

APPENDIX D: DICHOTOMOUS FIELD KEY TO MAPPING UNITS AT OURAY NWR

How to use the Key – On the following pages, associations/alliances are arranged in dichotomous couplets with corresponding field descriptions. Starting with the number “1”, read through the statements and select the one that is most appropriate. If necessary, follow the numbers in 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 parentheses after each association name. Note - not all associations were mapped directly (1:1) on the map; consequently, some map units may appear within alliances.

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 that variability, there will always be exceptions. Stands can represent transition zones between two vegetation types. Furthermore, 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 least 50 m diameter area around a point, or at least 100 m length in riparian areas) when classifying or determining representative areas within stands.

1. Site located immediately adjacent to the Green River and terraces created by the River.
Floodplain Associates (2)
1. Site located on badland bluffs, ridges, and associated erosion fans, and sandy to silty-clay areas along the upper boundary of the river floodplain. **Upland Associations (24)**
1. Upland or floodplain sites with obvious signs of human or animal disturbance.
Modified Vegetation (33)
 2. Floodplain sites dominated by herbaceous early successional native or exotic species.
Floodplain Units – Herbaceous Non-wetland (3)
 3. Sites found in drying mud basins of Leota Bottom, Sheppard Bottom, or Johnson Bottom. **(4)**
 4. Site dominated by *Atriplex rosea*. **(4a)**
 - 4a. *Atriplex rosea* Semi-natural Herbaceous Vegetation
Red Orache Semi-natural Herbaceous Vegetation (Map Unit 61)
 4. Site dominated by clumps of *Medicago sativa* and seedling *Populus fremontii* in Leota Bottom. **(4b)**
 - 4b. *Medicago sativa* / *Populus fremontii* Herbaceous Vegetation
Alfalfa / Fremont Cottonwood Herbaceous Vegetation (Map Unit 65)
 4. Site dominated by *Kochia scoparia* with very few associated species. **(4c)**
 - 4c. *Kochia scoparia* Semi-natural Herbaceous Vegetation
Kochia Semi-natural Herbaceous Vegetation
 4. Site dominated by *Iva axillaris* and little else. This type appears to occur only in limited situations in the northwest corner of Sheppard Bottom close to SH88. **(4d)**
 - 4d. *Iva axillaris* Herbaceous Vegetation
Poverty Sumpweed Herbaceous Vegetation (Map Code 63)

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4. Site dominated by *Xanthium strumarium* and little else; cover is usually less than 50%. **(4e)**
 - 4e. *Xanthium strumarium* Herbaceous Vegetation
Cocklebur Herbaceous Vegetation (Map Unit 62)
3. Sites found mainly in drying mud basins of Wyasket Bottom and drained basins in Sheppard Bottom. **(5)**
 5. Site dominated by *Ambrosia tomentosa* and *Helianthus annuus* with few associated species and total cover of less than 50%. **(5a)**
 - 5a. *Ambrosia tomentosa* - *Helianthus annuus* Herbaceous Vegetation
Bur Ragweed - Wild Sunflower Herbaceous Vegetation (Map Unit 60)
 5. Site dominated by almost monotypic stands of *Hordeum jubatum*. **(5b)**
 - 5b. *Hordeum jubatum* Herbaceous Vegetation
Foxtail Barley Herbaceous Vegetation (Map Unit 37)
3. Sites found throughout most of the Refuge's floodplains, in all bottoms and on various substrates. **(6)**
 6. Site not dominated by grasses, if present grass is not the major species. **(7)**
 7. Site dominated by an exotic forb, *Lepidium latifolium* forming thick stands characterized by fluffy white seed heads in summer through fall. Stands may show effects of herbicide or manual control efforts. **(7a)**
 - 7a. *Lepidium latifolium* Semi-natural Herbaceous Vegetation [Provisional]
Pepperweed Semi-natural Herbaceous Vegetation [Provisional] (Map Unit 66)
 7. Site dominated by a native species, *Apocynum cannabinum* forming thick stands (75-100% cover) and small patches. Forb is up to 1 meter tall and has similar appearance to a shrub. **(7b)**
 - 7b. *Apocynum cannabinum* Herbaceous Vegetation
Hemp Dogbane Herbaceous Vegetation (Map Unit 50).
 7. Small site or patch dominated by a native species, *Glycyrrhiza lepidota* forming stands with 25-50% cover. **(7c)**
 - 7c. *Glycyrrhiza lepidota* Herbaceous Vegetation
Wild Licorice Herbaceous Vegetation (Map Unit 68)
6. Site dominated by grass species. **(8)**
 8. Site occurs on alkaline, silty clay soils of low channels, depressions, and dike and levee embankments dominated by *Distichlis spicata*. **(8a)**
 - 8a. *Distichlis spicata* Herbaceous Vegetation
Saltgrass Herbaceous Vegetation (Map Unit 40)

