

CLASSIFICATION OF VEGETATION: THE U.S. NATIONAL VEGETATION CLASSIFICATION



NVC Partners

FGDC Vegetation Subcommittee



Goals of the NVC

- ◉ Define and adopt standards for vegetation data collection and analysis
- ◉ Facilitate inter-agency collaboration and inter-agency product consistency
- ◉ Foster accuracy, consistency, and clarity in the structure, labeling, definition and application of a systematic vegetation classification for the U.S.
- ◉ Establish a national set of standards for classifying existing vegetation
- ◉ Develop minimum metadata requirements
- ◉ Collaborate between state, federal and international efforts



NVC Hierarchy

Vegetated Areas	Natural Vegetation	Cultural Vegetation
Upper		
	1 - Formation Class	1 - Cultural Class
	2 - Formation Subclass	2 - Cultural Subclass
	3 - Formation	3 - Cultural Formation
		4 - Cultural Subformation
Middle		
	4 - Division	5 - Cultural Group
	5 - Macrogroup	6 - Cultural Subgroup
	6 - Group	
Lower		
	7 - Alliance	7- Cultural type
	8 - Association	8 - Cultural subtype

How does the NVC Classify Natural Vegetation

- The NVC vegetation classification is based on a combination of:
 - growth forms, as these respond to climate, elevation, substrates, etc, and
 - species, both dominant and diagnostic, as these reflect biogeographic and ecologic relations.
- The classification is [hierarchical](#) and incorporates the physiognomic (top 3 levels), general floristic-biogeographic (mid 3 levels), and detailed floristic (lowest 2 levels) criteria, guiding all criteria by ecological considerations.



Table 1. Summary of natural USNVC hierarchy levels.

Level	Concept	Example
Upper - Physiognomic		
L1 – Formation Class	Broad combinations of general dominant growth forms that are adapted to basic temperature (energy budget), moisture, and substrate/aquatic conditions.	Shrubland & Grassland <i>[mesomorphic]</i>
L2 – Formation Subclass	Combinations of general dominant and diagnostic growth forms that reflect global macroclimatic factors driven primarily by latitude and continental position, or that reflect overriding substrate/aquatic conditions.	Temperate & Boreal Shrubland & Grassland
L3 – Formation	Combinations of dominant and diagnostic growth forms that reflect global macroclimatic factors as modified by altitude, seasonality of precipitation, substrates, and hydrologic conditions.	Temperate Grassland & Shrubland
Middle – Physiognomic, Biogeographic and Floristic		
L4 – Division	Combinations of dominant and diagnostic growth forms and a broad set of diagnostic plant species that reflect biogeographic differences in composition and continental differences in mesoclimate, geology, substrates, hydrology, and disturbance regimes.	Great Plains Grassland & Shrubland
L5 – Macrogroup	Combinations of moderate sets of diagnostic plant species and diagnostic growth forms, that reflect biogeographic differences in composition and subcontinental to regional differences in mesoclimate, geology, substrates, hydrology, and disturbance regimes.	Great Plains Shortgrass Prairie & Shrubland
L6 – Group	Combinations of relatively narrow sets of diagnostic plant species (including dominants and co-dominants), broadly similar composition, and diagnostic growth forms that reflect regional mesoclimate, geology, substrates, hydrology, and disturbance regimes.	Great Plains Short Grass Prairie Group
Lower – Floristic		
L7 – Alliance	Diagnostic species, including some from the dominant growth form or layer, and moderately similar composition that reflect regional to subregional climate, substrates, hydrology, moisture/nutrient factors, and disturbance regimes.	Blue Grama Herbaceous Alliance
L8 – Association	Diagnostic species, usually from multiple growth forms or layers, and more narrowly similar composition that reflect topo-edaphic climate, substrates, hydrology, and disturbance regimes.	Blue Grama - Buffalograss Shortgrass Prairie

Orchards and Treed Lawns



Northern cherry orchard
Apple orchard (Empire)
Lawn with trees (Thomas Jefferson home)

