

### 3. VEGETATION DESCRIPTIONS FOR MOUNT RUSHMORE NATIONAL MEMORIAL

#### Quercus macrocarpa / Ostrya virginiana Forest

COMMON NAME	Bur Oak / Eastern Hop-Hornbeam Forest
SYNONYM	Bur Oak - Ironwood Forest
PHYSIOGNOMIC CLASS	Forest (I)
PHYSIOGNOMIC SUBCLASS	Deciduous forest (I.B)
PHYSIOGNOMIC GROUP	Cold-deciduous forest (I.B.2)
PHYSIOGNOMIC SUBGROUP	Natural/semi-natural (I.B.2.N)
FORMATION	Lowland or submontane cold-deciduous forest (I.B.2.N.a.)
ALLIANCE	<i>Quercus macrocarpa</i> Forest Alliance

CLASSIFICATION CONFIDENCE LEVEL 2

USFWS WETLAND SYSTEM Upland

RANGE

*Globally*

This community is found in the Black Hills of South Dakota, at elevations of 1067-1400 m (3500-4600 ft).

*Mount Rushmore National Memorial*

A single stand of this community was found in a tributary drainage in the southeast corner of the study area.

ENVIRONMENTAL DESCRIPTION

*Globally*

This community has been reported on gentle to moderately steep (14-47%) northerly slopes (Hoffman and Alexander 1987, Johnston 1987). Most occurrences are on upland slopes but some are along streams and gullies. The soils are sandy loams and loams with pH of 5.8-7.4 (Johnston 1987).

*Mount Rushmore National Memorial*

This community was found only in a drainage bottom of a tributary to Iron Creek in the southeast corner of the study area.

MOST ABUNDANT SPECIES

*Globally*

Stratum

Tree canopy

Subcanopy

Short shrub

Herbaceous

Species

*Quercus macrocarpa, Fraxinus pennsylvanica*

*Ostrya virginiana*

*Prunus virginiana, Ribes spp., Symphoricarpos occidentalis*

*Carex foenea, Carex sprengelii, Elymus virginicus*

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#### *Mount Rushmore National Memorial*

<u>Stratum</u>	<u>Species</u>
Tree canopy	<i>Ostrya virginiana</i> , <i>Betula papyrifera</i> , <i>Quercus macrocarpa</i>
Subcanopy	<i>Prunus virginiana</i> , <i>Amelanchier alnifolia</i>
Short shrub	<i>Physocarpus monogynus</i> , <i>Toxicodendron rydbergii</i>
Herbaceous	<i>Aralia nudicaulis</i> , <i>Maianthemum stellatum</i>

#### DIAGNOSTIC SPECIES

##### *Globally*

*Fraxinus pennsylvanica*, *Prunus virginiana*, *Amelanchier alnifolia*, *Symphoricarpos* spp., *Maianthemum stellatum*, *Quercus macrocarpa*, *Ostrya virginiana*

##### *Mount Rushmore National Memorial*

*Ostrya virginiana*, *Quercus macrocarpa*

#### VEGETATION DESCRIPTION

##### *Globally*

This community is dominated by closely spaced small trees of *Quercus macrocarpa*, with physiognomic similarity to those of *Q. gambelii* of the central Rocky Mountains. In some areas across the range of this type *Fraxinus pennsylvanica* may be present. *Ostrya virginiana* is present in the tree subcanopy, and *Carex foenea* is found in the herbaceous layer. Other species which may be found in this type include *Carex saximontana*, *Carex sprengelii*, *Elymus virginicus*, *Mahonia repens*, *Maianthemum stellatum*, *Phlox gracilis* ssp. *gracilis*, *Prunus virginiana* var. *virginiana*, *Ribes* spp., *Symphoricarpos occidentalis*, *Thalictrum* spp., and *Woodsia* spp. In four stands sampled by Hoffman and Alexander (1987), the shrubs covered an average of 16%, graminoids 17%, and forbs 17%. The basal area in these stands was 26.6 m<sup>2</sup>/ha.

##### *Mount Rushmore National Memorial*

A single stand of this vegetation type was found. The canopy was dominated by hardwoods, with several tall pines forming an emergent stratum. Canopy cover was estimated at 25 to 60%, with *Ostrya virginiana* the most abundant species. *Betula papyrifera* and *Quercus macrocarpa* were significant components. Subcanopy coverage was estimated at 10 to 25%; canopy species were present as well as *Prunus virginiana* and *Amelanchier alnifolia*. Short shrub cover was estimated at 25 to 60%, with *Physocarpus monogynus* the most abundant species. Herbaceous cover was in the 10 to 25% range. *Aralia nudicaulis* and *Maianthemum stellatum* were the most abundant components.

OTHER NOTEWORTHY SPECIES Information not available.

CONSERVATION RANK G2

RANK JUSTIFICATION Many

*Quercus macrocarpa*-dominated stands in the Black Hills are heavily grazed (Hoffman and Alexander 1987).

DATABASE CODE CEGL000555

#### COMMENTS

##### *Globally*

The suppression of fire may negatively impact this community, since disturbances such as fire may be required for the successful regeneration of oaks (Sieg 1991). One method to improve the condition of native woodlands is with proper range management techniques.

The riparian sites of this type may have experienced periodic flooding. The upland portions of this type may have been subject o periodic fire (which led to oak regeneration).

This community has been described only from the Black Hills. The stands used to document this type, as described by Hoffman and Alexander (1987) had high basal area and densities, possibly due to their sampling procedure.

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**Mount Rushmore National Memorial**

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REFERENCES

Hoffman, G. R. and R. R. Alexander. 1987. Forest vegetation of the Black Hills National Forest of South Dakota and Wyoming: A habitat type classification. Research Paper RM-276. USDA, Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 48 p.

Johnston, B. C. 1987. Plant associations of region two. Report R2-ECOL-87-2. P. 153, USDA, Forest Service, Rocky Mountain Region, Lakewood, CO. 429 p.

