



# The INSTITUTE for BIRD POPULATIONS

## **MAPS HSA Code Supplement**

**2022 PROTOCOL**

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## Background

**This supplement is not meant to be used alone, but as reference material for the Habitat Structure Assessment outlined in the MAPS Manual (beginning 2022).**

The National Vegetation Classification Standard (NVCS) was drafted in 1997 but was updated significantly to the 2021 version we will use moving forward. This standard will be adhered to by the HSA protocol in order to maintain consistency with the eventual publication of the NVCS spatial database. The HSA protocol is similar to the field data forms used by NVCS contributors but is more detailed. Below are two excerpts from published literature dealing with the objectives of creating this standard.

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### Vegetation Classification and Information Standards

The overall objective of the Vegetation and Information Standards is to support the use of a consistent national vegetation classification system (NVCS) to produce uniform statistics in vegetation resources from vegetation cover data at the national level. It is important that, as agencies map or inventory vegetated Earth cover, they collect enough data accurately and precisely to translate it for national reporting, aggregation, and comparisons. Adoption of the Vegetation Classification and Information Standards in subsequent development and application of vegetation mapping schemes will facilitate the compilation of regional and national summaries. In turn, the consistent collection of such information will eventually support the detailed, quantitative, geo-referenced basis for vegetation cover modeling, mapping, and analysis at the field level.

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### Choosing the appropriate alliance to describe HSA habitat types

We have provided this supplement with its linked PDF of the US National Vegetation Classification (USNVC) Database v2.031 2021 help you determine the NVCS Alliance level corresponding to any habitat type associated with your MAPS station.

This document outlines the upper levels of the NVCS hierarchical classification system and will help you narrow down your search for the appropriate alliance to describe a habitat type.

The included Glossary provides a list of terms used in the NVCS descriptions.

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**Step 1.** Study the first page of HSA Appendix 2 and make sure you understand the NVCS hierarchy and how codes are constructed.

**Step 2.** Use Appendix 2 to first narrow the search down to the FORMATION level code (e.g. IA8Nc - Giant temperate or subpolar needle-leaved evergreen forest). In Appendix 2 we provide a list of CLASS (e.g. I – Forest) level codes and their definitions. Under this there is a list of SUBCLASS level (e.g. IVA – Dwarf-shrubland ) codes and the page

numbers corresponding to the starts of the lists of GROUP/Subgroup and FORMATION level codes under that SUBCLASS. Choose the appropriate FORMATION code that describes the habitat type you are interested in.

**Step 3.** Once you have selected the FORMATION level code that corresponds to the general type of habitat you are trying to define move to Appendix 4, 5 or 6 (depending which region you are in – see above). To help you search the regional ALLIANCE lists for the alliance that describes your habitat type we have provided the page numbers upon which each CLASS (I-VII) level starts. Scan the list until you find the FORMATION code you selected from Appendix 2, under which is a list of the component ALLIANCES for that FORMATION (e.g. IIBNa1 - *Sequoiadendron giganteum* forest).

**Enter the chosen NVCS Alliance code in the space provided at the top of HSA Form H1.**

If, however, the habitat type you are considering is not described by any of the NVCS Alliances it is either not yet defined by NVCS, or is atypical for your region but may exist in a neighboring region. Firstly ensure that you record at least the FORMATION code, species names (please provide scientific names if possible), and an appropriate description of the habitat on HSA Form H1. You may also contact Phil Nott in case the alliance is atypical of your region but appears in a neighboring region – obviously it is cost limiting to send all persons the entire North American list of alliances.

#### **UPPER LEVELS OF THE CLASSIFICATION HIERARCHY: Description to Formation Level**

The upper levels of the NVCS hierarchical classification system are organized as follows. We suggest you determine the Class, Subclass, and Formation using the lists below before using the linked PDF (below) to determine the finer classes of Division through Alliance or Association.

**CLASS** - Study these definitions and choose the appropriate class of your habitat type:

- 1 Forest & Woodland Class
- 2 Shrub & Herb Vegetation Class
- 3 Desert & Semi-Desert Class
- 4 Polar & High Montane Scrub, Grassland & Barrens Class
- 5 Aquatic Vegetation Class
- 6 Open Rock Vegetation Class
- 7 Agricultural & Developed Vegetation Cultural Class

#### **SUBCLASS**

- 1.A Tropical Forest & Woodland Subclass
- 1.B Temperate & Boreal Forest & Woodland Subclass
- 2.A Tropical Grassland, Savanna & Shrubland Subclass
- 2.B Temperate & Boreal Grassland & Shrubland Subclass
- 2.C Shrub & Herb Wetland Subclass
- 3.A Warm Desert & Semi-Desert Woodland, Scrub & Grassland Subclass
- 3.B Cool Semi-Desert Scrub & Grassland Subclass
- 4.A Tropical High Montane Scrub & Grassland Subclass
- 4.B Temperate to Polar Alpine & Tundra Vegetation Subclass
- 5.A Saltwater Aquatic Vegetation Subclass
- 5.B Freshwater Aquatic Vegetation Subclass
- 6.A Tropical Open Rock Vegetation Subclass
- 6.B Temperate & Boreal Open Rock Vegetation Subclass
- 7.A Woody Agricultural Vegetation Cultural Subclass
- 7.B Herbaceous Agricultural Vegetation Cultural Subclass

