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Ecosym-Vegetation Classification

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ECOSYM - Vegetation Classification\(^1\)

by

Jan A. Henderson

and

Neil E. West\(^2\)

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\(^1\)Report 9 in Henderson, J. A. and L. S. Davis, ECOSYM - An Ecosystem classification and data storage system for natural resources management.

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ABSTRACT

A vegetation classification system is proposed for use in natural resource management fields. Eight hierarchical levels are recognized in the classification. These are Realm, Physiognomic type, Formation, Cover type, Community type, Phase, Community and Sample. In addition a coded condition class modifier is used to describe the structure and successional stage of a community.

Field methods for identifying units in the hierarchy are presented and concepts and methodology for mapping particular areas are discussed.
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INTRODUCTION

Classification and mapping of vegetation is a fundamental part of most ecosystem studies and management plans. It is therefore one of the more important and commonly used components of the ECOSYM classification.

The objective of the vegetation classification hierarchy is to identify and classify units of the vegetation which are sufficiently homogeneous at different levels of generalization that it is possible to make biological and managerial statements about them. We make no presumptions about whether these units are "natural" or "artificial." We hope that the classes we define are as natural as possible, but in many cases the boundaries between classes are purely arbitrary.

The individualistic approach advanced by Gleason (1962) and further developed by Curtis (1959) and McIntosh (1958, 1967) emphasizes that species respond independently to environmental pressures and therefore are distributed independently throughout the landscape. Although Daubenmire (1966) described a case where some steppe species' limits occurred concurrently along an environmental gradient in eastern Washington, and it can be shown that certain shade demanding species are associated with certain overstories and some saprophytes and parasites are associated with other vascular or non-vascular plants, it is perhaps a better working hypothesis to believe that species are distributed over the landscape more or less independently from each other.

This does not negate the need or the usefulness of recognizing discrete communities and aggregating such similar communities, into abstract classes for the purposes of studying and communicating about them (Whittaker 1975, p. 128). For the practical ecologist and manager, this dispute between whether the ultimate nature of communities is one of a continuum or of natural discrete community types is almost irrelevant. For practical purposes, the question
is, does it work as a tool to help me answer questions? If the answer is yes, use it. If no, find something else.

REVIEW OF EARLIER WORK

Reviews by Shimwell (1971), Mueller-Dombois and Ellenberg, (1974) and Whittaker (1975) provide entry into the extensive literature on vegetation classification. Early work in this area date back at least to the early 19th Century. Humboldt (1805) is credited with the concept of the association and probably represents one of the first efforts at a vegetation classification approach. Grisebach (1838) is credited with introducing the concept of the formation. This added more concept and structure to the developing classification system. A century after Humboldt, however, there was still considerable disagreement on what these words (i.e., association, formation) meant. It wasn't until the International Botanical Congress in 1950 that there was a general consensus among ecologists, at least among European and some North Americans. Daubenmire, however, continued to use "association" to denote a climax abstract community type in the tradition of F. E. Clements and following an earlier IBC ruling. This is unfortunate and avoidable since the concept of the association as Daubenmire and his followers use it can readily be substituted by the term "climax community type."

Contemporary (i.e., beginning with Cajander 1926) attempts at classifying vegetation have tried many different approaches, with varying success. Many were not classifications of vegetation per se, they were classifications of land based on the ground vegetation it could support, i.e., site types of Cajander (1926); or they were classifications of vegetation-soil-climate complexes (Rubel 1930, Sukachev and Dylis 1964). Classifications by
Mueller-Dombois and Ellenberg (1968) and Penfound (1963) must be included here even though they attempted to avoid non-vegetational elements; or they were classifications of vegetation as "organic entities," i.e., homologous to the organism in plant and animal taxonomy (Clements 1916, 1919, 1932, 1939); or they were classifications based on floristic (but not physiognomic) similarities (Braun-Blanquet 1932, 1968, Mueller-Dombois and Ellenberg 1973); or they were classifications of land based on the potential vegetation (Küchler 1968, Daubenmire 1952, 1968); or they were classifications of structural features or management related attributes of the vegetation, e.g., timber types or range suitability types as used by foresters and range managers in the U. S.

