CRITERIA FOR RATING SOILS FOR WILDLIFE HABITAT ELEMENTS

Most managed wildlife habitats are created, improved, or maintained by protecting or manipulating existing vegetation; planting suitable vegetation; by earth moving to create or enhance conditions for wildlife; or by a combination of such measures.

The species, communities, and growth habits of plants that comprise wildlife habitat are affected by soil properties. These properties are considered for development of wildlife habitat.

The plant and water communities used as general habitat elements in South Dakota are as follows:

a. Grain and seed crops
b. Domesticated grasses and legumes
c. Native herbaceous plants
d. Planted woody plants
e. Native deciduous trees
f. Native shrubs
g. Native coniferous plants
h. Wetland food and cover
i. Shallow water development

The criteria for rating soil potential for wildlife habitat elements are based on the soil interpretive groupings used within the state for other land uses. Grain and seed crops are rated according to land capability classes; domesticated grasses and legumes according to pasture suitability groups; native herbaceous plants according to range sites; planted woody plants according to windbreak suitability groups and slopes; and native deciduous trees and shrubs and native coniferous plants according to naturally wooded soils and canopy cover.

Wetland food and cover are rated according to soil drainage class, slope, and salinity. Criteria for rating soils for shallow water developments include soil drainage class, depth to bedrock, slope, and salinity are used to rate potential for construction of dams and levees.

The potential of soils is determined by evaluating the soils for their limitations to produce the wildlife habitat elements. It should be recognized that kinds and numbers of wildlife species using an area will continue to be largely determined by current land use and land use management. The best and most probable conservation uses of soils influence the ratings but not the current land use that might occur on a specific soil. Soils are rated in their unmodified condition. That is, they are rated for dryland production characteristics. Soils are rated without regard to their relationship with adjoining soils. Rating criteria apply only to habitat elements not to wildlife populations.

The rating of soils for producing wildlife habitats provides (1) an aid in the selection of sites for habitat management; (2) indication of management intensity needed to produce satisfactory results; (3) a means of grouping soils for broad scale wildlife land use planning; and (4) materials for interpretation sheets and other printed published material.

Rating Scale

Rating criteria for each habitat element are established on a four level scale. The rating levels are defined as follows:

1. Good: Habitats can be easily established, constructed, improved, or maintained. There are few or no soil limitations for the enhancement, maintenance, or creation of the vegetation element of habitat. Satisfactory results are generally assured.

2. Fair: Habitats usually can be established, constructed, improved, or maintained on these soils, but there are moderate soils limitations that affect habitat management or construction. A moderate intensity of management and fairly frequent attention may be required to maintain the resource base and assure satisfactory results.

3. Poor: Habitats can frequently be established, constructed, improved, or maintained on these soils but there are severe soil limitations.

Habitat establishment, management, or construction may be difficult, expensive, or require intensive effort. Results are questionable.

4. Very Poor: Soil limitations are very severe. Naturally occurring habitats can be maintained with specific management but it is generally not possible or feasible to establish, construct, or improve habitat on these soils.

The habitat elements are defined, examples are provided, and the criteria pertaining to each habitat element are given on the pages that follow.

Grain and Seed Crops

This habitat element includes domestic grains or other seed producing annual herbaceous plants usually established to produce wildlife foods. Examples of these crops include corn, sorghums, wheat, oats, soybeans, millets, buckwheat, and sunflowers. The land use capability class is used to indicate the potential of soils for producing wildlife food crops.

Rating Criteria:

1. Good: Soil conditions are favorable for repeated annual planting individually, in combinations, or in rotation of all climatically adapted species. Expected seed production is above average.
2. Fair: Soil conditions are suitable for the planting, individually or in combinations, of climatically adapted species, but requiring a conservation cropping system for soil improvement, protection, and maintenance. Seed production is expected to be about average.
3. Poor: Soil conditions are suitable for planting, individually or in combinations, a limited number of climatically adapted species, and require intensive conservation treatment for soil improvement, protection, and maintenance. Seed production is expected to be below average.
4. Very Poor: Soil conditions are such that production of grain and seed crops is impractical.

