

TECHNICAL NOTE

BIOLOGY TECHNICAL NOTE NO. 15

OCTOBER 1, 2008

WILDLIFE HABITAT MANAGEMENT INFORMATION

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The purpose of this technical note is to transmit wildlife information including, but not limited to, information found previously in the Upland Wildlife Habitat Management (645) Standard, Native Pollinator information issued via e-mail (October 2007), as well as, new non-game species information. This technical note is organized by Roman numeral with each number representing a different wildlife habitat management topic. This technical note further incorporates, by reference, Range Technical Note No. 4 for vegetation and planting information.

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I. Native Pollinator Information

In 2005, the Natural Resources Conservation Service (NRCS), in cooperation with the Xerces Society, developed a publication entitled “Farming for Pollinators” to provide guidance on specific conservation practices for farmers and ranchers, Extension agents, NRCS conservationists, conservation districts, and others. More recently, in 2007, the Xerces Society developed a publication entitled “Farming for Bees: Guidelines for Providing Native Bee Habitat on Farms.” This publication outlines “Three Steps to Success” for pollinator conservation action. The three steps are:

1. Recognize the native pollinators and pollinator habitats that are already on the conservation treatment unit.
2. Adapt existing production and land management practices to avoid causing undue harm to the pollinators already present.
3. Provide habitat for native pollinators on and around the conservation treatment unit.

Sites having relatively undisturbed conditions provide pollinator habitat. Potential pollinator forage and/or nest sites include all areas left untilled including, but not limited to, the following (Xerces Society 2007):

1. Riparian areas (streams, creeks, grassed waterways)
2. Utility easements
3. Road edges
4. Conservation areas
5. Unused land around fields, buildings, and service yards
6. Woody areas (draws, woodlots, shelterbelts)

Producers should also consider whether or not the need to remove “weeds” outweighs the value of the pollinators that the “weeds” support. However, noxious weeds must always be controlled to the extent practicable.

Producers that wish to take a more active role in pollinators should consider these three items to make their land more hospitable for pollinators (Xerces 2007):

1. Increase the available foraging habitat by including a range of native plants blooming at different times during the spring, summer, and fall.
2. Create nesting sites by providing suitable ground conditions or nesting structures.
3. Reduce the risk to bees from the use of insecticides and herbicides. Pesticides directly kill both pollinators and the plants they rely on. Provide buffer areas and select less toxic pesticides or use alternative pest management strategies.

According to the Xerces Society and the NRCS, if a producer wishes to provide native pollinator habitat then they should consider the following site characteristics:

1. Topography – slope and aspect influence soil drainage rates, moisture levels, and sun and wind exposure. For example, south facing slopes are drier and thus are preferred nesting sites for ground nesting pollinators. However, pollinator friendly plants planted at sites such as this will dry out faster and need to be more drought tolerant. Establish or protect forage plants in nearby low-lying or north-facing areas where plants may flower later or for longer periods in the summer. Attachment B provides plant site adaptation (soils and Major Land Resource Area (MLRA) information).
2. Distance from fields – the average foraging distance is 50 feet to 1/2 of a mile.
3. Size of habitat – if wildflowers and/or flowering shrubs are exclusively seeded/planted (separately from a range/grassland seeding), a minimum of at least five acres of wildflower forbs or no more than five percent of any field/tract/site should be planted to pure wildflower forbs; or at least 0.1 acres of flowering shrub planting per site. If the wildflowers are used in conjunction with the native grassland planting, the minimum of five percent of the seeding mixture (five percent times a full seeding rate) must be planted to native forbs.
4. Foraging habitat – plant selection should be made to ensure multiple species (>2) are blooming during each month of the entire growing season (April is included but may not be possible due to climate and seed/plant availability). Attachment A provides “Bloom Period” information for common native SD plants that are generally commercially available. Pollinator habitat plantings must remain undisturbed throughout the growing season (until after the first killing frost in the fall) so that flowers are available as a nectar source to adults and succulent herbage can be utilized by larvae. Maintenance treatments, such as grazing, burning, haying, or spraying, may be required outside of the flowering period.

Select flowering plant species from Attachment A of this technical note and follow seeding rates and methods found in Range Technical Note No. 4. If a plant is selected that was not previously listed in Range Technical Note No. 4, then refer to the last column in Attachment A for pertinent seeds per pound to be used in calculating the seeding rate (as described in Range Technical Note No. 4).

II. Dense Nesting Cover (DNC) and Winter Cover

Winter Cover (WC): By definition, winter cover consists of noncommodity crop (e.g., grasses, forbs, and shrubs) plants that provide standing residue with a VOR of at least 10 inches. The standing residue must be persistent/present/upright during the winter months. Typical winter months include December, January, and February. Early or late season snow storms may occur during any given year. Any single snow event may partially or completely fill and/or cover the standing residue. Select plant species that are appropriate for the ecological or range site descriptions. If planting winter cover, use Range Technical Note No. 4 for all planting and seedbed preparation information. In particular, use Table 2 for all herbaceous (grass and forbs) seeding rates.

Dense Nesting Cover: DNC is a mix of species (in the “right” proportions) that provides adequate vertical cover and an adequate insect food source during bird (e.g., pheasant and waterfowl) nesting and fledging/brood-rearing periods. DNC can be 1) a mix of cool-season grasses with forbs and/or legumes, or 2) a mix of warm- and cool-season grasses with forbs/legumes.

Users select the DNC Requirements category (i.e., cool-season DNC or cool- warm-season DNC) they wish to use on their respective site and prepare a plant mix based on Table 1.0 below. Table 1.0 includes the following information: 1) select plant list; 2) cross-reference to Range Technical Note No. 4 Tables 4A, 5, 6A, and 6B (for species soil/site adaptability only); 3) DNC rating; and 4) WC rating.

Cool-Season DNC Requirements –

1. Select at least 10 percent forbs and/or legumes;
2. Select at least two grass species;
3. The mix must contain at least 60 percent cool-season grasses;
4. No single grass species shall comprise more than 50 percent of the entire mix (except on closed depression and dense clay sites where a single grass species is acceptable).

Cool-Season and Warm-Season Combination DNC Requirements –

1. Select at least 10 percent forbs and/or legumes;
2. Where possible, select at least four grass species (at least two warm-season grass species);
3. No single grass species shall comprise more than 50 percent of the entire mix (see exceptions above).

Use Range Technical Note No. 4 for all planting and seedbed preparation information. In particular, use Table 2 for all seeding rates. If alfalfa is selected for planting, then ensure that the variety of alfalfa is rhizomatous and not a “hay-type” variety.

The following is an example of planning DNC for a Droughty Loam (dry) or Si (silty) site in MLRA 63B.

Step 1. Consultation of Range Tech Note No. 4 tables identified the following species from Table 1.0 below, as suitable:

- Cool-season – green needlegrass, intermediate wheatgrass, tall wheatgrass, and western wheatgrass
- Warm-season – big bluestem, Indiangrass, little bluestem, prairie sandreed, sand bluestem, sideoats grama, and switchgrass
- Forb/Legume – alfalfa, purple prairie clover, white prairie clover, Illinois bundleflower, Canada milkvetch, prairie coneflower, Maximilian sunflower, false sunflower

Step 2. Apply the 60 percent cool-season criteria:

- Green needlegrass and western wheatgrass both have a “Good” DNC rating and both are native so they should be selected over the introduced cool-season grasses.
- The percentage of the mix each of the two species should make up is up to the user but should equal 60 percent. You wanted a little winter cover so

you chose another 10 percent or 20 percent in warm-season grass (e.g., big bluestem and little bluestem).

Step 3. Apply the 10 percent forb/legume criteria:

- All forbs and legumes are rated “Good” except sweet clover has reliability issues. Therefore, you decide to make a 15 percent mix of different forbs/legumes.
- You wanted a little winter cover so you made sure you included Maximilian sunflower.

Step 4. Determine Seed Mix (must equal 100 percent and no single grass species >60 percent):

• Green needlegrass	35 percent
• Western wheatgrass	30 percent
• Big bluestem	10 percent
• Little bluestem	10 percent
• Purple prairie clover	3 percent
• Illinois bundleflower	3 percent
• Maximilian sunflower	5 percent
• Alfalfa	4 percent
Total	100 percent

Step 5. Seed Mix Calculations, consultation with Range Tech Note No. 4, Table 2:

• Green needlegrass:	7.5 #PLS/Ac x 35% = 2.630 PLS/ac
• Western wheatgrass:	10.0 #PLS/Ac x 30% = 3.000 PLS/ac
• Big bluestem:	7.5 #PLS/Ac x 10% = 0.750 PLS/ac
• Little bluestem:	4.5 #PLS/Ac x 10% = 0.450 PLS/ac
• Purple prairie clover:	3.8 #PLS/Ac x 3% = 0.114 PLS/ac
• Illinois bundleflower:	1.8 #PLS/Ac x 3% = 0.054 PLS/ac
• Maximilian sunflower:	1.0 #PLS/Ac x 5% = 0.050 PLS/ac
• Alfalfa:	6.5 #PLS/Ac x 4% = 0.260 PLS/ac

Table 1.0 Dense Nesting Cover and Winter Cover Plant Species for Areas Managed Primarily for Wildlife

Species	Reference Table(s) in Range Technical Note 4*	Dense Nesting Cover		Winter Cover Use (Good, Fair, Poor)	Height: Short (S) 1-12"; Medium (M) 13-24"; Tall (T) >24"
		Use with a forb/legume (Good, Fair, Poor)			
<u>Introduced Cool Season Grasses</u>					
Intermediate Wheatgrass	4A	Good		Fair	T
Tall Wheatgrass	4A	Good		Fair	T
<u>Native Cool-Season Grasses</u>					
Canada Wildrye	4A, 5, 6A, or 6B	Poor		Fair	T
Green needlegrass	4A, 5, 6A, or 6B	Good		Fair	T
Needle and thread	5, 6A, or 6B	Good		Poor	M
Porcupine grass	5, 6A, or 6B	Good		Poor	T
Virginia Wildrye	4A, 5, 6A, or 6B	Poor		Fair	T
Western/Thickspike Wheatgrass	4A, 5, 6A, or 6B	Good		Fair	M
<u>Native Warm-Season Grasses</u>					
Alkali sacaton	4A, 5, 6A, or 6B	Poor		Unknown	M
Big Bluestem	4A, 5, 6A, or 6B	Good		Good	T
Indiangrass	4A, 5, 6A, or 6B	Good		Good	T
Little Bluestem	4A, 5, 6A, or 6B	Good		Fair	M
Prairie sandreed	4A, 5, 6A, or 6B	Good		Fair	T
Sand Bluestem	4A, 5, 6A, or 6B	Good		Fair	T
Sand dropseed	consult w/range specialist for appropriate suitability	Good		Poor	M-T
Sideoats Grama	4A, 5, 6A, or 6B	Fair		Poor	M
Switchgrass	4A, 5, 6A, or 6B	Fair		Good	T
<u>Introduced Legumes</u>					
Alfalfa	4A	Good		Poor	N/A
Sweet Clover	4A	Fair to Good: Not reliable year to year		Poor	N/A
<u>Native Legumes/Forbs</u>					
Purple prairieclover	4A, 5, 6A, or 6B	Good		Poor	N/A
White prairieclover	4A, 5, 6A, or 6B	Good		Poor	N/A
Illinois bundleflower	4A, 5, 6A, or 6B	Good		Poor	N/A
Canada milkvetch	4A, 5, 6A, or 6B	Good		Poor	N/A
Maximilian sunflower	5, 6A, or 6B	Good		Good	N/A
Prairie/grayhead coneflower	5, 6A, or 6B	Good		Poor	N/A
False sunflower	6A or 6B	Good		Poor	N/A
Showy partridge pea	6A	Good		Poor	N/A

NOTES:

*Reference to the Range Technical Note #4 tables are only for soil/site adaptability. If there is a letter (Table 4a: G or F) or a percentage range (Tables 5, 6a, or 6b) under the site/group for that plant species then the plant is suitable.

The planner does not have to select all of the species listed for a site or concern themselves with the minimum or maximum percentages found in Tables 5, 6a, or 6b. Once species are selected refer to Table 2 for seeding rates and apply species based on the plant percentages (broad definition) for DNC in Section II of Biology Technical Note #15.

- 1) Species rated as "Good" in either category are preferred for their respective purpose (DNC or WC).
- 2) Species mix shall not be predominated by species with a "Poor" rating.
- 3) Species mix will be predominated by species with a rating of "Good" for the intended purpose (DNC or WC).
- 4) Introduced grass species not included in Conservation Cover (or other similar wildlife purpose standard) are not allowed (e.g. *Bromus* spp.)

Cover information was obtained from the following two Web sites:
 USDA Forest Service - <http://www.fs.fed.us/database/feis/plants/index.html>
 USDA Plants Database - <http://plants.usda.gov/>

III. Additional Management Information Applicable to Herbaceous Habitat with Wildlife as the Primary Purpose

Periodic disturbances by fire and grazing were essential in maintaining the climax plant communities in the prairies of the Northern Great Plains. Similar disturbances are needed to maintain habitat values once these prairie and similar grassland habitats are established. Without periodic disturbance, grassland plant communities begin to deteriorate. Typical signs of a deteriorating herbaceous plant community are excessive accumulation of plant residues that are reducing plant vigor, lack of seed heads, and invading species or other shifts in plant community composition. In SD, excess accumulation of plant litter that forms a dense layer several inches deep is a common problem observed in unmanaged herbaceous cover. Another common problem is invasion of the plant community with smooth brome grass, Kentucky bluegrass, cheatgrass, or other species, including noxious weeds. Disturbance treatments should be scheduled when litter buildup or a plant community composition shift is causing a loss of habitat quality that interferes with or reduces reproduction or survival of the desired wildlife species.

