

Guidelines for Determining Canadian National Vegetation Classification (CNVC) Macrogroup, Group, Alliance and Association Hierarchy Levels for Upland Vegetation

*CNVC Technical Committee
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Introductory Notes

1. The guidelines in this document apply only to upland vegetation, where climate is the primary environmental driver on broadly circum-mesic (“zonal”) sites. These guidelines include treatment of “azonal” upland conditions that share the dominant physiognomy of the Formation/Division (e.g., dry or moist forests). However, where primary vegetation patterns are determined by environmental factors other than climate (e.g., wetlands, beaches and shorelines, cliffs and exposed bedrock, aquatic vegetation, etc.), the CNVC accepts the EcoVeg interpretive guidelines presented in Faber-Langendoen et al, 2014 (Table 4).
2. The CNVC accepts all units in the three “Formation” levels plus the “Division” level (i.e., top 4 levels) of the EcoVeg hierarchy as representing climatic/physiognomic and biogeographic sub-divisions of Canadian vegetation according to international literature (for interpretive guidelines, see Faber-Langendoen et al, 2014 (Table 3)). This permits the CNVC to link to the global portion of the USNVC hierarchy at the Formation levels (which also uses the EcoVeg hierarchy), regardless of whether CNVC concepts for Macrogroup, Group, Alliance and Association levels are equivalent to those adopted by the USNVC.
3. All differentiation of units at the various hierarchical levels will be supported by data summaries of observable vegetation patterns within the CNVC national database and confirmed by Peer Review panels against guidelines for ecological interpretation summarized in this document.
4. Rule-sets will be developed as necessary during the analysis phases of hierarchy development.
5. Where a Canadian vegetation pattern represents a limited expression of a broader condition whose range is centered outside of Canada (e.g., Ontario “Carolinian” forest), efforts will be made to refer to international classification treatment of the condition when determining the CNVC classification treatment.

Hierarchy Levels for Upland Vegetation

CNVC Formation Class, Formation Subclass, Formation and Division

See EcoVeg definitions and interpretive guidelines in Faber-Langendoen et al, 2014 (esp. Table 3).

CNVC Macrogroup

Concept: A regionally distinct subset of plant species composition, abundance and/or dominance, representing primary regional climatic gradients as reflected in vegetation patterns on circum-mesic (“zonal”) sites.

Characteristics:

- vegetation patterns on circum-mesic sites reflecting the influence of primary regional gradients of climate (i.e., latitudinal, altitudinal, continentality gradients), including (climate-driven) stand structure (e.g., forest vs woodland physiognomy) and overall species floristics/dominance are distinguished;
- significant climate-driven variation in regional disturbance regimes or successional trajectories, as reflected in vegetation patterns on circum-mesic sites, can be Macrogroup diagnostics (e.g., fire regimes);
- on circum-mesic sites within any specific Formation, geological and broad-scale edaphic drivers (i.e. “azonal” environmental determinants) of vegetation patterns are not recognized at the Macrogroup level in the CNVC.

CNVC Macrogroup subtype

Concept: A regionally distinct subset of plant species composition, abundance and/or dominance, representing secondary regional climatic gradients within the Macrogroup as reflected in vegetation patterns on circum-mesic (zonal) sites. Secondary regional biogeographic gradients within Divisions are also distinguished at the Macrogroup subtype level.

Characteristics:

- vegetation patterns on circum-mesic sites reflecting the influence of secondary regional gradients of climate within the Macrogroup (i.e., latitudinal, altitudinal, continentality gradients), including overall species floristics and/or dominance are distinguished;
- climate-driven variation in disturbance regimes or successional trajectories within the Macrogroup, as reflected in vegetation patterns on circum-mesic sites (e.g., maritime boreal conditions with reduced fire regime) can be distinguished.

- secondary biogeographic gradients within similar dominant physiognomy and overall “Division” floristics, expressed at the regional scale, can be recognized at the Macrogroup subtype level (e.g., Cordilleran vs Central boreal forests).

CNVC Group

Concept: An aggregation of Alliances within the regional vegetation defined by a Macrogroup (or subtype), with consistency in dominant and/or diagnostic species. Groups describe regionally generalized vegetation patterns attributable to ecological drivers such as edaphic or geological conditions within the Macrogroup (subtype), successional relationships within the Macrogroup (subtype), etc.

Characteristics:

- broad vegetation patterns reflecting intra-regional non-climatic (i.e., “azonal”) ecological gradients (e.g., geology, geomorphology, soils) are distinguished;
- broad regional vegetation patterns of local site-level variability not recognized at the Alliance level (e.g., dry/mesic-site vs moist-site vegetation patterns) are distinguished;
- in the context of regionally consistent disturbance regimes and successional trajectories within the Macrogroup (subtype), successional relationships on similar site conditions between Alliances can be aggregated at the Group level;
- vegetation patterns on both “zonal” and “azonal” sites reflecting the influence of tertiary regional gradients of climate (e.g., regional coastal environments) within the Macrogroup (subtype) can be recognized at the Group level.

CNVC Group subtype

Concept: An aggregation of Alliances, with consistency in dominant and/or diagnostic species, describing regionally generalized vegetation patterns that do not indicate ecological differences strong enough to warrant recognition at the Group level.

CNVC Alliance

Concept: An aggregation of Associations, with consistency in dominant and/or diagnostic species, describing regionally repeating vegetation patterns at the local to sub-regional scale. Alliances are created by grouping Associations that are ecologically “related” into more generalized ecological units (e.g., successional related Associations on similar edaphic conditions can be aggregated into more generalized Alliances).

