

**From:** [Christine Paige](#)  
**To:** [Fox, Trevor T](#)  
**Subject:** Re: [EXTERNAL] deer and fence  
**Date:** Friday, December 9, 2022 8:33:23 AM  
**Attachments:** [Wildlife Crossing Suggestions for Grizzly Ridge Bison Fence.pdf](#)  
[ATT00001.htm](#)

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Hi Trevor,

Thank you for your concern — no worries on my end. Administrative hiccups are to be expected, especially with a short-notice consulting gig. NFWF tells me to expect funds deposited on Dec 19, so I can let you know when it comes through.

FYI, Ricketts' folks reached out again yesterday asking for a schematic of the wildlife crossing design they decided to use, as well as a sketch of the “floating rail” idea that Andrew Pettibone came up with. I thought that with all of our discussions and the materials I left with them, they were going to put it together themselves, but they wanted something to give the ranch staff. So I put together a little 2 page PDF that reviewed the specs we discussed in the field. It was cc'd to Matt, and I'm attaching it here. Andrew Pettibone supplied the floating rail sketch on short notice—I'm very grateful for that and for his suggestions. I hope the write-up meets their needs — I did not have a drawing at hand, but used a photo and text description.

I have not seen the map of ranch fences Morgan said he would send around, have you?

Thanks again for the opportunity to work on this—it's been an education! Hope you have lovely holidays.

Cheers,  
Chris

## Wildlife Crossing Suggestions for Grizzly Ridge Bison Fence

I was invited to visit the Grizzly Ridge Ranch in October, 2022 to tour the ranch bison fences and consult with the owner's agent, ranch manager, and tribal representatives on fence solutions to enhance wildlife movement. The visit resulted in a plan by Grizzly Ridge to modify fences with multiple wildlife crossings.

The current perimeter fences are 5- to 7-foot field fence supported by metal posts. Given this fence design, the most efficient crossing design would be to use 2 or 3 metal pipes as rails, welded or otherwise fastened securely to the metal posts (see photo).

Install crossings in fence sections at:

- 1) sites known by residents/locals to be wildlife movement areas;
- 2) sites with wildlife trails, tracks, or evidence of fence conflict;
- 3) riparian corridors and ridgelines;
- 4) fence corners, and
- 5) at regular intervals (e.g., 1/8 to 1/4 mile) along long stretches of fence.

Final placement of crossings will depend on topography and the needs of ranch operations.