Habitat conditions can be documented by tracking the visual obstruction readings for the site, with annual readings documented using form SD-CPA-57, Visual Obstruction Readings for Herbaceous Wildlife Habitat. In this way, the changes in plant community structure can be tracked to best identify when management treatments are needed. A typical sign of deteriorating herbaceous plant communities is reduced visual obstruction associated with excessive accumulations of litter and reduced plant vigor. Ideally, disturbance treatments should be scheduled when the average visual obstruction reading for the field has dropped below the minimum height required for herbaceous habitat.

Tall grass prairie area management intervals MLRA's 102A, 102B, 102C, and 56): habitat management for fully established grasslands in this part of the state typically consists of allowing the vegetation to grow for four or five years without use, and then using grazing, burning, or clipping and removal of residues to eliminate the buildup of plant litter or adjust for other identified problems with plant community characteristics or composition. Shorter or longer periods may be appropriate in some cases, depending on the particular problems at the site and the wildlife species for which management is intended. The timing and choice of treatment method will be fully documented on form SD-CPA-58, Upland Wildlife Habitat Management. Include the species of management concern, the precise habitat conditions and problem(s), the expected impacts on the desired wildlife species and other species of concern, and how adverse impacts will be avoided or minimized.

Mixed grass prairie area management intervals (MLRA's 53B, 53C, 54, 55B, 55C, 58D, 60A, 61, 63A, 63B, 64, 65, and 66): habitat management for fully established grasslands in this portion of the state typically consists of allowing the vegetation to grow for five to seven years without use. After that period, use grazing, burning, or clipping and removal of residues to eliminate the buildup of plant litter or adjust for other identified problems with plant community characteristics or composition. Longer or shorter periods may be appropriate in some cases, depending on the particular problems at the site and the wildlife species for which management is intended. The timing and choice of treatment method will be fully documented on form SD-CPA-58. Include the species of management concern, the precise habitat conditions and problem(s), the expected impacts on the desired wildlife species and other species or plant communities of concern, and how adverse impacts will be avoided or minimized. Burning shall not be used to manage extremely sensitive habitats, such as sagebrush steppe.

Short grass prairie area management intervals (some ecological sites in MLRA's 54, 58D, and 60A): habitat management for fully established grasslands in this region consists of allowing the vegetation grow for 10 or more years without use, and then using grazing, burning, or clipping and removal of residues to decrease the buildup of plant litter or adjust for identified problems with plant community characteristics or composition. The timing and choice of treatment method will be fully documented on form SD-CPA-58. Include the species of management concern, the precise habitat problem(s), the expected impacts on the desired wildlife species and other species or plant communities of concern, and how adverse impacts will be avoided or minimized. Burning shall not be used to manage extremely sensitive habitats, such as sagebrush steppe.

IV. Additional Grazing Information Applicable to the Restoration of Plant Communities

The grazing information in this section is intended to describe how intense the grazing should be and the duration of the grazing in general terms. The grazing management action implemented under the Upland Wildlife Habitat Management (645) Standard does not require the use or development of a prescribed grazing system using the Prescribed Grazing (528) Standard. Contact the local range specialist for additional information concerning the intensity and/or duration of this management measure.

High intensity – short duration graze: used to minimize the duration of habitat disturbance; to remove litter with intensive hoof action; to target the grazing impact on a particular plant species in a very short time period; and to release nutrients for desired plant species.

Average intensity – short duration graze: used to remove litter where there is no need to alter the plant community.

Low intensity – long duration graze: remove litter but leave a mosaic of varied plant heights.

V. Additional Fire Management (Burning) Information Applicable to the Restoration of Plant Communities

For detailed information concerning the use of burning as a management measure please consult the 528 standard and/or a range specialist.

Spring burns prior to May 1: reduce excess litter (e.g., remove aboveground biomass in wetland habitats), remove invading cool-season plants such as cheatgrass.

Spring burns May 1 to May 20: help reduce the invasion of Kentucky bluegrass and smooth brome.

VI. Select Habitat Requirements for Select Wildlife Species in SD

Before using the information contained in Attachment's B and C, the SD Wildlife Habitat Appraisal Guide (WHAG) must be completed if the 645 standard is proposed (see instructions on the first sheet of the WHAG). The information in this technical note can be used as assistance for general species information outside of the 645 standard (e.g., programs, other standards as applicable). The WHAG is not intended to provide site specific species needs information. Hence, the remaining need of Attachment B and Attachment C.

The information contained in Attachments B and C represents guild or species specific information (not including endangered species information) useful for detailed design and/or layout of a conservation practice or multiple features of a conservation practice. A guild can be defined as a group of species with a similar set of life history requirements or behaviors. Therefore, when planning practices for a guild, guilds, or ecosystem, more than one species could benefit from a single action. By benefiting multiple species and using an ecosystem or landscape approach, the relative risk of negative species effects can be minimized.

Attachment B presents information on major SD game species previously included in the 645 standard. The tables in Attachment B represent information concerning species requirements of food, space, cover, and water.

Attachment C presents non-game species (grassland birds, reptiles, amphibians, bats, and other mammals) information not previously issued. For ease of use, Attachment C describes select information concerning game and non-game species including, but not limited to, the following: 1) migratory/resident status, 2) distribution, 3) nesting or breeding season, 4) nesting or breeding habitat type, 5) habitat connectivity requirements (e.g., species requires upland and wetland habitats), 6) life history space requirements (e.g., for foraging, displaying, loafing/resting), 7) life history food requirements (e.g., adult and non-adult), and 8) territoriality.

References used for the tables in Attachment's B and C are footnoted and included with the table. A detailed list of literature cited can be found in Section VII.

VII. REFERENCES

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ATTACHMENT A

**BLOOM PERIOD & SITE INFORMATION FOR COMMON SOUTH DAKOTA
NATIVE PLANTS**

Bloom Period & Site Information for Common South Dakota Native Plants

Common Name ^{4,5,6,7,8}	Scientific Name ^{4,5,6,7,8}	Bloom Period Start ^{1,2,6,7,8}	Bloom Period End ^{1,2,6,7,8}	Soils & Site Information
Shrubs and Subshrubs				
Chokecherry	<u>Prunus virginiana L.</u>	May	June	silt to sandy loam; NO heavy clay
Cudweed sagewort / white sagebrush	<u>Artemisia ludoviciana</u>	August	September	dry, sandy to rocky soils
Dwarf false indigo	<u>Amorpha nana</u>	June	July	dry prairies and rocky or sandy hillside. Missouri River breaks and tributaries, and the glacially derived rangelands of the east.
Fringed sage / prairie sagewort	<u>Artemisia frigida</u>	August	September	lighter, dry porous soils
Golden / Buffalo Currant	<u>Ribes aureum</u>	April	May	dry, often in sandy soils; no other soils specified
Juneberry / Saskatoon service-berry	<u>Amelanchier alnifolia</u>	April	June	no soils specified
Leadplant	<u>Amorpha canescens</u>	June	August	not checked
Prairie rose	<u>Rosa arkansana</u>	May	August	no soils specified
Silver / dwarf sagebrush	<u>Artemisia cana</u>	August	September	Rocky open sites and floodplains
Silver / Russet Buffaloberry	<u>Shepherdia argentea (Pursh) Nutt.</u>	May	June	most well-drained soils
Western snowberry	<u>Symphoricarpos occidentalis</u>	June	July	no soils specified
Wild Plum	<u>Prunus americana</u>	April	May	

¹ = Be sure to contact your seed/plant provider for local specific blooming periods.

² = Great Plains Flora Association. 1986. Flora of the Great Plains. University Press of Kansas. Lawrence, Kansas.

³ = Reed, P.B. 1988. National list of plant species that occur in wetlands: North Plains (Region 4). USFWS Biol. Rep. 88(26.4). 64pp.

⁴ = USDA - NRCS. August/September 2008. PLANTS Database Plant Profiles.

⁵ = Brookings Field Support Office Seeding Tool, SD NRCS Range Technical Note No. 4

⁶ = Johnson, J.R. and Gary E. Larson. 1999. Grassland Plants of South Dakota and the Northern Great Plains: a field guide with color photographs.

⁷ = Larson, G.E. and J.R. Johnson. 1999. Plants of the Black Hills and Bear Lodge Mountains: a field guide with color photographs.

Bloom Period & Site Information for Common South Dakota Native Plants

Common Name ^{4,5,6,7,8}	Scientific Name ^{4,5,6,7,8}	Bloom Period Start ^{1,2,6,7,8}	Bloom Period End ^{1,2,6,7,8}	Soils & Site Information	Seeds/Pound For Species Not Listed in Range Tech Note #4
Flowering Herbs					
American licorice	Glycyrrhiza lepidota	June	August	no soils specified	
American vetch	Vicia americana	May	August	all MLRAs	
Annual Gaillardia / Indian blanket / firewheel	Gaillardia pulchella	May	September	loamy to sandy soils	
Black samson / Narrow leaf Purple Coneflower	Echinacea angustifolia	June	July	rocky hillside and weakly developed soils; no soils specified	
Blackeyed Susan	Rudbeckia hirta var. pulcherrima	July	September	loamy to sandy soils	
Blanket flower / common Gaillardia	Gaillardia aristata	July	August	no soils specified	
Blue Vervain / Swamp Verbena (FACW)	Verbena hastata	July	September	moist meadows/lowlands; no soils specified	
Boneset (OBL)	Eupatorium perfoliatum	July	September	common wetland plant	
Butterfly milkweed	Asclepias tuberosa	June	August	sandy, loamy, and/or rocky limestone	
Canada tickclover / showy ticktrefoil	Desmodium canadense	July	August	rocky or sandy prairies	
Canadian Milkvetch	Astragalus canadensis	June	August	no soils specified	
Common milkweed	Asclepias syriaca	May	August	sandy, clayey, and/or rocky calcareous soils	
Compass plant	Silphium laciniatum	June	September	no soils specified	
Culvers root (FAC)	Veronicastrum virginicum	June	August	no soils specified	
Cup plant (FACW)	Silphium perfoliatum	July	September	moist low ground; no soils specified	
Dotted Blazingstar / Gayfeather	Liatris punctata	August	September	no soils specified	
False Boneset	Brickellia eupatorioides	July	August	open prairies especially in loose, sandy soils (all MLRAs)	512,000
False gomwell / western marbleseed	Onosmodium beariense var. occidentale	June	July	alluvial soils, outwash slopes, glacial outwash (MLRAs 102A, 102B, 102C, 63A, 53C, 53B, 63B/66, 64/60A)	24,000
False Sunflower / smooth oxeye	Heliopsis helianthoides	July	September	no soils specified	
Fragrant / lavender / blue giant hyssop	Agastache foeniculum	July	September	Moist woodlands especially along streams and shores; infrequently along wet ditches & prairies at higher elevations.	
Fuzzytongue Penstemon / crested beardtongue	Penstemon eriantherus	May	July	dry, sandy or gravelly soil (MLRAs 58D, 54, 60A/61, 63A, 64/63B)	600,000
Geyer's aster	Symphyotrichum laeve var. qeyeri	August	September	MLRAs 54/63A, 53B/55B, 02A, 102B, 102C, 63B/66, 61/62, 58D/60A/64	1,014,000
Golden Alexander / zizia (FAC-)	Zizia aurea	April	July	no soils specified	
Gray goldenrod	Solidago nemoralis	July	September	dry sandy soils	
Grayhead / Pinnate Prairie Coneflower	Ratibida pinnata	June	September	Loam, Clay, & sandy soil; mostly calcareous	
Groundplum milkvetch	Astragalus crassicaarpus	May	June	no soils specified but avoid high clay content	
Heath / White Aster	Symphyotrichum ericoides	August	October	dry, sand dunes/sandy soils	
Hoary vervain	Verbena stricta	June	September	loamy soils	
Illinois bundleflower	Desmanthus illinoensis	July	August	loamy soils	
Illinois ticktrefoil / tickclover	Desmodium illinoense	July	August	no soils specified	
Indian breadroot scurripea / large indian breadroot	Pediomelum esculentum	May	June	no soils specified	

