

APPENDIX D

RECOMMENDATIONS REGARDING PLANT SPECIES for USE in GrSG HABITAT MANAGEMENT and RESTORATION (from MONSEN 2005)

The content in the following tables is from Monsen (2005), but the format is in some cases altered from Monsen (2005). The tables are numbered for use in this appendix; the corresponding table numbers found in Monsen (2005) are provided in the table descriptions.

Table D-1. Ecological status, use index, competitiveness, seeding rates, and natural spread index of species adapted for seeding mountain brush and juniper-pinyon sites that receive over 15 – 20 in of annual precipitation (from Monsen, Stevens USDA, RMRS – GTR – 2004 in press). This is “Table 1” in Section II of Monsen (2005).

Species	Ecological Status ^a	Use index for:		Competitiveness ^b as a seedling, in the presence of:		Mature plant	Natural spread ^c
		Restoration Planting	Revegetation plantings	Maximum competition	Minimum competition		
Grasses							
Bluegrass, big	P,E,L	X	X	ME	ME	ME	3
Bluegrass, Canada	P,E,L		X	ME	ME	ME	3
Bluegrass, Sandberg	P,E,L	X	X	ME	ME	ME	4
Brome, mountain	P,E,L	X		ME	ME	ME	5
Brome, nodding	P,E,L	X		ME	ME	ME	5
Brome, Regar	P,E,L		X	EX	EX	ME	4
Brome, smooth, northern	P,E,L		X	EX	EX	EX,NC	5
Brome, smooth, southern	P,E,L		X	EX	EX	EX,NC	5
Fescue, Sulcata sheep	P,E,L	X		ME	EX	EX	3
Junegrass, prairie	P,E,L	X		ME	ME	ME	3
Muttongrass	P,E,L	X		ME	ME	ME	4
Needle-and-thread	P,E	X	X	ME	ME	EX	4
Needlegrass, green	P,E,L	X	X	ME	ME	EX	3
Orchardgrass “Paiute”	P,E,L		X	EX	EX	EX	5
Ricegrass, Indian	P,E,L	X		ME	ME	EX	3
Rye, mountain	P,E		X	EX	EX	PO	5
Squirreltail, bottlebrush	P,E,L	X	X	EX	EX	ME	4
Trisetum, spike	P,E,L	X		ME	ME	ME	3
Wheatgrass, bluebunch	P,E,L	X		EX	EX	EX	3
Wheatgrass, fairway	P,E,L		X	EX	EX	EX,NC	3
Wheatgrass, standard	P,E,L		X	EX	EX	EX,NC	3
Wheatgrass, intermediate	P,E,L		X	EX	EX	EX,NC	5
Wheatgrass, slender	P,E,L	X	X	ME	ME	ME	4
Wheatgrass, thickspike	P,E,L	X	X	ME	ME	EX	4
Wheatgrass, western	P,E,L	X	X	ME	ME	EX	4
Forbs							
Alfalfa (drought tolerant)	P,E,L		X	EX	EX	ME	3
Aster, blueleaf	P,E,L	X	X	EX	EX	EX	4
Aster, Pacific	P,E,L	X	X	EX	EX	EX	4
Balsamroot, arrowleaf	E,L	X		PO	PO	EX	2
Balsamroot, cutleaf	E,L	X		PO	PO	EX	2
Balsamroot, hairy	E,L	X		PO	PO	EX	2
Burnet, small	P,E,L		X	EX	EX	ME	4
Crownvetch	P,E,L		X	ME	ME	ME	4
Eriogonum, cushion	P,E,L	X	X	ME	ME	ME	3
Flax, Lewis	P,E,L	X	X	ME	ME	ME	5
Goldeneye, showy	P,E,L	X	X	ME	ME	ME	3
Goldenrod, Parry	P,E,L	X		ME	ME	ME	3
Helianthella, oneflower	P,E	X		ME	ME	ME	4
Lupine, Nevada	E,L	X		PO	PO	EX	2
Lupine, silky	E,L	X		PO	PO	ME	2
Lomatium, Nuttall	P,E,L	X		ME	ME	ME	3
Milkvetch, cicer	P,E,L		X	ME	ME	ME	4

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Table D-1. Ecological status, use index, competitiveness, seeding rates, and natural spread index of species adapted for seeding mountain brush and juniper-pinyon sites that receive over 15 – 20 in of annual precipitation (from Monsen, Stevens USDA, RMRS – GTR – 2004 in press). This is “Table 1” in Section II of Monsen (2005).

