revised and refined regularly. The current version of the typology (v1.0.1) is available [here](#).

IUCN Ecosystem Classification Level 2	IUCN Ecosystem Classification Level 3
Terrestrial T1 Tropical-subtropical forests	T1.1 Tropical-subtropical lowland rainforests
	T1.2 Tropical-subtropical dry forests and scrubs
	T1.3 Tropical-subtropical montane rainforests
	T1.4 Tropical heath forests
Terrestrial T2 Temperate-boreal forests & woodlands	T2.1 Boreal and temperate montane forests and woodlands
	T2.2 Temperate deciduous forests and shrublands
	T2.3 Oceanic temperate rainforests

	T2.4 Warm temperate rainforests
	T2.5 Temperate pyric humid forests
	T2.6 Temperate pyric sclerophyll forests and woodlands
Terrestrial T3 Shrublands & shrubby woodlands	T3.1 Seasonally dry tropical shrublands
	T3.2 Seasonally dry temperate heaths and shrublands
	T3.3 Cool temperate heathlands
	T3.4 Rocky pavements, screes and lava flows
Terrestrial T4 Savannas and grasslands	T4.1 Trophic savannas
	T4.2 Pyric tussock savannas
	T4.3 Hummock savannas
	T4.4 Temperate wooded savannas
	T4.5 Temperate grasslands
Terrestrial T5 Deserts and semi-deserts	T5.1 Semi-desert steppes
	T5.2 Thorny deserts and semi-deserts
	T5.3 Sclerophyll deserts and semi-deserts
	T5.4 Cool temperate deserts
	T5.5 Hyper-arid deserts
Terrestrial T6 Polar-alpine	T6.1 Ice sheets, glaciers and perennial snowfields
	T6.2 Polar-alpine rocky outcrops

	T6.3 Polar tundra
	T6.4 Temperate alpine meadows and shrublands
	T6.5 Tropical alpine meadows and shrublands
Terrestrial T7 Intensive land-use systems	T7.1 Croplands
	T7.2 Sown pastures and old fields
	T7.3 Plantations
	T7.4 Urban and infrastructure lands
Subterranean S2 Anthropogenic subterranean voids	S1.1 Aerobic caves
	S1.2 Endolithic systems
	S2.1 Anthropogenic subterranean voids
Subterranean-Freshwater SF1 Subterranean freshwaters	SF1.1 Underground streams and pools
	SF1.2 Groundwater ecosystems
Subterranean-Freshwater SF2 Anthropogenic subterranean freshwaters	SF2.1 Water pipes and subterranean canals
Subterranean-Marine SM1 Tidal subterranean systems	SM3.1 Anchialine caves
Freshwater-Terrestrial TF1 Palustrine wetlands	TF1.1 Tropical flooded forests and peat forests
	TF1.2 Subtropical/temperate forested wetlands
	TF1.3 Permanent marshes
	TF1.4 Seasonal floodplain marshes
	TF1.5 Episodic arid floodplains

	TF1.6 Boreal, temperate and montane peat bogs
	TF1.7 Boreal and temperate fens
Freshwater F1 Rivers and streams	F 1.1 Permanent upland streams
	F 1.2 Permanent lowland rivers
	F1.3 Freeze-thaw rivers and streams
	F 1.4 Seasonal upland streams
	F 1.5 Seasonal lowland rivers
	F 1.6 Episodic arid rivers
Freshwater F2 Lakes	F2.1 Large permanent freshwater lakes
	F2.2 Small permanent freshwater lakes
	F2.3 Seasonal freshwater lakes
	F2.4 Freeze-thaw freshwater lakes
	F2.5 Ephemeral freshwater lakes
	F2.6 Permanent inland salt lakes
	F2.7 Ephemeral salt lakes
	F2.8 Artesian springs and oases
	F2.9 Geothermal
Marine-Terrestrial MT1 Shoreline systems	MT1.1 Rocky shores
	MT1.2 Muddy shores

	MT1.3 Sandy shores
	MT1.4 Boulder-cobble shores
Marine-Terrestrial MT2 Supralittoral coastal systems	MT2.1 Coastal shrublands and grasslands
Marine-Terrestrial MT3 Anthropogenic shorelines	MT3.1 Artificial shores
Marine-Freshwater-Terrestrial MFT1 Brackish tidal systems	MFT 1.1 Coastal river deltas
	MFT1.2 Intertidal forests and shrublands
	MFT 1.3 Coastal saltmarshes

## World Ecosystems Map Crosswalk to IUCN Typology

This table provides LandScale assessors with the correspondence between the 431 world ecosystems derived from the World Ecosystem map ([Sayre et al. 2020](#)) and IUCN global ecosystem typology v1.01 ([Keith et al. 2020](#)) to help simplify the identification and mapping of natural ecosystems at the landscape scale. When available, national classification and maps of natural ecosystems can be used to refine the delimitation and identification of natural ecosystems at the landscape scale. The table below establishes a crosswalk between the two data-sets, starting with ecosystems with the largest extent in descending order.