8. Site occurs on undisturbed floodplain terrace and is dominated by *Sporobolus airoides*. **(8b)**
- 8b.** *Sporobolus airoides* Southern Plains Herbaceous Vegetation
Alkali Sacaton Southern Plains Herbaceous Vegetation (Map Unit 41)
3. Site limited to portions of Leota Bottom and Wyasket Bottom on undisturbed terraces of the floodplain, site is not located on mud flat. **(9)**
9. Site dominated by high cover of *Pascopyrum smithii* and may occur as nearly monotypic patches on slightly raised mounds. **(9a)**
- 9a.** *Pascopyrum smithii* Herbaceous Vegetation
Western Wheatgrass Herbaceous Vegetation (Map Unit 42)
2. Floodplain sites dominated by herbaceous natives species either growing in standing water, saturated soil, or in close proximity to water. **Floodplain Units – Herbaceous Wetland (10)**
10. Site has floating vegetation occurring on a thin layer of standing water. **(11)**
11. Site is dominated by *Potamogeton natans*. **(11a)**
- 11a.** *Potamogeton natans* Herbaceous Vegetation
Floating Pondweed Herbaceous Vegetation (Map Unit 27)
10. Site has emergent vegetation anchored to the substrate, either growing through standing water or in saturated soil. **(12)**
12. Vegetation is less than ½ meter tall growing in standing water. Vegetation has multiple leaves growing from a bent central stem. **(13)**
13. Site is dominated by *Polygonum amphibium*, which has bright pink to red seed head at the terminus of the stem during summer and fall. **(13a)**
- 13a.** *Polygonum amphibium* Permanently Flooded Herbaceous Alliance
Water Smartweed Permanently Flooded Herbaceous Alliance (Map Unit 28)
13. Site is dominated by *Polygonum lapathifolium*, which has pale pink to white seed head at the terminus of the stem during summer and fall. **(13b)**
- 13b.** *Polygonum lapathifolium* Permanently Flooded Herbaceous Vegetation
Pale Smartweed Permanently Flooded Herbaceous Vegetation (Map Unit 29)
12. Vegetation is less than ½ meter tall growing in slightly saturated to dry soil. Vegetation has small single leaves (may appear as stems) that do not branch. Type may occur in association with grass species. **(14)**
14. Site is dominated by *Juncus balticus* with very little else. **(14a)**
- 14a.** *Juncus balticus* Herbaceous Vegetation
Baltic Rush Herbaceous Vegetation (Map Unit 33)

- 14.** Site is dominated by *Eleocharis palustris* and may have a large amount of *Pascopyrum smithii* but little else. (Note: The same species may appear as understory components of other vegetation types) **(14b)**

14b. *Eleocharis palustris* Herbaceous Vegetation
Common Spikerush Herbaceous Vegetation (Map Unit 34)

- 13.** Vegetation is more than ½ meter tall growing in saturated soil. Dominant vegetation has single leaves (may appear as stems) that do not branch. **(15)**