Species	Ecological Status ^a	Use index for:		Competitiveness ^b as a seedling, in the presence of:		Mature plant	Natural spread ^c
		Restoration Planting	Revegetation plantings	Maximum competition	Minimum competition		
Penstemon, Eaton	P,E,L	X		EX	EX	ME	5
Penstemon, low	P,E,L	X		EX	EX	ME	5
Penstemon, Palmer	P,E	X	X	EX	EX	PO	5
Penstemon, Rocky Mtn.	P,E,L	X	X	ME	ME	PO	5
Penstemon, sidehill	P,E,L	X		ME	ME	ME	5
Penstemon, thickleaf	P,E,L	X		ME	ME	ME	5
Penstemon, toadflax	P,E,L	X		PO	ME	ME	5
Penstemon, Wasatch	P,E,L	X		EX	EX	ME	5
Sainfoin	P,E,L		X	ME	ME	ME	4
Sage, Louisiana	P,E,L	X	X	PO	PO	ME	4
Sage, tarragon	P,E,L	X		PO	PO	ME	5
Salsify, vegetable	P,E		X	EX	EX	ME	5
Sweetvetch, Utah	P,E,L	X		PO	ME	ME	3
Yarrow, western	P,E,L	X	X	ME	ME	ME	4
Shrubs							
Ash, singleleaf	P,E,L	X		PO	PO	ME	2
Bitterbrush, antelope	P,E,L	X	X	ME	EX	EX	4
Buckwheat, Wyeth	P,E,L	X		EX	EX	ME	4
Ceanothus, Martin	P,E,L	X		ME	ME	EX	3
Chokecherry, black	P,L	X		PO	ME	EX	2
Cliffrose, Stansbury	P,E,L	X		ME	ME	EX	3
Elderberry, blue	P,E,L	X		PO	ME	EX	2
Ephedra, green	P,E,L	X		ME	ME	EX	2
Kochia, forage	P,E	X		EX	EX	ME	5
Mahogany, curlleaf	P,E	X		PO	ME	EX	2
Mahogany, true	E,L	X		PO	ME	EX	2
Maple, Rocky Mountain	E,L	X		ME	ME	EX	2
Rabbitbrush, mountain rubber	P,E,L	X	X	EX	EX	ME	5
Rabbitbrush, mountain and basin white stem rubber	P,E,L	X	X	ME	ME	ME	5
Rose, Woods	P,E,L	X	X	PO	ME	EX	1
Sagebrush, mountain big	P,E,L	X	X	ME	EX	EX	4
Saltbush, fourwing	P,E,L	X	X	ME	ME	ME	2
Serviceberry, Saskatoon	P,E,L	X	X	PO	PO	EX	2
Snowberry, longflower	E,L	X		PO	PO	EX	1
Snowberry, mountain	P,E,L	X		PO	ME	EX	1
Squawapple	P,E,L	X		PO	ME	EX	1
Sumac, Rocky Mountain	P,E,L	X	X	PO	ME	EX	2
Sumac, skunkbush	P,E,L	X	X	PO	ME	EX	2
Winterfat	P,E,L	X	X	ME	ME	EX	3
Seeding Rate							
Growth Form	Lbs/Acre ^d						
Grasses	4 - 7						
Forbs	5 - 6						
Shrubs	3 - 4						

^a Species status: P = pioneer; E = early seral; L = late seral.

^b Competitiveness rating: PO = poor competitor; ME = medium competitor; EX = excellent competitor; NC = noncompatible with other species.

^c Natural spread: 1 = poor; 2 = fair; 3 = moderate; 4 = good; 5 = excellent.

^d Drill rate—broadcast seeding requires 1/4 - 1/3 additional seed.

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Table D-2. Ecological status, use index, competitiveness, and seeding rates of species adapted for seeding juniper-pinyon intermixed with mountain big sagebrush or black sagebrush sites that receive 11 - 15 in of annual precipitation. (From Monsen and Stevens RMRS - GTR - 2004. In press). This is "Table 4" in Section II of Monsen (2005).

Species	Ecological Status ^a	Use index for:		Competitiveness ^b as a seedling, in the presence of:		Mature plant	Natural spread ^c
		Restoration Planting	Revegetation plantings	Maximum competition	Minimum competition		
Grasses							
Bluegrass, big	P,E,L	X	X	ME	ME	ME	3
Bluegrass, Canada	P,E,L		X	ME	ME	ME	3
Bluegrass, Sandberg	P,E,L	X	X	ME	ME	ME	4
Brome, nodding	P,E,L	X	X	ME	ME	ME	4
Brome, Regar	P,E,L		X	ME	ME	ME	4
Brome, smooth, southern	P,L		X	EX	EX	EX,NC	5
Dropseed, sand	P,E,L	X		EX	ME	ME	4
Fescue, hard sheep	P,E,L		X	ME	ME	ME,NC	4
Fescue, Sulcata sheep	P,E,L	X	X	ME	ME	EX	3
Grama, blue	P,E,L	X		ME	ME	EX	4
Junegrass, prairie	P,E,L	X		ME	ME	ME	3
Muttongrass	P,E,L	X		ME	ME	ME	4
Needle-and-thread	P,E	X		ME	ME	ME	4
Needlegrass, green	P,E,L	X	X	ME	ME	EX	3
Orchardgrass, "Paiute"	P,E,L		X	EX	EX	EX	5
Ricegrass, Indian	P,E,L	X		ME	ME	EX	3
Rye, mountain	P,E		X	EX	EX	PO	5
Squirreltail, bottlebrush	P,E,L	X	X	EX	EX	ME	4
Trisetum, spike	P,E,L	X		ME	ME	ME	3
Wheatgrass, bluebunch	P,E,L	X	X	ME	ME	EX	3
Wheatgrass, fairway	P,E,L		X	EX	EX	EX,NC	3
Wheatgrass, standard	P,E,L		X	EX	EX	EX,NC	3
Wheatgrass, intermediate	P,E,L		X	EX	EX	EX,NC	5
Wheatgrass, pubescent	P,E,L		X	EX	EX	EX,NC	5
Wheatgrass, Siberian	P,E,L		X	EX	EX	EX	3
Wheatgrass, streambank	P,E,L	X	X	EX	EX	EX	4
Wheatgrass, thickspike	P,E,L	X	X	ME	EX	EX	4
Wheatgrass, western	P,E,L	X	X	ME	ME	EX	4
Wildrye, Great Basin	E,L	X		PO	ME	EX	2
Wildrye, Russian	P,E,L		X	PO	ME	EX	3
Forbs							
Alfalfa (drought tolerant)	P,E,L		X	EX	EX	EX	3
Aster, Pacific	P,E,L	X	X	PO	ME	ME	4
Balsamroot, arrowleaf	E,L	X		PO	PO	EX	2
Burnet, small	P,E,L		X	EX	EX	ME	4
Flax, Lewis	P,E,L	X	X	EX	EX	ME	5
Globemallow, gooseberryleaf	E,L	X	X	ME	ME	EX	2
Goldeneye, showy	P,E,L	X	X	ME	ME	ME	3
Penstemon, Palmer	P,E	X	X	EX	EX	PO	5
Sainfoin	E,L		X	ME	ME	ME	4
Salsify, vegetable	P,E		X	EX	EX	ME	4
Sweetvetch, Utah	P,E,L	X		ME	ME	ME	3
Yarrow, western	P,E,L	X	X	ME	ME	ME	4
Shrubs							
Apache-plume	E,L	X		PO	ME	EX	3
Ash, singleleaf	E,L	X		PO	PO	EX	2