World Ecosystem Map Type		Corresponding IUCN Ecosystem Functional Groups
VALUE	W_ECOSYSTEM	
55	Boreal Moist Forest on Mountains	T2.1 Boreal and temperate montane forests and woodlands
2	Polar Moist Snow and Ice on Plains	T6.1 Ice sheets, glaciers and perennial snowfields
53	Boreal Moist Forest on Plains	T2.1 Boreal and temperate montane forests and woodlands
389	Tropical Moist Forest on Plains	T1.1 Tropical-subtropical lowland rainforests
362	Tropical Desert Sparsley or Non vegetated on Plains	T5.1 Semi-desert steppes
50	Boreal Moist Forest on Hills	T2.1 Boreal and temperate montane forests and woodlands

97	Cool Temperate Moist Forest on Mountains	T2.1 Boreal and temperate montane forests and woodlands
111	Cool Temperate Moist Forest on Plains	T2.4 Warm temperate rainforests
262	Sub Tropical Moist Forest on Mountains	T1.3 Tropical-subtropical montane rainforests
314	Sub Tropical Desert Sparsley or Non vegetated on Plains	T5.1 Semi-desert steppes
333	Tropical Dry Cropland on Plains	T7.1 Croplands
398	Tropical Moist Forest on Hills	T1.3 Tropical-subtropical montane rainforests
116	Cool Temperate Moist Cropland on Plains	T7.1 Croplands
283	Sub Tropical Dry Sparsley or Non vegetated on Plains	T5.1 Semi-desert steppes
145	Cool Temperate Dry Cropland on Plains	T7.1 Croplands
176	Warm Temperate Moist Forest on Mountains	T2.4 Warm temperate rainforests
5	Polar Moist Sparsley or Non vegetated on Mountains	T5.1 Semi-desert steppes
1	Polar Moist Sparsley or Non vegetated on Plains	T5.1 Semi-desert steppes
332	Tropical Dry Sparsley or Non vegetated on Plains	T5.1 Semi-desert steppes
52	Boreal Moist Shrubland on Plains	T2.1 Boreal and temperate montane forests and woodlands
392	Tropical Moist Forest on Mountains	T1.3 Tropical-subtropical montane rainforests
45	Boreal Moist Sparsley or Non vegetated on Plains	T5.1 Semi-desert steppes
105	Cool Temperate Moist Forest on Hills	T2.1 Boreal and temperate montane forests and woodlands
341	Tropical Dry Shrubland on Plains	T3.1 Seasonally dry tropical shrublands
387	Tropical Moist Cropland on Plains	T7.1 Croplands
63	Boreal Moist Forest on Tablelands	T2.1 Boreal and temperate montane forests and woodlands
284	Sub Tropical Dry Shrubland on Plains	T3.1 Seasonally dry tropical shrublands
187	Warm Temperate Dry Cropland on Plains	T7.1 Croplands
90	Boreal Dry Forest on Mountains	T2.1 Boreal and temperate montane forests and woodlands
68	Boreal Dry Forest on Plains	T2.1 Boreal and temperate montane forests and woodlands
151	Cool Temperate Dry Sparsley or Non vegetated on Plains	T5.4 Cool temperate deserts

54	Boreal Moist Shrubland on Mountains	T2.1 Boreal and temperate montane forests and woodlands
16	Polar Moist Sparsley or Non vegetated on Hills	T6.2 Polar-alpine rocky outcrops
153	Cool Temperate Dry Grassland on Plains	T4.5 Temperate grasslands
268	Sub Tropical Moist Forest on Hills	T1.3 Tropical-subtropical montane rainforests
173	Warm Temperate Moist Cropland on Mountains	T7.1 Croplands
72	Boreal Dry Forest on Hills	T2.1 Boreal and temperate montane forests and woodlands
51	Boreal Moist Sparsley or Non vegetated on Mountains	T5.1 Semi-desert steppes
160	Warm Temperate Moist Cropland on Plains	T7.1 Croplands
110	Cool Temperate Moist Cropland on Hills	T7.1 Croplands
201	Warm Temperate Dry Sparsley or Non vegetated on Plains	T5.1 Semi-desert steppes
184	Warm Temperate Dry Cropland on Mountains	T7.1 Croplands
183	Warm Temperate Dry Shrubland on Mountains	T3.2 Seasonally dry temperate heaths and shrublands
289	Sub Tropical Dry Grassland on Plains	T4.1 Trophic savannas
340	Sub Tropical Desert Sparsley or Non vegetated on Hills	T5.1 Semi-desert steppes
17	Polar Dry Grassland on Mountains	T6.4 Temperate alpine meadows and shrublands
269	Sub Tropical Moist Cropland on Mountains	T7.1 Croplands
390	Tropical Moist Cropland on Hills	T7.1 Croplands
286	Sub Tropical Dry Shrubland on Mountains	T3.1 Seasonally dry tropical shrublands
142	Cool Temperate Dry Grassland on Mountains	T4.5 Temperate grasslands
149	Cool Temperate Dry Grassland on Hills	T4.5 Temperate grasslands
374	Tropical Desert Sparsley or Non vegetated on Hills	T5.1 Semi-desert steppes
360	Tropical Dry Grassland on Plains	T4.2 Pyric tussock savannas
147	Cool Temperate Dry Sparsley or Non vegetated on Hills	T5.4 Cool temperate deserts
205	Warm Temperate Dry Sparsley or Non vegetated on Mountains	T5.1 Semi-desert steppes