Plantation Forests



Poplar plantation
Douglas fir plantation (40 yr)
Red pine plantation

Natural Forests



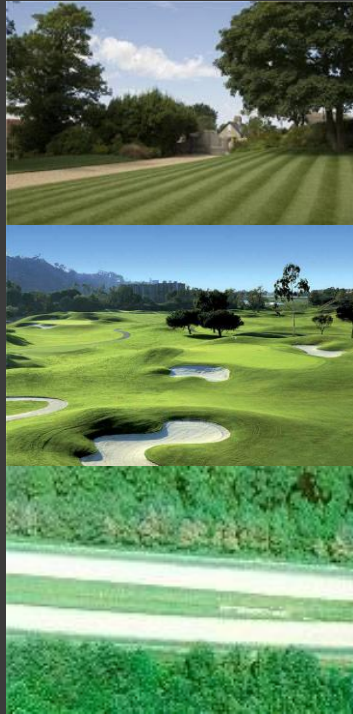
Beech - maple northern hardwood forest,
- mature & partially logged
Red pine forest

Cultural Vegetation

Ruderal, Plantation and Native Vegetation



Developed (Hortomorphic) Vegetation



Lawn
Golf course
Right-of-way

Agricultural (Agromorphic) Vegetation



Corn field
Intensive Hay field
Intensive Hay field: Red top,
with timothy, tall fescue,
creeping foxtail (e. OR)

Grassland & Shrubland (Mesomorphic) Vegetation

Ruderal



Crested wheatgrass (exotic), SD
Cogon grass (exotic)
southeastern U.S.
Heavy/light grazed (planted)
pasture, Texas

Natural



Tallgrass prairie, WI
Mixed grass prairie, SD
Shortgrass prairie, CO

Cultural Vegetation



Ruderal & Native Vegetation



Forest & Woodland



(Mesomorphic)



Shrubland & Grassland



Semi-Desert Vegetation
(Xeromorphic Vegetation)



Aquatic Vegetation
(Hydromorphic Vegetation)



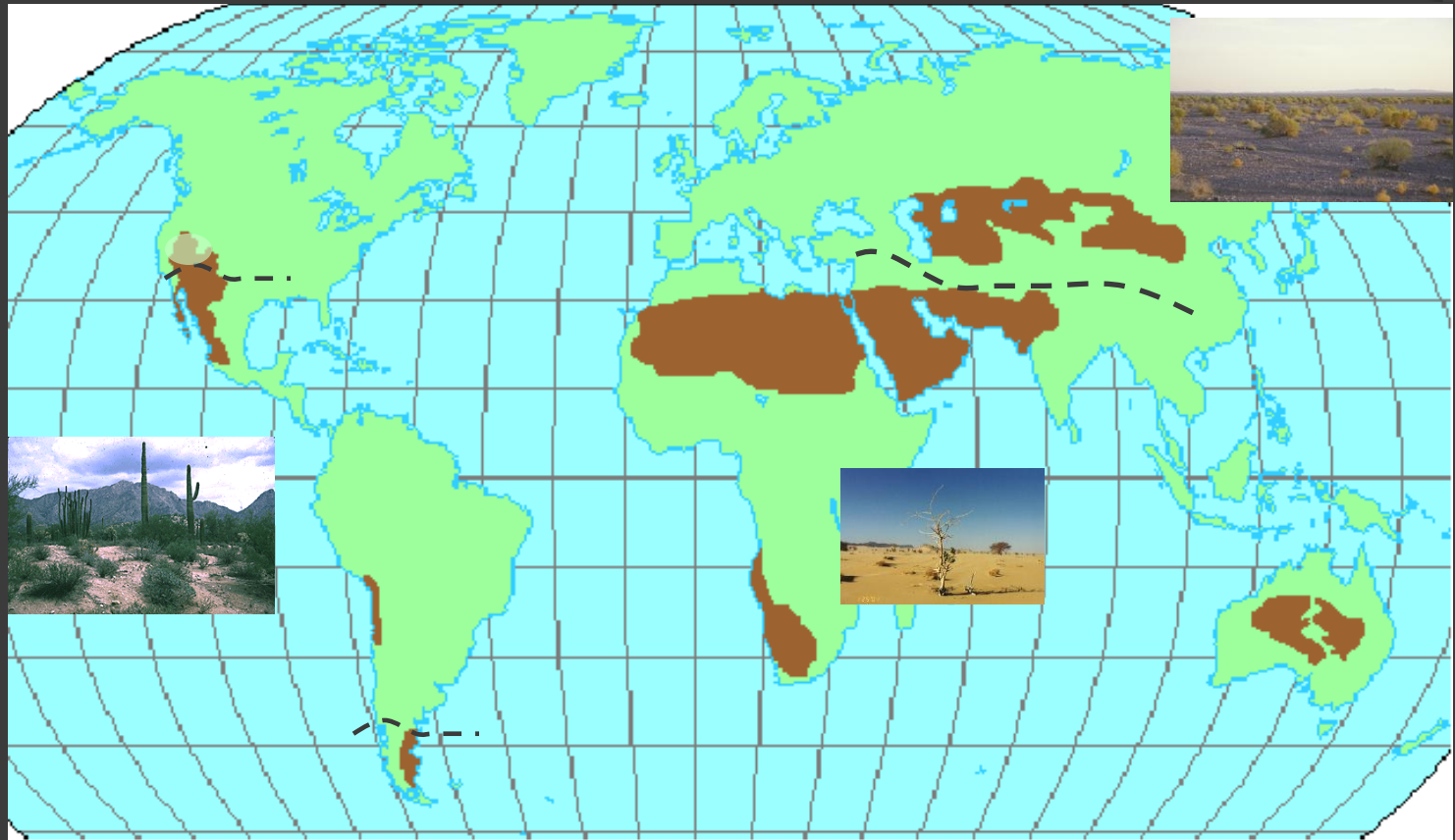
Polar and High Mountain Vegetation
(Cryomorphic Vegetation)