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Table D-2. Ecological status, use index, competitiveness, and seeding rates of species adapted for seeding juniper-pinyon intermixed with mountain big sagebrush or black sagebrush sites that receive 11 - 15 in of annual precipitation. (From Monsen and Stevens RMRS - GTR - 2004. In press). This is "Table 4" in Section II of Monsen (2005).

Species	Ecological Status ^a	Use index for:		Competitiveness ^b as a seedling, in the presence of:		Mature plant	Natural spread ^c
		Restoration Planting	Revegetation plantings	Maximum competition	Minimum competition		
Bitterbrush, antelope	P,E,L	X	X	EX	EX	EX	4
Buckwheat, Wyeth	P,E,L	X	X	ME	EX	ME	4
Ceanothus, Fendler	E,L	X		ME	ME	EX	3
Cliffrose, Stansbury	E,L	X		ME	ME	EX	2
Elder, blueberry	E,L	X		PO	ME	EX	2
Ephedra, green	E,L	X		ME	ME	EX	2
Kochia, forage	P,E		X	EX	EX	ME	5
Mahogany, curleaf	E,L	X		ME	ME	EX	2
Mahogany, littleleaf	E,L	X		ME	ME	EX	2
Mahogany, true	E,L	X		ME	ME	EX	2
Peachbrush, desert	L	X		PO	PO	EX	2
Rabbitbrush, mountain rubber	P,E,L	X	X	ME	ME	ME	3
Rabbitbrush, mountain and basin white stem rubber	P,E,L	X	X	ME	ME	ME	5
Sagebrush, basin big	P,E,L	X	X	ME	ME	EX	5
Sagebrush, black	P,E,L	X	X	ME	ME	EX	5
Sagebrush, mountain	P,E,L	X	X	ME	ME	EX	4
Saltbush, fourwing	E,L	X	X	ME	ME	ME	2
Serviceberry, Saskatoon	P,E,L	X	X	PO	PO	EX	2
Serviceberry, Utah	E,L	X	X	PO	PO	EX	2
Snowberry, mountain	E,L	X	X	PO	PO	EX	2
Squawapple	E,L	X		PO	PO	EX	2
Sumac, Rocky Mountain smooth	E,L	X	X	PO	ME	EX	2
Sumac, skunkbush	E,L	X	X	PO	ME	EX	2
Winterfat	P,E,L	X	X	ME	ME	EX	3
Seeding Rate							
Growth Form	Lbs/Acre ^d						
Grasses	4 - 6						
Forbs	4 - 6						
Shrubs	3 - 4						

^a Species status: P = pioneer; E = early seral; L = late seral.

^b Competitiveness rating: PO = poor competitor; ME = medium competitor; EX = excellent competitor; NC = noncompatible with other species.

^c Natural spread: 1 = poor; 2 = fair; 3 = moderate; 4 = good; 5 = excellent.

^d Drill rate—broadcast seeding requires 1/4 - 1/3 additional seed.

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Table D-3. Ecological status, use index, competitiveness, seeding rate, and natural spread index of species adapted for seeding mountain big sagebrush sites receiving over 15 in annual precipitation. (From Monsen and Stevens RMRS - GTR - 2004. In press). This is “Table 5” in Section II of Monsen (2005).

