



White-Tailed
Deer
Habitat
Requirements
&
Management
in Wyoming

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**White-Tailed Deer Habitat Requirements and
Management in Wyoming**

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Introduction

For many wildlife enthusiasts, white-tailed deer (*Odocoileus virginianus*) provide many hours of recreational and aesthetic benefits. Economically, white-tailed deer hunting in Wyoming generates millions of dollars in revenue for the state economy each year.



Figure 1. Ideal white-tailed deer habitat in Wyoming consists of lower elevation areas with alfalfa, corn, or small grain croplands located adjacent to streamside willow-cottonwood riparian habitat, wetland marshes, interspersed woodlots, or abandoned farmsteads with brushy cover areas.

Wyoming's greatest concentration of white-tailed deer has traditionally been located in the northeastern portion of the state in the Black Hills area. However, in recent years white-tail populations have been gradually increasing statewide along cottonwood-willow stream/river bottoms and in agricultural areas where alfalfa, corn, and small grain crops predominate. White-tailed deer association with these preferred habitat types makes private lands an important component in supporting deer populations.

Habitat requirements

White-tailed deer are shy, secretive, and elusive. Whitetails are active during the late afternoon, early evening, and early morning hours before they retreat to heavy protective cover offered by riparian areas, forested areas, or damp, brushy draws. Bedding locations are selected to provide optimum concealment, a view of surrounding terrain, and access to escape routes when danger threatens.

White-tailed deer are not animals associated with mature woodland areas. Rather, they prefer an interspersed habitat area where several habitat types exist in a subclimax or “temporary” condition prior to maturation. Also, a mix of habitat types such as open meadows, wetland/riparian areas, forested woodlots, brushy areas, and croplands provide diversity and attract white-tailed deer. Ideal white-tailed deer habitat in Wyoming includes the following combinations: lower elevation areas with alfalfa, corn, or small grain croplands located adjacent to streamside cottonwood-willow riparian habitat; wetland marshes; or interspersed woodlots with intermixed abandoned farmsteads reverting to brushy cover areas. In the Black Hills area of northeastern Wyoming, white-tailed deer prefer habitat where alfalfa fields or croplands are interspersed with ponderosa pine (*Pinus ponderosa*) forests and associated riparian areas.

Unlike mule deer (*Odocoileus hemionus*) whitetails are sedentary and migrate only a short distance, usually less than two miles, between winter and summer ranges. Most of the year they establish definite “home ranges” which may vary from a few hundred acres to more than a square mile depending on the arrangement and abundance of food, cover, and water.

In Wyoming, white-tailed deer ranges may support a population all year (year-long range) or only a portion of the year (seasonal ranges such as winter, summer, or transitional spring and fall). The ideal combination of essential habitat components (food, cover, and water) to support maximum deer densities will vary with the type of range. For example, escape cover may not be as important on winter range as in fawning areas, water is more important on late summer and fall ranges than on winter range, and certain evergreen

shrubs and trees are more important on winter range for thermal cover than on summer and transitional ranges. On year-long range, all three essential habitat components must be plentiful and properly interspersed to support deer populations.



Figure 2. Wetland marshes and willow riparian areas offer ideal winter thermal protection for white-tailed deer by providing protection from cold winds, thus decreasing body-heat loss.

Water requirements

White-tailed deer obtain much of their required water intake from water stored in succulent food sources such as vegetation growing near water sources. When native succulent vegetation and ephemeral ponds dry up in late summer and early fall, deer must depend on permanent streams, springs, and seeps for daily moisture requirements. In springs, available free water is essential on fawning areas to meet the requirements of lactating does.

The best way to ensure adequate water on deer range is to avoid the destruction of existing wetland and riparian habitat that supplies permanent water. Activities such as filling, draining, excavating, diverting water, removing vegetation, overgrazing, increasing nutrient loads, and introducing toxic chemicals may destroy water sources for deer. Dewatering of springs and seeps not only eliminates a source of water in later summer and fall but also removes essential food and cover plants growing in these moist areas.

Cover requirements

The primary functions of cover are to provide shelter from the weather, escape routes, and hiding places for security from predators and hunters. White-tailed deer cover requirements fall into two major categories: hiding cover (also known as escape or security cover) and thermal cover. Unlike antelope, deer do not have the ability to escape predators through extended high-speed maneuvers. Instead, deer use quick dashes into dense vegetation for protection. Feeding white-tailed deer rarely venture far from a heavily vegetated riparian river bottom, a woodland area, or a damp, bushy draw.