Common Name ^{4,5,6,7,8}	Scientific Name ^{4,5,6,7,8}	Bloom Period Start ^{1,2,6,7,8}	Bloom Period End ^{1,2,6,7,8}	Soils & Site Information	Seeds/Pound For Species Not Listed in Range Tech Note #4
Flowering Herbs					
Lewis Flax / Prairie Flax	Linum lewisii	June	July	well drained soils; sandy loam to loamy soils (MLRAs 102A, 102B/102C, 58D, 60A/61/62)	
Maximilian sunflower	Helianthus maximiliani	August	October	sandy soils	
Meadow / Rocky Mountain blazing star	Liatris ligulistylis	July	September	no soils specified	
Narrow leaved / showy / smooth Penstemon	Penstemon angustifolius Symphyotrichum novae-angliae	May	June	sandy to gravelly soils; sandhills and occasional shale outcrops (MLRAs 55C, 66/63B, 63A/64, 58D, 54, 61/62/60A)	313,000
New England Aster (FACW)	Symphyotrichum anglicum	September	October	sandy, loamy and clayey soils	
Plains coreopsis / golden tickseed (FAC)	Coreopsis tinctoria	June	September	seasonally damp and disturbed sites and low sandy ground	
Prairie / tall cinquefoil	Potentilla arguta	July	September	no soils specified	
Prairie / upright / yellow coneflower	Ratibida columnifera Symphyotrichum falcatum	June	September	Loam, Sandy Loam, Clayey Loam	
Prairie Aster	Symphyotrichum falcatum	August	September	all MLRAs except 64 & 65	496,000
Prairie Ironweed (FACW)	Vernonia fasciculata	July	October	damp prairies, streambanks, pothole edges; no soils specified	
Prairie Spiderwort	Tradescantia occidentalis	May	July	sandy often dry soils (MLRAs 55B, 102A, 58D/54, 63/66/64/65, 60A/61/62)	160,000
Prairie Sunflower	Helianthus petiolaris	July	September	silty, shallow, thin soil (MLRAs 53B/53C/55C, 63A/54, 64/63B/66, 60A/61/62, 102B/102C)	273,000
Purple prairie clover	Dalea purpurea	July	September	loamy soils	
Rocky Mountain Bee Plant	Cleome serrulata	June	August	loamy to sandy soils (MLRAs 58D, 54, 63A/53C, 60A/61/62/64, 66/63B, 55C, 102B/102C)	64,000
Rough / Tall blazing star	Liatris aspera	August	October	loamy and sandy soils	
Round-headed bush clover / lespedeza	Lespedeza capitata	August	September	ltd soils specified; sand dunes	
Scarlet Globemallow / red false mallow	Sphaeralcea coccinea	June	August	loamy to sandy soils (all MLRAs)	500,000
Shell leaved / large penstemon	Penstemon grandiflorus	May	June	sandy to loamy soils	
Showy Goldenrod	Solidago speciosa	July	September	rocky clay soils (MLRAs 55C/102B/102C, 58D, 61, 62, 60A)	1,520,000
Showy partridgepea	Chamaecrista fasciculata	July	September	rocky to sandy/sandy loam soils (MLRAs 102B/102C)	
Silky Lupine	Lupinus sericeus	June	July	sandy to loamy sand soils	24,550
Silvery Lupine	Lupinus argenteus	June	July	rocky prairie hillsides; loamy to sandy loam soils (MLRAs 58D/60A/54, 61/62/64)	126,000
Spotted Joe-pye weed (FACW+)	Eupatoriadelphus maculatus	July	September	moist to saturated soils	
Stiff goldenrod	Oligoneuron rigidum var. humile	August	October	dry/drying prairies, racky open sites, sandy soils	
Stiff sunflower	Helianthus pauciflorus	July	October	silty, shallow/thin soils	
Swamp milkweed (OBL)	Asclepias incarnata	June	September	wetlands, stream banks, floodplains, moist areas	
Tall / purple meadow rue (FAC)	Thalictrum dasycarpum	June	July	moist prairie/wet meadow; no soils specified	
Thickspike Gayfeather / Prairie Blazing Star (FAC)	Liatris pycnostachya	July	September	open damp prairies; no soils specified	
Western / White / common yarrow	Achillea millefolium	May	October	sandy to loamy sand soils	
White prairie clover	Dalea candida	July	August	sandy to loamy sand soils	
Wild Beebalm / bergamont	Monarda fistulosa	July	August	loamy to sandy soils	
Winter fat / white sage	Krascheninnikovia lanata	June	July	dry clay or chalky soils; saline or alkaline soils	

(FAC) = Wetland Indicator Status if applicable.

1 = Be sure to contact your seed/plant provider for local specific blooming periods.

2 = Great Plains Flora Association. 1986. Flora of the Great Plains. University Press of

3 = Reed, P.B. 1988. National list of plant species that occur in wetlands: North Plains (Region

4 = USDA - NRCS. August/September 2008. PLANTS Database Plant Profiles.

5 = Brookings Field Support Office Seeding Tool, SD NRCS Range Technical Note 4

6 = Johnson, J.R. and Gary E. Larson. 1999. Grassland Plants of South Dakota and the

7 = Larson, G.E. and J.R. Johnson. 1999. Plants of the Black Hills and Bear Lodge Mountains:

8 = Vance, Fenton R., J. R. Jowsey, and J.S. McLean. 1995. Wildflowers of the Northern

ATTACHMENT B

**MINIMUM HABITAT REQUIREMENTS FOR SELECTED GAME SPECIES IN
SOUTH DAKOTA**

SPECIES	HOME RANGE	HABITAT NEEDED	HABITAT CHARACTERISTICS AND EXPLANATIONS	QUANTITY OR MANAGEMENT
Upland ground nesting waterfowl (such as Mallard, Gadwall, Pintail, Widgeon, Northern shoveler, and Teal sp.)	Using a seasonal, semi-permanent, or permanent waterbody as the center point, pair cover, nesting cover, and brood cover will be provided within one-half mile of the wetland edge.	Nesting Cover	See Section 2 of Biology Technical Note 15 for Dense Nesting Cover Requirements. In general, the larger the block of cover the better, with 20 acre blocks considered minimal. An ideal upland to wetland ratio of three or four acres of upland per acre of wetland.	A minimum of 20 acres of DNC will be provided.
		Pair Habitat	Temporary or seasonal wetlands will be located within one half mile of nesting cover.	See the practice "Wetland Wildlife Habitat Management" (644).
		Brood Habitat	A semi-permanent or permanent wetland or another semi-permanent or permanent water body will be located within one mile of the nesting cover.	See the practice "Wetland Wildlife Habitat Management" (644). Dugouts without dense surrounding emergent wetland vegetation shall not be considered as brood habitat, as there is no escape cover for the brood.
		Food	Food will be satisfied by providing the required wetlands.	Avoid use of herbicides or insecticides that could impact the food web of the wetlands in the area managed.

SPECIES	HOME RANGE	HABITAT NEEDED	HABITAT CHARACTERISTICS AND EXPLANATIONS	QUANTITY OR MANAGEMENT
Ring-necked pheasant, Phasianus colchicus	Use winter storm cover as the center point of the home range. The average home range for pheasants includes an area with a radius of one mile. All other life requisites must be provided within that area.	Nesting Cover	See Section 2 of Biology Technical Note 15 for Dense Nesting Cover Requirements. In general, the larger the block of cover the better.	A minimum of 20 acres of DNC within one mile radius will be provided in a single block. Nesting cover will be within one mile of winter storm cover.
		Winter Cover - Roosting, Storm, and Loafing	See Section 2 of Biology Technical Note 15 for Winter Cover Requirements. In general, the larger the block of cover the better. Winter storm cover is provided by dense windbreaks or large areas of heavy wetland cover.	At least 10 acres of roosting cover within a one mile radius are required.
			Windbreaks shall have at least 9 rows and be 3 acres in size. Twin-row-high-density designs for winter storm cover will have at least five sets. Wetlands and/or complexes at least 10 acres in size with a dense stand of cattails or river bulrush.	At least one area of winter storm cover will be available within the home range.
			Loafing cover is an area of shrubby cover with 30-60 percent canopy cover. It may be a small clump planting or be included as a part of a large windbreak.	At least one area of loafing cover, at least 0.1 acres in size, will be provided within a one mile radius.
		Food -Winter	Winter food consists of weed seeds, waste grains, and planted food plots. The foods that provide highest food value include corn, sorghum, millet, or tame sunflowers. Waste grain and some other food sources are not necessarily available with heavy snow or ice.	Winter food will be available within one-quarter mile of winter cover. Use tillage systems that leave waste grain on the soil surface over winter. If natural weedy areas or livestock feeding areas are not present, plant a food plot using one or more of the grains listed. Food plots should be rotated.
Food - Summer	Food for nesting hens and young, up to 12 weeks of age, consists primarily of insects. Therefore, use of insecticides should be discouraged on or adjacent to nesting cover.	Avoid or minimize use of insecticides or herbicides that interfere with the food web in the area being managed. Food plots should be rotated.		

SPECIES	HOME RANGE	HABITAT NEEDED	HABITAT CHARACTERISTICS AND EXPLANATIONS	QUANTITY OR MANAGEMENT
Sharp-tailed grouse, <i>Tympanuchus phasianellus</i>	The average home range for sharp-tailed grouse is an area around the lek (dancing ground) with a radius of about one mile.	Nesting Cover	Nesting cover consists of herbaceous cover with a visual obstruction reading (VOR) of at least 5 inches in blocks at least 60 acres in size. Studies suggest that grazing systems that allow for one year of rest on at least one pasture each year are most productive of grouse.	Provide at least 320 acres of nesting cover within a one mile radius in blocks at least 60 acres in size.
		Brood Cover	Broods require shade that can be provided either by dense grass stands at least 9 inches tall, or by shrubby cover on up to 40 percent of the area.	At least five percent of the area within the home range will provide brood cover.
		Food - Summer	Insects are an important part of the diet for nesting hens and young grouse.	Avoid use of insecticides or herbicides that interfere with the food web in the area being managed for grouse.
		Food - Winter	Winter food may be a limiting factor in some years. Sharptails will migrate to areas with winter food available. Species important to sharptails include buffaloberry, snowberry, rose, hawthorn, chokecherry, sagebrush, currant, cottonwood, aspen, plum, sumac, oak, willow, cedars, and junipers.	Provide shrubby areas with important perennial food species, or plant a food plot at least 0.5 acre in size with one or more of the following grains: corn, grain sorghum, buckwheat, barley, oats, wheat, millet.
		Winter Cover	Tall coarse, dense herbaceous vegetation.	Provide at least one five-acre block within a one mile radius.

SPECIES	HOME RANGE	HABITAT NEEDED	HABITAT CHARACTERISTICS AND EXPLANATIONS	QUANTITY OR MANAGEMENT
Greater prairie chicken, Tympanuchus cupido	All life requisites will be provided within a radius of two miles	Summer Cover	Herbaceous cover with a visual obstruction reading of at least 8 inches and 40 percent canopy cover. Studies suggest that grazing systems that allow for one year of rest on at least one pasture each year are most productive of prairie chickens.	Provide at least 320 acres of nesting cover within a two mile radius in blocks at least 60 acres in size.
		Winter Cover	Tall dense herbaceous cover with a visual obstruction reading of 10 inches or more.	Provide at least one five-acre block within a two mile radius.
		Food - Summer	Insects are an important part of the diet for nesting hens and young prairie chickens.	Limit use of insecticides on the area under management for prairie chickens.
		Food - Winter	Winter food may be a limiting factor in some years. Prairie chickens will migrate to areas with winter food available. Winter foods include natural seed sources and crops. Food plots of the following annual plants should be at least 0.5 acre in size: corn, grain sorghum, buckwheat, barley, oats, wheat, and millets.	Provide a winter food source within 0.5 mile of blocks of winter cover.
Wild turkey, Meleagris gallopavo	Two mile radius	Cover	Habitat should include at least 20 percent forest cover mixed with grassland and cropland, as long as roost trees are available.	Maintain forested areas and cottonwood and green ash corridor forests with trees of all age classes. Old, tall trees are necessary for roosting.
		Nest Cover	Tall trees with an understory of tall herbaceous and shrubby cover, brush piles, and fallen limbs or young trees that have a visual obstruction reading of at least eight inches.	Avoid heavy grazing in woody cover, especially from March to July.
		Brood Cover	The forest and herbaceous cover interface provides brood cover if it has dense grass stands at least nine inches tall or shrubby cover on up to 40 percent of the area.	Provide 30 acres within a two mile radius of herbaceous cover within 150 feet of forest/woody cover.
		Water Food	Consumed daily. Seeds, forbs, green grasses, fruits, flowers, and insects. Food plots of corn, sorghum, or sunflowers should be at least five acres in size.	Available within one mile of roost sites. Avoid use of insecticides during nesting and summer. Provide a source of winter food.

SPECIES	HOME RANGE	HABITAT NEEDED	HABITAT CHARACTERISTICS AND EXPLANATIONS	QUANTITY OR MANAGEMENT
Sage grouse (Centrocercus urophasianus)	The lek is considered as the center of the home range. Provide all other habitat requirements within a five-mile radius of the lek.	Lek	The lek is considered as the center of primary sage grouse breeding activity. Leks are areas with low sage brush canopy where sage grouse congregate for strutting displays. Leks will be identified on the habitat development map for the plan. No new fences, above-ground water developments, or other infrastructure will be located on or within one-quarter mile of lek. Lek abandonment has been correlated with levels of conversion to cropland within one mile of the lek.	If more than 30 percent of the area within 1 mile of the lek is cropland or hayland, native plant communities will be restored, including sage brush establishment, on sufficient acres to have 70 percent native plant communities within the 1-mile radius.
		Breeding and Brood Rearing Habitat	The area considered as primary breeding and rearing habitat includes land within a three-mile radius of an active lek.	Optimize nesting and brood rearing cover within three miles of a lek.
		Nesting Cover	Acceptable nesting cover has a sagebrush canopy of 10-25 percent with average sagebrush height of >12 inches, and >15 percent grass canopy and 10 percent forb canopy at least 5 inches tall. The majority of nesting occurs within three miles of lek sites.	Optimize nest cover by improving rangeland health and restoring native climax plant communities within three miles of a lek site. Provide management with grazing management or use exclusions to improve sage brush height and canopy and adjust grass and forb abundance and height.
		Winter Cover	Acceptable winter cover has a sagebrush canopy of >10 percent with average height of >10 inches and is located within a 5-mile radius of a lek.	Optimize winter cover by improving rangeland health and restoring native climax plant communities within five miles of a lek site. Provide management with grazing management or use exclusions to improve sage brush height and canopy and adjust grass and forb abundance and height.
		Food for Young and Brood Rearing	Diets of young birds include a high percentage of insects. No use of insecticides should be planned in or near brood rearing areas. Riparian areas and wet meadows with good vegetative cover are essential within 100 yards of sagebrush cover. These areas need to have >5 percent green growing forb canopy in July and August.	Optimize food for young sage grouse by managing livestock grazing, delaying haying, or implementing a use exclusion on riparian areas, wet meadows, springs, and wetland areas. Do not use insecticides in nesting areas or brood rearing areas.

