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EUNIS HABITAT CLASSIFICATION
2001 WORK PROGRAMME
FINAL REPORT

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Introduction

This report presents the EUNIS habitat classification as updated in February 2002. It contains the keys to the classification in Word 2000 format.

The classification has been amended since 1999 in response to proposals received at a international workshops concentrating on marine habitats organised by the OSPAR Commission, The International Council for the Exploration of the Sea (ICES) and the European Environment Agency (EEA) in autumn 2000, and at a meeting of the ICES Marine Habitats Mapping Working Group (spring 2001). Further amendments have been made in response to comments from a number of users of the classification, and in order to update the direct links between the EUNIS classification and other initiatives, notably the Palaearctic habitat classification, CORINE Land Cover nomenclature and Annex I of the EU Habitats Directive 92/43/EEC.

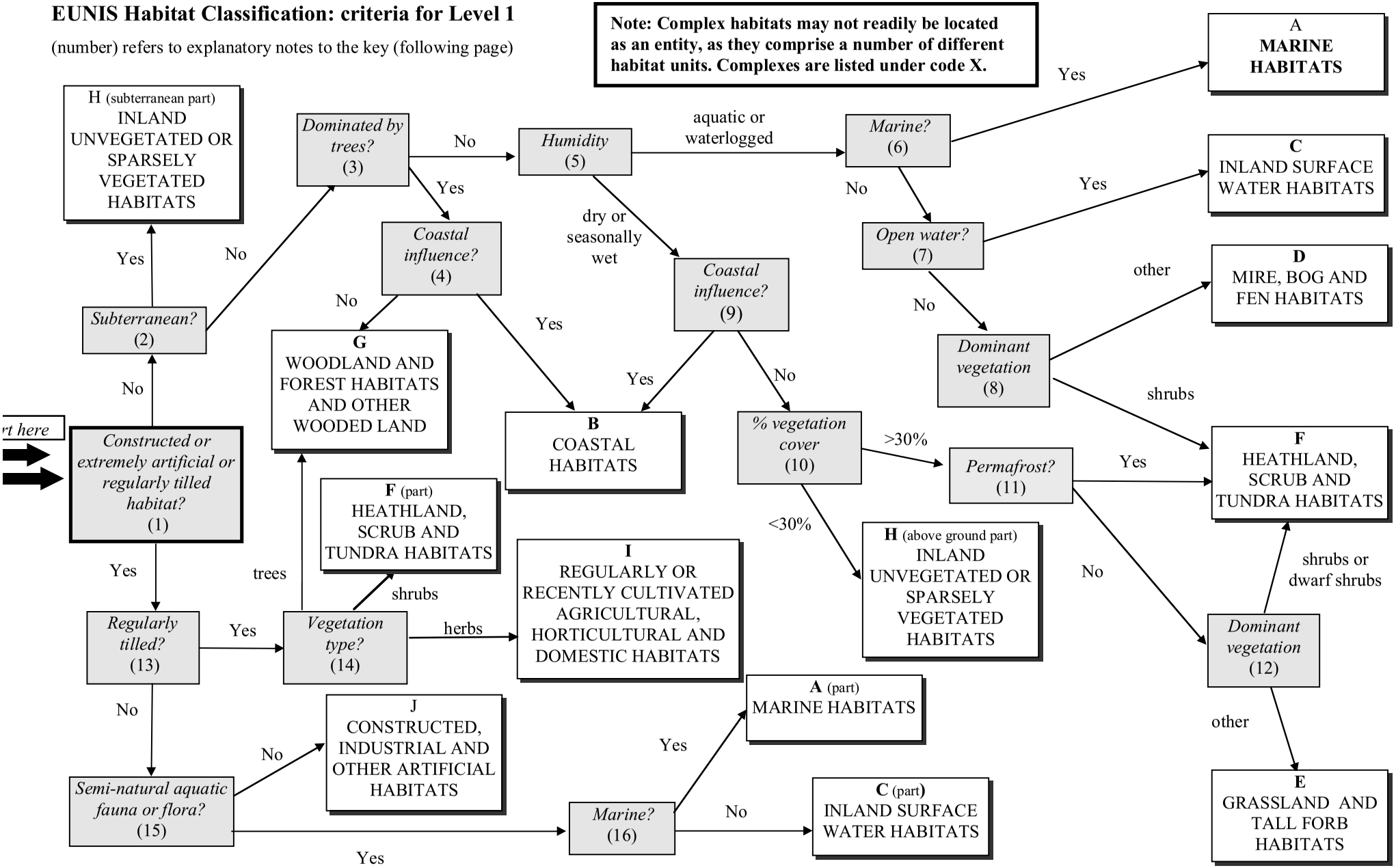
Use of the key

Criteria diagrams for levels 1 to 3 of the 2002 version of the EUNIS Habitat Classification are presented with additional detailed explanatory notes accompanying each grey 'decision box'. These notes explain how the decision box is to be applied, and form an integral and essential part of the criteria. For levels 1 and 2, the notes follow the diagrams after each level and are numbered sequentially across levels 1 - 2. For level 3 criteria, the notes are numbered sequentially within each level 1 unit with the appropriate lower case letter preceding the number (e.g. a1 is the first note for criteria for Marine level 3 units). Criteria have been developed for all units to level 3. Criteria have also been developed for salt marshes at level 4. The complete key is available on the website together with a glossary of terms to aid in the interpretation of terminology in the classification.

EUNIS Habitat Classification: criteria for Level 1

(number) refers to explanatory notes to the key (following page)

Note: Complex habitats may not readily be located as an entity, as they comprise a number of different habitat units. Complexes are listed under code X.



Note: Complex habitats may not readily be located as an entity, as they comprise combinations of a number of different habitat units. Complexes are e listed under code X, see Annex C.

Explanatory notes to the key: Level 1

1. Is the habitat highly artificial, i.e. either constructed or with a man-made substrate; industrial; maintained solely by frequent tilling; or arising from recent abandonment of previously tilled or constructed habitats (path = *Yes*)? All other habitats follow path = *No*. Note that habitats which originated through extractive industries (quarries, mines, peat diggings etc) but which have been colonised by natural or semi-natural plant and/or animal communities (other than pioneer or ruderal communities) follow path = *No*.
2. The criterion separates subterranean non-marine caves and passages and underground waters (path = *Yes*).
3. Habitats where the dominant vegetation is, or was until very recently, trees, typically single-stemmed, and with a canopy cover of at least 10% are distinguished (path = *Yes*) from habitats dominated by other types of vegetation or without vegetation or dominated by animal communities. Lines of trees, coppices, and very recently clear-felled areas with pre-existing ground cover, not yet re-stocked and with no succession to weedy vegetation follow path = *Yes*. Sparsely wooded areas of grassland with canopy cover of 5 - 10%, including parkland, follow path = *No*, also successional weedy communities follow path = *No* and are categorised under E, Grassland and tall forb habitats. Hedges which may have occasional tall trees follow path = *No*, and are categorised under F, Heathland, scrub and tundra. Trees are normally able to reach a height of 5m at maturity but this height may be lower at high latitudes or altitudes. Note that dwarf trees and scrub (under 50cm such as occur in extreme alpine conditions) follow path = *No*. Occasionally tall shrubs such as hazel (*Corylus*) and some willows (*Salix*) may have a woodland-type structure and follow path = *Yes*. Tree heaths, for example tree-like formations of *Erica arborea*, also follow path = *Yes*. Canopy cover 10% and height 5m are taken from the FAO TBFRA 2000 definitions (Temperate and Boreal Forest Resource Assessment 2000). It should be noted that in some areas e.g. the Boreal zone, the normal dividing point is 30%. Statistics produced at a regional scale might reflect this divergence.
4. Habitats occupying coastal features and characterised by their proximity to the sea (path = *Yes*), including coastal dunes and wooded coastal dunes, beaches and cliffs, are separated from other terrestrial habitats (path = *No*).
5. The criterion separates habitats which are either *aquatic* or *waterlogged* from those which are always *dry*, or are only *seasonally wet*. Note that the term '*aquatic'* includes: marine and fresh open water habitats; marine littoral habitats which are subject to wet and dry periods on a tidal cycle; marine littoral habitats which are normally water-covered but intermittently exposed due to the action of wind or atmospheric pressure changes; freshly deposited marine strandlines characterised by marine invertebrates; dune slack pools; normally wet habitats which may be dry seasonally (rivers and lakes and their littoral zones); freshwater littoral zones include those parts of banks or shores which are sufficiently frequently inundated to prevent the formation of closed terrestrial vegetation. '*Waterlogged'* refers to: habitats which are saturated, with the water table at or above ground level for at least half of the year, e.g. bogs, marshes; those parts of the geolittoral zone (i.e. above the between the mean and high water mark of non-tidal marine waters) which have a high water table. The *dry or seasonally wet* path should be followed in the case of: habitats which are regularly but infrequently flooded or occasionally flooded by extreme weather conditions but which are free-draining; free-draining supralittoral habitats adjacent to marine habitats normally only affected by spray or splash; old strandlines characterised by

terrestrial invertebrates; damp heaths and grasslands; moist and wet coastal dune slacks (other than dune slack pools); and permanent snow and surface ice.

6. Marine habitats (path = *Yes*) are distinguished from inland saline, brackish and freshwater aquatic or waterlogged habitats, and inland artificial habitats with semi-natural fauna or flora (path = *No*). Note that marine habitats are directly connected to the oceans, i.e. part of the continuous body of water which covers the greater part of the earth 's surface and which surround its land masses. Marine waters may be fully saline, brackish or almost fresh. Marine habitats include those below spring high tide limit (or below mean water level in non-tidal waters), tidal saltmarshes, and also enclosed coastal saline or brackish waters, without a permanent surface connection to the sea but either with intermittent surface or sub-surface connections (as in lagoons). Waterlogged littoral zones above the mean water level in non-tidal waters or above the spring high tide limit in tidal waters are included with marine habitats (path = *Yes*). Note also that rockpools in the supralittoral zone are considered as enclaves of the marine zone and follow the marine path.
7. Habitats with open water (e.g. rivers, streams, lakes and pools), including the littoral zones of the waterbodies (path = *Yes*), are separated from habitats with the water table permanently at or near the surface, but normally without free-standing water. Note that waterlogged habitats with integral pools of open water are considered as complexes.
8. Waterlogged terrestrial habitats are divided according to the type of dominant vegetation: *shrubs;* or *other.* Note that shrubs refers to larger species such as some willows (*Salix* spp.) but dwarf shrub species (for example ericoïd species) follow path = *other*. Note also that habitats dominated by trees (G) are separated earlier (note 3).
9. Habitats occupying coastal features and characterised by their proximity to the sea (path = *Yes*), including coastal dunes, beaches and cliffs, are separated from other terrestrial habitats (path = *No*).
10. Habitats with *less than 30%* vegetation cover are separated from those with *greater than 30%* vegetation cover. Note that chasmophytic, scree and cliff vegetation follow path = *<30%.*
11. Habitats characterised by the presence of permafrost are distinguished (path = *Yes*).
12. Dry terrestrial habitats with greater than 30% vegetation cover are divided according to the type of dominant vegetation: *shrubs or dwarf shrubs;* or *other* grasses and non-woody vegetation (including bryophytes and lichens where cover is greater than 30%). Note that habitats dominated by trees (G) are separated earlier (note 3).
13. Habitats maintained solely by frequent tilling or arising from recent abandonment of previously tilled ground such as arable land and gardens (path = *Yes*) are distinguished from completely artificial habitats (path = *No*), which are primarily human settlements, industrial developments, transport or waste dump sites or highly artificial waters with wholly constructed beds or heavily contaminated water.
14. Regularly tilled habitats are separated according to dominant vegetation type: *shrub* orchards; *tree* nurseries and tree-crop plantations; and habitats dominated by cultivated herbaceous vegetation (path = *herbs*).
15. Constructed habitats which support a semi-natural aquatic fauna and flora are separated from all others. Constructed marine saline habitats below water level (such as in marinas, harbours, etc) which support a semi-natural community of both plants and animals follow path = *Yes*, but highly artificial saline habitats such as industrial lagoons and saltworks which are virtually devoid of plant and animal life follow path = *No*. Constructed inland freshwater, brackish or saline waterbodies (such as canals, ponds, etc) which support a semi-natural community of both plants

and animals follow path = *Yes*, but highly artificial waters with heavily contaminated water or which are virtually devoid of plant and animal life follow path = *No*. Constructed terrestrial habitats including buildings and the transport network follow path = *No*.

16. Constructed marine habitats with semi-natural fauna or flora (path = *Yes*), are separated from inland constructed non-marine surface water habitats with semi-natural fauna or flora (path = *No*). (See note 6 for definition of marine).

Descriptions of level 1 habitats

A Marine habitats

Marine habitats are directly connected to the oceans, i.e. part of the continuous body of water which covers the greater part of the earth ‘s surface and which surround its land masses. Marine waters may be fully saline, brackish or almost fresh. Marine habitats include those below spring high tide limit (or below mean water level in non-tidal waters) and enclosed coastal saline or brackish waters, without a permanent surface connection to the sea but either with intermittent surface or sub-surface connections (as in lagoons). Rockpools in the supralittoral zone are considered as enclaves of the marine zone. Includes marine littoral habitats which are subject to wet and dry periods on a tidal cycle including tidal saltmarshes; marine littoral habitats which are normally water-covered but intermittently exposed due to the action of wind or atmospheric pressure changes; freshly deposited marine strandlines characterised by marine invertebrates. Waterlogged littoral zones above the mean water level in non-tidal waters or above the spring high tide limit in tidal waters are included with marine habitats. Includes constructed marine saline habitats below water level as defined above (such as in marinas, harbours, etc) which support a semi-natural community of both plants and animals. The marine water column includes bodies of ice.

B Coastal habitats

Coastal habitats are those above spring high tide limit (or above mean water level in non-tidal waters) occupying coastal features and characterised by their proximity to the sea, including coastal dunes and wooded coastal dunes, beaches and cliffs. Includes free-draining supralittoral habitats adjacent to marine habitats which are normally only affected by spray or splash, strandlines characterised by terrestrial invertebrates and moist and wet coastal dune slacks. Excludes dune slack pools and rockpools.

C Inland surface water habitats

Inland surface water habitats are non-coastal above-ground open fresh or brackish waterbodies (e.g. rivers, streams, lakes and pools, springs), including their littoral zones. Also includes dune slack pools. Includes constructed inland freshwater, brackish or saline waterbodies (such as canals, ponds, etc) which support a semi-natural community of both plants and animals; normally wet habitats which may be dry seasonally (temporary or intermittent rivers and lakes and their littoral zones). Freshwater littoral zones include those parts of banks or shores which are sufficiently frequently inundated to prevent the formation of closed terrestrial vegetation. Excludes permanent snow and ice.
Note that habitats which intimately combine waterlogged habitats with pools of open water are considered as complexes.

D Mire, bog and fen habitats

Habitats which are saturated, with the water table at or above ground level for at least half of the year, dominated by herbaceous or ericoïd vegetation e.g. bogs, marshes. Includes waterlogged

habitats where the groundwater is frozen. Excludes waterlogged habitats dominated by trees or large shrubs.
Note that habitats which intimately combine waterlogged habitats with pools of open water are considered as complexes.

E Grassland and tall forb habitats

Non-coastal habitats which are dry or only seasonally wet (with the water table at or above ground level for less than half of the year) with greater than 30% vegetation cover. The dominant vegetation is grasses and other non-woody vegetation (including moss-, lichen-, fern- and sedge-dominated communities). Includes sparsely wooded grassland areas with canopy cover of 5 -10%. Includes successional weedy communities and managed grasslands such as recreation fields and lawns. Does not include regularly tilled habitats dominated by cultivated herbaceous vegetation such as arable fields.

F Heathland, scrub and tundra habitats

Non-coastal habitats which are dry or only seasonally wet (with the water table at or above ground level for less than half of the year) with greater than 30% vegetation cover. The dominant vegetation is shrubs or dwarf shrubs. Includes regularly tilled shrub orchards, hedges (which may have occasional tall trees) and habitats characterised by the presence of permafrost. Also includes dwarf trees and scrub (under 50cm, such as occur in extreme alpine conditions).

G Woodland and forest habitats and other wooded land

Habitats where the dominant vegetation is, or was until very recently, trees, typically single-stemmed, and with a canopy cover of at least 10%. Includes lines of trees, coppices, and very recently clear-felled areas with pre-existing ground cover, not yet re-stocked and with no succession to weedy vegetation. Trees are normally able to reach a height of 5m at maturity but this height may be lower at high latitudes or altitudes. Tall shrubs such as hazel (*Corylus*) and some willows (*Salix*) with a woodland-type structure are treated as woodland. Includes regularly tilled tree nurseries and tree-crop plantations. Excludes dwarf trees and scrub (under 50cm) such as occur in extreme alpine conditions and sparsely wooded grassland areas with canopy cover 5 - 10% , including parkland.

H Inland unvegetated and sparsely vegetated habitats

Non-coastal habitats with less than 30% vegetation cover (other than where the vegetation is chasmophytic or on scree and or cliff) which are dry or only seasonally wet (with the water table at or above ground level for less than half of the year). Subterranean non-marine caves and passages including underground waters. Habitats characterised by the presence of permanent snow and surface ice other than marine ice bodies.

I Regularly or recently cultivated agricultural, horticultural and domestic habitats

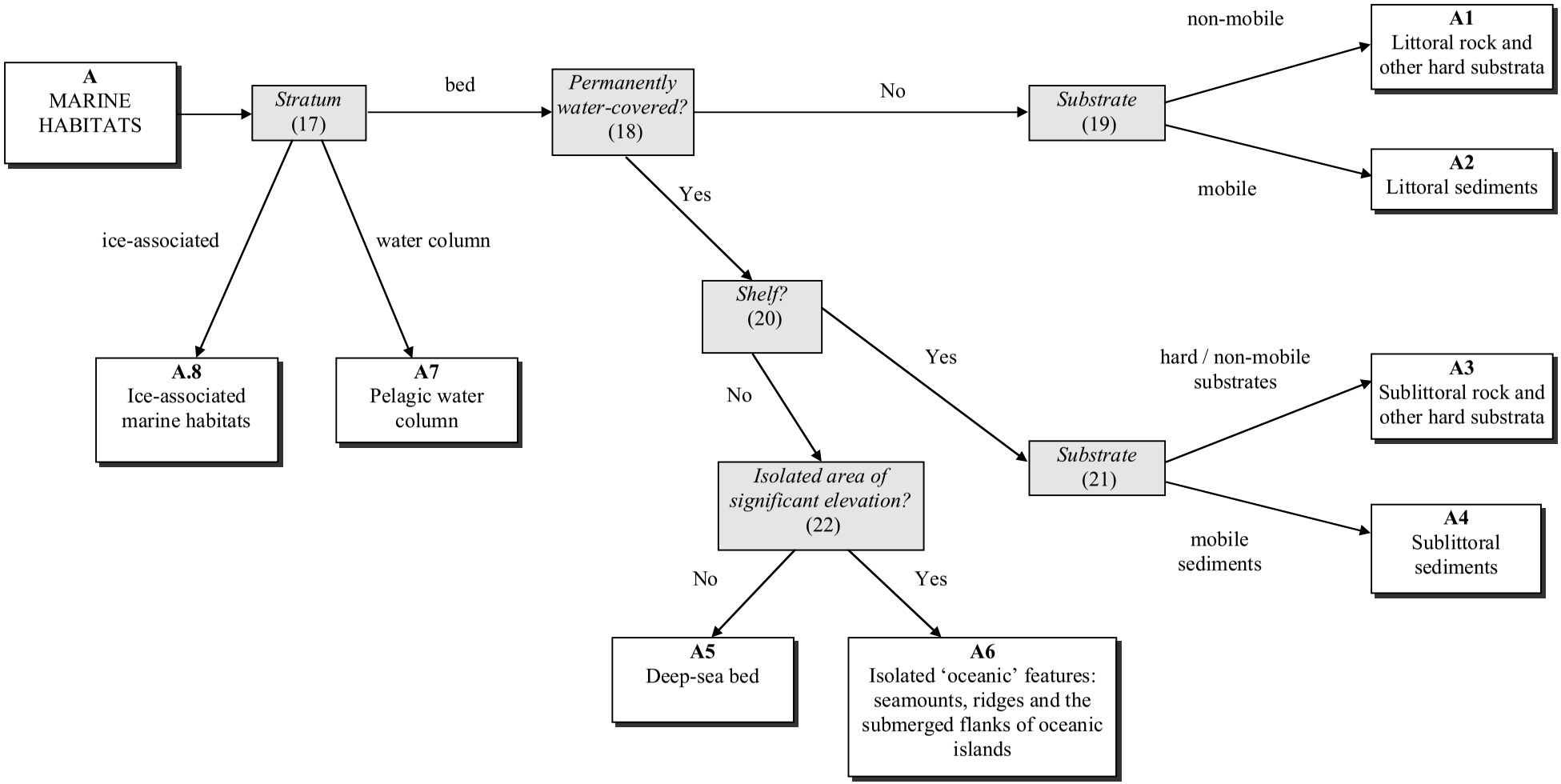
Habitats maintained solely by frequent tilling or arising from recent abandonment of previously tilled ground such as arable land and gardens. Includes tilled ground subject to inundation. Excludes shrub orchards, tree nurseries and tree-crop plantations.

J Constructed, industrial and other artificial habitats

Primarily human settlements, buildings, industrial developments, the transport network, waste dump sites. Includes highly artificial saline and non-saline waters with wholly constructed beds or heavily contaminated water (such as industrial lagoons and saltworks) which are virtually devoid of plant and animal life.

EUNIS Habitat Classification: criteria for marine habitats to Level 2

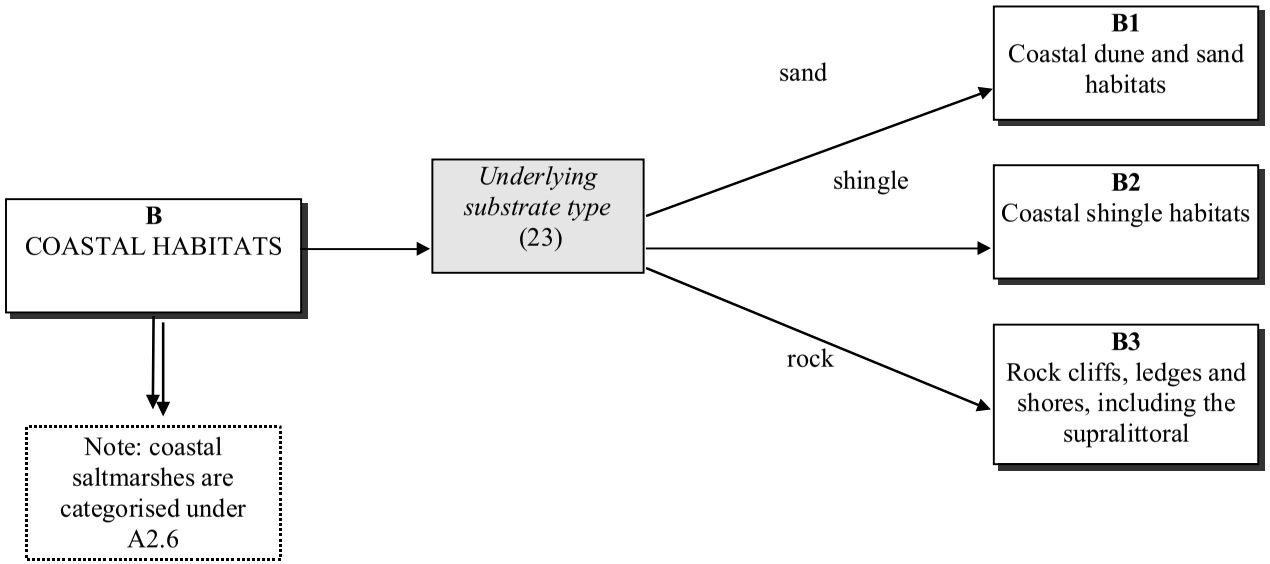
Note that the key to Level 1 shows two pathways to reach habitat type A: these are recombined here.
(number) refers to explanatory notes to the key (following page)



Explanatory notes to the key: Level 2, marine habitats

17. The criterion distinguishes between strata: the sea *bed* (non-tidal, inter-tidal and sub-tidal); the *water column* (in shallow or deep sea, or enclosed coastal waters); and ice or *ice-associated* marine habitats.
18. Is the bed permanently covered by water (path = *Yes*), or either regularly exposed at some stage in the tidal cycle (littoral / inter-tidal), subjected to frequent non-tidal change in water level or above the high water mark but with a high water table (path = *No*)? Note that under extreme conditions the uppermost fringe of the 'permanently water-covered' zone may be exposed.
19. *Non-mobile* substrates include continuous hard and soft bedrock and also non-mobile boulders, rocks and consolidated cobbles, non-mobile artificial substrates and compacted soft substrates such as clay and peat; *mobile* substrates include substrates such as mobile cobbles, pebbles, sand and mud. Note that substrata comprising a mixture of cobbles, pebbles, gravel, sand and mud follow path = *mobile*.
20. This criterion separates sublittoral zones of the shelf (including infralittoral and circalittoral zones) (path = *Yes*), from the deep seabed, beyond the shelf break (path = *No*). The shelf break occurs at variable depth, but is generally over 200 metres. The upper limit of the deep-sea zone is marked by the edge of the shelf. Note that all sublittoral caves follow path = *Yes* irrespective of depth.
21. *Non-mobile* substrates include continuous hard and soft bedrock and also non-mobile boulders, rocks and consolidated cobbles, non-mobile artificial substrates and compacted soft substrates such as clay and peat; *mobile* substrates include substrates such as mobile cobbles, pebbles, sand and mud. Note that substrata comprising a mixture of cobbles, pebbles, gravel, sand and mud follow path = *mobile*..
22. Isolated regions of the deep-sea bed with significant elevation (>200m) are separated from the rest of the deep-sea bed (path = *Yes*). Note that troughs and trenches follow path = *No*.

EUNIS Habitat Classification: criteria for coastal habitats to Level 2
(number) refers to explanatory notes to the key (following page)

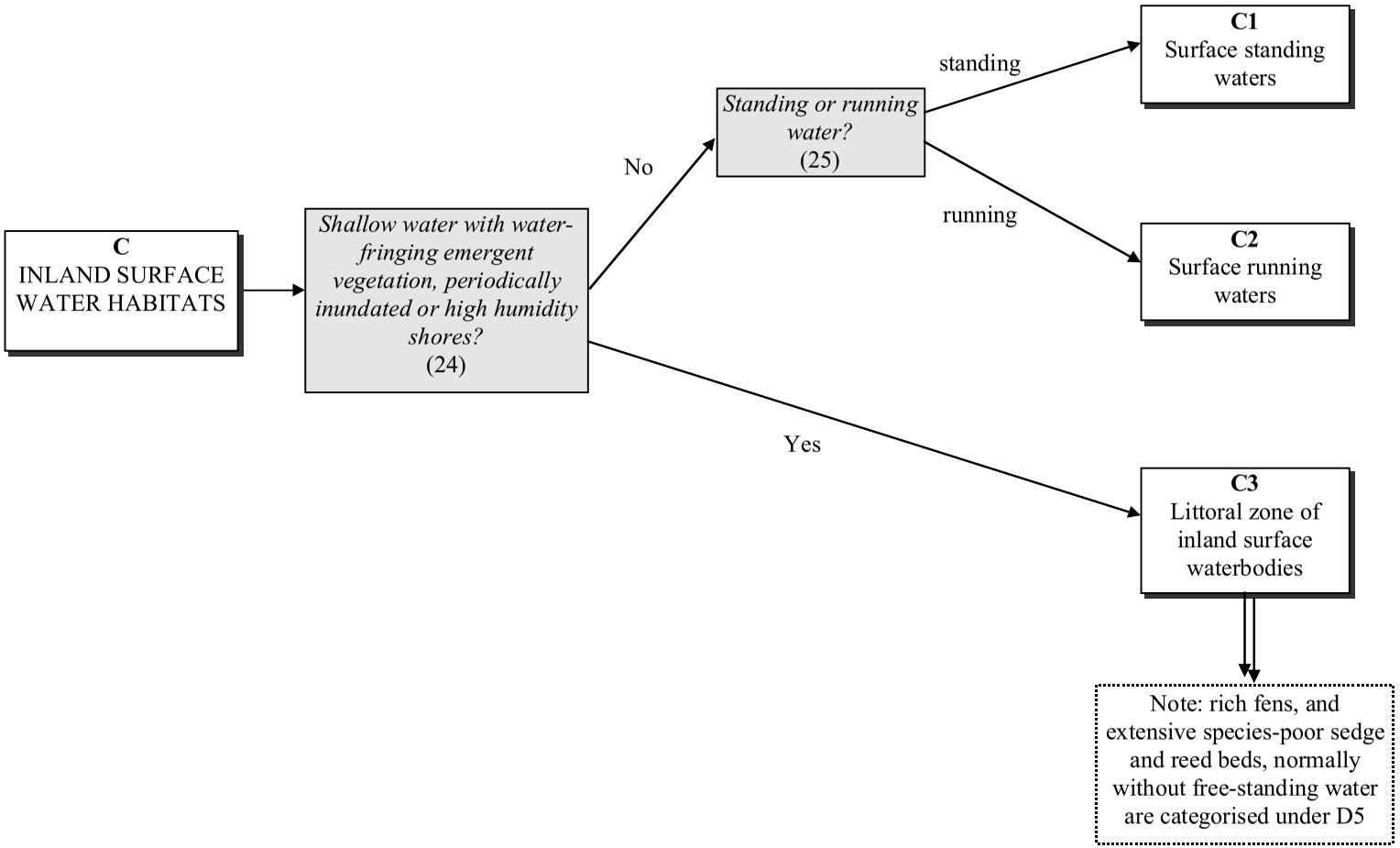


Explanatory notes to the key: Level 2, coastal habitats

23. Non-aquatic coastal habitats are divided on the basis of underlying substrate (which may be overlain with superficial deposits): *sand* substrates form coastal dune and sand habitats; *shingle* substrates form mobile or stable shingle beaches and banks; *rock* substrates (which include non-mobile boulders) comprise sea and coastal lagoon cliffs and rocky sea shores including the supra-littoral spray zone.

EUNIS Habitat Classification: criteria for inland surface water habitats to Level 2

Note that the key to Level 1 shows two pathways to reach habitat type C: these are recombined here.
(number) refers to explanatory notes to the key (following page)



Explanatory notes to the key: Level 2, inland surface water habitats

24. Periodically inundated shores adjacent to surface water habitats (without vegetation or with ephemeral or amphibious herbs), littoral zones with high humidity which may be due to steam or spray, or narrow (<5m wide) bands of permanent water fringing emergent vegetation (path = *Yes*) are separated from the fully aquatic components of waterbodies (path = *No*). Note that temporary streams with no defined boundaries, completely covered by littoral-type vegetation follow path = Yes. Note also that sedge or reed beds normally without free-standing water are categorised under D5.
25. Is the waterbody *standing* (with no perceptible flow such as lakes, ponds, or extremely slow-moving parts of rivers etc.); or *running* (with perceptible flow, such as rivers, streams, springs, etc.)? Note that standing waters include semi-natural canals, temporary standing waters and seasonally dry lake beds; running waters include temporary or intermittent streams.

EUNIS Habitat Classification: criteria for mire, bog and fen habitats to Level 2

Note that mire bog, and fen habitats do not include wet heaths, moist grasslands, and riverine or swamp woodlands, which follow separate paths at Level 1.
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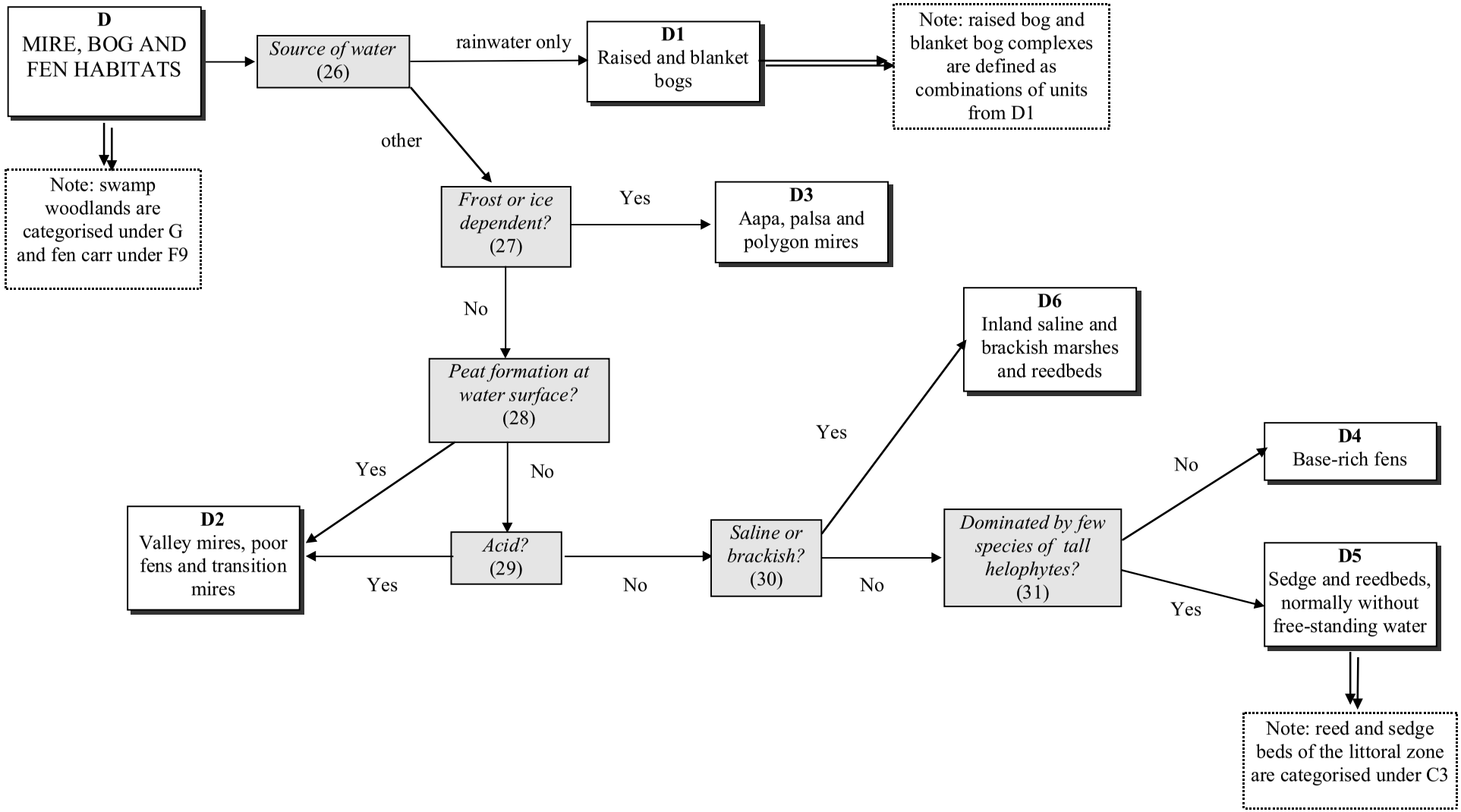
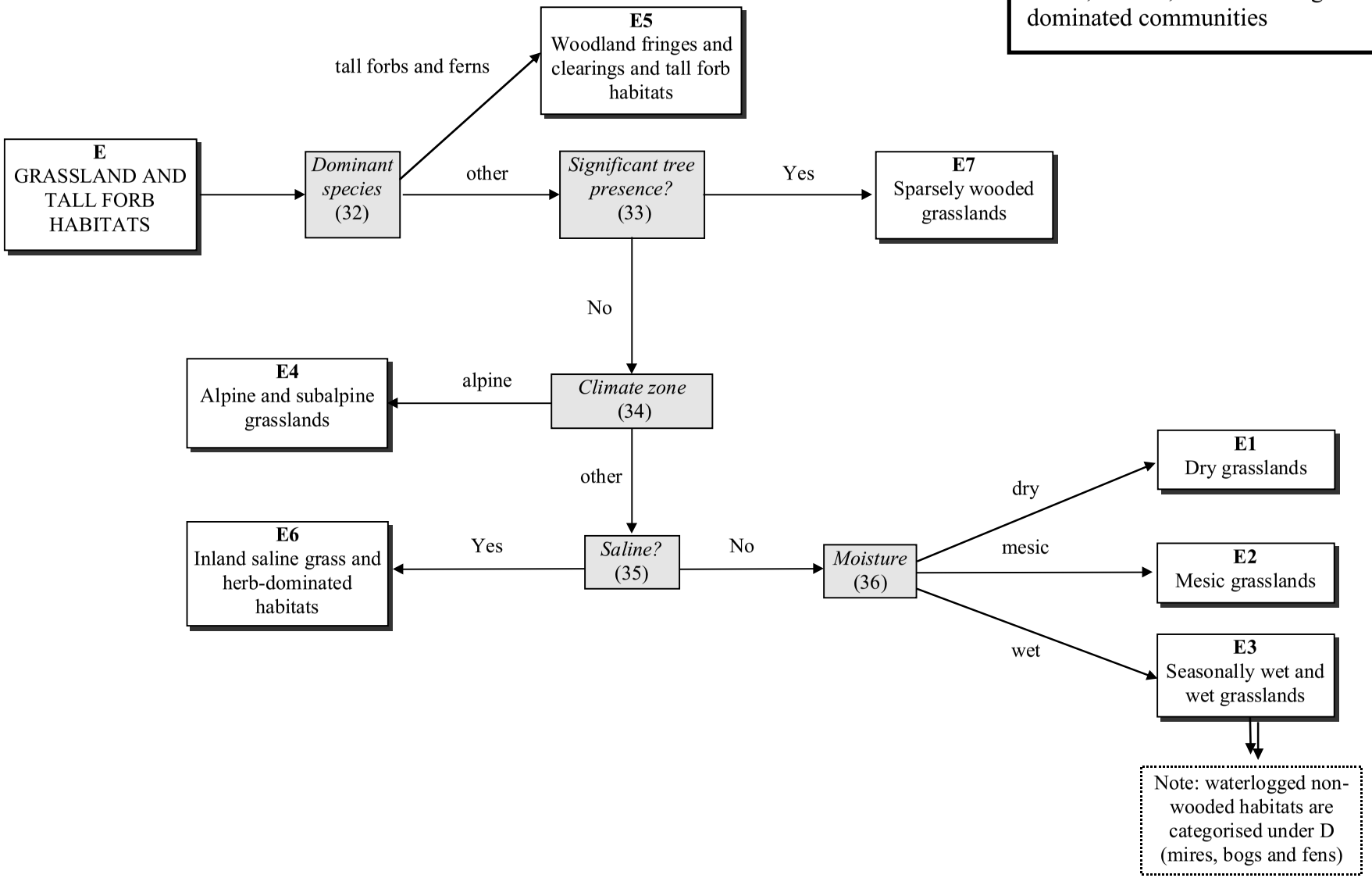


Explanatory notes to the key: Level 2 mire, bog and fen habitats

26. The criterion separates habitats on the basis of the source of their water supply: completely or primarily ombrogenous (*rainwater only*) from *other* sources which are combinations of ombrogenous, soligenous (run-off) and topogenous (groundwater) but where the ombrogenous water supply is of less importance.
27. Mires whose formation and maintenance is completely dependent on the action of frost or ice are separated (path = *Yes*).
28. Transition mires in which the water table is at or near the surface and peat forms a floating raft at the water surface are distinguished (path = *Yes*).
29. Mires in which the peat formation occurs in waterlogged ground are separated if they have a predominantly acid water supply (path = *Yes*).
30. Marshes and reedbeds with a saline or brackish water supply (> 0.5 parts per thousand salt) (path = *Yes*) are distinguished from freshwater habitats (path = *No*).
31. Separates topogenous and soligenous habitats dominated by few species of tall helophytes (plants rooted below the water table but with emergent aerial shoots), typically species-poor extensive sedge and reed beds (path = *Yes*), from habitats dominated by low-growing vegetation on shallow organic or mineral substrates, which is typically species-rich vegetation of fens (path = *No*). Note: reed and sedge beds of the littoral zone (usually less than 5m wide) rooted in open water with associated aquatic species are categorised under C3.