Hiding cover, defined as “any vegetation capable of hiding 90 percent of a deer from human view at a distance equal to or less than 200 feet,” provides the security needed by an animal throughout the year. Scattered patches of relatively dense vegetation (woodlots or brushy draws) from 10-30 acres in size or riparian bottom lands are adequate for hiding deer, provided these areas are not more than 0.25-0.5 mile apart.

Thermal cover, which helps an animal maintain body temperatures within tolerable limits to conserve energy for body maintenance and reproduction, must be available to protect deer from cold temperatures, high winds, and snows in winter as well as heat and insects in summer. Thick vegetation, such as dense stands of juniper and ponderosa pine, wetland marshes, and willow riparian areas decrease body-heat loss in white-tailed deer by providing protection from winter winds, thus reducing radiant heat loss.

Small evergreen trees and shrubs on winter ranges and deciduous trees and shrubs on summer and transitional ranges provide excellent thermal cover for deer. Deciduous trees

such as cottonwood or aspen which provide overhead shade and open understories to allow passage of cool breezes are examples of summer and transitional range thermal cover. Ideal summer thermal cover consists of sapling trees or shrubs at least 5 feet tall with 75 percent closure of the canopy.



Figure 3. Aspen stands offer summer and transitional range thermal cover by providing overhead shade and open understories to allow passage of cool breezes.

Winter thermal cover in a forest vegetation type should consist of evergreen trees at least pole size or larger with a minimum of 60 percent closure of the canopy. Optimum patches of winter or summer thermal cover should be 2-5 acres in size comprised of vegetation at least 3-5 feet tall. In Wyoming's Black Hills region, the ponderosa pine forest provides ideal winter thermal cover for white-tailed deer. In other areas of the state, juniper plant communities are important as summer and winter thermal cover and provide cover for daily movement patterns.

Food requirements

In addition to thermal cover, deer depend on the insulation of their coats and energy obtained from food to maintain body temperature. On the average, this requires the intake of 3½ to 4 pounds of good, dry-weight feed per 100 pounds of body weight per day during the winter.



Figure 4. White-tailed deer thrive in agricultural areas and often prefer cultivated crops such as corn, alfalfa, and small grains such as winter wheat, barley, and oats.

White-tailed deer diets vary seasonally, and thus important white-tailed deer ranges require a mixture of various vegetative types such as trees, shrubs, forbs (herbaceous, broad-leaved flowering plants), and grasses. Preferred

foraging areas are locations where food and cover occur together such as pastures or croplands adjacent to riparian bottom land areas. According to recent studies, white-tailed deer generally will not use foraging areas that are farther than 0.5-1 mile from protective vegetative cover.

White-tailed deer thrive in agricultural areas and often prefer cultivated crops such as alfalfa, corn, and small grains (winter wheat, barley, oats) over native browse. In some areas of Wyoming, white-tailed deer cause considerable damage to agricultural crops through excessive consumption, uprooting seedlings, and trampling. Crop damage by white-tailed deer is especially prevalent on irrigated farmland in arid areas where surrounding native forage dries up due to a lack of precipitation. Succulent forage on irrigated areas readily attracts white-tailed deer.

Palatability, succulence, and nutritional value are important factors in food selection by white-tailed deer. However, seasonal availability of the various plant communities, vegetative production, and seasonal metabolic requirements of deer also dictate selection of food materials during different times

of the year. Generally, the native seasonal foods of white-tailed deer consist of the following:

Spring – As early greening grasses and forbs emerge, white-tailed deer stop eating shrubs of relatively low nutritional value and start consum-

ing palatable, succulent, and nutritionally rich herbaceous plants. In late spring, their diet includes a variety of forage including grasses, forbs, and shrubs.

Summer – In summer, white-tailed deer eat a wide variety of foods. However, grass consumption decreases drastically while forbs use increases to as much as 2/3 of the diet. In late summer, increased shrub consumption replaces forbs in the diet.

Fall – Following initial fall frosts, white-tailed deer make a distinct transition to predominately shrubby vegetation in the diet. However, forbs still receive moderate use, if available, and may account for up to 25 percent of the total diet.

Winter – During this period, trees and shrubs comprise 75 percent or more of the diet due to the unavailability of other forage species from plant senescence or snow cover.

Specific plants comprising white-tailed deer diets are listed in Table 1. However, the following native species are particularly important to white-tailed deer in the Black Hills region



Figure 5. Willow is an important food source for white-tailed deer in Wyoming along with other plant species such as aspen, serviceberry, chokecherry, dogwood, true mountain mahogany, woods rose, bur oak, and Oregon grape.