Species	Ecological Status ^a	Use index for:		Competitiveness ^b as a seedling, in the presence of:		Mature plant	Natural spread ^c
		Restoration Planting	Revegetation plantings	Maximum competition	Minimum competition		
Grasses							
Bluegrass, big	P,E,L	X	X	ME	ME	ME	3
Bluegrass, Canada	E,L		X	ME	ME	ME	3
Bluegrass, Sandberg	P,E,L	X		ME	ME	ME	4
Brome, Regar	P,E,L		X	EX	EX	ME	4
Brome, smooth, southern	P,E,L		X	EX	EX	EX,NC	5
Dropseed, sand	P,E,L	X		EX	ME	ME	4
Fescue, hard	P,E,L		X	ME	ME	EX,NC	3
Fescue, Idaho	E,L	X		PO	ME	ME	3
Fescue, sheep	P,E,L	X	X	ME	ME	ME	3
Galleta	P,E,L	X		ME	ME	ME	4
Grama, blue	P,E,L	X		ME	ME	EX	4
Junegrass, prairie	P,E,L	X		ME	ME	ME	3
Muttongrass	P,E,L	X		ME	ME	ME	4
Needle-and-thread	P,E	X		ME	ME	ME	4
Needlegrass, green	P,E,L	X	X	ME	ME	ME	4
Needlegrass, Letterman	P,E,L	X		ME	ME	ME	3
Oatgrass, tall	P,E		X	ME	ME	ME	4
Orchardgrass, ‘Paiute’	P,E,L		X	EX	EX	EX	5
Ricegrass, Indian	P,E,L	X		ME	EX	ME	3
Rye, Mountain	P,E		X	EX	EX	ME	5
Squirreltail, bottlebrush	P,E	X	X	EX	EX	ME	4
Wheatgrass, bluebunch	P,E,L	X		EX	EX	ME	3
Wheatgrass, fairway	P,E,L		X	EX	EX	EX,NC	3
Wheatgrass, standard	P,E,L		X	EX	EX	EX,NC	3
Wheatgrass, intermediate	P,E,L		X	EX	EX	EX,NC	5
Wheatgrass, pubescent	P,E,L		X	EX	EX	EX,NC	5
Wheatgrass, slender	P,E,L	X		EX	EX	ME	4
Wheatgrass, streambank	P,E,L	X	X	ME	ME	ME	4
Wheatgrass, thickspike	P,E,L	X	X	ME	ME	EX	4
Wheatgrass, western	P,E,L	X	X	PO	ME	EX	4
Wildrye, Great Basin	E,L	X		PO	ME	ME	2
Wildrye, Salina	E,L	X		PO	ME	EX	4
Forbs							
Agoseris, pale	P,E,L	X		EX	ME	ME	5
Alfalfa (drought tolerant)	P,E,L		X	EX	EX	ME	3
Aster, Pacific	P,E	X	X	ME	ME	ME	4
Balsamroot, arrowleaf	E,L	X		PO	PO	EX	2
Burnet, small	P,E,L		X	EX	EX	ME	4
Crownvetch	P,E,L		X	ME	ME	ME	4
Hawksbeard, tapertip	P,E,L	X		ME	ME	ME	4
Flax, Lewis	P,E,L	X	X	EX	EX	ME	5
Goldeneye, showy	P,E,L	X	X	ME	ME	PO	3
Lupine, mountain	E,L	X		PO	ME	ME	2
Lupine, silky	E,L	X		ME	ME	ME	2
Milkvetch, cicer	P,E,L		X	ME	ME	ME	4
Penstemon, Eaton	P,E,L	X		EX	EX	ME	5

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Table D-3. Ecological status, use index, competitiveness, seeding rate, and natural spread index of species adapted for seeding mountain big sagebrush sites receiving over 15 in annual precipitation. (From Monsen and Stevens RMRS - GTR - 2004. In press). This is “Table 5” in Section II of Monsen (2005).

Species	Ecological Status ^a	Use index for:		Competitiveness ^b as a seedling, in the presence of:		Mature plant	Natural spread ^c
		Restoration Planting	Revegetation plantings	Maximum competition	Minimum competition		
Penstemon, low	P,E,L		X	EX	EX	EX	5
Penstemon, Palmer	P,E	X		EX	EX	PO	5
Penstemon, Rocky Mtn	P,E,L	X	X	ME	ME	ME	5
Penstemon, Wasatch	P,E,L	X		EX	EX	ME	5
Sainfoin	P,E		X	ME	ME	ME	5
Sweetvetch, Utah	P,E,L	X		ME	ME	ME	3
Trefoil, birdsfoot	P,E		X	ME	ME	ME	3
Yarrow, western	P,E,L	X	X	EX	EX	ME	4
Shrubs							
Bitterbrush, antelope	P,E,L	X	X	ME	EX	EX	4
Buckwheat, sulfur	P,E,L	X	X	ME	ME	ME	4
Buckwheat, Wyeth	P,E,L	X	X	ME	ME	ME	4
Ceanothus, Martin	E,L	X		PO	ME	EX	3
Ceanothus, snowbush	E,L	X		ME	ME	EX	3
Chokecherry, black	E,L	X		PO	PO	EX	2
Cliffrose, Stansbury	E,L	X		ME	ME	EX	2
Elderberry, blue	E,L	X		PO	ME	EX	2
Ephedra, green	E,L	X		ME	ME	ME	2
Kochia, forage	P,E		X	ME	EX	ME	5
Mahogany, curlleaf	E,L	X	X	PO	ME	EX	2
Mahogany, true	E,L	X	X	PO	ME	EX	2
Rabbitbrush, mountain low	P,E,L	X	X	EX	EX	EX	5
Rabbitbrush, mountain rubber	P,E,L	X	X	EX	EX	EX	5
Rabbitbrush, mountain and basin white stem rubber	P,E,L	X	X	EX	EX	EX	5
Rose, Woods	E,L	X	X	PO	PO	EX	2
Sagebrush, low	P,E,L	X		EX	EX	ME	5
Sagebrush, mountain big	P,E,L	X	X	EX	EX	EX	5
Sagebrush, silver	P,E,L	X		EX	EX	ME	5
Saltbush, fourwing	P,E	X	X	ME	ME	ME	2
Serviceberry, Saskatoon	E,L	X		PO	PO	EX	2
Snowberry, mountain	E,L	X		PO	PO	EX	2
Squawapple	E,L	X		PO	PO	EX	2
Sumac, skunkbush	E,L	X		PO	ME	EX	2
Sumac, Rocky Mountain smooth	E,L	X		PO	ME	EX	2
Seeding Rate							
		Precipitation					
Growth form		12 - 17 inches	17+ inches				
		Lbs/Acre ^d					
Grasses		4 - 6	4 - 5				
Forbs		4 - 6	3 - 5				
Shrubs		3 - 4	3 - 4				

^a Species status: P = pioneer; E = early seral; L = late seral.