Table 1. Criteria for Rating Soils for Grain and Seed Crops

Potential	Capability Class
Good	I & II
Fair	III
Poor	IV
Very Poor	V, VI, VII, VIII

Domesticated Grasses and Legumes

This pertains to domesticated perennial grasses and herbaceous legumes that are established by planting and furnish wildlife habitat. Examples of these plants include smooth bromegrass, redtop, reed canarygrass, intermediate wheatgrass, tall wheatgrass, vetches, clovers, and alfalfa. Potential ratings are made using pasture suitability groups.

Rating Criteria:

1. Good: Soil conditions are favorable for the establishment of a wide variety of climatically adapted species and the maintenance of adequate stands for wildlife cover and food. Growth rates and forage or seed production are expected to be above average.
2. Fair: Soil conditions are suitable for the establishment of a wide variety of climatically adapted species. Fertilization or renovation is needed to maintain adequate cover and food. Growth rates and forage or seed production are expected to be about average.
3. Poor: Soil conditions are such that there are severe limitations that make renovation difficult or that may limit successful establishment to a very few species. Growth rates and forage or seed production are usually below average but may be higher for one or two species.
4. Very Poor: Soils are such that preclude the establishment of any but very sparse stands, or which make seeding, fertilization, or renovation either impossible or impractical.

Table 2. Criteria for Rating Soils for Domesticated Grasses and Legumes

Potential	Pasture Suitability Group
Good	A, F, K
Fair	D, E, G, H, I
Poor	B, C, J
Very Poor	Capability Class VI. A-J, and Not Suitable

Native Herbaceous Plants

This pertains to native plant communities occurring on range sites that provide food and/or cover for wildlife. These plant communities usually occur naturally, but may, on many range sites, be reestablished culturally. They succeed toward an optimum potential plant community under specific management. These plant communities in optimum and near optimum condition include primarily grasses, forbs, sedges, and low growing woody plants. They may include shrubs and trees. Plants are mostly native perennials but some native annuals and invader plants, both annual and perennial, will occur.

Ratings are made considering the optimum plant potential of range sites.

Rating Criteria:

1. Good: Successional response to beneficial management is rapid. Growth rate and seed production are expected to be above average. Soil conditions are favorable for the establishment and vigorous growth of a wide variety of species. Cultural reestablishment can be accomplished, generally without difficulty.

2. Fair: Soil conditions are suitable for a limited number of species. Growth rates and seed production may be high for one or two species, but in general, are expected to be about average. Cultural reestablishment can be accomplished, generally with difficulty.

3. Poor: Soil conditions are suitable for only a few species. Growth rates and seed production are below average. Successional response to beneficial management is moderate or slow. Cultural reestablishment is either very difficult or impractical.

4. Very Poor: Soil conditions are such that the numbers of adapted species and the total production is so low or unreliable that no significant food or cover for wildlife is produced.

Table 3. Criteria for Rating Soils for Native Herbaceous Plants

Potential	Pasture Suitability Group
Good	Loamy overflow, Loamy Terrace, Clayey overflow, Sandy, Silty, Clayey, Savannah, Loamy Terrace Overflow,[1/] Mountain Prairie, High Country Silty
Fair	Limy Subirrigated, Subirrigated, Wet Meadow,[1/] Saline Subirrigated, Saline Lowland, Sands, Thin Upland, Shallow, Porous Clay, Shallow Clay, Stoney Hills, High Country Shallow, Savannah
Poor	Claypan, Shallow to Gravel, Closed Depressions, Very Shallow, Thin Claypan, Choppy Sands, Dense Clay, Saline Upland, Shallow Dense Clay, Grazable Woodlands,[2/] Shallow Marsh, Wetland[3/]
Very Poor	Land types not placed in range sites

Planted Woody Plants

This pertains to deciduous and coniferous trees, shrubs, and woody vines established by planting that produce fruits, nuts, buds, catkins, twigs, or foliage used as cover or food by wildlife. Examples of these plants include wild plum, chokecherry, honeysuckle, buffaloberry, Russian olive, and green ash. Ratings are made using windbreak suitability groups and slopes, and the Class VIII land capability designation.