These have been useful and important approaches to vegetation classification but none have been found to be suitable (at least by themselves) for use as a broad based multi-resource classification data storage and mapping system. Some can be incorporated into such a system and elements from others can be used but none can fill such a broad need by themselves.

**THE CLASSIFICATION SYSTEM**

The ECOSYM vegetation classification system, like all other "ECOSYM" components is intended to be hierarchical, objective and based as much as possible on already existing approaches. In the case of vegetation it must be based as much as possible on strictly plant floristic or physiognomic attributes, avoiding integrated approaches to classifying by soil-vegetation or climate-vegetation interactions except as they are reflected in the vegetation itself. We feel the classification proposed below will fulfill these objectives and provide the necessary vegetation classification framework for natural resources data storage, mapping, and retrieval.
The discrete plant community is the basic unit of the vegetation classification hierarchy, just as the pedon is to soil classification and the organism is to plant or animal taxonomy.

Parameters on which the classification is based do not depend on characteristics of adjacent communities, making the classification space independent. The vegetation hierarchy, therefore, is made up of more and more general classes to identify the same discrete community. It is not made up of more and more general classes which are applied over broader and broader areas as is done using the zonal or Clementsian formation concept; however, when mapped, these broader vegetation classes are more commonly used for map units at smaller and smaller scales. At these levels inclusions become more common and there is greater variation within the map unit.

The classification system therefore is comprised of eight hierarchical levels and one condition class modifier: 1) realm, 2) physiognomic type, 3) formation, 4) cover type, 5) community type, 6) phase, 7) community, 8) sample (releve'). These eight hierarchical levels are defined as follows:

**Realm** (floristic Realm, Walter 1973). Floristically defined units of the Earth which have evolved under divergent historical and environmental conditions (Figure 1). Examples are Holarctic, Palearctic and Neoeartic realms.

**Physiognomic type** (Penfound 1963) is a vegetation type named and classified on the basis of the life-form of the dominant plants. Examples are forest, shrubland, herland.

**Formation** (Mueller-Dombois and Ellenberg 1974). An aggregation of plant communities which are dominated by one particular life-form, and which recurs on similar habitats. Examples are Boreal conifer forest, grass steppe or heath.
Cover type (SAF 1940). A descriptive term used to group communities of similar character as regards composition and development (of the overstory layer). Such cover types have a distinctive ecological, and management significance and is strictly applied to types now occupying the ground, no implication being conveyed whether it is temporary or permanent. This is similar to the Dominance type of Whittaker (1975). Examples are Artemisia tridentata, Pseudotsuga menziesii or Agropyron spicatum cover types.

Community type (Smith 1974). A group of communities in which more or less the same combination of species (in all major layers) occurs can be classified as the same community type named after the dominant organisms of each major layer and preferably the ones with the highest constancy and fidelity.

Phase A subdivision of the community type based on minor but consistent variations in composition. Examples are Artemisia tridentata/Agropyron spicatum - Poa secunda phase or Pseudotsuga menziesii/Holodiscus discolor-Berberis nervosa phase.

Community A concrete group of plants (i.e. plant community) which is homogeneous with respect to species composition, size and structure.

Sample A particular portion of a community which is sampled in a specified way for species composition, coverage and structure.

Condition class is used as a modifier in the hierarchical system to describe the structure and successional stage of a community.