^b Competitiveness rating: PO = poor competitor; ME = medium competitor; EX = excellent competitor; NC = noncompatible with other species.

^c Natural spread: 1 = poor; 2 = fair; 3 = moderate; 4 = good; 5 = excellent.

^d Drill rate—broadcast seeding requires 1/4 - 1/3 additional seed.

Table D-3. Ecological status, use index, competitiveness, seeding rate, and natural spread index of species adapted for seeding silver sagebrush, timberline sagebrush, and subalpine big sagebrush sites. (From Monsen and Stevens RMRS - GTR - 2004. In press). This is "Table 6" in Section II of Monsen (2005).

Species	Ecological Status ^a	Use index for:		Competitiveness ^b as a seedling, in the presence of:		Mature plant	Natural spread ^c
		Restoration Planting	Revegetation plantings	Maximum competition	Minimum competition		
Grasses							
Barley, meadow	P,E,L	X	X	EX	EX	ME	4
Bluegrass, big	E,L	X	X	ME	ME	ME	4
Bluegrass, Canada	E,L		X	ME	ME	ME	4
Brome, meadow	P,E,L		X	ME	ME	ME	4
Brome, mountain	P,E,L	X	X	EX	EX	EX	5
Brome, nodding	P,E,L	X		EX	EX	EX	5
Brome, smooth, northern	P,E,L		X	EX	EX	EX,NC	5
Brome, smooth, southern	P,E,L	X		EX	EX	EX	5
Brome, subalpine	E,L		X	ME	EX	EX,NC	5
Fescue, hard sheep	P,E,L		X	ME	ME	EX,NC	3
Fescue, sheep	P,E,L	X	X	ME	ME	EX,NC	3
Foxtail, creeping	P,E,L		X	ME	EX	EX	5
Foxtail, meadow	P,E,L		X	ME	ME	EX	5
Needlegrass, green	P,E,L	X		ME	ME	ME	3
Needlegrass, Letterman	P,E,L	X	X	ME	ME	ME	3
Oatgrass, tall	P,E		X	ME	EX	ME	5
Orchardgrass	P,E,L		X	EX	EX	ME	5
Hair-grass, tufted	P,E	X	X	PO	ME	ME	5
Sedge, ovalhead	P,E,L	X		PO	ME	EX	2
Timothy	P,E		X	EX	EX	PO	5
Timothy, alpine	P,E,L	X		EX	EX	ME	5
Wheatgrass, slender	P,E,L	X	X	EX	EX	ME	4
Forbs							
Alfalfa (non-irrigated type)	P,E		X	EX	EX	ME	3
°Aster, blueleaf	P,E,L	X		ME	ME	EX	4
Aster, Englemann	P,E,L	X		PO	ME	EX	4
Crownvetch	E,L		X	ME	ME	EX	4
Geranium, sticky and Richardson	P,E,L	X	X	ME	ME	EX	4
Goldeneye, showy	P,E	X		ME	EX	EX	3
Goldenrod, Canada	P,E,L	X		ME	ME	EX	4
Groundsel, butterweed	P,E	X		PO	ME	EX	4
Lupine, mountain	E,L	X		ME	ME	EX	2
Lupine, silky	E,L	X		ME	ME	EX	2
Milkvetch, cicer	E,L		X	ME	EX	ME	4
Penstemon, Eaton	P,E	X	X	ME	ME	ME	5
Penstemon, low	P,E	X	X	ME	ME	ME	5
Penstemon, Rocky Mountain	P,E	X	X	ME	ME	ME	5
Penstemon, Wasatch	P,E	X	X	ME	ME	EX	5
Sage, Louisiana	P,E	X	X	ME	ME	PO	5
Sainfoin	E		X	ME	EX	ME	4
Sweetanise	E,L	X	X	ME	ME	ME	4
Yarrow, western	P,E,L	X	X	ME	ME	ME	4
Shrubs							
Chokecherry, black	E,L	X	X	PO	PO	EX	2

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Table D-3. Ecological status, use index, competitiveness, seeding rate, and natural spread index of species adapted for seeding silver sagebrush, timberline sagebrush, and subalpine big sagebrush sites. (From Monsen and Stevens RMRS - GTR - 2004. In press). This is "Table 6" in Section II of Monsen (2005).

Species	Ecological Status ^a	Use index for:		Competitiveness ^b as a seedling, in the presence of:		Mature plant	Natural spread ^c
		Restoration Planting	Revegetation plantings	Maximum competition	Minimum competition		
Cinquefoil, bush	E,L	X	X	ME	ME	EX	2
Elderberry, red	L	X	X	PO	ME	EX	2
Rabbitbrush, mountain low	P,E	X	X	ME	ME	ME	5
Sagebrush, silver	P,E,L	X	X	ME	ME	EX	5
Sagebrush, timberline	P,E,L	X	X	ME	ME	EX	5
Snowberry, mountain	P,E,L	X	X	PO	PO	EX	5
Seeding Rate							
Growth Form	Lbs/Acre ^d						
Grasses	4 - 5						
Forbs	3 - 4						
Shrubs	3 - 4						

^a Species status: P = pioneer; E = early seral; L = late seral.