- 15.** Site has tall vegetation growing in saturated soil with thin and tubular leaves, most terminate with a small umbel shaped seed head in the summer and fall. Typically occurs in floodplain bottoms, tributary drainages, and wetland depressions. Site dominated by *Schoenoplectus acutus* and little else. **(15a)** Very small site (<1 acre) dominated by *Schoenoplectus pungens* and little else. **(15b)**

15a. *Schoenoplectus acutus* Herbaceous Vegetation
Hardstem Bulrush Herbaceous Vegetation (Map Unit 30)

15b. *Schoenoplectus pungens* Herbaceous Vegetation
Threesquare Herbaceous Vegetation (Map Unit 32)

- 15.** Site has tall vegetation growing in saturated soil dominated by either *Typha domingensis*, *T. angustifolia*, or *T. latifolia* and little else. Leaves are thick and broad, large tubular-shaped seed heads appear on separate stems in the summer and fall. Typically occurs in flooded basins with standing water. **(15c)**

15c. *Typha domingensis* (*Typha angustifolia*, *latifolia*) Herbaceous Vegetation
Southern (Broad-leaved, Narrow-leaved) Cattail Herbaceous Vegetation (Map Unit 31)

- 12.** Vegetation is more than ½ meter tall growing in saturated or slightly dry soil. Dominant vegetation is a grass with large seed head in the summer and fall. Type may be intermixed with other emergent wetland species. **(16)**

- 16.** Site is dominated by *Phragmites australis*. **(16a)**

16a. *Phragmites australis* Western North America Temperate Semi-natural Herbaceous Vegetation
Common Reed Western North America Temperate Semi-natural Herbaceous Vegetation (Map Unit 35)

- 16.** Site is dominated by *Phalaris arundinacea*. **(16b)**

16b. *Phalaris arundinacea* Western Herbaceous Vegetation
Reed Canary Grass Western Herbaceous Vegetation (Map Unit 36)

2. Floodplain sites dominated by shrubs. **Floodplain Units – Shrublands (17)**

- 17.** Sites dominated by native shrub species over 1 ½ meters tall, close to the Green River. **(18)**

- 18** Site located on sandy soil (usually sandbars, first terraces, and point bars) along the Green River or major tributary dominated by *Salix exigua*. **(18a)**

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- 18a.** Salix exigua / Barren Shrubland
Coyote Willow / Barren Shrubland (Map Unit 5)
- 18** Site located on sandy soil on second terraces along the Green River dominated by large, bushy *Rhus trilobata*. **(18b)**
- 18b.** Rhus trilobata – Salix exigua Temporarily Flooded Shrubland
Ill-scented Sumac – Coyote Willow Shrubland (Map Unit 8)
- 18.** Sites dominated by *Shepherdia argentea* forming small, linear stands along the riverbanks. **(18c)**
- 18c.** Shepherdia argentea Great Basin Shrubland
Silver Buffaloberry Great Basin Shrubland (Map Unit 9)
- 17.** Sites dominated by native shrub species less than 1 ½ meters tall and usually not close to the Green River. **(19)**
- 19.** Site dominated by *Sarcobatus vermiculatus*, *Ericameria nauseosa* may also have high cover values. Type occurs on the floodplain of the Green River and usually only on the second or third terrace. **(19a)**
- 19a.** Sarcobatus vermiculatus / Distichlis spicata Shrubland
Black Greasewood – Saltgrass Shrubland (Map Unit 11)
- 19.** Site dominated by *Sarcobatus vermiculatus*; *Atriplex gardneri* may also have high cover. Sites are located on sediments washed from badland formations and are best developed above Wyasket Bottom and on a large erosion fan west of Leota Bottom sites. **(19b)**
- 19b.** Sarcobatus vermiculatus / Atriplex gardneri Shrubland
Black Greasewood / Gardner’s Saltbush Shrubland (Map Unit 12)
- 19.** Site dominated by *Ericameria parryi* with *Ericameria nauseosa*; geasewood is not abundant. Sites are usually small and on the outer edges of the floodplain. **(19c)**
- 19c.** Ericameria parryi – Sarcobatus vermiculatus Shrubland [Provisional]
Parryi Rabbitbrush – Black Greasewood Shrubland [Provisional] (Map Unit 14)
- 19.** Very small site (<1 acre) dominated by *Symphoricarpos occidentalis*, mixed with various graminoids and forbs. **(19d)**
- 19d.** Symphoricarpos occidentalis Shrubland
Western Snowberry Shrubland (Map Unit 10)
- 17.** Sites dominated by non-native or exotic shrub species with very thin, fine textured leaves. **(20)**
- 20.** Site dominated by *Tamarix* spp. with no understory species. Type is monotypic and occurs on floodplains and basins of the Green River. Other locations include sandbars, islands, side channels, basin edges, dikes, levees roadsides, and riparian habitats. **(20a)**
- 20a.** Tamarix spp. Temporarily Flooded Shrubland
Tamarisk spp. Temporarily Flooded Shrubland (Map Unit 7)