Sieg, C. H. 1991. Ecology of bur oak woodlands in the foothills of the Black Hills, South Dakota. Ph.D. dissertation. Department of Range and Wildlife Management, Texas Tech University. Lubbock, Texas.

## Betula papyrifera / Corylus cornuta Forest

COMMON NAME	Paper Birch / Beaked Hazel Forest
SYNONYM	Paper Birch / Hazel Forest
PHYSIOGNOMIC CLASS	Forest (I)
PHYSIOGNOMIC SUBCLASS	Deciduous forest (I.B)
PHYSIOGNOMIC GROUP	Cold-deciduous forest (I.B.2)
PHYSIOGNOMIC SUBGROUP	Natural/semi-natural (I.B.2.N)
FORMATION	Montane or boreal cold-deciduous forest (I.B.2.N.b)
ALLIANCE	<i>Betula papyrifera</i> Forest Alliance

CLASSIFICATION CONFIDENCE LEVEL 2

USFWS WETLAND SYSTEM Upland

RANGE

*Globally*

This community occurs in North Dakota, South Dakota, and Wyoming.

*Mount Rushmore National Memorial*

This community occurs throughout the study area. It is best developed in major drainages, such as Grizzly Bear Creek, Starling Basin, Lafferty Gulch, and other tributaries south of Battle Creek.

ENVIRONMENTAL DESCRIPTION

*Globally*

This community has been sampled in the Kildeer Mountains of North Dakota and the Bear Lodge Mountains of Wyoming. It was found on nearly level ground with silt loam soil in North Dakota (Girard et al. 1989, McAdams et al. 1998) and on steep north facing slopes in Wyoming (Jones 1992).

*Mount Rushmore National Memorial*

This community occurs in drainage bottoms and adjacent lower slopes. It was observed on slopes ranging from 0 to 20 degrees and the aspect generally was northerly.

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#### MOST ABUNDANT SPECIES

##### *Globally*

<u>Stratum</u>	<u>Species</u>
Tree canopy	<i>Betula papyrifera</i>
Shrub	<i>Corylus cornuta</i> , <i>Prunus virginiana</i>
Herbaceous	<i>Actaea rubra</i> , <i>Aralia nudicaulis</i> , <i>Carex</i> spp., <i>Maianthemum canadense</i>

##### *Mount Rushmore National Memorial*

<u>Stratum</u>	<u>Species</u>
Tree canopy	<i>Betula papyrifera</i>
Subcanopy	<i>Betula papyrifera</i> , <i>Populus tremuloides</i> , <i>Quercus macrocarpa</i>
Tall shrub	<i>Corylus cornuta</i>
Herbaceous	<i>Aralia nudicaulis</i> , <i>Maianthemum canadense</i> , <i>Viola canadensis</i> (see Vegetation Description below)

#### DIAGNOSTIC SPECIES

##### *Globally*

*Betula papyrifera*, *Corylus cornuta*

##### *Mount Rushmore National Memorial*

*Betula papyrifera*, *Corylus cornuta*

#### VEGETATION DESCRIPTION

##### *Globally*

This community has a predominantly closed canopy dominated by *Betula papyrifera*. Other trees that may contribute significantly to the canopy are *Quercus macrocarpa*, *Populus tremuloides*, and, in the Bear Lodge Mountains, *Pinus ponderosa*. *Fraxinus pennsylvanica* may be present, especially as small trees or saplings. There is a tall shrub layer that usually reaches 2 m or more. The most abundant shrub is *Corylus cornuta*. Other species found in this layer are *Amelanchier alnifolia* and *Prunus virginiana*. Jones (1992) reported a low shrub layer that consisted of *Symphoricarpos* spp., *Spiraea betulifolia*, *Shepherdia argentea*, and *Ribes* spp. Common herbaceous species include *Actaea rubra*, *Maianthemum canadense*, *Carex* spp., *Aralia nudicaulis*, *Apocynum androsaemifolium*, and *Schizachne purpurescens*.

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This community is dominated by *Betula papyrifera* in the canopy and subcanopy. *Populus tremuloides* and *Quercus macrocarpa* are often present but not dominant. A few tall pines may form an emergent stratum. Canopy coverage is at least 10% and often in the 60 to 100 % range. Subcanopy coverage is more variable, but can be high as well. Tall shrub cover typically is in the 25 to 60% range, but can be greater. *Corylus cornuta* strongly dominates this stratum. Herbaceous cover usually is greater than 60% and very species-rich. No species occurs in abundance; several of the more consistently occurring species are listed above.

OTHER NOTEWORTHY SPECIES Information not available.

CONSERVATION RANK G2?

#### RANK JUSTIFICATION

Currently there are seven occurrences documented from North Dakota; the community is also reported from Wyoming and South Dakota. The state rank in Wyoming is S1S2. Estimated total number of occurrences is fewer than 25 but may be larger. The total currently documented acreage is less than 120 ha. Most occurrences are smaller than 20 ha, so the total acreage is probably less than 250 ha. The range may be fairly restricted. Most of the documented occurrences are also in good condition.

DATABASE CODE CEGL002079

COMMENTS

## USGS-NPS Vegetation Mapping Program

### Mount Rushmore National Memorial

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#### REFERENCES

Girard, M. M., H. Goetz, and A. J. Bjugstad. 1989. Native woodland habitat types of southwestern North Dakota. Research Paper RM-281. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 36 p.

Jones, G. 1992. Wyoming plant community classification. Wyoming Natural Diversity Database, The Nature Conservancy, Laramie. 183 p.

McAdams, A. G., D. A. Stutzman, and D. Faber-Langendoen. 1998. Black Hills Community Inventory, unpublished data. The Nature Conservancy, Midwest Regional Office, Minneapolis, MN.