^b Competitiveness rating: PO = poor competitor; ME = medium competitor; EX = excellent competitor; NC = noncompatible with other species.

^c Natural spread: 1 = poor; 2 = fair; 3 = moderate; 4 = good; 5 = excellent.

^d Drill rate—broadcast seeding requires 1/4 - 1/3 additional seed.

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Table D-4. Ecological status, use index, competitiveness, seeding rate, and natural spread index of species adapted for seeding basin big sagebrush sites. (From Monsen and Stevens RMRS – GTR - 2004. In press). This is “Table 7” in Section II of Monsen (2005).

Species	Ecological Status ^a	Use index for:		Competitiveness ^b as a seedling, in the presence of:		Mature plant	Natural spread ^c
		Restoration Planting	Revegetation plantings	Maximum competition	Minimum competition		
Grasses							
Bluegrass, Sandberg	P,E,L	X		ME	ME	ME	4
Dropseed, sand	P,E,L	X		EX	ME	ME	4
Fescue, hard sheep	P,E,L		X	ME	ME	EX,NC	3
Fescue, Idaho	E,L	X		PO	ME	ME	3
Fescue, sheep	P,E,L	X		ME	ME	ME	3
Galleta	P,E,L	X		ME	ME	ME	4
Grama, blue	P,E,L	X		ME	ME	ME	4
Needle-and-thread	P,E	X		ME	ME	ME	4
Needlegrass, Thurber	P,E,L	X		ME	ME	EX	4
Orchardgrass, 'Paiute'	P,E,L		X	ME	ME	ME	5
Ricegrass, Indian	P,E,L	X		ME	EX	EX	3
Rye, mountain	P,E		X	EX	EX	ME	5
Squirreltail, bottlebrush	P,E,L	X	X	EX	EX	ME	4
Trisetum, spike	P,E,L	X		ME	ME	ME	3
Wheatgrass, bluebunch	P,E,L	X		ME	ME	EX	3
Wheatgrass, fairway	P,E,L		X	EX	EX	EX,NC	3
Wheatgrass, standard	P,E,L		X	EX	EX	EX,NC	3
Wheatgrass, intermediate	P,E,L		X	EX	EX	EX,NC	5
Wheatgrass, pubescent	P,E,L		X	EX	EX	EX,NC	5
Wheatgrass, Siberian	P,E,L		X	EX	EX	EX,NC	3
Wheatgrass, streambank	P,E,L	X	X	ME	ME	ME	4
Wheatgrass, tall	P,E		X	ME	ME	ME	2
Wheatgrass, thickspike	P,E,L	X	X	ME	ME	EX	4
Wheatgrass, western	P,E,L	X	X	PO	ME	EX	4
Wildrye, Great Basin	E,L	X		PO	ME	EX	2
Wildrye, Russian	P,E,L		X	PO	ME	EX	2
Forbs							
Agoseris, pale	P,E,L	X		EX	ME	ME	5
Alfalfa (drought tolerant)	P,E,L		X	EX	EX	ME	3
Aster, Pacific	P,E	X	X	ME	ME	ME	4
Burnet, small	P,E,L		X	EX	EX	ME	4
Flax, Lewis	P,E,L	X	X	ME	EX	ME	5
Goldeneye, showy	P,E,L	X	X	ME	ME	PO	3
Globemallow Gooseberryleaf and scarlet	E,L	X	X	ME	ME	EX	2
Hawksbeard, tapertip	P,E,L	X		ME	ME	ME	4
Lupine, Nevada	E,L	X		ME	ME	EX	2
Penstemon, Eaton	P,E,L	X		EX	EX	ME	5
Penstemon, low	P,E,L	X		EX	EX	EX	5
Penstemon, Palmer	P,E	X	X	EX	EX	PO	5
Salsify, vegetable	P,E,L	X		ME	ME	ME	4
Sweetvetch, Utah	P,E,L	X		ME	ME	ME	3
Yarrow, western	P,E,L	X	X	EX	EX	ME	4
Shrubs							
Bitterbrush, antelope	P,E,L	X		ME	EX	EX	4
Ephedra, green	E,L	X		PO	ME	EX	2
Hopsage, spiny	E,L	X		ME	ME	EX	2

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Table D-4. Ecological status, use index, competitiveness, seeding rate, and natural spread index of species adapted for seeding basin big sagebrush sites. (From Monsen and Stevens RMRS – GTR - 2004. In press). This is “Table 7” in Section II of Monsen (2005).

Species	Ecological Status ^a	Use index for:		Competitiveness ^b as a seedling, in the presence of:		Mature plant	Natural spread ^c
		Restoration Planting	Revegetation plantings	Maximum competition	Minimum competition		
Kochia, forage	P,E,L		X	EX	EX	ME	5
Rabbitbrush, mountain low	P,E,L	X	X	EX	EX	ME	5
Rabbitbrush, mountain and basin white stem rubber	P,E,L	X	X	EX	EX	ME	5
Sagebrush, basin big	P,E,L	X	X	ME	EX	EX	5
Sagebrush, Wyoming big	P,E,L	X		ME	EX	EX	4
Sagebrush, low	P,E,L	X		ME	EX	EX	5
Saltbush, fourwing	E,L	X	X	ME	ME	ME	2
Winterfat	P,E,L	X	X	ME	ME	ME	3
Seeding Rate							
		Precipitation					
Growth form		9-13 inches	13+ inches				
		Lbs/Acre ^d					
Grasses		4 - 5	4 - 5				
Forbs		4 - 5	5 - 6				
Shrubs		3 - 4	4 - 5				

^a Species status: P = pioneer; E = early seral; L = late seral.