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- 20.** Site dominated by *Tamarix* spp. with *Sporobolus airoides* in the understory. **(20b)**
- 20b.** *Tamarix* spp. / *Sporobolus airoides* Shrubland
Tamarisk spp. / Alkali Sacaton Shrubland (Map Unit 6)
- 2.** Floodplain sites dominated by trees. **Floodplain Units – Forests and Woodlands (21)**
- 21.** Sites dominated by native tree species. **(22)**
- 22.** Site dominated by large *Populus fremontii* trees with sufficient tree density to provide for interlocking canopies among individual trees. **(22a)**
- 22a.** *Populus fremontii* Temporarily Flooded Forest Alliance
Fremont Cottonwood Temporarily Flooded Forest Alliance (Map Unit 1)
- 22.** Site dominated by large *Populus fremontii* trees with not enough tree density to provide for interlocking canopies of individual trees. **(22b)**
- 22b.** *Populus fremontii* Temporarily Flooded Woodland Alliance
Fremont Cottonwood Temporarily Flooded Woodland Alliance (Map Unit 2)
- 22.** Site dominated by tall *Salix amygdaloides* trees and small stands of *Salix exigua* in the understory. **(22c)**
- 22c.** *Salix amygdaloides* / *Salix exigua* Woodland
Peachleaf Willow / Coyote Willow Woodland (Map Unit 3)
- 21.** Sites dominated by non-native or exotic tree species with silver-colored foliage. **(23)**
- 23** *Elaeagnus angustifolia* Semi-Natural Woodland
Russian-olive Semi-natural Woodland
- 24.** Upland site dominated by grass species. **Upland Units - Herbaceous (25)**
- 25.** Site dominated by native grass species. **(26)**
- 26.** Site on sandy soil, dominated by *Achnatherum hymenoides* with few other grass species. **(26a)**
- 26a.** *Achnatherum hymenoides* Herbaceous Alliance
Indian Ricegrass Herbaceous Alliance (Map Unit 43)
- 26.** Site on sandy soil, dominated by *Achnatherum hymenoides* with high cover of *Agropyron cristatum*. **(26b)**
- 26b.** *Achnatherum hymenoides* - *Agropyron cristatum* Herbaceous Vegetation
Indian Ricegrass - Crested Wheatgrass Herbaceous Vegetation (Map Unit 44)
- 26.** Site on sandy soil, dominated by *Sporobolus cryptandrus* with many associated species. **(26c)**
- 26c.** *Sporobolus cryptandrus* Great Basin Herbaceous Vegetation
Sand Dropseed Great Basin Herbaceous Vegetation (Map Unit 45)

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26. Site on silty-clay soil, dominated by *Hesperostipa comata* with many associated species. **(26d)**

26d. *Hesperostipa comata* Great Basin Herbaceous Vegetation
Needle-and-Thread Great Basin Herbaceous Vegetation (Map Unit 46)