- 7.C Herbaceous & Woody Developed Vegetation Cultural Subclass
- 7.D Agricultural & Developed Aquatic Vegetation Cultural Subclass

### **FORMATION**

- 1.A.1 Tropical Dry Forest & Woodland Formation
- 1.A.2 Tropical Lowland Humid Forest Formation
- 1.A.3 Tropical Montane Humid Forest Formation
- 1.A.4 Tropical Flooded & Swamp Forest Formation
- 1.A.5 Mangrove Formation
- 1.B.1 Warm Temperate Forest & Woodland Formation
- 1.B.2 Cool Temperate Forest & Woodland Formation
- 1.B.3 Temperate Flooded & Swamp Forest Formation
- 1.B.4 Boreal Forest & Woodland Formation
- 1.B.5 Boreal Flooded & Swamp Forest Formation
- 2.A.1 Tropical Lowland Grassland, Savanna & Shrubland Formation
- 2.A.2 Tropical Montane Grassland & Shrubland Formation
- 2.A.3 Tropical Scrub & Herb Coastal Vegetation Formation
- 2.B.1 Mediterranean Scrub & Grassland Formation
- 2.B.2 Temperate Grassland & Shrubland Formation
- 2.B.3 Boreal Grassland & Shrubland Formation
- 2.B.4 Temperate to Polar Scrub & Herb Coastal Vegetation Formation
- 2.C.1 Tropical Bog & Fen Formation
- 2.C.2 Temperate to Polar Bog & Fen Formation
- 2.C.3 Tropical Freshwater Marsh, Wet Meadow & Shrubland Formation
- 2.C.4 Temperate to Polar Freshwater Marsh, Wet Meadow & Shrubland Formation
- 2.C.5 Salt Marsh Formation
- 3.A.1 Tropical Thorn Woodland Formation
- 3.A.2 Warm Desert & Semi-Desert Scrub & Grassland Formation
- 3.B.1 Cool Semi-Desert Scrub & Grassland Formation
- 4.A.1 Tropical High Montane Scrub & Grassland Formation
- 4.B.1 Temperate & Boreal Alpine Tundra Formation
- 4.B.2 Polar Tundra & Barrens Formation
- 5.A.1 Floating & Suspended Macroalgae Saltwater Vegetation Formation
- 5.A.2 Benthic Macroalgae Saltwater Vegetation Formation
- 5.A.3 Benthic Vascular Saltwater Vegetation Formation
- 5.A.4 Benthic Lichen Saltwater Vegetation Formation
- 5.B.1 Tropical Freshwater Aquatic Vegetation Formation
- 5.B.2 Temperate to Polar Freshwater Aquatic Vegetation Formation
- 6.A.1 Tropical Cliff, Scree & Other Rock Vegetation Formation
- 6.B.1 Temperate & Boreal Cliff, Scree & Other Rock Vegetation Formation
- 7.A.1 Woody Horticultural Crop Cultural Formation
- 7.A.2 Forest Plantation & Agroforestry Cultural Formation
- 7.A.3 Woody Wetland Horticultural Crop Cultural Formation
- 7.B.1 Row & Close Grain Crop Cultural Formation
- 7.B.2 Pasture & Hay Field Crop Cultural Formation
- 7.B.3 Herbaceous Horticultural Crop Cultural Formation
- 7.B.4 Fallow Field & Weed Vegetation Cultural Formation
- 7.B.5 Herbaceous Wetland Crop Cultural Formation
- 7.C.1 Lawn, Garden & Recreational Vegetation Cultural Formation
- 7.C.2 Other Developed Vegetation Cultural Formation
- 7.C.3 Developed Wetland Vegetation Cultural Formation
- 7.D.1 Agricultural Aquatic Vegetation Cultural Formation
- 7.D.2 Developed Aquatic Vegetation Cultural Formation

## **DIVISION through ALLIANCE & ASSOCIATION CODES**

These are listed in an Excel file at the following link:

<https://www.birdpop.org/docs/misc/USNVCSummary.xlsx>

Go to the section headed by your determined Class, Subclass, and Formation to narrow down the Division and enter the four part code on the data sheet, e.g. 1.B.2.Nd.

Then determine the appropriate Association for this habitat. If a specific Association cannot be determined, try narrowing down to at least the level of Alliance. Knowing the dominant species can make this process much easier.

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You may also contact Danielle Kaschube (609-892-0445) if you need assistance with this.

## SECTION 2 – GLOSSARY

The following terms and definitions are used in the National Vegetation Classification Standard.

**Agricultural Field** - Bare Soil, Crop Residue - Cropland, either tilled or untilled, which has little or no live crop vegetation present. Such areas may or may not have crop residue from previous crops on the surface. This category also includes cropland in a fallow state – that is, cropland which has been left idle during the whole or greater portion of the growing season.

**Alliance** - A physiognomically uniform group of Associations sharing one or more diagnostic (dominant, differential, indicator, or character) species which, as a rule, are found in the uppermost stratum of the vegetation.

**Alluvial** - Characterized by the deposition of sediment by a stream or other running water at any point along its course.

**Alpine** - The zone on mountain tops between permanent snow and the cold limits of trees.

**Annual** - Plant species that complete their life-cycle within a single growing season.

**Annual Close-Grown Forbs and Grasses** - Annual (non-perennial) forbs and grasses which are drill-seeded or broadcast. Examples include wheat, barley, and oats.