^b Competitiveness rating: PO = poor competitor; ME = medium competitor; EX = excellent competitor; NC = noncompatible with other species.

^c Natural spread: 1 = poor; 2 = fair; 3 = moderate; 4 = good; 5 = excellent.

^d Drill rate—broadcast seeding requires 1/4 - 1/3 additional seed.

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Table D-5. Ecological status, use index, competitiveness, seeding rate, and natural spread index of species adapted for seeding Wyoming big sagebrush sites. (From Monsen and Stevens RMRS-GTR - 2004. In press). This is "Table 8" in Section II of Monsen (2005).

Species	Ecological Status ^a	Use index for:		Competitiveness ^b as a seedling, in the presence of:		Mature plant	Natural spread ^c
		Restoration Planting	Revegetation plantings	Maximum competition	Minimum competition		
Grasses							
Bluegrass, Sandberg	P,E,L	X		ME	ME	EX	4
Dropseed, sand	P,E,L	X	X	EX	ME	EX	4
Fescue, hard sheep	P,E,L		X	ME	ME	EX	3
Fescue, Idaho	P,E,L	X		PO	ME	ME	3
Galleta	P,E,L	X		ME	ME	ME	4
Gramma, blue	P,E,L	X		ME	ME	EX	4
Needle-and-thread	P,E	X		ME	ME	ME	4
Needlegrass, Thurber	P,E,L	X		ME	ME	EX	4
Ricegrass, Indian	P,E,L	X		ME	ME	EX	3
Rye, mountain	P,E		X	EX	EX	ME	5
Squirreltail, bottlebrush	P,E,L	X	X	EX	EX	EX	4
Trisetum, spike	P,E,L	X		ME	ME	ME	3
Wheatgrass, bluebunch	P,E,L		X	EX	EX	EX	3
Wheatgrass, fairway	P,E,L		X	EX	EX	EX,NC	3
Wheatgrass, standard	P,E,L		X	EX	EX	EX,NC	3
Wheatgrass, pubescent	P,E,L		X	EX	EX	EX,NC	5
Wheatgrass, Siberian	P,E,L		X	EX	EX	EX,NC	3
Wheatgrass, streambank	P,E,L	X		ME	ME	ME	4
Wheatgrass, thickspike	P,E,L	X		ME	ME	EX	4
Wheatgrass, western	P,E,L	X		PO	ME	EX	4
Wildrye, Great Basin	E,L	X		PO	ME	EX	2
Wildrye, Russian	P,E,L		X	PO	ME	EX	3
Wildrye, Salina	E,L	X	X	ME	ME	EX	4
Forbs							
Agoseris, pale	P,E,L	X		EX	ME	ME	5
Alfalfa	P,E,L		X	ME	ME	PO	3
Alfileria	P,E		X	EX	EX	ME	5
Balsamroot, arrowleaf	E,L	X		ME	ME	EX	2
Burnet, small	P,E,L		X	ME	ME	PO	4
Flax, Lewis	P,E,L	X	X	ME	ME	PO	5
Goldeneye, showy	P,E,L	X	X	ME	ME	PO	3
Globemallow, gooseberryleaf	E,L	X	X	PO	ME	EX	2
Globemallow, scarlet	E,L	X	X	PO	ME	EX	2
Hawksbeard, tapertip	P,E,L	X		ME	ME	ME	4
Lupine, Nevada	E,L	X		ME	ME	ME	2
Penstemon, littlecup	P,E,L	X		ME	ME	ME	5
Penstemon, low	P,E,L	X		ME	ME	ME	5
Penstemon, Palmer	P,E,L	X	X	ME	ME	PO	5
Yarrow	P,E,L	X		ME	ME	ME	4
Shrubs							
Ephedra, green	E,L	X		PO	PO	PO	2
Hopsage, spiny	E,L	X		PO	ME	EX	2
Kochia, forage	P,E,L		X	EX	EX	ME	5
Peachbrush, desert	E,L	X		PO	PO	EX	2

Table D-5. Ecological status, use index, competitiveness, seeding rate, and natural spread index of species adapted for seeding Wyoming big sagebrush sites. (From Monsen and Stevens RMRS-GTR - 2004. In press). This is "Table 8" in Section II of Monsen (2005).

Species	Ecological Status ^a	Use index for:		Competitiveness ^b as a seedling, in the presence of:		Mature plant	Natural spread ^c
		Restoration Planting	Revegetation plantings	Maximum competition	Minimum competition		
Rabbitbrush, mountain low	P,E,L	X	X	EX	EX	ME	5
Rabbitbrush, mountain and basin white stem rubber	P,E,L	X	X	EX	EX	EX	5
Saltbush, fourwing	E,L	X	X	ME	ME	ME	2
Winterfat	P,E,L	X	X	ME	ME	ME	3
Seeding Rate							
Growth Form	Lbs/Acre ^d						
Grasses	5 – 6						
Forbs	4 – 5						
Shrubs	2 – 3						

^a Species status: P = pioneer; E = early seral; L = late seral.

^b Competitiveness rating: PO = poor competitor; ME = medium competitor; EX = excellent competitor; NC = noncompatible with other species.

^c Natural spread: 1 = poor; 2 = fair; 3 = moderate; 4 = good; 5 = excellent.