EUNIS Habitat Classification: criteria for grassland and tall forb habitats to Level 2
(number) refers to explanatory notes to the key (following page)

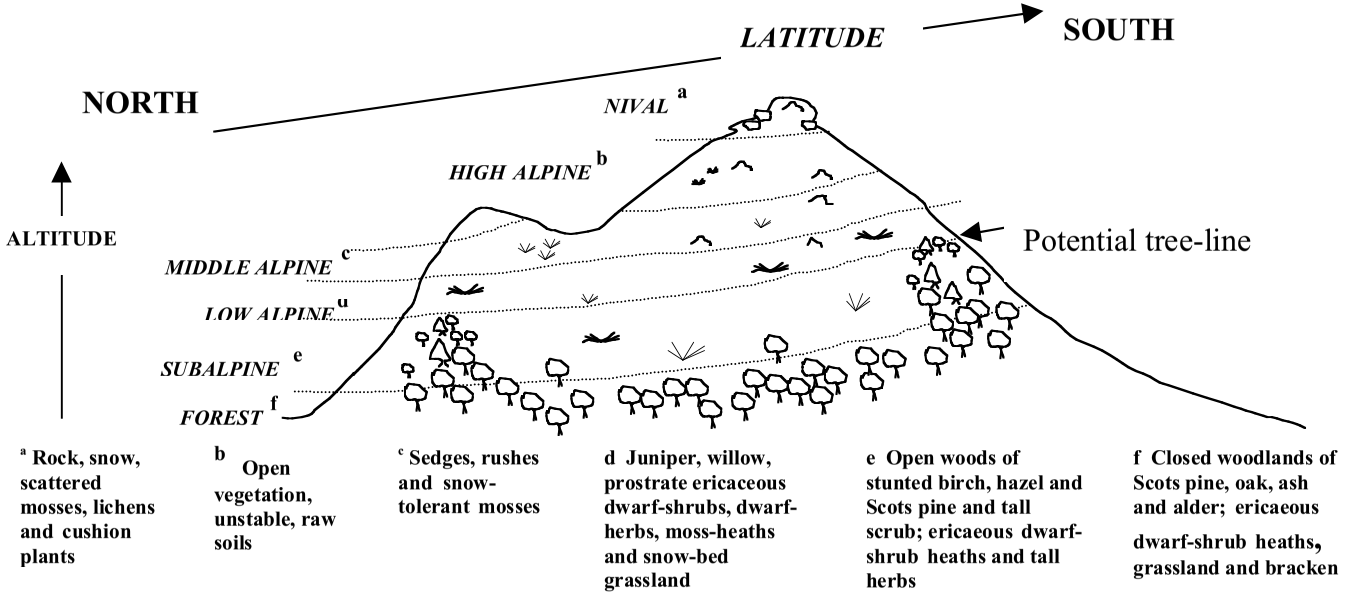
Note that grassland may include moss-, lichen-, fern- and sedge-dominated communities



Explanatory notes to the key: Level 2, grassland and tall forb habitats

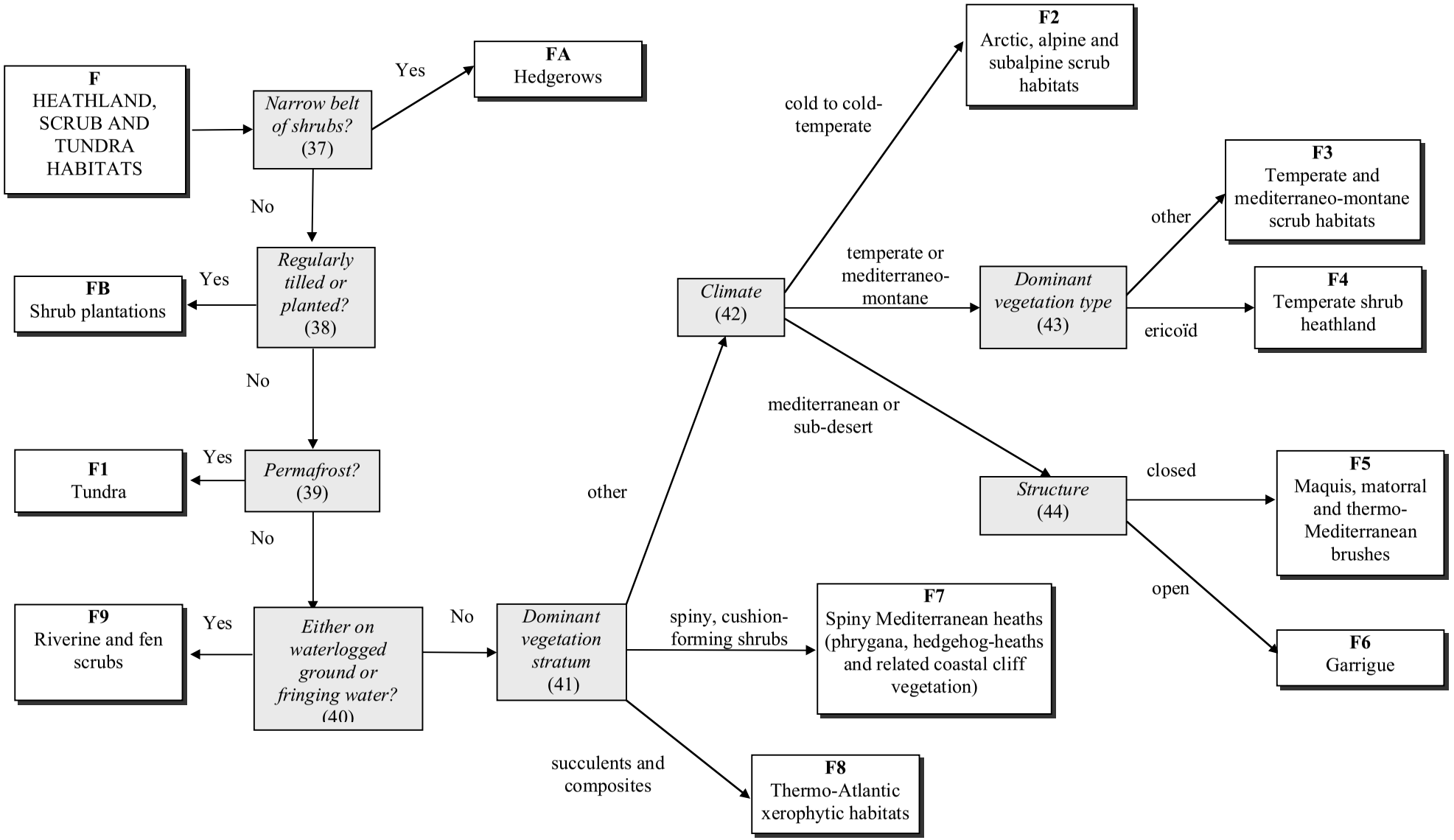
32. Habitats dominated by *tall forbs or ferns* are distinguished from habitats where the dominant vegetation type is *other* low-growing herbs, especially grasses, but also bryophytes and lichens (where cover is greater than 30%).
33. Grasslands which have a significant tree presence, i.e. canopy cover between 5 - 10%, are separated (path = *Yes*).
34. Climate zone separates *alpine* grasslands from *other* grassland habitats which are more typical of montane, collinar or lowland levels. Alpine grasslands are typically found towards or beyond the forest limit but below permanent snow generally at higher altitudes in the mountains of Europe, although they may penetrate to lower altitudes, especially at higher latitudes and in the oceanic parts of Europe. (*See figure 1.*)
35. Grasslands and herb-dominated habitats on saline soils (path = *Yes*) are distinguished.
36. Seasonally *wet* and wet grasslands which have some affinities with wetlands, but which are not permanently waterlogged (Level 1, criterion note 5) are distinguished from predominantly *dry* grasslands and from *mesic* grasslands (including non-alpine bracken fields) which are usually mesotrophic or eutrophic.

Figure 1



EUNIS Habitat Classification: criteria for heathland, scrub and tundra habitats to Level 2

Note that the key to Level 1 shows two pathways to reach habitat type F: these are recombined here.
(number) refers to explanatory notes to the key (following page)

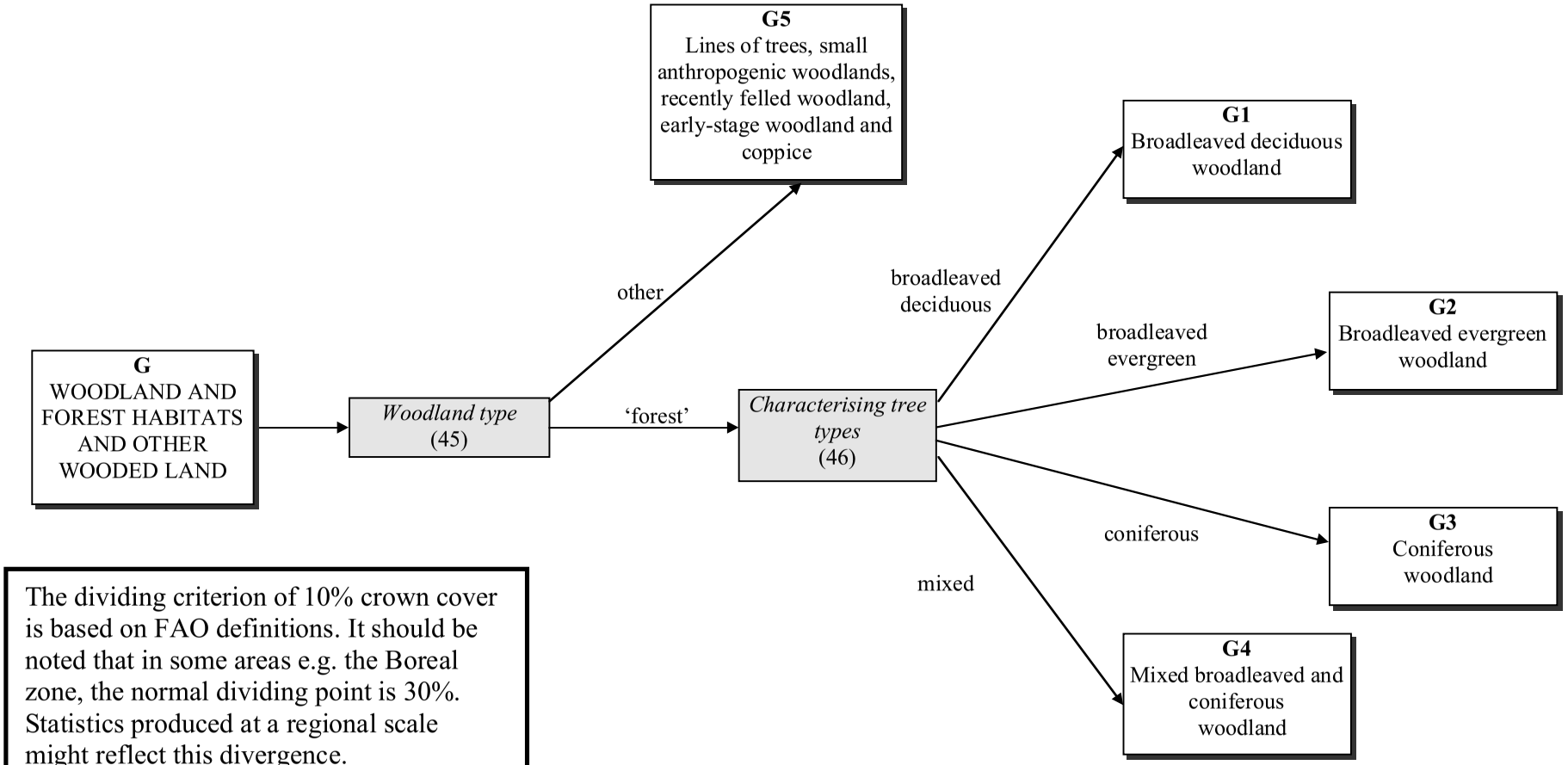


Explanatory notes to the key: Level 2, heathland scrub and tundra habitats

37. Hedgerows, comprising narrow linear belts of shrubs, which may or may not be managed, with or without occasional trees, are distinguished (path = *Yes*). Note that shrubby habitats of forest edges are classified under G.
38. Shrub plantations which are cultivated regularly, but not necessarily annually (vineyards, fruit orchards and tea plantations), are distinguished (path = *Yes*).
39. Tundra habitats characterised by the presence of permafrost are separated (path = *Yes*).
40. Scrubs and thickets on waterlogged ground or fringing temporary or permanent rivers and streams are separated (path = *Yes*) from other shrub habitats in drier areas.
41. Habitats are separated on the basis of the vegetation type: s*ucculents and composites* (members of the family Compositae)*;* and *spiny; cushion-forming shrubs;* and *other* shrubs and low trees. Note that 'low trees' are defined as tree species when they are restricted in their growth form (and which may be prostrate).
42. This criterion separates habitats characterised by their temperature regime, but this may operate at a variety of geographical and altitudinal scales: *cold to cold-temperate* climate in the arctic, alpine or subalpine zones; *temperate or mediterraneo-montane* climate in warmer areas in the arctic or alpine and subalpine zones or cooler areas of the mediterranean region (i.e. warm temperate areas of the mountains of the mediterranean region); and *mediterranean or sub-desert* climates in the Mediterranean zone.
43. Habitats with a temperate climate are separated according to their dominant vegetation type: *ericoïd* shrubs; or *other* broadleaved deciduous or coniferous shrubs and low trees.
44. Garrigue is distinguished from maquis and matorral: garrigue always has an *open* vegetation and some bare ground, usually with many annuals and geophytes and dominated by vernal species, usually with some patches of shrubs (e.g. *Cistus*, *Lavendula*, *Rosmarinus* and *Stoechas*) and there may be some larger shrubs and scattered trees present; maquis and matorral comprise more *closed* vegetation, usually with 100% cover, mainly shrubs with few annuals and some geophytes, trees are nearly always present, some of which may be in shrub form.

EUNIS Habitat Classification: criteria for woodland and forest habitats and other wooded land to Level 2

(number) refers to explanatory notes to the key (following page)



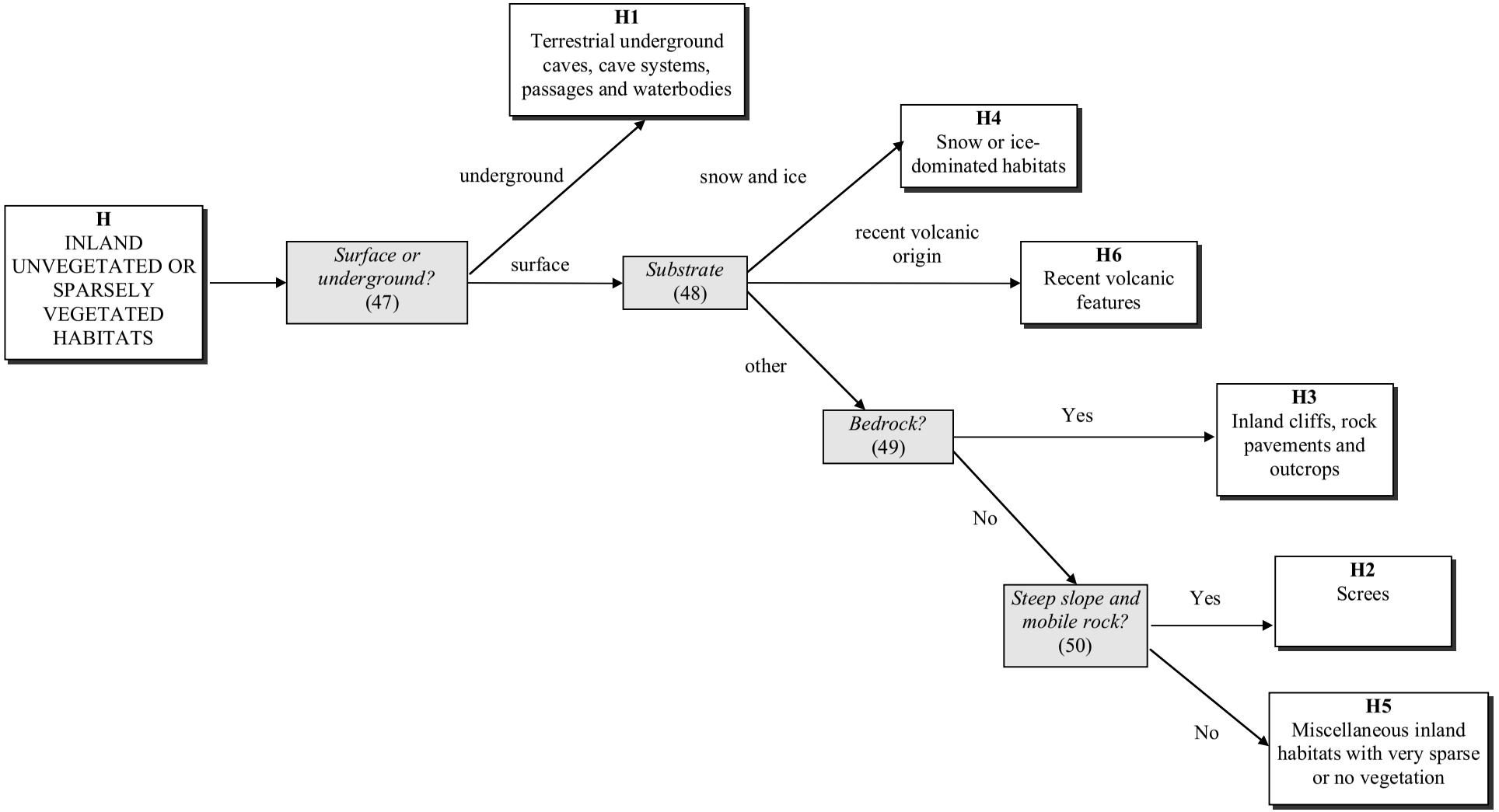
The dividing criterion of 10% crown cover is based on FAO definitions. It should be noted that in some areas e.g. the Boreal zone, the normal dividing point is 30%. Statistics produced at a regional scale might reflect this divergence.

Explanatory notes to the key: Level 2, woodland and forest habitats and other wooded land

45. *'Forest'* habitats are separated from *other* wooded habitats. '*Forest'* habitats are defined as: natural stands of area greater than 0.5ha and crown cover greater than 10% and tree height greater than 5m; natural stands of area less than 0.5ha and crown cover greater than 10% and tree height greater than 5m with more or less natural ground flora (i.e. not heavily influenced by man through management or damage); plantations of area greater than 0.5ha and crown cover greater than 10% and tree height greater than 5m. *Other* wooded land includes: natural stands of area less than 0.5ha and crown cover greater than 10% and tree height greater than 5m heavily influenced by man through management or damage (small, intensively managed woods and small woods strongly influenced by anthropogenic activities); young natural stands with trees of height less than 5m and potential crown cover of greater than 10%; plantations of young trees with potential crown cover of greater than 10% and tree height less than 5m; plantations of area less than approximately 0.5ha with potential crown cover of greater than 10% and tree height greater than 5m; areas normally part of the forest area but temporarily unstocked as a result of human intervention or natural causes; coppice; narrow lines of mature trees, such as avenues and windbreaks. Note that dwarf trees and scrub (under 50cm such as occur in extreme alpine conditions) are included in F, Heathland scrub and tundra. Note that areas of grassland with trees where the crown cover is 5 -10 % are categorised under E7.
46. Forest is characterised by the dominant tree types, which may be mixtures of species within the categories *broadleaved deciduous; mixed* broadleaved and coniferous*; broadleaved evergreen;* and *coniferous*. Note that broadleaved woodland is defined as wooded land on which more than 75% of the tree crown cover consists of broadleaved species and that coniferous woodland is defined as wooded land on which more than 75% of the tree crown cover consists of coniferous species (based on FAO definition). Mixed woodland is defined as wooded land on which neither coniferous, nor broadleaved species account for more than 75% of the crown cover.

EUNIS Habitat Classification: criteria for inland unvegetated or sparsely vegetated habitats to Level 2

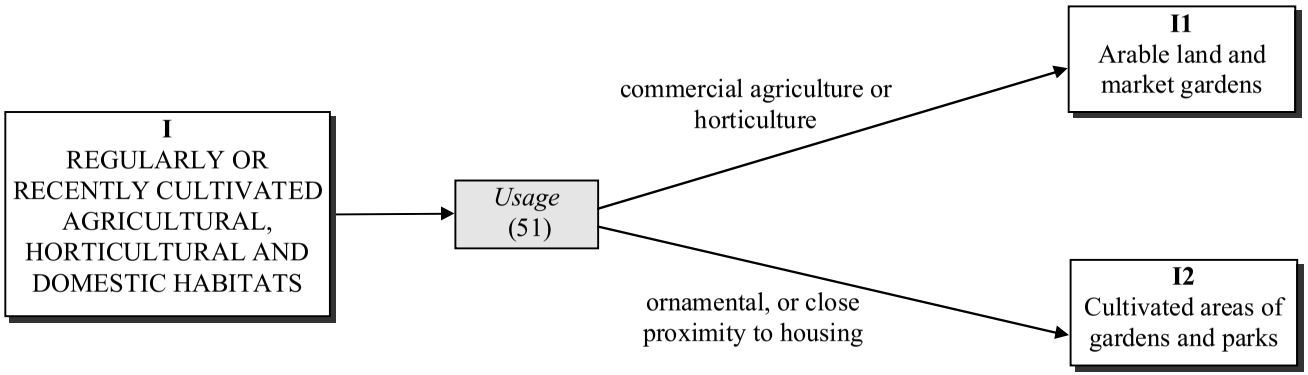
Note that the key to Level 1 shows two pathways to reach parts of habitat type H: these are recombined here.
(number) refers to explanatory notes to the key (following page)



Explanatory notes to the key: Level 2, inland unvegetated or sparsely vegetated habitats

47. Natural *underground* systems are separated from *surface* habitats irrespective of other criteria. Note that disused man-made underground systems which have been colonised by natural or semi-natural communities are also included here. Note also that caves in glaciers follow path = *surface*.
48. Habitats with unvegetated or sparsely vegetated surfaces are separated on the nature of the dominating substrate type. Three types are distinguished: *snow and ice*; *recent volcanic origin;* and *other* substrates. Note that non-permanent snow patches are included with alpine grasslands (E4).
49. Cliffs and rock pavements comprising exposed horizontal or vertical bedrock are separated (path = *Yes*).
50. Screes consisting of mobile rocks and rock fragments on steep slopes are separated (path = *Yes*) from all other unvegetated or sparsely vegetated inland habitats.

EUNIS Habitat Classification: criteria for regularly or recently cultivated agricultural, horticultural and domestic habitats to Level 2
(number) refers to explanatory notes to the key (following page)

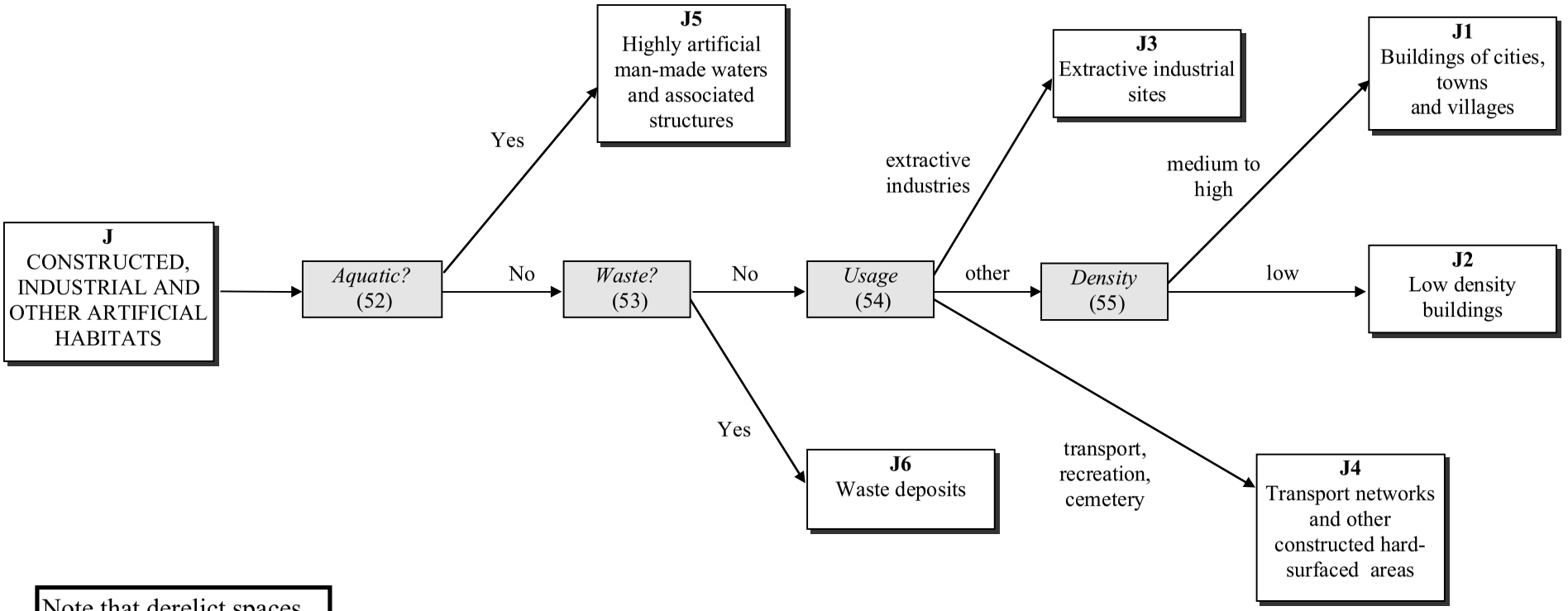


Note: domestic and other gardens, parks and city squares are treated as complexes comprising combinations of units from any other level 1 unit.

Explanatory notes to the key: Level 2, crops and regularly cultivated habitats ornamental parks and gardens.

51. Land used for purposes of *commercial agriculture or horticulture*, usually large plots with few or no buildings, is distinguished from other regularly or recently cultivated habitats which are usually of smaller size, often in close proximity to buildings or which are highly ornamental (path = *ornamental, or close proximity to housing*). Note that allotments follow path = *commercial agriculture or horticulture*.

EUNIS Habitat Classification: criteria for constructed, industrial and other artificial habitats to Level 2
(number) refers to explanatory notes to the key (following page)

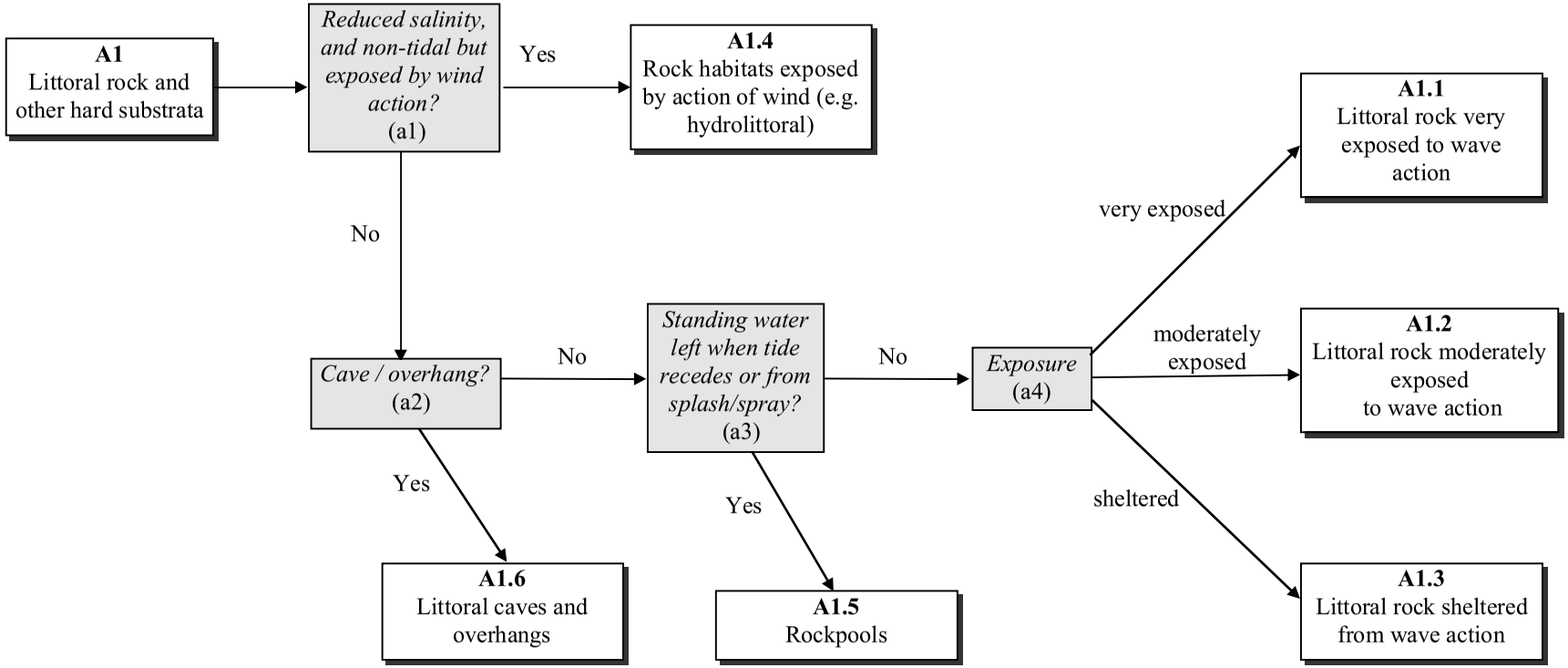


Note that derelict spaces are categorised according to the nature of the surrounding areas.

Explanatory notes to the key: Level 2, constructed, industrial and other artificial habitats

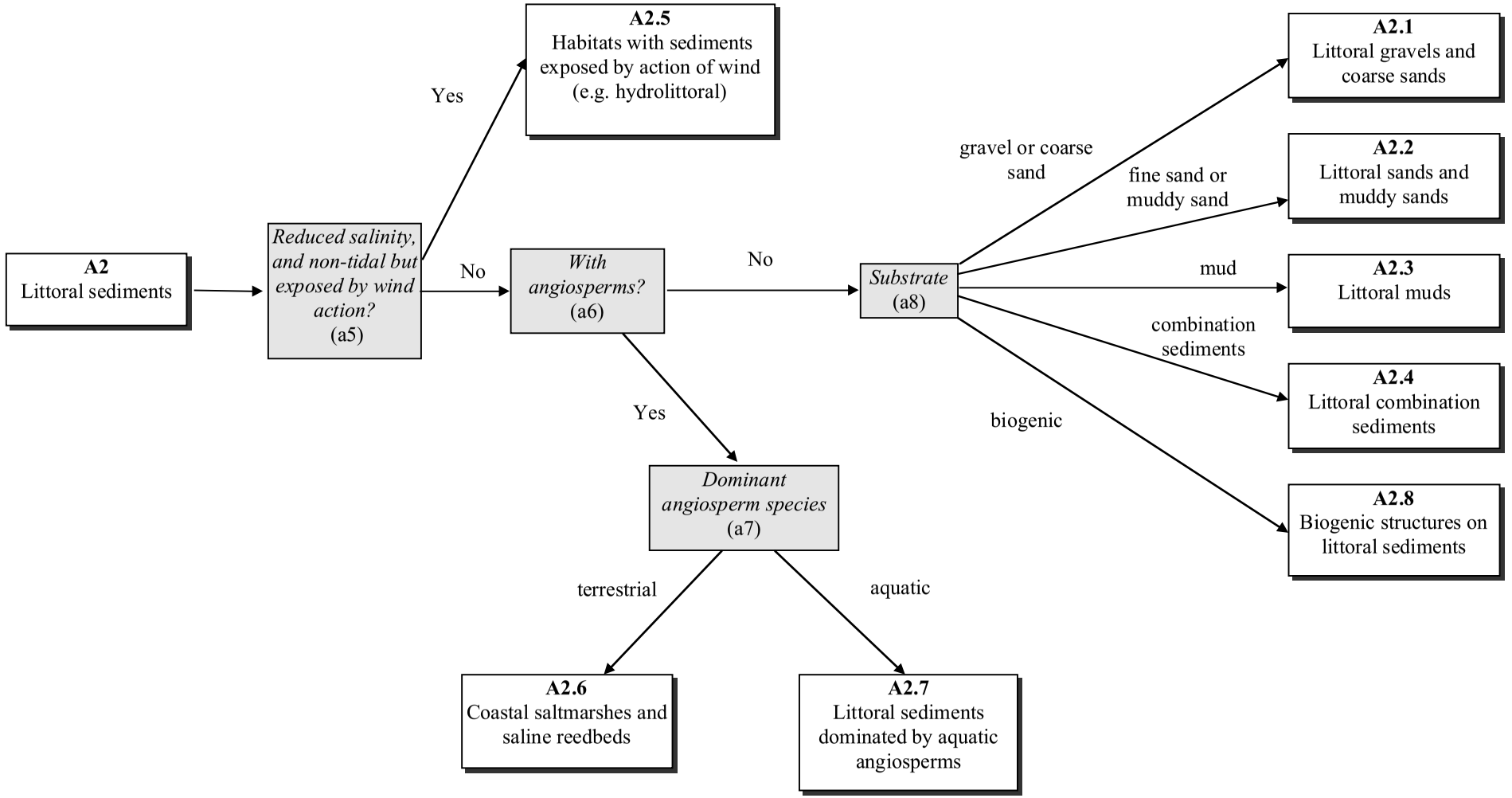
52. Highly artificial waterbodies, with wholly-constructed beds or heavily contaminated water, and associated conduits and containers (path = *Yes*) are separated from non-aquatic artificial habitats.
53. Artificially constructed habitats comprising waste matter (such as slag heaps, landfill, agricultural waste) are separated (path = *Yes*)
54. Habitats are distinguished according to current or recent usage: *extractive industries* (quarries, mines etc); transport networks, including paved footpaths, recreation areas (hard surfaces constructed for recreational purposes) and the constructed parts of cemeteries (all including the immediately associated land but excluding the buildings thereon) (path = *transport, recreation, cemetery*); all *other* buildings. Note also that ruderal or pioneer communities invading these habitats are included here, but habitats which originated through man's activities, but which have reverted to occupation by natural or semi-natural plant and animal communities are categorised with their counterparts elsewhere.
55. Habitats comprising buildings are differentiated according to their density; *medium to high* density building as in cities, towns and villages is distinguished from *low* density (isolated) housing, agricultural, commercial and non-extractive industrial buildings and sites in a rural setting (surrounded by more natural habitats).