## Pinus ponderosa / Arctostaphylos uva-ursi Woodland

COMMON NAME	Ponderosa Pine / Bearberry Woodland
SYNONYM	Ponderosa Pine / Kinikinnick Woodland
PHYSIOGNOMIC CLASS	Woodland (II)
PHYSIOGNOMIC SUBCLASS	Evergreen woodland (II.A)
PHYSIOGNOMIC GROUP	Temperate or subpolar needle-leaved evergreen woodland (II.A.4)
PHYSIOGNOMIC SUBGROUP	Natural/semi-natural (II.A.4.N)
FORMATION	Rounded-crowned temperate or subpolar needle-leaved evergreen woodland (II.A.4.N.a.)
ALLIANCE	<i>Pinus ponderosa</i> Woodland Alliance

CLASSIFICATION CONFIDENCE LEVEL 1

USFWS WETLAND SYSTEM Upland

#### RANGE

*Globally*

This community is found in southeastern Montana, eastern Wyoming, and western South Dakota.

#### *Mount Rushmore National Memorial*

This community is widely distributed. It is best developed in areas underlain by granite.

#### ENVIRONMENTAL DESCRIPTION

*Globally*

This community is found on flat to gently sloping terrain (3-21%) in the Black Hills and surrounding areas (Hoffman and Alexander 1987). It has been found from 1540-3000 m (4250-9100 ft). The slopes are more likely to be facing northward than southward. Soils are sandy loams and clay loams.

#### *Mount Rushmore National Memorial*

This community was found on gentle to moderate slopes (usually less than 20 degrees) of all aspects. Rock outcrops are common. This type is best developed in areas underlain by granite, with the *Arctostaphylos uva-ursi* often forming large mats among outcrops. It is less common in areas underlain by schist.

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### Mount Rushmore National Memorial

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#### MOST ABUNDANT SPECIES

##### Globally

<u>Stratum</u>	<u>Species</u>
Tree canopy	<i>Pinus ponderosa</i>
Short shrub	<i>Arctostaphylos uva-ursi</i> , <i>Juniperus communis</i> , <i>Symphoricarpos albus</i>
Herbaceous	<i>Oryzopsis asperifolia</i>

##### Mount Rushmore National Memorial

<u>Stratum</u>	<u>Species</u>
Tree canopy	<i>Pinus ponderosa</i>
Short shrub	<i>Arctostaphylos uva-ursi</i>

#### DIAGNOSTIC SPECIES

##### Globally

*Pinus ponderosa*, *Arctostaphylos uva-ursi*, *Shepherdia canadensis*

##### Mount Rushmore National Memorial

*Pinus ponderosa*, *Arctostaphylos uva-ursi*

#### VEGETATION DESCRIPTION

##### Globally

*Pinus ponderosa* is the dominant tree in this woodland community. *P. ponderosa* reproduces successfully in this community and is found as seedlings and saplings as well as mature trees. There may be seedlings of *Populus tremuloides* and *Quercus macrocarpa*. In northern New Mexico and southern Colorado, *Pseudotsuga menziesii* may also be present, but elsewhere rarely do any species except *Pinus ponderosa* grow larger than saplings. Shrubs are prominent in this community. Hoffman and Alexander (1987) found that in 10 stands in the Black Hills, shrubs averaged 43.9% cover while the herbaceous stratum averaged 19.3% cover. The most abundant shrub was *Arctostaphylos uva-ursi*, which covered an average of 33% (range of 10-85%) of the surface. Other shrubs that are likely to be present are *Spiraea betulifolia*, *Juniperus communis*, and *Symphoricarpos albus*. Typical herbaceous species are *Achillea millefolium*, *Fragaria virginiana*, *Lathyrus ochroleucus*, and *Oryzopsis asperifolia*.

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This community is dominated by *Pinus ponderosa* in the canopy. Coverage generally is less than 25%. Subcanopy typically is sparse or absent, but can have coverage as high as 60%, with *P. ponderosa* and *Populus tremuloides* occurring most commonly. *Arctostaphylos uva-ursi* dominates the short shrub stratum, with coverage usually greater than 10% and often significantly higher (25 to 60%).

OTHER NOTEWORTHY SPECIES Information not available.

CONSERVATION RANK G4

RANK JUSTIFICATION

DATABASE CODE C EGL000844

#### COMMENTS

##### Globally

Fire was likely an important factor in the regulation of stand structure historically.

The stands used to document the *Pinus ponderosa* / *Arctostaphylos uva-ursi* Habitat Type described by Hoffman and Alexander (1987) had very high basal area and densities for a woodland, possibly due to their sampling procedure. The dense structure may have affected the floristic makeup of the stands and made the list of dominant species a poor reflection of the community as a whole.

## USGS-NPS Vegetation Mapping Program

### Mount Rushmore National Memorial

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#### REFERENCES

Alexander, R. R. 1988. Forest vegetation on national forests in the Rocky Mountain and Intermountain region: habitat types and community types. General Technical Report RM-162. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 47 p.

Hoffman, G. R. and R. R. Alexander. 1987. Forest vegetation of the Black Hills National Forest of South Dakota and Wyoming: A habitat type classification. Research Paper RM-276. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 48 p.

Jones, G. 1992. Wyoming plant community classification. Unpublished draft. Wyoming Natural Diversity Database, The Nature Conservancy, Laramie, WY.

McAdams, A. G., D. A. Stutzman, and D. Faber-Langendoen. 1998. Black Hills Community Inventory, unpublished data. The Nature Conservancy, Midwest Regional Office, Minneapolis, MN.

## Pinus ponderosa / Juniperus communis Woodland

COMMON NAME	Ponderosa Pine / Common Juniper Woodland
SYNONYM	Ponderosa Pine / Common Juniper Woodland
PHYSIOGNOMIC CLASS	Woodland (II)
PHYSIOGNOMIC SUBCLASS	Evergreen woodland (II.A)
PHYSIOGNOMIC GROUP	Temperate or subpolar needle-leaved evergreen woodland (II.A.4)
PHYSIOGNOMIC SUBGROUP	Natural/semi-natural (II.A.4.N)
FORMATION	Rounded-crowned temperate or subpolar needle-leaved evergreen woodland (II.A.4.N.a.)
ALLIANCE	<i>Pinus ponderosa</i> Woodland Alliance

CLASSIFICATION CONFIDENCE LEVEL 2

USFWS WETLAND SYSTEM Upland

#### RANGE

##### *Globally*

This community is found in eastern Montana, the Bighorn Mountains in northern Wyoming, and the Black Hills of western South Dakota and eastern Wyoming.