Realms

Some vegetation or vegetation-climate classifications have been made and applied to the world (Eyre 1971, Mueller-Dombois and Ellenberg 1968). However, because the vegetation in different parts of the world has develop-
oped via divergent evolutionary pathways, it seems best to develop a vegetation classification for these areas separately. For example, the scrub bushlands of dry equatorial regions, tropical forest areas and southern hemisphere podocarps each have taxonomic and physiognomic peculiarities which make it difficult to force these vegetations into classifications developed elsewhere in the world. Therefore, we make the first break in a "world" vegetation classification system at the level of the Realm. Following Walter (1973) we recognize six realms each of which may require a different classification system for use in natural resource management. All of non-tropical North America (and Eurasia) falls in the Holarctic Realm. The vegetation in this area seems to have evolved from a similar ancestral flora dominated heavily by the Pinaceae, Festuceae, Ericaceae, Rosaceae, Fagaceae and Asteraceae.

**Physiognomic types**

Within the Holarctic realm we first recognize Physiognomic types based on the gross structure of the tallest growth form of plants exerting dominance on the community.

This is the grossest level of differentiating communities based on structural characteristics. The classes at this level represent abstract units which are readily recognized by the "man on the street" and which are also readily interpreted by small scale remote sensing when maps are desired. Heavy reliance of the growth form of the tallest layer in the community presumes that it exerts the greatest influence on the community and is of major importance to natural resource management.

The physiognomic types in the holarctic realm are forest, woodland, shrubland, herbland, bryoland and algal dominated communities.
These physiognomic types are similar to some of the physiognomic types described by Penfound (1963) and to the formation classes described by Mueller-Dombois and Ellenberg (1968). Penfound's tundra is not used since it is actually a vegetation-climate unit. His savanna is incorporated into "forest" and grassland, herland and forbland are combined into herland. Lastly, his vineland is not recognized, since it is a minor type and can be incorporated into the classification elsewhere, e.g., as forest, herland, or shrubland.

According to Mueller-Dombois and Ellenberg (1968), woodland means any sparsely stocked stand of trees. We prefer to use "woodland" to denote particular growth-forms intermediate between trees and shrubs which often occur as open widely-spaced stands, but we see no reason to classify together a sparsely stocked stand (Parkland?) of subalpine fir and a normally (but widely spaced) stand of pinyon-juniper. Some stem succulent cacti are also included here as woodland. Stocking is handled in the ECOSYM approach either by lower levels in the hierarchy or by use of the condition class to describe the stocking of a community or stand. The "shrub, and dwarf-shrub" formation classes of Mueller-Dombois and Ellenberg (1968) are combined into our shrubland. Their "deserts" and other scarcely vegetated areas are not recognized as part of our vegetation hierarchy. Deserts are vegetative-climatic units and "sparsely vegetated areas" are handled by the condition class. Various kinds of deserts are recognized as formations under appropriate physiognomic types. Mueller-Dombois and Ellenberg's (1968) aquatic formation includes both algal and vascular plant communities. We separate algal dominated communities from herbaceous communities which occur in aquatic environments. In the ECOSYM classification these groups are handled at the formation or lower levels.
Naming and Identifying the Physiognomic Type

The tallest layer in the community is used as the indicator of the physiognomic type, if it has at least 25% of the total coverage of the next tallest layer. For most purposes the next tallest layer can be assumed to have 100% cover and the physiognomic type can be identified on the basis of 25% absolute cover of the tallest layer. The only exception to this is that Savanna, i.e., forest-shrub or forest-grassland with 5-25% cover of trees is included with the forest physiognomic type.

The Physiognomic types can be identified by using the following key:

1. Species which normally develop into trees when mature, forming at least 5% absolute ground cover and overtopping the next dominant layer.

2. Dominant tree layer comprised of species which are clearly trees e.g. Pseudotsuga, most Pinus, Tsuga, Picea, etc. FOREST

2. Dominant tree layer comprised of dwarf trees or tree species which may also develop a shrub growth form on harsh sites at or near lower timberline, e.g. most Juniperus, pinyon pines, some Quercus, bigtooth maple WOODLAND

1. Trees absent or having less than 5% absolute cover or not overtopping the next dominant layer.

2. Shrubs codominating or overtopping the next most dominant layer. For communities with complete ground cover, i.e., approaching 100% total cover, shrubs should have at least 25% total absolute cover. For sparser or depauperate stands shrubs should total at least 25% of the total ground coverage of all species SHRUBLAND
2. Shrubs not codominating or dominating the tallest layer in the community. This usually means that total relative shrub cover is less than 25%, the shrubs which are present are overtopped by forbs or grasses, or that shrubs are absent.