EUNIS Habitat Classification: criteria for littoral rock and other hard substrata (A1) to Level 3
(number) refers to explanatory notes to the key

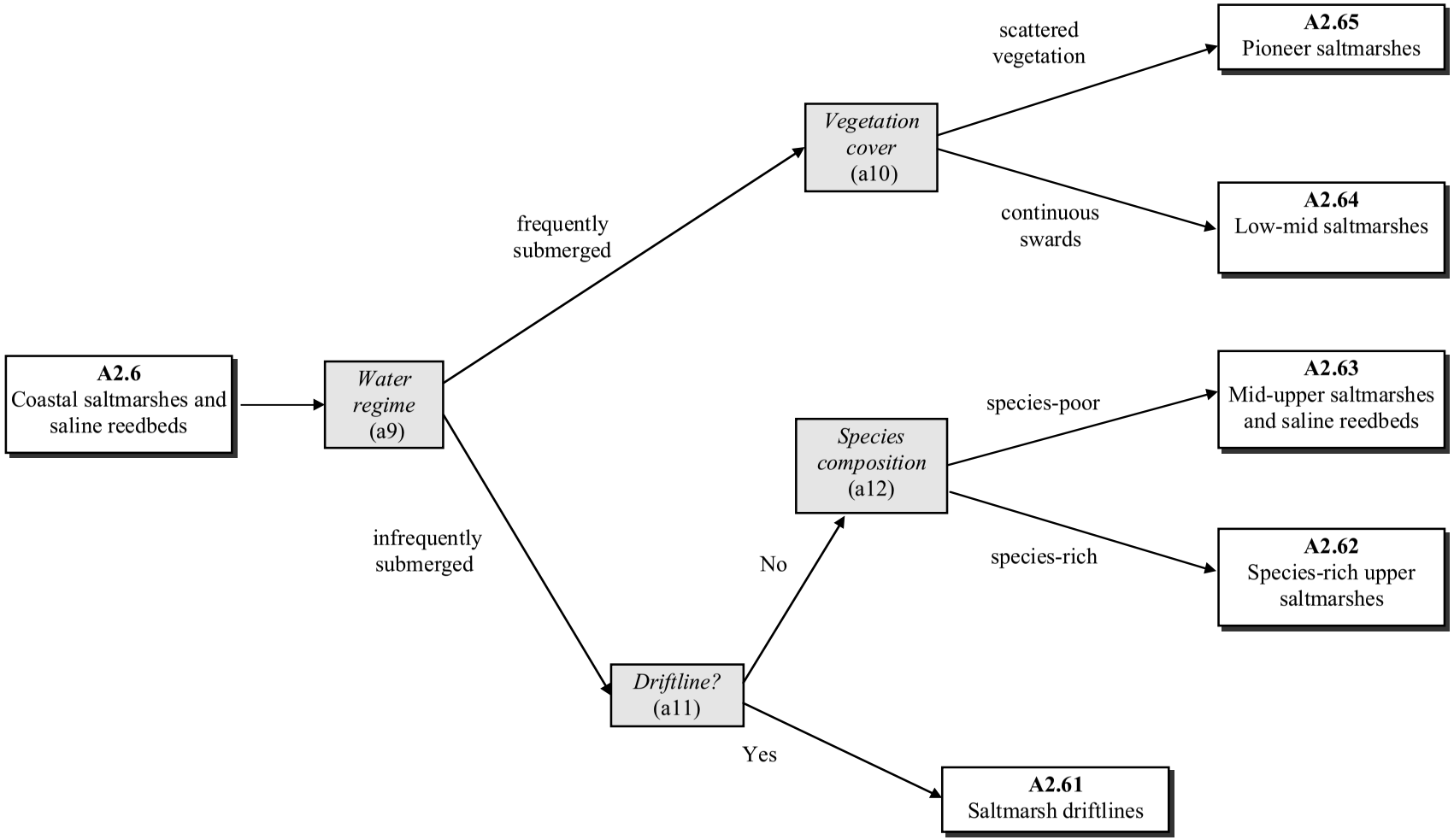


Note: Rockpools (filled by splash and spray) located in the supralittoral zone are classified in A1.5

EUNIS Habitat Classification: criteria for littoral sediments (A2) to Level 3
(number) refers to explanatory notes to the key

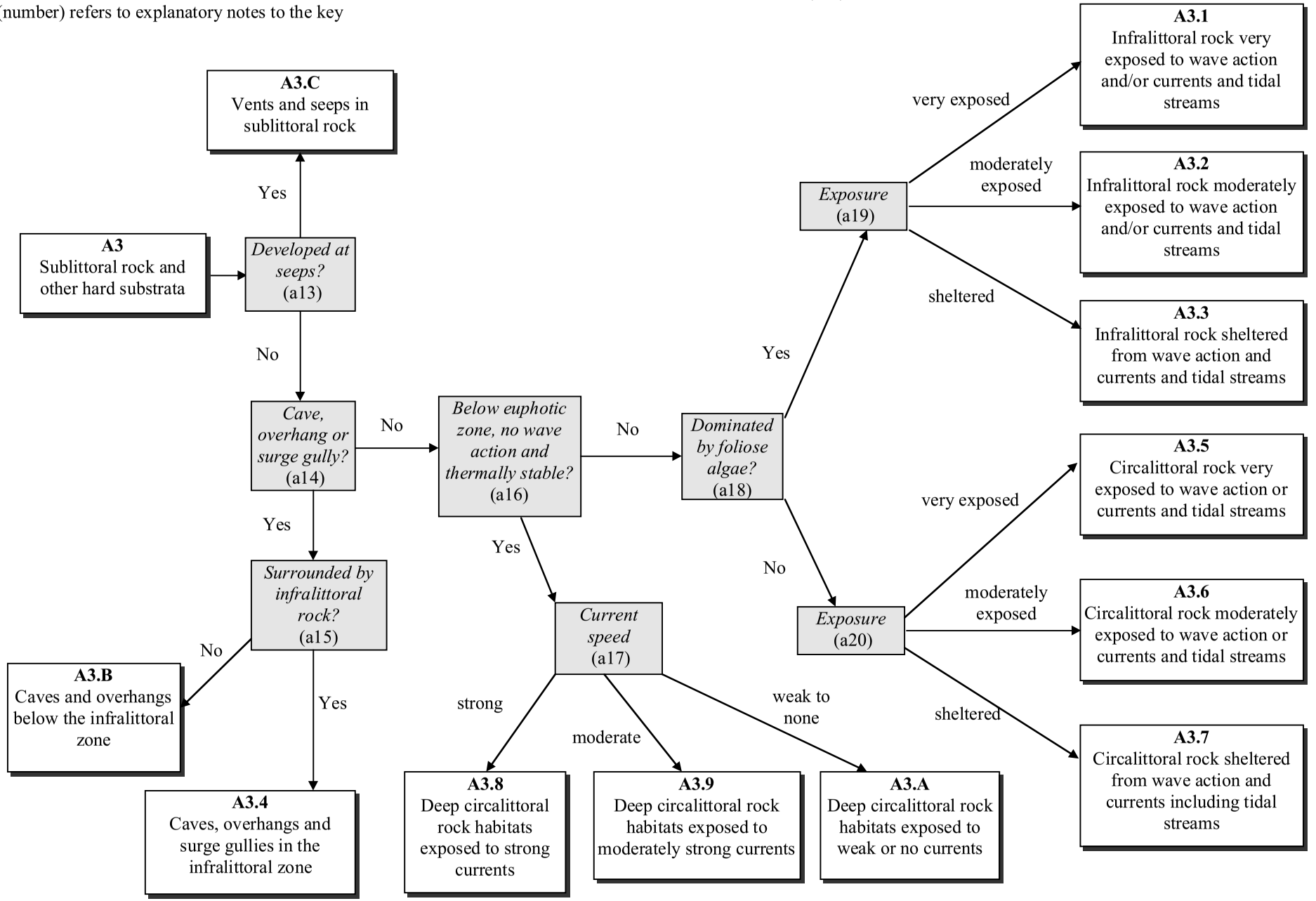


EUNIS Habitat Classification: criteria for coastal saltmarshes and saline reedbeds (A2.6) to Level 4
(number) refers to explanatory notes to the key



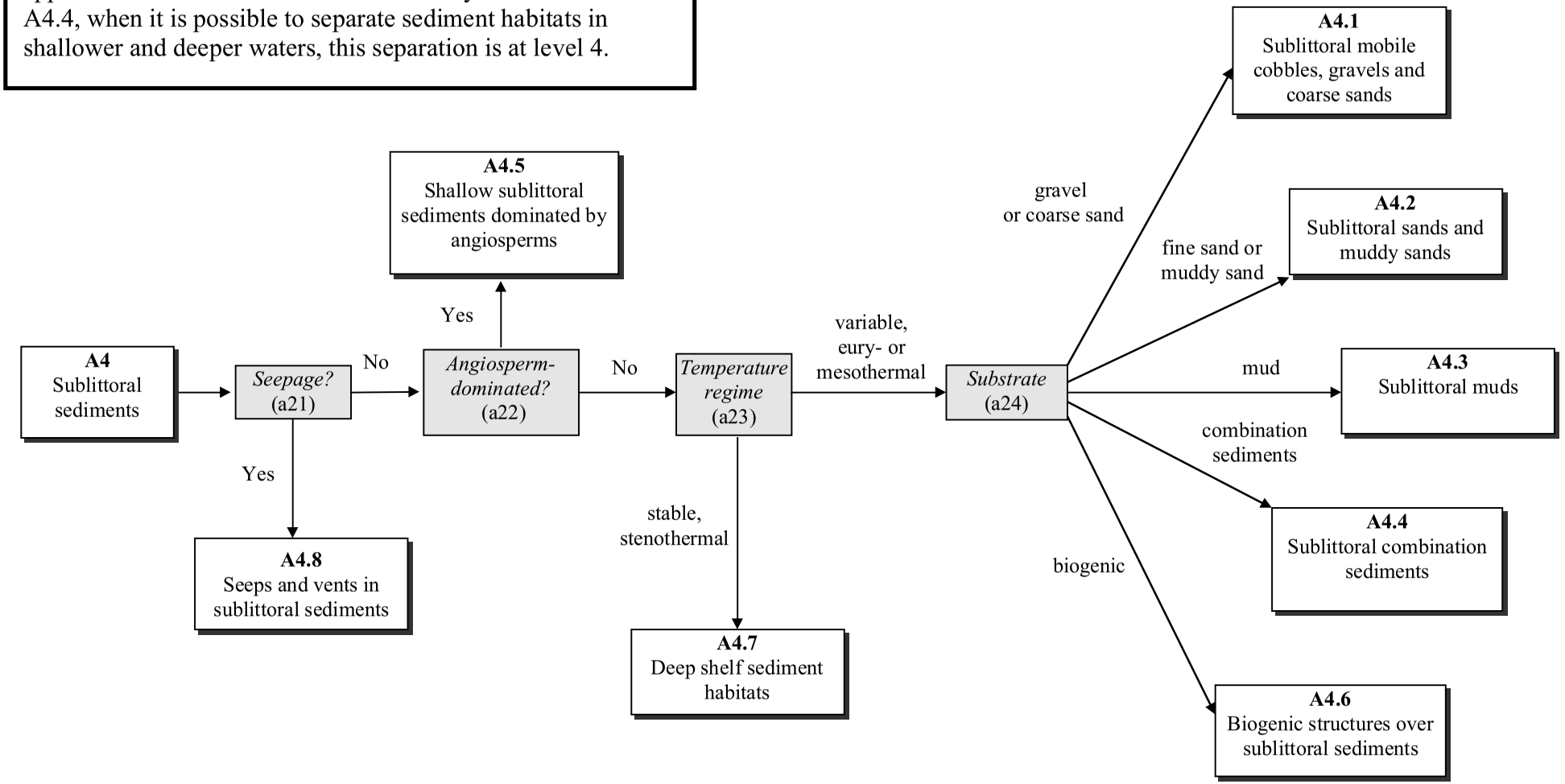
EUNIS Habitat Classification: criteria for sublittoral rock and other hard substrata (A3) to Level 3

(number) refers to explanatory notes to the key

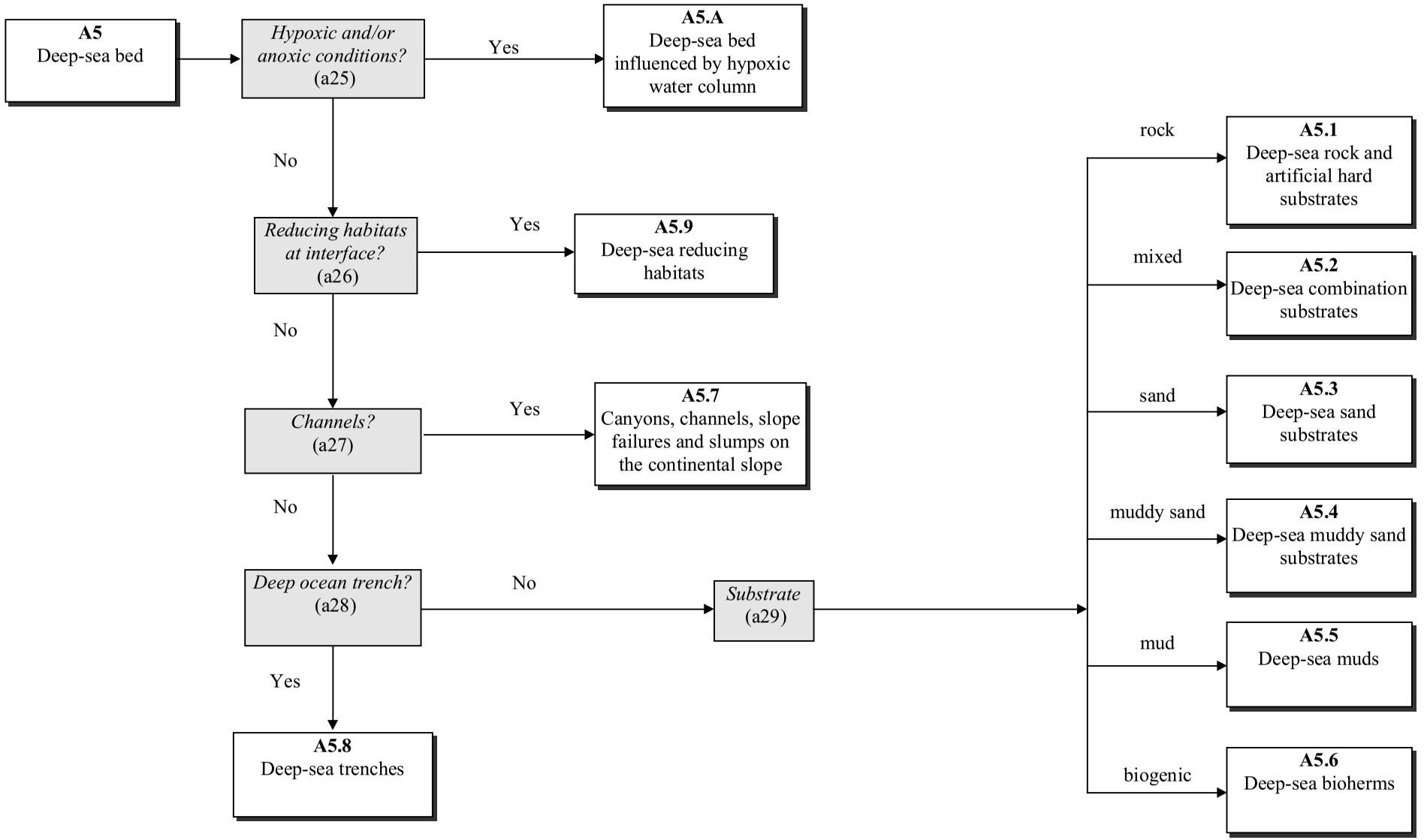


EUNIS Habitat Classification: criteria for sublittoral sediments (A4) to Level 3
(number) refers to explanatory notes to the key

Note: In some marine areas a clear distinction can be made between infralittoral and circalittoral sediments, but this has proved difficult to formalise in this key as a consistent criterion applicable across the whole area covered by EUNIS. In A4.1 to A4.4, when it is possible to separate sediment habitats in shallower and deeper waters, this separation is at level 4.

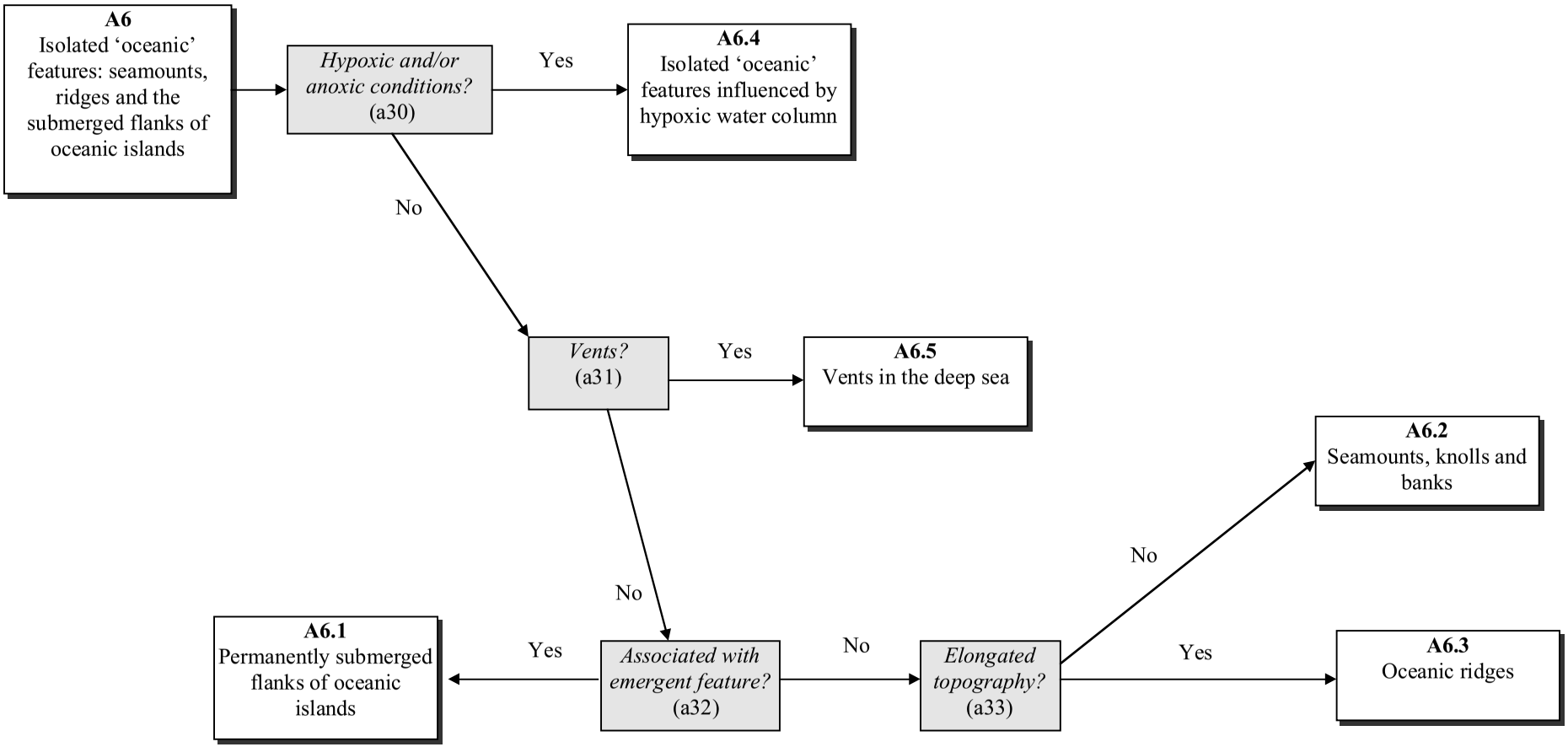


EUNIS Habitat Classification: criteria for the deep-sea bed (A5) to Level 3
(number) refers to explanatory notes to the key



EUNIS Habitat Classification: criteria for Isolated 'oceanic' features: seamounts, ridges and the submerged flanks of oceanic islands (A6) to Level 3

(number) refers to explanatory notes to the key



EUNIS Habitat Classification: criteria for Pelagic habitats (A7) to Level 3
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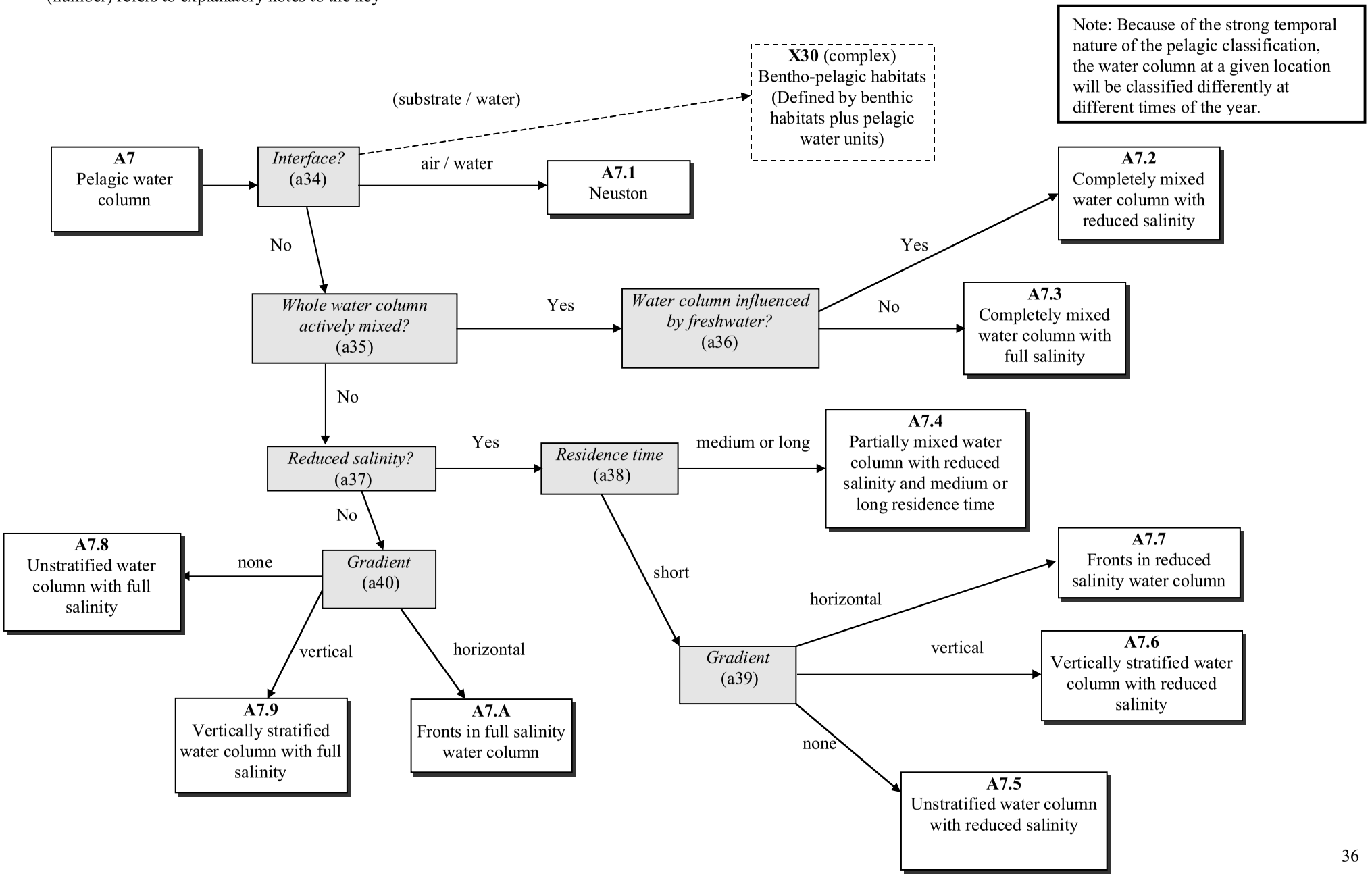
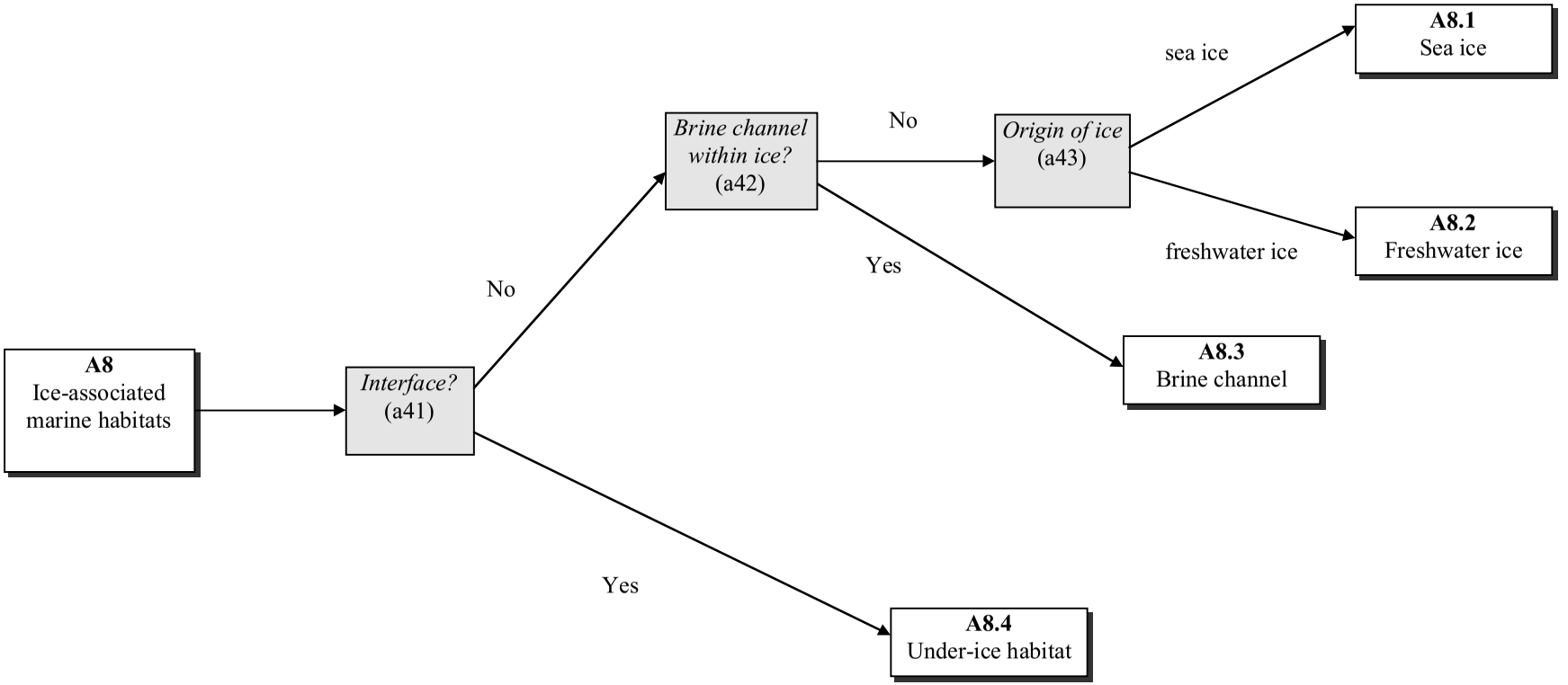


EUNIS Habitat Classification: criteria for Ice-associated marine habitats (A8) to Level 3

(number) refers to explanatory notes to the key



Explanatory notes to the key: Level 3 (Habitat type A)

a1. Hard substrate shores of non-tidal, reduced salinity waters which are either: below the mean water level and normally water-covered, but regularly or occasionally exposed by the action of wind, (hydrolittoral); or waterlogged shores between the mean and high water level (parts of the geolittoral e.g. in the Baltic) (path = *Yes*) are separated from hard substrate littoral habitats in full salinity waters below the high water mark.

a2. Habitats developed either in rock caves or underneath overhangs are separated (path = *Yes*).

a3. Rock pools (depressions filled by standing water left when tide recedes or by splash and spray, path = *Yes*) are distinguished from areas which are periodically submerged and drained.

a4. The criterion separates out habitats which are *very exposed* to wave and/or tidal action from those only *moderately exposed* or *sheltered*. Note that 'very exposed' also includes extremely exposed and exposed categories and that 'sheltered' also encompasses the categories very sheltered and ultra sheltered (see glossary).

a5. Sedimentary shores of non-tidal, reduced salinity waters which are either: below the mean water level and normally water-covered, but regularly or occasionally exposed by the action of wind, (hydrolittoral); or waterlogged shores between the mean and high water level (parts of the geolittoral e.g. in the Baltic) (path = *Yes*) are separated from littoral habitats in full salinity waters below the high water mark (path = *No*).

a6. Habitats dominated by aquatic (e.g. *Zostera* spp.) or terrestrial (e.g. *Salicornia* spp.) angiosperms, (path = *Yes*) are distinguished from those dominated by animal communities, with or without algae.

a7. Angiosperm-dominated habitats are differentiated between those whose dominant species are entirely *aquatic* but which can tolerate occasional emersion (e.g. *Zostera* spp., *Ruppia* spp., *Posidonia*), and those which are primarily *terrestrial* but can tolerate varying amounts of immersion (e.g. *Salicornia* spp., *Spartina* spp.).

a8. Habitats are divided on the basis of the dominating particle size of the substrate. *Gravel or coarse sand* > 1 mm grain size (including shingle and mobile cobbles); *fine sand or muddy sand* <= 1mm with <=30% silt (less than 0.063 mm grain size); *mud* >30% less than 0.063mm grain size; *combination sediments* - intimate mixtures of the above, and mosaics and veneers; or *biogenic* structures.

a9. Saltmarsh habitats are separated according to the water regime (determined by the position on the shore), between those *frequently submerged*, with soil moisture and salinity relatively constant, and *infrequently submerged*, with soil moisture and salinity variable.

a10. Habitats with pioneer vegetation dominated by annual or perennial species with <30% vegetation cover (path = *scattered vegetation*) are separated from those with more-or-less *continuous swards*.

a11. Driftline vegetation of saltmarshes (the highest zone, characterised by annual nitrophiles) is separated (path = *Yes*).

a12. *Species-poor* saltmarshes and reedbeds (pure stands or those dominated by a few species) are distinguished from those which are *species-rich*, with a wide range of communities, and a rich flora, not dominated by any one species.

a13. Habitats in submarine hard substrata specific to sources of seeping or bubbling gases, oils or water are distinguished (path = *Yes*).

a14. Habitats developed in rock caves, underneath overhangs or in wave-scoured surge gullies are separated (path = *Yes*).

a15. Surge gullies, caves and overhangs which are surrounded by infralittoral rock and wave or tide-disturbed are separated (path = *Yes*) from habitats developed in rock caves, or underneath overhangs below the limit of wave disturbance. Note that where conditions are the same as at deeper

levels of the seabed (i.e. total darkness, no hydrodynamic action and constant temperature) these habitats should be classified as enclaves of the caves of deeper zones (path = *No*).

a16. Deep circalittoral habitats which are below the euphotic zone (aphotic), thermally stable and below the influence of wave action are separated (path = *Yes*) from habitats which do not satisfy all three conditions.

a17. The deep circalittoral zone is divided according to the maximum current speed affecting the habitat; very *strong* or strong; *moderate*ly strong; and *weak to none* (weak to very weak). (See glossary.)

a18. Infralittoral zones dominated by foliose algae, within the euphotic zone in relatively shallow sub-tidal or non-tidal water, are separated (path = *Yes*) from deeper animal-dominated circalittoral zones (path = *No*). Circalittoral zones are below deeper sub-tidal or non-tidal water with insufficient light penetration to allow algae to dominate; however encrusting algae and very sparse foliose algae may be present. Note that habitats normally dominated by foliose algae, but which, as a result of storm damage or heavy grazing, are characterised by encrusting algae follow path = *Yes*.

a19. The criterion separates out habitats in the infralittoral which are *very exposed* to wave action, currents or tidal streams from those only *moderately exposed* or *sheltered*. Note that 'very exposed' includes categories belonging to the wave exposure classes "extremely exposed", "very exposed" or "exposed" OR belonging to the tidal streams/currents classes "very strong" or "strong"; 'moderately exposed' includes categories belonging to the wave exposure class "moderately exposed" OR belonging to the tidal streams/currents class "moderately strong"; and 'sheltered' includes categories belonging to the wave exposure classes "sheltered", "very sheltered", "extremely sheltered" or "ultra sheltered" OR belonging to the tidal streams/currents classes "weak" or "very weak". (See glossary.)

a20. The criterion separates out habitats in the circalittoral which are *very exposed* to wave action, currents or tidal streams from those only *moderately exposed* or *sheltered*. Note that 'very exposed' includes categories belonging to the wave exposure classes "extremely exposed", "very exposed" or "exposed" OR belonging to the tidal streams/currents classes "very strong" or "strong"; 'moderately exposed' includes categories belonging to the wave exposure class "moderately exposed" OR belonging to the tidal streams/currents class "moderately strong"; and 'sheltered' includes categories belonging to the wave exposure classes "sheltered", "very sheltered", "extremely sheltered" or "ultra sheltered" OR belonging to the tidal streams/currents classes "weak" or "very weak". (See glossary.)

a21. Habitats specific to sublittoral sources of seeping or bubbling gases or liquids through sediments are distinguished (path = *Yes*).

a22. Habitats dominated by aquatic angiosperms (path = *Yes*) are distinguished from those dominated by animal communities, with or without algae.

a23. The deep circalittoral zone below deeper water on the shelf (sub-tidal or non-tidal), characterised by stable conditions and stenothermal organisms is distinguished (path = *stable, stenothermal*) from shallower zones where the temperature regime is variable to a greater or lesser extent and the biota are eurythermal or mesothermal (path = *variable, eury- or mesothermal*).

a24. Habitats are divided on the basis of the dominating particle size of the substrate. *Gravel or coarse sand* > 1 mm grain size (including shingle and mobile cobbles); *fine sand or muddy sand* <= 1mm with <=30% silt (less than 0.063 mm grain size); *mud* >30% less than 0.063mm grain size; *combination sediments* - intimate mixtures of the above, mosaics and veneers; or *biogenic* structures.

a25. Deep-sea habitats influenced by hypoxic and/or anoxic conditions in the water column above are separated (path = *Yes*).

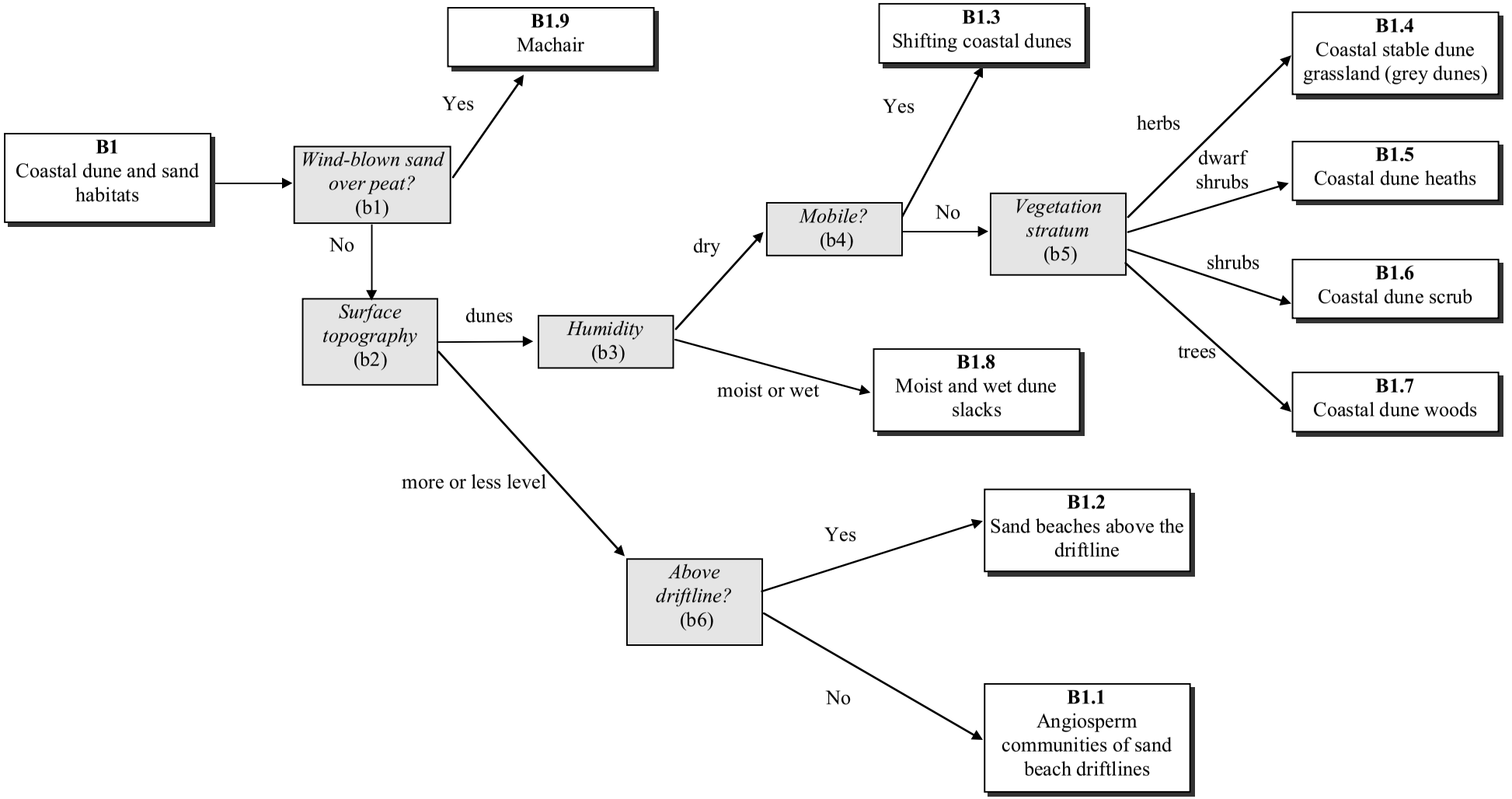
a26. Interface habitats on the deep-sea bed where reducing conditions exist are separated (path = *Yes*). These habitats are not generally associated with drastically elevated temperatures.

a27. Downslope or along-slope channels on the deep-sea bed are separated (path = *Yes*).
a28. Deep ocean trenches, typically greater than 6000m depth with an active margin reduction zone are separated (path = *Yes*).
a29. Deep-sea benthic habitats are separated into those with substrates predominantly *rock* (or artificial hard substrates)*;* of *mixed* particle size, *sand*; *muddy sand*; *mud*; or of *biogenic* origin.
a30. Habitats on isolated features of significant elevation influenced by hypoxic and/or anoxic conditions in the water column above are separated (path = *Yes*).
a31. Habitats developed at sublittoral sources of seeping or bubbling gases or liquids are distinguished (path = *Yes*).
a32. Permanently submerged flanks of emergent oceanic islands are separated (path = *Yes*) from raised features which are fully submerged.
a33. Raised ridges of the deep sea floor with elongated topography associated with the boundary of one or more tectonic plates are distinguished (path = *Yes*) from seamounts.
a34. Is the habitat developed at the interface between *air / water;* or in the main water column (path = *No*)? Note that where the habitat is developed at the interface between the substrate and water it is best described as Complex X30 - a combination of units from A1 to A6 with units from A7.
a35. Is the water column completely and actively mixed, usually due to its relatively shallow nature, (Path = *Yes*), or is it unmixed or only partially mixed because the depth of the water body is greater than the depth of mixing (Path = *No*)?
a36. Is the water column influenced by freshwater i.e. is the salinity reduced relative to the adjacent fully marine seawater (Path = *Yes*)? These units are usually found in relatively shallow, coastal situations, and are the result of river inflow or ice melt. Note that some discretion should be used in the interpretation of "adjacent", for example in the Baltic Sea, "adjacent" fully marine seawater is reached only in the Kattegat.
a37. Water columns which are not fully mixed and which have reduced salinity relative to the adjacent fully marine seawater are separated (Path = *Yes*). These units are usually found in deeper coastal water situations and are the result of river inflow or ice melt. Note that some discretion should be used in the interpretation of "adjacent", for example in the Baltic Sea, "adjacent" fully marine seawater is reached only in the Kattegat.
a38. Partially mixed reduced salinity waters with a *short* residence time are separated from those with *medium or long* residence times. Short residence time is defined as changing diurnally, medium residence time is greater than daily and up to about 14 days (based on the time required for the phytoplankton population to double) and long residence time lasting longer than 14 days.
a39. Reduced salinity habitats are distinguished by the type and degree of gradient: those with pronounced *vertical* stratification (e.g. caused by seasonal temperature changes, river discharge influence or ice-melt); *horizontal* gradients giving rise to fronts; and those with very weak gradients or *none*. Note that units with vertical stratification are separated at level 4 by the cause and degree of persistence of the gradient – e.g. seasonal temperature gradients or persistent salinity gradients etc. Units with horizontal stratification are separated at level 4 by the degree of persistence of the stratification.
a40. Full salinity habitats characterised by the degree and direction of gradient are distinguished: those with pronounced *vertical* stratification (e.g. caused by atmospheric temperature); *horizontal* gradients giving rise to fronts; and those with very weak gradients or *none*. Note that units with horizontal stratification are separated at level 4 by the degree of persistence of the stratification – ephemeral such as eddies, gyres and upwellings; seasonal upwellings; or persistent water mass interfaces.
a41. Is the habitat developed at the interface between the lower surface of the ice and the water column below (path = *Yes*), or is it on the upper surface of or within the ice itself (path = *No*)?

a42. Is the habitat developed within the ice matrix in a three-dimensional network of tubes and channels containing brine solution, characterised by low light intensity, low temperature and high salinity (path = *Yes*)?

a43. Is the ice of freshwater origin, originating from a glacier (path = *freshwater ice*), or is it frozen seawater (path = *sea ice*)?