Table 1. This is a partial list of forage species and their relative value as food and cover for white-tailed deer in the Black Hills region of northeastern Wyoming and elsewhere throughout the state (Martin et. al., 1961, Richardson and Petersen 1974).

	Summer Forage	Winter Forage	Hiding/ Escape Cover	Thermal Cover	Fawning Cover
Black Hills Area:					
Bur Oak	Good	Good	Good	Excellent	Good
Common Juniper	Poor	Fair	Good	Excellent	Good
Rocky Mountain Juniper	Fair	Good	Excellent	Excellent	Good
Ponderosa Pine	Poor	Poor	Excellent	Excellent	Fair
Oregon Grape	Good	Good	Poor	Poor	Poor
Bearberry	Fair	Fair	Poor	Poor	Poor
Chokecherry	Excellent	Good	Good	Fair	Good
Snowberry	Good	Good	Fair	Fair	Fair
Serviceberry	Good	Good	Fair	Fair	Fair
Wood's Rose	Good	Good	Poor	Poor	Poor
True Mountain Mahogany	Excellent	Excellent	Fair	Fair	Good
Pussytoes	Good	Poor	Poor	Poor	Poor
Assorted grass and grass-like species	Fair	Poor	Poor	Poor	Poor
Assorted forbs	Good	Poor	Poor	Poor	Poor
Agricultural crops (alfalfa, oats, winter wheat)	Excellent	Fair	Good	Poor	Poor
Other Areas Statewide					
Quaking Aspen	Good	Fair	Good	Good	Good
Cottonwood	Fair	Fair	Good	Good	Excellent
Willow	Good	Excellent	Excellent	Good	Excellent
Juniper	Fair	Good	Excellent	Excellent	Good
Serviceberry	Good	Good	Fair	Fair	Fair
Chokecherry	Excellent	Good	Good	Fair	Good
Wild Rose	Good	Good	Poor	Poor	Poor
Dogwood	Good	Good	Good	Fair	Good
True Mountain Mahogany	Excellent	Excellent	Fair	Fair	Good
Sweet Clover	Good	Poor	Good	Poor	Poor
Assorted grass and grass-like species	Fair	Poor	Poor	Poor	Poor
Assorted forbs	Good	Poor	Poor	Poor	Poor
Agricultural crops (alfalfa, oats, winter wheat)	Excellent	Fair	Good	Poor	Poor

of northeastern Wyoming: bur oak (*Quercus macrocarpa*), Oregon grape (*Berberis repens*), bearberry (*Arctostaphylos uva-ursi*), chokecherry (*Prunus virginianus*), and snowberry (*Symphoricarpos* spp.). In other areas of Wyoming, plant species of most importance to white-tailed deer include quaking aspen (*Populus tremuloides*), willow (*Salix* spp.), serviceberry (*Anelaanchier* spp.), chokecherry (*Prunus virginianus*), dogwood (*Cornus* spp.), true mountain mahogany (*Cercocarpus montanus*), and woods rose (*Rosa woodsii*).

Other habitat requirements

Fawning habitat

For fawning, white-tailed deer select 1-5 acre areas with adequate water, cover, and succulent vegetation. Succulent vegetation and available free water are critical for does to produce milk for nursing. Ideal fawning habitat consists of areas comprised of low shrubs or small trees 2-6 feet tall, an over-story tree canopy cover of approximately 50 percent, slopes less than 15 percent, and available water within 600 feet. Adequate succulent vegetation should be available, especially during June.

Special Seasonal Habitat Needs

Adequate winter range in good condition is essential for maintaining white-tailed deer populations. Because migration distances between summer and winter ranges are generally short, white-tailed deer prefer to occupy year-long habitats such as cottonwood-willow riparian bottom lands, wetland marshes, and /or scattered woodland areas if snow pack is minimal, preferred browse species are abundant and available, and both food and cover exist contiguously.

Table 2. This is a summary of optimum habitat combinations for white-tailed deer on summer/transitional range and winter range (Severson and Medina 1983).

	Percent of habitat type			
	Foraging Areas*	Escape/ Hiding Cover	Thermal Cover	Fawning Cover
Summer/Transitional Range	60	22	11	7
Winter Range	60	20	25	-

Interspersed Habitat Needs

Studies indicate that the optimum combination of interspersed cover types (Table 2) required by white-tailed deer on summer and transitional ranges include: (1) 20 percent in hiding cover, (2) 10 percent in thermal cover, (3) 5 percent in fawning cover, and (4) an additional 5 percent in hiding, thermal, or fawning cover. The remaining 60 percent of white-tailed deer habitat should be comprised of foraging areas such as adjacent pastures, open meadows, and/or agricultural cropland areas. Within winter range, the 40 percent cover to 60 percent forage area ratio should remain with an increased percentage of thermal cover.