SPECIES	HOME RANGE	HABITAT NEEDED	HABITAT CHARACTERISTICS AND EXPLANATIONS	QUANTITY OR MANAGEMENT
Northern bobwhite, <i>Colinus virginianus</i>	One square mile, one-quarter mile in summer. The primary range for this species in SD includes the following Counties: Bon Homme, Tripp, Charles Mix, Clay, Gregory, Lincoln, Union, and Yankton	General	High interspersion of grass (30-40 percent) crop (40-60 percent), brush (5-20 percent), and trees (5-40 percent).	Provide cover with the appropriate composition of cover types.
		Nest	Herbaceous cover with open woody cover present or nearby, with a visual obstruction reading of six inches or more. Orchards, brushy fence rows, windbreaks, forest or wood lot edges, roadsides, odd areas, etc., are potential nesting areas.	Avoid disturbance of nesting areas from April through July. A minimum of 20 acres of nesting cover per one mile radius will be provided. At least five acres of nesting cover will be provided in a single block.
		Winter	Dense brush and tree cover.	Provide scattered areas of dense woody cover with herbaceous or shrubby ground cover. At least 10 acres of roosting cover per one mile radius are required.
		Food – summer	Insects are important during nesting and for young birds. Seeds are also used.	Avoid use of insecticides.
		Food – winter	Seeds.	Maintain waste grain, food plots, or natural seed sources adjacent to winter cover.
		Gray partridge, <i>Perdix perdix</i>	One-half mile radius	Nest
Winter	Grassy cover as required for nesting, brushy fence rows, or other brushy cover.	Provide at least 30 acres per one mile radius.		
Food – winter	Small grains and weed seeds are the primary foods of adults.	Treat croplands to maintain as much crop residue as possible over winter.		
Food-Spring, summer, and fall	The diet of partridge broods during the first six weeks includes insects, especially grasshoppers, ants, and ant eggs. Forbs, green plant parts, and insects are eaten by adult birds during spring, summer, and fall.	Avoid use of insecticides.		

SPECIES	HOME RANGE	HABITAT NEEDED	HABITAT CHARACTERISTICS AND EXPLANATIONS	QUANTITY OR MANAGEMENT
Pronghorn antelope, Antilocapra americana	5-10 square miles	Fall and Winter Food	Browse from shrubby cover 6 to 20 inches tall with 5 to 45 percent ground cover. Important species include sagebrush, snowberry, rabbitbrush, salt brush, and sumac.	Provide winter food areas with at least two shrub species.
		Food - Summer	Forbs are used year round and are the primary food in spring and summer. Important species include: dandelion, prickly lettuce, sageworts, salsify, asters, scurpea, prairie clover, dotted gayfeather, milkvetch, sunflowers, and alfalfa.	Provide for at least five percent forb canopy cover with at least four of the preferred forb species listed above.
		Water	Antelope will use water within a three-mile radius.	Provide cover along streams and around wetlands and other water bodies.
White-tailed deer, Odocoileus virginianus, and Mule deer, Odocoileus hemionus	One-to-three square miles depending on habitat quality	Food	Browse is used year round. Important species include: chokecherry, bur oak, snowberry, pine, rose, hawthorn, dogwood, sumac, plum, big sagebrush, buffaloberry, rabbitbrush, aspen, ash, juniper, grape, mountain mahogany, and bearberry. Forbs are used year round but are most important in summer. Agricultural crops are heavily used as available. Corn and sorghum are preferred and are suitable for food plots.	Provide a diversity of shrubby cover less than five feet in height. Encourage abundant fruit and nut producing species. Provide a high diversity of forbs, with at least 20 percent ground cover by forbs.
		Cover – General	Woody cover and grasslands in a variety of successional stages. Woody cover will include both shrubs and trees.	
		Winter Cover	Landscapes with rolling to steep terrain, large wetlands, or creek bottoms with tall herbaceous cover, dense shrubs, and evergreens provide good winter cover	Provide a suitable wintering area within the management area.
		Fawning Cover	Woody and tall herbaceous covers are used for fawning with visual obstruction ratings of eight inches or more.	Provide suitable fawning areas within the management area, with 50 acres per one mile radius, as a minimum.
		Water	Deer will use water within a three-mile radius	Provide cover along streams and around wetlands and other water bodies.
Elk (Cervus elaphus)	Elk home range is very large. For purposes of planning for this standard, the calving and bedding area is considered as the core and all other habitat elements will be provided within.	Calving and Bedding	Area will have woody cover with a dense shrubby layer, and should comprise about 40 percent of the area being managed for elk.	Provide at least one riparian area or north facing slope that is protected from livestock access.
		Food – Grasses and Forbs	About 50 to 55 percent of elk diet in the Southern Black Hills is grasses and 15-20 percent is forbs. About 60 percent of the area managed should provide forage.	Provide at least 18 lbs. of grass/forb forage per adult elk per day, based on the size of the elk herd expected to use the planning area.
		Food - Browse	About 20-25 percent of elk diets in the southern Black Hills is browse.	Provide areas of browse consisting of bearberry, oregon grape, and other shrubby and young woody species.
		Water – Natural Watering Areas	Need water that provides 5-10 gallons/day/adult elk.	Provide natural water to the extent possible to provide water for the size of the elk herd expected to use the planning area. Protect natural watering sites and riparian corridors from livestock access. Protect a watering site within one-half mile of riparian area or rest area.
		Water - Other	Water developments for elk are not needed unless natural water sites have been adversely affected by drought. If natural water areas are not protected from livestock, water facilities for elk will not be developed.	Provide water to supplement natural water areas in proportion to water needs for the expected size of the elk herd that will use the planning area. If natural water areas are not protected from livestock, water facilities for elk will not be developed

Amendment to Attachment B

Additional Information Concerning The Establishment of Northern Bobwhite Quail Habitat

The information provided below applies to the following counties only: Tripp, Gregory, Charles Mix, Bon Homme, Yankton, Clay, Union, and Lincoln.

Herbaceous Vegetation Component – The table below contains basic seeding recommendations and seeding rates for the establishment of bobwhite quail habitat. If more complex mixes or alternative species are desired they may be designed using wildlife friendly species found in Range Technical Note Number 4 (the Range Seeding tables and/or Prairie Restoration tables) with the following guidelines.

A minimum of three grasses and one legume/forb is required. On slopes less than six percent the seeding rates will be reduced by one-third and bunchgrass species will make up at least 60 percent of the species mix. On slopes over 6 percent, use the listed seeding rates and rhizomatous species must make up 40 percent of the species mix. The remaining percentage will be bunchgrasses and forb/legumes. In both cases, legumes/forbs must make up at least 25 percent of the species mix. All percentages are on a pure live seed (PLS) basis.

Woody Vegetation Composition - Planting of woody vegetation is limited to shrubs suited to the site. This component is critical to bobwhite quail and must be established when appropriate woody habitat is not present within one-quarter mile of the field border. Woody cover establishment will be according to the woody cover component of Upland Wildlife Habitat (645). Selected shrub species should include only native shrubs listed as beneficial to wildlife. Areas devoted to woody vegetation should not occupy more than 10 percent of the total area within a field border.

Table 1.0 Establishment of Northern Bobwhite Quail Habitat

For Slopes less than six percent

	PLS LBS		PLS LBS		PLS LBS
Green Needlegrass	1.2	Green Needlegrass	1.2	Green Needlegrass	1.2
Canada wildrye	1.9	Sideoats Grama	1.2	Little bluestem	0.8
Western Wheatgrass	1.2	Canada wildrye	1.9	Sideoats Grama	1.2
Alfalfa or	1.0	Alfalfa or	1.0	Alfalfa or	1.0
Purple Prairie Clover	0.8	Purple Prairie Clover	0.8	Purple Prairie Clover	0.8

For Slopes over six percent

	PLS LBS
Western wheatgrass	4.7
Green Needlegrass	1.5
Sideoats Grama	1.5
Alfalfa or	1.3
Purple Prairie Clover	0.9

ATTACHMENT C

MINIMUM HABITAT REQUIREMENTS FOR SELECTED NONGAME SPECIES IN SOUTH DAKOTA

Literature Used to Determine Select Habitat Requirements for Other South Dakota Wildlife

- 1 = Birds of South Dakota (Tallman et. al. 2002)
 - 2 = The Birds of North America (authors and dates are species dependent)
 - 3 = Sharing Your Land with Shortgrass Prairie Birds (Gillihan et. al. 2001)
 - 4 = Integrating Bird Conservation into Range Management (VerCaueren and Gillihan 2004)
 - 5 = Field Guide to South Dakota Amphibians (Fischer 1999)
 - 6 = South Dakota All Bird Conservation Plan (Bakker 2005)
 - 7 = Wild Mammals of South Dakota (Higgins et al 2000)
 - 8 = South Dakota Bat Management Plan (SDGF&P 2004)
 - 9 = A Field Guide to South Dakota Turtles (Bandas and Higgins 2004)
 - 10 = Effects of management practices on grassland birds (Johnson et al [Series Coordinators] 2004)
 - 11 = Effects of management practices on wetland birds (Johnson and Dechant-Shaffer [Series Coordinators] 2002)
 - 12 = Migratory Bird Responses to Grazing (WRP Grassland Workgroup Report, NRCS, 2005)
- NatureServe Explorer Internet Database used to verify or provide Life History Requirements for all species

Non-Game Species Guild Summaries

Guild	Common Representatives	General Reproductive Habitat	General Habitat Connectivity Requirements	General Life History Space Requirements	General Life History Food Requirements	Management	Standard Beneficial Measures
Shorebirds	Avocets, plovers, sandpipers, godwits, curlews, phalaropes, yellowlegs, dowitchers, dunlin, willet, and whimbrel	7 species in SD; all different nesting habitats (upland, wetland, shoreline)	Wetland and upland complexes. Wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates.	Forages and loafs along exposed, moist substrate or in shallow water (e.g. mudflats, flooded fields, wetland edges, moist soils) with little emergent vegetation.	Invertebrates (aquatic or earthworms)	Wetland vegetation may need to be managed to ensure mudflat or wetland edge foraging access. If designing a wetland do not focus on specific depths rather ensure the basin has shallow slopes and the correct hydroperiod (e.g. temporary, seasonal).	Avoid use of pesticides in or near wetlands. Ensure waterways and wetlands have an adequate riparian or upland buffer (>100 feet) surrounding the water body (per side if a water course). Avoid cattle or human disturbances to wetland (and buffer) habitat during the nesting/fledging season (typically May 1 - August 1). Cattle-caused nest failure may be largely influenced by individual herd behavior rather than stocking rates (Nack & Ribic 2005). Therefore, if this guild is of concern then perhaps "Stockmanship" type methods could be employed.
Wading Birds	Bitterns, herons, egrets, rails, cranes, ibis', coot	Bitterns: emergent vegetation. All others: primarily in trees or shrubs, few in emergent vegetation.	Most require wetlands. Few require wetland/upland complexes.	Forages and loafs in emergent wetlands and shallow (up to a depth of their un-feathered leg). Cattle egret exclusively on land.	Vertebrates (fish, amphibians, snakes) and invertebrates.	Wetland emergent vegetative management should focus on providing varying degrees of vertical structure and density. A highly irregular emergent vegetation edge should be maintained. There is no optimal "vegetated to open water ratio." If a site was formerly a PSS or PFO and is now de-vegetated then planting shrubs and trees would provide colonial nesting bird habitat.	Avoid use of pesticides in or near wetlands. Ensure waterways and wetlands have an adequate riparian or upland buffer (>100 feet) surrounding the water body (per side if a water course). Avoid cattle or human disturbances to wetland (and buffer) particularly during the nesting/fledging season (typically May 1 - August 1).
Grassland Nesting Songbirds	sparrows, larks, longspurs, upland sandpiper	Mixed, tall or short grass prairies with varying vegetative heights, densities & litter	Some species are highly area sensitive and require large habitat patches, but size is variable.	Foraging, loafing, displaying occur within reproductive habitat.	Seeds and Invertebrates	Be aware of ecological drivers (continual and pervasive processes) versus disturbances (infrequent and episodic events) when proposing management actions (Askins et al 2007). The amount of precipitation in combination with soil quality are primary drivers. Grazing is a secondary driver. Fire is a disturbance. All of the drivers and disturbances vary temporally and spatial, hence landscape heterogeneity. Ensure the right tool (e.g. grazing vs. mowing/burning) is selected to manage the prairie type (e.g. mixed vs. tall grass). Ensure multiple vegetative patches (e.g. different heights, densities) are available within the site and adjacent. Do not apply management treatments across 100% of the site.	Limit the use of pesticides on grasslands to small areas or use mechanical means so as to reduce reduction in forbs, invertebrates or mast. Limit cattle or human disturbances during the nesting/fledging season (typically May 1 - August 1). Cattle-caused nest failure may be largely influenced by individual herd behavior rather than stocking rates (Nack & Ribic 2005). Therefore, if this guild is of concern then perhaps "Stockmanship" type methods could be employed. Non-native invasive species (e.g. reed canary grass, smooth brome, downy brome, etc) must be controlled and limited in extent. Sustained rest (no drivers or disturbances) in mixed-grass prairies did not occur historically and is not beneficial for this guild.
Birds of Prey	Eagles, hawks, falcons, owls	N. Harrier and short eared owl nest on ground in/near wetlands. Burrowing owl nests underground. The remainder nest in trees generally in nests/holes abandoned by other species.	Generally expansive open country (grasslands or woodlands). May require water or woods.	Generally expansive open country (grasslands or woodlands). May require water or woods.	All are carnivorous; Osprey is strictly a fish eater	Predators are dependent on their prey species; provide the prey species habitat (ecosystem approach) and predators will come. Artificial nesting structures may be used for some species (osprey, Northern Saw-whet owl) but not others (eagle nesting structures generally are ineffective; but, artificial roosting trees can work).	Avoid the use of pesticides, grass cutting, and burning on grasslands and wetlands during the March to June timeframe. Ensure adequate prairie dog or other den sites are maintained for burrowing owl use. Ensure forest or woodlands contain a mix of age classes as well as live and dead trees for nest sites. Avoid forest or woodland harvest (in any fashion) during the nesting season (February - June). If harvest is required then be sure to look for occupied nests and wholes and avoid impacts to the nesting tree AND surrounding trees out to a certain distance.

