RMEF

WILDLIFE-FRIENDLY FENCE MODIFICATION AND CONSTRUCTION

WILDLIFE MANAGEMENT

A BEST PRACTICES SERIES FOR LANDOWNERS AND MANAGERS OF WILDLIFE HABITAT | **NO. 1**

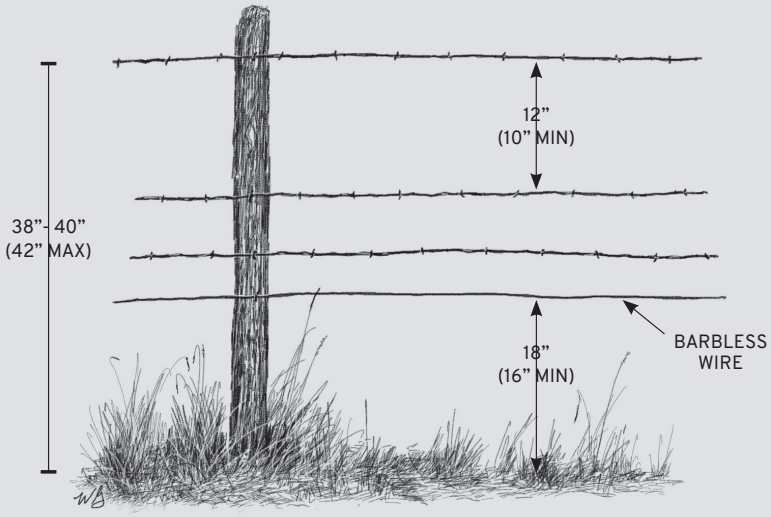
WILDLIFE-FRIENDLY FENCE SPECIFICATIONS

QUICK REFERENCE

Fence modifications can be implemented to improve ease of migration for elk and other wildlife. Please reach out to your local wildlife and natural resource agency personnel for further assistance and possible project development and partnership.

SPECS AT A GLANCE

- Top wire or pole height is 38”-40” (42” maximum, smooth wire preferred)
- Distance between top wire or pole and next wire is 12” (10” minimum)
- Distance from smooth bottom wire to ground is 18” (16” minimum).
- Recommended distance between posts is 14’ to 16’
- Use smooth wire at least on the bottom wire, and on all wires if possible, to reduce snagging wildlife as they pass under or over.



DESIGNS FOR HIGH TRAFFIC AREAS

Lay-down fence

- Made of three- or four-strand wire that can be laid down over extended distances while keeping tension.
- Lay-down fence is highly effective if used during times when livestock are not being contained and wildlife move seasonally.

Adjustable top and bottom wires or rails

- Top and bottom wires may be lowered or raised by fastening against the next wire.
- Pole top rails can be made to raise or lower seasonally.
- Welded pipe fence segments or gates can include hinged top pipes that swing out of the way.

REMEMBER, THE MOST WILDLIFE-FRIENDLY DESIGN IS TO HAVE NO FENCE AT ALL. UNNECESSARY FENCES SHOULD BE REMOVED WHEREVER POSSIBLE!

INTRODUCTION

There is a movement afoot, particularly in the Western U.S. to protect migration routes and remove or modify barriers that make it difficult or impossible for wildlife to complete seasonal migrations. These seasonal movements are critical to species that rely on different habitat types and locations along migration paths throughout the year to thrive. Nongame friendly fence can cause significant obstruction to animals moving across the landscape and can cause landowners major losses in time and resources as they repair damaged fence lines.

Private landowners, conservation groups, state and federal agencies and others are stepping up and working together to address this important issue. RMEF supports research and fieldwork, education and outreach, and on the ground implementation. Even our volunteers and staff are getting involved with fence removal and fence modification projects. This 'best practices' guide is an effort to condense and promote the latest recommendations in wildlife friendlier fence specifications, and offer assistance to landowners and managers to remove or reduce barriers to big game species.

