APPENDIX G.

Field Key to the NVCS Vegetation Associations at THRO

(Created by Jack Butler, slides by USBR)

(referenced on pp. 3-9 and 4-1)

PLANT ASSOCIATION/ALLIANCE KEY - THEODORE ROOSEVELT NATIONAL PARK

How to Use the Key--- On the following pages, associations/alliances are arranged in 24 dichotomous couplets with corresponding field descriptions. Starting with the number "1", read through the statements and choose the one that is most appropriate. If necessary, follow the numbers within the parentheses until a "best match" is found. Read the description to verify the match. It may be necessary to compare descriptions for similar associations by backtracking. The map code for each association is given in parenthesis after each association name. Note that not all associations were mapped directly (1:1) on the THRO map, so some may appear within alliances or complexes on the map.

There will be some stands that do not match any of the descriptions exactly. Many plant associations are variable in composition, and, while the descriptions attempt to address variability, there will be exceptions. Stands can represent transition zones between two types. There can be small inclusions of one type in larger stands of another. It is important to survey sufficiently large stands (~0.5 ha or at least 50 m diameter area around a point, or at least 100 m length in riparian areas) when classifying, and to base decisions on representative areas within stands.

1. Site unvegetated to < 25% vegetated; comprised of eroding cliffs, mounds, haystacks, fans, drainages, and flats formed from mudstone, claystone, siltstone, scoria, and some sandstone.
Badlands Sparse Vegetation Complex. (Map Unit 2)

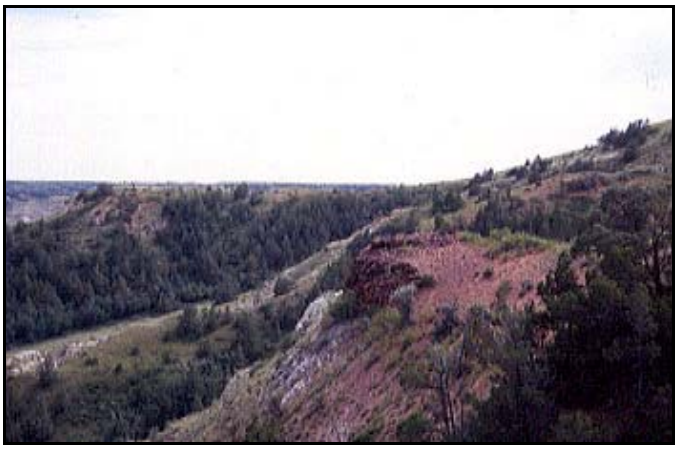


Five associations occur within this complex, and each is supported by a description:
Artemisia longifolia **Badlands Sparse Vegetation** (Map Unit 4);


Artemisia tridentata **ssp.** ***wyomingensis / Pascopyrum smithii*** **Shrubland;**
Artemisia tridentata - Atriplex confertifolia **Shrubland;**
Eroding Great Plains Badlands Sparse Vegetation; and
Scoria Sparse Vegetation Complex (Map Unit 3) (Photo on next page).

1. Site vegetated > 25% cover **(2)**.

2. Site supports > 10% tree and/or shrub aerial cover **(3)**.
2. Site mostly herbaceous; grasses and forbs, shrubs and/or trees, if present, providing < 10% aerial cover **(16)**.



(Map Unit 3 Photo)

3. Site mostly vegetated by trees > 4 m tall (tree cover > 10%, and typically > 25%) **(4)**.
3. Site mostly vegetated by shrubs < 4 m tall (shrub cover > 10%, and typically > 25%) **(9)**.

4. Trees mostly evergreen, *i.e.* Rocky Mountain juniper and ponderosa pine **(5)**.
4. Trees mostly deciduous, *i.e.* cottonwood, peachleaf willow, green ash, American elm, quaking aspen **(6)**.

5. Ponderosa pine present, > 25% aerial cover, associated with Rocky Mountain juniper.
***Pinus ponderosa / Juniperus scopulorum* Woodland.** (Map Unit 48)

(no photo available)

5. Rocky Mountain juniper present, >25% aerial cover, associated with littleseed ricegrass, and green ash and ponderosa pine <25% cover; occupies steep north-facing slopes and drier (usually upper) reaches of upland draws and drainages.
***Juniperus scopulorum / Oryzopsis micrantha* Woodland.** (Map Unit 47)



6. Site within floodplain, or immediately above first terrace, of the Little Missouri River **(7)**.

6. Moderate to steep slopes, upland draws, and depressions; trees mostly green ash or quaking aspen.

***Fraxinus pennsylvanica - Ulmus americana / Prunus virginiana* Woodland.** (Map Unit 44)



***Populus tremuloides / Prunus virginiana* Woodland.** (Map Unit 46)



7. Cottonwood trees dominate and clearly form an emergent layer **(8)**.
7. Green ash dominant with Siberian elm as a secondary species.