Nonvascular
Vegetation
(Lithomorphic
Vegetation)

Agricultural Vegetation; Developed Vegetation

Cool and Warm Semi-Desert Formations (L3)



Another Example of NVC Hierarchy

Formation Class: Forest and Woodland

Formation Subclass: Temperate Forest

Formation: Cool Temperate Forest

Division: Western North American Cool Temperate Forest

Macrogroup: Southern Rocky Mountain Lower Montane Forest

Group: Southern Rocky Mountain Ponderosa Pine Forest and Woodland

Alliance: Ponderosa Pine Woodland

Association: Ponderosa Pine / Gambel Oak Woodland

Tools for accessing the NVC & supporting material

1. Content Maintenance & Dissemination



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United States National Vegetation Classification

Overview Get Involved Explore The Classification Revisions Data Standard Resources About

The U.S. National Vegetation Classification

YOUR GUIDE TO INVENTORING NATURAL AND CULTURAL PLANT COMMUNITIES



Your Guide to Inventorying Natural and Cultural Vegetation Communities

Classifying vegetation is a critical to sound ecological science and efficient land assessment, management and planning. The National Vegetation Classification (NVC) is a central organizing framework for how all vegetation in the United States is inventoried and studied, from broad scale formations (biomes) to fine-scale plant communities. The purpose of the NVC is to produce uniform statistics about vegetation resources across the nation, based on vegetation data gathered at local, regional, or national levels. The latest classification standard was published in 2008 by the Federal Geographic Data Committee and provides the basis for ongoing refinement of the NVC. We invite your participation in this dynamic process and hope you will make use of the considerable resources of this web portal.

Highlights

Website Launch >

Try out the new Hierarchy Explorer
View vegetation classifications for U.S. plant communities

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Association Records = Selected for report browsing.

Browse (Unique ID)	Scientific Name Common Name Translated Name	NatureServe Status	Distribution: United States & Canada
Evergreen forest			
Quercus virginiana - (Sabal palmetto) Forest Alliance Live Oak - (Cabbage Palmetto) Forest Alliance			
<input checked="" type="checkbox"/>	Quercus virginiana - Quercus hemisphaerica - Pinus taeda / Persea (borbonia) palustris - Ilex vomitoria Forest	92	USA: GA, NC, SC, VA
CEGL007027	Atlantic Coast Maritime Evergreen Forest Live Oak - Sand Laurel Oak - Loblolly Pine (Redbay, Swampbay) - Yaupon Forest		
<input checked="" type="checkbox"/>	Quercus virginiana - Quercus hemisphaerica - Pinus taeda - Quercus falcata / Persea palustris Forest	92	USA: NC, SC
CEGL007028	Atlantic Coastal Fringe Evergreen Forest Live Oak - Sand Laurel Oak - Loblolly Pine - Southern Red Oak / Swampbay Forest		
Deciduous forest			
Quercus prinus - Quercus (alba, falcata, rubra, velutina) Forest Alliance Rok Chestnut Oak - (White Oak, Southern Red Oak, Northern Red Oak, Black Oak) Forest Alliance			
<input checked="" type="checkbox"/>	Quercus prinus - Pinus palustris Forest	9203	USA: AL
CEGL004060	Southern Ridge and Valley Chestnut Oak - Longleaf Forest Rok Chestnut Oak - Longleaf Pine Forest		
Mixed evergreen-deciduous forest			
Fagus grandifolia - Magnolia grandiflora Forest Alliance American Beech - Southern Magnolia Forest Alliance			
<input checked="" type="checkbox"/>	Fagus grandifolia - Magnolia virginiana - (Pinus palustris) / Chasmanthium sessiliflorum Sandhill Streamhead Forest	9203	USA: AR, LA, TX
CEGL007976	West Gulf Coastal Plain Streamhead Forest American Beech - Sweetbay - (Longleaf Pine) / Longleaf Spikegrass Sandhill Streamhead Forest		

1. Content Maintenance & Dissemination

A prototype browser for the hierarchy –
Currently missing design elements, those will be added as the web design evolves.