**Annual Row-Crop Forbs and Grasses** - Annual (non-perennial) forbs and grasses planted in rows on a regular and generally consistent row and plant spacing. Examples include corn, soybeans, tomatoes, potatoes, sorghum, and cotton.

**Annual Vegetation** - Associations that persist for less than one year or are dominated by annual species.

**Assemblages** - Vegetative communities composed of several to many different species of plants that assemble themselves based on specific site conditions and the presence of seed.

**Association** - The finest level of the classification standard. The Association is a physiognomically uniform group of vegetation stands that share one or more diagnostic (dominant, differential, indicator, or character) overstory and understory species. These elements occur as repeatable patterns of assemblages across the landscape, and are generally found under similar habitat conditions. (The Association refers to existing vegetation, not a potential vegetation type).

**Biennial** - Plant species that complete their life-cycles within two growing seasons.

**Boreal** - Northern biogeographical region typically referring to subpolar and cold temperate areas.

**Brackish** - Tidal water with a salinity of 0.5-30 parts per thousand.

**Broad-leaved** - A plant with leaves that have well-defined leaf blades and are relatively wide in outline (shape) as opposed to needle-like or linear; leaf area is typically greater than 500 square millimeters or 1 square inch. **Bryophyte** - Nonvascular, terrestrial green plant, including mosses, hornworts, and liverworts.

**Bunch Grass** - Multi-stemmed (caespitose) life form of grasses characterized by clumps of erect shoots that slowly spread horizontally by tillers, generally creating distinct individual plants spaced across the ground; often applied to sedges and other graminoids with similar life forms.

**Caespitose (cespitate)** - Describes a low branching pattern from near the base that forms a multi-stemmed or a bunched appearance.

**Canopy Cover** - The proportion of ground, usually expressed as a percentage, that is occupied by the perpendicular projection down on to it of the aerial parts of the vegetation or the species under consideration. The additive cover of multiple strata or species may exceed 100%.

**Canopy Stratum** - Canopy layer.

**Classification** - The grouping of similar types (in this case - vegetation) according to criteria (in this case - physiognomic and floristic) which are considered significant for this purpose. The rules for classification must be clarified prior to identification of the types within the classification standard. The classification methods should be clear, precise, where possible quantitative, and based upon objective criteria, so that the outcome would be the same whoever performs the definition (or description). Classification necessarily involves definition of class boundaries (UNEP/FAO 1995).

**Cliff** - Any high, very steep to perpendicular, or overhanging face of a rock outcrop.

**Closed Tree Canopy** - A class of vegetation that is dominated by trees with interlocking crowns (generally forming 60-100% crown cover).

**Cloud Forest** - Tropical and subtropical montane forest characterized by a high incidence of low-level cloud cover, usually at the canopy level, promoting development of an abundance of vascular epiphytes.

**Cold Deciduous** - A class of vegetation where the leaves drop in the unfavorable season of winter frost and freeze. The foliage is dropped every year. Applied to vegetation adapted to cold season influences (temperate).

**Conical-crowned** - Describes a needle-leaved evergreen tree with a pyramidal or cone-shaped canopy or life form; for example, Douglas fir and silver fir (*Pseudotsuga menziesii* and *Abies amabilis*).

**Cover** - The area of ground covered by the vertical projection of the aerial parts of plants of one or more species.

**Cover Type** - A designation based upon the plant species forming a plurality of composition within a given area (e.g., Oak-Hickory).

**Creeping** - The pattern of stems growing at or just beneath the surface of the ground and usually producing roots at nodes.

**Crosswalk** - Organizational and definitional property of a classification standard which provides that all its categories either share a common definition with an FGDC vegetation standard category at some level of the hierarchy, or represent a subset of one and only one category at a given level of the FGDC Vegetation Classification Standard. When a standard crosswalks with the FGDC Vegetation Classification, it means that all categories of the standard have one and only one place with the FGDC Standard where they logically exist. It does not mean that all categories of the standard must crosswalk to the same level of the FGDC Standard.

**Crustose Lichen** - Lichen life form that grows in intimate contact with its substrate, lacks a lower cortex and rhizoids (root-like structures), and is impossible to separate from the substrate without destroying the thallus; lichen with an unlobed, flattened thallus, growing adnate to the substrate.

**Cushion Plant** - A low, woody, plant life form so densely branched that it forms a compact canopy that is pad- or bolster-like in appearance; usually with microphyllous foliage; characteristic of alpine and tundra plants.

**Cylindrical-crowned** - A needle-leaved evergreen tree with a narrow, essentially cylinder-shaped canopy or life form; for example, subalpine fir and black spruce (*Abies lasiocarpa* and *Picea mariana*).

**Deciduous** - A woody plant that seasonally loses all of its leaves and becomes temporarily bare-stemmed.

**Deciduous Cover** - Vegetation classes where 75% or more of the diagnostic vegetation is made up of tree or shrub species that shed foliage simultaneously in response to an unfavorable season. There is usually one "leaf-off" season every year.

**Deciduous Vegetation** - Associations in which deciduous woody plants generally contribute 75% or more to total dominant plant cover.