135	Cool Temperate Dry Sparsley or Non vegetated on Mountains	T5.4 Cool temperate deserts
18	Polar Moist Grassland on Mountains	T6.3 Polar tundra
391	Tropical Moist Cropland on Mountains	T7.1 Croplands
196	Warm Temperate Dry Shrubland on Plains	T3.2 Seasonally dry temperate heaths and shrublands
10	Polar Moist Sparsley or Non vegetated on Tablelands	T6.3 Polar tundra
47	Boreal Moist Sparsley or Non vegetated on Hills	T6.3 Polar tundra
282	Sub Tropical Dry Cropland on Plains	T7.1 Croplands
146	Cool Temperate Dry Cropland on Hills	T7.1 Croplands
6	Polar Moist Snow and Ice on Mountains	T6.1 Ice sheets, glaciers and perennial snowfields
288	Sub Tropical Dry Forest on Plains	T1.2 Tropical-subtropical dry forests and scrubs
336	Tropical Dry Cropland on Hills	T7.1 Croplands
101	Cool Temperate Moist Forest on Tablelands	T2.2 Temperate deciduous forests and shrublands
137	Cool Temperate Dry Forest on Mountains	T2.2 Temperate deciduous forests and shrublands
148	Cool Temperate Dry Cropland on Mountains	T7.1 Croplands
267	Sub Tropical Moist Cropland on Hills	T7.1 Croplands
274	Sub Tropical Dry Forest on Mountains	T1.2 Tropical-subtropical dry forests and scrubs
303	Sub Tropical Moist Forest on Tablelands	T1.1 Tropical-subtropical lowland rainforests
136	Cool Temperate Dry Shrubland on Mountains	T3.2 Seasonally dry temperate heaths and shrublands
361	Tropical Dry Forest on Plains	T1.2 Tropical-subtropical dry forests and scrubs
56	Boreal Moist Grassland on Mountains	T6.3 Polar tundra
335	Tropical Dry Shrubland on Hills	T3.1 Seasonally dry tropical shrublands
301	Sub Tropical Moist Forest on Plains	T1.1 Tropical-subtropical lowland rainforests
89	Boreal Dry Grassland on Mountains	T6.3 Polar tundra
285	Sub Tropical Dry Shrubland on Hills	T3.1 Seasonally dry tropical shrublands
14	Polar Dry Sparsley or Non vegetated on Plains	T6.2 Polar-alpine rocky outcrops
4	Polar Dry Sparsley or Non vegetated on Mountains	T6.3 Polar tundra
190	Warm Temperate Dry Cropland on Hills	T7.1 Croplands
194	Warm Temperate Dry Forest on Mountains	T2.2 Temperate deciduous forests and shrublands
103	Cool Temperate Moist Cropland on Mountains	T7.1 Croplands
49	Boreal Moist Shrubland on Hills	T6.4 Temperate alpine meadows and shrublands
396	Tropical Moist Shrubland on Plains	T3.1 Seasonally dry tropical shrublands



273	Sub Tropical Dry Sparsley or Non vegetated on Mountains	T5.1 Semi-desert steppes
107	Cool Temperate Moist Grassland on Mountains	T4.5 Temperate grasslands
281	Sub Tropical Dry Sparsley or Non vegetated on Hills	T5.1 Semi-desert steppes
272	Sub Tropical Dry Cropland on Mountains	T7.1 Croplands
193	Warm Temperate Dry Shrubland on Hills	T3.2 Seasonally dry temperate heaths and shrublands
186	Warm Temperate Dry Grassland on Mountains	T4.5 Temperate grasslands
312	Sub Tropical Desert Sparsley or Non vegetated on Mountains	T5.1 Semi-desert steppes
261	Sub Tropical Moist Shrubland on Mountains	T3.1 Seasonally dry tropical shrublands
363	Tropical Dry Forest on Hills	T1.2 Tropical-subtropical dry forests and scrubs
290	Sub Tropical Dry Forest on Hills	T1.2 Tropical-subtropical dry forests and scrubs
66	Boreal Dry Sparsley or Non vegetated on Plains	T6.3 Polar tundra
88	Boreal Dry Sparsley or Non vegetated on Mountains	T6.3 Polar tundra
168	Warm Temperate Moist Cropland on Hills	T7.1 Croplands
82	Boreal Dry Forest on Tablelands	T2.1 Boreal and temperate montane forests and woodlands
166	Warm Temperate Moist Forest on Plains	T2.4 Warm temperate rainforests
278	Sub Tropical Dry Cropland on Hills	T7.1 Croplands
297	Sub Tropical Moist Cropland on Plains	T7.1 Croplands
409	Tropical Moist Forest on Tablelands	T1.1 Tropical-subtropical lowland rainforests
57	Boreal Moist Sparsley or Non vegetated on Tablelands	T6.3 Polar tundra
96	Cool Temperate Moist Shrubland on Mountains	T3.3 Cool temperate heathlands
163	Warm Temperate Moist Forest on Hills	T2.2 Temperate deciduous forests and shrublands
339	Tropical Dry Sparsley or Non vegetated on Mountains	T5.2 Thorny deserts and semi-deserts
334	Tropical Dry Sparsley or Non vegetated on Hills	T5.2 Thorny deserts and semi-deserts
102	Cool Temperate Moist Cropland on Tablelands	T7.1 Croplands
221	Warm Temperate Desert Sparsley or Non vegetated on Plains	T5.1 Semi-desert steppes
302	Sub Tropical Moist Cropland on Tablelands	T7.1 Croplands
197	Warm Temperate Dry Sparsley or Non vegetated on Hills	T5.1 Semi-desert steppes