National Vegetation Classification Hierarchy Browser

with description with link to NatureServe

- ▣ 1 Forest & Woodland (Mesomorphic Tree Vegetation)
- ▣ 2 Shrubland & Grassland (Mesomorphic Shrub & Herb Vegetation)
- ▣ 3 Semi-Desert (Xeromorphic Scrub & Herb Vegetation)
- ▣ 4 Polar & High Montane Vegetation (Cryomorphic Shrub & Herb Vegetation)
- ▣ 5 Aquatic Vegetation (Hydromorphic Vegetation)
- ▣ 6 Nonvascular & Sparse Vascular Rock Vegetation (Lithomorphic Vegetation)
- ▣ 7 Agricultural Vegetation (Agromorphic Vegetation)
- ▣ 8 Developed Vegetation (Hortomorphic Vegetation)

Key

- ▣ Class
 - ▣ *Subclass*
 - ▣ Formation
 - ▣ *Division*
 - ▣ Macrogroup
 - ▣ Group
 - ▣ Association

Note: Place your mouse pointer over an item to see what type it is

Status

	Total	With Description		With Link to NatureServe	
Classes	8				
Subclasses	21				
Formations	45				
Divisions	104				
Macrogroups	272	10	3%		
Groups	511	10	1%		
Associations	5755			5723	99%

[http://usnvc.org/explore-classification/ /](http://usnvc.org/explore-classification/)

Allows text searches and highlights the relevant pathways.

Currently searching the type names, once the supporting database is in place this will allow searches of the full descriptions .

National Vegetation Classification Hierarchy Browser

 with description with link to NatureServe

- + 1 Forest & Woodland (Mesomorphic Tree Vegetation)
 - + 2 Shrubland & Grassland (Mesomorphic Shrub & Herb Vegetation)
 - + 3 Semi-Desert (Xeromorphic Scrub & Herb Vegetation)
 - + 4 Polar & High Montane Vegetation (Cryomorphic Shrub & Herb Vegetation)
 - + 5 Aquatic Vegetation (Hydromorphic Vegetation)
 - + 6 Nonvascular & Sparse Vascular Rock Vegetation (Lithomorphic Vegetation)
 - + 7 Agricultural Vegetation (Agromorphic Vegetation)
 - + 8 Developed Vegetation (Hortomorphic Vegetation)
-

Navigating down through the hierarchy. At the association level – a link takes you to the NatureServe Description

National Vegetation Classification Hierarchy Browser

 with description with link to NatureServe

- [-] 1 Forest & Woodland (Mesomorphic Tree Vegetation)
 - [-] 1.A Tropical Moist Forest
 - [-] 1.B Tropical Dry Forest
 - [-] 1.C Temperate Forest
 - [-] 1.C.1 Warm Temperate Forest
 - [-] 1.C.2 Cool Temperate Forest
 - [-] 1.C.2.a Eastern North American Cool Temperate Forest
 - [-] 1.C.2.b Western North American Cool Temperate Forest
 - [-] MG017 Northern Rocky Mountain Lower Montane & Foothill Forest
 - [-] MG020 Rocky Mountain Subalpine & High Montane Conifer Forest
 - MG021 Sierra Madre High Montane Forest
 - [-] MG022 Southern Rocky Mountain Lower Montane Forest
 - [-] MG023 Southern Vancouverian Montane & Foothill Forest
 - [-] G344 California Montane [Sierra, Klamath-Siskiyou & Southern Cascade] Conifer Forest & Woodland Group
 - [-] G234 Sierran-Intermontane Desert Western White Pine - White Fir Woodland Group
 - C EGL000256 Abies concolor - Pinus contorta / Carex pensylvanica - Achnatherum occidentale Forest
 - C EGL000260 Abies concolor - Pinus monticola / Ribes viscosissimum Forest
 - C EGL000014 Abies concolor - Pinus ponderosa / Amelanchier alnifolia Forest
 - C EGL000017 Abies concolor - Pinus ponderosa / Arctostaphylos patula - Mahonia spp. Forest
 - C EGL000257 Abies concolor - Pinus ponderosa / Carex inops ssp. inops Forest
 - C EGL000258 Abies concolor - Pinus ponderosa / Ceanothus velutinus Forest
 - C EGL000259 Abies concolor - Pinus ponderosa / Purshia tridentata Woodland
 - C EGL000018 Abies concolor - Pinus ponderosa / Symphoricarpos spp. Forest



Ecological Association Comprehensive Report: Record 1 of 1

selected.