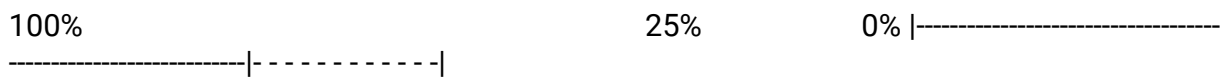
**Diagnostic Species** - a.k.a. indicator species or phytometers. Used to evaluate [i.e., diagnose] an area, or site, for some characteristic. For example, the presence and relative



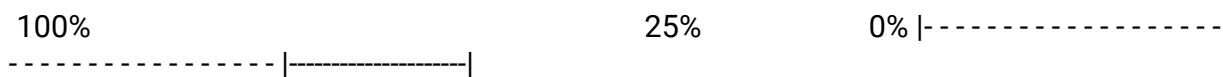
density of a *Vaccinium stamineum* var. *stamineum* (gooseberry) understory existing beneath a canopy of chestnut oak, black oak, and Virginia pine indicates that the site is xeric (or dry). The oaks and pines can inhabit a wide range of sites, wet to dry. But the gooseberry understory is the indicator of a drier habitat (which is probably due to a combination of factors including: soil type, slope, aspect, elevation, and site history).

**Division** - This is the first level in the classification standard separating Earth cover into either vegetated or non-vegetated categories (See also Order)

**Dominance** - The extent to which a given species or life form predominates in a community because of its size, abundance or cover, and affects the fitness of associated species. Dominance is interpreted in two different ways for vegetation classification purposes:



Where one or more vegetation strata (life form) covers greater than 25% (represented by the --- line), the life form greater than 25% which constitutes the uppermost canopy is referred to as the dominant life form.



Where no vegetation life form covers greater than 25% (represented by the - - - line), the life form with the highest percent canopy cover is referred to as the dominant life form. In the case of a 'tie', the upper canopy will be referred to as the dominant life form.

**Dominant** - An organism, group of organisms, or taxon that by its size, abundance, or coverage exerts considerable influence upon an association's biotic (such as structure and function) and abiotic (such as shade and relative humidity) conditions.

**Dominant Vegetation Stratum** - see Canopy Stratum (above).

**Drought Deciduous** - Vegetation where the leaves drop in response to an annual unfavorable season characterized by drought. The foliage is dropped every year. Applied to vegetation adapted to climates with seasonal drought and little cold-season influence (tropical-subtropical).

**Dwarf Shrubland** - A class of vegetation dominated by a life form of shrubs and/or trees under 0.5 m tall. These types generally have greater than 25% cover of dwarf shrubs and less than 25% cover of trees and shrubs. Herbs and non-vascular plants may be present at any cover value. In rare cases (e.g., alpine and polar regions), dwarf shrub cover may exceed the cover of trees, shrubs, herbs and, non-vascular plants and be less than 25% of the total cover.

**Dwarf Shrubs** - Multi-stemmed woody plants with a life form at a height of less than 0.5 m due either to genetic or environmental constraints.

**Earth Cover** - The observed physical cover as seen on the ground or through remote sensing. Examples of earth cover classes might be vegetated, unvegetated, water and artificial cover (human construction). A given piece of land can only fit in one earth cover class that makes earth cover mutually exclusive at the same scale of mapping.

**Ephemeral Forb Vegetation** - Annual associations or synusiae that, during favorable periods, dominate areas that are usually sparsely vegetated or unvegetated for most of the year.

**Epiphyte** - Vascular plant that grows by germinating and rooting on other plants or other perched structures; sometimes called "air plants."

**Episodic Forb Vegetation** - Herbaceous-dominated associations that occupy areas periodically denuded of vegetation.

**Ericoid** - Plants of the Heath Family or Family Eriaceae; for example, heaths, rhododendrons, and blueberries (Erica, Rhododendron, and Vaccinium).

**Established** - Species that invade, occupy, and reproduce on a non-native site.

**Evergreen** - A plant that has green leaves all year round; or a plant that in xeric habitats has green stems or trunks and never produces leaves.

**Evergreen Cover** - Vegetation classes where 75% or more of the diagnostic vegetation consists of trees or shrubs having leaves all year. Canopy is never without green foliage. Examples are pine, spruce, juniper, laurel, Cefrela, Ceiba, Guaiacum, Live Oak, Magnolia, Mescal Bean, Texas Ebony, Palms, etc.

**Evergreen Vegetation** - Associations in which evergreen woody plants generally contribute 75% or more to total dominant plant cover; vegetation canopy is never without photosynthetic tissue.

**Extremely Xeromorphic** - Associations that are adapted primarily to growing in drought-persistent environments and are only secondarily adapted to other environmental stresses; plants typically have several well-developed xeromorphic characteristics.

**Facultatively Deciduous** - Evergreen species that shed leaves only under extreme conditions; this strategy is often associated with plants found in semiarid saline/alkaline environments; for example, Atriplex-Kochia saltbush in Australia and North America.

**Foliose Lichen** - Lichen life form that is leafy in appearance and loosely attached to its substrate; lichen with a lobed, flattened thallus growing loosely attached to the substrate, the lobes flattened or inflated with distinctly differentiated upper and lower surfaces; umbilicate lichens are included.

**Forb** - A broad-leaved herbaceous plant.

**Formation** - A level in the classification based on ecological groupings of vegetation units with broadly defined environmental and additional physiognomic factors in common. This level is subject to revision as the vegetation Alliances and Associations are organized under the upper levels of the hierarchy. Different variables are applied to this hierarchical level in the sparsely vegetated class.

