

## Vegetation Map Units by Ecological Groups

### Bogs

- Tread Bogs
- Black Spruce Bog
- Shrub Bogs
- Black Spruce/whiteleaf Described Bog
- Leatherleaf Bog
- Beaver Basin Break-up Mosaic

### Northern Shrub and Graminoid Fens

- Shrub Fens
- Bog Birch-Willow Shore Fen
- Leatherleaf (Sweet) Gale Shore Fen
- Tamarack Scrub Poor Fen

### Graminoid Fens

- Northern Sedge Poor Fen

### Wet Meadows

- Wet Meadows
- Canada Bluff/nt Eastern Meadow
- Wet Meadow/Fen Mosaic/Complex

### Marshes

- Emergent Marshes
- Eastern Reed Marsh
- Freshwater Bulrush Marsh
- Midwest Cattail Deep Marsh
- Wild Rice Marsh
- Deep Marsh Mosaic/Complex
- Rooted and Floating Aquatic Marshes
- Midwest Hardwood Submerged Aquatic Wetland
- Northern Water Lily Aquatic Wetland

### Northern Conifer and Hardwood Swamps

- Rich Hardwood Swamps
- Black Ash-Mixed Hardwood Swamp
- White Cedar-Black Ash Swamp
- Rich Conifer Swamps
- Black Spruce/Alder Rich Swamp
- Northern Tamarack Rich Swamp
- White Cedar-Mixed Conifer/Alder Swamp (rich soil phase)
- White Cedar-Mixed Conifer/Alder Swamp (poorland phase)
- Poor Conifer Swamps
- Black Spruce/Labrador Tea Poor Swamp (evergreen phase)
- Black Spruce/Labrador Tea Poor Swamp (mixed phase)

### Northern Shrub Swamps

- Northern Shrub Swamps
- Dogwood-Pussy Willow Swamp
- Speckled Alder Swamp

### Rock Barrens

- Tread Rock Barrens
- Boreal Pine Rocky Woodland (jack pine phase)
- Boreal Pine Rocky Woodland (mixed pine phase)
- Jack Pine/Lichen Tundra Barrens
- Mixed Aspen Rocky Woodland
- Northern Pin Oak-Bur Oak-(Jack Pine) Rocky Woodland (deciduous phase)
- Northern Pin Oak-Bur Oak-(Jack Pine) Rocky Woodland (jack pine-oak phase)
- Northern Pin Oak-Bur Oak-(Jack Pine) Rocky Woodland (mixed pine-oak phase)
- Shrub and Herb Rock Barrens
- Boreal Harebell-Servicelberry Rocky Shrubland
- Poverty Grass Granite Barrens

### Northern White Cedar-(Hardwood) Forests

- Northern White Cedar-(Hardwood) Forests
- White Cedar-Boreal Conifer Mosaic Forest
- White Cedar-Tsuga Forest

### Northern Pine-(Hardwood) Forests

- Northern Pine-(Hardwood) Forests
- Jack Pine-Aspen Forest Mosaic
- Jack Pine-Balsam Fir Forest
- White Pine-Red Pine-Quaking Aspen-Paper Birch Forest
- Red Pine-Blueberry Dry Forest
- White Pine-Mountain Maple Mixed Forest

### Northern Spruce-Fir-(Hardwood) Forests

- Northern Spruce-Fir-(Hardwood) Forests
- Spruce-Fir-Aspen Forest
- Black Spruce-Feathermoss Forest
- Spruce-Fir-Mountain Maple Forest