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—Jump to Section—

***Abies concolor* - *Pinus monticola* / *Ribes viscosissimum* Forest**

Translated Name: White Fir - Western White Pine / Sticky Currant Forest

Unique Identifier: CEGLO00260

Classification Approach: International Vegetation Classification (IVC)

Summary: This association is only known from the Warner Mountains of south-central Oregon and northeastern California. It is found on the mid and upper northerly slopes of moderate (10-30%) steepness. Elevations are between 1980 and 2260 m (6500-7400 feet). Soils are typically rocky loams over basalt or rhyolite parent material. *Abies concolor* is usually dominant, but *Pinus monticola* and *Pinus ponderosa* are also important in contributing to a mostly closed tree canopy. *Ribes viscosissimum* is common on most sites, but is occasionally absent. Common understory herbs are *Hieracium albiflorum*, *Poa wheeleri*, and *Carex inops* ssp. *heliophila*. After fires, *Pinus monticola* regenerates well, especially at higher elevations.

Classification

—Jump to Section—

Classification Confidence: 2 - Moderate

Classification Comments: *Pinus monticola* is more common than *Pinus ponderosa*, and has replaced it in the name.

Vegetation Hierarchy

Formation Class	I - Forest
Formation Subclass	I.A - Evergreen forest
Formation Group	I.A.9 - Temperate or subalpine needle-leaved evergreen forest

If a description for a Macrogroup or Group is available - a link to a pdf is provided.

***Important Note - Alliances are not included in the hierarchy.

National Vegetation Classification Hierarchy Browser

- ☐ 1 Forest & Woodland (M)
- ☐ 1.A Tropical Moist For
- ☐ 1.B Tropical Dry Fores
- ☐ 1.C Temperate Forest
- ☐ 1.C.1 Warm Temperat
- ☐ 1.C.2 Cool Temperate
- ☐ 1.C.2.a Eastern Nor
- ☐ MG153 Central Me
- ☐ MG012 Central Oa
- ☐ MG013 Eastern Nc
- ☐ MG159 Northern &
- ☐ MG151 Northern G
- ☐ MG014 Northern H
- ☐ MG016 Southern H
- ☐ G346 Chinkapin
- ☐ G164 Montane
- ☐ G165 Piedmont
- ☐ G012 Shortleaf
- ☐ 1.C.2.b Western No
- ☐ 1.C.2.c Western No
- ☐ 1.C.3 Temperate Floo
- ☐ 1.D Boreal Forest
- ☐ 2 Shrubland & Grassland
- ☐ 3 Semi-Desert (Xeromor

1. Mesomorphic Tree Vegetation (Forest & Woodland)
1.C.2. Cool Temperate Forest
1.C.2.a. Eastern North American Cool Temperate Forest
MG016. Southern Hardwood & Pine Forest

[Peer Review] [833279] G012. Shortleaf Pine - Oak Forest Group

LeadResp / Assignment: Southeast / Milo
Reviewers: E, MW, SE

OVERVIEW

Database Code for Type: G012

Scientific Name: *Pinus echinata* - *Quercus (falcata, prinus, stellata)* Forest & Woodland Group

Common Name (Translated Scientific Name): Shortleaf Pine - (Southern Red Oak, Chestnut Oak, Post Oak)
Forest & Woodland Group