**Fresh Water** - Water with a salinity of less than 0.5 parts per thousand.

**Fruit/Nut Shrubs and Vines (vineyards)** - Areas dominated by fruit or nut shrubs and vines planted on a regular and generally consistent row and plant spacing. Vegetation is planted for the purpose of producing a fruit or nut crop. Examples include blueberries, cranberries, blackberries, and grapes.

**Fruticose Lichen** - Lichen life form that is bunched, shrubby or "hairy" in appearance and loosely attached to its substrate; lichen with the thallus branched, the branches solid, or hollow and round, or flattened without distinctly differentiated upper and lower surfaces; squamulose lichens are included.

**Giant** - Mature forests in which the height of a typical canopy exceeds 50 meters or 165 feet.

**Graminoid** - Grasses and grass-like plants, including sedges and rushes.

**Grassland** - Vegetation dominated by perennial graminoid plants.

**Growth Form** - The shape or appearance of a plant; it primarily reflects the influence of growing conditions.

**Hemi-sclerophyllous** - A plant with stiff, firm, leathery leaves that partially retain their rigidity during wilting; for example, rhododendron and salal (*Rhododendron* and *Gaultheria*).

**Herb** - A vascular plant without significant woody tissue above or at the ground; an annual, biennial, or perennial plant lacking significant thickening by secondary woody growth, with perennating buds borne at or below the ground surface (hemicryptophytes, geophytes, helophytes, and therophytes of Raunkier).

**Herbaceous** - A class of vegetation dominated by non-woody plants known as herbs (graminoids, forbs and ferns). Herbs generally form at least 25% cover. Trees, shrub and dwarf shrub generally have less than 25% cover. In rare cases, herbaceous cover exceeds the combined cover of trees, shrubs, dwarf shrubs, and non-vascular plants and is less than 25% cover. Height classes for the graminoids are short (<0.5 m), medium-tall (0.5-1 m) and tall (>1 m). Height classes for the forbs are low (<1 m) and tall (>1 m). For both

graminoids and forbs, the height classes are measured when the inflorescences are fully developed.

**Herbaceous Vegetation** - Vegetation in which herbs (mostly graminoids, forbs, and ferns) form at least 25% cover, and woody vegetation has generally less than 25% cover; herbaceous cover may be less than 25% in cases where the cover of each of the other life forms present is less than 25% and herbaceous cover exceeds the cover of the other life forms.

**Herbs** - Non-woody vascular plants such as grasses, grass-like plants, and forbs.

**Hydrophyte** - A plant which has evolved with adaptations to live in aquatic or very wet habitats, e.g., cattail, water lily, water tupelo.

**Hydromorphous Herbs** - Herbaceous plants structurally adapted for life in water-dominated or aquatic habitats.

**Intermittently Flooded** - Substrate is usually exposed, but surface water can be present for variable periods without detectable seasonal periodicity. Inundation is not predictable to a given season and is dependent upon highly localized rain storms. This modifier was developed for use in the arid West for water regimes of Playa lakes, intermittent streams, and dry washes but can be used in other parts of the U.S. where appropriate. This modifier can be applied to both wetland and non-wetland situations. Equivalent to Cowardin's Intermittently Flooded modifier.

**Krummholz** - Growth form assumed by tree species at the upper treeline or in the alpine zone; characterized by a creeping and multi-stemmed growth pattern due to desiccation and physical damage caused by wind and blowing ice crystals near the upper treeline; the same species grows as an erect, single-stemmed tree at lower elevation.

**Landscaped Urban/Suburban/Rural** - Areas consisting of partially or entirely planted vegetation which is intensively managed for aesthetics, erosion control, horticultural, and/or recreation. Examples include vegetated areas around residential dwellings, industry, golf courses, transportation right-of-ways, and nurseries.

**Legend** - The list of classification types that are portrayed on a map. The legend will contain a subset of the total classes in the overall classification standard.

**Lichen** - An organism generally recognized as a single plant that consists of a fungus and an alga or cyanobacterium living in symbiotic association.

**Life Form (growth form)** - A classification of plants based upon their size, morphology, habit, life span, and woodiness.

**Lignified** - A plant with woody tissue developed by secondary cell wall thickening by lignin and cellulose.

**Low Forb** - A broad-leaved herbaceous plant usually less than 1 meter or 3 feet tall when inflorescences are fully developed.

**Lowland** - A large land area with vegetation reflecting limits set by regional climate and soil/site conditions; an area where elevation is not the primary gradient affecting vegetation zonation.

**Matted** - A creeping plant that by reiterative growth has overlapping stems and forms a low, dense ground cover.

**Medium-tall Grassland** - Graminoid-dominated vegetation usually between 0.5 to 1 meter or 1.5 to 3 feet tall when inflorescences are fully developed in temperate zones and to 2 meters or 6 feet in tropical zones.

**Metadata** - Data about data. This describes the content, quality, condition, and other characteristics of data. Its purpose is to: help organize and maintain a organization's internal investment in spatial data, provide information about an organization's data holdings to data catalogues, clearinghouses, and brokerages, and provide information to process and interpret data received through a transfer from an external source.

**Microphyllous** - A plant with small leaves; individual leaf surface areas are less than 500 square millimeters or one square inch.

**Mixed Evergreen-deciduous** - Vegetation in which evergreen and deciduous species each generally contribute 25-75% to the total canopy cover.