26. Site on a variety of soils, dominated by *Pleuraphis jamesii* with many associated species. **(26e)**

26e. *Pleuraphis jamesii* Herbaceous Vegetation
James' Galleta Herbaceous Vegetation (Map Unit 47)

25. Sites dominated by non-native grasses, specifically by the annual *Bromus tectorum* typically in disturbed areas. **(27)**

27. *Bromus tectorum* Semi-natural Herbaceous Alliance
Cheatgrass Semi-natural Herbaceous Alliance (Map Unit 48)

24. Upland site dominated by shrub species. **Upland Units - Shrubland (28)**

28. *Artemisia* spp. (sagebrush) is the dominant species. Other shrubs such as rabbitbrush, greasewood, joint-fir, or snakeweed may be present; however, they should be considered subdominant to sagebrush. **(29)**

29. Site is dominated by *Artemisia tridentata* shrubs, silver-gray in appearance with forked leaves. **(29a)**

29a. *Artemisia tridentata* Shrubland
Big Sagebrush Shrubland (Map Unit 13)

29. Site is dominated by short green *Artemisia dracunculus* shrubs and occurs on sparsely vegetated badland slopes or bluffs. **(29b)**

29b. *Artemisia dracunculus* Dwarf-shrubland
Tarragon Dwarf-shrubland (Map Unit 20)

29. Site is dominated by short, dark gray *Artemisia nova* shrubs occurring on coarse, cobbly soils. **(29c)**

29c. *Artemisia nova* Dwarf-shrubland
Black Sagebrush Dwarf-shrubland (Map Unit 22)

28. *Atriplex* spp. (Saltbushes) are the dominant species. Other species maybe present, especially spiny hopsage, rabbitbrush, or short-spine horsebrush but they are clearly not dominant. **(30)**

30. Site is dominated by *Atriplex canescens* shrubs occurring on sandy soils near the Refuge entryway gate and along SH88 corridor paralleling the west side of the Refuge. **(30a)**

30a. *Atriplex canescens* / *Pleuraphis jamesii* Sparse Shrubland
Fourwing Saltbush / James' Galleta Sparse Shrubland (Map Unit 16)

30. Site is dominated by *Atriplex confertifolia* shrubs occurring on gravel and cobble outcrops. **(30b)**

- 30b.** *Atriplex confertifolia* / *Pleuraphis jamesii* Shrubland
Shadscale / James' Galleta Shrubland (Map Unit 23)
- 30.** Site is dominated by short *Atriplex corrugata* shrubs occurring on clay barrens in the Wonsit Valley and just south of the fish hatchery complex. **(30c)**
- 30c.** *Atriplex corrugata* Dwarf-shrubland
Mat Saltbush Dwarf-shrubland (Map Unit 24)
- 30.** Site is dominated by short *Atriplex gardneri* shrubs occurring on erosion fans, especially common west of Leota Bottom. **(30d)**
- 30d.** *Atriplex gardneri* Dwarf-shrubland
Gardner's Saltbush Dwarf-shrubland (Map Unit 25)
- 28.** Neither *Atriplex* spp. (saltbushes) or *Artemisia* spp. (sagebrush) are the dominant species. **(31)**
- 31.** Shrub species occur on sparse gravelly slopes with little associated species. The most common species is *Ephedra torreyana*. **(31a)**
- 31a.** *Ephedra torreyana* – (*Atriplex canescens*, *confertifolia*) Sparse Vegetation [Provisional]
Torrey's Joint-fir – (Fourwing Saltbush, Shadscale) Sparse Vegetation [Provisional]
(Map Unit 21)
- 31.** Shrub species occur on open, flat to rolling plains with little associated species. **(32)**
- 32.** Site is dominated by *Ericameria nauseosa* and is not in the floodplain. Individual plants are short and spaced widely apart. **(32a)**
- 32a.** *Ericameria nauseosa* Sand Deposit Sparse Vegetation
Rubber Rabbitbrush Sand Deposit Sparse Vegetation (Map Unit 15)
- 32.** Site is dominated by *Grayia spinosa* shrubs and appears to be the most extensive upland shrubland type in the Refuge. This type occurs on deep silty-clay soils of plains and basins and deep sandy soils of plains and rolling hills. **(32b)**
- 32b.** *Grayia spinosa* / *Pleuraphis jamesii* Shrubland
Spiny Hopsage / James' Galleta Shrubland (Map Unit 17)
- 32.** Site is dominated by *Tetradymia spinosa* shrubs distributed in the western one-third of the Refuge, most common on deeper, silty clay soils. **(32c)**
- 32c.** *Tetradymia spinosa* / *Pleuraphis jamesii* Dwarf-shrubland
Short-spine Horsebrush / James' Galleta Dwarf-shrubland (Map Unit 18)
- 32.** Site is dominated by small *Gutierrezia sarothrae* plants on thin silty clay soils and gravel and cobble bed. **(32d)**
- 32d.** *Gutierrezia sarothrae* – (*Opuntia* spp.) / *Pleuraphis jamesii* Dwarf-shrubland
Broom Snakeweed – (Prickly-pear spp.) / James' Galleta Dwarf-shrubland (Map Unit 19)
- 32.** Site is dominated by small *Eriogonum schockleyi* shrubs on cobbly soils. **(32e)**