369	Tropical Desert Sparsley or Non vegetated on Mountains	T5.2 Thorny deserts and semi-deserts
408	Tropical Moist Shrubland on Hills	T3.1 Seasonally dry tropical shrublands
128	Cool Temperate Moist Grassland on Plains	T4.5 Temperate grasslands
159	Warm Temperate Moist Grassland on Plains	T4.5 Temperate grasslands
189	Warm Temperate Dry Grassland on Plains	T4.5 Temperate grasslands
46	Boreal Moist Grassland on Plains	T6.3 Polar tundra
338	Tropical Dry Cropland on Mountains	T7.1 Croplands
48	Boreal Moist Grassland on Hills	T6.3 Polar tundra
342	Tropical Dry Shrubland on Mountains	T3.1 Seasonally dry tropical shrublands
365	Tropical Dry Forest on Mountains	T1.2 Tropical-subtropical dry forests and scrubs
192	Warm Temperate Dry Grassland on Hills	T4.5 Temperate grasslands
347	Sub Tropical Desert Sparsley or Non vegetated on Tablelands	T5.2 Thorny deserts and semi-deserts
144	Cool Temperate Dry Shrubland on Plains	T3.2 Seasonally dry temperate heaths and shrublands
115	Cool Temperate Moist Shrubland on Plains	T3.2 Seasonally dry temperate heaths and shrublands
25	Polar Moist Shrubland on Mountains	T6.3 Polar tundra
164	Warm Temperate Moist Grassland on Hills	T4.5 Temperate grasslands
275	Sub Tropical Dry Grassland on Mountains	T4.2 Pyric tussock savannas
29	Polar Moist Forest on Mountains	T2.1 Boreal and temperate montane forests and woodlands
307	Sub Tropical Moist Shrubland on Hills	T3.1 Seasonally dry tropical shrublands
279	Sub Tropical Dry Grassland on Hills	T4.1 Trophic savannas
393	Tropical Moist Grassland on Plains	T4.2 Pyric tussock savannas
70	Boreal Dry Sparsley or Non vegetated on Hills	T6.2 Polar-alpine rocky outcrops
11	Polar Moist Snow and Ice on Tablelands	T6.1 Ice sheets, glaciers and perennial snowfields
74	Boreal Dry Grassland on Hills	T6.3 Polar tundra
300	Sub Tropical Moist Shrubland on Plains	T3.1 Seasonally dry tropical shrublands
180	Warm Temperate Moist Forest on Tablelands	T2.4 Warm temperate rainforests
12	Polar Dry Sparsley or Non vegetated on Hills	T6.3 Polar tundra
58	Boreal Moist Shrubland on Tablelands	T2.1 Boreal and temperate montane forests and woodlands
156	Cool Temperate Dry Grassland on Tablelands	T7.2 Sown pastures and old fields
150	Cool Temperate Dry Cropland on Tablelands	T7.1 Croplands