**Mixed Evergreen Deciduous Cover** - A class of vegetation types where trees (or shrubs) are the dominant life form and neither deciduous nor evergreen species represent more than 75% of cover present.

**Montane** - The zone in mountainous regions where the influence of altitude (vertical relief) results in local climatic regimes that are sufficiently different from those in the adjacent lowlands as to cause a complex vertical climate-vegetation-soil zonation; includes vegetation at the base of a mountain when it is different from lowland vegetation.

**Natural/Semi-natural** - Areas dominated by native or established vegetation that has not been cultivated or treated with any annual management or manipulation regime. In cases where it cannot be assessed whether the vegetation was planted or cultivated by humans, the vegetation is considered "Natural/Semi-Natural."

**Needle-leaved** - A plant with slender, elongated leaves; for example, pine and fir trees (Pinus and Abies).

**Non-agricultural Disturbed Areas** - Areas with little or no vegetation which have been disturbed by human activity other than for the production of agricultural crops. Examples

include areas such as construction sites for urban and residential, mining operations, and landfills.

**Non-vascular** - Bryoids and lichens dominate with generally at least 25 % canopy cover, while trees, shrubs, dwarf shrubs, and herbs generally make up less than 25% cover. In some regions, non-vascular cover may exceed trees, shrubs, dwarf shrubs, and herbs and be less than 25% of the total cover.

**Non-vascular Plant** - A plant without specialized water or fluid conductive tissue (xylem and phloem); includes bryophytes, lichens, and algae.

**Non-vascular Vegetation** - Vegetation that is dominated by bryophytes and lichens, generally forming at least 25% cover, with other vegetation forming less than 25% cover; nonvascular cover may be less than 25% in cases where the cover of each of the other life forms present is less than 25% and nonvascular cover exceeds the cover of other life forms.

**Non-vegetated** - A class with less than 1 % of the surface area with vegetation cover naturally or from which vegetation is removed and replaced by man (human)-made surfaces or structures.

**Open Tree Canopy** - A class of vegetation types dominated by trees with crowns not touching, generally forming 25-60% cover. In rare cases, tree cover may exceed the combined cover of shrubs, dwarf shrubs, herbs and non-vascular plants and be less than 25% of the total cover.

**Orchards and Groves** - Areas dominated by fruit or nut trees planted on a regular and generally consistent row and plant spacing. Stands are planted for the purpose of producing a fruit or nut crop. Examples include areas used for the production of apples, peaches, oranges, pecans, walnuts, cherries, and bananas.

**Order** - This is a the next level in the hierarchy under Division. The Orders within the Vegetated Division are generally defined by dominant life form (tree, shrub, dwarf shrub, herbaceous, or non-vascular).

**Pavement** - A relatively flat surface of consolidated material, generally exposed bedrock.

**Perennial** - Plant species with a life-cycle that characteristically lasts more than two growing seasons and persists for several years.

**Perennial Forb Close-Grown Crops** - Perennial forbs which are drill-seeded or broadcast. Examples include alfalfa, clover, and lespedeza.

**Perennial Forb Row Crops** - Perennial forb vegetation planted in rows on a regular and generally consistent row and plant spacing. Examples include strawberries.

**Perennial Grass Crops (hayland, pastureland)** - Areas of dominantly perennial grasses, either native or non-native species, planted and/or intensively managed as pure or mixed-species stands. Stands often managed for the production of feed or seed, or are grazed. Examples include hayland, pastureland, and native pasture.

**Perennial Herbaceous Vegetation** - Associations that persist for several years and are dominated by herbaceous species.

**Permanently Flooded** - Water that covers the land surface at all times of the year in all years. Equivalent to Cowardin's (1979) "permanently flooded".

**Permanently Flooded-tidal** - Salt water that covers the land surface at all times of the year in all years. This modifier applies only to permanently flooded areas irregularly flooded by fresh tidal water. Equivalent to Cowardin's (1979) "permanently flooded/tidal".

**Physiognomic Class** - A level in the classification hierarchy defined by the relative percent canopy cover of the tree, shrub, dwarf shrub, herb, and nonvascular life form in the uppermost strata during the peak of the growing season.

**Physiognomic Group** - A level in the classification defined by a combination of climate, leaf morphology, and leaf phenology. Different variables are applied to this hierarchical level in the sparsely vegetated class.

**Physiognomic Subclass** - A level in the classification determined by the predominant leaf phenology of classes defined by tree, shrub, or dwarf shrub stratum (evergreen, deciduous, mixed evergreen-deciduous), and the average vegetation height for the herbaceous stratum (tall, medium, short). Different variables are applied to this hierarchical level in the sparsely vegetated class.

**Physiognomy** - The structure and life form of a plant community.

**Plantations** - Areas dominated by trees planted on a regular and generally consistent row and plant spacing. Stands are planted for the purpose of producing a crop of timber, Christmas trees, or other products. Examples include planted hardwood and softwood timber stands.

**Planted/Cultivated** - Areas dominated with vegetation which has been planted in its current location by humans and/or is treated with annual tillage, a modified conservation tillage, or other intensive management or manipulation. The majority of vegetation in these areas is planted and/or maintained for the production of food, feed, fiber, or seed. This subgroup is denoted by a "C" and includes:

- a) Vegetation planted in built-up settings, for recreation, erosion control, or aesthetic purposes.
- b) All areas used in the production of crops, such as corn, soybeans, vegetables, tobacco, cotton, wheat, and rice, grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops.

c) Orchards, vineyards, and tree plantations planted for the production of fruit, nuts, fiber (wood), or ornamental.  
In cases where one can not assess whether it was planted by humans (e.g., some mature forests), the vegetation is considered "natural/semi-natural." Denoted by subgroup "N".