Non-Game Species Guild Summaries

Guild	Common Representatives	General Reproductive Habitat	General Habitat Connectivity Requirements	General Life History Space Requirements	General Life History Food Requirements	Management	Standard Beneficial Measures
Mammals	shrews, voles, furbearers	High degree of variability	High degree of variability	High degree of variability	High degree of variability	High degree of variability	High degree of variability
Mammals - Bats	Bats	Live and Dead trees with perfoliating bark, cavities, and crevices; some species use cliffs and steep banks.	Sometimes water features but otherwise none.	Forests and woodlands with multiple vegetation stratum	Foraging above foliage, within foliage, in clearings and over water. All are invertivores.	Focus on providing or protecting roosting and nesting habitat. Encourage wooded riparian corridor succession (e.g. cottonwood reproduction). Caves and human structures are used, and sometimes required (Townsend's Big-eared Bat) but are not covered by this document	Avoid the use of pesticides in forests and woodlands and along water bodies. Avoid removing all dead vegetation especially trees with exfoliating bark, cavities and crevices. Supplement forests and woods with understory plantings. Provide bat boxes to attract bats to certain areas that will not be harvested or manipulated.
Amphibians	Frogs, toads, salamanders, mud puppy	All wetland types and most perennial water courses.	Uplands and riparian areas with either moist (soft) substrate and/or sufficient detritus (humus, logs, rocks) located generally upslope of wetlands or streams. Can burrow underground in woods or grasslands.	Foraging and loafing habitat are either found within breeding habitat and can include grasslands.	All are carnivorous	Protect all wetland types and their associated upland buffers within a certain distance. Limit vegetation density and ensure some open water. Temporary and seasonal wetlands are important because they do not generally contain predatory fish.	Avoid the use of pesticides in wetlands, water courses, buffers and riparian areas. Avoid livestock grazing in wetlands and buffers. Severely limit and/or control livestock grazing in stream riparian areas. Control livestock access to streams.
Turtles	River turtles, land turtles, other aquatic turtles	Reproduces in all wetland types, streams, rivers and lakes. But, lays eggs in soft substrate outside of water (e.g. sandbar, in riparian area or floodplain, & shoreline). The western ornate box turtle is entirely terrestrial.	Uplands and riparian areas with either moist (soft) substrate and/or sufficient detritus (humus, logs, rocks) located generally upslope of wetlands or streams. Except the western ornate box turtle which is entirely terrestrial.	Foraging and loafing habitat are found within breeding habitat.	All are omnivorous	Protect permanent wetlands and flowing watercourses. Specifically, protect their shorelines and channel bar features as nesting sites. Ensure some open water in wetlands. The western ornate box turtle has its own unique management considerations.	Avoid the use of pesticides in wetlands, water courses, buffers and riparian areas. Avoid livestock grazing in wetlands. Severely limit and/or control livestock grazing in stream riparian areas. Control livestock access to streams. Avoid "mining" for sand, gravel or cobble from channel features.

Select Habitat Requirements for Other South Dakota Wildlife (not inclusive)

Guild	Species	State Distribution ¹	Resident year-round [R], Spring/Summer [SM], Winter/Spring [WM]; Migrant Only [M]	Nesting ¹	Nesting Habitat Type ^{1,2,6}	Habitat Connectivity Requirements (e.g. upland and wetland)	Life History Space Requirements (e.g. loafing/resting, feeding, display, migratory corridors)	Life History Food Requirements (e.g. season, age class)	Territoriality ^{2,10} (breeding density; may overlap)	Area Sensitive Species ^{10,11}	Robel VOR ^{2,3,4 or 6} (inches)	Vegetation Height ^{2,3,4 or 6} (inches)	Litter Depth ^{2,3,4 or 6} (inches)	Grazing Response ¹² Responses are (-) negative, (+) positive, (0) neutral, or (?) unknown		Disturbance Regime (grazing) ^{2,3,4, 6, 10}	
														Annual (50% forage consumed)	Periodic (50%; 2-5 yrs East River; 3-10 yrs West River)		
Grassland Birds	Upland Sandpiper	Statewide	SM	Late May - mid July	extensive, open tracts of short grassland habitat; native prairie, dry meadows, pastures, domestic hayfields, plowed fields, along highway rights-of-way, & dry patches of wet meadows	large areas of short grass for feeding and courtship with interspersed or adjacent taller grasses for nesting and brood cover	foraging and loafing occur within nesting habitat	invertebrates	20-30 acres	highly sensitive; requires large habitat patches	9	24	10	-	+	light - west; light to moderate - east	
	Lark Bunting	Statewide	SM	June - July	xeric Mixed grass prairie	none provided	foraging and loafing occur within nesting habitat	seeds and invertebrates	1 male/0.5 acres	unknown	none provided	20 (forb)	<1	-	+	light to moderate	
	Savannah Sparrow	Statewide	SM	Mid June - July	tallgrass prairie, idle and lightly grazed mixed-grass prairie, shortgrass, wet meadow zones surrounding prairie wetlands, alfalfa hayfields, native and tame dense nesting cover, Conservation Reserve Program lands, weedy crop and stubble fields, retired cropland, and wheat fields	none provided	foraging and loafing occur within nesting habitat	seeds and invertebrates	0.10-3.0 acres	highly sensitive; requires large habitat patches	none provided	short to intermediate	Well developed	not listed	not listed	moderate - east; light to moderate - west	
	Grasshopper Sparrow	Statewide	SM	June - July	grasslands of intermediate height and are often associated with clumped vegetation interspersed with patches of bare ground	none provided	foraging and loafing occur within nesting habitat	seeds and invertebrates	0.21 males/2.5 acres	highly sensitive; requires large habitat patches	none provided	>4	moderately deep	-	+	light to moderate - east; light - west	
	Baird's Sparrow	Nesting - Northwest and north central; Statewide migrant except BH	SM	Mid June - Mid July	xeric Mixed grass prairies and wet meadows within mixed grass prairies during dry years	none provided	foraging and loafing occur within nesting habitat	seeds and invertebrates	1 male/3.5 acres	unknown	none provided	4 to 12	0.5 to 1.5	-	+	idle to light	
	Le Conte's Sparrow	Nesting - East River north; East River migrant	SM	June - July	tall, dense vegetation in wet meadows and wetland edges but avoids standing water; dense grasslands with litter	none provided	foraging and loafing occur within nesting habitat	seeds and invertebrates	1 male/0.5 acres	unknown	none provided	tall	dense	-	+	idle to light	
	Chestnut-collared Longspur	Nesting - Statewide except BH and southeast	SM	Late May - mid July	mixed and short-grass prairies and stubble fields	moister, more thickly vegetated mixed-grass habitat, avoid tall, dense vegetation, preferring sparser upland grasslands with more bare ground	foraging and loafing occur within nesting habitat	seeds and invertebrates	1 male/1 to 4 acres	unknown	4	21	<1	+	-	moderate to heavy - east; moderate - west	
	Western Meadowlark	Statewide	R	Mid May - July	tall and mixed grass prairies; tame and native grasses	none provided	foraging and loafing occur within nesting habitat	seeds and invertebrates	1 male/ 10 to 32 acres	tolerant	none provided	>4	moderately deep	not listed	not listed	light to moderate	
	Henslow's Sparrow	northeast and east central	SM	n/a	n/a	none provided	wet meadows and tall grass prairies with a weedy or shrubby component lightly to moderately grazed pastures	seeds and invertebrates	1 male/0.75 to 1.7 acres	highly sensitive; requires large habitat patches	none provided	tall	dense	-	+	light periodically, not during breeding season	
	Dickcissel	Statewide except Black Hills	SM	Mid June - July	tall grass prairie, hayfields, old fields and other tall grassy habitats (e.g. CRP)	areas with abundant forbs and few shrubs	foraging and loafing occur within nesting habitat	seeds and invertebrates	1 male/0.75 to 2.7 acres	tolerant	none provided	4 to >6	2 to 6	-	+	idle	
	Bobolink	Statewide	SM	Late June - July	mixed and tall grass prairies; areas with moderate to tall vegetation, moderate to dense vegetation, and moderately deep litter, and without the presence of woody vegetation	create large patches of habitat and minimize woody edges	foraging and loafing occur within nesting habitat	seeds and invertebrates	1 male/1.7 to 5 acres	highly sensitive; requires large habitat patches	none provided	4 to >6	moderately deep	-	+	idle to light w/ short duration grazing system	
	Sprague's Pipit	Nesting - Northwest and North central; Migrant West River except Black Hills	SM	June - July	nests in mixed grass prairie, alkaline meadows, and wet meadows; mid-height vegetation	upland mixed-grass prairie and wetland complexes including: alkaline meadows, and wet meadow zones around alkali and freshwater lakes	foraging and loafing occur within upland-wetland complexes	seeds and invertebrates	1 male/2.5 acres	highly sensitive; requires large habitat patches	3	<6	moderate	-	+	idle to light, rotational grazing system	
	Lapland Longspur	Statewide except Black Hills	WM	n/a	n/a	none provided	forages and loafs in open country; typically seen in bare fields, wind-swept roads.	seeds	n/a	n/a	n/a	n/a	n/a	n/a	not listed	not listed	n/a
	Snow Bunting	Statewide except Black Hills	WM	n/a	n/a	none provided	forages and loafs in open country; grassy or weedy fields, stubble, and along roadsides and shores of lakes	seeds	n/a	n/a	n/a	n/a	n/a	n/a	not listed	not listed	n/a
	Horned Lark	Statewide	R	Late April - Mid July	mixed and tall grass prairies, sandy regions, areas with scattered low shrubs, grazed pastures, stubble fields, open cultivated areas; nests in hollow on ground often next to grass tuft or clod of earth or manure.	none provided	forages and loafs within breeding habitat	seeds and invertebrates	n/a	n/a	n/a	n/a	n/a	n/a	not listed	not listed	n/a
	McCown's Longspur	far west edge of state except BH	SM	n/a	n/a	none provided	short-grass prairies and areas with short vegetation such as prairie dog towns, stubble fields and bare ground	seeds and invertebrates	n/a	unknown	none provided	<4	<1	+	-	moderate to heavy	

Select Habitat Requirements for Other South Dakota Wildlife (not inclusive)

Guild	Species	State Distribution ¹	Resident year-round [R], Spring/Summer [SM], Winter/Spring [WM]; Migrant Only [M]	Nesting ¹	Nesting Habitat Type ^{1,2,6}	Habitat Connectivity Requirements	Life History Space Requirements	Life History Food Requirements	Territoriality ²	Area Sensitive Species ^{10,11}	Grazing Response ¹²		Disturbance Regime (grazing) ^{6,11}
											Responses are (-) negative, (+) positive, (0) neutral, or (?) unknown	Periodic (50%; 2-5 yrs East River; 3-10 yrs West River)	
											Annual (50% forage consumed)		
Wetland/Riparian Associated Songbirds	Lazuli Bunting	Statewide except interior Black Hills	SM	Mid June - July	nests in small trees, shrubs, or vines, 0.3-3 m above ground	riparian woodlands and groves; usually requires shrubs in prairie draws and grasslands	within nesting habitat	seeds and insects	none provided	unknown	not listed	not listed	not listed
	Red-Winged Blackbird	Statewide	R	Late May - July	PEM and PSS wetlands with tall emergent vegetation; fields with weeds or shrubs and feedlots	wetlands and uplands	within nesting habitat; forages up to 8 km from nest	seeds and insects	0.5 - 1.75 acres	tolerant	not listed	not listed	not listed; probably light
	Yellow-Headed Blackbird	All counties except interior Black Hills	R	Late May - mid July	deeper sloughs, marshes, and lakes; feedlots	wetlands and uplands	forage in fields and muddy ground near water; on seed bearing plants; forages up to 1.6 km from nest	seeds and insects	0.05 to 0.20 acres	tolerant	-	+	not listed; probably light
	Marsh Wren	All counties except interior Black Hills	SM	June - July	PEM wetlands with tall emergent vegetation	wetlands	yellow headed blackbird precludes this species from nesting	insects	0.01 to 2.5 acres	tolerant	-	+	USE EXCLUSION
	Sedge Wren	East River	SM	June - July	AVOIDS cattail marshes; uses damp sedge meadows, riparian edges, grasslands near water	prefers landscapes dominated by grasslands	vegetation types and soil moisture regimes that are highly susceptible to drying or flooding caused by annual and seasonal variation in rainfall.	insects	1 male/0.30 to 1.0 acres	highly sensitive; requires large habitat patches	-	+	Light
	Yellow Warbler	Statewide except interior Black Hills	SM	June - mid July	nests in upright fork or crotch of bush (e.g., willow), sapling, or large tree, from less than a meter above ground to high in tall trees	edges of PSS and PEM wetland types; PSS/PFO riparian wetlands	within riparian corridor or along wetland edge	insects	0.4 acres	tolerant	not listed	not listed	not listed
	Common Yellowthroat	Statewide	SM	Mid June - July	nests just above ground or over water, in weeds, reeds, cattails, grass tussocks, brier bushes, and similar situations; often at base of shrub or sapling, sometimes higher in weeds or shrubs up to c. 1 m	dense marsh vegetation, streamside thickets, tall grass prairie, and woodland edges	within riparian corridor or along wetland edge	insects	0.5 to 1.5 acres	tolerant	not listed	not listed	not listed
	Northern Waterthrush	All counties except interior Black Hills	SM	n/a	n/a	woods and water	deciduous woodlands and groves, especially along streams	insects	n/a	n/a	not listed	not listed	not listed
	Louisiana Waterthrush	Southeastern Iowa and Minnesota boarder counties	SM	n/a	n/a	woods and water	woodlands near water	insects	n/a	n/a	not listed	not listed	not listed
	Willow Flycatcher	Statewide except interior Black Hills	SM	Mid June - Mid July	shrubs and small trees often near water	conduct most of their activity within their defended territory, but will also use adjacent areas, especially when feeding young	use scattered trees for song and foraging perches and gleaning substrate	insects	1 male/0.75 to 1.0 acres	unknown	-	-	unknown but probably none to light
	Bell's Vireo	Statewide except Black Hills, northwest and northeast	SM	June - mid July	nests in shrub or low tree (5-10 yr age class), usually averaging about one meter above ground, typically near edge of thicket	shrubby riparian thickets and woody draws; riparian habitats are critical in semi-arid. Isolated habitats are important for wandering females	forages in dense brush, occasionally in treetops.	insects	0.25 to 1.25 acres	unknown	-	-	unknown but probably none to light
	Veery	Nesting - Black hills and northeast; statewide migrant	SM	Mid June - Mid July	damp woodlands and riparian thickets	dense, damp understory	within nesting habitat	insects and fruit	0.25 to 5.0 acres	area sensitive	not listed	not listed	none to light
	Ovenbird	Statewide	SM	June - early July	nests on the ground in wooded riparian areas, woodlands, and forests	forest and woodland fragmentation should be avoided	most often requires a closed canopy; foraging requires deep leaf litter	insects	none provided	area sensitive	not listed	not listed	not listed
	Swamp Sparrow	East River	SM	June - mid July	all wetland types; riparian areas	none provided	within nesting habitat	seeds and insects	0.25 to 1.5 acres	tolerant	not listed	not listed	not listed
Belted Kingfisher	Statewide	R	Mid May - Mid July	typically nests in a burrow in the bank of a creek, river, lake, pond, gravel or sand pit, or embankment of a road or railroad; usually but not always near water	Availability of foraging sites may be more limiting than the availability of nest sites. Regularly forages up to 8 km from the nest. Rarely fishes up to a kilometer offshore.	forages along stream, lake and marsh edges	fish and occasionally omnivore	dependent on tree edges and shape of marsh	tolerant	not listed	not listed	not listed	
Trumpeter Swan	West River	B	Mid April - July	shallow lakes and open marshes; edges of large inland waters; typically in emergent marsh vegetation, or on a muskrat house, beaver lodge, or island	may graze in fields	within nesting habitat	plants and invertebrates	5 to 10 acres	area sensitive	?	?	not listed	