3. Vascular herbaceous plants, i.e., forbs or grasses or grass-like monocots dominating the community.
   This implies that trees and shrubs are absent or occur in minor amounts. HERBLAND

3. Community dominated by non-vascular plants either low stature mosses or lichens or aquatic or marine algal communities.

4. Community dominated by mosses, liverworts and/or lichens. BRYOLAND

4. Community dominated by algae speciesa. ALGAL PHYSIOGNOMIC TYPE

Formations

Formations can be considered either subdivisions of the Physiognomic types based on additional Physiognomic characters or based on adaptation of the dominant growth form to similar environmental conditions; or they can be considered as aggregations of cover types adapted to similar environments.

It is important to recognize that formation as we use it is very similar to the European usage (Mueller-Dombois and Ellenberg, 1974) and not the "North American" usage as interpreted by Clements (1926) and Braun (1950).

a Note that aquatic vascular plants are included in Herbland and not the ALGAL PHYSIOGNOMIC TYPE.
It is strictly an abstract classification unit with no connotation about geographical location or extent implied.

Formations may be used for mapping purposes such that certain geographical areas are automatically characterized by the dominant vegetation. This usage approximates the Clementsian interpretation of formation.

**Naming and identifying the formations**

Formations are too numerous to develop rules or a key to identify them except for local areas. However, the process is similar to the recognition of cover types and community types. Formations are suggested by researchers in the area, published and then accepted by consensus, which is not greatly different from the method used in plant taxonomy. The general rules that should be followed include:

1. The formation should include several major cover types.
2. Each formation should be recognized on about the same level of generality and should encompass about the amount of structural and environmental variety.
3. Each formation should occur in the hierarchy under one and only one Physiognomic type.

**Cover types**

Cover types are abstract aggregations of plant community types based on the crown cover (or basal area if crown cover is not available) of the one or two (sometimes three) most dominant overstory species in the communities. Cover types named as a forest cover type must, obviously, satisfy the characteristics higher in the vegetation hierarchy which places it in the forest physiognomic type. Likewise, for shrubs, etc. Also, the same rules
are applied to separate shrub dominated communities from forests and shrubland from herbland, etc.

In the initial attempt at defining and describing forest cover types for Western United States, the term cover type was used only for forests, while woodlands and savanna structural types were omitted. Emphasis was also placed on use of the term as a mapping unit rather than an abstract classificatory unit. In our usage, cover types are recognized for all vegetation and the usage is more in the classificatory sense than the mapping sense, i.e., our *Larix occidentalis* cover type is an abstract aggregation of only those stands which are dominated by western larch. This is not to say that map units are not useful, it only emphasizes our separation between the abstract and place independent classification and its application to an area of land as a map.

Society of American Foresters (1940) cover types names were chosen from those species present in "significant" amounts or were based on "predominance" in an area. In general, they said that a species should comprise at least 50% of the volume of the stand but this is not a hard and fast rule since it must also outweigh the next important species in the mixture. The use of indicator types as suggested by the SAF (1940) is not used in our hierarchy.

The "commercial" viewpoint emphasized in the earliest attempts at cover type delineations (Society of American Foresters 1913) was carried over into the 1940 effort to some degree although this later effect corresponded much more to the ecological classification we propose today.

Lastly, the SAF cover types were recognized and named by consensus of a committee of foresters familiar with a broad range of forest conditions. Their names reflected what they saw and this made it difficult for them to
recognize firm and objective delineations between types. They also only wanted to recognize the major cover types or those of a distinct commercial value. The modern use of cover types in a broad ecological context must assign objective delineations between types wherever possible, so that two foresters or ecologists would place the same stand into the same (correct) cover type. It must also be capable of recognizing minor or locally imp­orted cover types and it must be applicable to all vegetation, not just forests.