**Plurality** - The plant species that has the most numerous numbers on a site.

**Polar** - Geographically, the areas within the Arctic and Antarctic circles in which the sun is entirely not visible for six months and is constantly above the horizon for the next six months; climatically, polar regions are characterized by the lack of a period of warmth and by enduring cold; in polar climates the average temperature of each month is below 10° C (50° F).

**Pulvinate Mosses** - Mosses growing in cushion-like mats or clumps.

**Rainforest** - Vegetation in frost-free areas dominated by trees that are always wet from rain.

**Repeatable Patterns of Assemblages** - see Cover Type

**Revolvate** - Rolled toward the lower surface of a leaf.

**Rosulate** - A plant with leaves arranged in rosettes (circular clusters).

**Rounded-crowned** - A needle-leaved evergreen tree with a basically semi-circular canopy or life form; for example, whitebark pine and alligator juniper (*Pinus albicaulis* and *Juniperus deppeana*).

**Saltwater** - Water with a salinity of greater than 30 parts per thousand.

**Saturated** - Surface water is seldom present, but substrate is saturated to surface for extended periods during the growing season. Equivalent to Cowardin's (1979) Saturated modifier.

**Scale-leaved** - A plant with small, overlapping leaves that usually lie flat on the stem; for example, eastern redcedar and western redcedar (*Juniperus virginiana* and *Thuja plicata*).

**Sclerophyllous** - A plant with usually evergreen leaves that are stiff and firm and retain their stiffness even when wilted; they are common in, but not restricted to, regions with a long summer drought and predictable yet limited winter rain.

**Scree** - A sheet of coarse rock debris covering a mountain slope without an adjacent cliff.

**Scrub** - Vegetation dominated by shrubs, including thickets.

**Seasonal** - Showing periodicity related to the seasons; applied to vegetation exhibiting pronounced seasonal periodicity marked by conspicuous physiognomic changes.



**Seasonal Evergreen Vegetation** - Associations in which most of the upper canopy plants retain leaves year-round and drop some leaves during unfavorable seasons.

**Seasonally Flooded** - Surface water is present for extended periods during the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is very variable, extending from saturated to a water table well below the ground surface. Includes Cowardin's (1979) Seasonal, Seasonal-Saturated, and Seasonal Well Drained modifiers.

**Semi-arid** - A climatic region having an annual precipitation, usually between 25.4 and 50.8 centimeters or 10 and 20 inches, that is higher than a truly arid climate; typically, vegetation is composed of grasses with or without woody plant layers.

**Semi-deciduous Vegetation** - Associations (usually tropical and subtropical) in which most of the upper canopy trees are drought-deciduous and many of the understory trees and shrubs are evergreen. The evergreen and deciduous woody plants are not always separated by layers.

**Semi-evergreen Vegetation** - Associations in which evergreen and deciduous species each generally contribute 25-75% of total tree cover; specifically, this term refers to tropical and subtropical vegetation in which most of the upper canopy trees are evergreen mixed with drought-deciduous trees.

**Semi-permanently Flooded** - Surface waters persists throughout growing season in most years except during periods of drought. Land surface is normally saturated when water level drops below soil surface. Includes Cowardin's (1979) Intermittently Exposed and Semi-permanently Flooded modifiers.

**Short Grassland** - Graminoid-dominated vegetation usually less than 0.5 meters or 1.5 feet tall when inflorescences are fully developed.

**Shrubland** - A class of vegetation defined by areas dominated by shrubs generally greater than 0.5 m tall with individuals or clumps not touching to interlocking. Shrub canopy cover is generally greater than 25% while tree cover is generally less than 25%. In rare cases, shrub cover exceeds the tree, dwarf shrub, herb, non-vascular plant cover and is less than 25% cover.

**Shrubs** - Woody plants greater than 0.5 m in height that generally exhibit several erect, spreading, or prostrate stems; and have a bushy appearance. In instances where life form cannot be determined, woody plants greater than 0.5 m in height, but less than 5 m in height will be considered shrubs.

**Sod Grass** - A life form of graminoids that tends to develop a solid mat of grass, sedge, etc. over the ground by vegetative increase of rhizomes or stolons; resulting vegetation generally has few spaces between plants.

**Sparsely Vegetated** - A class of vegetation types that are defined as having a surface area with 1-10% vegetation cover over the landscape at the peak of the growing season.

**Stomata** - Pores or openings for gas exchange that are generally concentrated on leaf surfaces.

**Subalpine** - Upper mountain vegetation immediately below the cold limits of tree and tall shrub growth.

**Subdesert** - An area of xerophytic shrubby vegetation with a poorly-developed herbaceous layer.

**Subgroup** - A level of the hierarchy that splits Natural/Semi-Natural vegetation types from the Planted/Cultivated vegetation types.

**Submontane** - An area where the influence of altitude (vertical relief) does not result in local climate regimes that are sufficiently different from the adjacent lowlands as to cause a complex vegetation-climate-soil zonation; generally includes the foothills of a mountain range; the lowland vegetation at the base of a mountain that displays vegetation zonation.