EUNIS Habitat Classification: criteria for coastal dune and sand habitats (B1) to Level 3
(number) refers to explanatory notes to the key



EUNIS Habitat Classification: criteria for coastal shingle habitats (B2) to Level 3
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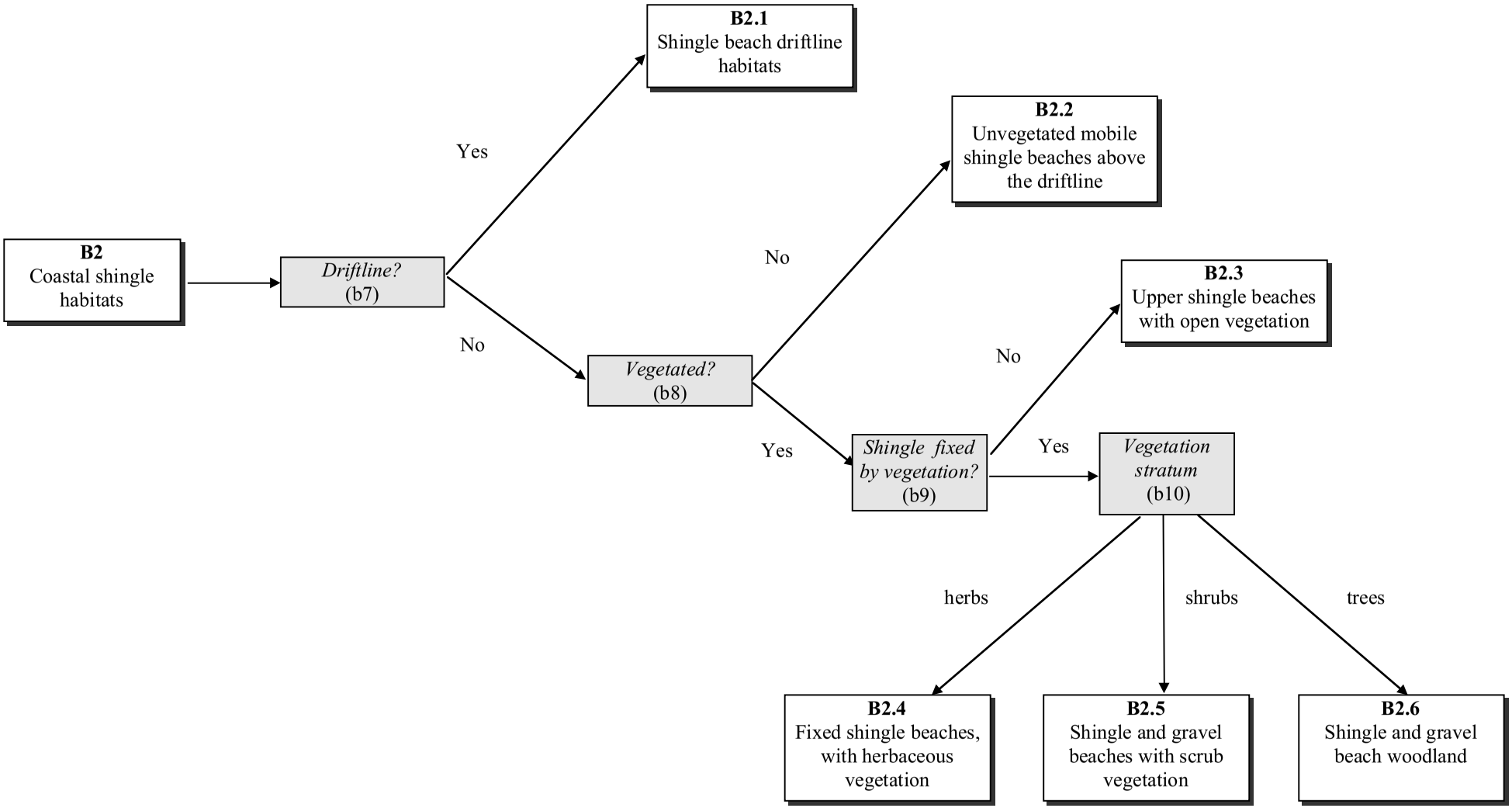
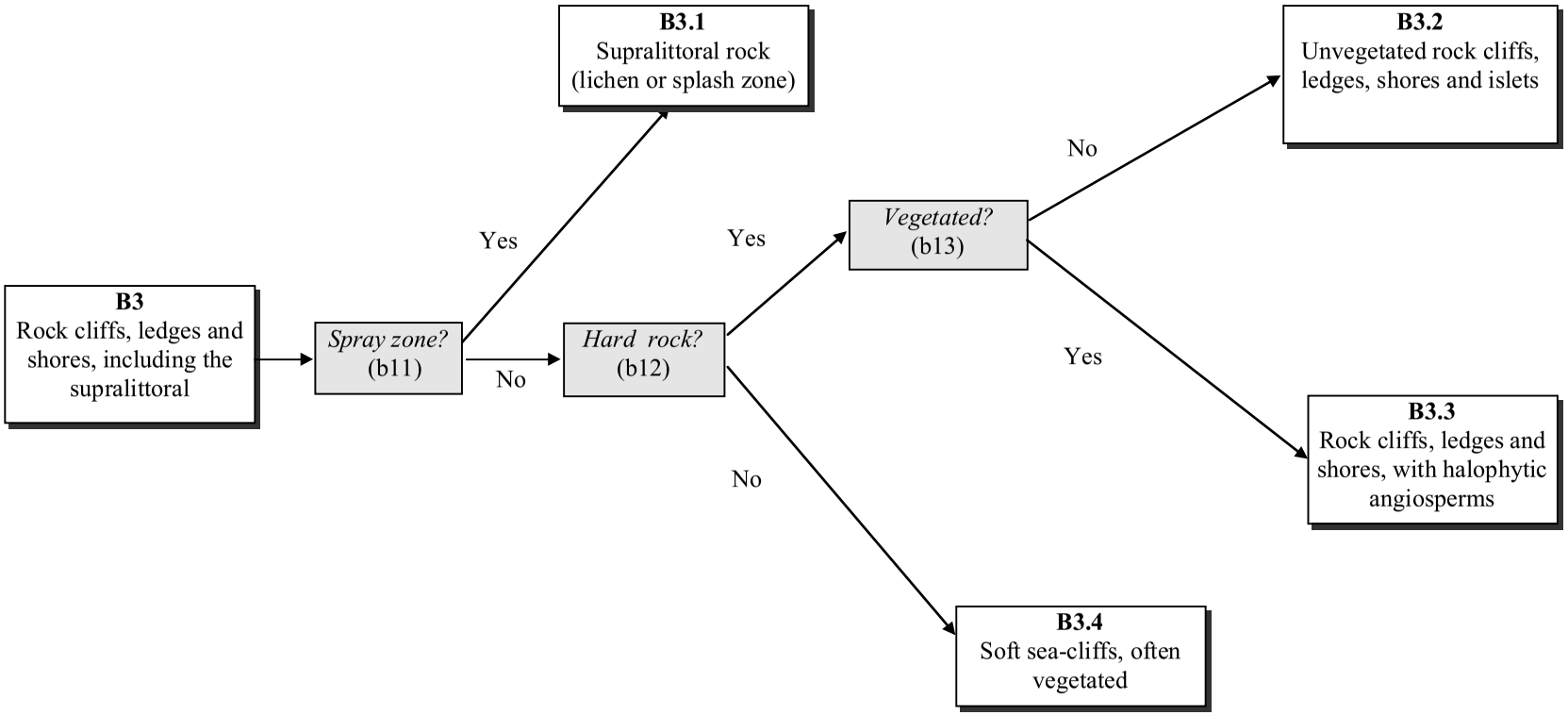


EUNIS Habitat Classification: criteria for rock cliffs, ledges and shores, including the supralittoral (B3) to Level 3
(number) refers to explanatory notes to the key



Explanatory notes to the key: Level 3 (Habitat type B)

b1. Machair (characterised by wind-blown calcareous sand with a predominance of shell fragments usually over peat, a low proportion of sand-binding vegetation and a long history of agricultural use) (path = *Yes*), is distinguished from other coastal sand habitats. Note that a machair complex is defined comprising units from B1, C and I.

b2. The topography of the surface distinguishes the abrupt mounds and hollows of sand *dunes* from *more or less level* sand beach habitats.

b3. *Dry* sand dunes are distinguished from *moist or wet* dune slacks. Note that dune slack pools are categorised under C.

b4. Unvegetated mobile sand dunes (path = *Yes*) are separated from dunes which have become stabilised by vegetation.

b5. Predominant vegetation type is used to distinguish between: dune grassland (*herbs*); dune heath (predominantly ericaceous *dwarf shrubs*); dune scrub (*shrubs*); and dune woodland (*trees*).

b6. Driftline habitats characterised by lines of wave-deposited organic material colonised by annual angiosperms are distinguished (path = *No*) from mobile sand beaches above the driftline. Note that freshly deposited driftlines characterised by marine invertebrates and without annual vegetation are included in A2.

b7. Driftline habitats characterised by lines of wave-deposited organic material are distinguished (path = *Yes*) from mobile or stabilised shingle beaches above the driftline.

b8. Unvegetated mobile shingle beaches (path = *No*) are separated from more stable vegetated coastal shingle habitats.

b9. Fixed shingle habitats with vegetation of grasses or heaths (path = *Yes*) are distinguished from more open communities dominated by other herbaceous species on substrates which may be more mobile.

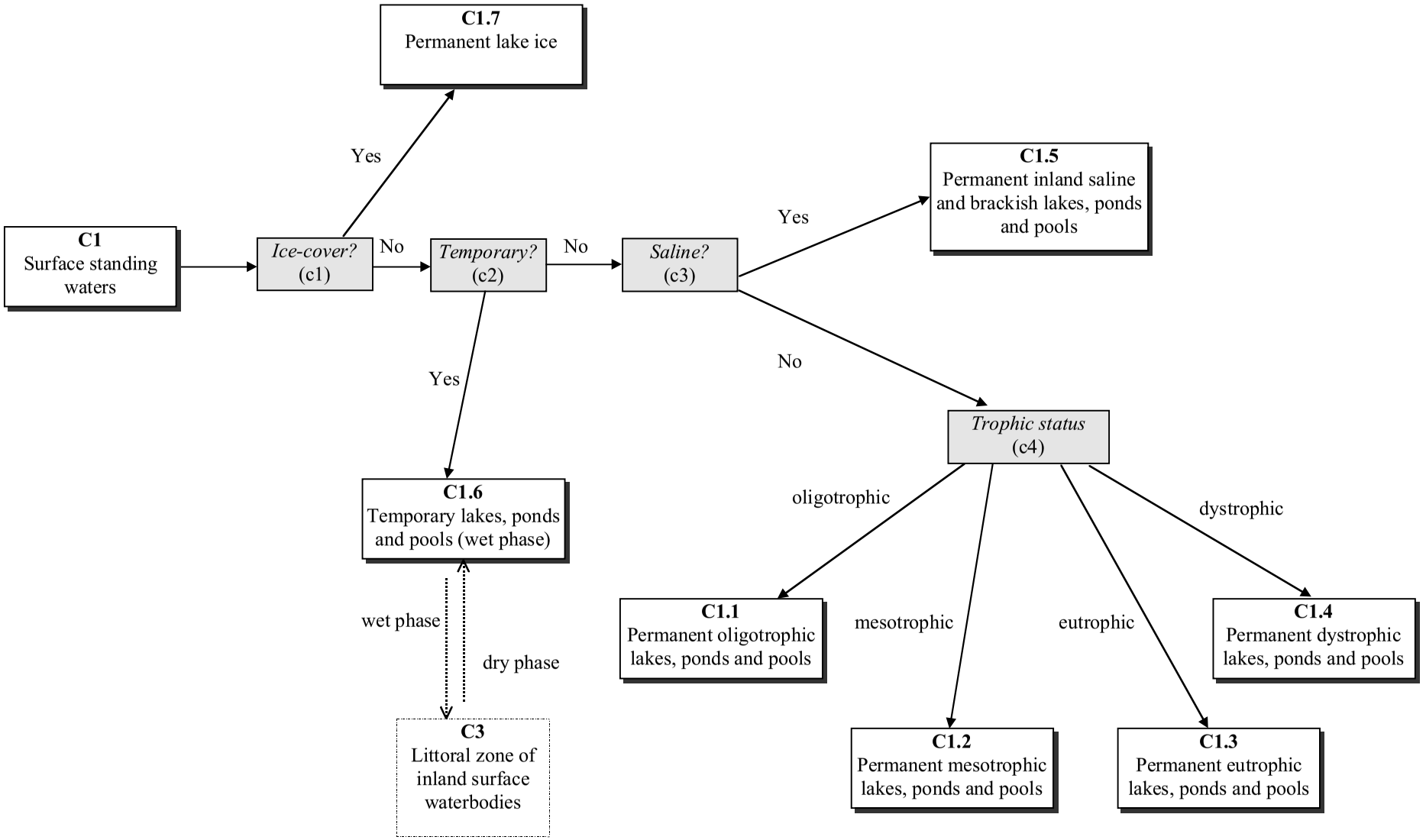
b10. Predominant vegetation type is used to distinguish between: shingle and gravel beach grassland, (*herbs*); shingle and gravel beach scrub (*shrubs*); and shingle and gravel beach woodland (*trees*).

b11. The lichen or spray zone above the high tide mark (or above the mean water level where non-tidal) (path = *Yes*) is distinguished from rock habitats not regularly affected by spray. Note that rock pools in the supralittoral are classified as enclaves of littoral rock pools.

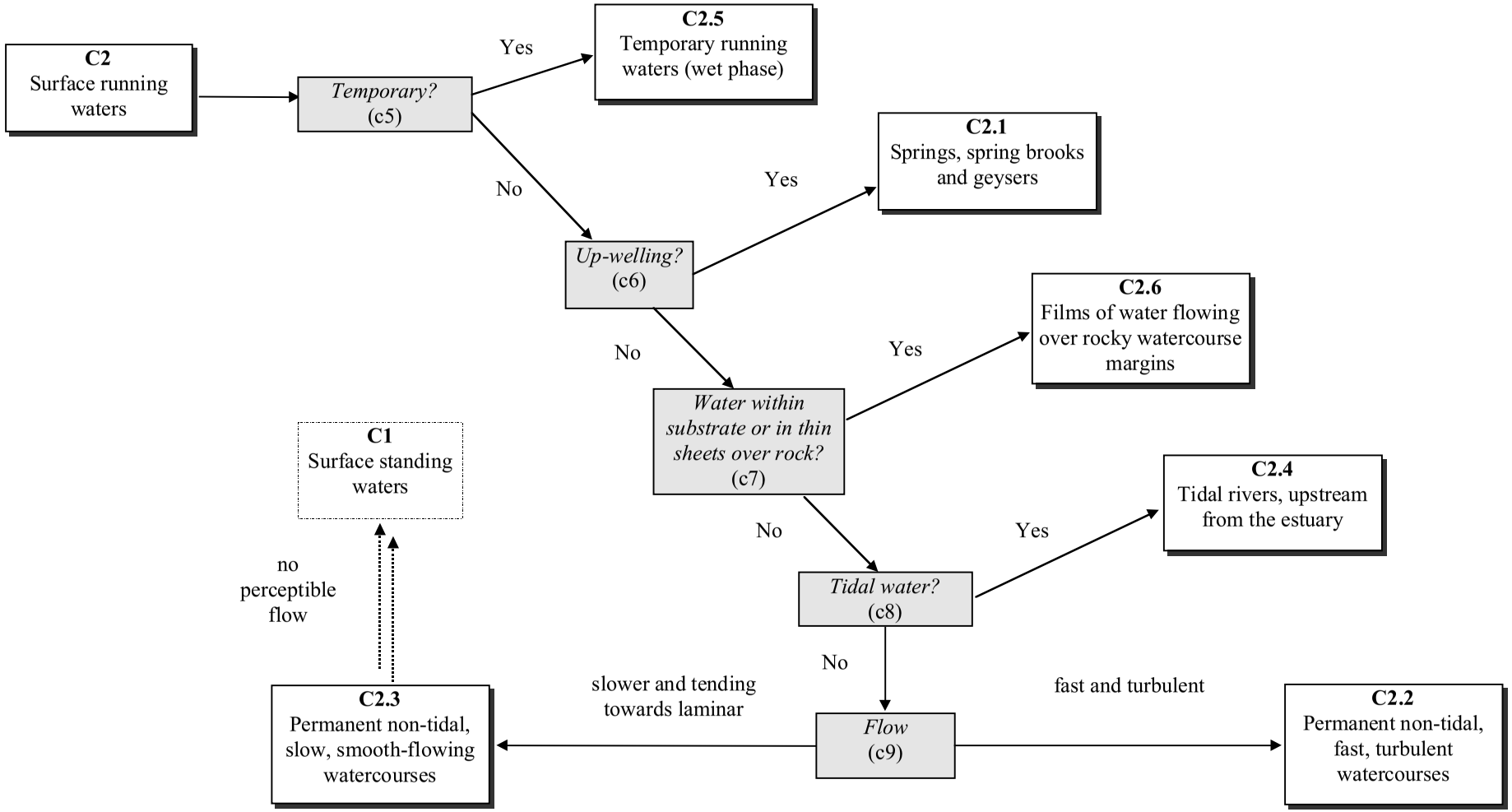
b12. Hard rock cliffs and ledges (path = *Yes*) are distinguished from cliffs of relatively soft, unconsolidated material.

b13. Unvegetated coastal hard rock cliffs and ledges (path =*No*) are separated from rocky habitats with halophytic angiosperms (path = *Yes*).

EUNIS Habitat Classification: criteria for surface standing waters (C1) to Level 3
(number) refers to explanatory notes to the key

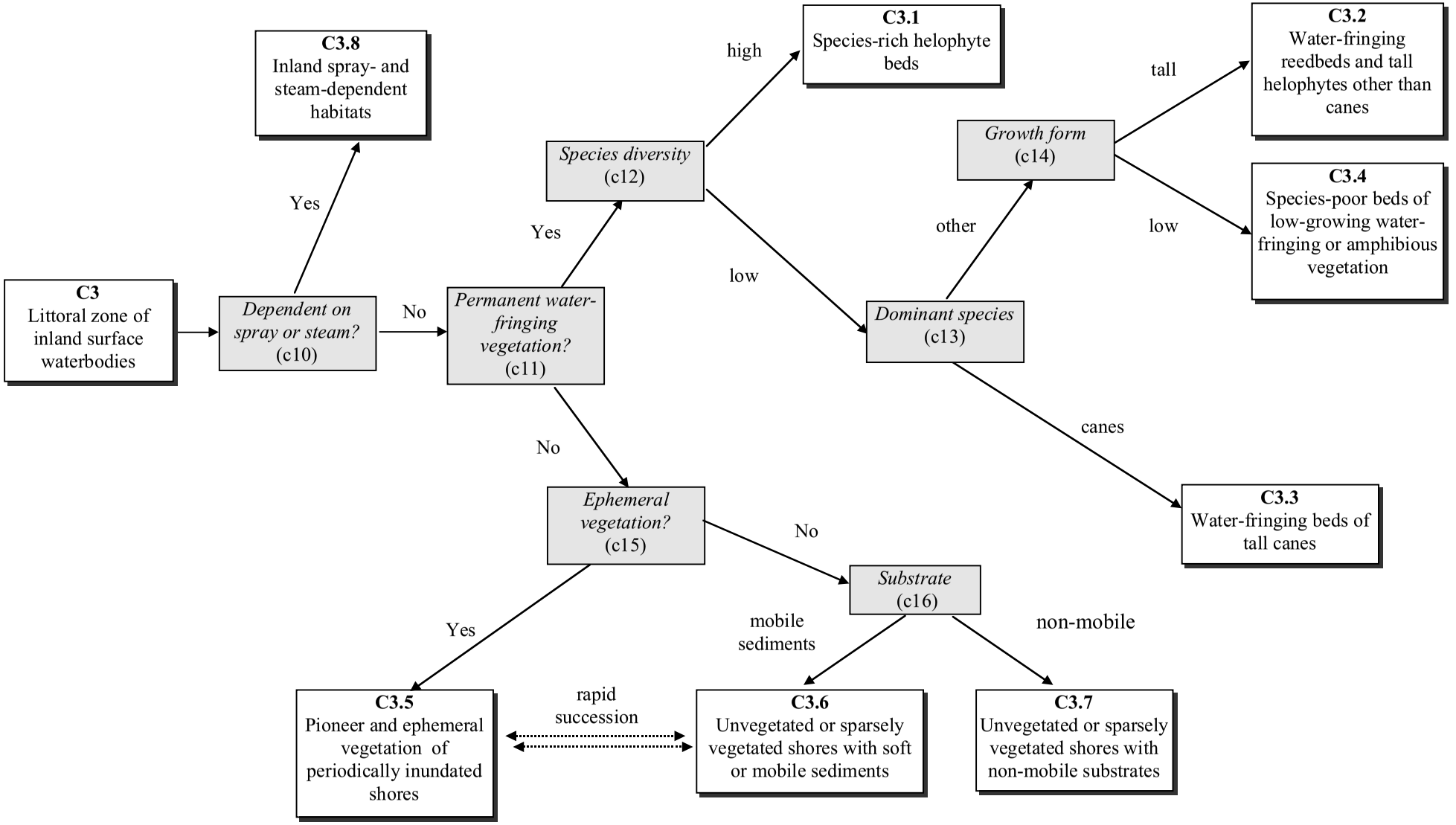


EUNIS Habitat Classification: criteria for surface running waters (C2) to Level 3
(number) refers to explanatory notes to the key



EUNIS Habitat Classification: criteria for littoral zone of inland surface waterbodies (C3) to Level 3

(number) refers to explanatory notes to the key



Explanatory notes to the key: Level 3 (Habitat type C)

c1. Permanent or almost permanent ice formations of lakes (continuous ice sheets that cover the entire surface for all of the year or which recede to part of the lake during summer accompanied or replaced by floating ice blocks, rafts and hummocks) (path = *Yes*) are distinguished from waterbodies with open water, which may or may not have occasional ice cover.

c2. Seasonal and otherwise temporarily-filled lakes, ponds and pools (path = *Yes*) are separated from surface water of more permanent character. Note that the wet phase only of temporary standing waters is characterised here. The habitat in its dry phase is normally characterised under C3. Note that temporarily flooded meadows and riverine forests are characterised as grassland and forest respectively.

c3. Inland saline and brackish lakes and pools are separated (path = *Yes*) from waterbodies with freshwater.

c4. Standing waters are separated on the basis of their trophic status; *oligotrophic* waters, of low nutrient status, usually on hard, acid rock with high oxygen concentration in the hypolimnion; *mesotrophic* waters, intermediate between oligotrophic and eutrophic waters; *eutrophic* waters with high productivity and potentially low oxygen concentration in the hypolimnion; *dystrophic* waters which are rich in humus, often with a brown colour.

c5. Seasonal and otherwise temporary running surface waters (path = *Yes*) are separated from surface running waters of more permanent character.

c6. Springs and geysers where the flow is caused by up-welling from the substrate and the stream immediately below, where the temperature regime is similar to the source water and significantly different from the surroundings, are distinguished (path = *Yes*).

c7. Habitats characterised by thin layers of moving water over rock surfaces adjacent to open water are distinguished (path = *Yes*) from the main open waterbody with which they are associated.

c8. Tidal rivers and streams (which may or may not be brackish) upstream of the estuary are distinguished (path = *Yes*) from running water not affected by tides. Note that estuarine waters, with variable salinity usually greater than 0.5ppt, are categorised under A and estuaries as complex X01.

c9. Watercourses where the flow-rate is *fast and turbulent* are distinguished from rivers where flow is *slower and tends towards* becoming *laminar*. Note that where flow is fast and turbulent, the oxygen concentration is high, and the bed usually composed of rocks, stones or gravel with only occasional sandy and silty patches; where flow is slower, oxygen concentration deficits may occur at times, and normally the substrate is mainly sand and mud. Rivers that are fast but with laminar flow follow path = *slower and tends towards* becoming *laminar*.

c10. Habitats dependent on spray or steam alongside waterfalls, geysers, and hot springs are separated (path = (*Yes*). Note that the spray zone of the supralittoral marine zone is categorised under B.

c11. Areas with significant cover by permanent water-fringing or amphibious vegetation normally in shallow water, but which may occasionally be subject to drying out (path = *Yes*) are separated from periodically inundated shores which are either unvegetated or characterised by ephemeral, seasonal or very sparse vegetation.

c12. Habitats with amphibious or helophytic vegetation of reeds or other graminoids and other helophytes (plants rooted in, but emergent from, mud or water) which may be dominated by a single species, but which also have associated layers of diverse smaller herbaceous species (species diversity = *high*), are distinguished from habitats which are dominated by one or two plant species and whose species diversity is relatively *low*.

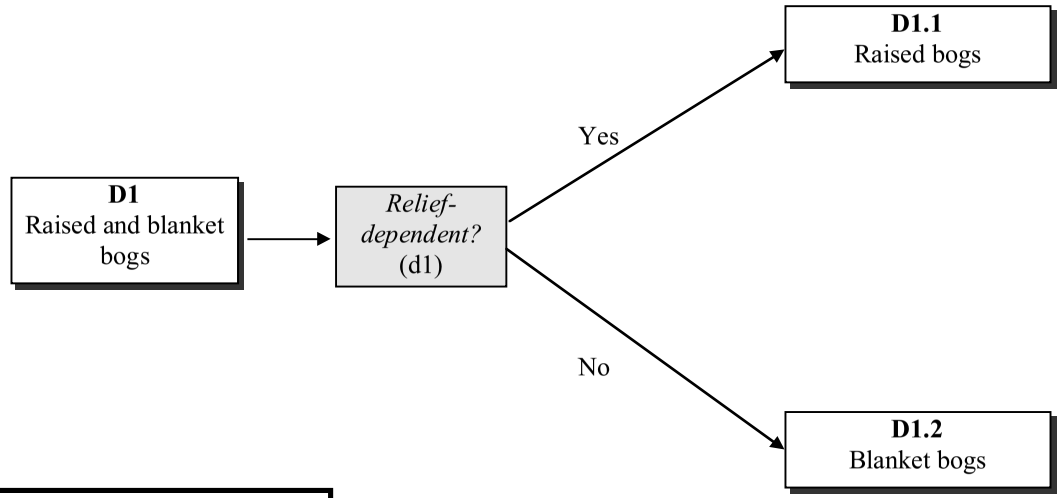
c13. Habitats with low species diversity where the dominant species are *canes* (e.g. *Arundo* sp., *Saccharum ravennae*) are separated from those with reeds or *other* helophytes.

c14. Species-poor water-fringing beds of *tall* emergent vegetation with no associated lower herb layer are separated from species-poor habitats with *low*er-growing emergent or amphibious vegetation

c15. Areas with pioneer vegetation and ephemeral annual vegetation (path = *Yes*) are separated from more or less unvegetated emergent banks and shores subject to periodic inundation.

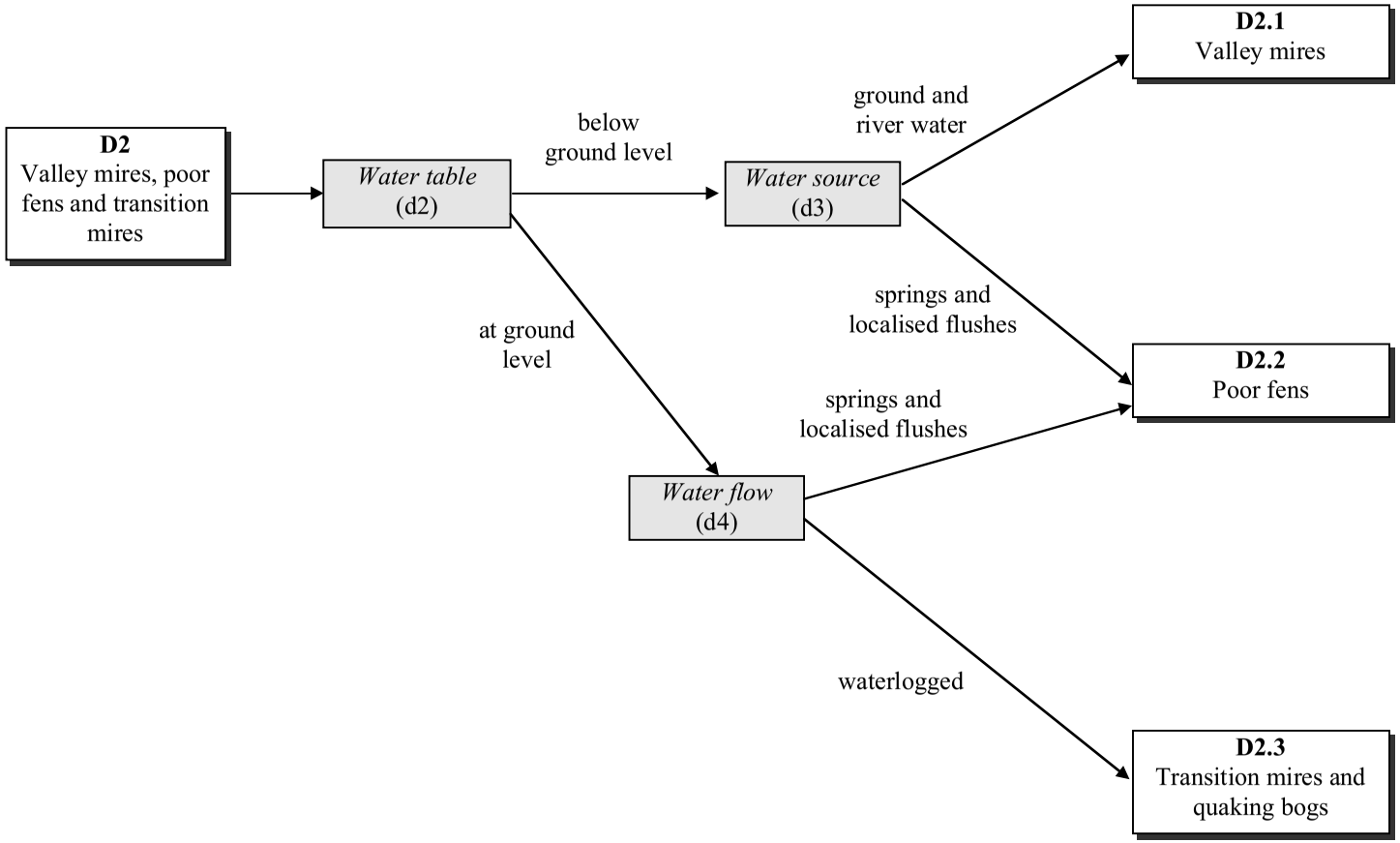
c16. Unvegetated periodically inundated shores and emergent banks are separated according to their substrate. *Mobile sediments* (such as mud, sand and mobile gravel) are distinguished from *non-mobile* hard or firm substrates including rock, boulders, consolidated clay and peat. Note that rapid succession between the habitat comprising unvegetated mobile sediment (C3.7) and ephemeral vegetation (C3.6) is likely and periods of inundation or submersion may cause reversal of the succession.

EUNIS Habitat Classification: criteria for raised and blanket bogs (D1) to Level 3
(number) refers to explanatory notes to the key

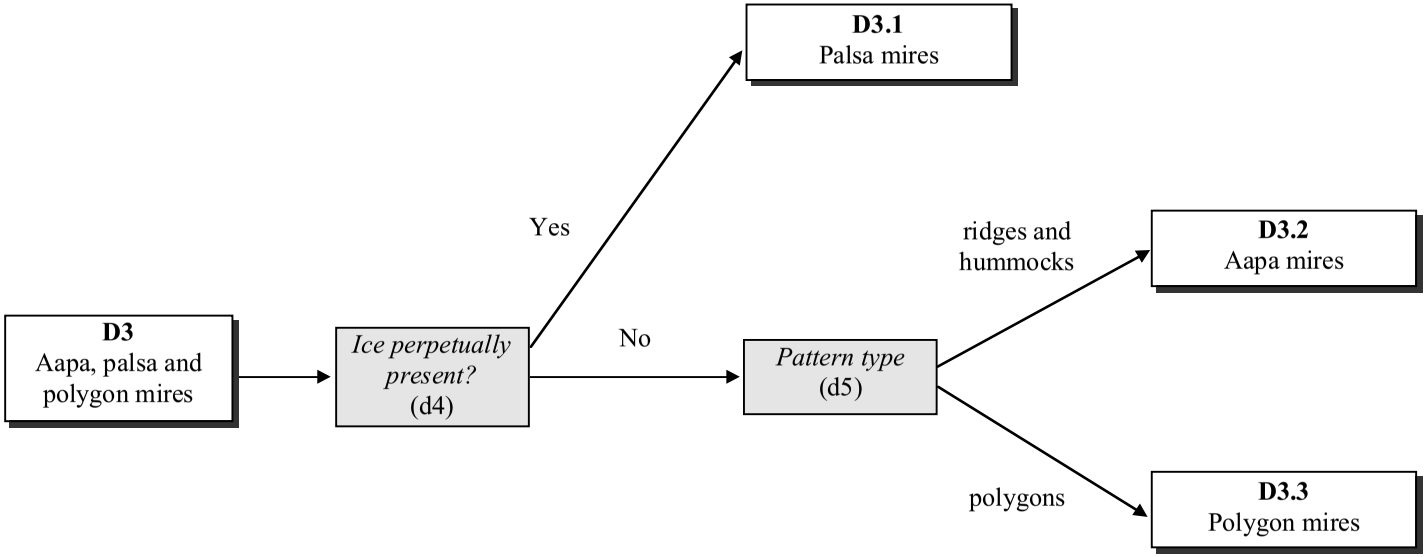


Note: the complete raised bog system is treated as a complex (X04). The vegetation of the raised bog is included within D1.1, and the open water elements (raised bog pools and lagg) within C1.4. A blanket bog complex may also be defined comprising elements of D and C

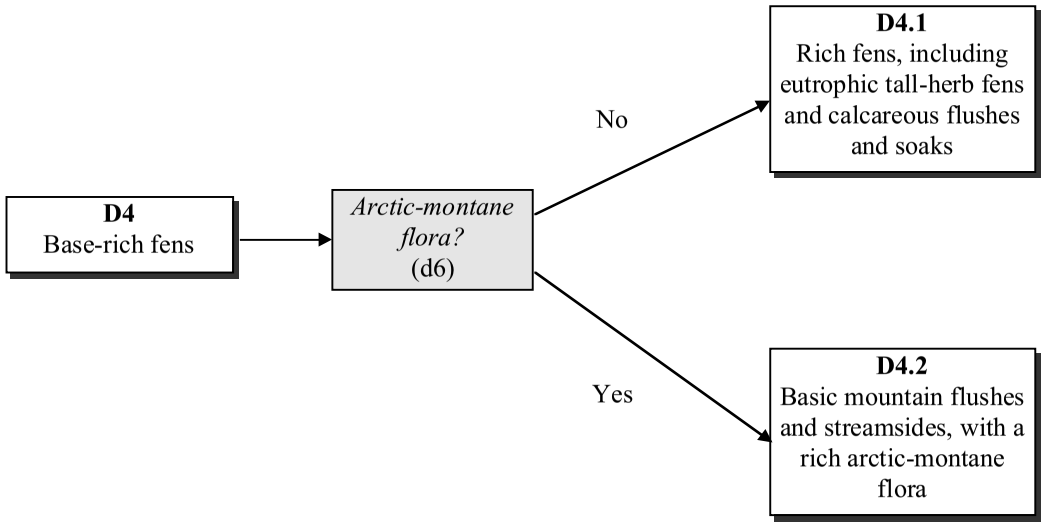
EUNIS Habitat Classification: criteria for valley mires, poor fens and transition mires (D2) to Level 3
(number) refers to explanatory notes to the key



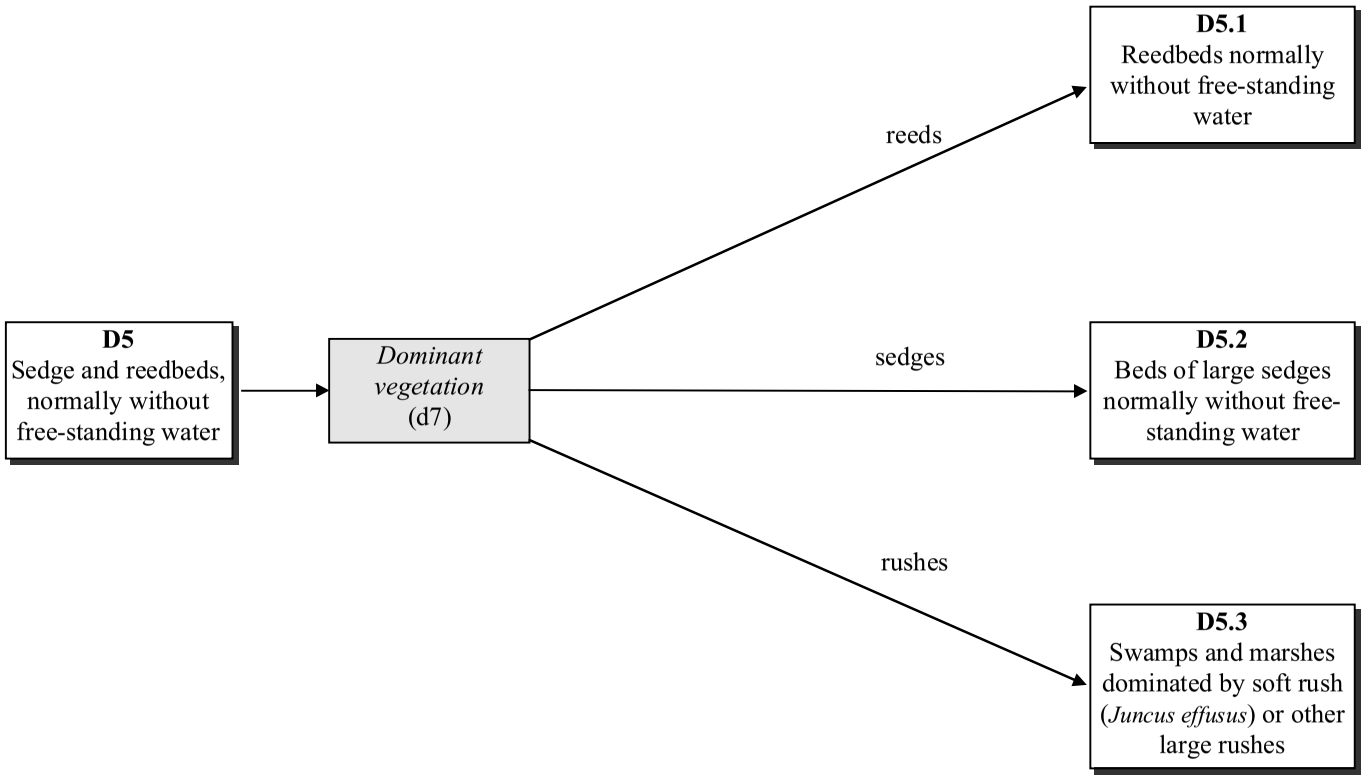
EUNIS Habitat Classification: criteria for aapa, palsa and polygon mires (D3) to Level 3



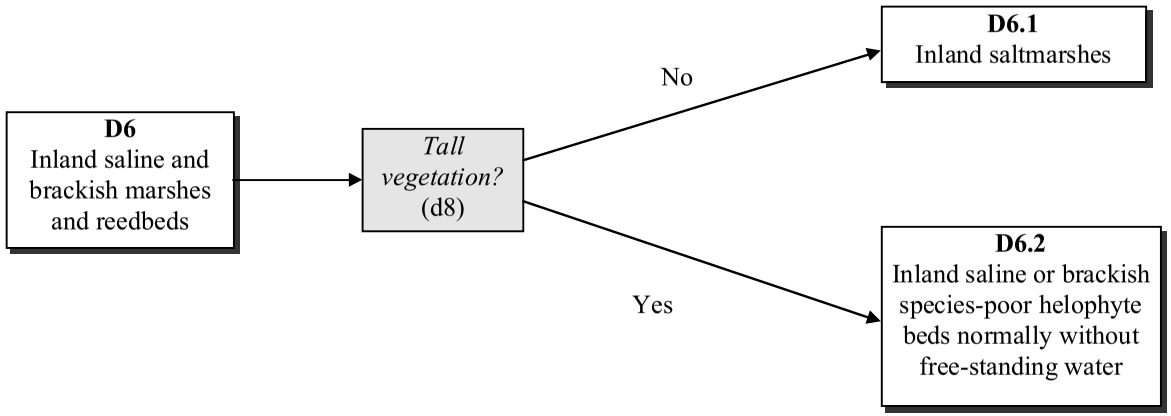
EUNIS Habitat Classification: criteria for base-rich fens (D4) to Level 3
(number) refers to explanatory notes to the key



EUNIS Habitat Classification: criteria for sedge and reedbeds, normally without free-standing water (D5) to Level 3
(number) refers to explanatory notes to the key



EUNIS Habitat Classification: criteria for inland saline and brackish marshes and reedbeds (D6) to Level 3
(number) refers to explanatory notes to the key



Explanatory notes to the key: Level 3 (Habitat type D)

d1. The criterion separates blanket bogs which follow but do not depend upon the topography, developing on flat or gently sloping ground with poor surface drainage (path = *No*) from raised bogs which are dependent upon the topography for their initial development, forming over depressions or on slopes (path = *Yes*). Raised bogs include a number of topographic types such as saddle and sloping bogs, and also condensation mires[1] (classified as D1.13).

d2. Transition mires where the water table is *at ground level*, where peat forms mostly in water, are distinguished from valley bogs and poor fens, where the water table is *below ground level* and peat forms in more-or-less saturated conditions.

d3. Poor fens (acid flushes dominated by small sedges and often sphagna) developing on a slope and fed with water flowing laterally from *springs and localised flushes* are distinguished from valley mires (peat areas maintained by *ground and river water*).

d4. Transition mires and quaking bogs where the ground is *waterlogged* are distinguished from poor fens fed with water flowing laterally from *springs and localised flushes*.

d5. Mires developing in permafrost zones where ice is present as a central solid ice core in a raised butte (path = *Yes*), are separated.

d6. Patterned frost-dependent mires are separated between aapa mires consisting of *ridges and hummocks* with alternating hollows, transverse to the slope, and mires characterised by structures of large *polygons*, 10 to 30 metres in diameter, formed by the juxtaposition of dry ridges, 0.3 to 0.5 metres high, and wet hollows.

d7. Habitats with small sedge fen and related vegetation of mountains maintained in an open condition by water movement and / or freeze thaw action are separated (path = *Yes*). Note that the habitat type may extend to lower altitudes in colder, northern parts of Europe.