The use of "cover type" as we are proposing it is developed from the cover type of the SAF (1913, 1940, 1954), but places it in a general vege­tation classification system so that the rules and type delineations are widely accepted and are not so variable that managers and researchers in a wide var­iety of fields cannot understand and use the terms.

A cover type in its strictest sense may sometimes appear to occur within more than one formation and physiognomic type. In such a case, a modifier or symbol must accompany the cover type name. An example of this is where a species may occur as both a tree and shrub growth form such as subalpine fir as a tree and as Krummholtz. The cover type would be Abies lasiocarpa Krumm­holtz, and would belong to the Krummholtz formation and shrubland physio­gnomic type.

The Society of American Foresters recognized forest cover types if they met these three criteria.

1. The cover type must actually be found occupying large areas in the aggregate. It does not require that it should cover any single large area in a solid stand, but that it should be the characteristic composition found typically through a considerable range of country.

2. The cover type must be distinctive and easily separated from other
types which most closely resemble it.

3. Within the foregoing limitations every important combination of cover must be recognized as a forest type. That is, only those types of distinctive character and considerable merit formal recognition as a type. Thus the types are predefined and recognized by a consensus and new types are not to be recognized casually or without scrutiny.

Naming the cover types

We propose the following rules, taken partially from SAF (1940) and expanded for our wider purposes.

A monomial cover type is one which is comprised of stands in which one species comprises at least 80% of the cover of the overstory layer. The second most dominant species therefore can have no more than 20% of the overstory cover. Understory (reproduction) cover is not included in identifying the cover type.

A binomial cover type in its strictest sense is one in which the two most dominant species together account for at least 80% of the overstory cover but neither of them has 80% by itself. This implies that both species have more than 20% of the cover. In a more practical sense a certain binomial type may include stands which are not suitably recognized elsewhere in the hierarchy.

A trinomial cover type is one in which three or more species have more than 20% cover each, none of which has over 80% cover and the type cannot be recognized as a binomial.

Application of the above criteria would mean that when a stand is recognized which has one species as dominant with at least 80% of the cover, if a
cover type has not been already identified to which it would belong, a new
cover type is automatically recognized, and likewise, for binomial and
trinomial stands. However it is safer to resist recognition of that type
until at least three and preferably ten such stands have been sampled.
It is also useful especially for mapping purposes to recognize major cover
types, those which are actually found occupying large areas in the aggregate.
Minor cover types necessarily have become inclusions on small scale maps.

In aggregating cover types into formations and physiognomic types place­
ment is made on the basis of the first name of the cover type which is usually
the most dominant overstory species in the community.

A problem arises here in cases such as subalpine fir dominated stands
with 25% Engelmann spruce and Engelmann spruce dominated stands with 25% sub­
alpine fir. We do not recognize spruce-fir and fir-spruce cover type. Both
combinations are known and all gradations in between are possible. To reduce
the total number of covertype names and help alleviate the complexities of
separating stands with 55-45% coverage combinations from stands with 45-55%
combinations, we arbitrarily give preferences to one of the two (or three)
species and use it consistently. Also since both spruce and fir cover types
are aggregated into the same formations, it makes no difference in the hier­
archy. For cases where the two codominating overstory species have approx­
imately equal cover the composition of the entire community is considered in
choosing the appropriate formation and hence the appropriate first name in
the cover type. Also, except in unusual cases such as alpine Krummholz,
cover types with the same dominant species should all go into the same
formation and physiognomic type. This means that some problems will
arise from some species which are adapted to a wide range of environmental
conditions or which can occur as both a tree and shrub growth form. Consensus
of ecological judgement based on direct gradient analysis should be used to identify the formation and the predominant growth form over a species range should be used to identify the physiognomic type.