98	Cool Temperate Moist Sparsley or Non vegetated on Mountains	T5.4 Cool temperate deserts
223	Warm Temperate Desert Sparsley or Non vegetated on Mountains	T5.2 Thorny deserts and semi-deserts
294	Sub Tropical Dry Forest on Tablelands	T1.2 Tropical-subtropical dry forests and scrubs
69	Boreal Dry Shrubland on Plains	T6.5 Tropical alpine meadows and shrublands
152	Cool Temperate Dry Sparsley or Non vegetated on Tablelands	T5.4 Cool temperate deserts
359	Tropical Dry Grassland on Hills	T4.2 Pyric tussock savannas
171	Warm Temperate Moist Grassland on Mountains	T4.5 Temperate grasslands
293	Sub Tropical Dry Shrubland on Tablelands	T1.2 Tropical-subtropical dry forests and scrubs
114	Cool Temperate Moist Grassland on Hills	T4.5 Temperate grasslands
404	Tropical Moist Shrubland on Mountains	T1.2 Tropical-subtropical dry forests and scrubs
92	Boreal Dry Shrubland on Mountains	T6.4 Temperate alpine meadows and shrublands
198	Warm Temperate Dry Cropland on Tablelands	T7.1 Croplands
75	Boreal Dry Grassland on Plains	T6.3 Polar tundra
143	Cool Temperate Dry Shrubland on Hills	T3.3 Cool temperate heathlands
93	Boreal Dry Cropland on Mountains	T7.1 Croplands
203	Warm Temperate Dry Shrubland on Tablelands	T4.4 Temperate wooded savannas
178	Warm Temperate Moist Cropland on Tablelands	T7.1 Croplands
175	Warm Temperate Moist Shrubland on Mountains	T3.2 Seasonally dry temperate heaths and shrublands
138	Cool Temperate Dry Forest on Plains	T2.2 Temperate deciduous forests and shrublands
208	Cool Temperate Desert Sparsley or Non vegetated on Hills	T5.4 Cool temperate deserts
364	Tropical Dry Shrubland on Tablelands	T1.2 Tropical-subtropical dry forests and scrubs
195	Warm Temperate Dry Forest on Plains	T2.2 Temperate deciduous forests and shrublands
311	Sub Tropical Moist Grassland on Plains	T7.2 Sown pastures and old fields
34	Polar Dry Shrubland on Plains	T6.4 Temperate alpine meadows and shrublands
305	Sub Tropical Moist Shrubland on Tablelands	T4.2 Pyric tussock savannas
218	Warm Temperate Desert Sparsley or Non vegetated on Hills	T5.1 Semi-desert steppes
375	Tropical Desert Sparsley or Non vegetated on Tablelands	T5.1 Semi-desert steppes

207	Cool Temperate Desert Sparsley or Non vegetated on Plains	T5.4 Cool temperate deserts
15	Polar Moist Snow and Ice on Hills	T6.1 Ice sheets, glaciers and perennial snowfields
22	Polar Moist Grassland on Plains	T6.3 Polar tundra
291	Sub Tropical Dry Sparsley or Non vegetated on Tablelands	T5.2 Thorny deserts and semi-deserts
206	Warm Temperate Dry Sparsley or Non vegetated on Tablelands	T5.1 Semi-desert steppes
271	Sub Tropical Moist Grassland on Mountains	T4.1 Trophic savannas
120	Cool Temperate Moist Settlement on Plains	T7.4 Urban and infrastructure lands
141	Cool Temperate Dry Shrubland on Tablelands	T3.2 Seasonally dry temperate heaths and shrublands
213	Cool Temperate Desert Sparsley or Non vegetated on Mountains	T5.4 Cool temperate deserts
199	Warm Temperate Dry Forest on Hills	T2.2 Temperate deciduous forests and shrublands
344	Tropical Dry Grassland on Mountains	T7.2 Sown pastures and old fields
411	Tropical Moist Cropland on Tablelands	T7.1 Croplands
287	Sub Tropical Dry Cropland on Tablelands	T7.1 Croplands
19	Polar Moist Shrubland on Plains	T6.3 Polar tundra
106	Cool Temperate Moist Shrubland on Hills	T3.3 Cool temperate heathlands
358	Tropical Dry Cropland on Tablelands	T7.1 Croplands
39	Polar Moist Cropland on Mountains	T7.1 Croplands
161	Warm Temperate Moist Settlement on Plains	T7.4 Urban and infrastructure lands
41	Polar Dry Shrubland on Mountains	T6.3 Polar tundra
356	Tropical Dry Sparsley or Non vegetated on Tablelands	T5.2 Thorny deserts and semi-deserts
295	Sub Tropical Moist Grassland on Hills	T7.2 Sown pastures and old fields
67	Boreal Moist Cropland on Mountains	T7.1 Croplands
403	Tropical Moist Grassland on Hills	T7.2 Sown pastures and old fields
59	Boreal Moist Grassland on Tablelands	T6.3 Polar tundra
204	Warm Temperate Dry Grassland on Tablelands	T4.5 Temperate grasslands
179	Warm Temperate Moist Grassland on Tablelands	T4.5 Temperate grasslands
62	Boreal Moist Cropland on Plains	T7.1 Croplands
31	Polar Dry Grassland on Plains	T6.3 Polar tundra
85	Boreal Dry Cropland on Hills	T7.1 Croplands