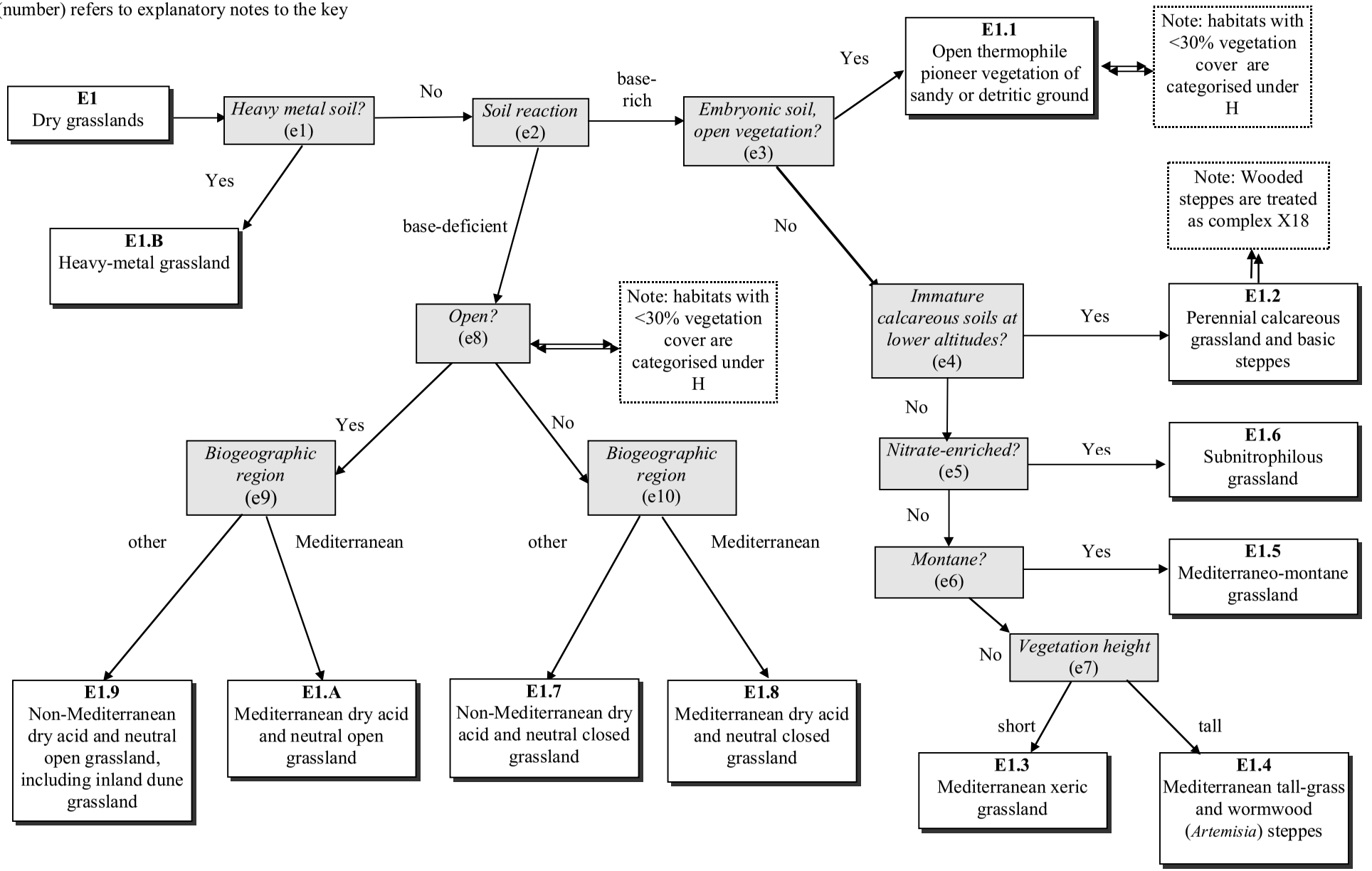
d8. Species-poor sedge and reed beds are separated according to the dominant vegetation type: *reeds* (including e.g. *Phragmites, Scirpus* and *Typha); sedges* (*Carex* and *Cyperus)*; and *rushes* (*Juncus)*.

d9. Vegetation dominated by few species of tall-growing graminoid macrophytes tolerant of saline or brackish conditions (path = *Yes*) are distinguished from habitats characterised by salt-dependent low-growing vegetation.

[1] There are about 20 examples of this outstanding mire type in the Alps and the Jura mountains, some of them up to 5 ha in size. They have developed on rock slides where, due to the cold air efflux from the cave system inside the rock slide, the water condenses on the surface. This condensation water is the basis for the formation of big *Sphagnum capillifolium* hummocks which merge together and thus form a peat layer of about 2 m depth. Being only supplied by atmospheric water it belongs to D1.

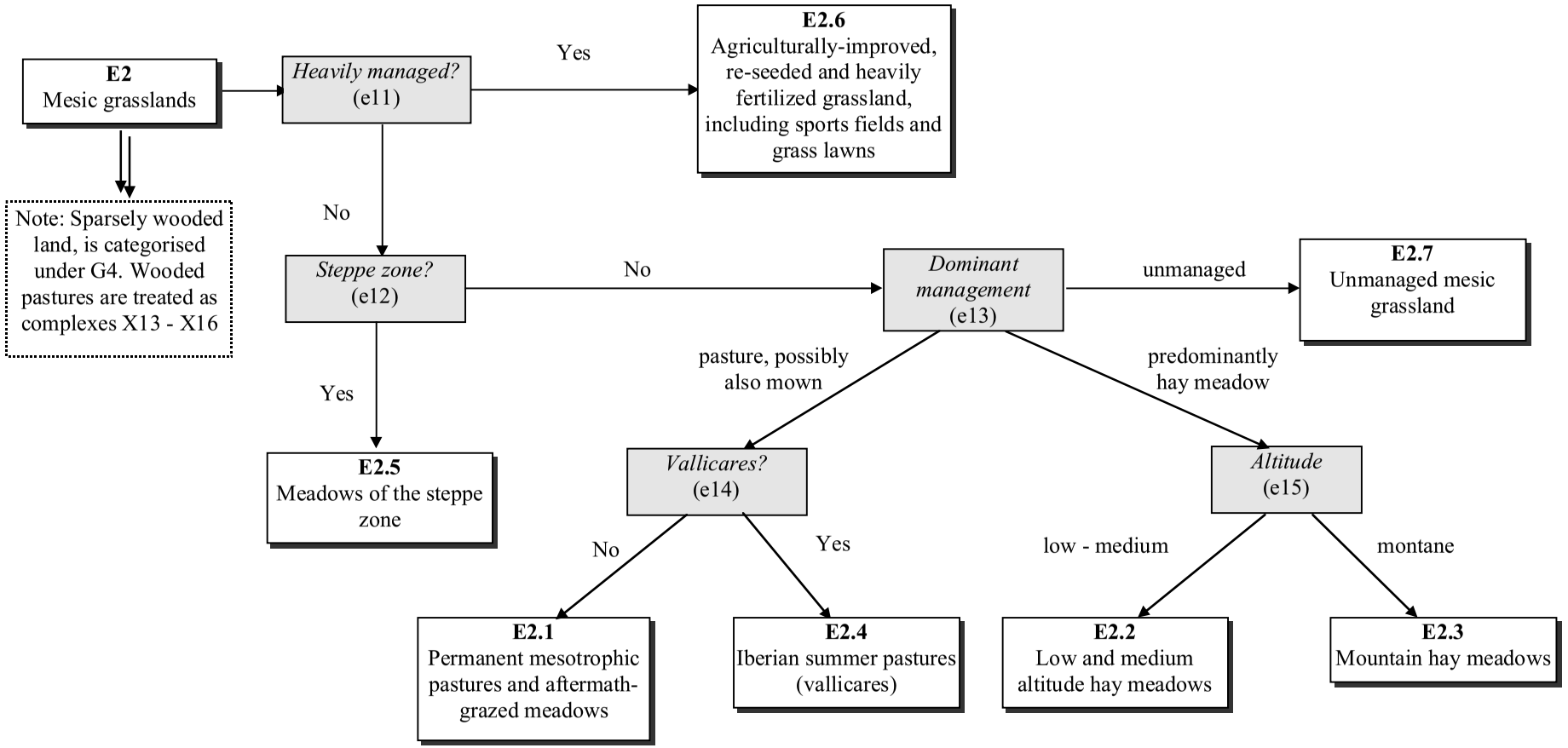
EUNIS Habitat Classification: criteria for dry grasslands (E1) to Level 3

(number) refers to explanatory notes to the key

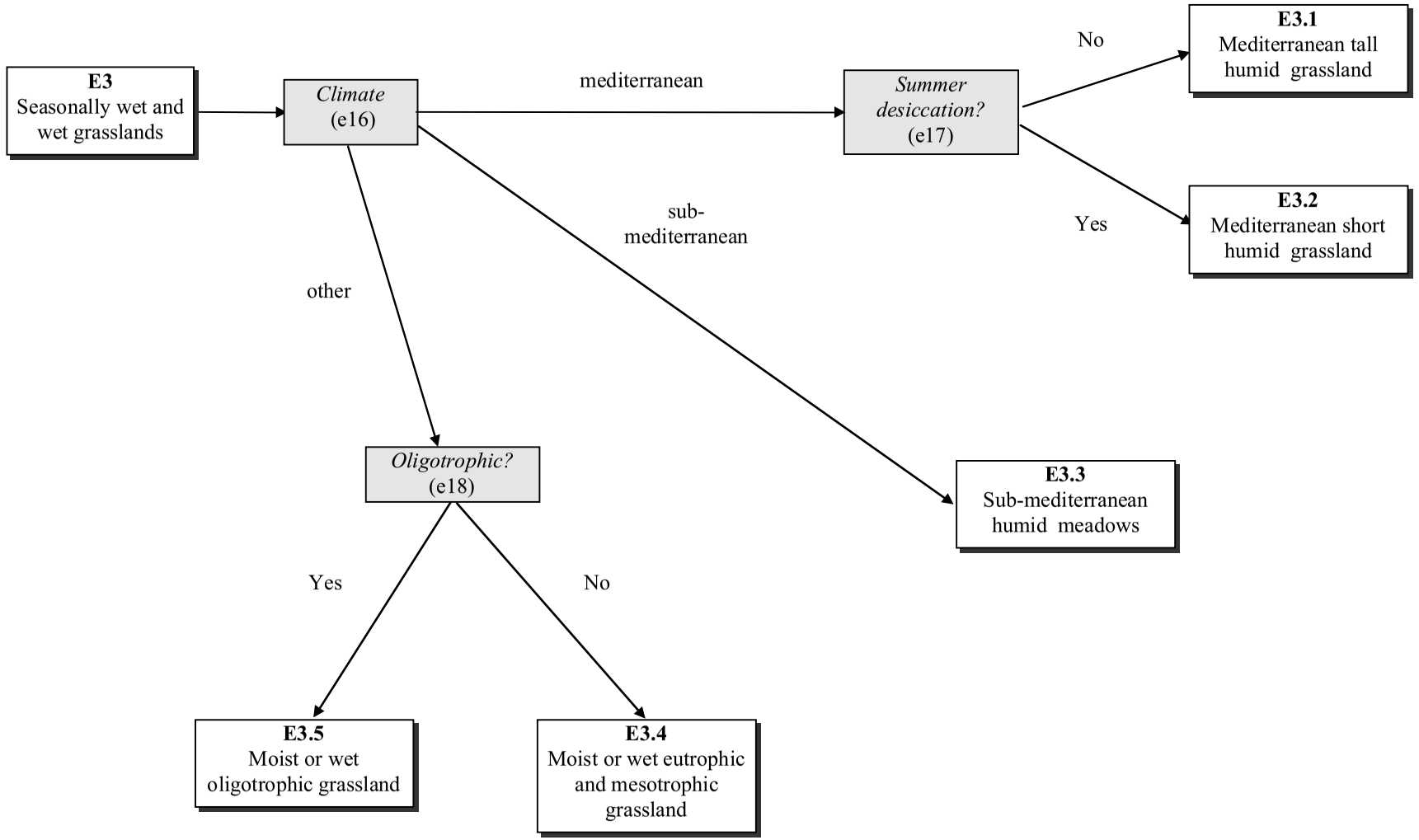


EUNIS Habitat Classification: criteria for mesic grasslands (E2) to Level 3

(number) refers to explanatory notes to the key

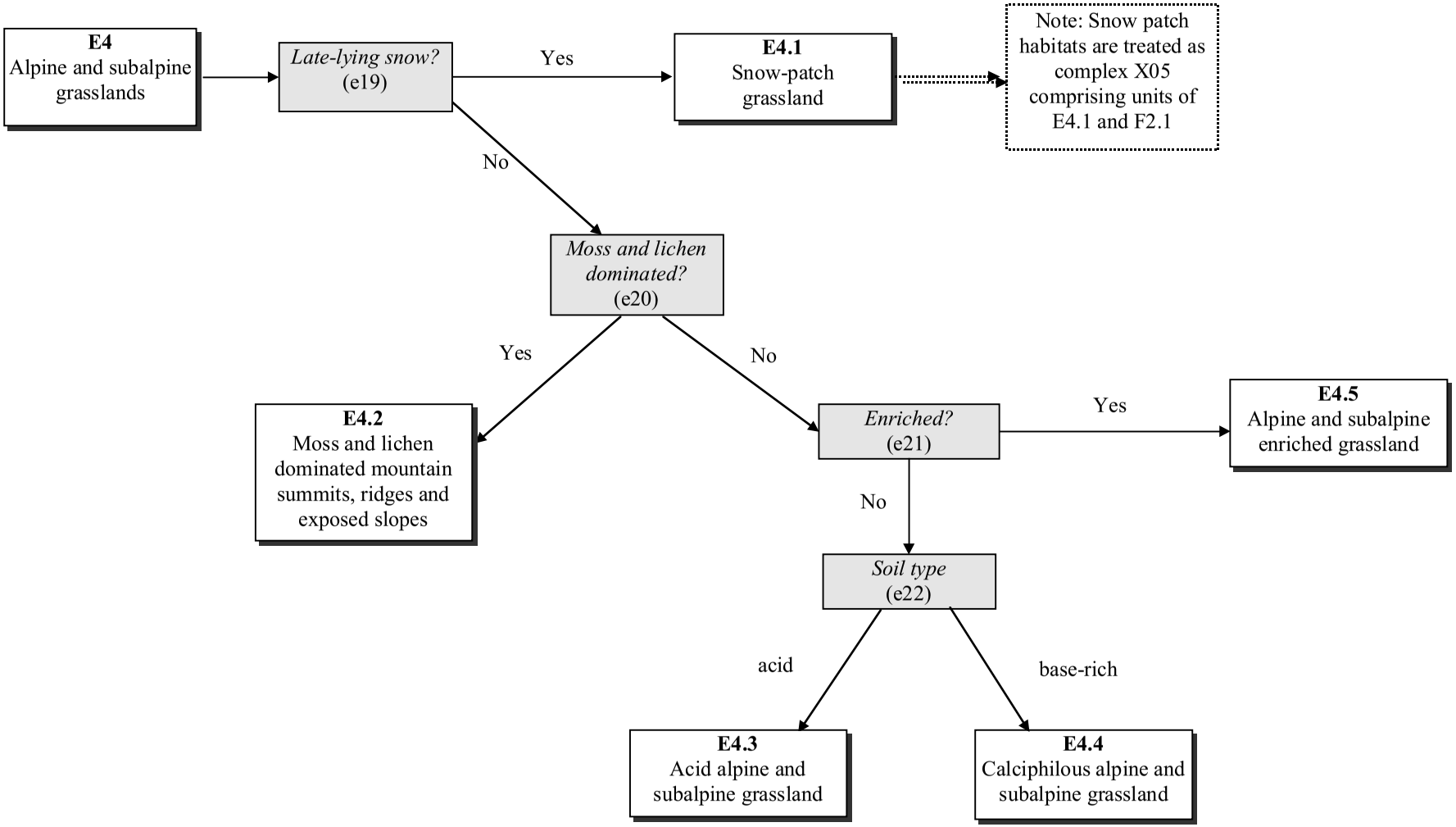


EUNIS Habitat Classification: criteria for seasonally wet and wet grasslands (E3) to Level 3
(number) refers to explanatory notes to the key

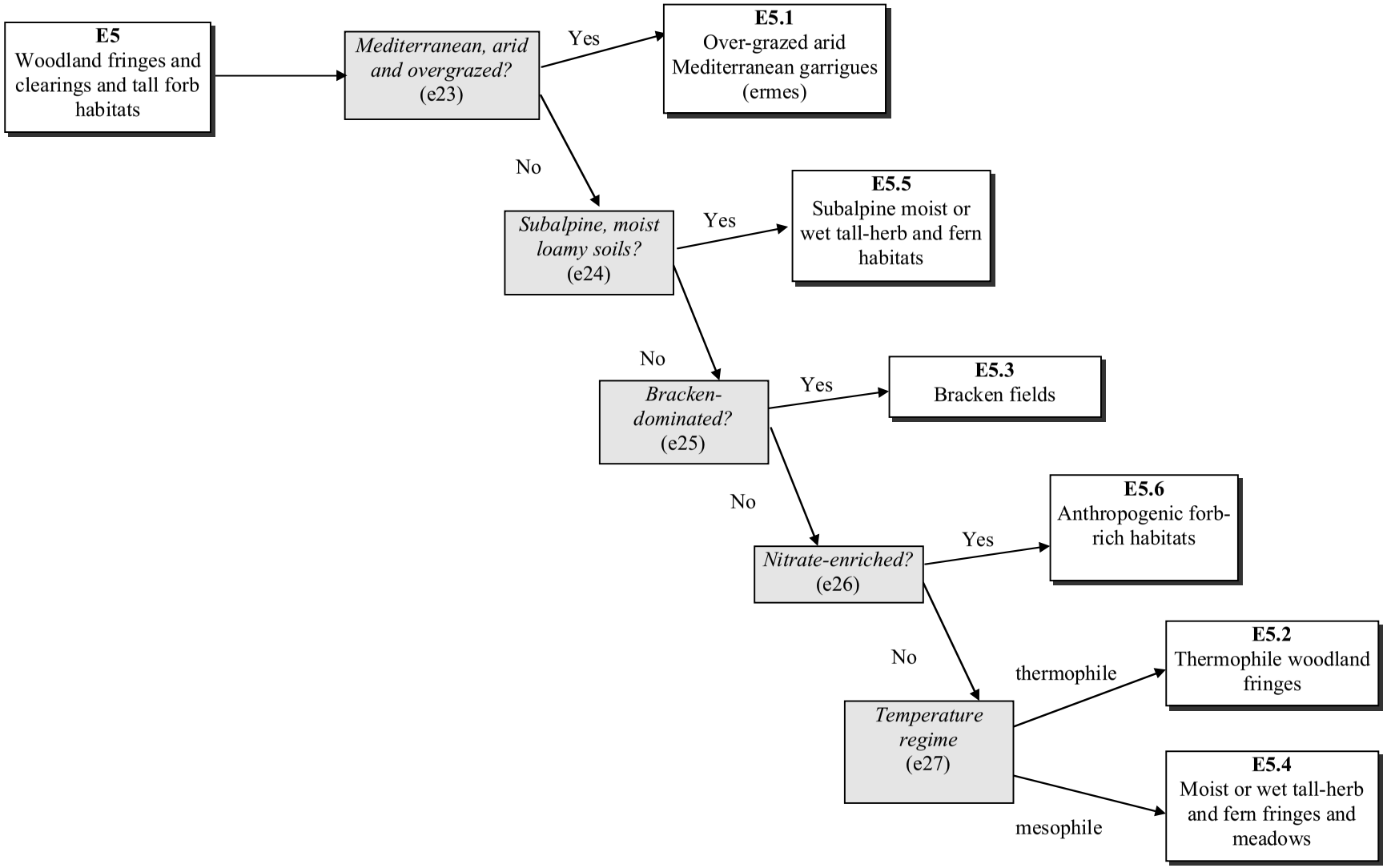


EUNIS Habitat Classification: criteria for alpine and subalpine grasslands (E4) to Level 3

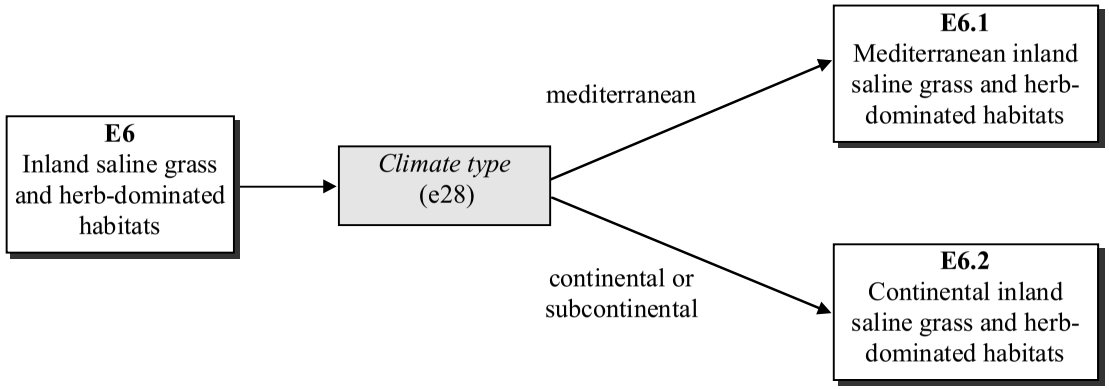
(number) refers to explanatory notes to the key



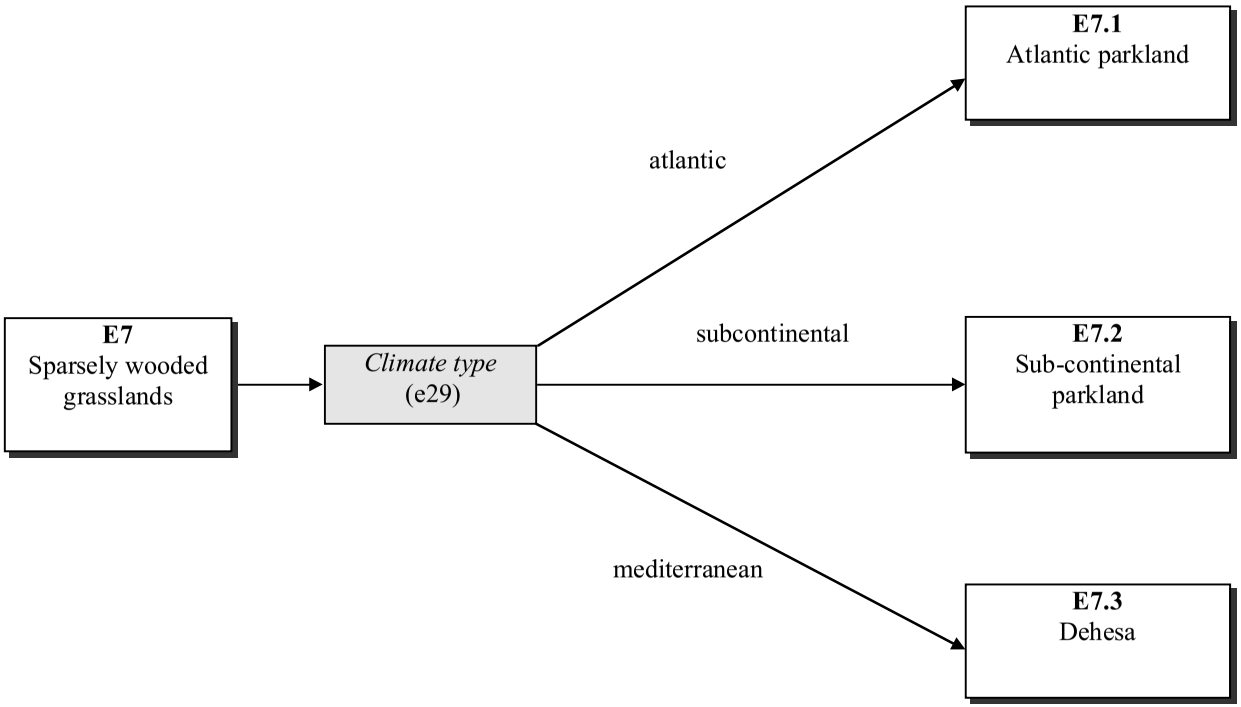
EUNIS Habitat Classification: criteria for woodland fringes and clearings and tall forb and fern habitats (E5) to Level 3
(number) refers to explanatory notes to the key



EUNIS Habitat Classification: criteria for inland saline grass and herb-dominated habitats (E6) to Level 3
(number) refers to explanatory notes to the key



EUNIS Habitat Classification: criteria for sparsely wooded grasslands (E7) to Level 3
(number) refers to explanatory notes to the key



Explanatory notes to the key: Level 3 (Habitat type E)

e1. Grasslands with metalliferous soils are separated (path = *Yes*) from those on calcareous, neutral or acid soils without a high heavy metal content.

e2. *Base-rich* grasslands are distinguished from *base-deficient* dry grassland habitats.

e3. Habitats on embryonic sandy or detritic soil with open pioneer vegetation (path = *Yes*) are distinguished from those on more developed soils. Note that very sparsely vegetated scree habitats are categorised under H2 and sparsely vegetated sandy ground under H5.3.

e4. Grasslands and steppes on immature calcareous soils at lower altitudes, often drought prone, typically comprising phytosociological communities of *Festuco-Brometea*, are separated (path = *Yes*).

e5. Grasslands of soils which are slightly enriched in nitrates, typically comprising phytosociological communities of *Brometalia rubenti-tectori*, or *Agropyrion intermedii* are separated (path = *Yes*).

e6. Open perennial grasslands of the montane thermophilous oak level of the Mediterranean climatic zone are separated (path = *Yes*).

e7. *Short* xerophile Mediterranean grasslands typically comprising phytosociological communities of *Thero-Brachypodietea* are distinguished from *tall* Mediterranean grasslands and *Artemisia* steppes.

e8. Open acid and neutral grasslands, usually pioneer formations developing on sand, including inland dunes, are separated (path = *Yes*).

e9. *Mediterranean* dry open acid and neutral grasslands are separated from those in *other* biogeographic regions.

e10. *Mediterranean* dry closed acid and neutral grasslands are separated from those in *other* biogeographic regions.

e11. The criterion separates intensively grazed or frequently mown, re-seeded and heavily fertilised grasslands (usually with restricted species composition) including sports fields and lawns (path = *Yes*) from less heavily managed habitats.

e12. Mesophile lowland and montane pasture and hay meadows of the Sarmatic, eastern Pontic and Siberian steppe zone are separated (path = *Yes*).

e13. Habitats are distinguished by the present or recent dominant management regime. *Pastures*, which are *possibly also mown* but the dominant management is grazing are separated from hay meadows where the predominant activity is mowing (path = *predominantly hay meadows*. *Unmanaged* grasslands show no evidence of recent management.

e14. Distinctive vallicares are separated (path = *Yes*). These are summer pastures of the Iberian peninsula, characterised by poor drainage, brief flooding and rapid desiccation, usually supporting phytosociological community *Agrostion castellanae*.

e15. *Low to medium* altitude hay meadows are distinguished from those in *montane* areas, usually above 600m altitude.

e16. The criterion separates out habitats with *mediterranean*; *sub-mediterranean*; or *other* climate types.

e17. Short-herb communities subject to alternating extreme conditions of inundation and summer desiccation (path = *Yes*) are distinguished from tall grassland in permanently humid conditions.

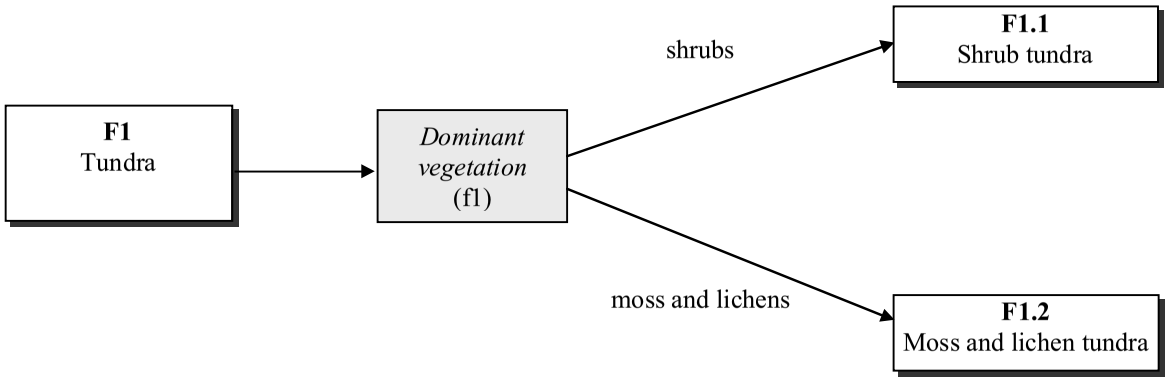
e18. Nutrient-poor (often acid) grasslands (path = *Yes*) are separated from meso- and eutrophic habitats. Note that nutrient-poor grasslands may be rich in chalk.

e19. Grassland habitats of areas that retain late-lying snow (i.e. areas retaining snow for longer than usual for that latitude and altitude) are separated (path = *Yes*). Note that permanently snow or ice covered habitats are categorised under H4.

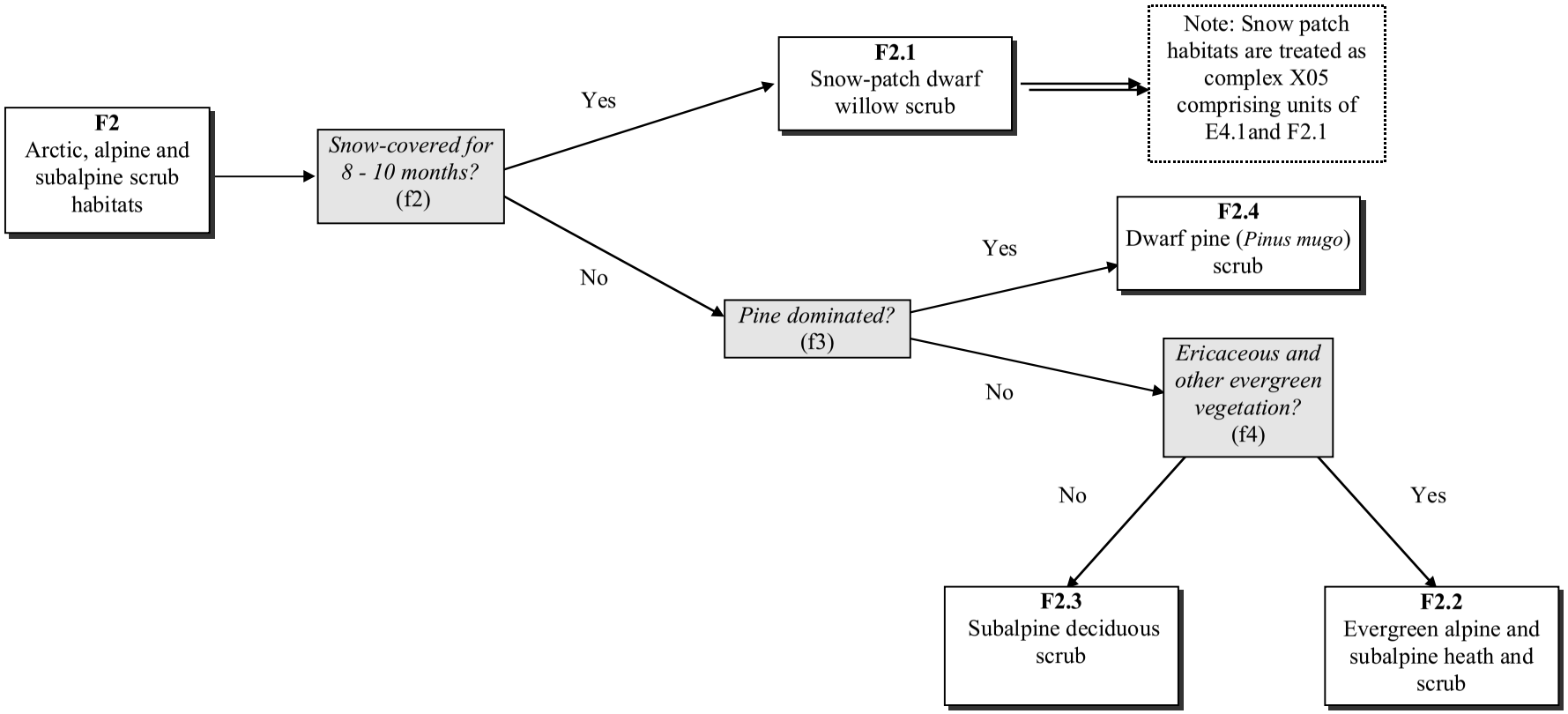
e20. Relatively snow-free exposed summits, slopes and ridges dominated by mosses and lichens are separated (path = *Yes*).

e21. Enriched (fertilised or manured) alpine and sub-alpine grassland habitats are separated (path = *Yes*). Note that manuring can be by concentrations of grazing animals.
e22. *Acid* alpine grasslands are distinguished from alpine grassland habitats on *base-rich* soils.
e23. Very dry over-grazed Mediterranean habitats (ermes), characterised by unpalatable tall herb species, are distinguished (path = *Yes*).
e24. Habitats with moist loamy soils typically at subalpine altitudes, but occasionally extending to alpine or montane levels are separated (path = *Yes*).
e25. Habitats dominated by bracken (*Pteridium aquilinum*) are separated (path = *Yes*).
e26. Anthropogenic forb-rich, often nitrate-enriched habitats colonised by or planted with forbs such as nettles and willow herbs (*Urtica dioica, Epilobium* spp.), other ruderal species or legumes (which are not on cropland) are separated (path = *Yes*).
e27. Tall herb and fern habitats of moderate temperatures with humid soils e.g. on stream sides or in damp meadows, or with shade are separated (path = *mesophile*) from those of more thermophilous character. Note that phytosociological alliances for example *Trifolion medii* are mesophilous and *Geranion sanguinei* are themophilous.
e28. Inland saline grassland and herb-dominated habitats characteristic of two climate types are distinguished: *mediterranean*; and *continental or subcontinental.*
e29. Sparsely wooded grasslands (canopy cover 5 - 10% trees) characteristic of three climate types are distinguished: *atlantic; subcontinental*; and *mediterranean*.