Rating Criteria:

1. Good: Soil conditions are well suited for dependable survival and vigorous growth of most of the climatically adapted woody species.
2. Fair: Soil conditions are somewhat less suitable for most of the climatically adapted woody species and growth of these species is favorable.
3. Poor: Soil conditions are suited only for a few woody species. Poor to fair growth may be attained but survival and longevity will be reduced.
4. Very Poor: The soils are unsuited for trees or soil conditions and are such that it is impossible or impractical for mechanical tree planting. Hand planting is generally possible on soils that are suitable for tree growth.

1/ The suitability of Overflow, Subirrigated, and Wet Meadow range sites vary by site and should be evaluated for each case because of potential for excess water for nesting cover. These range sites are generally good for winter cover or escape cover.

2/ Grazable woodlands are rated low because of the high number of trees in the community.

3/ Shallow Marsh and Wetland are rated as poor because of excess water for nesting cover, although winter cover value may be good.

Table 4. Criteria for Rating Soils for Planted Woody Plants

Potential	Windbreak Suitability Groups & Class VIII Lands	Slopes
Good	1, 2, 3, 4L	0-6
Fair	4C, 5, 6R	6-9
Poor	6G, 7, 8, 9	9-15+
Very Poor	10 and Capability Class VIII	

Native Deciduous Trees

This pertains to naturally wooded lands that provide food and/or cover for wildlife. Trees are at least 16 1/2 feet (5 meters) tall at maturity. Examples of these lands are the deciduous woodlands of northeastern and southeastern South Dakota, the predominantly deciduous woodlands on many of the larger alluvial flood plains throughout the state, woody draws, and some areas of the Black Hills.

Rating Criteria:

1. Good: Soil conditions are favorable for vigorous growth and reproduction of naturally occurring hardwood trees. Canopy cover is at least 25 percent.
2. Fair: Soil conditions are favorable for moderate growth and reproduction of naturally occurring deciduous trees. Canopy cover is from 5 to 25 percent.
3. Poor: Soil conditions provide only limited potential for growth and reproduction of naturally occurring hardwood trees. There are scattered or occasional trees with less than five percent canopy cover.
4. Very Poor: Soil conditions are such that essentially no deciduous trees will grow naturally.

Table 5. Criteria for Rating Soils for Native Deciduous Trees

Potential	Soils
Good	Naturally wooded soils (canopy cover of 25% or more)
Fair	Naturally wooded soils (5-25% canopy cover)
Poor	Soils with occasional or scattered trees or clumps of trees (5% canopy cover or less)
Very Poor	All other soils

Native Shrubs

This pertains to soils that naturally support a shrub community. Shrubs are defined as woody perennial plants, usually with multiple stems that are from 1 1/2 to 16 1/2 feet (0.5-5 meters) in height at maturity.

Rating Criteria:

1. Good: Soil conditions are favorable for vigorous growth and reproduction of naturally occurring shrubs. Canopy cover is at least 25 percent.
2. Fair: Soil conditions are favorable for moderate growth and reproduction of naturally occurring shrubs. Canopy cover is from 5 to 25 percent.
3. Poor: Soil conditions provide only limited potential for growth and reproduction of naturally occurring shrubs. There are

scattered or occasional shrubs with less than five percent canopy cover.

4. Very Poor: Soil Conditions are such that essentially no shrub habitat will grow naturally.

Table 6. Criteria for Rating Soils for Native Shrubs

Potential	Soils
Good	Naturally shrubby soils (canopy cover of 25% or more)
Fair	Naturally shrubby soils (5-25% canopy cover)
Poor	Soils with occasional or scattered shrubs (5% canopy cover or less)
Very Poor	All other soils

Native Coniferous Plants

This pertains to soils that naturally support a community of coniferous plants.

Rating Criteria:

1. Good: Soil conditions are favorable for vigorous growth and reproduction of naturally occurring coniferous plants. Canopy cover is at least 25 percent.

2. Fair: Soil conditions are favorable for moderate growth and reproduction of naturally occurring coniferous plants. Canopy cover is from 5 to 25 percent.

3. Poor: Soil conditions provide only limited potential for growth and reproduction of naturally occurring coniferous plants. There are scattered or occasional coniferous trees with less than five percent canopy cover.