78	Boreal Dry Sparsley or Non vegetated on Tablelands	
394	Tropical Dry Forest on Tablelands	
410	Tropical Moist Shrubland on Tablelands	
21	Polar Moist Grassland on Hills	
140	Cool Temperate Dry Forest on Tablelands	
108	Cool Temperate Moist Settlement on Hills	T7.4 Urban and infrastructure lands
139	Cool Temperate Dry Forest on Hills	
3	Polar Dry Snow and Ice on Mountains	
109	Cool Temperate Moist Grassland on Tablelands	
7	Polar Dry Sparsley or Non vegetated on Tablelands	
188	Warm Temperate Dry Settlement on Plains	T7.4 Urban and infrastructure lands
23	Polar Dry Grassland on Hills	
202	Warm Temperate Dry Forest on Tablelands	
60	Boreal Moist Cropland on Hills	T7.1 Croplands
167	Warm Temperate Moist Shrubland on Plains	
71	Boreal Dry Shrubland on Hills	
77	Boreal Dry Cropland on Plains	T7.1 Croplands
124	Boreal Moist Snow and Ice on Mountains	
79	Polar Dry Cropland on Mountains	T7.1 Croplands
346	Sub Tropical Desert Cropland on Plains	T7.1 Croplands
36	Polar Dry Forest on Plains	
83	Boreal Dry Grassland on Tablelands	
100	Cool Temperate Moist Shrubland on Tablelands	
172	Warm Temperate Moist Settlement on Mountains	T7.4 Urban and infrastructure lands
169	Warm Temperate Moist Settlement on Hills	T7.4 Urban and infrastructure lands
298	Sub Tropical Dry Grassland on Tablelands	
224	Warm Temperate Desert Sparsley or Non vegetated on Tablelands	
65	Polar Dry Forest on Mountains	
401	Tropical Moist Grassland on Mountains	
185	Warm Temperate Dry Settlement on Mountains	T7.4 Urban and infrastructure lands
219	Cool Temperate Desert Grassland on Mountains	
382	Tropical Dry Grassland on Tablelands	
233	Warm Temperate Desert Cropland on Plains	T7.1 Croplands

113	Cool Temperate Moist Settlement on Mountains	T7.4 Urban and infrastructure lands
388	Tropical Moist Settlement on Plains	T7.4 Urban and infrastructure lands
308	Sub Tropical Moist Settlement on Plains	T7.4 Urban and infrastructure lands
304	Sub Tropical Moist Grassland on Tablelands	
27	Polar Moist Forest on Plains	
157	Cool Temperate Dry Settlement on Plains	T7.4 Urban and infrastructure lands
231	Warm Temperate Desert Grassland on Plains	
112	Cool Temperate Moist Sparsley or Non vegetated on Plains	
216	Cool Temperate Desert Sparsley or Non vegetated on Tablelands	
243	Warm Temperate Desert Shrubland on Mountains	
73	Boreal Moist Cropland on Tablelands	T7.1 Croplands
26	Polar Moist Grassland on Tablelands	
343	Tropical Dry Settlement on Plains	T7.4 Urban and infrastructure lands
210	Cool Temperate Desert Grassland on Plains	
367	Tropical Desert Cropland on Plains	T7.1 Croplands
310	Sub Tropical Desert Shrubland on Mountains	
165	Warm Temperate Moist Shrubland on Hills	
264	Sub Tropical Moist Settlement on Mountains	T7.4 Urban and infrastructure lands
181	Warm Temperate Moist Shrubland on Tablelands	
191	Warm Temperate Dry Settlement on Hills	T7.4 Urban and infrastructure lands
38	Polar Dry Grassland on Tablelands	
276	Sub Tropical Dry Settlement on Plains	T7.4 Urban and infrastructure lands
81	Boreal Dry Shrubland on Tablelands	
313	Sub Tropical Desert Shrubland on Plains	
118	Cool Temperate Moist Snow and Ice on Mountains	
91	Boreal Dry Cropland on Tablelands	T7.1 Croplands
395	Tropical Moist Sparsley or Non vegetated on Plains	
414	Tropical Moist Grassland on Tablelands	
104	Cool Temperate Moist Sparsley or Non vegetated on Hills	
154	Cool Temperate Dry Settlement on Hills	T7.4 Urban and infrastructure lands
20	Polar Moist Shrubland on Hills	

407	Tropical Moist Settlement on Hills	T7.4 Urban and infrastructure lands
129	Cool Temperate Moist Settlement on Tablelands	T7.4 Urban and infrastructure lands
263	Sub Tropical Moist Settlement on Hills	T7.4 Urban and infrastructure lands
174	Warm Temperate Moist Sparsley or Non vegetated on Mountains	
246	Cool Temperate Desert Shrubland on Mountains	
158	Cool Temperate Dry Settlement on Mountains	T7.4 Urban and infrastructure lands
306	Polar Desert Sparsley or Non vegetated on Mountains	
405	Tropical Moist Settlement on Mountains	T7.4 Urban and infrastructure lands
24	Polar Moist Shrubland on Tablelands	
266	Sub Tropical Dry Settlement on Mountains	T7.4 Urban and infrastructure lands
99	Cool Temperate Moist Sparsley or Non vegetated on Tablelands	
376	Tropical Desert Shrubland on Mountains	
28	Polar Moist Forest on Hills	
320	Sub Tropical Desert Grassland on Mountains	
32	Polar Dry Shrubland on Hills	
373	Tropical Desert Shrubland on Plains	
324	Polar Desert Shrubland on Mountains	
270	Sub Tropical Moist Sparsley or Non vegetated on Mountains	
277	Sub Tropical Dry Settlement on Hills	T7.4 Urban and infrastructure lands
177	Warm Temperate Moist Settlement on Tablelands	T7.4 Urban and infrastructure lands
370	Tropical Desert Grassland on Plains	
402	Tropical Moist Sparsley or Non vegetated on Mountains	
337	Tropical Dry Settlement on Hills	T7.4 Urban and infrastructure lands
349	Sub Tropical Desert Cropland on Hills	T7.1 Croplands
352	Sub Tropical Desert Grassland on Hills	
331	Sub Tropical Desert Shrubland on Hills	
30	Polar Moist Forest on Tablelands	
348	Sub Tropical Moist Settlement on Tablelands	T7.4 Urban and infrastructure lands
372	Tropical Desert Cropland on Mountains	T7.1 Croplands