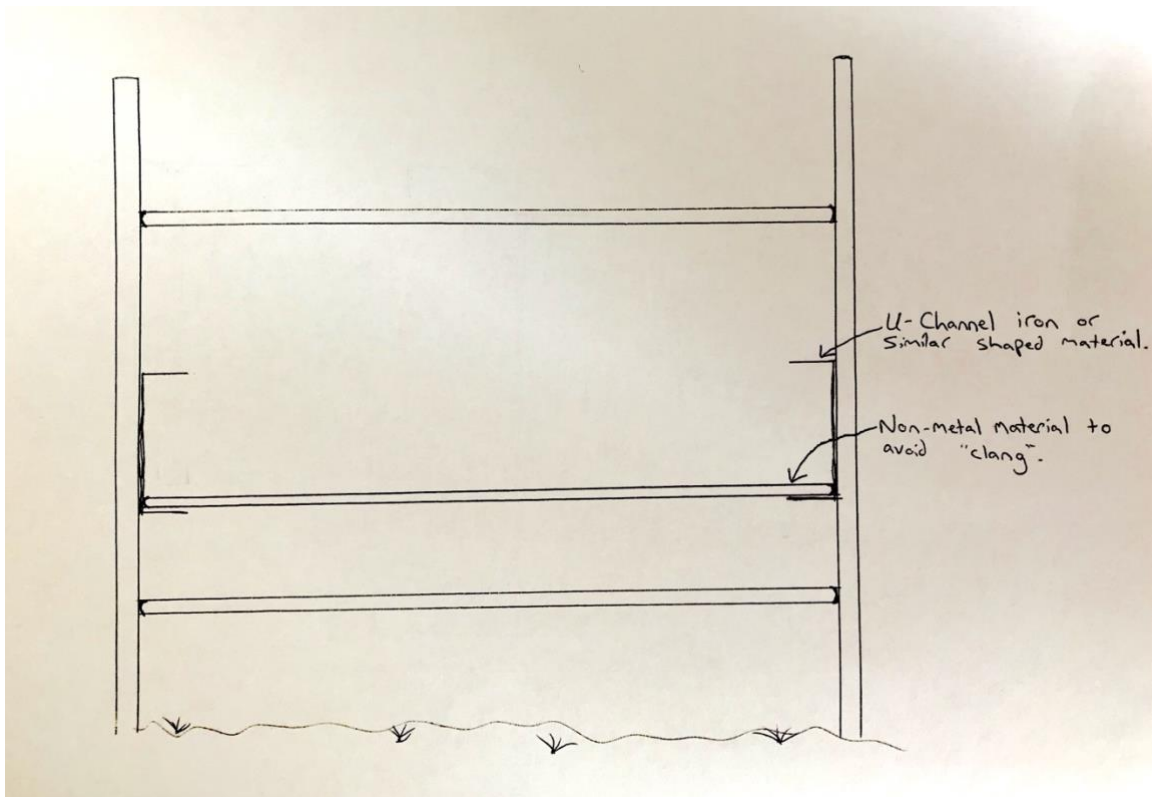


Spacing for 3 rails:

- 1) Place bottom rail at least 18" above ground level to allow wildlife to pass under (especially young ungulates and mule deer).
- 2) Normally, the recommended top rail height for deer and elk is 40" to 42", with middle rail at 30" to allow 12" between middle and top to prevent leg entanglements. However, this top height may not be suitable in all locations for bison fence.
- 3) If a higher top rail is necessary for bison, I suggest spacing rails at 18" bottom, 36" middle, and 48" to 54" top. This allows an 18" gap between the bottom and middle rail for animals to crawl through, and 12" to 18" between middle and top rail.
- 4) *I especially recommend at least 18" between the bottom and middle rail for moose calf crossing.*

In addition, Andrew Pettibone (USFWS, Choteau, MT, [Andrew\\_pettibone@fws.gov](mailto:Andrew_pettibone@fws.gov)), who was part of the tour, suggested a trial for a moose calf crossing with a moveable middle rail that will float as an animal pushes between the bottom and middle rail. This could be easier for moose calves to negotiate – see illustration.

The floating rail should be of durable non-metal material to avoid clanging. It should be held in place by U-channel or similar box shape to allow the rail to slide up and down but prevent it from popping out.



*Illustration by Andrew Pettibone*

Note that these recommended crossing designs are experimental for bison fence, in determining rail spacing that will work for local wildlife species and bison behavior, and in trialing a floating rail. Ranch managers will need to adapt if designs do not meet expectations. I would very much appreciate hearing feedback on any lessons learned.

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On Dec 9, 2022, at 7:32 AM, Fox, Trevor T <[trevor\\_fox@fws.gov](mailto:trevor_fox@fws.gov)> wrote:

Hi Chris,

I saw some more activity this week regarding your invoice. I apologize that it is taking so long to get it through. Will you please send me a note or give me a call when that invoice gets paid? I'll ask the admin folks to notify me too, but I want to make sure it gets taken care of.

Hope all is well,  
Trevor

<Outlook-vn15he5r.svg>  
Trevor Fox  
Deputy Assistant Regional Director  
National Wildlife Refuge System  
U.S. Fish and Wildlife Service  
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Cell 303-253-4259  
*Pronouns: he/him*

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**From:** Christine Paige <[wanderofftrail@gmail.com](mailto:wanderofftrail@gmail.com)>  
**Sent:** Tuesday, October 18, 2022 9:16 PM  
**To:** Fox, Trevor T <[trevor\\_fox@fws.gov](mailto:trevor_fox@fws.gov)>; Pettibone, Andrew L <[andrew\\_pettibone@fws.gov](mailto:andrew_pettibone@fws.gov)>  
**Subject:** [EXTERNAL] deer and fence

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Hi Trevor and Andrew,

Attached is the new paper I mentioned that examined white-tailed and mule deer interactions with fence. Some good stuff.

Thanks again for the great discussions. Do stay in touch.

All best,  
Chris

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