- 32e.** *Eriogonum schockleyi* Badlands Sparse Vegetation [Provisional]
Schockley's Buckwheat Badlands Sparse Vegetation [Provisional] (Map Unit 26)
- 32.** Site is dominated by *Krascheninnikovia lanata* with some galleta grass intermixed occurring near SH88 in the vicinity of Sheppard Bottom. **(32f)**
- 32f.** *Krascheninnikovia lanata*/ *Pleuraphis jamesii* Dwarf-shrubland
Winter-fat / James' Galleta Dwarf-shrubland (Map Unit 51)
- 33.** Site has been modified by the planting of native grasses, mainly *Bouteloua gracilis*. **(33a).**
- 33a.** *Bouteloua gracilis* Introduced Grassland
Blue Grama Introduced Grassland (Map Unit 49)
- 33.** Site shows evidence prairie dog activity, holes, mounds, runs, etc. Vegetation includes *Opuntia polyacantha*, *Gutierrezia sarothrae*, *Halogeton glomeratus*, and *Bromus tectorum* along with other weedy or disturbed species. **(33b)**
- 33b.** *Opuntia polyacantha* - *Gutierrezia sarothrae* / *Halogeton glomeratus* - *Bromus tectorum*
Disturbed Vegetation
Prairie Dog Town Disturbed Vegetation (Map Unit 67)
- 33.** Site is dominated by *Schoenoplectus acutus*, *Typha latifolia* or *T. domingensis* and shows evidence of being burned in the past or regenerating recently from a burn. **(34)**
- 34.** Site is dominated by *Schoenoplectus acutus*. **(34a)**
- 34a.** *Schoenoplectus acutus* Herbaceous Vegetation - Burned
Hardstem Bulrush Herbaceous Vegetation - Burned (Map Unit 101)
- 34.** Site is dominated by *Typha latifolia*, *T. domingensis* or both. **(34b)**
- 34b.** *Typha latifolia* - *Typha domingensis* Herbaceous Vegetation - Burned
Southern (Broad-leaved, Narrow-leaved) Cattail Herbaceous Vegetation - Burned (Map Unit 103)
- 33.** Site is dominated by *Typha latifolia*, *T. domingensis*, or both and shows evidence of being disked in the past or regenerating recently from being disked. **(35)**
- 35.** *Typha latifolia* - *Typha domingensis* Herbaceous Vegetation - Disked
Southern (Broad-leaved, Narrow-leaved) Cattail Herbaceous Vegetation - Disked (Map Unit 104)