**Subpolar** - Geographically, the region immediately equator-ward of the Arctic and Antarctic circles; climatically, winters are long and extremely cold, and summers are very short; only one month per year has a monthly average warmer than 10\* C (50\* F); as a rule, the ground is completely covered by snow for at least half a year; the region between the tundra and cold temperate forests or steppes.

**Subtropical** - Pertains to areas within tropical regions with variable (seasonal) temperature and moisture regimes; climatically, it has seasonal variation marked by dry/wet seasons rather than cold/hot seasons; parts of this region are subject to sub-0\* C (32\* F) temperatures but rarely have freezing periods of 24 hours or longer; in the United States this term includes southern Florida and the southern tip of Texas.

**Succulent** - A plant with fleshy stems or leaves with specialized tissue for the conservation of water; a xeromorphic strategy for tolerating long periods of drought.

**Suffruticose** - A somewhat shrubby plant in which the upper vegetative and flowering shoots die back to leave only the lower parts to survive unfavorable seasons.

**Synusia** - An association of plant species with a similar life form and similar ecological requirements occurring together in the same habitat; sometimes called a "union"; most habitats are occupied by several synusiae, which may grow above each other in layers, beside each other, or in mixture; for example, an open tree synusia or layer over a grass-dominated synusia or layer.

**Tall Forb** - Broad-leaved herbaceous plants usually greater than 1 meter or 3 feet tall when inflorescences are fully developed.

**Tall Grassland** - Graminoid-dominated vegetation usually over 1 meter or 3 feet tall when inflorescences are fully developed in temperate zones and greater than 2 meters or 6 feet in tropical zones.

**Talus** - A sloping accumulation of coarse rock fragments at the base of a cliff.

**Temperate** - A geographically, the region between the polar and tropical regions; climatically, the region is moderate with distinct seasons of alternating long, warm summers and short, cold winters.

**Temporarily Flooded** - Surface water present for brief periods during growing season, but water table usually lies well below soil surface. Often characterizes flood-plain wetlands. Equivalent to Cowardin's (1979) Temporary modifier.

**Tidally Flooded** - Areas flooded by the alternate rise and fall of the surface of oceans, seas, and the bays, rivers, etc. connected to them, caused by the attraction of the moon and sun [or by the back-up of water caused by unfavorable winds].

**Trees** - Woody plants that generally have a single main stem and have more or less definite crowns. In instances where life form cannot be determined, woody plants equal to or greater than 5 m in height will be considered trees.

**Treeline** - A zone where the normal growth of trees is limited; cold temperatures often combined with drought form the upper or arctic treeline, and drought combined with hot temperatures form lower or arid treeline.

**Tropical** - Geographically, the area between the Tropic of Cancer (23 27' N) and the Tropic of Capricorn (23 27' S), which includes tropical montane and alpine zones; climatically, the tropics are described as either the equatorial limits of freeze or, in temperate marine locations without freezing, the 65\* F isotherm for the coldest month of the year; generally, tropical regions are characterized by high mean temperatures, small annual variation in temperature, and abundant rainfall throughout the year, although mountainous areas within the tropics are more variable.

**Tuft-tree** - Woody plant with large leaf-fronds or rosulate branches at the tips of major trunk(s); for example, palms and tree ferns.

**Tundra** - The treeless region north of the Arctic Circle (arctic tundra) or above the treeline of high mountains (alpine tundra) and on some sub-Antarctic islands; characterized by very low winter temperatures, short cool summers, permafrost below a surface layer subject to summer melt, short growing season, and low precipitation.

**Tussock** - Graminoid life form consisting of bunch-like tufts, sometimes more than 1 meter or 3 feet tall, in which the hard, old, withered leaves are intermingled with the fresh, young, green leaves.

**Vascular Plant** - Plant with water and fluid conductive tissue (xylem and phloem); includes seed plants, ferns, and fern allies.

**Vegetated** - Areas having equal to or greater than 1% or more of the land or water surface with live vegetation cover at the peak of the growing season.

**Vegetation** - The collective plant cover over an area.

**Vegetation Cover** - Vegetation that covers or is visible at or above the land or water surface. It is a sub-category of Earth cover. The percentage of the ground covered by a vertical projection of the outermost perimeter of the natural spread of the foliage of plants.

**Vegetation Data** - The attributes of the vegetation that are used to classify and characterize the vegetation type and to map a vegetation stand. These data come from the interpretation of remotely sensed imagery, field work, and other thematic data sources.

**Vegetation Stands** - Contiguous areas that are homogenous with respect to the current condition of vegetation; that is, these are plant communities possessing sufficient uniformity in regard to composition and structure to be clearly different from adjacent areas.

**Winter-rain** - A climatic regime characterized by precipitation that occurs mostly as rain during cool winters that alternate with dry, hot summers; often associated with sclerophyllous vegetation.

**Woody Plant** - Plant species life form with woody tissue and buds on that woody tissue near or at the ground surface or above; plants with limited to extensive thickening by secondary woody growth and with perennating buds; includes phanerophytes and chamaephytes of Raunkier.

**Woody** - Containing lignified plant tissue.

**Xeromorphic (Scleromorphic)** - Having structural characteristics common among plants adapted to drought, i.e., small thick leaves with sunken stomata or revolute margins, surfaces that are heavily pubescent, waxy or highly reflective and small vein islets.