Select Habitat Requirements for Other South Dakota Wildlife (not inclusive)

Guild	Species	State Distribution ¹	Resident year-round [R], Spring/Summer [SM], Winter/Spring [WM]; Migrant Only [M]	Nesting ¹	Nesting Habitat Type ^{1,2,6}	Habitat Connectivity Requirements	Life History Space Requirements	Life History Food Requirements	Territoriality ²	Grazing Response ¹²		Disturbance Regime (grazing) ^{6,10}
										Responses are (-) negative, (+) positive, (0) neutral, or (?) unknown	Periodic (50%; 2-5 yrs East River; 3-10 yrs West River)	
Wading Birds						(e.g. upland and wetland)	(e.g. loafing/resting, feeding, display, migratory corridors)	(e.g. season, age class)	(breeding density; may overlap)	Annual (50% forage consumed)		
	American Bittern	Statewide except Black Hills	SM	Mid June - late July	sloughs, marshes, riparian areas and dry grassy areas near wetlands; substantial emergent vegetation and variable open water	smaller wetlands not used for nesting are used for foraging	all-purpose territory provides both feeding and nesting sites	carnivorous	home range 320 acres; core use area 65 acres	-	+	Avoids grazed areas
	Least Bittern	East River and Bennett Co.	SM	Early June - mid July	Marshes and sloughs with dense emergent vegetation. Cattail stands of at least 15 acres interspersed with open water are most suitable for breeding. Nests usually built over shallow water (0.1-1.0 m deep) and tend to be near, less than ten meters from open water.	smaller wetlands not used for nesting are used for foraging	all-purpose territory provides both feeding and nesting sites	carnivorous	semicolonial	not listed	not listed	unknown
	Great Blue Heron	Statewide	SM; R in SE	April - May	requires large trees or shrubs for colonies; all wetland types.	ponds, larger streams, lakes, wetlands, upland pastures and grasslands	generally nests close to foraging habitat (wetlands, rivers, lakes); may forage in ag. Fields	carnivorous	colony nesting	not listed	not listed	unknown
	Little Blue Heron	East River	SM	Mid June - July	nests in trees and shrubs to about 4 m above ground or water	large marshes with dense but open stands of cattails, bulrushes and other emergent vegetation	forages in emergent wetlands and shallow (length of their legs) open water	carnivorous	colony nesting	not listed	not listed	not listed
	Tricolored Heron	Northeast	SM	June - July	Requires trees or shrubs for colonies; all wetland types	none	forages in emergent wetlands and shallow (length of their legs) open water	carnivorous	colony nesting	not listed	not listed	not listed
	Green Heron	East River, Gregory, Fall River and Custer Counties	SM	Mid May - June	requires trees or shrubs for nests; all wetland types; riparian areas	non-shrub or forested wetlands and riparian areas not used for nesting may be used for foraging	forages in emergent wetlands and shallow (length of their legs) open water	carnivorous	Usually nests singly sometimes colony nesting	not listed	not listed	not listed
	Black-Crowned Night-Heron	Nesting - East River and Bennett Co.; Statewide migrant	SM	Late May - July	all wetland types with substantial emergent vegetation and variable open water; riparian areas; usually nests in trees or shrubs but can nest on ground	non-shrub or forested wetlands and riparian areas not used for nesting may be used for foraging	forages in emergent wetlands and shallow (length of their legs) open water	carnivorous	Usually nests singly sometimes colony nesting	not listed	not listed	unknown
	Yellow-Crowned Night-Heron	East River	SM		all wetland types with substantial emergent vegetation and variable open water; riparian areas; usually nests in trees or shrubs but can nest on ground	non-shrub or forested wetlands and riparian areas not used for nesting may be used for foraging	forages in emergent wetlands and shallow (length of their legs) open water	carnivorous	Usually nests singly sometimes colony nesting	not listed	not listed	not listed
	Snowy Egret	Northeast and Bennett Co. resident; East River migrant	SM	Early June - mid July	nests in trees or shrubs or, in some areas, on ground or in marsh vegetation	non-shrub or forested wetlands and riparian areas not used for nesting may be used for foraging	forages in emergent wetlands and shallow (length of their legs) open water	carnivorous	colony nesting	not listed	not listed	not listed
	Great Egret	Northeast resident; Statewide migrant	SM	Mid June - July	nests in trees or shrubs or, in some areas, on ground or in marsh vegetation.	non-shrub or forested wetlands and riparian areas not used for nesting may be used for foraging	forages in emergent wetlands and shallow (length of their legs) open water; may forage in farm fields.	carnivorous	colony nesting	not listed	not listed	not listed
	Cattle Egret	East River	SM	Early June - mid July	pastures and wetland edges; large wetlands with dense but open areas of cattails and bulrushes	non-shrub or forested wetlands and riparian areas not used for nesting may be used for foraging	forages on land (pastures, riparian areas or upland).	carnivorous	colony nesting	not listed	not listed	not listed
	Sandhill Crane	Statewide	M		wet fields, lowland meadows and shallow lakes	none provided	forages in marshes, meadows, pastures, and fields	omnivore	n/a	not listed	not listed	not listed
	American Coot	Statewide	R	May - July	permanent emergent wetlands	none provided	forages and loafs in emergent wetlands	opportunistic	vicinity of nest	-	+	not listed
	Sora	Statewide	SM	June - August	shallow emergent wetlands (cattail, sedge, or bulrush)	none provided	forages and loafs in emergent wetlands	seeds and invertebrates	vicinity of nest	-	+	USE EXCLUSION
	Virginia Rail	Statewide except interior Black Hills	SM	Late May - mid August	emergent wetlands with substantial emergent vegetation and variable open water; wet meadows	none provided	inhabits shallow emergent wetlands of every size and type from roadside ditches and borders of lakes and streams to large cattail marshes	seeds, invertebrates, and plants	vicinity of nest	-	+	USE EXCLUSION
	White-Faced Ibis	Nesting- northeast; Statewide Migrant	SM	June - July	nests in marshes; in low tree, on the ground in bulrushes or reeds, or on a floating mat.	none	forages in emergent wetlands and shallow (length of their legs) open water, flooded fields	carnivorous	colony nesting	not listed	not listed	not listed

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										Responses are (-) negative, (+) positive, (0) neutral, or (?) unknown	Annual (50% forage consumed)		Periodic (50%; 2-5 yrs East River, 3-10 yrs West River)
Shorebirds	GENERAL CONSIDERATIONS: Due to variation in water levels over seasons or years, wetland complexes are more likely to have at least some wetlands with water and plant regimes favorable to a particular species, thus ensuring diverse species' representation in a geographical area												
	Black-Bellied Plover	Statewide except Black Hills	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs along shorelines, mud flats, and wet fields	invertebrates and seeds	n/a	not listed	not listed	not listed	
	American Golden-Plover	East River	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs in short grass, stubble, bare dirt near puddles	invertebrates	n/a	not listed	not listed	not listed	
	Semipalmated Plover	Statewide except Black Hills	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs along mudflats and shallow ponds	invertebrates	n/a	not listed	not listed	not listed	
	Piping Plover	T&E species refer to SD GF&P Wildlife Management Plan (2005)			sandbars and shores						+	-	
	Least Tern	T&E species refer to SD GF&P Wildlife Management Plan (2005)			sandbars, beaches and islands						-	+	
	Killdeer	Statewide except Black Hills	SM	April - June	nests on ground in open dry or gravelly situations, sometimes in similar situations on roofs, driveways, etc.	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs in fields, muddy areas and shorelines	invertebrates	<1 acre	+	-	moderate	
	Black-Necked Stilt	Statewide except Black Hills	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs in shallow water with soft muddy bottom; grassy marshes, mudflats, shallow ponds, flooded fields	invertebrates	n/a	not listed	not listed	not listed	
	American Avocet	Statewide except Black Hills	SM	Late May - mid July	Usually nests on open flats or areas with scattered tufts of grass on islands or along lakes (especially alkaline) and marshes. Readily nests on artificial islands (such as those created for waterfowl) in impoundments	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs along mudflats and shallow ponds	invertebrates	colony nesting	not listed	not listed	unknown	
	Greater Yellowlegs	Statewide except Black Hills	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs in shallow water with soft muddy bottom; grassy marshes, mudflats, shallow ponds, flooded fields	invertebrates	n/a	not listed	not listed	not listed	
	Lesser Yellowlegs	Statewide except Black Hills	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs in shallow ponds, mud flats and flooded meadows	invertebrates	n/a	not listed	not listed	not listed	
	Solitary Sandpiper	Statewide	M	n/a	n/a	favors areas where vegetation extends to the water's edge	forages and loafs in streamside's, wooded ponds, mudflats, and flooded meadows	invertebrates	n/a	not listed	not listed	not listed	
	Willet	Nesting - statewide except southeast; statewide migrant	SM	Mid June - early July	nests on the ground in open places; mudflats and wet meadows	Breeding requires large expanses of short, sparse grasslands for nesting and foraging, and wetland complexes for foraging. In both upland and wetland habitats, adults with broods use somewhat taller, denser grass cover than do breeding pairs during nesting	Territories are large and include both feeding and nesting areas. Nonbreeding: forages singly or small loose groups; gathers in large flocks to sleep or rest. Avoids dense wetland vegetation.	invertebrates	highly variable; 110 acres	+	0	Moderate to heavy, before 3/1 or after nesting	
	Spotted Sandpiper	Statewide	SM	Mid June - mid July	lake and stream edges; prefers rocky areas	nests near freshwater in both open and wooded areas, less frequently in open grassy areas away from water; on ground in growing herbage or low shrubby growth, or against log or plant tuft	Forages along shores or some distance inland if insects are abundant there.	invertebrates	1 female/ 0.25 acre	not listed	not listed	not listed	
	Whimbrel	Statewide except Black Hills	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs along mudflats, wet meadows, flooded fields, and rocky shores	invertebrates; can eat berries	n/a	not listed	not listed	not listed	
	Long-Billed Curlew	Missouri River counties west except Black Hills	SM	May - June	Mixed grass prairies. Nests on ground usually in flat area with short grass, sometimes on more irregular terrain, often near rock or other conspicuous object.	generally nests near water so upland and water bodies	forages on sand or mud in or near shallow water and on shrubbery.	opportunistic	15 to 20 acres	0	+	Moderate - deferred until late June	
	Hudsonian Godwit	East River and Bennett Co.	M	n/a	n/a		forages and loafs in marshes, mud flats, and wet fields	invertebrates	n/a	not listed	not listed	n/a	
	Marbled Godwit	Nesting - Statewide except Black Hills, northwest and southeast	SM	Late May - early July	Nests on ground in grassy prairies, pastures, and hayfields, near lakes and ponds. Often nests in semi-permanent wetlands, may select ephemeral alkali and temporary ponds when available.	Short, sparse to moderately vegetated landscapes that include native grasslands and wetland complexes including ephemeral, temporary, seasonal, semipermanent, and permanent wetlands, as well as intermittent streams. Often in flooded livestock feedlots.	forages and loafs within breeding habitat	invertebrates	1 male/ 200 to 250 acres	+	0	Previously heavily grazed but idle during breeding season; if season long then delay grazing until mid June	