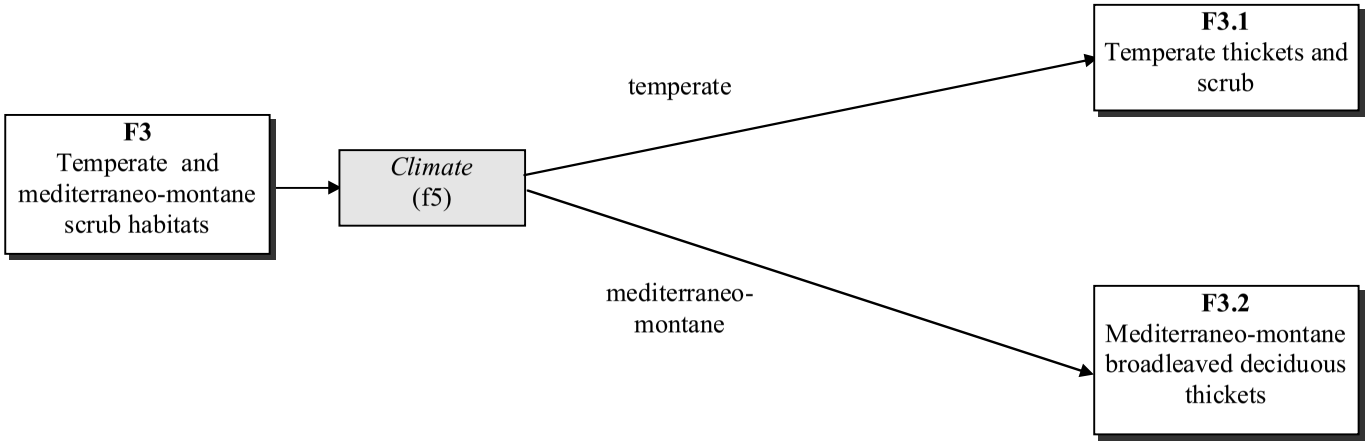
EUNIS Habitat Classification: criteria for tundra (F1) to Level 3
(number) refers to explanatory notes to the key



EUNIS Habitat Classification: criteria for arctic, alpine and subalpine scrub habitats (F2) to Level 3
(number) refers to explanatory notes to the key

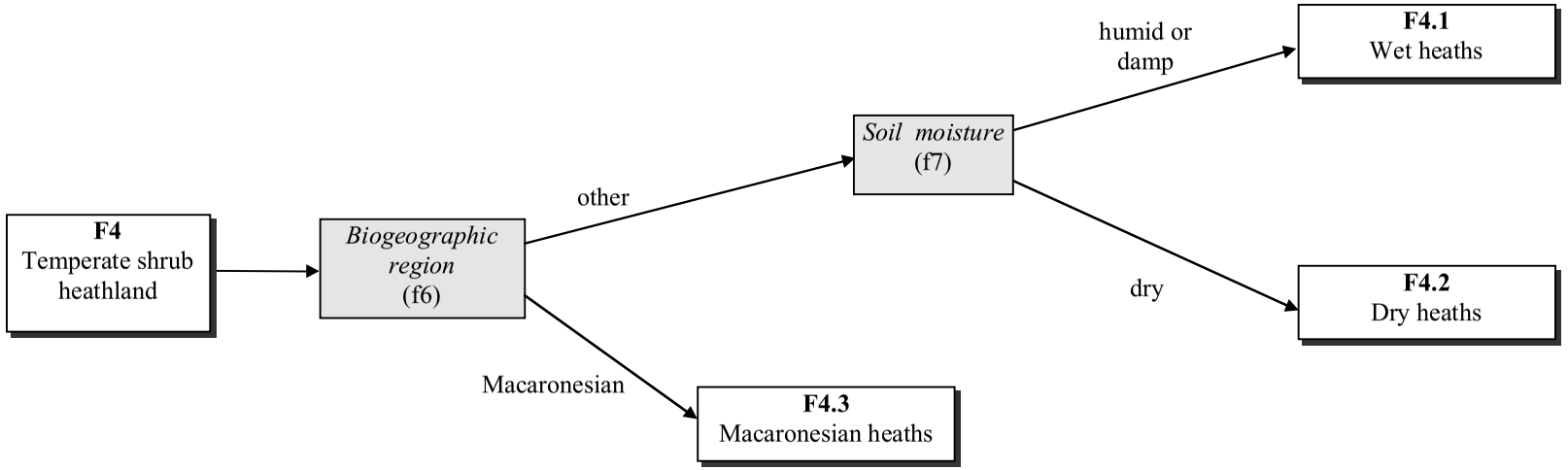


EUNIS Habitat Classification: criteria for temperate and mediterraneo-montane scrub habitats (F3) to Level 3
(number) refers to explanatory notes to the key



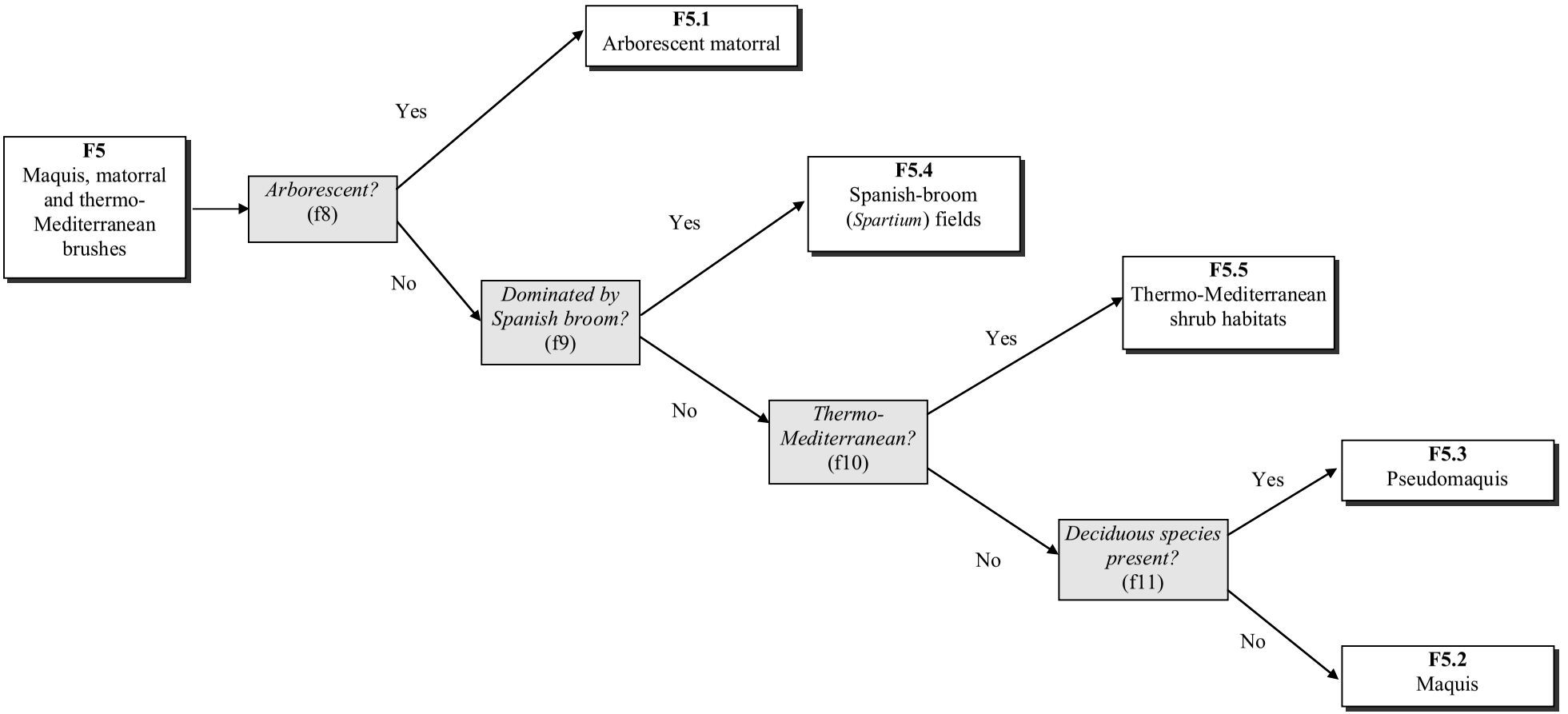
EUNIS Habitat Classification: criteria for temperate shrub heathland (F4) to Level 3

(number) refers to explanatory notes to the key

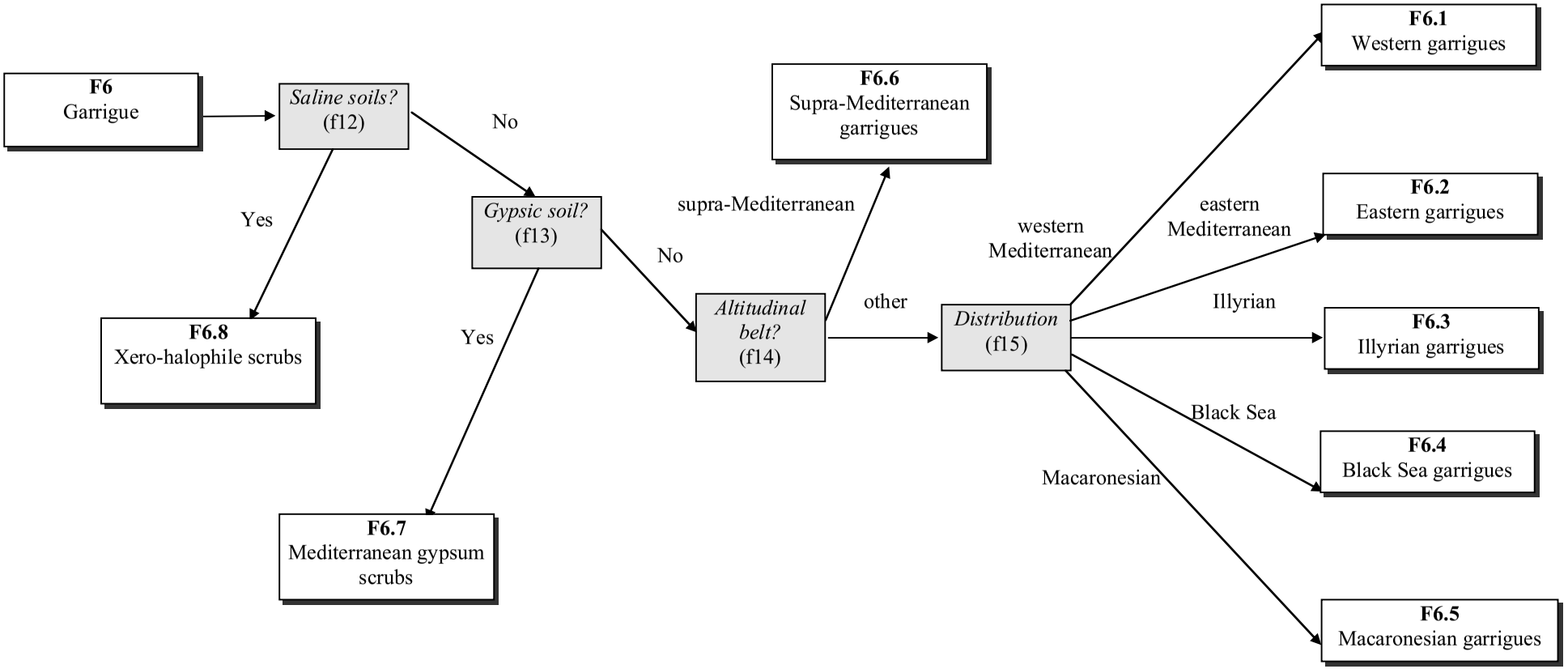


EUNIS Habitat Classification: criteria for maquis, matorral and thermo-Mediterranean brushes (F5) to Level 3

(number) refers to explanatory notes to the key

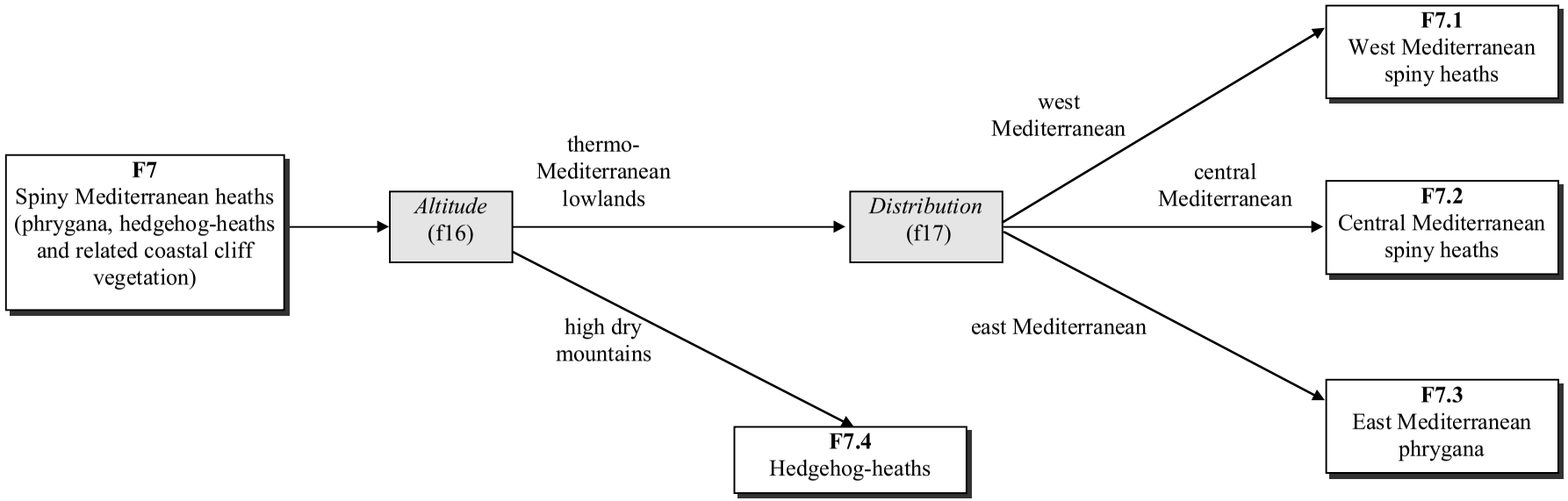


EUNIS Habitat Classification: criteria for garrigue (F6) to Level 3
(number) refers to explanatory notes to the key

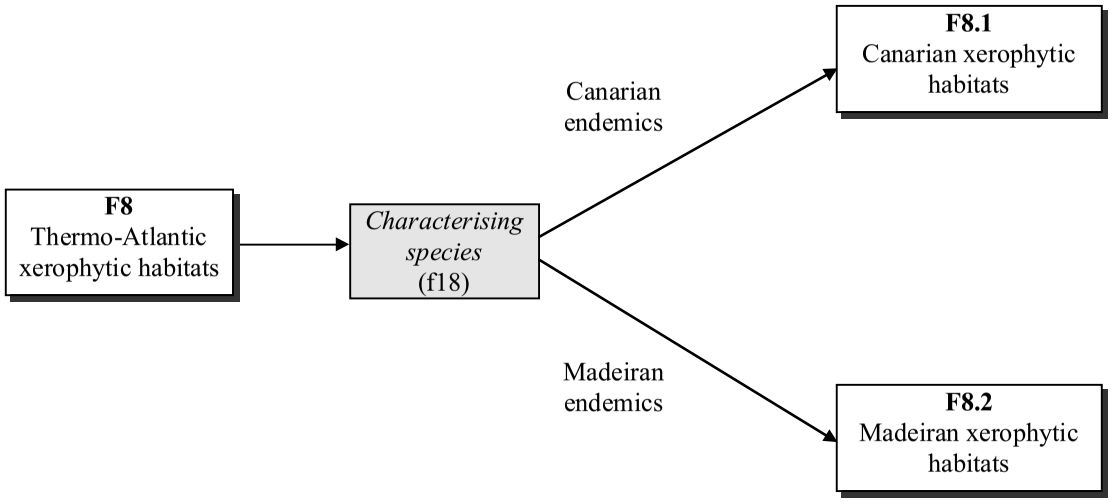


EUNIS Habitat Classification: criteria for spiny Mediterranean heaths (phrygana, hedgehog-heaths and related coastal cliff vegetation) (F7) to Level 3

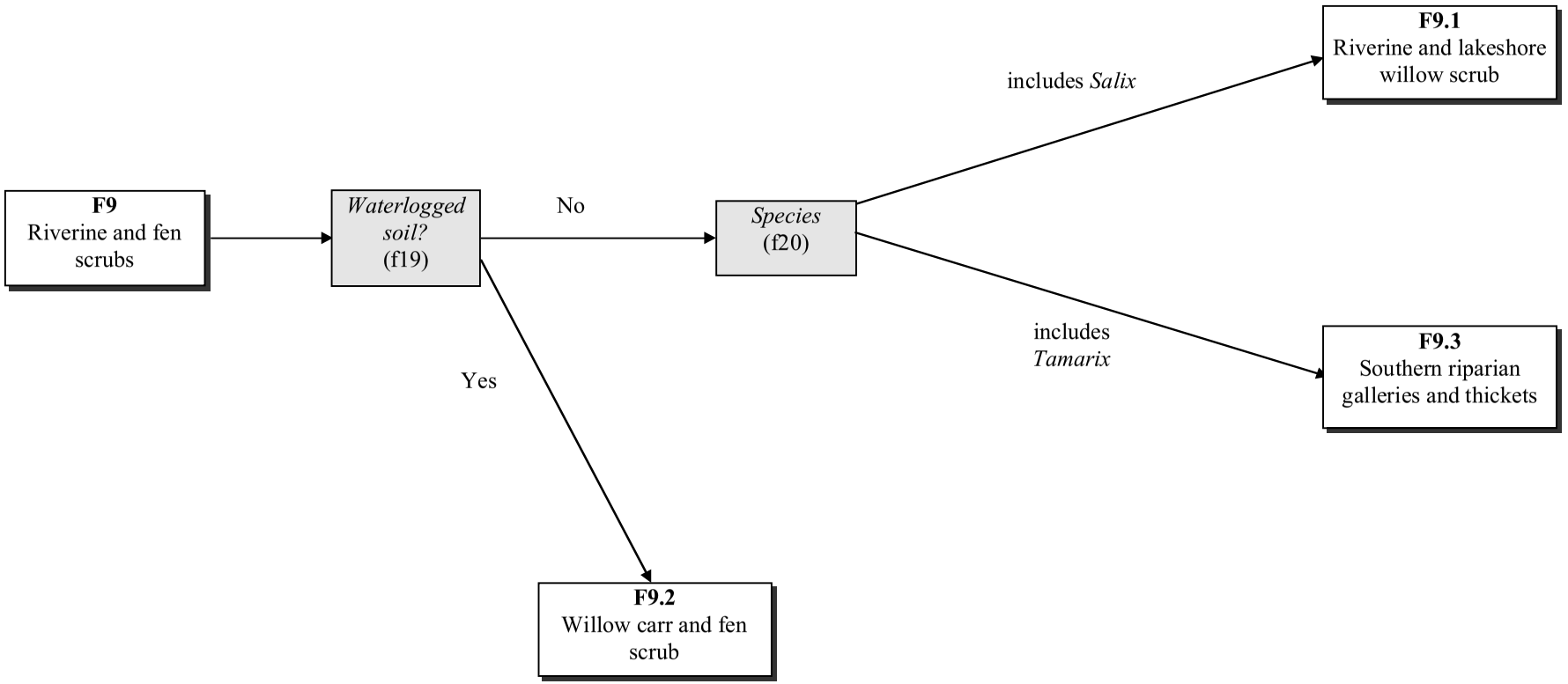
(number) refers to explanatory notes to the key



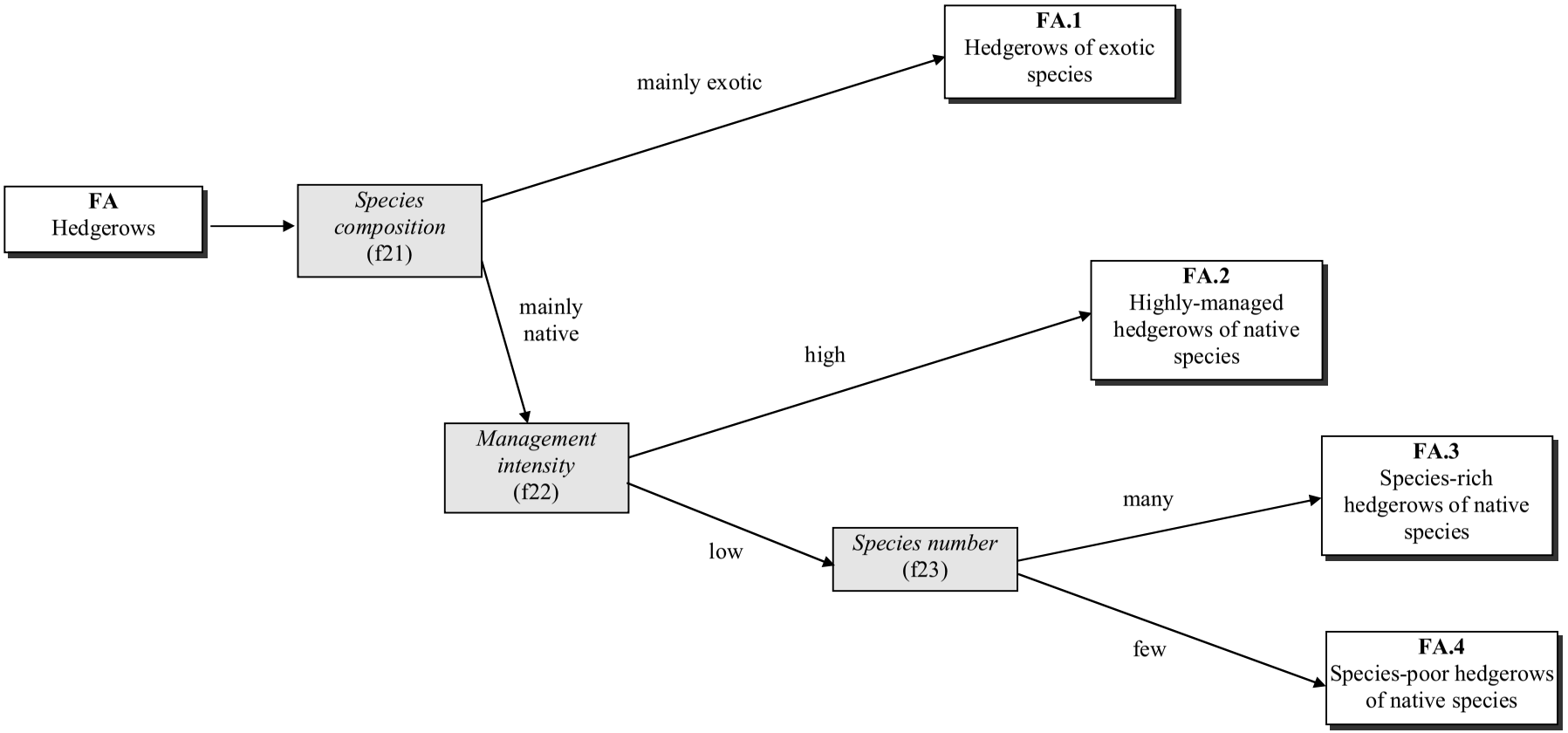
EUNIS Habitat Classification: criteria for thermo-Atlantic xerophytic habitats (F8) to Level 3
(number) refers to explanatory notes to the key



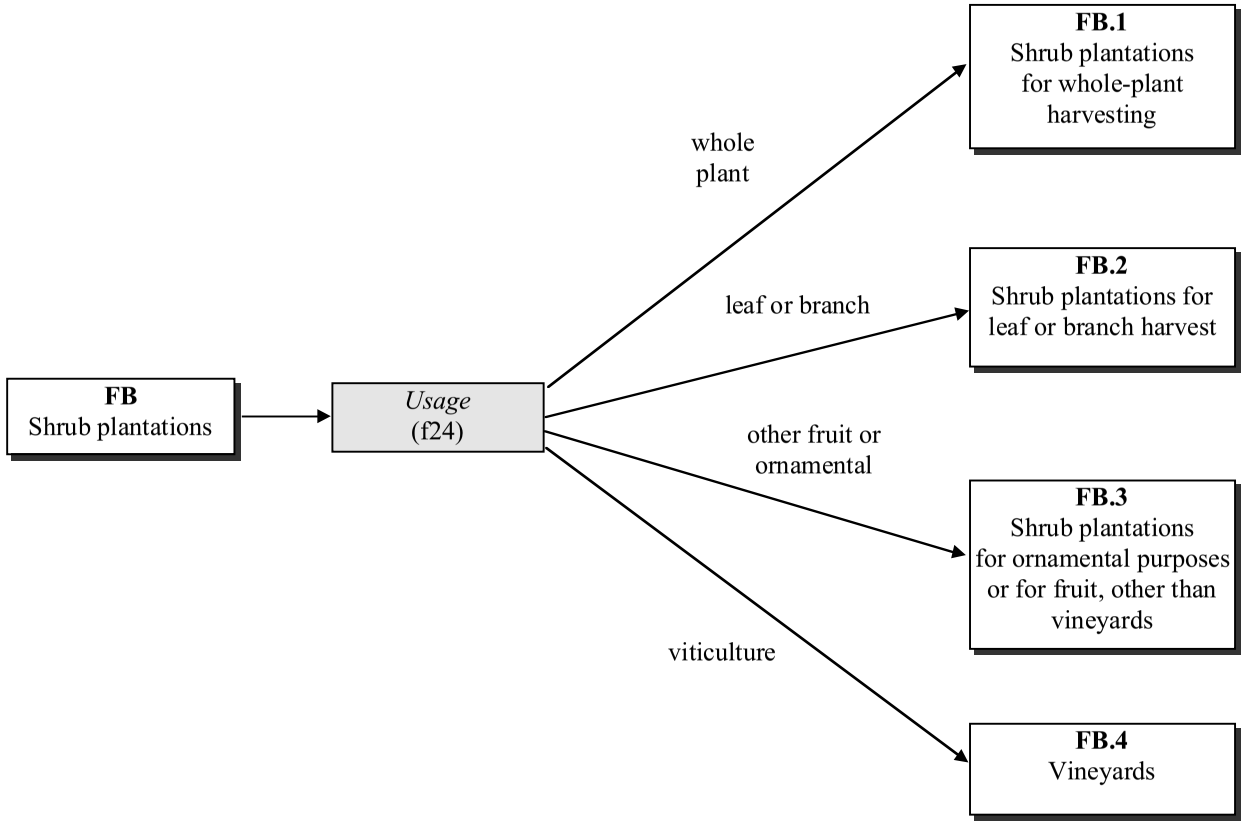
EUNIS Habitat Classification: criteria for riverine and fen scrubs (F9) to Level 3
(number) refers to explanatory notes to the key



EUNIS Habitat Classification: criteria for hedgerows (FA) to Level 3
(number) refers to explanatory notes to the key



EUNIS Habitat Classification: criteria for shrub plantations (FB) to Level 3
(number) refers to explanatory notes to the key



Explanatory notes to the key: Level 3 (Habitat type F)

f1. Tundra habitats are distinguished by their dominant vegetation types: *shrubs* or *moss and lichens*.
f2. Habitats characterised by species tolerant of snow cover for most of the year are distinguished (path = *Yes*).
f3. Habitats in the subalpine zone dominated by dwarf needle-leaved trees (primarily *Pinus mugo*) are separated (path = *Yes*).
f4. Evergreen vegetation largely dominated by ericoids is separated (path = *Yes*) from deciduous scrubs developed in areas sheltered by snow from wind and frost. These latter areas are normally characterised by the permanent presence of moving water, allowing turnover of nutrients and preventing accumulation of mor.
f5. Habitats in *temperate* and warmer *mediterraneo-montane* climatic zones are distinguished. Note that localised microclimate conditions may allow the temperate unit to appear in the Mediterranean zone - follow path = *temperate*.
f6. The criterion separates temperate heaths of the *Macaronesian* biogeographic region from those occurring in Atlantic, Continental, Boreal or Alpine zones (path = *other*).
f7. Heathlands are distinguished by the soil moisture: *humid or damp* (usually peaty soils); or *dry* (usually podzolic soils, but may be peat).
f8. Matorral characterised by arborescent species is separated (path = *Yes*).
f9. Habitats dominated by Spanish broom (*Spartium*) are distinguished (path = *Yes*).
f10. Brush habitats characteristic of the thermo-Mediterranean altitudinal belt are distinguished (path = *Yes*).
f11. Pseudomaquis (deciduous species found together with sclerophyllous species) is distinguished (path = *Yes*).
f12. Scrub habitats with species characteristic of very dry, saline soils are separated (path = *Yes*).
f13. Garrigues occupying gypsum-rich soils, characterised floristically by the presence of numerous gypsophilous species, and usually very open, are distinguished (path = *Yes*).
f14. Garrigues of the *supra-Mediterranean* altitudinal belt (degradation stage of thermophile deciduous forest) are separated from *other* garrigue formations.
f15. Garrigues are distinguished on the basis of their characteristic species corteges, rather than by dominant species alone: this is best expressed by their geographical location. The five groups are: *western Mediterranean* (*Rosmarinetalia*) found in Iberia, France, Italy and large western islands; *eastern Mediterranean* (*Micromerietalia*) found in Greece, Cyprus, Asia Minor and Levant; *Illyrian* found in the northern Balkan peninsula from Albania northwards; areas around the *Black Sea*; *Macaronesia*.
f16. Habitats are separated by the species composition characteristic of *thermo-Mediterranean lowland* areas and of *high dry mountains*. Thermo-Mediterranean phryganas are sclerophyllous scrubs and are often summer-deciduous.
f17. 'Phrygana' habitats are separated according to the species composition characteristic of different parts of the Mediterranean biogeographic region: *west Mediterranean* phryganas are usually characterised by *Astragalus massiliensis* or *Anthyllis hermanniae*; c*entral Mediterranean* phryganas may be dominated by a variety of species; e*ast Mediterranean* phryganas are widespread and diverse.
f18. Xerophytic habitats dominated by succulents, rosette-forming *Aeonium* spp. and composites are separated on the basis that the geographical locations support a large number of different endemic species; to the Canaries (*Canarian endemics*); or to Madeira and the Selvagen Islands (*Madeiran endemics*).

f19. Scrub habitats on poorly drained waterlogged ground such as fens (path = *Yes*) are separated from scrubs alongside permanent or temporary waterbodies.

f20. Scrubs usually alongside alpine or lowland permanent or temporary waterbodies and comprising mainly willows (*includes Salix* spp) (sometimes with *Myricaria germnanica, Hippophaea rhamnoides, Myrica gale* and *Frangula alnus*) are separated from riverine scrubs more typical of the thermo-Mediterranean climate, such as tamarisk (*includes Tamarix*) or *Nerium oleander, Vitex agnus-castus, Securinegia, Prunus or Viburnum*. Note that the willow scrubs may occur in warmer climates as well.

f21. Hedgerows are separated between those mainly composed of species exotic to their location (e.g. the Californian Leyland Cypress *x Cupressocyparis leylandii*) (path = *mainly exotic*), and those mainly consisting of native species (path = *mainly native*).

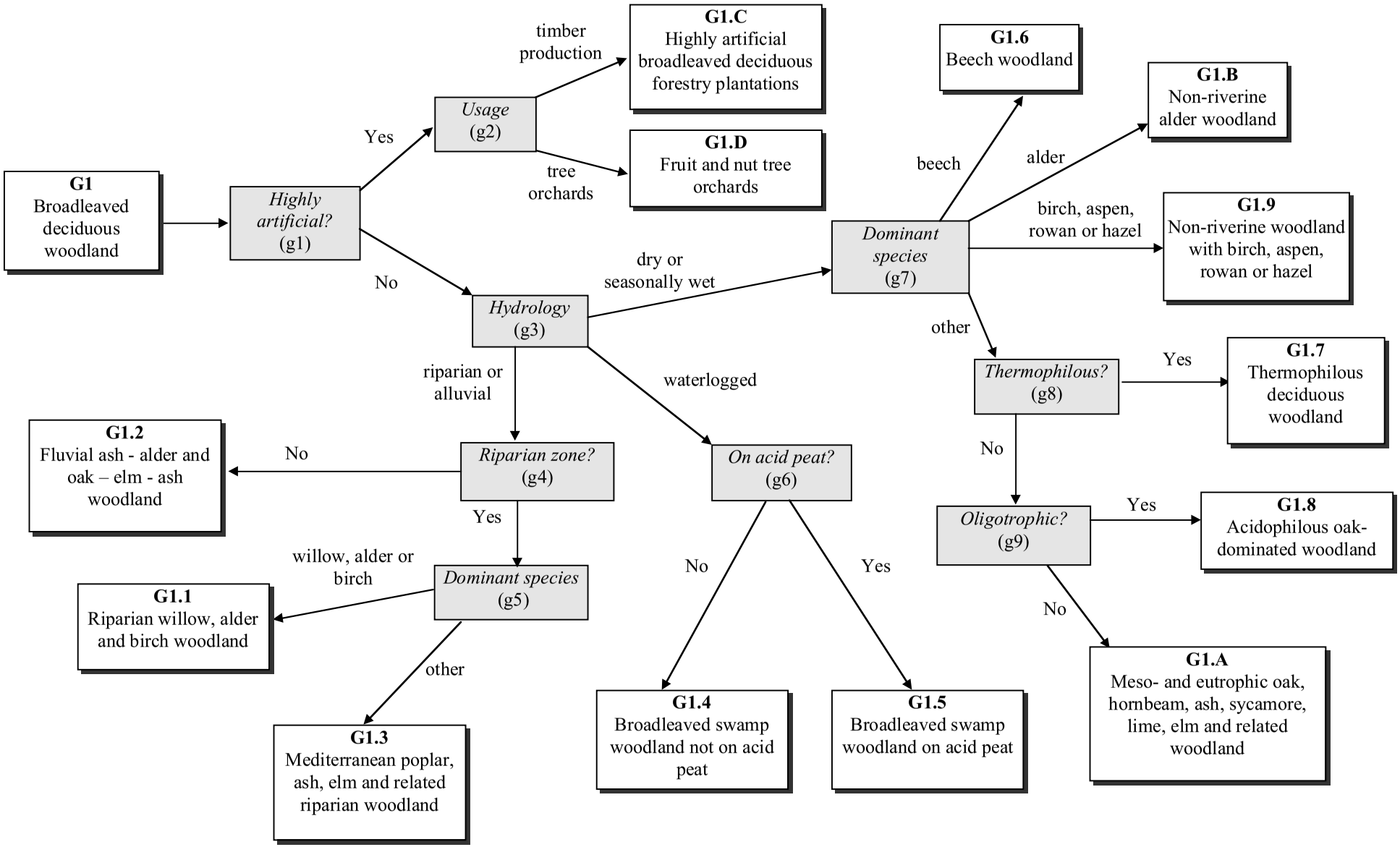
f22. Hedgerows mainly of native species managed intensively (e.g. by regular trimming) (path = *high*) are separated from those subject to little or no management (path = *low*).

f23. Hedges which are rich in shrub species and ground flora (path = *many*) are separated from those dominated by one or two shrub species (path = *few*).

f24. Shrub plantations are separated on the basis of their usage: for *whole plant* harvesting, such as horticultural shrub nurseries; for *leaf or branch* harvest, such as osiers or tea; for ornamental purposes e.g. flowers, or fruit other than vines (path = *other fruit or ornamental*); vines, usually for wine production (path = *viticulture*).

EUNIS Habitat Classification: criteria for broadleaved deciduous woodland (G1) to Level 3

(number) refers to explanatory notes to the key



EUNIS Habitat Classification: criteria for broadleaved evergreen woodland (G2) to Level 3

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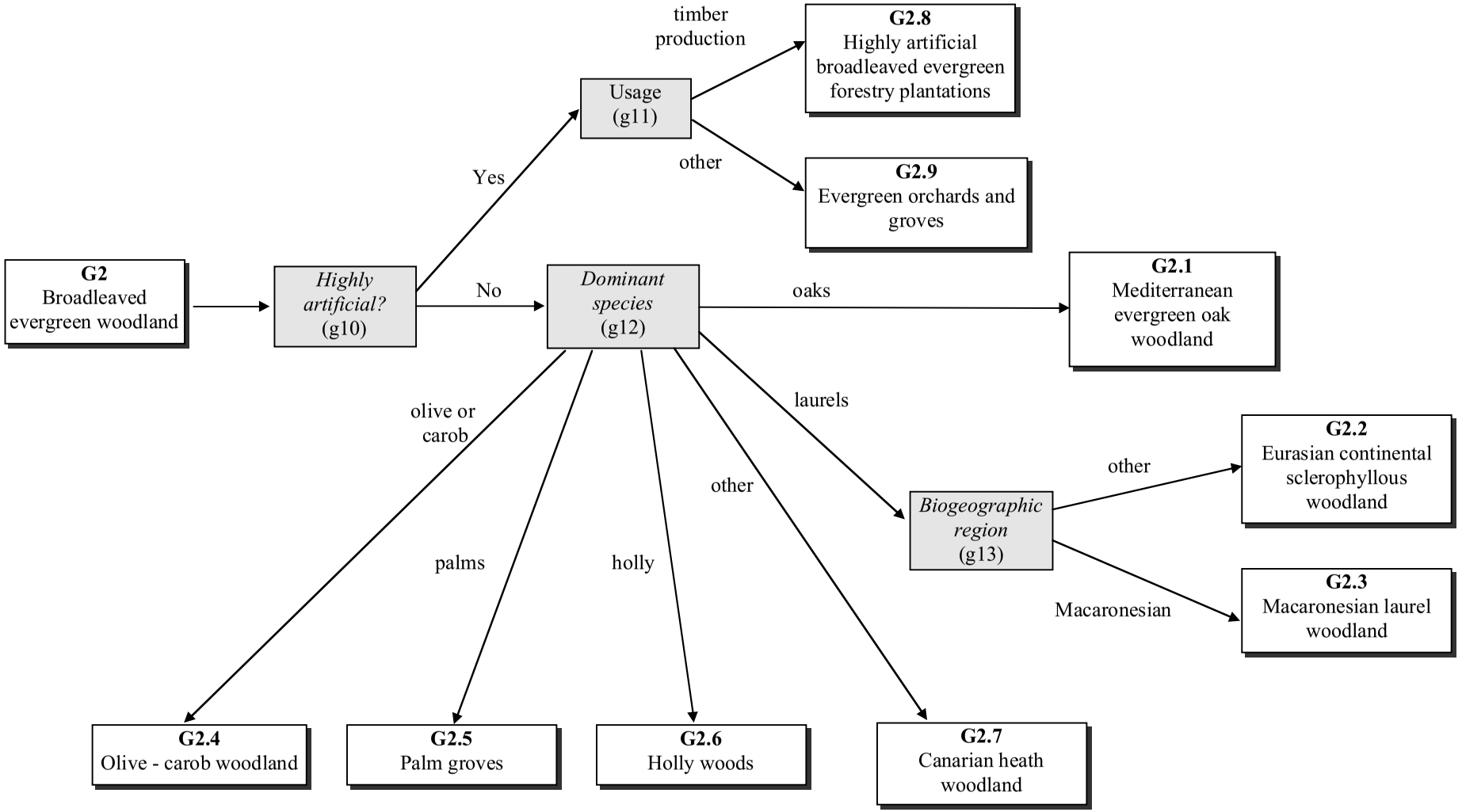

EUNIS Habitat Classification: criteria for coniferous woodland (G3) to Level 3

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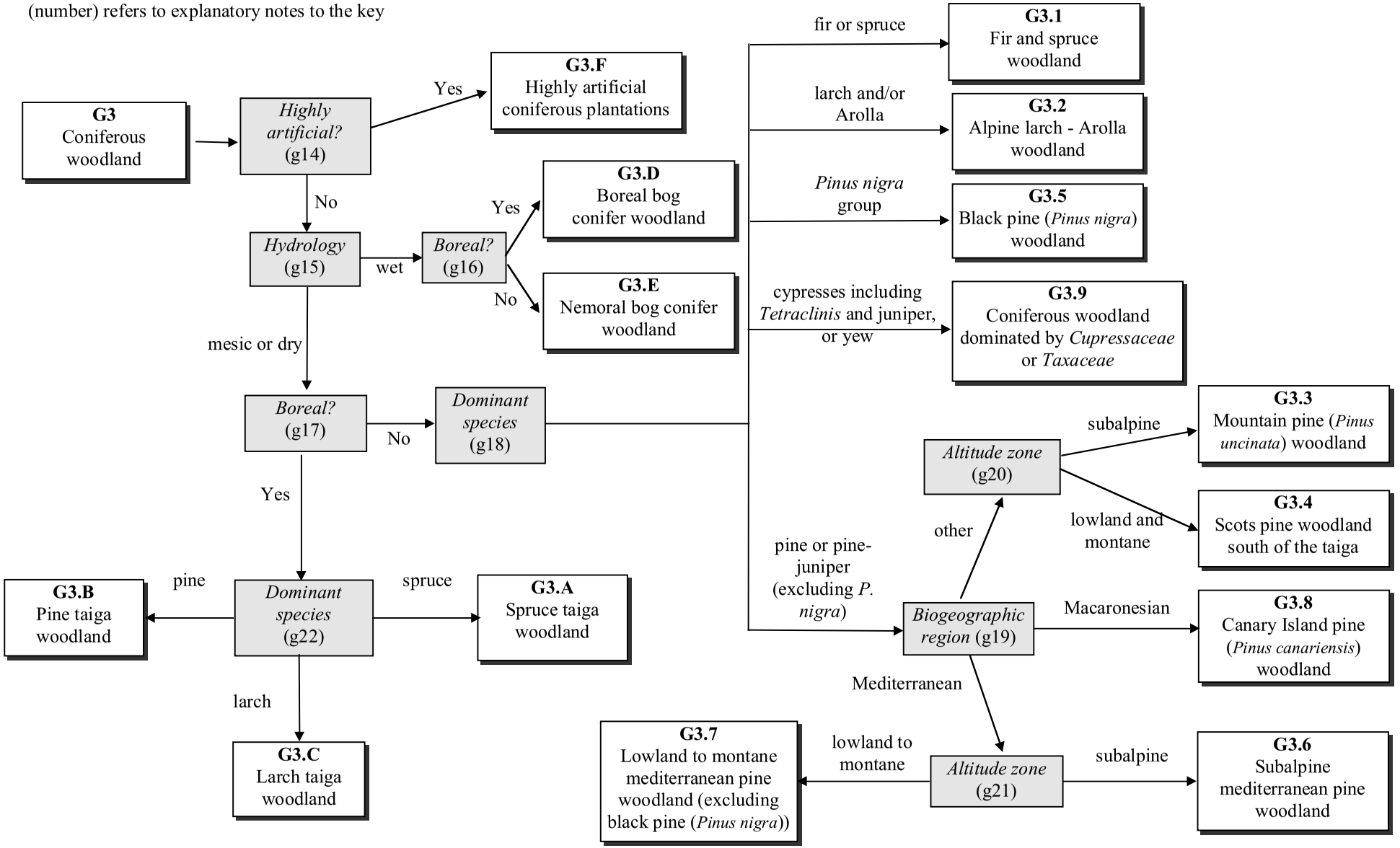