##### *Mount Rushmore National Memorial*

This community is widespread and was found throughout the study area.

#### ENVIRONMENTAL DESCRIPTION

##### *Globally*

This community is most often found on moderate north and west facing slopes (Hansen and Hoffman 1987, Hoffman and Alexander 1987, Hoffman and Alexander 1976). The soils are shallow and loamy.

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### Mount Rushmore National Memorial

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#### *Mount Rushmore National Memorial*

This community occurs on moderate to steep slopes (typically between 15 and 30 degrees), and on all aspects but southerly. Sites are underlain with granite and/or schist and rock outcrops are common.

#### MOST ABUNDANT SPECIES

##### *Globally*

<u>Stratum</u>	<u>Species</u>
Tree canopy	<i>Pinus ponderosa</i>
Short shrub	<i>Mahonia repens</i> , <i>Juniperus communis</i>
Herbaceous	<i>Carex inops</i> ssp. <i>heliophila</i> , <i>Lathyrus ochroleucus</i> , <i>Schizachyrium scoparium</i>

#### *Mount Rushmore National Memorial*

<u>Stratum</u>	<u>Species</u>
Tree canopy	<i>Pinus ponderosa</i>
Subcanopy	<i>Pinus ponderosa</i>
Short shrub	<i>Juniperus communis</i>

#### DIAGNOSTIC SPECIES

##### *Globally*

*Pinus ponderosa*, *Juniperus communis*., *Mahonia repens*, *Achillea millefolium*.

#### *Mount Rushmore National Memorial*

*Pinus ponderosa*, *Juniperus communis*

#### VEGETATION DESCRIPTION

##### *Globally*

This community is dominated by *Pinus ponderosa* in the overstory. Other tree species that may be present are *Picea glauca* and *Populus tremuloides*. The canopy is usually moderately closed but can become nearly closed in stands that are not disturbed for long periods. There is a prominent low shrub layer whose most abundant component is *Juniperus communis*. This species covered an average of 25% (range of 4-42%) in 7 stands in the Black Hills of South Dakota and Wyoming (Hoffman and Alexander 1987). Total average cover by the shrub layer was 51% and by the herb layer was 8%. Other shrub species found in this community across its range are *Arctostaphylos uva-ursi*, *Mahonia repens*, *Spiraea betulifolia*, and *Symphoricarpos albus*. Typical herbaceous species are *Achillea millefolium*, *Carex inops* ssp. *heliophila*, *Schizachyrium scoparium*, *Fragaria* spp., and *Lathyrus ochroleucus* (McAdams et al. 1998).

#### *Mount Rushmore National Memorial*

This vegetation type is dominated by *Pinus ponderosa* in both the canopy and subcanopy. Coverage and structure vary. Canopy cover often is in the 10 to 25% range, with subcanopy cover somewhat greater (25 to 60%). But it is not unusual to have coverages greater than 60% for one or both strata. Doghair patches are common in this type. Typically, the understory is relatively sparse. *Juniperus communis* occurs consistently in the short shrub stratum, but is rarely abundant. Herbaceous cover is often less than 10% and usually less than 25%. Species composition is variable. *Carex rossii* and *Danthonia spicata* frequently were found in this type.

#### OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G4?

RANK JUSTIFICATION

DATABASE CODE C EGL000859

#### COMMENTS

##### *Globally*

The canopy in this type is usually moderately closed but can become nearly closed in undisturbed stands (i.e., where the natural disturbance regime has been disrupted).

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### Mount Rushmore National Memorial

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The stands used to document the *Pinus ponderosa* / *Juniperus communis* Habitat Type described by Hoffman and Alexander (1987) and Hansen and Hoffman (1988) had very high basal area and densities for a woodland, possibly due to their sampling procedure. The dense structure may have affected the floristic makeup of the stands. Additionally, there is some ambiguity between this type as a forest or woodland; in increasingly dense stands, this type has >60% canopy closure.

#### *Mount Rushmore National Memorial*

This community often occurs in mosaics with other pine communities, especially *Pinus ponderosa* / *Oryzopsis asperifolia* Woodland.

#### REFERENCES

- Hansen, P. L. and G. R. Hoffman. 1988. The vegetation of the Grand River/ Cedar River, Sioux, and Ashland Districts of the Custer National Forest: A habitat type classification. General Technical Report RM-157. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 68 p.
- Hoffman, G. R. and R. R. Alexander. 1976. Forest vegetation of the Bighorn Mountains, Wyoming: A habitat type classification. Research Paper RM-170. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 38 p.
- Hoffman, G. R. and R. R. Alexander. 1987. Forest vegetation of the Black Hills National Forest of South Dakota and Wyoming: A habitat type classification. Research Paper RM-276. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 48 p.
- Johnston, B. C. 1987. Plant associations of region two. R2-ECOL-87-2. USDA Forest Service, Rocky Mountain Region, Lakewood, CO. 429 p.
- Jones, G. 1992. Wyoming plant community classification. Unpublished draft. Wyoming Natural Diversity Database, The Nature Conservancy, Laramie, WY.
- McAdams, A. G., D. A. Stutzman, and D. Faber-Langendoen. 1998. Black Hills Community Inventory, unpublished data. The Nature Conservancy, Midwest Regional Office, Minneapolis, MN.
- Thilenius, J. F. 1970. An isolated occurrence of limber pine (*Pinus flexilis* James) in the Black Hills of South Dakota. American Midland Naturalist 84(2):411-417.