Colloquial Name: Shortleaf Pine - Oak Forest Group

Hierarchy Level: Group

Placement in Hierarchy: MG016. Southern Hardwood & Pine Forest

Type Concept: This group encompasses forests and woodlands of the interior plateaus, Appalachians, Ozark-Ouachita, and upper coastal plain regions (north of the range of *Pinus palustris*) in which *Pinus echinata* is the canopy dominant (or at least an important component). Examples can occur on a variety of topographic and landscape positions, including ridgetops, upper and midslopes, as well as lower elevations (generally below 700 m [2300 feet]) in the Southern Appalachians such as mountain valleys, as well as on rolling uplands in the Upper East Gulf Coastal Plain. Examples occur on a variety of acidic soils or bedrock types. Stands may be codominated by *Quercus* spp., *Carya* spp., and other hardwoods, with the varying proportion of pine versus hardwood depending on management (both commercial forestry and ecological management), particularly time since fire. Although examples of this group occur throughout this broad area, there is considerable local variation in their extent in the landscape and in their structure and composition. In more open stands (such as ones in naturally drier regions or ones which have experienced more recent/frequent fire), the understory is characterized by *Andropogon gerardii*, *Schizachyrium scoparium*, and other prairie graminoid elements. In the lower elevations of the Southern Appalachians, and under current conditions, stands are dominated by *Pinus echinata* or *Pinus virginiana*. *Pinus rigida* may sometimes be present. Hardwoods are sometimes abundant, especially dry-site oaks such as *Quercus falcata*, *Quercus prinus*, *Quercus stellata*, and *Quercus coccinea*, but also *Carya glabra* and other hickories. The shrub layer may be well-developed, with *Vaccinium pallidum*, *Gaylussacia baccata*, or other acid-tolerant species being most characteristic. Herbs are usually sparse but may include *Pityopsis graminifolia* and *Tephrosia virginiana*.

2. Maintenance & Dissemination of Supporting Data



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1-49	50-99	100-249
250-999	1,000-3,000	> 3,000

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Project	Added
Cherokee National Forest	17-Nov-05
Talladega-Oakmulgee National ...	17-Nov-05
Osceola National Forest	17-Nov-05
Ocala National Forest	17-Nov-05

Data in VegBank

Plots:	21235
--Classified Plots:	14890
----to NVC communities:	4996
Plant Concepts:	91884
--accepted by USDA:	43753
----and on plots:	6829
Community Concepts:	15082
--in the NVC:	8390
----and on plots:	868

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- A public archive for vegetation records
- Key data can be viewed by a simple web link.
(e.g. <http://vegbank.org/get/std/observation/5153>)

3. Preparation & Submission of Proposals for Revising Content

The screenshot displays the NVC Revision System website. At the top, the title "NVC Revision System" is shown in green. Below it is a navigation bar with "Home" and "About" links. The date "June 15, 2005" is on the left, and "Welcome!" is on the right. The main content area is titled "Welcome to the NVC Revision System" and contains a paragraph explaining the system's purpose and a paragraph inviting proposals. A "LOGIN" form is centered, with fields for "Login name: peet" and "Password: ●●●●", and a "Login" button. Below the form are links for "Forgot your password? Retrieve it here" and "If you have not registered, please register". The left sidebar includes "Home", "Registered user" (with "Please login"), "New user" (with "Please Register"), "Return to Proceedings", and "Helpful links" with logos for VEGBANK, NatureServe Explorer, and ESA Vegetation Panel. The footer contains the copyright notice "© 2004 Ecological Society of America".

NVC Revision System

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June 15, 2005 Welcome!

Home

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VEGBANK

NatureServe Explorer

ESA Vegetation Panel

Welcome to the NVC Revision System

The NVC Revision System is an online tool for preparing, submitting, reviewing and managing proposals for changes in the U.S. National Vegetation Classification (NVC). The Revision System is maintained by the the Vegetation Panel of the Ecological Society of America in collaboration with the Vegetation Subcommittee of the U.S. Federal Geographic Data Committee (F.G.D.C) and NatureServe.

All interested parties are invited to propose changes to the classification. Proposals should be compliant with F.G.D.C. standards. Compliance with E.S.A. Guidelines is strongly encouraged. Proposals should be for changes to the current classification as posted on NatureServe Explorer and as subsequently modified in the Proceedings.

LOGIN

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<http://herbarium.unc.edu:8080/nvcrs/>

NVC and Other Hierarchies

USNVC ¹	Braun-Blanquet ²	Brown et al. 1998 ³	Rübel ⁴
Upper			
L1 – Formation Class			
L2 – Formation Subclass			
L3 – Formation	<i>Formation</i> ⁵	<i>Formation-type</i>	Formation
Mid			
L4 – Division	<i>Division</i> ⁵		
L5 – Macrogroup	Class	Biotic Community	
L6 – Group	Order		
Lower			
L7 – Alliance	Alliance	Series/Alliance	Alliance
L8 – Association	Association	Association	Association

Questions?