Community types

The community type is used as the basic abstract unit of vegetation classification and is essentially the same as the plant association concept used by many Europeans, (Poore 1955, Becking 1957, Braun-Blanquet (1964). It is defined as an abstract grouping of stands (communities) based on floristic and structural similarities of both the understory and overstory layers. Similar definitions can be found in Smith (1974, p. 254); Odum (1971, p. 145); Whittaker (1975, p. 128). Moreover, community type is used in this sense in Franklin and Dyrness (1973), Spurr and Barnes (1973), Pfister et al. (1974), Steele et al. (1975). However, it is somewhat different from that used by F. C. Hall. b

Although community type is considered synonymous with association by many modern ecologists, different uses of the term association (cf Daubenmire 1968, p. 27 and 28) makes the term community type preferable to association in this country. Community type also does not carry with it the latinized endings which is in common usage among Europeans and avoids the implied organismic nature that the term "association" carries with it in the

b Unpublished material.
United States from an earlier Clementsian era.

Community types as we use it is also synonymous with the "sociation" as used by some earlier ecologists (Whittaker 1975) and is used here, only in this specific sense and not in the general sense used by Whittaker (1975). When we mean a type of plant community and do not wish to specify the particular hierarchical level in this classification we use the term "vegetation type."

Recognition and naming of the community type is based on the initial recognition of the community or stand. The connotation of a stand is different from a community although they are used somewhat synonymously as the basic concrete unit in a vegetation classification hierarchy. Daubenmire (1968) defines the stand as a piece of vegetation that is essentially homogeneous in all layers and differs from contiguous vegetation by either quantitative or qualitative characters.

Whittaker (1975) defines a plant community as an assemblage of populations of plants, bacteria and fungi that live in an environment and interact with one another, forming a living system with its own composition, structure, environmental relations, development and function. In this sense "stand" lacks the implications of life and interactions whereas, community has the structural and compositional features of a stand but also implies the biological interactions of an ecosystem. For the purposes of classifying vegetation, we may use these two terms interchangeably.

**Naming the community type**

The name of the community type is determined in a similar fashion to the procedures used by European schools: Shimwell (1971), Mueller-Dombois and Ellenberg (1974). The dominant species in the overstory layer (i.e., the name of the cover type) is used as the first name in a binomial set, where the second name is the single species (sometimes two or three are used) indicator
of the understory union best represented in the community. Where more than one union is represented (where one is a shrub dominated union and the other is a forb dominated union) or where two species best name or indicate a union, the second name in the set can be binomial. Thus, the overstory dominant (cover type) is separated from the understory dominant by a slash and co-dominants within a layer are separated by a hyphen (Franklin and Dyrness 1973, p. 61), e.g., a community dominated by subalpine fir in the overstory and Berberis repens in the understory is identified and written as:

\[ \text{Abies lasiocarpa/Berberis repens} \]

if the understory is co-dominated by Berberis repens and Pachistima myrsinites, the trinomial is formed by hyphenating the two understory species, e.g.,

\[ \text{Abies lasiocarpa/Berberis repens - Pachistima myrsinites} \]

Mostly, binomials are preferred and trinomials or larger names are to be avoided if possible. Excessively long names can be avoided by choosing one species of an understory union to be the indicator of that group of species and only using that one species in the name. The procedure for naming community types is patterned after that used in Europe for naming Associations (Moravec 1964, Braun-Blanquet 1968).

**Phases**

The phase is a subdivision of the community type which represents minor variations within the type. Phases may only have local significance or they may be widely occurring variants of the type.