## Pinus ponderosa / Oryzopsis asperifolia Woodland

COMMON NAME	Ponderosa Pine / Rough-Leaved Ricegrass Woodland
SYNONYM	Ponderosa Pine / Rough-Leaved Ricegrass Woodland
PHYSIOGNOMIC CLASS	Woodland (II)
PHYSIOGNOMIC SUBCLASS	Evergreen woodland (II.A)
PHYSIOGNOMIC GROUP	Temperate or subpolar needle-leaved evergreen woodland (II.A.4)
PHYSIOGNOMIC SUBGROUP	Natural/semi-natural (II.A.4.N)
FORMATION	Rounded-crowned temperate or subpolar needle-leaved evergreen woodland (II.A.4.N.a.)
ALLIANCE	<i>Pinus ponderosa</i> Woodland Alliance

## USGS-NPS Vegetation Mapping Program

### Mount Rushmore National Memorial

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CLASSIFICATION CONFIDENCE LEVEL 2

USFWS WETLAND SYSTEM Upland

#### RANGE

*Globally*

This community is described only in western South Dakota.

*Mount Rushmore National Memorial*

This community is widespread and was found throughout the study area.

#### ENVIRONMENTAL DESCRIPTION

*Globally*

This community has been found on flat to moderately sloping topography (2-24%) (Hoffman and Alexander 1987). The soils range from sandy loams to silt loams. This type is generally found on north aspects.

*Mount Rushmore National Memorial*

This community occurs on gentle to moderate slopes (typically less than 20 degrees) with a variety of aspects in areas underlain by granite and schist.

#### MOST ABUNDANT SPECIES

*Globally*

##### Stratum

Tree canopy

Short shrub

Herbaceous

##### Species

*Pinus ponderosa*

*Arctostaphylos uva-ursi*, *Spiraea betulifolia*, *Symphoricarpos albus*,

*Carex foenea*, *Danthonia spicata*, *Oryzopsis asperifolia*, *Schizachne purpurescens*

*Mount Rushmore National Memorial*

##### Stratum

Tree canopy

Subcanopy

Herbaceous

##### Species

*Pinus ponderosa*

*Pinus ponderosa*

*Oryzopsis asperifolia*

#### DIAGNOSTIC SPECIES

*Globally*

*Pinus ponderosa*, *Symphoricarpos albus*, *Oryzopsis asperifolia*

*Mount Rushmore National Memorial*

*Pinus ponderosa*, *Oryzopsis asperifolia*

#### VEGETATION DESCRIPTION

*Globally*

This community is dominated by *Pinus ponderosa* in the overstory and *Oryzopsis asperifolia* in the herbaceous layer. Shrubs are scattered but readily apparent, particularly *Spiraea betulifolia*, *Arctostaphylos uva-ursi*, and *Symphoricarpos albus*. *Carex foenea*, *Danthonia spicata*, *Galium boreale*, and *Schizachne purpurescens* are present in the herb layer. In the stands in the Black Hills on which this description is based, shrubs had 10% cover and herbaceous species 20-25% cover (Hoffman and Alexander 1987).

*Mount Rushmore National Memorial*

This community is dominated by *Pinus ponderosa* in both the canopy and subcanopy. Coverage for each stratum typically ranges from 10 to 60%. A short shrub stratum usually is present, but species composition is variable. *Juniperus communis* and *Symphoricarpos albus* occur most consistently. Herbaceous cover typically is 10 to 25% but can be greater locally. A wide variety of species may be present. *Oryzopsis asperifolia* occurs consistently but is not abundant.

OTHER NOTEWORTHY SPECIES Information not available.

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CONSERVATION RANK G?

RANK JUSTIFICATION

DATABASE CODE CEGL002123

#### COMMENTS

##### *Globally*

Fire likely played an important role in the dynamics of this woodland type. Fire scars are apparent on many of the older trees.

The stands used to document the *Pinus ponderosa* / *Oryzopsis asperifolia* Habitat Type described by Hoffman and Alexander (1987) had very high basal area and densities for a woodland, possibly due to their sampling procedure. The dense structure may have affected the floristic makeup of the stands and made the list of dominant species a poor reflection of the community as a whole. This community is described on the basis of 4 stands in the Black Hills National Forest. This type was originally described as a phase of *Pinus ponderosa* / *Symphoricarpos albus* Habitat Type. More information needs to be collected on it to verify its diagnostic features and relationship to other communities.

##### *Mount Rushmore National Memorial*

This community often occurs in mosaics with the *Pinus ponderosa* / *Juniperus communis* Woodland.

#### REFERENCES

Hoffman, G. R. and R. R. Alexander. 1987. Forest vegetation of the Black Hills National Forest of South Dakota and Wyoming: A habitat type classification. Research Paper RM-276. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 48 p.

McAdams, A. G., D. A. Stutzman, and D. Faber-Langendoen. 1998. Black Hills Community Inventory, unpublished data. The Nature Conservancy, Midwest Regional Office, Minneapolis, MN.

## Pinus ponderosa / Quercus macrocarpa Woodland

COMMON NAME	Ponderosa Pine / Bur Oak Woodland
SYNONYM	Ponderosa Pine / Bur Oak Woodland
PHYSIOGNOMIC CLASS	Woodland (II)
PHYSIOGNOMIC SUBCLASS	Evergreen woodland (II.A)
PHYSIOGNOMIC GROUP	Temperate or subpolar needle-leaved evergreen woodland (II.A.4)
PHYSIOGNOMIC SUBGROUP	Natural/semi-natural (II.A.4.N)
FORMATION	Rounded-crowned temperate or subpolar needle-leaved evergreen woodland (II.A.4.N.a.)
ALLIANCE	<i>Pinus ponderosa</i> Woodland Alliance
CLASSIFICATION CONFIDENCE LEVEL	1

## USGS-NPS Vegetation Mapping Program

### Mount Rushmore National Memorial

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USFWS WETLAND SYSTEM Upland

#### RANGE

##### *Globally*

This community is found in northeastern Wyoming and in parts of southeastern Montana and western South Dakota.

##### *Mount Rushmore National Memorial*

This community occurs most commonly in drainages in the eastern half of the study area (east of Mt. Rushmore).