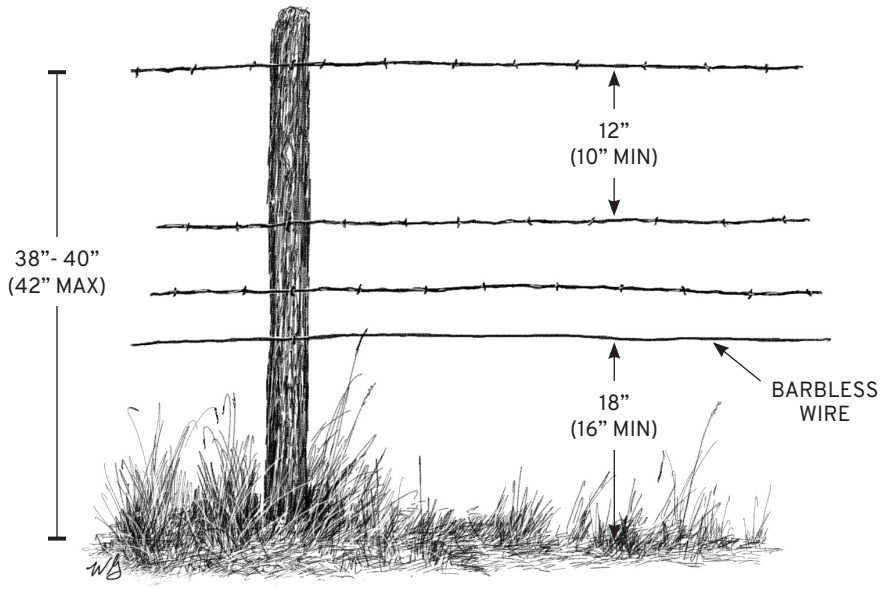
The specifications provided here focus on elk, with the understanding that many landowners and stewards have several species of wildlife that cross their lands. The height specifications provided here are also the recommended heights for mule deer, bighorn sheep, moose and pronghorn, though further modifications are sometimes recommended for those species based on seasonal use, habitat types, size and age class of animals, etc. Fence designs should incorporate multiple factors depending on location and terrain, habitats available, seasons of use, and the practical needs of agricultural operations. Please talk with your local game agency personnel for additional information.

Of course, no fence at all is almost always the best-case scenario for wildlife, unless barrier fencing is needed to direct wildlife to safer crossing points. Whenever possible, RMEF encourages land managers to consider options for fewer fences, or removing fences, over modifying or constructing new fence.

DESIGN SPECIFICATIONS SIMPLIFIED

The following specifications are recommended for elk:

- Top wire or pole height is 38”-40” (42” maximum, smooth wire preferred)
- Distance between top wire or pole and next wire is 12” (10” minimum)
- Distance from smooth bottom wire to ground is 18” (16” minimum).
- Recommended distance between posts is 14’ to 16’
- Use smooth wire at least on the bottom wire, and on all wires if possible, to reduce snagging wildlife as they pass under or over.



Recent research shows elk are more successful crossing over a fence with a top wire/rail that is 40 inches from the ground. This has also been found, generally, for mule deer, white-tailed deer, moose and bighorn sheep. Many ungulates often jump with their hind legs in a forward position, which makes their hooves hang down and easily snag in a wire. In addition, their wide-angle vision is optimized for seeing predators, but they have somewhat poor depth perception and see in dichromatic color (blues, yellows, black, greys and whites), making it more difficult to detect grey wires.

A bottom wire that is 18 inches from the ground will better facilitate the movement of elk calves and deer fawns as they are not able to jump over. While pronghorn are physically capable of jumping over a fence, they highly prefer to crawl under. Some mule deer (particularly females) will also regularly go under a fence, rather than over. Studies show that bottom wire fencing that is shorter than 18 inches from the ground can increase the rate that ungulates attempt passage through the middle sections of the fence, often leading to entanglements.

Using 3-strand fencing (rather than 4) can reduce entanglements, provides flexibility in wire heights and can still be effective for most livestock practices.

DEATH METAL: A 2006 study found some fences kill one elk, deer, moose or antelope per year for every 2.5 miles of length. Fences play a vital role for landowners and livestock, but even small modifications can make a massive difference for wildlife.