EUNIS Habitat Classification: criteria for mixed broadleaved and coniferous woodland (G4) to Level 3

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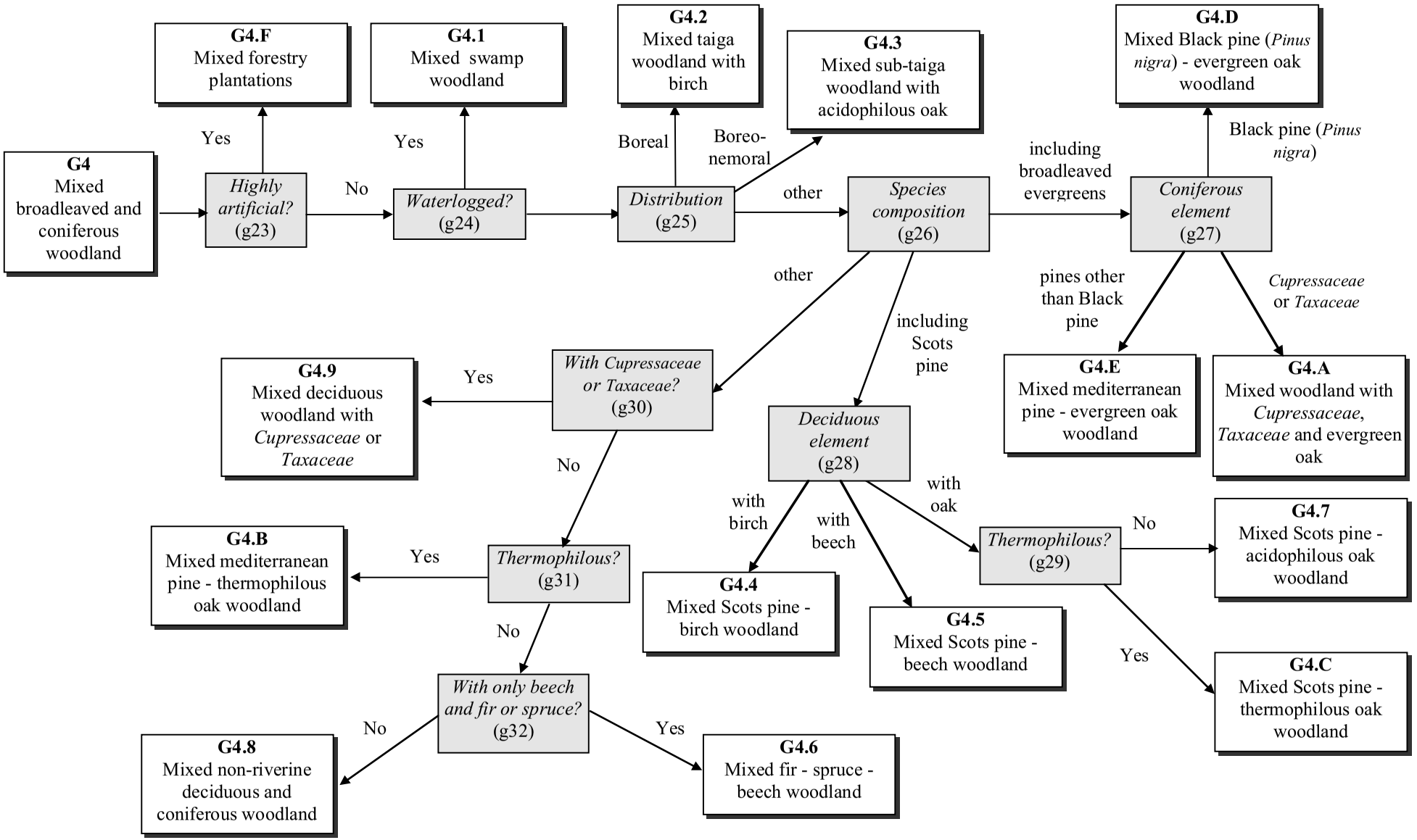


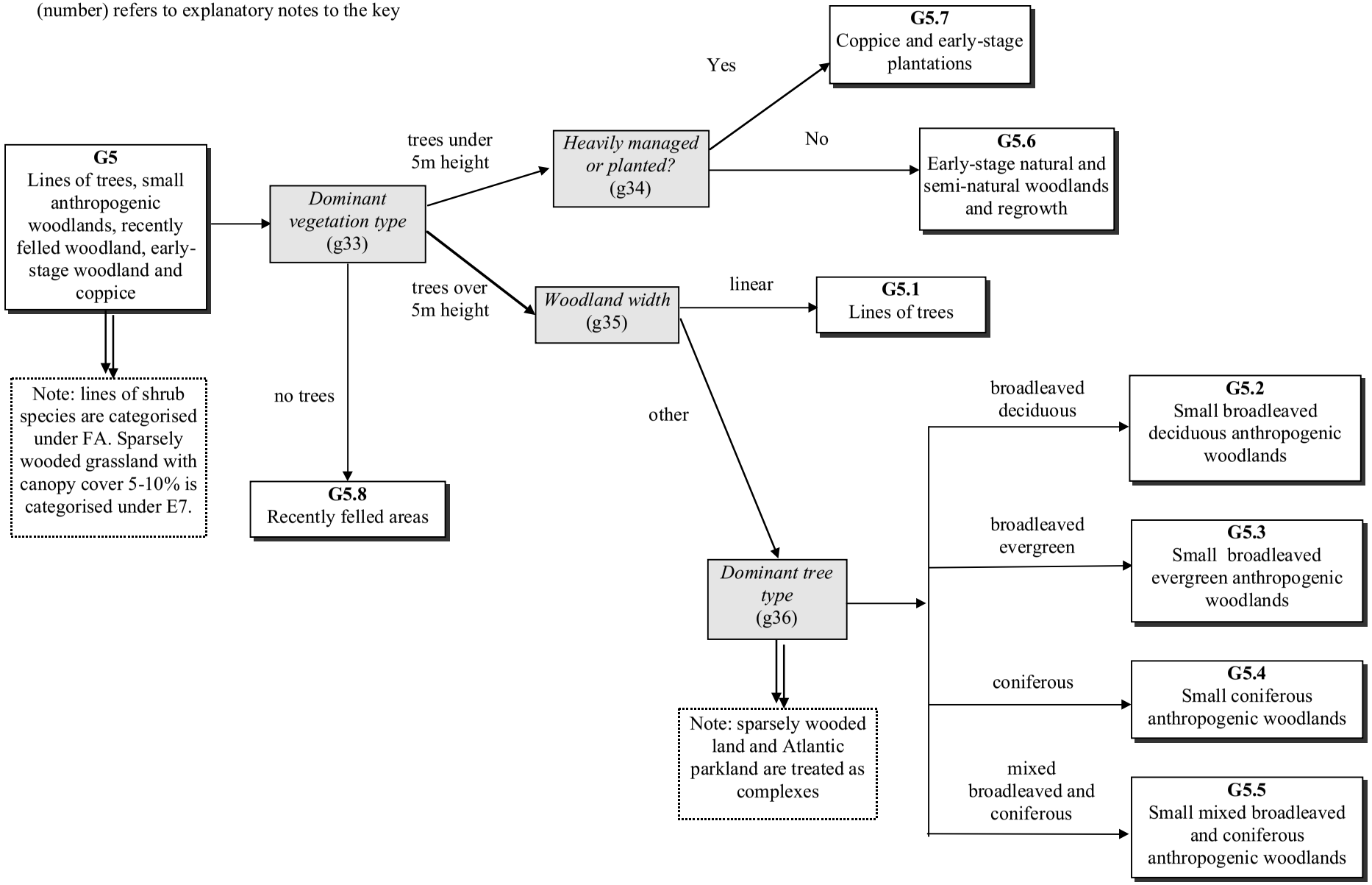
Derivation of mixed broadleaved and coniferous woodland units (G4)

Parent EUNIS units	Titles of 'parent' units	Title and code for combined unit
G1.5 + G3.D + G3.E (+ G1.4)	• Broadleaved swamp woodland on acid peat • Boreal bog conifer woodland • Nemoral bog conifer woodland • (Swamp woodland not on acid peat)	**G4.1** Mixed swamp woodland
G1.91 + G3.A + G3.B + G3.C	• Birch woodland not on marshy terrain • Spruce taiga woodland • Pine taiga woodland • Larch taiga woodland	**G4.2** Mixed taiga woodland with birch
G1.8 + G3.A + G3.B + G3.C	• Acidophilous oak- dominated woodland • Spruce taiga woodland • Pine taiga woodland • Larch taiga woodland	**G4.3** Mixed sub-taiga woodland with acidophilous oak
G1.9 + G3.4	• Non-riverine woodland with birch, aspen, rowan or hazel • Scots pine woodland south of the taiga	**G4.4** Mixed Scots pine - birch woodland
G1.6 + G3.4	• Beech woodland • Scots pine woodland south of the taiga	**G4.5** Mixed Scots pine - beech woodland
G1.6 + G3.1	• Beech woodland • Fir and spruce woodland	**G4.6** Mixed fir - spruce - beech woodland
G1.8 + G3.4	• Acidophilous oak- dominated woodland • Scots pine woodland south of the taiga	**G4.7** Mixed Scots pine – acidophilous oak woodland
G1.9 + G1.6 + G3.1	• Non-riverine woodland with birch, aspen, rowan or hazel • Beech woodland • Fir and spruce woodland	**G4.8** Mixed non-riverine deciduous and coniferous woodland
G1.A + G3.9	• Meso- and eutrophic oak, hornbeam, ash, sycamore, lime, elm and related woodland • Coniferous woodland dominated by *Cupressaceae* or *Taxaceae*	**G4.9** Mixed deciduous woodland with *Cupressaceae* or *Taxaceae*
G2.1 + G3.9	• Mediterranean evergreen oak woodland • Coniferous woodland dominated by *Cupressaceae* or *Taxaceae*	**G4.A** Mixed woodland with *Cupressaceae*, *Taxaceae* and evergreen oak

Parent EUNIS units	Titles of 'parent' units	Title and code for combined unit
G1.7 + G3.7	• Thermophilous deciduous woodland • Lowland to montane mediterranean pine woodland (excluding black pine (*Pinus nigra*))	**G4.B** Mixed mediterranean pine - thermophilous oak woodland
G1.7 + G3.4	• Thermophilous deciduous woodland • Scots pine woodland south of the taiga	**G4.C** Mixed Scots pine - thermophilous oak woodland
G2.1 + G3.5	• Mediterranean evergreen oak woodland • Black pine (*Pinus nigra*) woodland	**G4.D** Mixed Black pine (*Pinus nigra*) - evergreen oak woodland
G2.1 + G3.7	• Mediterranean evergreen oak woodland • Lowland to montane mediterranean pine woodland (excluding black pine (*Pinus nigra*))	**G4.E** Mixed mediterranean pine - evergreen oak woodland
G1.D + G3.F	• Highly artificial broadleaved deciduous forestry plantations • Highly artificial coniferous plantations	**G4.F** Mixed forestry plantations

EUNIS Habitat Classification: criteria for lines of trees, small anthropogenic woodlands, recently felled woodland, early-stage woodland and coppice (G5) to Level 3

(number) refers to explanatory notes to the key



Explanatory notes to the key: Level 3 (Habitat type G)

g1. Highly artificial broadleaved deciduous forests (often of exotic species) of uniform age and structure, completely dependent on man's operations and with impoverished associated communities (path = *Yes*) are separated from less highly managed habitats.

g2. Highly artificial forestry plantations normally used primarily for *timber production* (including for fibre and wood-pulp) are separated from fruit and nut *tree orchards*. Note that shrub orchards are categorised under FB.

g3. Three hydrological regimes are distinguished: *waterlogged* (permanently wet, with the water table at or close to the surface), *riparian or alluvial* (dependent on flowing water, giving rise to a high water table and subject to occasional flooding) and *dry or seasonally wet*.

g4. Ribbon-like tracts of trees on flood plains near rivers or streams (riparian gallery or fringe forests) (path = *Yes*) are distinguished from fluvial forests on river terraces (path = *No*). Note that woodlands of riparian type (mainly comprising phytosociological communities of *Salicetea purpureae*, *Alnion incanae*) can occur directly on banks of rivers and streams, but also in other parts of flood plains with sufficiently high water levels close to the ground surface.

g5. Riparian woodlands dominated by *willow, alder and birch* are separated from riparian woodland habitats characteristic of the mediterranean climate dominated by *other* species (mainly comprising phytosociological communities of *Populetalia albae*, *Platanetalia orientalis*). Note that Mediterranean willow woods follow path = *willow, alder and birch*.

g6. Broadleaved swamp woodlands are distinguished between those growing on acid peat (path = *Yes*) and those formed under neutral or basic conditions (path = *No*).

g7. Dry and seasonally wet woodland habitats are separated according to their dominant species: *beech*; *alder; birch, aspen, rowan or hazel*; and *other*.

g8. Woodlands characterised by thermophilous species (e.g. phytosociological communities of *Quercetea pubescentis*) (path = *Yes*) are distinguished from those of other climatic types.

g9. Woodlands characteristic of oligotrophic soils, usually with acidophilous species, are separated (path = *Yes*) from those on more meso- to eutrophic substrates. Note that birch may be present but never dominant in habitat units in G1.8. More or less pure stands of birch are included under G1.9.

g10. Highly artificial broadleaved evergreen forests (often of exotic species) of uniform age and structure, completely dependent on man's operations and with impoverished associated communities (path = *Yes*) are separated from less highly managed habitats.

g11. Highly artificial evergreen forestry plantations normally primarily used for *timber production* are separated from those used for *other* purposes (including olive groves and palm plantations).

g12. Habitats are separated according to their dominant species: *oaks* (mainly comprising phytosociological communities of *Quercetalia ilicis*, *Quercetalia pubescentis* with dominance of *Quercus ilex*, communities of *Quercus suber*); *laurels* (*Laurus); holly* (*Ilex); palms (Phoenix)*; *olive (Olea europea) or carob* (*Ceratonia siliqua*); and *other* very tall, forest-like formations dominated by *Erica arborea, Myrica faya, Arbutus canariensis* or *Visnea mocanera*.

g13. Laurel (*Laurus*)-dominated habitats characteristic of the *Macaronesian* biogeographic region are separated from those of the Mediterranean and Atlantic regions (path = *other*).

g14. Highly artificial coniferous forests (often of exotic species) of uniform age and structure, completely dependent on man's operations and with impoverished associated communities (path = *Yes*) are separated from less highly managed habitats.
g15. Two hydrological regimes are distinguished: *wet* (with the water table at or close to the surface for at least half the year); and *mesic or dry*.
g16. Wet coniferous woodland habitats characteristic of the Boreal zone are distinguished (path = *Yes*).
g17. Mesic or dry coniferous woodland habitats characteristic of the Boreal zone are distinguished (path = *Yes*).
g18. Mesic and dry non-Boreal habitats are separated according to their dominant species groups: *fir or spruce* (mainly comprising phytosociological communities of *Abieti-Piceion*, *Chrysanthemo rotundifolii-Piceion*, *Piceetalia excelsae*); *larch (Larix spp.) and/or Arolla* (*Pinus cembra*); *Pinus nigra group* (*Pinus nigra*, *Pinus dalmatica*, *Pinus laricio*, *Pinus pallasiana*), *cypresses (Cupressus and Tetraclinis), juniper (Juniperus) or yew (Taxus baccata); pine or pine-juniper (excluding P. nigra)*.
g19. Pine (*Pinus*) and juniper (*Juniperus*)-dominated woodlands are separated between biogeographic region: *Mediterranean*; *Macaronesian* and *other* (Atlantic, Continental, Alpine, etc.)
g20. Pine woodlands in the *subalpine* altitude zone (usually dominated by *Pinus uncinata*) are distinguished from those in the *lowland and montane* altitude zones usually dominated by *Pinus sylvestris*. Note that *Pinus sylvestris* forests may occur in the subalpine zone but follow path = *lowland and montane*.
g21. Mediterranean pine woodlands other than of *Pinus nigra* are separated by altitude into a group in the montane and *subalpine* zones close to the tree-line (dominated by *Pinus heldreichii (=Pinus leucodermis)*, *Pinus peuce*) and thermophilous pine woodlands in *lowland to montane* situations (dominated by *Pinus halepensis, P. pinea* and *P. pinaster*).
g22. Coniferous woodlands of the taiga zone are separated between those dominated by *spruce;* by *pine;* and by *larch*.
g23. Highly artificial mixed broadleaved deciduous and coniferous forests (often of exotic species and of uniform age and structure), completely dependent on man's operations and with impoverished associated communities (path = *Yes*) are separated from less highly managed habitats.
g24. Habitats which are waterlogged (permanently wet, with the water table at or close to the surface) are separated (path = *Yes*) from those with other hydrological regimes.
g25. Coniferous woodland characteristic of the *Boreal* zone with an admixture of birch; or of the *Boreo-nemoral* zone with an admixture of other deciduous species (usually oaks); are separated from *other* mixed woodlands.
g26. The dominant species or species type separates three categories of mixed woodlands: those *including broadleaved evergreens*; those *including Scots pine* (*Pinus sylvestris*); and those where the species composition comprises *other* species.
g27. Mixed woodland habitats including broadleaved evergreen species are separated according to the main coniferous species present: with cypresses and yews (*Cupressaceae or Taxaceae*); with mixed *pines other than Black pine* (*Pinus nigra*); and those including *Black pine (Pinus nigra)*.
g28. Mixed woodland habitats including Scots pine (*Pinus sylvestris*) are separated according to the main deciduous species present: those *with oaks*; those *with beech*; and those *with birch*.
g29. Woodland habitats characterised by a mixture of Scots pine and thermophilous oak species are separated (Path = *Yes*).
g30. Habitats characterised by a mixture of deciduous tree species and cypresses or yews (*Cupressaceae or Taxaceae*) are distinguished (path = *Yes*).
g31. Habitats characterised by a mixture of pines, juniper and thermophilous oak species are separated (Path = *Yes*).

g32. Other mixed coniferous and deciduous woodland habitats are separated according to their species composition: those with only beech and fir or spruce are separated (path = *Yes*) from those with combinations of the deciduous species birch, aspen, rowan or hazel and occasionally some beech together with fir, spruce or pine.

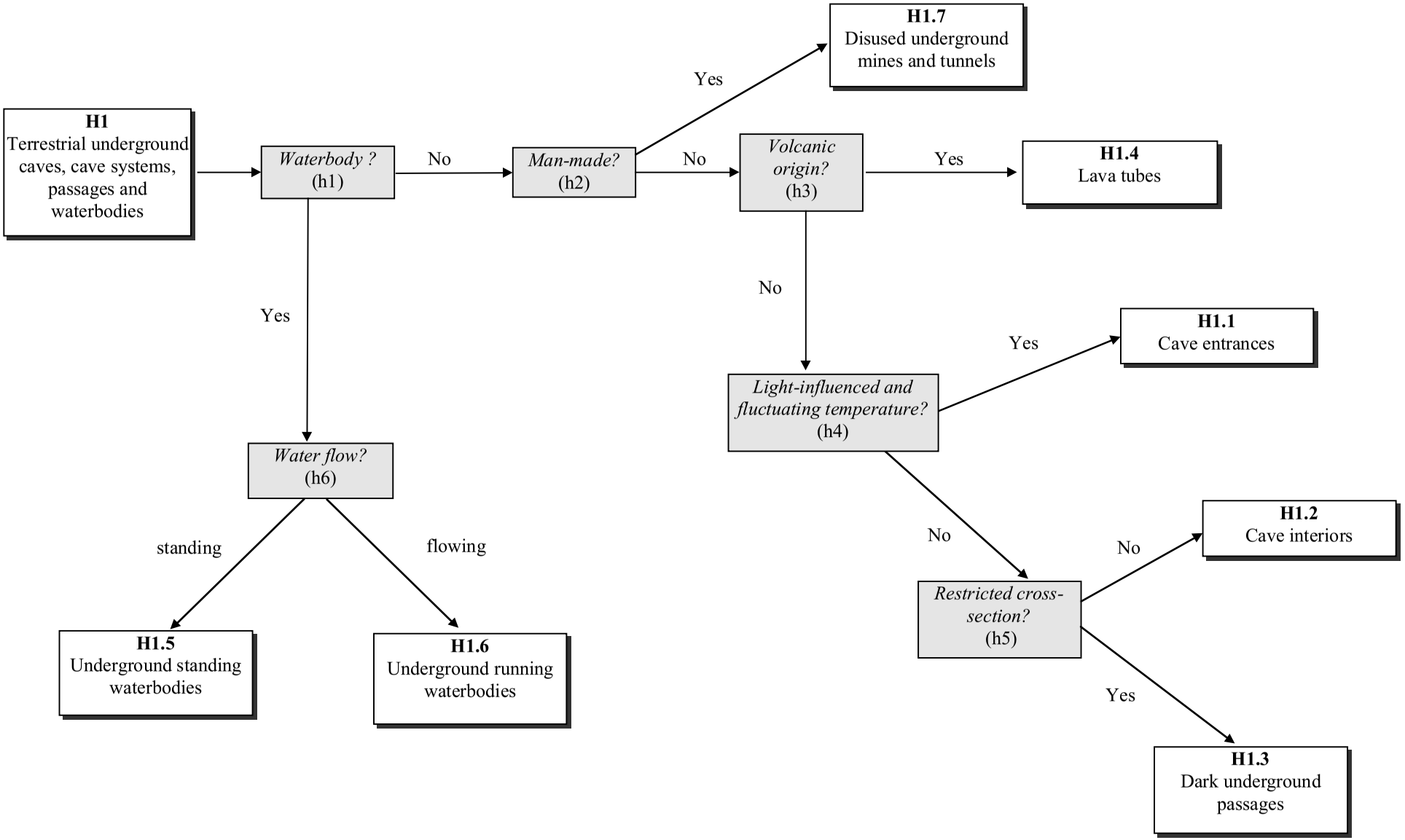
g33. The dominant vegetation type separates three categories of these miscellaneous woodlands: *trees under 5 metres height* (including young stages of forest re-growth or early colonisation by tree species, trees planted for early whole tree harvesting, such as Christmas trees, and coppice, where tree species are artificially maintained in the shrub phase); areas normally part of the forest area but very recently clear-felled and not yet re-stocked and with no succession to weedy vegetation or temporarily unstocked due to natural causes such as wind-throw, (path = *no trees*); or *trees over 5 metres height*.

g34. Young plantations and woodlands maintained in the young stage through coppicing are separated (path = *Yes*) from stands of young trees arising from natural colonisation or forest regrowth.

g35. More or less continuous lines of trees and *linear* plantations comprising one to three distinct lines of trees, such as windbreaks and avenues, are separated from *other* small, intensively managed woods, small woods strongly influenced by anthropogenic activities and small plantations. Small woodlands are those up to about 0.5ha in extent. Tree cover may often comprise completely or partially non-native species.

g36. Small anthropogenic woods and small plantations (less than about 0.5ha in extent) are characterised by the dominant tree types, which may be mixtures of species within the categories *broadleaved deciduous; broadleaved evergreen; coniferous;* and *mixed broadleaved and coniferous*. Small natural and semi-natural woodlands are characterised with their larger counterparts in G1 – G4. Note that broadleaved woodland is defined as wooded land on which more than 75% of the tree crown cover consists of broadleaved species and that coniferous woodland is defined as wooded land on which more than 75% of the tree crown cover consists of coniferous species (based on FAO definition). Mixed woodland is defined as wooded land on which neither coniferous, nor broadleaved species account for more than 75% of the crown cover.

EUNIS Habitat Classification: criteria for terrestrial underground caves, cave systems, passages and waterbodies (H1) to Level 3
(number) refers to explanatory notes to the key



EUNIS Habitat Classification: criteria for screes (H2) to Level 3
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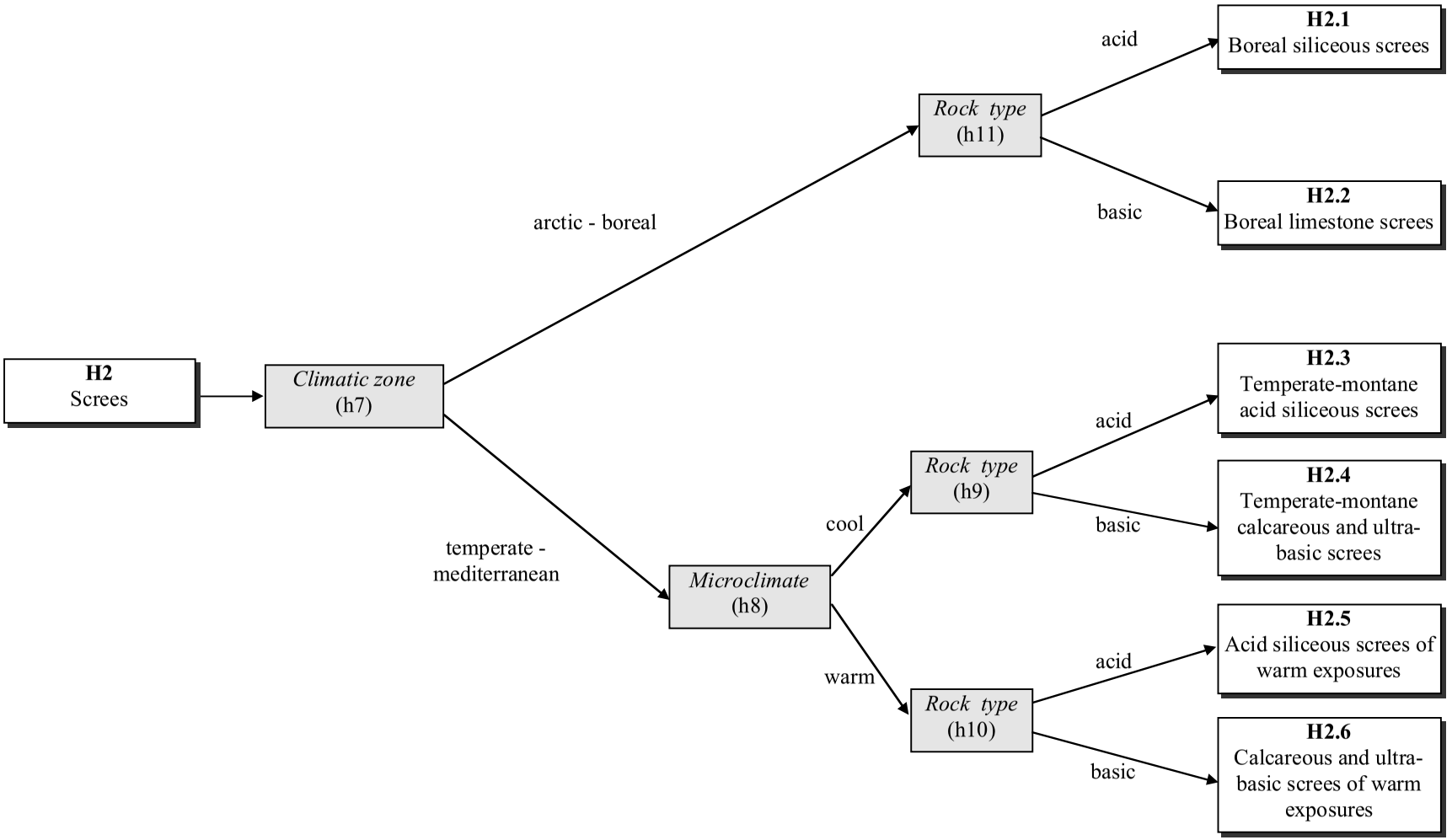
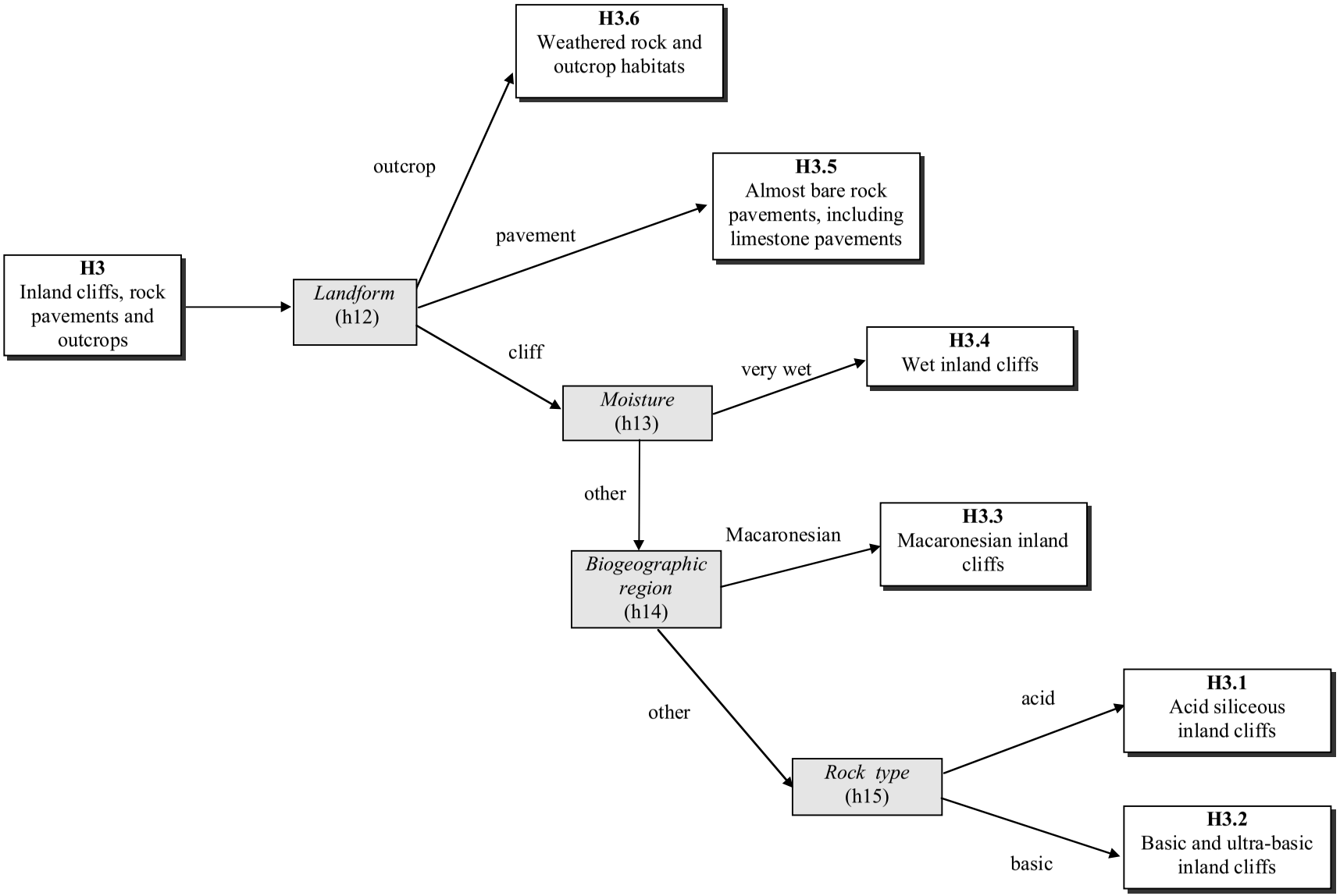


EUNIS Habitat Classification: criteria for inland cliffs, rock pavements and outcrops (H3) to Level 3
(number) refers to explanatory notes to the key



EUNIS Habitat Classification: criteria for snow or ice-dominated habitats (H4) to Level 3
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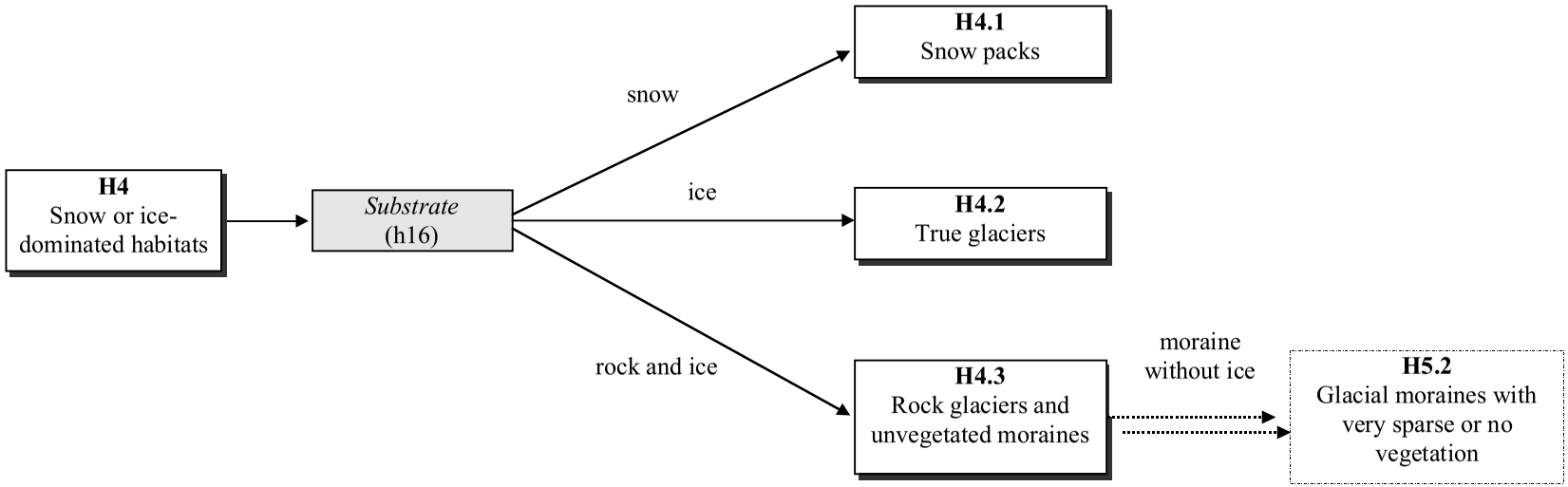

EUNIS Habitat Classification: criteria for miscellaneous inland habitats with very sparse or no vegetation (H5) to Level 3
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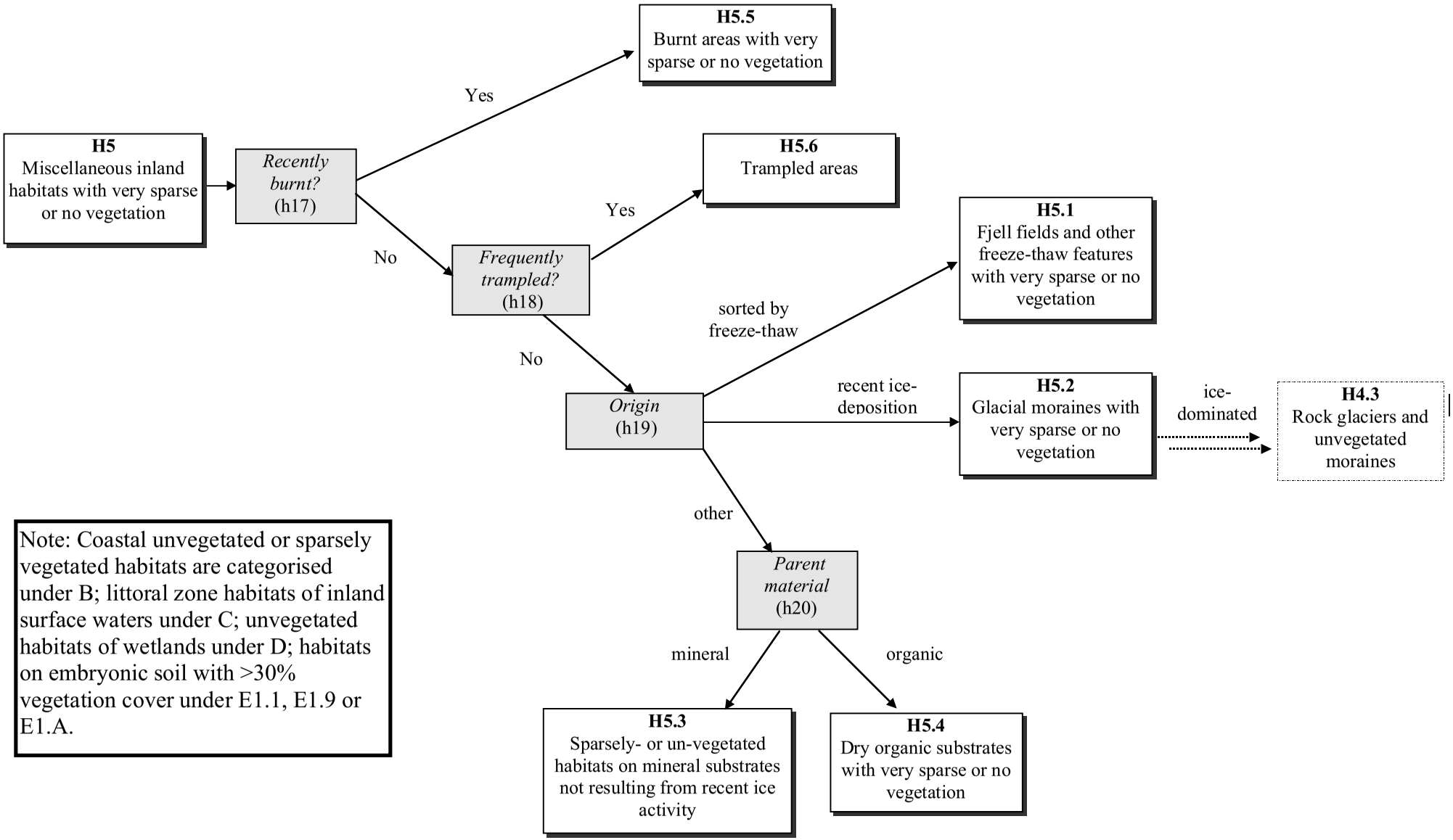
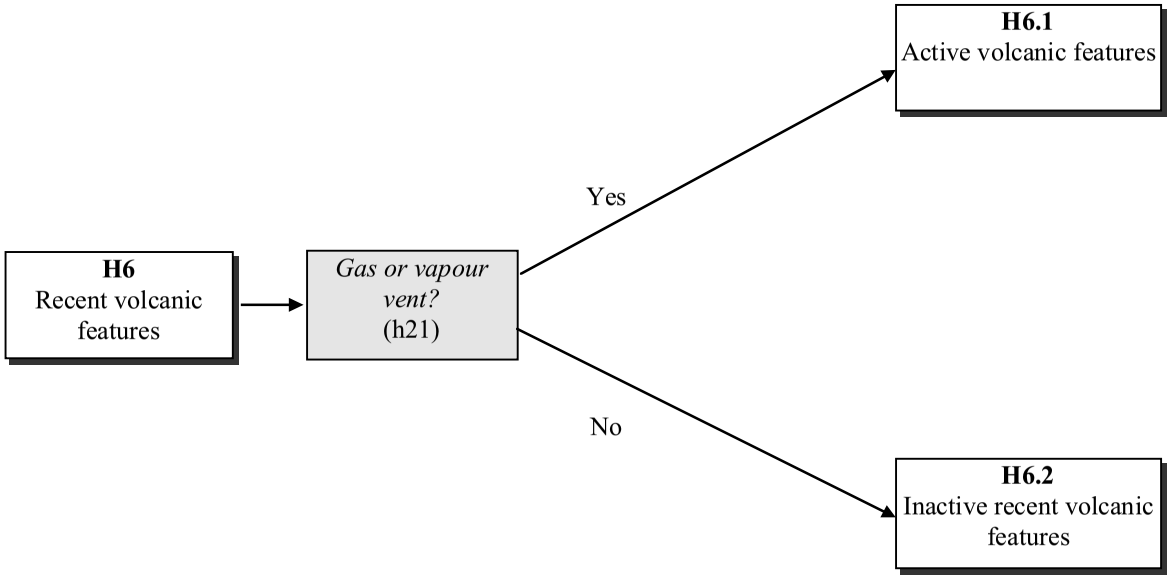


Note: Coastal unvegetated or sparsely vegetated habitats are categorised under B; littoral zone habitats of inland surface waters under C; unvegetated habitats of wetlands under D; habitats on embryonic soil with >30% vegetation cover under E1.1, E1.9 or E1.A.