#### ENVIRONMENTAL DESCRIPTION

##### *Globally*

This community is found on rolling hills and ridgetops on calcareous substrates (Hoffman and Alexander 1987, Johnston 1987). Hoffman and Alexander report that it may also occur on soils derived from igneous substrates. The soils are sandy loams to clayey loams with a pH of 5.3-6.0.

##### *Mount Rushmore National Memorial*

Stands of this community were found typically in drainage bottoms. Stands of pine with significant amounts of oak occasionally are found on slopes.

#### MOST ABUNDANT SPECIES

##### *Globally*

<u>Stratum</u>	<u>Species</u>
Tree canopy	<i>Pinus ponderosa</i>
Subcanopy	<i>Quercus macrocarpa</i>
Short shrub	<i>Amelanchier alnifolia</i> , <i>Mahonia repens</i> , <i>Prunus virginiana</i>
Herbaceous	<i>Carex foenea</i> , <i>Galium boreale</i> , <i>Maianthemum stellatum</i> , <i>Oryzopsis asperifolia</i> , <i>Vicia americana</i>

##### *Mount Rushmore National Memorial*

<u>Stratum</u>	<u>Species</u>
Tree canopy	<i>Pinus ponderosa</i> , <i>Quercus macrocarpa</i>
Subcanopy	<i>Pinus ponderosa</i> , <i>Quercus macrocarpa</i>
Short shrub	<i>Symphoricarpos</i> spp.

#### DIAGNOSTIC SPECIES

##### *Globally*

*Pinus ponderosa*, *Quercus macrocarpa*

##### *Mount Rushmore National Memorial*

*Pinus ponderosa*, *Quercus macrocarpa*

#### VEGETATION DESCRIPTION

##### *Globally*

*Pinus ponderosa* is the only species found in the canopy in most stands of this community. Hoffman and Alexander (1987) sampled 4 stands of this type and found an average basal area of 36.2 m<sup>2</sup>/ha and an average density of 587 trees/ha. *Quercus macrocarpa* forms a discontinuous subcanopy with an average cover of 18%. Common shrubs are *Amelanchier alnifolia*, *Mahonia repens*, *Prunus virginiana*, and *Spiraea betulifolia*. Typical herbaceous species are *Carex foenea*, *Apocynum androsaemifolium*, *Galium boreale*, *Maianthemum stellatum*, *Oryzopsis asperifolia*, *Lupinus argenteus*, and *Vicia americana*. Hoffman and Alexander (1987) found the cover by strata was shrubs - 60%, and herbaceous - 18%.

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Stands of this vegetation type are dominated by both *Pinus ponderosa* and *Quercus macrocarpa*. *Q. macrocarpa* may occur as occasional individuals in other pine types also. *Populus tremuloides* occasionally is present and may contribute significantly to the canopy. Canopy or subcanopy coverage often is greater than 60%. Stand structure varies. In some stands, *Q. macrocarpa* forms the canopy with an occasional emergent *P. ponderosa*. In other situations, *P. ponderosa* forms a sparse canopy with *Q. macrocarpa* and *P. ponderosa* in the understory. *Prunus*

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*virginiana* and *Symphoricarpos* spp. are the most common shrub species. Herbaceous cover usually is greater than 60% with a variety of species present.

#### OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G3

RANK JUSTIFICATION

DATABASE CODE CEGL000873

#### COMMENTS

*Globally*

Periodic fires are probably important in promoting oak regeneration.

The stands used to document the *Pinus ponderosa* / *Quercus macrocarpa* Habitat Type described by Hoffman and Alexander (1987) had very high basal area and densities for a woodland, possibly due to their sampling procedure. The dense structure may have affected the floristic makeup of the stands.

#### REFERENCES

Hoffman, G. R. and R. R. Alexander. 1987. Forest vegetation of the Black Hills National Forest of South Dakota and Wyoming: a habitat type classification. Research Paper RM-276. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 48 p.

Johnston, B. 1987. Plant associations of region two. R2-ECOL-87-2. USDA Forest Service, Rocky Mountain Region, Lakewood, CO. 429 p.

McAdams, A. G., D. A. Stutzman, and D. Faber-Langendoen. 1998. Black Hills Community Inventory, unpublished data. The Nature Conservancy, Midwest Regional Office, Minneapolis, MN.

Thilenius, J. F. 1972. Classification of deer habitat in the ponderosa pine forest of the Black Hills, South Dakota. USDA Forest Service Research Paper RM-1, Fort Collins, CO. 28 p.

## Carex lanuginosa - Calamagrostis stricta Herbaceous Vegetation

COMMON NAME	Woolly Sedge - Bluejoint Sp. Herbaceous Vegetation
SYNONYM	Bluejoint - Woolly Sedge Wet Meadow
PHYSIOGNOMIC CLASS	Herbaceous (V)
PHYSIOGNOMIC SUBCLASS	Perennial graminoid vegetation (V.A)
PHYSIOGNOMIC GROUP	Temperate or subpolar grassland (V.A.5)
PHYSIOGNOMIC SUBGROUP	Natural/semi-natural (V.A.5.N)
FORMATION	Temporarily flooded temperate or subpolar grassland (V.A.5.N.j)
ALLIANCE	<i>Carex lanuginosa</i> Temporarily Flooded Herbaceous Alliance
CLASSIFICATION CONFIDENCE LEVEL	2

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USFWS WETLAND SYSTEM Palustrine

#### RANGE

##### *Globally*

This community is found in Saskatchewan, Manitoba, western Minnesota, North Dakota, South Dakota, and Iowa.

##### *Mount Rushmore National Memorial*

Wetlands were found at widely-scattered locations in the west half of the study area (west of Mt. Rushmore). This community was found in Starling Basin in the Memorial west of Mount Rushmore.

#### ENVIRONMENTAL DESCRIPTION

##### *Globally*

This community occurs on level ground in shallow depressions and other lowlands on poorly drained sandy, loamy, or silty clay soils. Standing water can be present for a few to several weeks a year (Dix and Smeins 1967, Smeins and Olsen 1970). Soil pH is circumneutral to somewhat alkaline and organic content can be moderately high.