***Fraxinus pennsylvanica (Ulmus americana)* Temporarily Flooded Woodland.** (Map Unit 45).

***Fraxinus pennsylvanica - (Ulmus americana) / Symphoricarpos occidentalis* Forest.** (Map Unit 45)

8. Cottonwood trees generally large and mature, lacking secondary tree species, understory primarily herbaceous; buckbrush common to infrequent.

***Populus deltoides* Temporarily Flooded Woodland.** (Map Unit 43)



8. Cottonwood dominant with Rocky Mountain juniper or peachleaf willow subdominant.

***Populus deltoides / Juniperus scopulorum* Woodland.** (Map Unit 42)

***Populus deltoides - (Salix amygdaloides) / Salix exigua* Woodland.** (Map Unit 41)

9. Dwarf shrublands (<30 cm tall) dominated by horizontal juniper.
***Juniperus horizontalis / Schizachyrium scoparium* Dwarf Shrubland.** (Map Unit 30).

9. Shrubs of various heights to 3 m tall, predominantly silver sagebrush, big sagebrush, three- leaved sumac, buckbrush (wolfberry), sandbar willow, greasewood, and/or rabbitbrush **(10)**.

10. Shrubs tall, > 2 m, predominantly silver buffaloberry and sandbar willow **(11).**
10. Short shrubs, < 1.5 m, predominantly silver sagebrush, three-leaved sumac, buckbrush (wolfberry), greasewood, and/or rabbitbrush **(12)**

11. Shrub thickets, predominantly silver buffaloberry, silvery green color, dense, spiny, impenetrable.
***Shepherdia argentea* Shrubland.** (Map Unit 36)

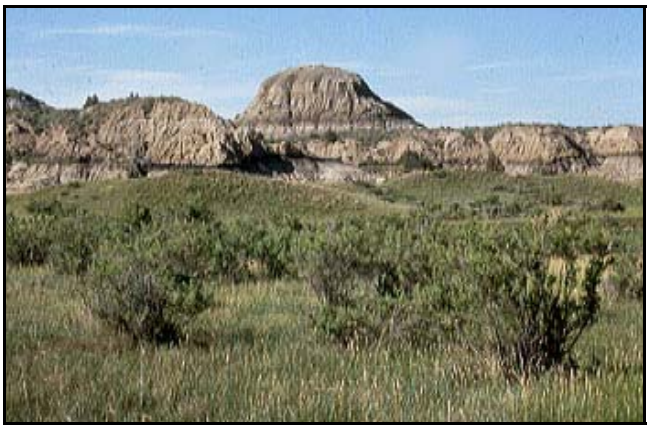

11. Shrub thickets along river and creek banks, wet and moist drainages, predominantly sandbar willow, gray-green color, dense, penetrable.

***Salix exigua* Temporarily Flooded Shrubland.** (Map Unit 38)



12. Shrubs 1-1.5 m tall, occupying saline clay hardpans, predominantly greasewood, yellow green with white stems, brittle, spiny, cover often between 10 and 25%.

***Sarcobatus vermiculatus / Pascopyrum smithii - (Elymus lanceolatus)* Shrub H.V.** (Map Unit 39)



12. Shrubs not spiny, typically shorter than 1 m tall, occupying a variety of habitats. **(13)**

13. Shrubs of draws, drainages, within river and creek floodplains, gentle slopes, and depressions **(14).**

13. Shrubs of steep scoria slopes, slumps, and fill slopes adjacent to roadways **(15).**

14. Short-statured silver sagebrush shrubs, < 1.5 m tall, occupying shrub savannas (10-25%) within river and creek floodplains, draws, gentle slopes, sagebrush flats, and depressions in relatively open stands. Shrub cover variable.