Characteristics:

- moderately generalized regional vegetation patterns of local site-scale variability may be distinguished at the Alliance level (e.g., dry-site vs mesic-site vegetation patterns);
- generalized regional patterns of stand structure (e.g., feathermoss forests, dry woodlands) may be recognized at the Alliance level;
- in the context of regionally consistent disturbance regimes and successional trajectories within the Macrogroup, successional relationships on similar site conditions between Associations can be aggregated at the Alliance level;
- with the possible exception of regionally repeating vegetation patterns caused by local micro- or mesoclimate (e.g., local coastal environments; terrain-influenced cold air drainage), climate drivers are not recognized at the Alliance level in the CNVC.

CNVC Alliance subtype

Concept: An aggregation of Associations, with consistency in dominant and/or diagnostic species, describing regionally repeating vegetation patterns at the local to sub-regional scale that do not indicate ecological differences strong enough to warrant recognition at the Alliance level.

CNVC Association

Concept: A plant community type with consistency of species dominance and overall floristic composition, having a clearly interpretable ecological context in terms of site-scale climate, substrate and/or hydrology conditions, moisture/nutrient factors and disturbance regimes, as expressed by diagnostic indicator species.

Characteristics:

- variation in species dominance at the stand scale is distinguished (e.g., recognition of conifer/mixed/broadleaved overstory distinctions);
- vegetation patterns resulting from site-scale environmental ecological drivers (e.g., soil moisture and nutrient regimes; soil texture and depth; cold air drainage) are distinguished using diagnostic species indicators;

- changes in physiognomy (stand structure) resulting from site-scale ecological factors are distinguished (e.g., woodlands on dry/poor sites);
- in the context of regionally consistent disturbance regimes and successional trajectories within the Macrogroup, successional relationships may exist between Associations.

CNVC subassociation

Concept: Consistent patterns of species occurrence or vegetation dominance that do not indicate ecological differences strong enough to warrant recognition at the Association level.

**Interpretive Guidelines for Ecological Gradients Emphasized at Canadian National Vegetation Classification (CNVC)
Macrogroup, Group, Alliance and Association Hierarchy Levels for Upland Vegetation**

| Ecological Gradients and Observable Vegetation Criteria for upland sites* | | | | | |
|---|--|--|---|---|---|
| CNVC Technical Committee, May 2015 | | | | | |
| Hierarchy Level | Conceptual Spatial Scale and Vegetation Criteria | Physiognomy | Climate | Disturbance regime / Succession | Edaphic / Geology |
| CNVC Macrogroup | Sub-continental to regional scale: regionally distinct subsets of species composition, abundance and/or dominance are distinguished between Macrogroups | Stand structure differences on circum-mesic sites (i.e., climate-driven) are distinguished between Macrogroups (e.g., forest vs woodland); dominant growth forms on circum-mesic sites are broadly uniform both within and between Macrogroups within a Division | Primary regional climatic gradients as reflected in vegetation patterns on circum-mesic sites are distinguished between Macrogroups (e.g., latitudinal, altitudinal, continentality gradients) | Generally consistent disturbance and successional regimes within a Macrogroup, indicative of regional climate | Broad range of edaphic and geological conditions within a Macrogroup |
| CNVC Group | Regional to local scale: consistency in stand-level dominant and/or diagnostic species within Groups | Generally uniform physiognomy within a Group; stand structure variation due to sub-regional “azonal” drivers (e.g., alvar woodlands) or regionally consistent local site-scale drivers (e.g., dry woodlands) is distinguished between Groups | Regionally consistent local [tertiary] climate influences (e.g., coastal microclimates) on both circum-mesic and “azonal” sites can be distinguished between Groups | Disturbance regime within a Group is typically consistent; Groups may describe aggregations of successional related Alliances, reflecting regionally consistent successional trajectories within Macrogroups (or subtypes) | Within-region broad consistency of selected site-scale edaphic or geological conditions within a Group (e.g., grouping of Alliances with moderately similar site-scale moisture and nutrient conditions) |
| CNVC Alliance | Regional to local scale: consistency in stand-level dominant and/or diagnostic species within Alliances | Uniform physiognomy within an Alliance; dominant growth form differences (e.g., conifer vs broadleaved dominance) may be distinguished between Alliances; stand structure variation due to local or regionally consistent site-scale drivers (e.g., dry woodlands) may be distinguished between Alliances | Local climate influences (e.g., topo-edaphic cold microclimates) are distinguished between Alliances | Consistent disturbance regime within an Alliance; Alliances may describe groupings of successional related Associations | Within-(sub)region consistency in selected site-scale edaphic or geological conditions (e.g., grouping of Associations with similar site-scale moisture and nutrient conditions) |
| CNVC Association | Local scale: consistency in stand-level floristics, dominance and diagnostic species of plant communities within Associations | Uniform physiognomy within an Association; stand structure variation due to local site-scale drivers (e.g., dry woodlands) is distinguished between Associations | Local climate influences (e.g., topo-edaphic cold microclimates) are distinguished between Associations | Consistent disturbance regime within an Association; disturbance or successional relationships may exist between Associations | Narrow range of edaphic or geological conditions within an Association, indicative of locally significant site factors (e.g., soil moisture and nutrient regimes) |

* Bold type in table indicates a primary factor at that level of hierarchy.