##### *Mount Rushmore National Memorial*

This community was found in a drainage bottoms.

#### MOST ABUNDANT SPECIES

##### *Globally*

###### Stratum

Herbaceous

###### Species

*Calamagrostis stricta*, *Carex lanuginosa*, *Carex sartwellii*, *Juncus balticus*

##### *Mount Rushmore National Memorial*

###### Stratum

Herbaceous

###### Species

*Calamagrostis stricta*, *Poa palustris*, *Scirpus microcarpus*

#### DIAGNOSTIC SPECIES

##### *Globally*

*Carex lanuginosa*, *Calamagrostis stricta*

##### *Mount Rushmore National Memorial*

*Calamagrostis stricta*

#### VEGETATION DESCRIPTION

##### *Globally*

The vegetation of this community provides approximately 100% cover and the dominant vegetation is graminoids, typically 0.3-1.0 m tall. Forbs can be common; they had 25% relative cover in the stands studied by Nelson et al. (1981), but shrubs are very rare. The most abundant species are *Calamagrostis stricta*, *Carex lanuginosa*, *C. sartwellii*, *Anemone canadensis*, *Apocynum cannabinum*, *Aster lanceolatus*, *Eleocharis compressa*, *Juncus balticus*, *Phalaris arundinacea*, *Polygonum amphibium*, and *Scirpus americanus*. *Carex buxbaumii* can be common, except in North Dakota.

##### *Mount Rushmore National Memorial*

A single stand of this vegetation type was sampled, in the drainage west of Mt. Rushmore (Starling Basin). This is an area of old beaver ponds undergoing succession, and the vegetation is a complex of types arranged on an environmental gradient from wet to dry. Included are open water, stands of *Typha latifolia* and graminoid-dominated meadow. Common meadow species include *Scirpus microcarpus*, *Calamagrostis stricta*, and *Poa palustris*. In drier areas, understory species from adjacent *Betula papyrifera* / *Corylus cornuta* Forest become common, including *Heracleum sphondylium*, *Lysimachia ciliata*, *Osmorhiza* sp., and *Galium triflorum*.

OTHER NOTEWORTHY SPECIES Information not available.

CONSERVATION RANK G?

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RANK JUSTIFICATION

DATABASE CODE CEGL002254

COMMENTS

*Mount Rushmore National Memorial*

The small size and steep environmental gradient make linking the single stand of this type to the national classification somewhat difficult. Further comparison with wetlands found in the Black Hills may result in a re-assignment of the global name.

REFERENCES

Dix, R. L. and F. E. Smeins. 1967. The prairie, meadow, and marsh vegetation of Nelson County, North Dakota. Canadian Journal of Botany 45:21-58.

Nelson, W. T., W. T. Barker, and Harold Goetz. 1981. Habitat type classification of grasslands of Sheyenne National Grassland of southeastern North Dakota. Cooperative agreement No RM-80-139-CA.

Smeins, F. E. and D. E. Olsen. 1979. Species composition and production of a native northwestern Minnesota tall grass prairie. American Midland Naturalist 84(2):398-410.

## **Pinus ponderosa / Schizachyrium scoparium Wooded Herbaceous Vegetation**

COMMON NAME	Ponderosa Pine / Little Bluestem Wooded Herbaceous Vegetation
SYNONYM	Ponderosa Pine / Little Bluestem Savanna
PHYSIOGNOMIC CLASS	Herbaceous vegetation (V)
PHYSIOGNOMIC SUBCLASS	Perennial graminoid vegetation (V.A)
PHYSIOGNOMIC GROUP	Temperate or subpolar grassland with a sparse tree layer (V.A.6)
PHYSIOGNOMIC SUBGROUP	Natural/semi-natural (V.A.6.N)
FORMATION	Medium-tall temperate or subpolar grassland with a sparse needle-leaved evergreen or mixed tree layer (V.A.6.N.f.)
ALLIANCE	<i>Pinus ponderosa</i> Wooded Medium-tall Herbaceous Alliance

CLASSIFICATION CONFIDENCE LEVEL 1

USFWS WETLAND SYSTEM Upland

RANGE

*Globally*

Currently reported from western Nebraska, South Dakota, and Wyoming; it is unknown if it also occurs in Montana and Colorado.

*Mount Rushmore National Memorial*

This community occurs at widely-scattered sites, generally outside the Memorial boundaries. It is not common.

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#### ENVIRONMENTAL DESCRIPTION

##### *Globally*

This community is found on loamy, sandy, or rocky soil. It is usually found on gentle to moderate slopes. Parent material is usually either sandstone or limestone (McAdams et. al 1998).

##### *Mount Rushmore National Memorial*

Stands of this community were observed on slopes ranging from 13 to 24 degrees with southerly and westerly aspects, in areas underlain by schist.

#### MOST ABUNDANT SPECIES

##### *Globally*

<u>Stratum</u>	<u>Species</u>
Tree canopy	<i>Pinus ponderosa</i> , <i>Juniperus scopulorum</i>
Short shrub	<i>Rhus trilobata</i> , <i>Symphoricarpos occidentalis</i>
Herbaceous	<i>Bouteloua gracilis</i> , <i>Carex filifolia</i> , <i>Schizachyrium scoparium</i>

##### *Mount Rushmore National Memorial*

<u>Stratum</u>	<u>Species</u>
Tree canopy	<i>Pinus ponderosa</i>
Subcanopy	<i>Pinus ponderosa</i>
Short shrub	<i>Juniperus communis</i>
Herbaceous	<i>Schizachyrium scoparium</i>

#### DIAGNOSTIC SPECIES

##### *Globally*

*Pinus ponderosa*, *Schizachyrium scoparium*, *Yucca glauca*, *Opuntia* spp.