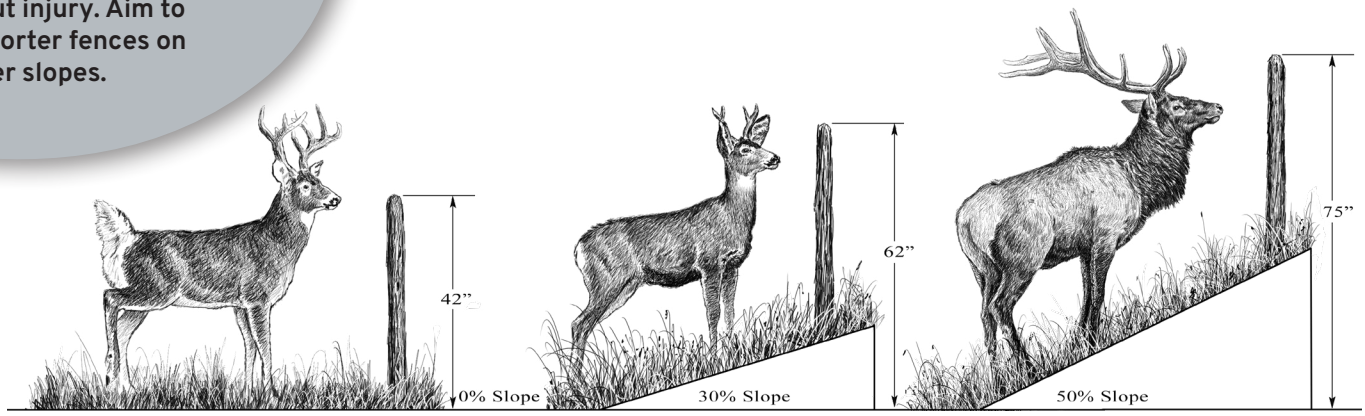
One major cause of ungulate fence mortalities is entanglements as they attempt to jump fences. The majority of mortalities are shown to occur at sites where the top wire height exceeds 40 inches. In addition, by using smooth top wire or placing PVC pipe on the top wires you can reduce the risk of fence barbs catching ungulate legs as they jump over.

FACTORS TO CONSIDER

Install high visibility features where needed such as pvc-coated top wire, vinyl clips, cable or top rails; and if using a top rail, plan to use extended lengths rather than short sections of this style. Wildlife will usually choose to cross where the fence is wire-only versus more solid materials like pole tops, and they will alter their route if it's a short distance to a wire-only section. Areas where vegetation is dense and tall such as riparian areas, forests, or tall shrublands may require the use of these higher visibility features. High-use areas/fence crossing also benefit from advanced visibility.

POST AND RAIL FENCES are best built with two round rails placed 40" (42"maximum) and at least 18" off the ground.

KILLER SLOPES: The steeper the hill, the higher the jump, until it becomes close to impossible to clear without injury. Aim to use shorter fences on steeper slopes.



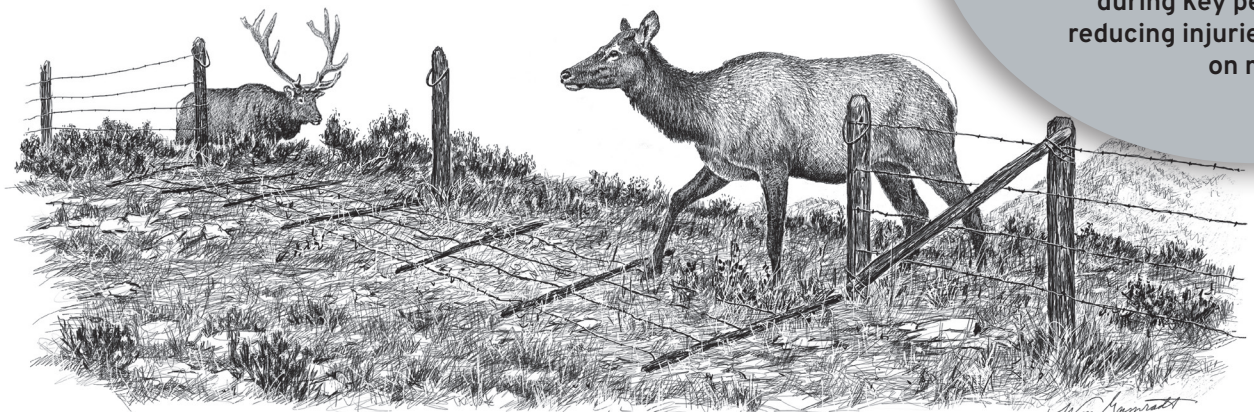
Use smooth wire at least on the bottom wire, and on all wires if possible, to reduce snagging wildlife as they pass under or over.

Snow depth can affect the ability of ungulates to go under or over a fence; consider using clips to further raise the bottom or lower the top wire when snow is present.

The slope of a hill can greatly affect the navigability of a fence. If the fence is located on a steep slope, animals crossing the uphill side will need to jump much higher than those crossing the downhill side. In places where the primary movement is from downhill to uphill, consider lowering the height of the top wire or rail.