### Boreal Hardwood Forests

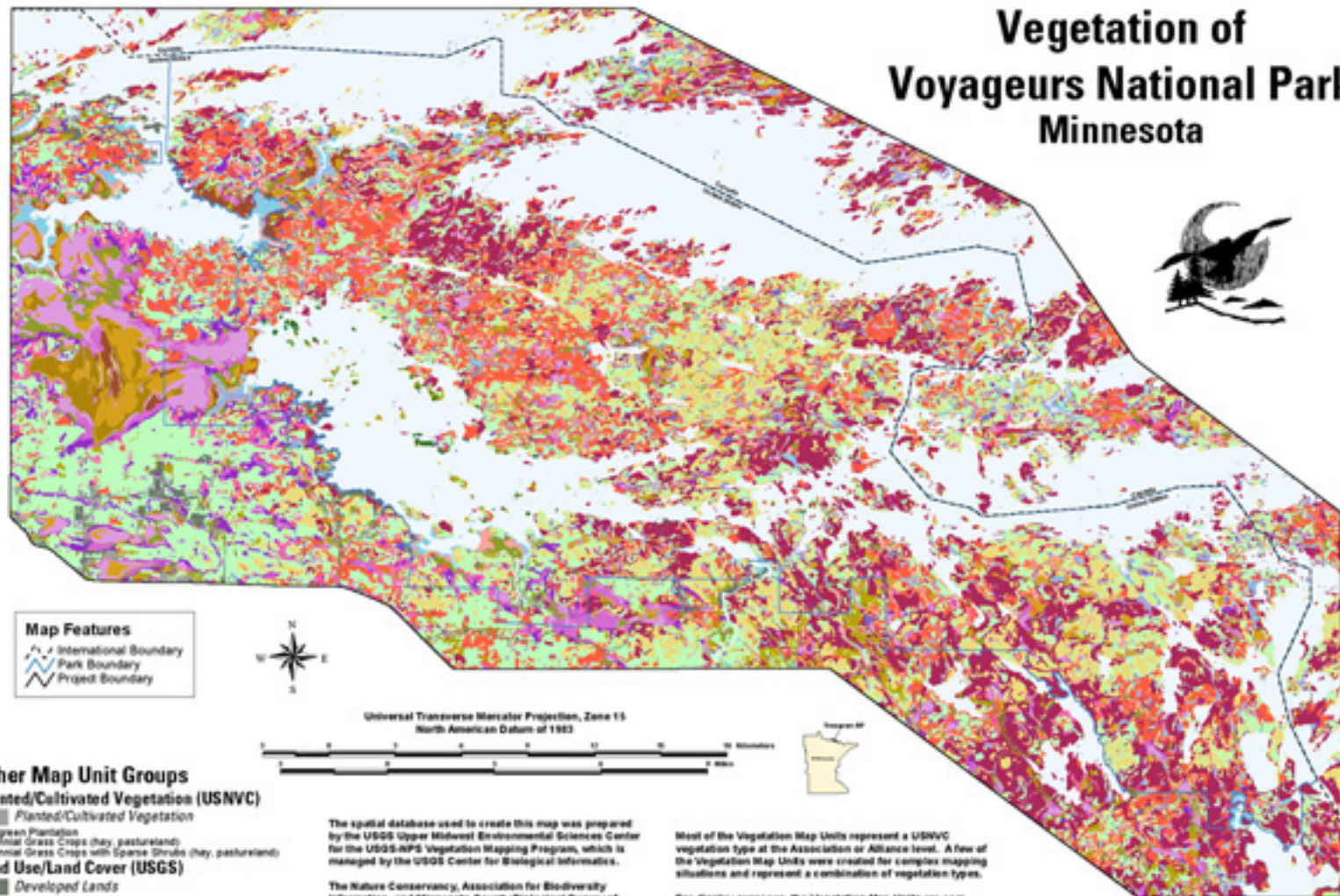
- Boreal Hardwood Forests
- Quaking Aspen-Paper Birch Forest
- Paper Birch/Fir Forest
- Trembling Aspen-Balsam Poplar Leland Forest

### Northern Hardwood Forests

- Northern Hardwood Forests
- Northern Bur Oak Mosaic Forest



Red Pine at Blind Ash Bay



### Map Features

- International Boundary
- Park Boundary
- Project Boundary



Universal Transverse Mercator Projection, Zone 15  
North American Datum of 1983



### Other Map Unit Groups

#### Planted/Cultivated Vegetation (USNVC)

- Planted/Cultivated Vegetation
- Evergreen Plantation
- Perennial Grass Crops (hay, pastureland)
- Perennial Grass Crops with Sparse Shrubs (hay, pastureland)

#### Land Use/Land Cover (USGS)

- Developed Lands
- Cropland and Pasture
- Other Agricultural Land
- Strip Mines, Quarries, and Gravel Pits
- Commercial and Services
- Residential
- Transportation, Communications, and Utilities
- Lakes and Streams

- Lakes (> 16 ha)
- Streams and Canals

#### Small Islands and Natural Ponds

- Small Islands (< 1-hectare)
- Small Island with Grass
- Small Island with Shrubs
- Small Island with Trees
- Small Island with Rock
- Small Natural Ponds (> 1% vegetated)
- Water-Beaver Pond
- Water-Natural Pond (< 16 ha)

The spatial database used to create this map was prepared by the USGS Upper Midwest Environmental Sciences Center for the USGS-NPS Vegetation Mapping Program, which is managed by the USGS Center for Biological Informatics.

The Nature Conservancy, Association for Biodiversity Information, and Minnesota County Biological Survey of the Minnesota Department of Natural Resources provided vegetation field sampling, analysis, and classification development based on the U.S. National Vegetation Classification (USNVC).

The spatial database was produced by the stereo interpretation of fall 1995 and 1996 color infrared aerial photographs (0.15,040-scale). Prior to delineating polygons, field reconnaissance was performed to learn photographic appearances of vegetation types and to link map units to vegetation communities. The interpreted data were transferred to base maps gridded from USGS 3.75-minute digital orthophoto quadrangles (DOQs) or, for portions of Canada not covered by DOQs, to Canada Basic Mapping Series topographic maps (0.28,040-scale). The referenced data were digitized and a database for geographic information systems was generated. Standard minimum mapping unit is 0.5 hectares.

Most of the Vegetation Map Units represent a USNVC vegetation type at the Association or Alliance level. A few of the Vegetation Map Units were created for complex mapping situations and represent a combination of vegetation types.

For display purposes, the Vegetation Map Units are combined into Ecologic or Ecological Groups (groups of vegetation types that share similar ecological processes). The Other Map Units are combined into general categories. The spatial database offers finer details of the map units (relationship to vegetation communities, physiographic features of vegetation, crosswalk to other classification systems).

The spatial database reflects conditions that existed at the time of aerial photograph collection. A margin of error is inherent with integrating aerial photographs. Based on results of a thematic accuracy assessment, the estimated overall accuracy for the Vegetation Map Units is 82.4%. Those using the database should determine for themselves the fitness of the data prior to use.

The spatial database, along with supporting information, is located on the Internet at <http://biology.usgs.gov/vegg>.

# Vegetation of Voyageurs National Park Minnesota



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USGS NPS Vegetation Mapping Program