209	Cool Temperate Desert Cropland on Plains	T7.1 Croplands
386	Tropical Desert Shrubland on Hills	
345	Tropical Dry Settlement on Mountains	T7.4 Urban and infrastructure lands
350	Sub Tropical Desert Cropland on Mountains	T7.1 Croplands
162	Warm Temperate Moist Sparsley or Non vegetated on Plains	
322	Sub Tropical Desert Grassland on Plains	
200	Warm Temperate Dry Settlement on Tablelands	T7.4 Urban and infrastructure lands
236	Warm Temperate Desert Shrubland on Plains	
380	Tropical Desert Cropland on Hills	T7.1 Croplands
330	Sub Tropical Desert Settlement on Plains	T7.4 Urban and infrastructure lands
415	Tropical Moist Sparsley or Non vegetated on Hills	
378	Tropical Desert Settlement on Plains	T7.4 Urban and infrastructure lands
226	Warm Temperate Desert Grassland on Mountains	
299	Sub Tropical Moist Sparsley or Non vegetated on Plains	
155	Cool Temperate Dry Settlement on Tablelands	T7.4 Urban and infrastructure lands
371	Tropical Desert Grassland on Mountains	
86	Boreal Moist Settlement on Plains	T7.4 Urban and infrastructure lands
134	Cool Temperate Moist Snow and Ice on Hills	
61	Polar Dry Cropland on Plains	T7.1 Croplands
412	Tropical Desert Shrubland on Tablelands	
170	Warm Temperate Moist Sparsley or Non vegetated on Hills	
251	Boreal Desert Grassland on Mountains	
122	Boreal Dry Settlement on Mountains	T7.4 Urban and infrastructure lands
230	Warm Temperate Desert Grassland on Hills	
383	Tropical Desert Grassland on Hills	
252	Boreal Desert Sparsley or Non vegetated on Mountains	
214	Cool Temperate Desert Grassland on Hills	
117	Boreal Dry Settlement on Hills	T7.4 Urban and infrastructure lands
42	Polar Moist Cropland on Tablelands	T7.1 Croplands
87	Boreal Moist Settlement on Hills	T7.4 Urban and infrastructure lands



84	Boreal Dry Settlement on Plains	T7.4 Urban and infrastructure lands
130	Boreal Dry Snow and Ice on Mountains	
351	Sub Tropical Desert Settlement on Mountains	T7.4 Urban and infrastructure lands
227	Warm Temperate Desert Cropland on Mountains	T7.1 Croplands
131	Boreal Moist Snow and Ice on Tablelands	
76	Polar Dry Cropland on Hills	T7.1 Croplands
35	Polar Dry Shrubland on Tablelands	
413	Tropical Moist Settlement on Tablelands	T7.4 Urban and infrastructure lands
416	Tropical Moist Sparsley or Non vegetated on Tablelands	
228	Cool Temperate Desert Grassland on Tablelands	
220	Cool Temperate Desert Cropland on Mountains	T7.1 Croplands
296	Sub Tropical Dry Settlement on Tablelands	T7.4 Urban and infrastructure lands
254	Polar Desert Grassland on Mountains	
43	Polar Dry Forest on Hills	
126	Boreal Moist Snow and Ice on Plains	
9	Polar Dry Snow and Ice on Plains	
366	Sub Tropical Desert Grassland on Tablelands	
232	Warm Temperate Desert Cropland on Hills	T7.1 Croplands
379	Tropical Desert Forest on Plains	
121	Boreal Moist Settlement on Mountains	T7.4 Urban and infrastructure lands
13	Polar Dry Snow and Ice on Hills	
40	Polar Moist Cropland on Plains	T7.1 Croplands
182	Warm Temperate Moist Sparsley or Non vegetated on Tablelands	
397	Tropical Desert Grassland on Tablelands	
265	Sub Tropical Moist Sparsley or Non vegetated on Hills	
225	Warm Temperate Desert Settlement on Mountains	T7.4 Urban and infrastructure lands
37	Polar Moist Cropland on Hills	T7.1 Croplands
354	Sub Tropical Desert Settlement on Hills	T7.4 Urban and infrastructure lands
381	Tropical Desert Settlement on Hills	T7.4 Urban and infrastructure lands
217	Cool Temperate Dry Snow and Ice on Mountains	
355	Sub Tropical Desert Cropland on Tablelands	T7.1 Croplands