^d Drill rate—broadcast seeding requires 1/4 - 1/3 additional seed.

Table. D-6: Food and cover value for sage-grouse. This is “Appendix I” in Monsen (2005).




FORBS			
Common Name	Scientific Name	Cover Value ¹	Food Value ¹
Western yarrow	<i>Achillea millefolium</i>		
False dandelion	<i>Agoseris glauca</i>		
Everlasting	<i>Antennaria spp.</i>		
Pacific aster	<i>Aster chilensis</i>		
Blueleaf aster	<i>A. glaucodes</i>		
Hairy balsamroot	<i>Balsamorhiza hookeri</i>		
Cutleaf balsamroot	<i>B. macrophylla</i>		
Arrowleaf balsamroot	<i>B. sagittata</i>		
Sego lily	<i>Calochortus spp.</i>		
Indian paintbrush	<i>Castilleja spp.</i>		
Tiny trumpet	<i>Collomia linearis</i>		
Hawksbeard	<i>Crepis spp.</i>		
Fleabane	<i>Erigeron spp.</i>		
Sulfur eriogonum	<i>E. umbellatum</i>		
Wyeth eriogonum	<i>Eriogonum hereleoides</i>		
Prairiesmoke	<i>Gayophytum spp.</i>		
Curlcup gumweed	<i>Grindelia squarrosa</i>		
Utah sweetvetch	<i>Hedysarum boreale</i>		
Prickley lettuce	<i>Lactuca serriola</i>		
Pea	<i>Lathyrus spp.</i>		
Pepperweed	<i>Lepidium spp.</i>		
Gilia	<i>Linanthus spp.</i>		
Lewis flax	<i>Linum perenne</i>		
Desertparsley	<i>Lomatium spp.</i>		
Lupine	<i>Lupinus spp.</i>		
Alfalfa	<i>Medicago sativa</i>		
Monkey flower	<i>Minulus spp.</i>		
Broomrape	<i>Orobanche spp.</i>		
Firecracker penstemon	<i>Penstemon eatonii</i>		
Palmer penstemon	<i>P. palmeri</i>		
Phlox	<i>Phlox spp.</i>		
Cinquefoil	<i>Potentilla spp.</i>		
Small burnet	<i>Sanquisorba minor</i>		
Groundsel	<i>Senecio spp.</i>		
Globemallow	<i>Sphaeralcea spp.</i>		

Table. D-6: Food and cover value for sage-grouse. This is “Appendix I” in Monsen (2005).



















































FORBS			
Common Name	Scientific Name	Cover Value¹	Food Value¹
Common dandelion	<i>Taraxacum officinale</i>		
Salsify	<i>Tragopogon spp.</i>		
Clover	<i>Trifolium spp.</i>		
GRASSES			
Thickspike wheatgrass	<i>Agropyron dasytachyum</i>		-
Standard/desert wheatgrass	<i>A. desertotum</i>		-
Intermediate wheatgrass	<i>A. intermedium</i>		-
Fairway crested wheatgrass	<i>A. cristatum</i>		-
Siberian crested wheatgrass	<i>A. fragile</i>		-
Western wheatgrass	<i>A. smithii</i>		-
Bluebunch wheatgrass	<i>A. spicatum</i>		-
Slender wheatgrass	<i>A. trachycaulum</i>		-
Blue gramma	<i>Bouteloua gracilis</i>		-
Mountain brome	<i>Bromus carinatus</i>		-
Smooth brome	<i>B. inermus</i>		-
Orchard grass	<i>Dactylis glomerata</i>		-
Great Basin wildrye	<i>Elymus cinereus</i>		-
Russian wildrye	<i>E. junceus</i>		-
Junegrass	<i>Koeleria macrantha</i>		-
Indian ricegrass	<i>Oryzopsis hymenoides</i>		-
Mutton bluegrass	<i>Poa fendleriana</i>		-
Sandberg bluegrass	<i>P. secunda</i>		-
Squirreltail	<i>Sitanion hystrix</i>		-
Sand dropseed	<i>Sporobolus cryptandrus</i>		-
Needle-and-threadgrass	<i>Stipa comata</i>		-
Green needlegrass	<i>S. lettermanii</i>		-

Table. D-6: Food and cover value for sage-grouse. This is “Appendix I” in Monsen (2005).

SHRUBS			
Common Name	Scientific Name	Cover Value¹	Food Value¹
Saskatoon serviceberry	<i>Amelanchier alnifolia</i>		-
Utah serviceberry	<i>A. utahensis</i>		-
Low sagebrush	<i>Artemisia arbuscula</i>		
Silver sagebrush	<i>A. cana</i>		
Black sagebrush	<i>A. nova</i>		
Basin big sagebrush	<i>A. tridentata ssp. tridentata</i>		
Mountain big sagebrush	<i>A. t. spp. vaseyana</i>		
Wyoming big sagebrush	<i>A. t. spp. wyomingensis</i>		
Fourwing saltbush	<i>Atriplex canescens</i>		-
Shadscale	<i>A. confertifolia</i>		-
Rubber rabbitbrush	<i>Chrysothamnus nauseosus</i>		-
Winterfat	<i>Ceratoides lanata</i>		
Chokecherry	<i>Prunus virginiana</i>		-
Antelope bitterbrush	<i>Purshia tridentata</i>		-
Mountain snowberry	<i>Symphoricarpos oreophilus</i>		-

¹ - No value

 **Low**

 **Low-Medium**

 **Medium**

 **Medium-High**

 **High**