4. Very Poor: Soil conditions are such that essentially no coniferous plants will grow naturally.

Table 7. Criteria for Rating Soils for Native Coniferous Plants

Potential	Soils
Good	Naturally wooded soils (canopy cover of 25% or more)
Fair	Naturally wooded soils (5-25% canopy cover)
Poor	Soils with occasional or scattered woody growth (5% canopy cover or less)
Very Poor	All other soils

Wetland Food and Cover

This pertains to soils and land types that have plant potentials and wetness characteristics capable of providing waterfowl breeding habitat and furbearer habitat.

Emergent aquatic plants common to these soils are smartweed, wild millets, cattails, bulrushes, saltgrass, spikerushes, rushes, sedges, managrass, and cordgrass.

Ratings are made considering the soil drainage class, slope, and salinity.

Rating Criteria:

1. Good: Soil conditions are favorable for growth of a wide variety of emergent aquatic plants valuable as food and cover. Vigor of growth and amount of seed production are above average.

2. Fair: Soil conditions are suited for a variety of emergent aquatic plants valuable as food and cover. Vigor of growth and amount of seed production are about average.

3. Poor: Soil conditions are such that only a very limited number of emergent aquatic plants valuable as food and cover are produced. Vigor of growth and amount of seed production is very low.

4. Very Poor: Soil conditions are such that emergent aquatic plants are not produced in stands that have a significant food or cover value for wetland wildlife.

Table 8. Criteria for Rating Soils for Wetland Food and Cover

Potential	Soil Drainage Class	Slope %	Salinity Electrical Conductivity mmhos/cm
Good	Very poorly drained, and poorly drained soils that are ponded over 50% of the time; marsh; intermittent lakes	0-2	0-4
Fair	Very poorly drained and poorly drained soils that are ponded less than 50% of the time	0-2	4-8
Poor	Somewhat poorly drained soils	0-2	8-12
Very Poor	Moderately well drained and better drained soils	>2	>12

Shallow Water Development

This pertains to the potential of soils for the improvement of natural wetland areas, such as shallow dugouts, shallow dugouts with island, level ditches, and blasted ponds, or for development of wetland areas created by the construction of dams and levees. The depth of these areas will generally not exceed eight feet. Natural wet areas that are aquifer fed or ponded are rated according to the criteria of soil drainage class, depth to bedrock, and salinity (Table 9). Wetland areas created by the construction of dams or levees are rated according to permeability, depth to bedrock, slope, and salinity (Table 10). Water is assumed to be available for these wetland areas.

Rating Criteria:

1. Good: Soil conditions are favorable for natural wet areas that remain ponded for long periods or for the construction and maintenance of shallow water areas involving control of water levels.

2. Fair: Soil conditions either somewhat limit natural wet areas because of unreliable water levels or present difficulties in creating or maintaining shallow water areas.

3. Poor: Soil conditions severely limit choice of measures; present serious construction problems; or pose major difficulties in maintaining desired water control.

4. Very Poor: Soil conditions are such that it is impossible or impractical to obtain sufficient water control to be of value to wetland wildlife.

Table 9. Criteria for Rating Soils for Improvement of Natural Wetland Areas

Potential	Soil Drainage	Depth to Bedrock Feet	Salinity Electrical Conductivity mmhos/cm
Good	Very poorly drained, and poorly drained soils that are ponded over 50% of the time; marsh; intermittent lakes	≥5	0-4
Fair	Very poorly drained and poorly drained soils that are ponded less than 50% of the time	≥5	4-8
Poor	Somewhat poorly drained soils	3-5	8-12
Very Poor	Moderately well drained and better drained soils	<3	>12

Table 10. Criteria for Rating Soils for Wetland Areas Created by the Construction of Dams and Levees

Potential	Permeability	Depth to Bedrock Feet	Slope %	Salinity Electrical Conductivity mmhos/cm
Good	Slow, very slow	≥5	0-2	0-4
Fair	Moderately slow	≥5	0-2	4-8
Poor	Moderate	3-5	0-2	8-12
Very Poor	Moderately rapid, very rapid	<3	>2	>12