ENHANCED MODIFICATIONS FOR HIGH-TRAFFIC CROSSING AREAS

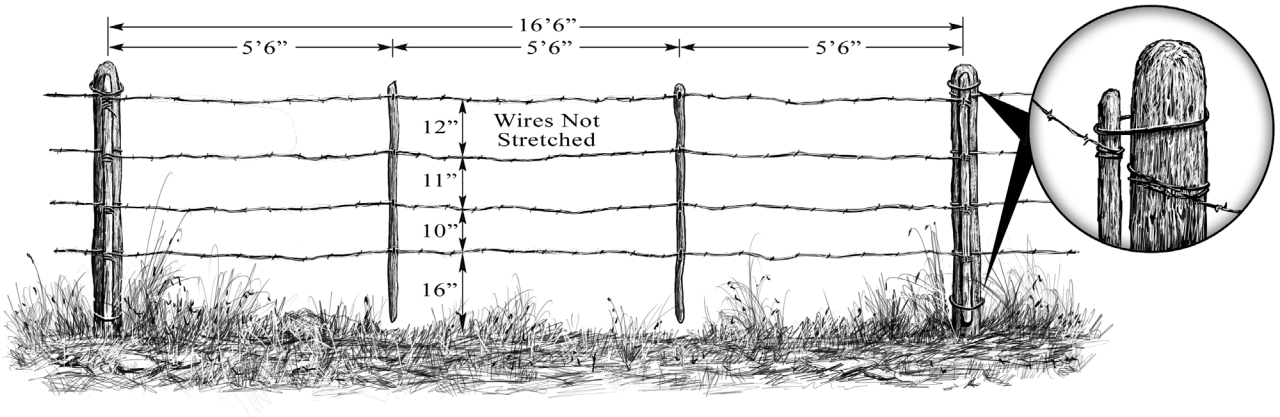
There are some cases where wildlife traffic is concentrated, due to seasonal movement patterns, topographic features, manmade barriers or other factors. Landowners and managers may need to take additional measures to facilitate easier wildlife passage in those high-traffic areas, or face consequences of significant fence and property damage and repeated repairs, livestock loss due to escape, etc. There are several modification designs meant to address these challenges. The most popular include lay-down fence segments, adjustable top wire or rail crossings and gate installations where they can be left open at high-migration times of year.



A LAY-DOWN SECTION on a standard 4-wire fence can be laid down to ease wildlife passage during key periods of use, reducing injuries and saving on maintenance.

LAY-DOWN FENCING

Lay-down or let-down fencing is typically made of three- or four-strand wire that can be laid down over extended distances while keeping tension. The wires are attached to wood or metal stays that are wired at the base of ground-installed posts spaced no more than 16 feet, 6 inches apart. When the fence segment is upright, it attaches to the tops of the posts with wire 'bails.' H-brace supports should be located at least every 1/3 mile along lay-down fence line. Lay-down fencing is highly effective if used during times when livestock are not being contained and wildlife move seasonally through the area.



Barb Johnson, who holds a voluntary conservation agreement with RMEF, works to modify boundary fencing to wildlife-friendly fencing on Terry Creek Ranch in Wyoming.

ADJUSTABLE BY SEASON: Binding one or more wires can allow animals easy passage when livestock aren't present. Drop the top wire 25" or less and use a simple staple lock. Install two fence staples horizontally and less than an inch apart on the post, then slip the fence wire between them, secured by a third staple hooked through like a latch.

ADJUSTABLE TOP AND BOTTOM WIRES OR RAILS

Methods are evolving to adapt to concentrated wildlife crossing areas. One design is to lower a top wire or rail for short fence segments where animals funnel through to cross. Wires can be lowered with clips or staples at the posts, and top rails can be designed to be removable or lowered as shown at right. New designs are emerging using welded pipe with hinged top pipes that may be swung out of the way during seasonal migration. Land stewards are innovators and designs continue to evolve as land prochallenges arise and new materials are available!

Garrett Henry of Mule Creek Ranch, land protected by an RMEF voluntary conservation agreement, shows his adjustable pole-crossing section.

These are just a few of the modification designs one can implement to create a more wildlife-friendly environment and improve ease of migration for elk and other wildlife. Reach out to your local wildlife and natural resource agency personnel for further assistance and possible project development and partnership. For further reading and more detailed descriptions of fence design and construction, refer to the resources listed below.

INFORMATIONAL RESOURCES FOR WILDLIFE-FRIENDLY FENCE DESIGN

HOW DID THE DEER CROSS THE FENCE: An evaluation of wildlife-friendlier fence modifications to facilitate deer movement. https://doi.org/10.3389/fcosc.2022.991765

Wildlife-friendly fence designs and elk fence crossing behavior. https://doi.org/10.1002/wsb.1400

Species and demographic responses to wildlife-friendly fencing on ungulate crossing success and behavior. https://doi.org/10.1111/csp2.285

ROCKY MOUNTAIN ELK FOUNDATION. May 17, 2018. Mending Fences – Wildlife-friendly Fencing. Bugle Magazine. https://www.rmef.org/elk-network/mending-fences-wildlife-friendly-fencing

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