##### *Mount Rushmore National Memorial*

*Pinus ponderosa*, *Schizachyrium scoparium*

#### VEGETATION DESCRIPTION

##### *Globally*

This community has scattered mature trees with a fairly continuous graminoid understory. *Pinus ponderosa* is the most abundant tree species, sometimes with *Juniperus scopulorum* present as small trees or tall shrubs. The most abundant graminoids in the understory are *Schizachyrium scoparium*, *Stipa comata*, *Carex filifolia*, *Bouteloua gracilis*, and *B. curtipendula*. *Calamovilfa longifolia* and *Koeleria macrantha* may be found on sandy soils in the eastern part of this community's range. Forbs that may be present include *Gaura coccinea*, *Psoraleidium lanceolatum*, and *Asclepias pumila*. In addition to the herbaceous species, shrubs such as *Symphoricarpos occidentalis*, *Rhus trilobata*, and *Cercocarpus montanus* are sometimes found in this community.

##### *Mount Rushmore National Memorial*

This community is dominated by *Pinus ponderosa* in the canopy and subcanopy, and by *Schizachyrium scoparium* in the understory. *Juniperus communis* (short shrub) was observed consistently but was never abundant. Canopy and subcanopy coverages are moderate to high (50 to 100%) while herbaceous cover generally is greater than 50%.

OTHER NOTEWORTHY SPECIES Information not available.

CONSERVATION RANK G2G3

#### RANK JUSTIFICATION

There are probably fewer than 100 occurrences in a restricted range in the northwestern Great Plains. Three occurrences are currently documented, one from South Dakota, and two from Nebraska. Over 8000 acres are currently documented, and at least that much is expected in other occurrences. Two of the currently documented occurrences are in fair condition; it seems likely that occurrences have been degraded by cattle grazing.

DATABASE CODE CEGL002019

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#### COMMENTS

##### *Globally*

Periodic fires are probably important in maintaining the open grassland understory of this type.

##### *Mount Rushmore National Memorial*

This community often occurs in mosaics with other pine types, especially the *Pinus ponderosa* / *Oryzopsis asperifolia* Woodland and *Pinus ponderosa* / *Juniperus communis* Woodland.

This community differs significantly from stands at lower elevations in the Black Hills, where this vegetation type is common. In those lower areas, canopy coverage typically is less than 25%, subcanopy is sparse to absent, and herbaceous cover is higher and more diverse, consisting predominantly of prairie species.

#### REFERENCES

Hayward, H. H. 1928. Studies of plants in the Black Hills of South Dakota. Botanical Gazette 85(4):353-412.

McAdams, A. G., D. A. Stutzman, and D. Faber-Langendoen. 1998. Black Hills Community Inventory, unpublished data. The Nature Conservancy, Midwest Regional Office, Minneapolis, MN.

Steinauer, G. 1989. Characterization of the natural communities of Nebraska. Pp. 103-141, in, M. Clausen, M. Fritz, and G. Steinauer. The Nebraska Natural Heritage Program, Two Year Progress Report, Appendix D. Lincoln, NE.

## Black Hills Rock Outcrop Sparse Vegetation

COMMON NAME	Black Hills Rock Outcrop Sparse Vegetation
SYNONYM	Black Hills Rock Outcrop
PHYSIOGNOMIC CLASS	Sparse vegetation (VII)
PHYSIOGNOMIC SUBCLASS	Consolidated rock sparse vegetation (VII.A)
PHYSIOGNOMIC GROUP	Sparsely vegetated cliffs (VII.A.1)
PHYSIOGNOMIC SUBGROUP	Natural/semi-natural (VII.A.1.N)
FORMATION	Cliffs with sparse vascular vegetation (VII.A.1.N.a.)
ALLIANCE	Rock Outcrop / Butte Sparse Vegetation

CLASSIFICATION CONFIDENCE LEVEL 3

USFWS WETLAND SYSTEM Upland

#### RANGE

##### *Globally*

This community has only been identified in western South Dakota.

##### *Mount Rushmore National Memorial*

This vegetation type occurs throughout the study area. Granite outcrops are best developed in the central and western parts of the study area. Schists are more abundant to the east.

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#### ENVIRONMENTAL DESCRIPTION

##### *Globally*

This community is found where granite or schist bedrock is exposed in the higher areas of the Black Hills. Slopes range from none (flat) to steep. There is little soil development; what soil there is can be found in cracks and depressions in the rock surface.

##### *Mount Rushmore National Memorial*

This community occurs in areas with large exposures of granite and schist. Plants occur on soil pockets and in cracks on the outcrops.

#### MOST ABUNDANT SPECIES

##### *Globally*

Stratum                      Species

Information not available.

##### *Mount Rushmore National Memorial*

Stratum                      Species

Tree canopy                  *Pinus ponderosa*

Short shrub                    *Arctostaphylos uva-ursi, Juniperus communis*

#### DIAGNOSTIC SPECIES

##### *Globally*

Information not available.

##### *Mount Rushmore National Memorial*

large, sparsely vegetated rock outcrops

#### VEGETATION DESCRIPTION

##### *Globally*

Few vascular plants grow in this community, although lichens are common. Widely scattered *Pinus ponderosa* grow where there is enough soil to support their roots. Dwarf-shrubs and herbaceous species such as *Arctostaphylos uva-ursi, Juniperus communis*, and *Carex inops* ssp. *heliophila* can be found in soil pockets as well.

##### *Mount Rushmore National Memorial*

This vegetation type consists of sparse vascular plant cover, typically with a few scattered *Pinus ponderosa* trees growing in cracks. Lichens are common. On granite outcrops, mats of *Arctostaphylos uva-ursi* on pockets of soil.

OTHER NOTEWORTHY SPECIES Information not available.

CONSERVATION RANK G4G5

RANK JUSTIFICATION

DATABASE CODE C EGL002295

#### COMMENTS

*Mount Rushmore National Memorial*                  This type is often found in mosaics with *Pinus ponderosa* / *Arctostaphylos uva-ursi* Woodland and *Pinus ponderosa* / *Juniperus communis* Woodland.

REFERENCES