Habitat Improvement Techniques

In Wyoming, perpetuating and protecting cottonwood-willow riparian habitat, marshlands, and interspersed shrub and woodland complexes will help preserve existing habitat for white-tailed deer. However, in some cases habitat manipulation may be necessary to enhance existing food, cover, and water conditions.

Water Development and Management

Strategically located water developments will enhance white-tailed deer distribution, particularly during hotter periods of the year such as summer and early fall when water consumption demands are greater. Some specific development and management ideas to consider include:

- Contacting the Wyoming Game and Fish Department, Bureau of Land Management, U. S. Forest Service, or the Soil Conservation Service for assistance in designing and/or constructing watering devices for white-tailed deer.
- Maintaining a distance of 2.5-3 miles between water developments and locating water developments within .05 miles of suitable coverage and foraging areas.



Figure 6 – Water developments such as livestock troughs are important for white-tailed deer, particularly during the summer and early fall when water consumption demands are greater. Make sure that watering troughs should be low enough for fawns.



Figure 7. Livestock watering gaps can be used to avoid trampling and overgrazing of riparian vegetation, thus enhancing white-tailed deer habitat.

- Maintaining water in cattle troughs and ponds fed by springs even if livestock are not using them and ensuring that troughs are low enough for fawns to reach the water. In areas of heavy livestock use, controlled livestock access to water through fencing or water gap construction will enhance vegetative cover for deer, especially in wetland or riparian habitats.
- Having a water sample analyzed for mineral content by the University of Wyoming or the state hydrologist. Deer will not drink water containing high salt concentrations. Water with a total soluble salt content of less than 1,000 ppm is optimum for deer use.
- Avoiding the concentration of cattle on riparian habitat or other sources of water where degradation of riparian vegetation and water quality may occur. Judicious livestock grazing management or fencing may be used to avoid habitat degradation.
- Making use of the fact that strip-mining operations often provide available water from underground springs and water tables. Where feasible, develop a number of small watering ponds rather than one or two large lakes for deer use. Ensure that the ponds have a source of fresh water to avoid water quality problems.

Tree and Brush Management

Coniferous forests provide excellent hiding and winter thermal cover while deciduous trees such as aspen and cottonwood provide thermal cover on summer and transitional ranges. The objective for tree management is to maintain a forest of mixed age classes to provide adequate cover and a constant supply of browse (woody food material) and mast (acorns). Likewise, brush-management strategies should be

designed to maintain habitat interspersed with both wood and herbaceous vegetation.

Extensive clear-cutting in coniferous forest areas or riparian bottom lands where thermal cover patches are reduced to less than 10-acre

blocks should be avoided. Likewise, extensive brush control should be avoided to preserve the integrity of the area for winter cover, summer cover, and food sources for white-tailed deer. Following are more specific habitat enhancement suggestions:

- In the Black Hills area of northeastern Wyoming, selectively cut or burn ponderosa pine tracts to promote aspen growth and understory forage production. This treatment should be applied so that food-producing regeneration sites are interspersed with uncut plots that provide shelter and escape cover.
- Selectively thin mature bur oak trees by cutting on both private and U. S. Forest Service lands in the Black Hills to encourage resprouting to enhance browse and mast production on crucial winter range areas. Cutting areas should be limited to size and scope and should be cut during the fall and winter to provide both a source of winter food and to ensure resprouting the following spring.



Figure 8. Clear-cutting is one technique to rejuvenate decadent aspen stands for enhancing summer thermal cover and forage production for white-tailed deer.

- Within logging areas, timbered wildlife travel corridors 75-300 feet wide should be left to provide some protective cover. The length of these corridors should be determined by the topography of the logged area.
- Rejuvenation of decadent aspen patches for summer thermal cover and forage production can be accomplished by clear-cutting or the prescribed burning of selected clones over a prescribed interval such as 10-20 years. These techniques produce the greatest amount of food per treated unit area than any method.
- If water manipulation is possible on cottonwood-dominated riparian areas, periodic flooding over a prescribed interval in selected locations will enhance cottonwood germination to improve summer thermal cover within this community type.
- Extensive brush control methods on winter range areas dominated by shrubs important in the winter diet should be avoided. However, prescribed burning and/or mechanical treatments such as rotobating can be implemented on small, selected patches within the winter range over a prescribed interval of years to maintain browse condition and a habitat interspersed with woody and herbaceous forage. Mechanical treatments, such as rotobating, are most successful in areas that receive at least 12-14 inches of precipitation annually.