327	Sub Tropical Desert Forest on Mountains	
133	Cool Temperate Moist Snow and Ice on Tablelands	
368	Tropical Dry Settlement on Tablelands	T7.4 Urban and infrastructure lands
417	Tropical Desert Forest on Mountains	
244	Cool Temperate Desert Shrubland on Plains	
377	Tropical Desert Settlement on Mountains	T7.4 Urban and infrastructure lands
241	Warm Temperate Desert Shrubland on Tablelands	
316	Sub Tropical Moist Sparsley or Non vegetated on Tablelands	
329	Sub Tropical Desert Shrubland on Tablelands	
406	Tropical Desert Forest on Hills	
80	Polar Dry Cropland on Tablelands	T7.1 Croplands
328	Sub Tropical Desert Forest on Plains	
248	Cool Temperate Desert Shrubland on Tablelands	
8	Polar Dry Snow and Ice on Tablelands	
132	Cool Temperate Moist Snow and Ice on Plains	
234	Warm Temperate Desert Settlement on Plains	T7.4 Urban and infrastructure lands
421	Polar Desert Sparsley or Non vegetated on Tablelands	
125	Boreal Moist Snow and Ice on Hills	
44	Polar Dry Forest on Tablelands	
94	Boreal Moist Settlement on Tablelands	T7.4 Urban and infrastructure lands
418	Tropical Desert Forest on Tablelands	
239	Warm Temperate Desert Shrubland on Hills	
211	Cool Temperate Desert Cropland on Hills	T7.1 Croplands
123	Boreal Dry Settlement on Tablelands	T7.4 Urban and infrastructure lands
212	Cool Temperate Desert Settlement on Plains	T7.4 Urban and infrastructure lands
424	Polar Desert Sparsley or Non vegetated on Plains	
237	Warm Temperate Desert Grassland on Tablelands	
249	Warm Temperate Desert Forest on Mountains	
119	Polar Dry Settlement on Mountains	T7.4 Urban and infrastructure lands
33	Polar Moist Settlement on Mountains	T7.4 Urban and infrastructure lands
385	Tropical Desert Cropland on Tablelands	T7.1 Croplands
253	Boreal Desert Cropland on Mountains	T7.1 Croplands

353	Sub Tropical Desert Forest on Hills	
235	Warm Temperate Desert Cropland on Tablelands	T7.1 Croplands
357	Sub Tropical Desert Settlement on Tablelands	T7.4 Urban and infrastructure lands
240	Warm Temperate Desert Settlement on Hills	T7.4 Urban and infrastructure lands
423	Polar Desert Shrubland on Tablelands	
222	Cool Temperate Desert Settlement on Mountains	T7.4 Urban and infrastructure lands
292	Polar Desert Cropland on Mountains	T7.1 Croplands
245	Cool Temperate Desert Shrubland on Hills	
309	Polar Desert Forest on Mountains	
384	Tropical Desert Settlement on Tablelands	T7.4 Urban and infrastructure lands
280	Cool Temperate Desert Forest on Mountains	
428	Polar Desert Settlement on Mountains	T7.4 Urban and infrastructure lands
215	Cool Temperate Desert Settlement on Hills	T7.4 Urban and infrastructure lands
229	Cool Temperate Desert Cropland on Tablelands	T7.1 Croplands
259	Warm Temperate Desert Forest on Plains	
321	Polar Desert Snow and Ice on Mountains	
238	Warm Temperate Desert Settlement on Tablelands	T7.4 Urban and infrastructure lands
242	Cool Temperate Desert Forest on Plains	
399	Warm Temperate Moist Snow and Ice on Mountains	
64	Polar Moist Settlement on Plains	T7.4 Urban and infrastructure lands
326	Boreal Desert Sparsley or Non vegetated on Plains	
257	Boreal Desert Sparsley or Non vegetated on Tablelands	
95	Polar Dry Settlement on Plains	T7.4 Urban and infrastructure lands
318	Polar Dry Settlement on Tablelands	T7.4 Urban and infrastructure lands
127	Polar Moist Settlement on Hills	T7.4 Urban and infrastructure lands
425	Polar Desert Shrubland on Plains	
427	Polar Desert Forest on Plains	
429	Warm Temperate Desert Forest on Tablelands	
319	Polar Dry Settlement on Hills	T7.4 Urban and infrastructure lands
426	Polar Desert Cropland on Plains	T7.1 Croplands
315	Cool Temperate Desert Snow and Ice on Mountains	
422	Polar Desert Settlement on Tablelands	T7.4 Urban and infrastructure lands
431	Polar Desert Grassland on Plains	

400	Sub Tropical Desert Forest on Tablelands	
317	Boreal Desert Forest on Mountains	
247	Cool Temperate Desert Settlement on Tablelands	T7.4 Urban and infrastructure lands
250	Warm Temperate Desert Forest on Hills	
255	Boreal Desert Grassland on Plains	
325	Boreal Desert Settlement on Mountains	T7.4 Urban and infrastructure lands
419	Warm Temperate Dry Snow and Ice on Mountains	
430	Polar Desert Grassland on Tablelands	
256	Boreal Desert Cropland on Plains	T7.1 Croplands
420	Cool Temperate Dry Snow and Ice on Plains	
258	Boreal Desert Grassland on Tablelands	
260	Cool Temperate Desert Forest on Hills	
323	Boreal Desert Shrubland on Mountains	