***Artemisia cana / Pascopyrum smithii* Shrubland.** (Map Unit 31)


14. Short-statured buckbrush shrubs < 0.5 m tall, forming rounded colonies in oxbows, moist drainages, swales, and depressions, and long narrow colonies in upland draws.
***Symphoricarpos occidentlis* Shrubland.** (Map Unit 37)


15. Site supporting predominantly three-leaved sumac shrubs, on steep scoria slopes or scoria ridgelines. Shrub cover is often between 10 and 25%.
Rhus trilobata / Carex filifolia
Shrub Herbaceous Vegetation. (Map Unit 35)



15. Site supporting predominantly rabbitbrush, on disturbed substrate, usually cut and fill slopes adjacent to roadways and slumps (rabbitbrush is also a minor component of the Badlands Sparse Vegetation Complex).
***Chrysothamnus nauseousus / Pseudoroegneria spicata* Shrubland**. (Map Unit 33)

16. Site a prairie dog town, replete with burrow mounds and barking critters (except in recently abandoned sites); predominantly weedy native forbs and introduced grasses or western wheatgrass or blue grama.
Blacktailed Prairie Dog Town Grassland Complex. (Map Unit 1)

16. Site not a prairie dog town (no burrow mounds and/or no barking critters), although burrowing activity by other fossorial mammals (pocket gophers, and ground squirrels) and bison wallows may be evident, predominantly upland grasses or grass-like wetland species **(17).**

17. Site predominantly (>70%) introduced/exotic species, especially *Bromus inermis, Poa pratensis, Agropyron cristatum, Cirsium arvense, and Euphorbia esula* **(18)**.
17. Site predominantly native, perennial grass or grass-like species **(19).**

18. Site predominantly (>70%) exotic forbs, especially *Euphorbia esula* and *Cirsium arvense*. Can occupy a wide variety of habitats but more common along the floodplain of the Little Missouri River (especially *Euphorbia esula*) and upland draws and drainages.

***Euphorbia esula* Herbaceous Vegetation.** (Map Unit 10) (Photos on next page)
***Cirsium arvense* - Weedy Forb Great Plains Herbaceous Vegetation.** (Map Unit 11) (Photos on next page)


(Map Unit 10 Photos)


(Map Unit 11 Photos)

18. Site predominantly (>70%) exotic/introduced perennial grasses, along roadways and in abandoned fields, especially *Bromus inermis*, *Poa pratensis*, and *Agropyron cristatum.*

Introduced Grassland. (Map Unit 17)


Three semi-natural or introduced grassland associations may occur (all in Map Unit 17):
***Bromus inermis* - *(Pascopyrum smithii)* Semi-natural Herbaceous Vegetation;**
***Poa pratensis* - *(Pascopyrum smithii)* Semi-natural Herbaceous Vegetation;**
***Agropyron cristatum* - *(Pascopyrum smithii, Stipa comata)* Semi-natural Herbaceous Vegetation.**

19. Sites with saturated to moist soils dominated by cattails, bulrushes or prairie cordgrass and sedges **(20).**

20. Grassland species of upland soils ranging from clayey to sandy range sites and occupying various topol positions **(21).**

20. Sites with saturated to moist soils dominated by cattails and bulrushes.

***Typha* spp. *Great Plains* Herbaceous Vegetation.** (Map Unit 14) (Photo on next page)

(Map Unit 14 photo)

21. Sites with saturated to moist soils dominated by prairie cordgrass and sedges.
***Spartina pectinata* - *Carex* spp Herbaceous Vegetation.** (Map Unit 13).

22. Site on clayey and silty range sites, occupying drainages, valleys, and hillsides; supporting predominantly rhizomatous grasses and some bunchgrasses. **(22).**

21. Site on sandy or very shallow range sites, occupying tables, plains, hilltops, hillsides, depressions, breaks, and slope shoulders; supporting stoloniferous grasses and bunchgrasses, short to tall in height **(23).**

23. Site dominated by western wheatgrass, usually in association with needle-and-thread grass, threadleaf sedge, blue grama, and/or little bluestem.
***Pascopyrum smithii* - *Bouteloua gracilis* - *Carex filifolia* Herbaceous Vegetation.** (Map Unit16)

22. Site dominated by western wheatgrass in association with green needlegrass.
***Pascopyrum smithii* - *Nassela viridula* Herbaceous Vegetation.** (Map Unit16)

23. Site on coarse textured level to nearly level range sites, typically dominated by short to medium tall grasses, such as needle-and-thread, blue grama, threadleaf sedge, and prairie Junegrass.
***Stipa comata - Bouteloua gracilis - Carex filifolia* Herbaceous Vegetation.** (Map Unit 18)

24. Site on sandy range sites along ridge lines associated with upland draws and drainages, hillslopes and broad drainages, dominated by the medium tall grasses prairie sandreed, little bluestem, and sideoats grama. **(24).**

24. Site dominated by prairie sandreed.
***Calamovilfa longifolia / Carex inops ssp. heliophila* Herbaceous Vegetation.** (Map Unit 12)

25. Site dominated by little bluestem.
***Schizachyrium scoparium - Bouteloua (curtipendula, gracilis) - Carex filifolia* Herbaceous Vegetation**. (Map Unit 15)