Guild	Species	State Distribution ¹	Resident year-round [R], Spring/Summer [SM], Winter/Spring [WM]; Migrant Only [M]	Nesting ¹	Nesting Habitat Type ^{1,2,6}	Habitat Connectivity Requirements	Life History Space Requirements	Life History Food Requirements	Territoriality ²	Grazing Response ¹²		Disturbance Regime (grazing) ^{6,10,11}
										Responses are (-) negative, (+) positive, (0) neutral, or (?) unknown	Annual (50% forage consumed)	
Shorebirds	GENERAL CONSIDERATIONS: Due to variation in water levels over seasons or years, wetland complexes are more likely to have at least some wetlands with water and plant regimes favorable to a particular species, thus ensuring diverse species' representation in a geographical area											
	Ruddy Turnstone	Statewide except Black Hills	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs on rocky shorelines, sandy beaches, mudflats, and plowed fields	opportunistic	n/a	not listed	not listed	not listed
	Red Knot	East River	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs on mudflats and sandy shorelines	invertebrates, seeds, fish	n/a	not listed	not listed	not listed
	Sanderling	Statewide except Black Hills	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs on sandy shores, flooded gravel roads, and mudflats	invertebrates	n/a	not listed	not listed	not listed
	Semipalmated Sandpiper	Statewide except Black Hills	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs on mudflats, sandy beaches, shores of lakes and ponds, and wet meadows	invertebrates	n/a	not listed	not listed	not listed
	Western Sandpiper	Statewide except Black Hills	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs on mudflats, beaches, shores of lakes and ponds, shallow lagoons, and flooded fields	invertebrates	n/a	not listed	not listed	not listed
	Least Sandpiper	Statewide except Black Hills	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs on shorelines, mudflats, flooded fields and meadows	invertebrates	n/a	not listed	not listed	not listed
	White-Rumped Sandpiper	Statewide except Black Hills	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs on grassy marshes, mudflats, sandy beaches, flooded fields, and shores of ponds and lakes	invertebrates	n/a	not listed	not listed	not listed
	Baird's Sandpiper	Statewide except Black Hills	M	n/a	n/a	dry grassy areas near lakes and ponds, rarely dry pastures and prairies away from water	Prefers foraging and loafing on grassy margins of ponds, marshes, and wet pastures	invertebrates	n/a	not listed	not listed	not listed
	Pectoral Sandpiper	Statewide except Black Hills	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs on flooded meadows, mudflats and shorelines	invertebrates	n/a	not listed	not listed	not listed
	Dunlin	East River	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs on mudflats and shorelines	invertebrates	n/a	not listed	not listed	not listed
	Stilt Sandpiper	Statewide except Black Hills	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs on mudflats, flooded fields and shorelines	invertebrates	n/a	not listed	not listed	not listed
	Buff-Breasted Sandpiper	Statewide except Black Hills	M	n/a	n/a	edges of ponds are used for wading, drinking, and bathing, but not feeding	forages and loafs on wet meadows and ploughed, newly planted, or recently burned fields; man-altered habitats	invertebrates	n/a	not listed	not listed	not listed
	Short-Billed Dowitcher	Statewide except Black Hills	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs on mudflats, flooded fields, shorelines, and shallow ponds	invertebrates	n/a	not listed	not listed	not listed
	Long-Billed Dowitcher	Statewide except Black Hills	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs on mudflats, flooded fields, shorelines, and shallow ponds	invertebrates	n/a	not listed	not listed	not listed
	Wilson's Phalarope	Statewide except Black Hills and southeast	SM	Late May - June	nesting habitat varies widely, including wetlands, wet meadows, upland grasslands, and road rights-of-way	grazing and disturbances during nesting highly detrimental.	forages and loafs on wet meadows, shallow ponds, and shorelines	invertebrates	gregarious and nonterritorial	-	+	Defer until after July 15
	Red-Necked Phalarope	Statewide except Black Hills	M	n/a	n/a	wetland fluctuating water levels (temporary and seasonal); any area where a fluctuation exposes a mudflat & provides invertebrates	forages and loafs on shallow ponds and shorelines	invertebrates	n/a	not listed	not listed	not listed
Common Snipe	Statewide	SM	May - June	nests in tussock of vegetation in or at edge of marsh, wet meadow, or bog	none provided	forages and loafs on wet meadows, roadside ditches, mudflats, and shorelines	invertebrates	none provided	not listed	not listed	not listed	
American Woodcock	eastern edge of East River	SM	May - early June	deciduous forests, forest edges, and moist thickets	ideal habitat consists of young forests and abandoned farmland mixed with forested land; generally considered an edge species	Requires open display areas. But, forages under vegetative cover. Closely associated with young, second-growth hardwoods and other early-successional habitats that are a result of periodic forest disturbance.	invertebrates	vicinity of peenting/singing grounds	not listed	not listed	not listed	

Select Habitat Requirements for Other South Dakota Wildlife (not inclusive)

Guild	Species	State Distribution ¹	Resident year-round [R], Spring/Summer [SM], Winter/Spring [WM]; Migrant Only [M]	Nesting ¹	Nesting Habitat Type ^{1,2,6}	Habitat Connectivity Requirements	Life History Space Requirements	Life History Food Requirements	Territoriality ²	Grazing Response ¹² Responses are (-) negative, (+) positive, (0) neutral, or (?) unknown	Disturbance Regime (grazing) ^{6, 10, 11}	
Other Waterbirds	GENERAL CONSIDERATIONS: Due to variation in water levels over seasons or years, wetland complexes are more likely to have at least some wetlands with water and plant regimes favorable to a particular species, thus ensuring diverse species' representation in a geographical area											
	Caspian Tern	Nesting - northeast and Lake Oahe; Statewide migrant except Black Hills	SM	June - July	lakes and rivers	none provided	forages and loafs along shorelines; forages over water	carnivorous	colony nesting	not listed	not listed	not listed
	Common Tern	Nesting - northeast and Lake Oahe; Migrant statewide except Black Hills	SM	June	emergent marshes, lakes and rivers	none provided	forages and loafs along shorelines; forages over water	carnivorous	colony nesting	not listed	not listed	unknown
	Forster's Tern	Statewide except Black Hills	SM	June - early July	emergent marshes, lakes and rivers	none provided	forages and loafs along shorelines; forages over water	carnivorous	colony nesting	not listed	not listed	not listed
	Black Tern	Statewide except Black Hills	SM	June	lakes and marshes; nearly equal proportions of well-interspersed emergent vegetation and open water	more common in wetlands that had semipermanent wetlands within 0.4 km than in wetlands without semipermanent wetlands nearby; positively correlated with the total area of semipermanent wetlands in the surrounding landscape	avoids areas of dense monotypic cattails; loafs along shorelines; forages over water	carnivorous	semicolonial	-	+	unknown
	Franklin's Gull	Nesting - Northeast; Migrant statewide	SM	Late May - June	marshes, lakes and plowed fields	none provided	forages and loafs along shorelines and tilled fields; forages over water	invertebrates	colony nesting	-	+	unknown
	Bonaparte's Gull	Statewide	M			none provided	forages and loafs along shorelines and tilled fields; forages over water	invertebrates	n/a	not listed	not listed	not listed
	Ring-Billed Gull	Nesting - Northeast and Lake Oahe; Migrant statewide	WM; SM	Mid May - June	lakes, marshes, and large rivers	none provided	forages and loafs along shorelines and tilled fields; forages over water	opportunistic	colony nesting	not listed	not listed	not listed
	Herring Gull	Nesting - Lake Oahe; Migrant statewide	WM	May - June	marshes, rivers, and lakes	none provided	forages and loafs along shorelines and tilled fields; forages over water	opportunistic	n/a	not listed	not listed	not listed
	Pied-Billed Grebe	Statewide	SM	Mid May	lakes and wetlands with emergent vegetation	none provided	forages underwater in wetlands	invertebrates and fish	vicinity of nest	-	+	not listed
	Horned Grebe	Nesting - northcentral & northeastern counties; statewide migrant except Black Hills	SM	Late May - mid July	seasonally flooded wetlands and small ponds with emergent vegetation extensive open water	none provided	forages underwater in wetlands	invertebrates and fish	1 pair/<2.5 acres, but can be colony nesting	-	+	unknown
	Red-Necked Grebe	Uncommon resident in northeast; rare migrant East River	SM	Late May - mid July	wetlands with emergent vegetation and extensive open water; lakes	none provided	forages over or underwater in wetlands	invertebrates and fish	2.5 to 3.5 acres	not listed	not listed	unknown
	Eared Grebe	East River nesting; Statewide migrant	SM	Early June - mid July	seasonal to permanent wetlands with emergent vegetation and extensive open water	none provided	forages over or underwater in wetlands	invertebrates and fish	colony nesting	not listed	not listed	unknown
	Western Grebe	Statewide	SM	Late May - mid July	larger wetlands with emergent vegetation and extensive open water; lakes	none provided	forages underwater in wetlands	invertebrates and fish	vicinity of nest	not listed	not listed	unknown
	American White Pelican	Nesting - Northeast and Bennett Co.; Migrant - Statewide except Black Hills	SM	May - August	large bodies of water and sloughs; nests on small isolated islands and sandbars with gentle slopes free of shrubs	none provided	max distance between breeding site and breeding foraging area up to 300 km	fish	colony nesting	?	?	unknown

Select Habitat Requirements for Other South Dakota Wildlife (not inclusive)

Guild	Species	State Distribution ¹	Resident year-round [R], Spring/Summer [SM], Winter/Spring [WM]; Migrant Only [M]	Nesting ¹	Nesting Habitat Type ^{1,2,6}	Habitat Connectivity Requirements	Life History Space Requirements	Life History Food Requirements	Territoriality ²	Grazing Response ¹²		Disturbance Regime (grazing) ^{6,10,11}
										Responses are (-) negative, (+) positive, (0) neutral, or (?) unknown		
						(e.g. upland and wetland)	(e.g. loafing/resting, feeding, display, migratory corridors)	(e.g. season, age class)	(breeding density; may overlap)	Annual (50% forage consumed)	Periodic (50%; 2-5 yrs East River; 3-10 yrs West River)	
Raptors	Golden Eagle	Statewide	R; WM	February - June	generally open country, in prairies, open wooded country, and barren areas, especially in hilly or mountainous regions	within nesting habitat	within nesting habitat	carnivore	30-90 miles	not listed	not listed	Moderate to heavy
	Bald Eagle	Statewide	WM; SM	February - June	usually nests in tall trees or on cliffs near water. Nest trees include pines, spruce, firs, cottonwoods, oaks, poplars, and beech	generally requires water bodies, adjacent riparian area plus upland further away	Wintering areas: associated with open water though in some areas eagles use habitats with little or no open water if other food resources (e.g. rabbit or deer carrion) are readily available. Avoids areas with nearby human activity.	carnivore	variable	?	?	unknown
	Northern Harrier	Statewide except interior Black Hills	R; SM	Late April - early June	nests on the ground in tall vegetation within wetlands, riparian areas and upland grasslands	requires both uplands and wetlands	within nesting habitat	carnivore	25 - 125 acres	-	+	Idle to light
	Osprey	Nesting - Black Hills; Statewide migrant	SM	April - August	live or dead trees on the edge of lakes, streams or rivers or over the water on platforms	requires riparian edges and open water	within nesting habitat	fish	vicinity of nest	not listed	not listed	not listed
	Burrowing Owl	Statewide	SM	Late May - July	dry grasslands/pastures; usually associated with prairie dogs, badgers or ground squirrels	xeric uplands plus uplands with burrows	within nesting habitat	invertebrates and vertebrates	vicinity of nest burrow	+	0	Heavy for nesting; rotational grazing for prey
	Northern Saw-whet	Statewide	WM; R in Black Hills	May - mid June	dense coniferous or mixed forest, cedar groves, alder thickets, swamps, and tamarack bogs; Nests usually in old woodpecker hole, also in other tree cavity, or in nest box	may hunt in areas with thick shrub cover	when not breeding, in dense second growth, brushy areas, arid scrub, and open buildings; often roosts in dense evergreens in winter	carnivore	260 acres	not listed	not listed	not listed
	Eastern Screech Owl	Statewide except interior Black Hills	R	Late April - Early July	live and dead trees (snags and hollows); deciduous woodlands; mature trees	none provided	open woodland, deciduous forest, orchards, woodland/forest edge, residential areas in towns, scrub, and riparian woodlands	carnivore	260 acres	not listed	not listed	not listed
	Snowy Owl	Statewide	WM	n/a	n/a	none provided	open country such as prairie, marshes, fields, pastures, frozen lakes and sand dunes	carnivore	n/a	not listed	not listed	not listed
	Long-Eared Owl	Statewide	R	May - June	nests in tree usually in old nest of crow, squirrel, hawk, magpie, or heron; sometimes in tree cavity; rarely on ground; woodlands and forests	requires woods/forests and open areas	juniper and pine groves; woodland edges and open country with scattered trees; often hunts over grasslands, wetlands and old field	carnivore	260 acres	-	+	not listed
	Short-eared Owl	Statewide except interior Black Hills	R	May - June	builds a crude nest on the ground in open country (upland) often near wetlands or water	Broad expanses of open land with low vegetation for nesting and foraging are required.	open grasslands and cultivated fields	carnivore	40 - 500 acres	-	+	Light to Moderate

Select Habitat Requirements for Other South Dakota Wildlife (not inclusive)