Prescribed Burning

Prescribed burning can be beneficial to white-tailed deer by encouraging grass and forb production on summer and transitional ranges, removing rank dead grass residue, and stimulating the sprouting of certain browse species such as true mountain mahogany, chokecherry, serviceberry, snowberry,

and aspen on winter range. Following are recommended guidelines for burning:

- Prescribed burning should follow detailed prescriptions for the specific management goals intended and should be conducted only in years

with average or above-average precipitation. Adequate soil moisture is essential for vegetative growth following burning.

- Late summer or early fall burns in 50-100-acre patches are ideal for grass and forb enhancement while spring burns are preferred to enhance shrubs that respond by sprouting.
- Where livestock grazing is present, burn only in areas where livestock can be excluded for at least two growing seasons following the burn to allow for plant reestablishment.
- Do not re-burn grass/forb areas for at least 5-7 years and shrub areas for at least 10-12 years. However, this interval can vary depending on moisture regimes, soil conditions, and climatic factors.



Figure 9 – Prescribed burning can benefit white-tailed deer by stimulating grass and forb production on summer and transitional ranges, removing rank dead grass residue, and encouraging the sprouting of true mountain mahogany, chokecherry, serviceberry, snowberry, and aspen on winter ranges.

- Contact the Wyoming Game and Fish Department, Bureau of Land Management, U. S. Forest Service, and/or Soil Conservation Service for assistance and planning prior to burning.

Planting and Propagating Food Patches

In some areas of Wyoming, depending on climatic conditions, the establishment and propagation of small gram (winter wheat, oats, barley) and/or legume (alfalfa, yellow sweet clover, red clover, vetches) food patches may enhance white-tail deer nutrition. Strategically located food patches adjacent to cover such as cottonwood-willow riparian areas, wetlands, and/or woodlots are essential for deer use. The following recommendations are for food patches designed specifically for white-tailed deer:

- An optimum food patch for white-tailed deer consists of drilling 4-6 pounds of winter wheat per acre in the fall and seeding the following legume mixture in spring on top of the winter wheat: 3 pounds alfalfa (*Medicago sativa*), 1 pound alsike clover (*Trifolium hybridum*), 2 pounds yellow sweet clover (*Melilotus officinalis*), and 4 pounds birdsfoot trefoil (*Lotus corniculatus*) per acre.
- Food patches should be planted in strips near riparian areas, wetlands, and/or woodlots on a basis of approximately 0.5 acre per deer to provide adequate supplemental forage.
- Several strategically located 20-acre strips are more desirable than one 100-acre strip to avoid concentrations and ensure access for more deer.
- Avoid deer hunting on or near food patches to avoid discouraging deer use of the patches.

- If separate small grain and legume food patches are established, postpone livestock grazing on small grains until after deer have moved onto newly emerging spring vegetation and on legumes until after deer have started browsing shrub species.

Livestock Grazing Management

Although cattle and white-tailed deer generally do not compete for the same native forage, there are situations where indirect competition does exist. Deer damage to haystacks and alfalfa fields can impact forage availability for cattle. Likewise, heavy livestock use of riparian bottom lands can cause damage to white-tailed deer foods through trampling effects and consumption of browse when herbaceous forage is overused. Even though browse is a secondary food for cattle, they will supplement their diet with wood material when rangeland grasses become unavailable.

Young sprouts of aspen and cottonwood in riparian areas may be eaten by cattle to some extent, which can cause some impact on white-tailed deer. Following are specific recommendations for livestock grazing to enhance white-tailed deer forage:

- To enhance winter browse for deer, studies indicate that spring and early summer grazing by livestock that prefer grasses and forbs provides an advantage to shrubs competing with herbaceous plants for soil water, nutrients, and minerals. Alternatively, to enhance herbaceous plants for spring and early summer use by deer on transitional and summer ranges, sheep grazing on more woody plant species in late summer and early fall will provide a competitive advantage to grasses and some forbs.

- Moderate to light stocking of cattle will provide a growth stimulus to rangeland vegetation and improve overall range condition. Consider reducing stocking rates in areas adjacent to deer-cover habitat.
- Rotational and/or deferred grazing management systems can enhance rangeland vegetation, especially herbaceous plants used by deer in spring and early summer.
- Avoid concentrating cattle in riparian bottomlands to preserve and maintain the forage quality for white-tailed deer.

With just a little knowledge about white-tailed deer habitat requirements, landowners and wildlife enthusiasts alike can implement management practices to benefit deer that are compatible with other uses. For more information on white-tailed deer habitat management, contact a University of Wyoming extension educator or visit a local Wyoming Game and Fish Department district office.

Acknowledgements

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