EUNIS Habitat Classification: criteria for recent volcanic features (H6) to Level 3

(number) refers to explanatory notes to the key

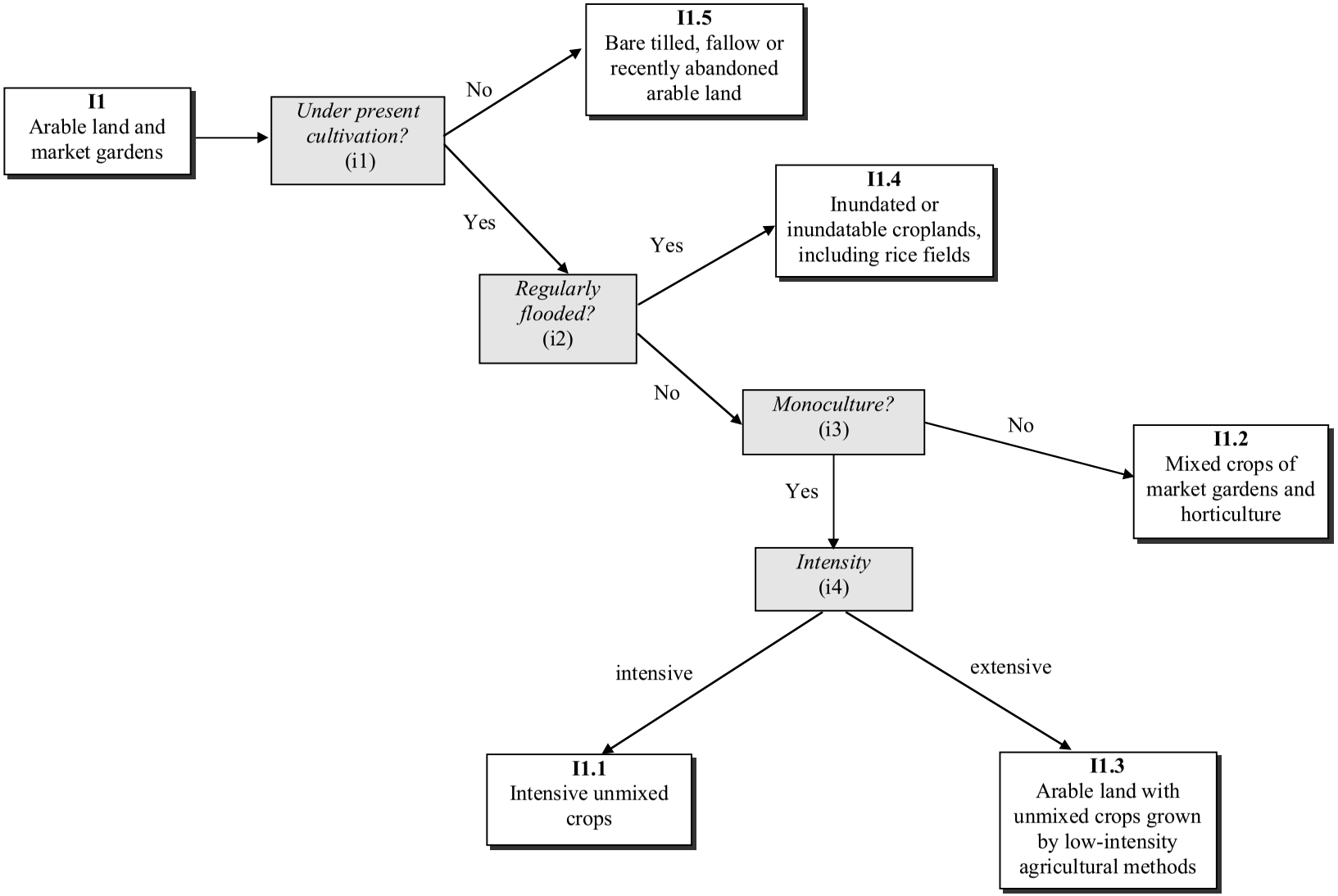


Explanatory notes to the key: Level 3 (Habitat type H)

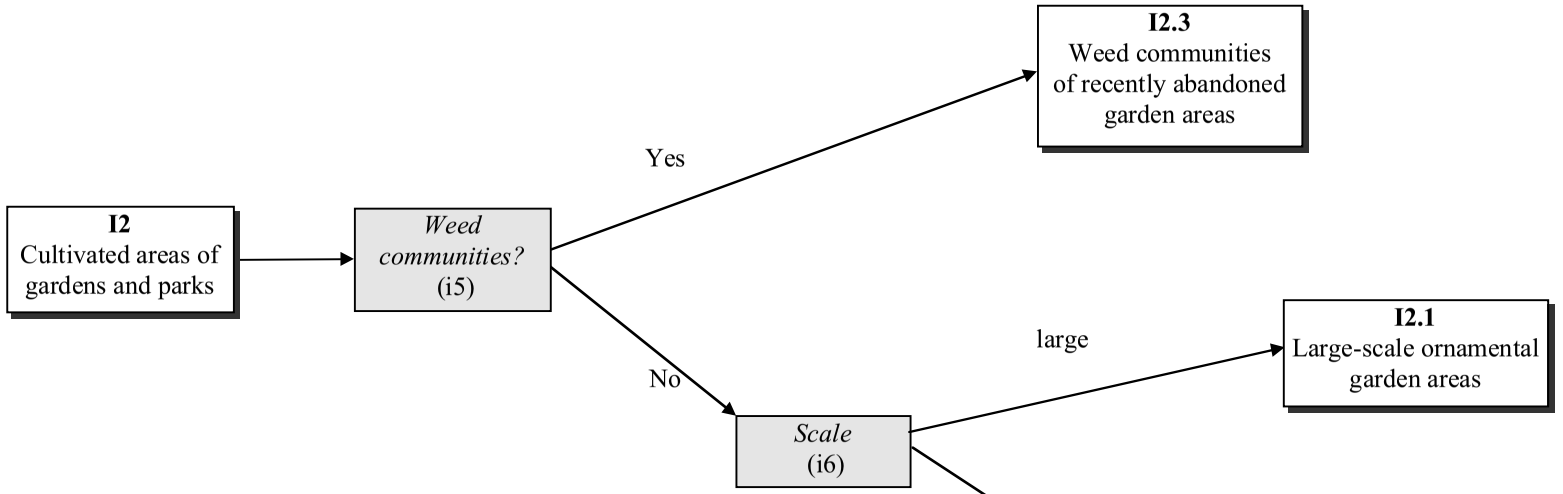
h1. Underground waterbodies whether or not within caves are distinguished (path = *Yes*).
h2. Disused mines and man-made passages, including tunnels, often with smoothed or constructed surfaces (path = *Yes*) are distinguished from natural subterranean habitats. Note that active mines are characterised under J3.1
h3. Caves formed from hollow basaltic tubes which result from the cooling of the surface of lava flows whose molten interior continued to flow are separated (path = *Yes*) from systems resulting from the action of water.
h4. Cave entrances which are influenced by light, and subject to fluctuating temperature, and which are unlikely to support a specialised fauna are separated (path = *Yes*) from cave interiors and passages beyond the reach of light and with a stable temperature.
h5. Passages restricted in cross-section in comparison with the spaces which they connect are separated (path = *Yes*).
h6. *Standing* waterbodies are separated from *flowing* waterbodies.
h7. Screes are separated according to the climatic zone: *arctic-boreal*; or *temperate-mediterranean.*
h8. Screes with a *warm* microclimate such as on south-facing exposures are distinguished from those with a *cool*er microclimate.
h9. A*cid* siliceous rocks in the temperate-mediterranean climatic zones but with a cool microclimate are distinguished from *basic* rock habitats. Note that basic includes calcareous, ultra-basic (serpentine) and dolomitic rocks.
h10. *Acid* siliceous rocks in the temperate-mediterranean climatic zones and with a warm microclimate are distinguished from *basic* rock habitats. Note that basic includes calcareous, ultra-basic (serpentine) and dolomitic rocks.
h11. *Acid* siliceous rocks in the boreal climatic zone are distinguished from *basic* rock habitats. Note that basic includes calcareous, ultra-basic (serpentine) and dolomitic rocks.
h12. Rock *outcrops* are separated from more or less horizontal rock *pavements* and more or less vertical *cliffs*.
h13. *Very wet* cliffs, usually with characteristic vegetation, are distinguished from *other* cliffs.
h14. Cliffs with chasmophytic vegetation characteristic of the *Macaronesian* biogeographic region are distinguished from *others*.
h15. Inland cliffs including their chasmophytic vegetation are separated according to rock type: *acid* siliceous, and *basic* (comprising calcareous and ultra-basic) types are distinguished.
h16. Habitats dominated by snow and ice are separated according to the substrate type: more or less permanent complete *snow* cover (névé, Firn); moving *ice*; or ice-dominated rock (path = *rock and ice*). Note that unvegetated glacial moraines where ice is no longer dominant are categorised under H5.2.
h17. Habitats created by fire which are unvegetated or sparsely vegetated are distinguished (path = *Yes*) from those created by other means.
h18. Habitats which are unvegetated or sparsely vegetated because of frequent trampling or compaction by occasional vehicles are distinguished (path = *Yes*).
h19. Substrates *sorted by* current or recent *freeze-thaw*; or arising from current or recent glacial activity comprising ice-deposited debris (but where ice is no longer dominant) (*recent ice-deposition*) are separated from those of *other* origin. Note that glacial moraines where ice is still dominant are categorised under H4.3.
h20. Other inland unvegetated habitats are distinguished according to the nature of their substrate: *mineral*; and *organic* (peat).

h21. Hot or cold gas or vapour vents are distinguished (path = *Yes*).

EUNIS Habitat Classification: criteria for arable land and market gardens (I1) to Level 3
(number) refers to explanatory notes to the key



EUNIS Habitat Classification: criteria for cultivated areas of gardens and parks (I2) to Level 3
(number) refers to explanatory notes to the key



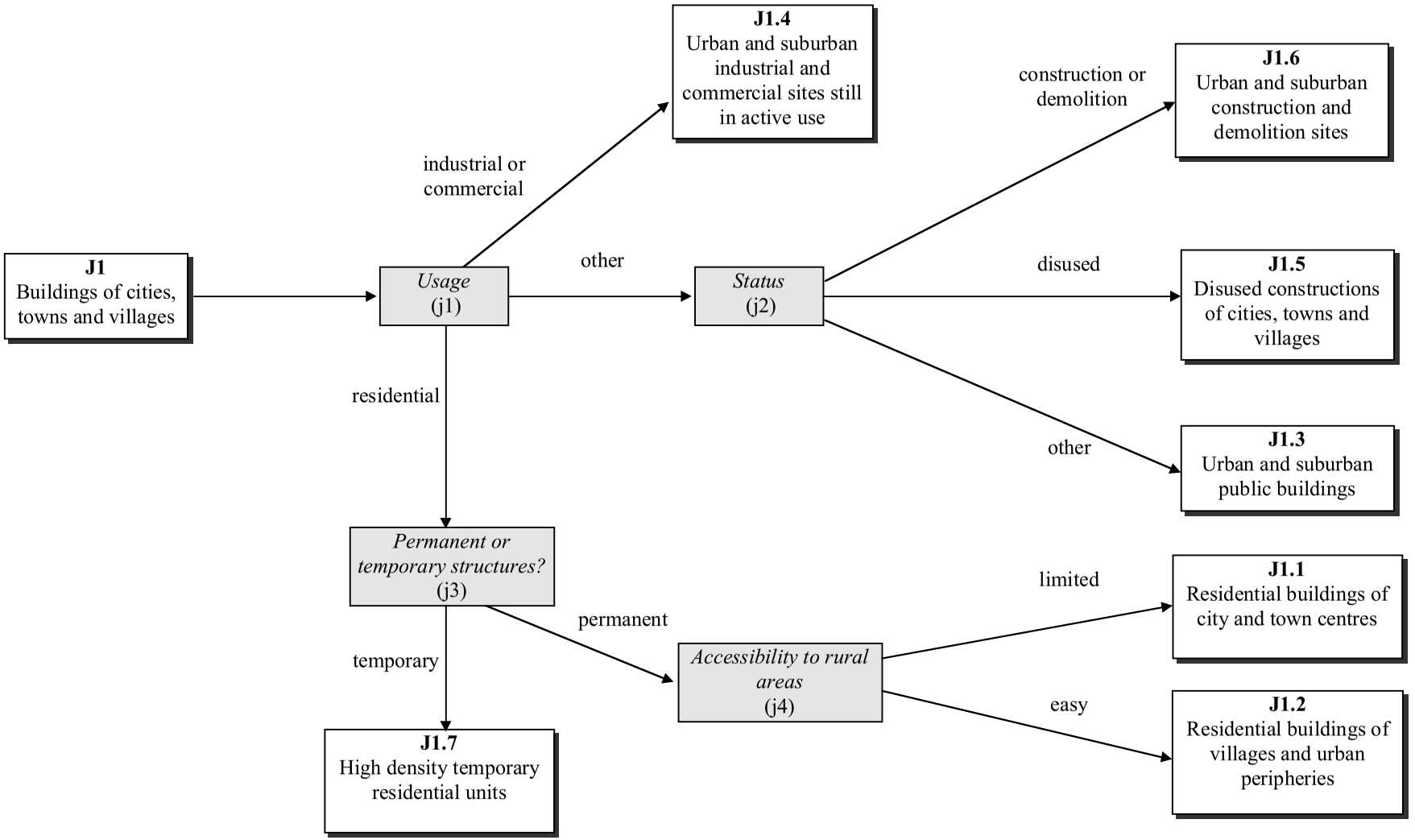
Note: Gardens, such as small-scale domestic gardens, often with very mixed species-rich flora and fauna (crops, lawns, shrubs, flowerbeds etc., frequently interspersed with paths and small buildings) in close proximity to human dwellings, urban green spaces (usually species-poor) and parks, are treated as complexes, comprising combinations of several level 1 units.

Explanatory notes to the key: Level 3 (Habitat type I)

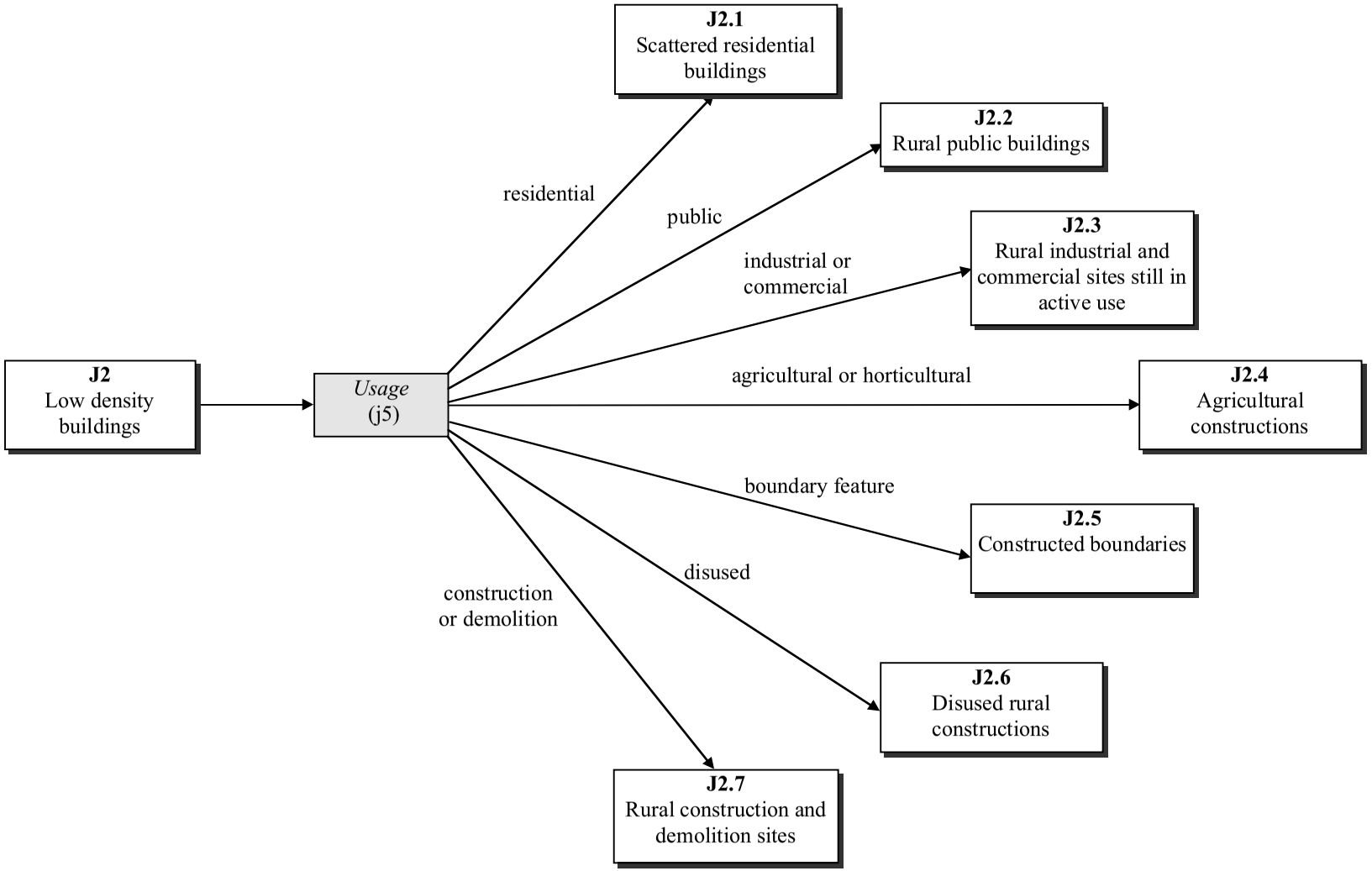
i1. Land under crops is separated (path = *Yes*).
i2. Habitats comprising land regularly flooded as part of crop cultivation are distinguished (path = *Yes*). (Note that water cress beds are categorised under C3.5)
i3. Crops (agricultural, horticultural and industrial) grown in monoculture on large, unbroken surfaces in open field landscapes are distinguished (path = *Yes*) from cultivation of alternating strips of different crops (including vegetables, flowers, small fruits, path = *No*).
i4. *Intensive* cultivation with high use of pesticides and/or high use of fertilisers is distinguished from *extensively* cultivated unmixed crops with or without low inputs of natural organic fertiliser.
i5. Previously cultivated but recently abandoned gardens colonised by weedy communities are distinguished (path = *Yes*).
i6. *Large* scale ornamental gardens, including botanic gardens with a high proportion of non-native and/or non-food species are separated from *small*-scale cultivated domestic or public garden areas often in close proximity to buildings.

Note that lawns are characterised under E2.7. Note also that waste organic material (such as dung heaps and old straw and haystacks) is categorised under J6.1 and J6.4.

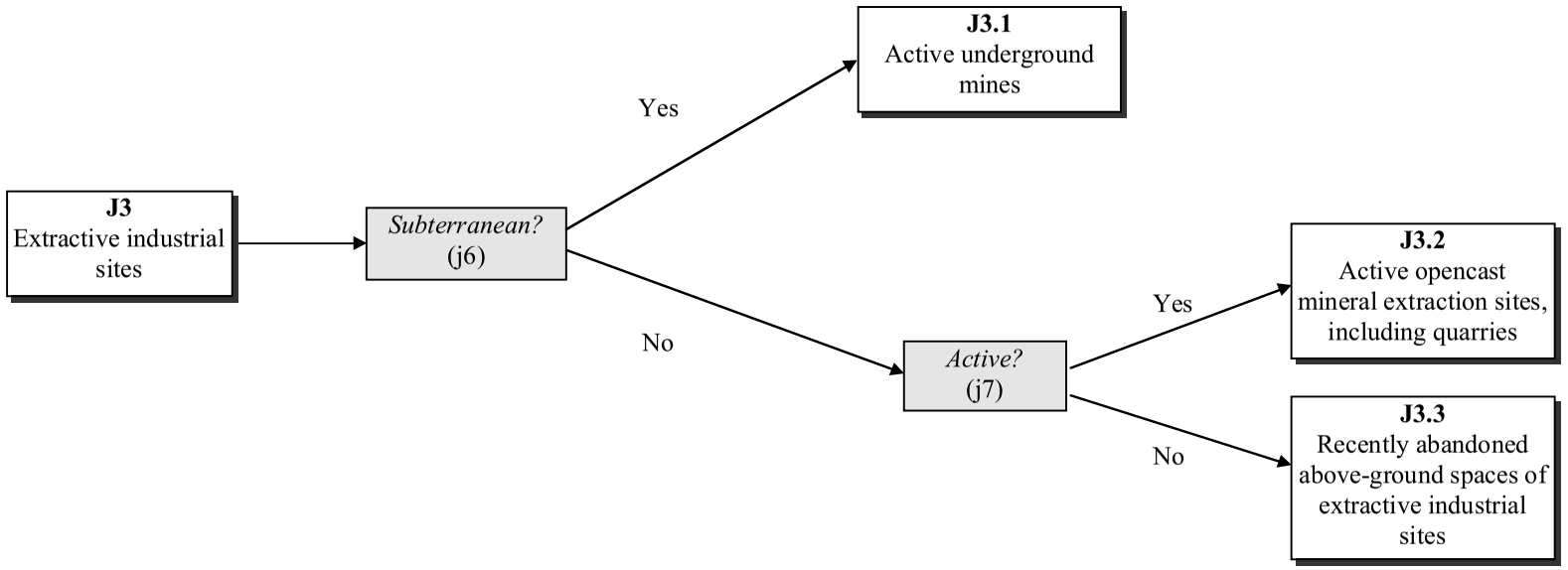
EUNIS Habitat Classification: criteria for buildings of cities, towns and villages (J1) to Level 3
(number) refers to explanatory notes to the key



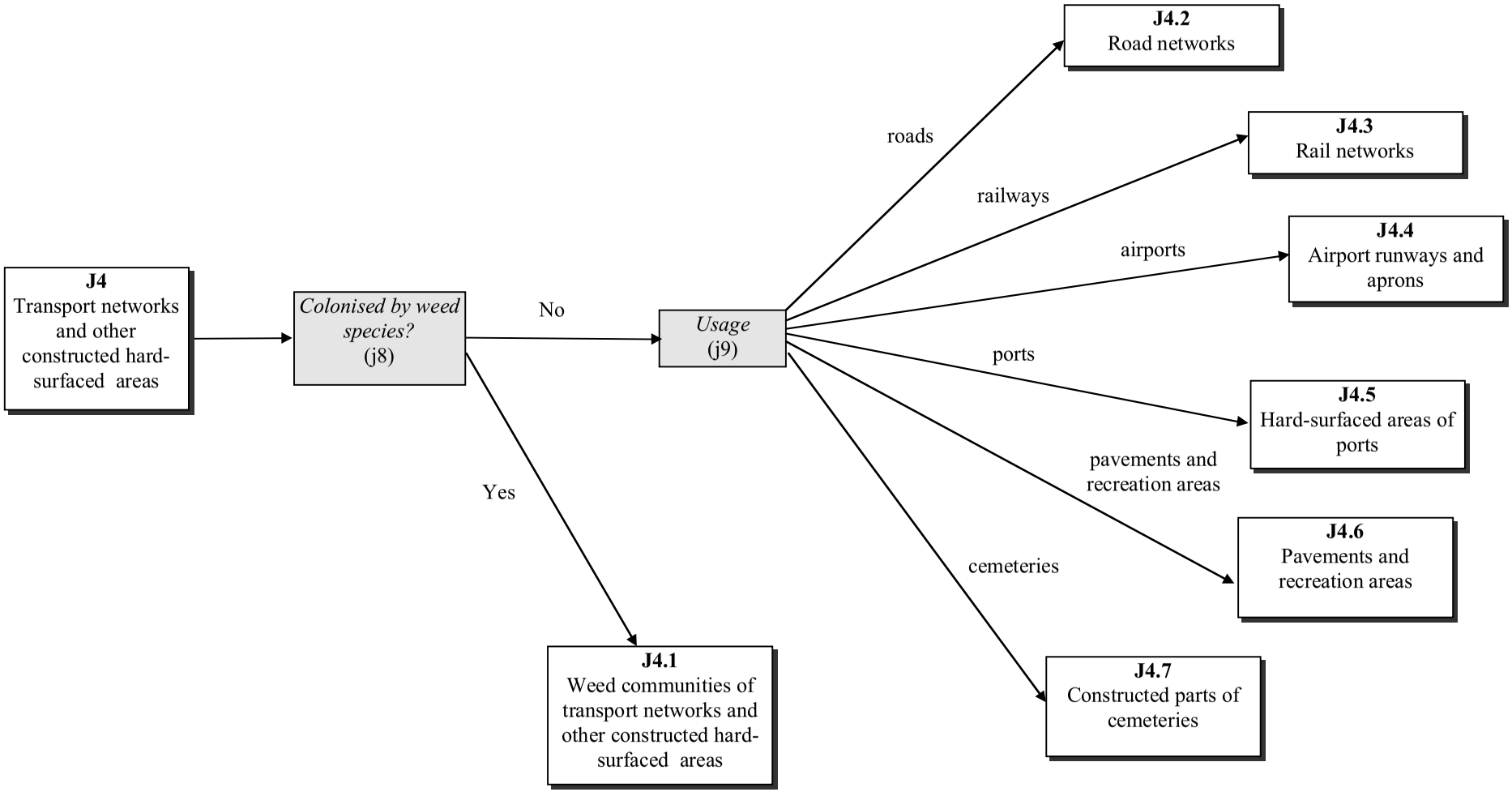
EUNIS Habitat Classification: criteria for low density buildings (J2) to Level 3
(number) refers to explanatory notes to the key



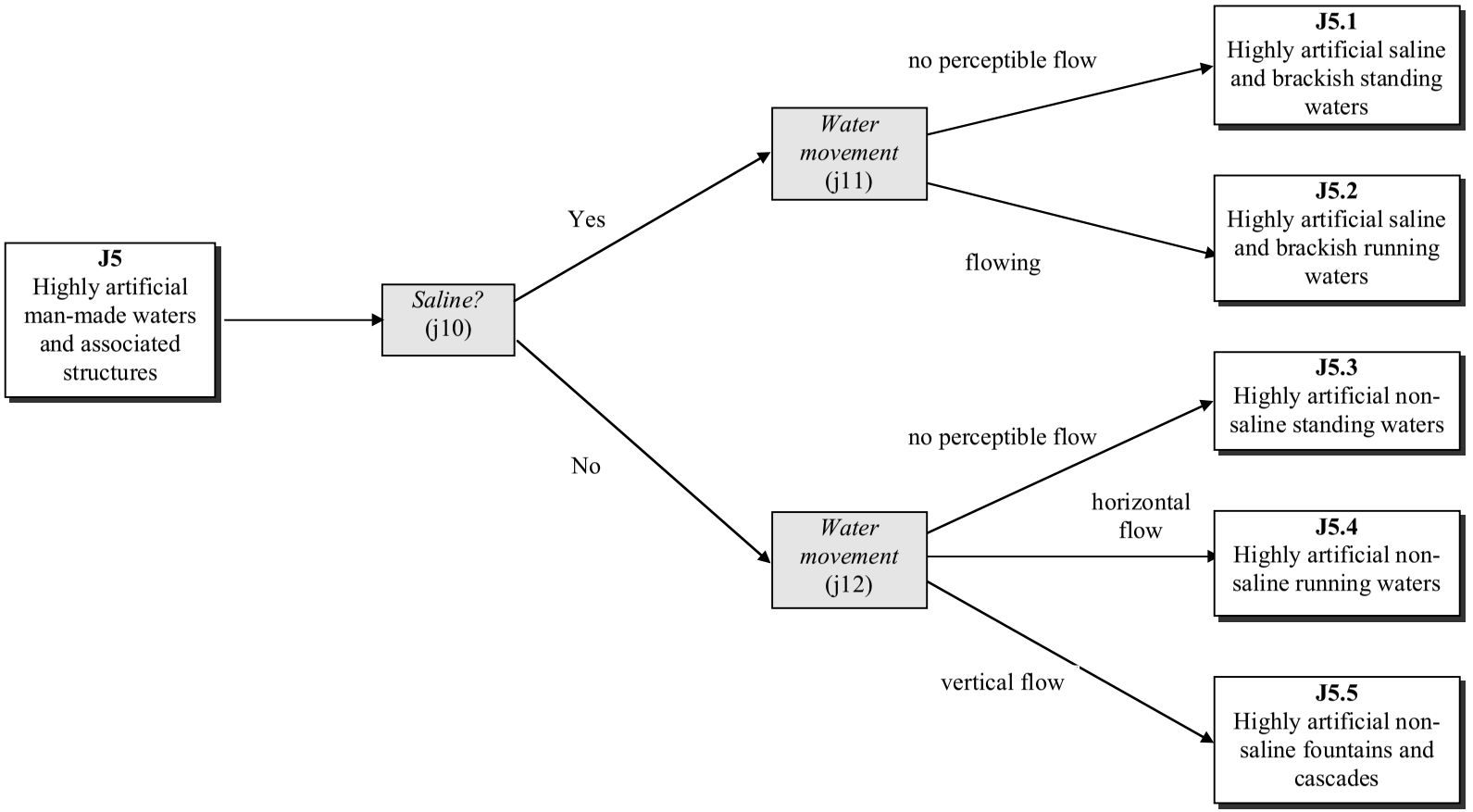
EUNIS Habitat Classification: criteria for extractive industrial sites (J3) to Level 3
(number) refers to explanatory notes to the key



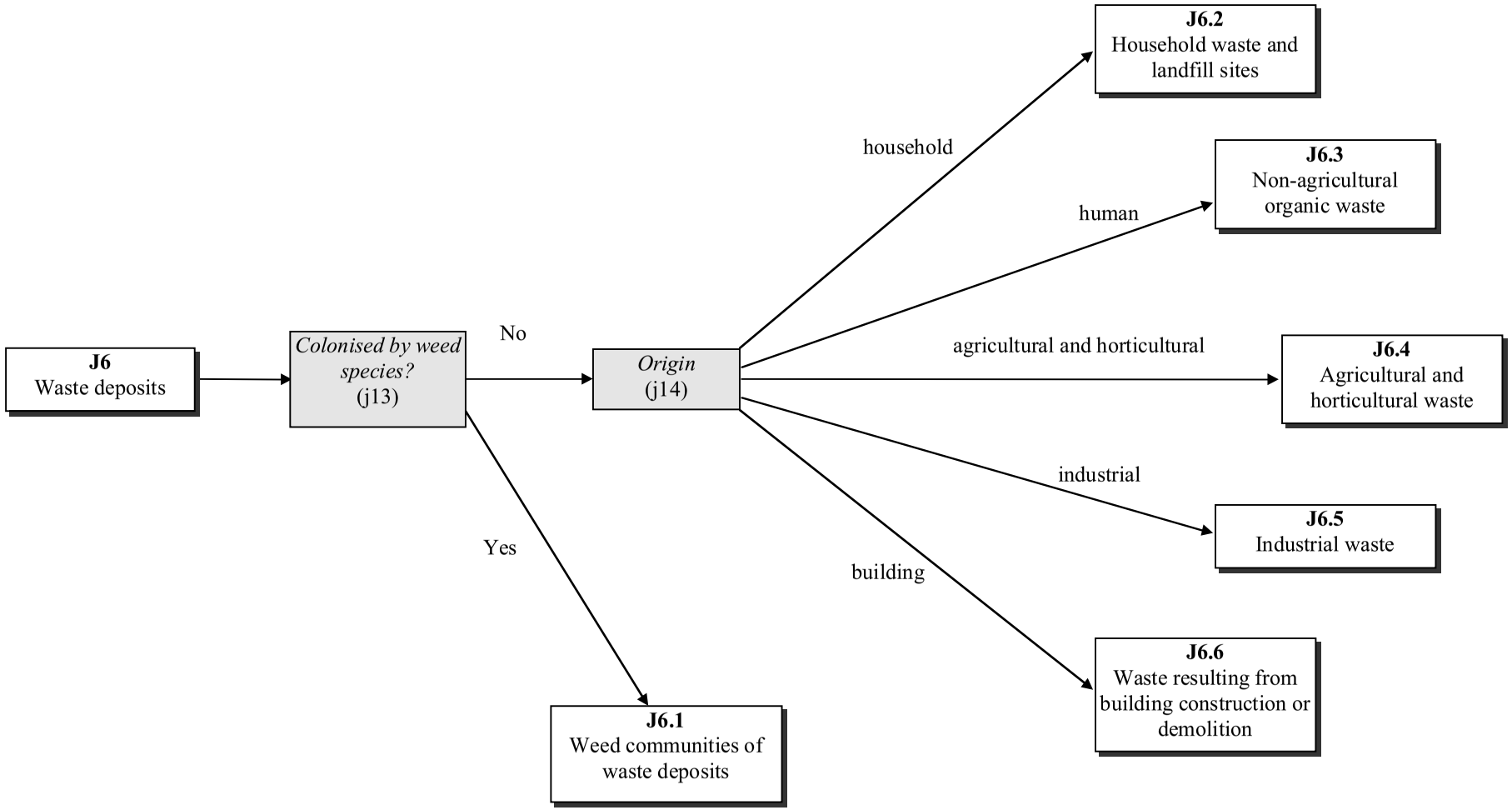
EUNIS Habitat Classification: criteria for transport networks and other constructed hard-surfaced areas (J4) to Level 3
(number) refers to explanatory notes to the key



EUNIS Habitat Classification: criteria for highly artificial man-made waters and associated structures (J5) to Level 3
(number) refers to explanatory notes to the key



EUNIS Habitat Classification: criteria for waste deposits (J6) to Level 3
(number) refers to explanatory notes to the key



Explanatory notes to the key: Level 3 (Habitat type J)

j1. Buildings are distinguished according to the amount and type of use: *residential*; *industrial or commercial*; or *other*.

j2. *Other* non-residential and non-industrial buildings, often with public access (including churches, public halls, libraries etc) are separated from *disused* buildings (including disused paved areas between buildings) and those in the process of *construction or demolition.*

j3. *Permanent* residential units are distinguished from high density *temporary* residential units. Note that isolated caravans are categorised under J2.1.

j4. Residential buildings of high density (densely populated urban areas within a medium to large size built-up ensemble, heavily interspersed with roads and footways, with *limited* access to surrounding rural areas) are distinguished from areas with moderate density housing (smaller groups of houses in rural areas and the periphery of more densely populated areas, with strong interconnections between the fauna of the built-up and countryside habitats, i.e. *easy* access to surrounding rural areas). Note that buildings include the associated constructed boundaries.

j5. Buildings in rural areas are distinguished according to the amount and type of use: *residential*; *public* access (including churches, public halls, libraries etc); *industrial or commercial*; structures connected with *agriculture or horticulture* (including greenhouses); constructed *boundaries*; *disused* (including disused paved areas); structures in the process of *construction or demolition*. Note that constructed boundaries include constructed boundaries of other vegetated areas such as woodland but that constructed boundaries closely associated with buildings are classified together with the buildings. Note that farm buildings used solely for human habitatation follow path = *residential*, but farm buildings of mixed residential and agricultural use follow path = *agriculture or horticulture.*

j6. Subterranean extractive industrial sites are distinguished (path = *Yes*) from open-cast mining and quarrying carried out at the ground surface. Note that detritus heaps and dump sites associated with extractive industries are categorised under J6 and disused subterranean sites are classified under H1.

j7. Above-ground mineral extraction sites in active use are distinguished (path = *Yes*) from recently abandoned sites. Note that disused quarries and other above-ground extractive sites with natural or semi-natural communities are characterised elsewhere.

j8. Communities of pioneering or introduced plants colonising areas associated with transport networks are separated (path = *Yes*).

j9. Six types of usage are distinguished: *roads* (including car parks and the immediate environment adjacent to roadways which is highly disturbed); *railways* (including the immediate environment which is highly disturbed); *airports* (constructed runways and aprons only); *ports* (terrestrial parts only); *pavements and recreation areas;* and the constructed parts of *cemeteries*. Note that associated buildings are categorised under J1 or J2 as appropriate.

j10. Highly artificial saline or brackish waterbodies and their associated conduits or containers (path = *Yes*) are distinguished from non-saline waters. Note that 'highly artificial' is defined as very artificial waters with wholly constructed beds or heavily contaminated water. Man-made but semi-natural water-bodies are categorised under C, and constructed habitats which support a semi-natural aquatic fauna and flora under A or C as appropriate (see level 1, note 15).

j11. Highly artificial saline or brackish waterbodies with *no perceptible flow*, together with their associated containers, are distinguished from those with perceptible flow, together with their associated conduits (path = *flowing*).

j12. Highly artificial non-saline waters with *no perceptible flow*, together with their associated containers, are distinguished from those with perceptible *horizontal flow*, together with their associated conduits and from those with *vertical flow* such as fountains and artificial cascades with wholly constructed substrates.
j13. Communities of pioneering, introduced or nitrophilous plants colonising waste deposits are separated (path = *Yes*).
j14. Habitats are distinguished by the origin of the waste material: *household* refuse; *human* waste; *agricultural and horticultural*; *industrial* waste*;* materials used for *building* or arising from their demolition.