Guild	Subgrouping or Species	State Distribution ^{7,8}	Resident year-round [R], Spring/Summer [SM], Winter/Spring [WM]; Migrant Only [M]	Breeding ^{7,8}	Habitat Type ^{7,8}	Habitat Connectivity Requirements	Life History Space Requirements (e.g. loafing/resting, feeding, display, migratory corridors)	Life History Food Requirements (e.g. season, age class)	Territoriality ² (breeding density; may overlap)	Disturbance Regime (grazing) ^{6,10,11}	
Mammals Associated with wetlands/riparian areas	Southern Bog Lemming	Gregory County	R	early spring late autumn	moist agricultural fields, sedge habitats, boggy sites, and grassy riparian areas	dense overhead canopy of grasses, humus (forest litter) or shrubs	within breeding habitat	herbivore	0.25 to 1.0 acres	unknown	
	Arctic Shrew	northeast (McPherson to Roberts counties)	R	March - September	moist valleys and lakeshores with an abundance of marsh grasses, willows, cattails, and mixed forbs; dry seasonal wetlands	fallen log/debris	within breeding habitat	invertebrates	0.25 acres	unknown	
	Masked Shrew (Hyden's Shrew)	Statewide	R	April - October	riparian woodlands, cattail marshes, shrublands/nongrasslands	burrowing in or using soil, fallen log/debris standing snag/hollow tree	within breeding habitat	invertebrates	0.5 to 1.5 acres	High Use/ Low Frequency (1 month/yr)	
	Meadow Vole	Statewide	R	year round, peak April to October	mesic grasslands, wet meadows, and riparian areas with cattails and other aquatic plants	needs loose organic soils for tunneling; build extensive underground tunnels	nests in these tunnels under rocks or logs, and in self-constructed grassy clumps	herbivore	0.25 acres	High Use/ Low Frequency (1 month/yr)	
	Mink	Statewide	R	February - April	favors forested, permanent or semipermanent wetlands with abundant cover, marshes, and riparian zones	wetland and riparian areas are required	dens in muskrat burrow, abandoned beaver den, hollow log, hole under tree roots, or in burrow dug by mink in streambank	carnivore and invertebrates	20-50 acres (female); 1900 acres or 5 miles (males)	any regime	
	Raccoon	Statewide	R	December - June	edges of all wetland types and riparian areas	very opportunistic and adaptable	within breeding habitat	omnivore	640 acres	any regime	
	Muskrat	Statewide	R	year round, peak April - August	all freshwater wetland types	none provided	within breeding habitat	herbivore	1 acre but variable	any regime	
	Mammals - Other	Black-tailed Prairie Dog		R	March	xeric mixed and short grass prairie	none provided	burrows; large colony areas	herbivore	colony	any regime
		Swift Fox		R	December - February	open prairie and arid plains, including areas intermixed with winter wheat fields.	none provided	burrows	Omnivore	hundreds to thousands of hectares	any regime
		Big Brown Bat	Statewide	R	Mate in autumn or winter; born in late May to Mid June	Multi-Habitat Roosting - LIVE or DEAD trees (beneath bark), caves, mines, crevices and buildings	none provided	forages within foliage and above land or water	invertebrates	clusters	n/a
Eastern Red Bat		Statewide except in treeless areas	R	Mate in Aug/Sept; born mid-June	Tree Roosting - Deciduous and coniferous LIVE trees w/ adequate foliage	none provided	forages within foliage and above land or water	invertebrates	solitary but can have family roosts	n/a	
Evening Bat		Extreme southeast	R	late spring or early fall	Multi-Habitat Roosting - highly forested areas w/ LIVE or DEAD trees (beneath bark), crevices and buildings	none provided		invertebrates	clusters	n/a	
Fringed Myotis		Primarily Black Hills and Badlands; West River	R	Mate in autumn, winter or spring; born in late June or early July	Multi-Habitat Roosting - desert shrub to pine associations at moderate elevations; caves, mines, crevices and buildings	none provided	forages close to canopy; near ground and thick or thorny vegetation	invertebrates	solitary or small groups	n/a	
Hoary Bat		Statewide except in treeless areas	R	Mate late summer or early fall; born in mid May - July	Tree Roosting - Deciduous and coniferous LIVE trees w/ adequate foliage; typically at least 10 ft tall on the forest edge	none provided	forages in open areas above land or water, or along waters edge	invertebrates	solitary but can have family roosts	n/a	
Little Brown Myotis		Statewide except extreme south central	R	Mate in autumn, winter or spring; born in July	Multi-Habitat Roosting - LIVE and DEAD trees, caves, mines, crevices and buildings east river - cottonwood floodplain forests and other deciduous woods	none provided	forages above land or water, or along waters edge	invertebrates	solitary or clusters	n/a	
Long-eared Myotis		Black Hills and northwestern West River	R	Mate in autumn; born in July or August	Multi-Habitat Roosting - coniferous forests at higher elevations or arid badlands; LIVE and DEAD trees (beneath bark), caves, mines, crevices and buildings	none provided	forages over water or among trees and around shrubs.	invertebrates	solitary or clusters	n/a	
Long-legged Myotis		Western 2/3 of West River	R	Born in late summer	Multi-Habitat Roosting - coniferous-juniper forest at moderate elevations; lowland riparian areas; live and dead trees, caves, mines, and crevices	none provided	forages around, through and over forest canopy, forest clearings, and over water.	invertebrates	solitary or clusters	n/a	
Northern Myotis	Primarily Black Hills and Badlands but statewide	R	Mate in autumn; born in late July	Multi-Habitat Roosting - LIVE and DEAD trees, caves, mines, crevices and buildings east river - cottonwood floodplain forests	none provided	forages above and below the canopy; over forest clearings and occasionally over water.	invertebrates	solitary or clusters up to 100 bats	n/a		
Silver-haired Bat	Breeding - Black Hills and Northeast; statewide migrant	R	Mate late summer or early fall; born in spring	Tree Roosting - Deciduous and coniferous live and dead under bark, in snags, cavities or crevices; snags important for young; riparian corridors and old growth	recruitment and retention of snags and the maintenance of structural complexity in upland as well as riparian areas are important	forages over small water bodies within wooded and forested areas	invertebrates	solitary	n/a		
Townsend's Big-eared Bat	Western 1/2 of West River	R	Mate in autumn, winter or spring; born in late June or early July	Cave-Roosting - require underground structure year round arid western desert scrub and pine forests; mines, caves	none provided	forages near the foliage of trees and shrubs	invertebrates	clusters	n/a		
Western Small-footed Myotis	Primarily Black Hills and Badlands; West River	R	Mate in autumn; born in late June or July	Multi-Habitat Roosting - Arid habitats with cliffs, talus fields, & prairies containing clay buttes and steep banks along rivers; caves & mines	none provided	forages along cliffs and rocky slopes	invertebrates	solitary or small groups	n/a		

Select Habitat Requirements for Other South Dakota Wildlife (not inclusive)

Guild	Subgrouping or Species	State Distribution ^{5,9}	Resident year-round [R], Spring/Summer [SM], Winter/Spring [WM]; Migrant Only [M]	Breeding ^{5,9}	Habitat Type ^{5,9}	Habitat Connectivity Requirements	Life History Space Requirements	Life History Food Requirements	Territoriality ²	Disturbance Regime (grazing) ^{6,10,11}
Turtles	* Indicates Herptile State Species of Special Concern					(e.g. upland and wetland)	(e.g. loafing/resting, feeding, display, migratory corridors)	(e.g. adult and non-adult)	(breeding density; may overlap)	
	Western Painted Turtle	Statewide	R	May	any permanent water body with rocks and/or logs in the mud	lays eggs out of water	foraging and loafing habitat are found within breeding habitat	omnivore	none provided	any regime
	Spiny Softshell	Southeast; southwest and west central West River	R	June - early July	rivers, large lakes, streams and reservoirs with sandy or muddy substrate	lays eggs out of water	foraging and loafing habitat are found within breeding habitat	omnivore	none provided	any regime
	Smooth Softshell	Missouri River	R	June - early July	large rivers	lays eggs out of water	foraging and loafing habitat are found within breeding habitat	carnivore	none provided	any regime
	False Map Turtle	Missouri River	R	late May - early July	large rivers and associated oxbows, wetlands close to rivers	lays eggs out of water	foraging and loafing habitat are found within breeding habitat	omnivore	none provided	any regime
	Western Ornate Box Turtle	south central West River	R	June	fully terrestrial, sandy soils; sandy grasslands of southcentral SD	fully terrestrial	foraging and loafing habitat are found within breeding habitat	invertebrates and omnivore	none provided	unknown
	Blandings Turtle	Southeast	R	early June	open, slow moving waters, wetlands and ponds w/abundant vegetation and muddy substrate	lays eggs out of water	foraging and loafing habitat are found within breeding habitat	omnivore	none provided	any regime
Frogs and Toads	Bull Frog	southern board counties of SD	R	late June - July	all wetland habitat types	terrestrial but return to water to lay eggs and complete lifecycle, and to hibernate	foraging and loafing habitat are found within breeding habitat	carnivore	2 to 37 feet	any regime
	Northern Leopard Frog	Statewide	R	Mid April - May	all wetland habitat types	terrestrial but return to water to lay eggs and complete lifecycle, and to hibernate	foraging and loafing habitat are found within breeding habitat	carnivore	109 yards	any regime
	*Wood Frog	Roberts County	R	early April - ?	permanently to semipermanently flooded wetlands interspersed with flooded trees, particularly hardwoods; coulees at the northern-most edge of the Minnesota River	terrestrial; overwinter partially frozen under leaf litter or detritus; returns to water to lay eggs and complete lifecycle	foraging and loafing habitat are found within breeding habitat	carnivore	none provided	unknown
	*Plains Leopard Frog	Southeast boarder counties (Tripp to Union county)	R	March - early June	unclear but maybe similar to N. Leopard Frog	terrestrial but return to water to lay eggs and complete lifecycle, and to hibernate	foraging and loafing habitat are found within breeding habitat	carnivore	none provided	unknown
	*Eastern Gray Treefrog	Roberts, Marshall, Day, Charles Mix, BonHomme, Yankton, Clay and Union Counties	R	Mid May - June	semipermanent wetlands that contain flooded trees or shrubs	terrestrial; overwinter partially frozen under leaf litter or detritus; returns to water to lay eggs and complete lifecycle	foraging and loafing habitat are found within breeding habitat	carnivore	none provided	unknown
	*Cope's Gray Treefrog	Charles Mix, Bon Homme, Yankton, Clay and Union Counties	R	Mid May - June	semipermanent wetlands that contain flooded trees or shrubs	terrestrial; overwinter partially frozen under leaf litter or detritus; returns to water to lay eggs and complete lifecycle	foraging and loafing habitat are found within breeding habitat	carnivore	none provided	unknown
	*Blanchard's Cricket Frog	Big Sioux, James and Missouri River	R	Late May - July	riparian wetlands	terrestrial, burrows underground, but return to water to lay eggs and complete lifecycle	foraging and loafing habitat are found within breeding habitat	carnivore	none provided	unknown
	Chorus Frog (Boreal)	Statewide	R	Early April - Late May	inhabit any wet areas but prefer shallow, grassy wetlands	terrestrial, burrows underground, but return to water to lay eggs and complete lifecycle	foraging and loafing habitat are found within breeding habitat	carnivore	none provided	unknown
	Plains Spadefoot	all but northeast and east central	R	May to August	sandy or loose soil; large temporary wetlands easily flooded after heavy rains, void of heavy vegetation	terrestrial, burrows underground, but return to water to lay eggs and complete lifecycle	foraging and loafing habitat are found within breeding habitat	carnivore	none provided	any regime
	Great Plains Toad	Statewide	R	Mid May - mid July	shallowly flooded seasonal wetlands in pastures and grasslands devoid of heavy vegetation	terrestrial, burrows underground, but return to water to lay eggs and complete lifecycle	foraging and loafing habitat are found within breeding habitat	carnivore	1000-4000 feet	any regime
	Canadian (Dakota) Toad	East River	R	May - July	margins of larger permanent and semipermanent lakes/wetlands with open water surrounded by aquatic vegetation	terrestrial, burrows underground, but return to water to lay eggs and complete lifecycle	foraging and loafing habitat are found within breeding habitat	carnivore	none provided	any regime
	Woodhouse's (Rocky Mtn) Toad	Statewide	R	Early March - early August	all wetland habitat types	terrestrial, burrows underground, but return to water to lay eggs and complete lifecycle	foraging and loafing habitat are found within breeding habitat	carnivore	none provided	any regime
	American toad	East River	R	May - July	creeks, temporary wetlands, garden ponds, and lake shorelines	terrestrial; overwinter by burrowing into well-drained, preferably sandy soils; returns to water to lay eggs and complete lifecycle	foraging and loafing habitat are found within breeding habitat	carnivore	up to 3,300 feet	any regime
	Salamanders	Tiger Salamander Subspecies								
Eastern		Southeast	R	March - April	most wetland types	terrestrial, overwinters in underground burrows; returns to water to lay eggs and complete lifecycle	foraging and loafing habitat are found within breeding habitat	carnivore	none provided	any regime
Blotched		Western and Central	R	March - April	most wetland types	terrestrial, overwinters in underground burrows; returns to water to lay eggs and complete lifecycle	foraging and loafing habitat are found within breeding habitat	carnivore	none provided	any regime
Gray		Northeast	R	March - April	most wetland types	terrestrial, overwinters in underground burrows; returns to water to lay eggs and complete lifecycle	foraging and loafing habitat are found within breeding habitat	carnivore	none provided	any regime
Barred		Black Hills	R	March - April	most wetland types	terrestrial, overwinters in underground burrows; returns to water to lay eggs and complete lifecycle	foraging and loafing habitat are found within breeding habitat	carnivore	none provided	any regime
*Mud Puppy		Marshall, Day and Roberts counties	R	??	permanent lakes and larger rivers and streams	entirely aquatic	foraging and loafing habitat are found within breeding habitat	carnivore	none provided	any regime