The plant community type phase can be considered analogous to the phase of the series in soil taxonomy or varieties or subspecies in plant or animal taxonomy and is comparable to the subassociation and variant levels in the Braun-Blanquet system.
Condition classes

The community types are subdivided into structural or condition classes which recognize differences in size, spacing (horizontal structure) and successional status of the community. These condition classes are denoted by the following symbol:

\[
\frac{A - B - C}{D - E}
\]

Where the numerator indicates the size, cover class and successional status of the tree layer (if present) and the denominator indicates the cover class and successional status of the understory layer. Written another way, this condition class symbology is:

\[
\frac{\text{Size of overstory} - \text{cover of overstory} - \text{successional status of overstory}}{\text{cover of overstory} - \text{successional status of overstory}}
\]

The size class for trees are:

1 = $\geq 1$ dm DBH
2 = 1 – 3 dm DBH
3 = 3 – 6 dm DBH
4 = 6 – 12 dm DBH
5 = $> 12$ dm DBH

The cover classes are:

1 = 0.1 – 5%
2 = 5 – 25%
3 = 25 – 50%
4 = 50 – 75%
5 = 75 – 95%
6 = 95 – 100%
The successional status classes are:

1 = The community is clearly pioneer, representing the earliest stages of secondary succession after disturbance.

2 = The community is early seral but past the pioneer stage. Climax species may be present but the community structure and composition is mainly that of early successional development.

3 = The community is in a middle to late successional stage. Usually many "climax" species will be present but also many that are considered to be seral. The structure of the community is still not what would be expected of a climax or near-climax community.

4 = The community is clearly climax when considering both species composition and community structure.

Successional status classes are used to help describe the structure and function of a community in a way which a manager can visualize and utilize. We recognize some problems in employing this terminology and approach. It is not always very easy to determine the successional stage, and in cases where the succession is not known or is known to be cyclic (e.g., in some areas of boreal forests) the situation may not fit into this framework at all. We have doubts about considering succession to be such a predictable deterministic phenomenon, however, it is still useful in the context of a management oriented classification system.

Community

As defined on page 6.
As defined on page 6. See also discussion and details under "Methods."

The hierarchical vegetation classification structure is summarized with examples below.

<table>
<thead>
<tr>
<th>Classification Level</th>
<th>Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Realm</td>
<td>Holarctic</td>
<td>The total flora and vegetation of the non-tropical areas of North America and Europe.</td>
</tr>
<tr>
<td>2. Physiognomic type</td>
<td>Forest</td>
<td>The vegetation dominated by at least 5% cover of trees.</td>
</tr>
<tr>
<td>3. Formation</td>
<td>Subalpine conifer</td>
<td>All conifer forest vegetation in the Holarctic realm which is adapted to the cool and moist climates of high altitudes.</td>
</tr>
<tr>
<td>4. Cover type</td>
<td>Abies lasiocarpa</td>
<td>All subalpine forest vegetation which is dominated by subalpine fir. To qualify, at least 80% of the cover (or basal area) of the stand should be contributed by subalpine fir.</td>
</tr>
<tr>
<td>5. Community type</td>
<td>Abies lasiocarpa/ Berberis repens</td>
<td>All forest vegetation in the Abies lasiocarpa cover type which is dominated or at least characterized by Berberis repens or other species of the Berberis repens union.</td>
</tr>
<tr>
<td>6. Community type phase</td>
<td>Abla/Bere, Pachystima myrsinites phase</td>
<td>A minor subdivision of the Abla/Bere type based on minor variations in the understory layer, i.e., where Pachistima is an indicator.</td>
</tr>
<tr>
<td>7. Condition class</td>
<td>2-3-2 4-3</td>
<td>Condition class for a stand of Abla/Bere where the overstory has an average stand diameter of 1-3 dm, overstory crown coverage of 25-50%, and is in an early successional stage (overstory only) and the understory layer (tree species excluded) has a total cover of 50-75% and is in a middle to late successional stage.</td>
</tr>
</tbody>
</table>
8. Community or stand
A particular stand of Abla/Bere
A concrete entity representing something which is physically real as opposed to all higher levels which are abstractions of lower hierarchical levels.

9. Sample
A plot
A concrete sample taken on a prescribed area in a prescribed way within a particular community.