

# TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE STATE OF COLORADO NATURAL RESOURCES CONSERVATION SERVICE

Range Technical Note No. 39

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To: All Area and Field Offices

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## Fence Visual Markers to Reduce Wildlife Collisions or Entanglement

Highly visible fences help to reduce wildlife fatalities caused from collision or entanglement with wires. Most fatalities occur when fences are placed in areas where wildlife congregate or move, when visibility conditions are low, or when wildlife are fleeing or flushed. Unfortunately, fence fatalities are common to some species but it can be mitigated by making fences visible at greater distances; so that wildlife can better judge their jump or flight height to avoid impact. This technical note provides cost-effective options for land managers to improve fence visibility in areas that pose a risk.

This technical note is intended to be used with Conservation Practice Standard Fence (382) and Structures for Wildlife (649) as part of NRCS' guidelines for designing a "wildlife friendly" fence.

### Strategic Placement of Fence Markers

Not all fences present the same collision or entanglement risk; work with NRCS to determine the most appropriate fence locations to mark. Some general guidance:

- Mark fences located within and around grass/shrubland bird congregation areas. Particularly areas with gentle terrain. Mark at least a ¼ mile radius around a lek, and mark fences located within, and for 2 miles around, high-use nesting or brood-rearing areas.

*Species sensitive to collision include low-flying birds such as grouse, owls, falcons and prairie chickens. Most collisions occur when birds are flushed or when visibility is reduced by low-light, rain, fog or during strong winds.*

*Often the only indication of a bird collision is feathers on the wire or on the ground; scavengers are quick to pick up on the remains.*



- Mark newly constructed fences lines, where a fence had not been in place prior.
- Mark where big game cross the fence, such as draws, gullies and travel routes. Mark fences surrounding high-use areas (wintering areas, water sources and habitat projects).

*Species sensitive to entanglement include elk, pronghorn antelope, mule deer and other wildlife that require passage by jumping over or by crawling underneath the fence. When on the run, markers help them to judge jumping distance or to detour to avoid the fence.*

- Mark fences that cross or extend into streams or waterways.
- Mark fences around wetlands, especially near shallow wetlands, playas, wet meadows and surface irrigated fields where large water birds congregate. Also mark other high bird-use agricultural fields.

*Species sensitive to collision include large bodied birds such as sandhill cranes, swans and geese. At these sites, utility lines can also cause collision. Where this is a concern, the utility company can install utility line markers.*

### Marker Material Criteria

1. Markers should not add significant weight or wind resistance to fences, or have the potential to cause wear to the wire.
2. Markers should not be harmful to livestock or wildlife.
3. Markers should be durable enough to last for at least three years.
4. Markers should provide contrast with the surrounding landscape.

### Types of Visual Fence Markers

Examples of efficient and cost-effective fence markers are provided below.

Vinyl Siding Strips. Small sections of white, vinyl house siding (undersill) applied to the fence wire improves fence visibility.

Undersill is readily available at home improvement stores, often sold in twelve foot sections that can be cut with a tin snip or miter saw. Generally they are cut into 3" sections to fit in-between the barbs.

All-weather foil reflective tape may be applied to the marker to further enhance visibility.



Photo: Rocky Mountain Bird Observatory

The attached brochure provides details on making and installing these markers.

Specialized Top Wire. A highly visible top wire is a cost-effective method to cover long distances. Highly visible wire is manufactured in many forms, including: braided wire, tape, or polymer coated. The wire may be a bright color, reflective, or black, green or brown. The wire should be at least 5 mm thick; the thickness of the wire and the off-set in color will provide adequate visibility.

PVC Pipe. Sections of small diameter PVC pipe slipped over the top wire improves fence visibility. PVC is effective for short distances with high collision risk. The pipe should be just large enough diameter to cover the barbs; larger diameter pipe is not recommended due to its weight on the wire.

Using a table saw, the pipe is split along its entire length and installed by pushing the pipe onto the wire.



Photo: Montana Fish Wildlife & Parks

### Commercially Manufactured Markers

As demand has increased, there has been a good market response for prefabricated fence markers. An online search will reveal the variations available to the public.

### Other Considerations.

- White is most visible in the summer, and dark colors are most visible in the winter (against a snowy background); hence, a combination of colors or reflectors, may be needed.
- Mark the bottom wire to increase visibility for pronghorn and other wildlife that may cross underneath the fence.

### References

- George Miksch Sutton Avian Research Center. 2006. Fence Marking for Lesser Prairie-Chickens: A cooperative conservation solution. Online publication. [http://www.suttoncenter.org/fence\\_marking.html](http://www.suttoncenter.org/fence_marking.html)
- USDA NRCS. 2012. [Applying the Sage-Grouse Fence Collision Risk Tool to Reduce Bird Strikes](#). CEAP Conservation Insight. Online publication.

## Strategic Placement of Fence Markers

Not all fences present the same collision risk, work with NRCs to determine the most appropriate fences to mark.

In general, fences that are located near bird congregation areas (e.g. leks, playas & wetlands) with gentle terrain pose the greatest risk. Also, areas where big game cross (such as draws), especially where terrain is steep, are considered high risk areas for entanglement or collision.

## Adapting Markers to Improve Visibility

If needed, there are a variety of options available to enhance the visibility of white vinyl markers.

An effective technique is to add all-weather reflective tape to the marker; which enhances the visible distance and greatly improves visibility during low light conditions (when many collisions occur).

- Applying tape to the top and sides of the marker may also help protect the marker from sun/heat damage.

In areas with heavy snow cover, visibility can be improved by reflector tape or by alternating white and dark colored markers; to provide a visual contrast with the snowy background.

## Contact your local NRCs Service Center for more information

Local NRCs offices can be found online at:

[www.co.nrcs.usda.gov](http://www.co.nrcs.usda.gov)

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# How To Make and Install Fence Markers



## Making Fences Visible to Wildlife

Fence marking using white vinyl undersill is an effective and practical approach to increase fence visibility by wildlife to reduce potential collision or entanglement.

# Colorado

[www.co.nrcs.usda.gov](http://www.co.nrcs.usda.gov)



# HOW TO MAKE AND INSTALL FENCE MARKERS



## GETTING STARTED

### MATERIALS

- **Vinyl "undersill" Trim, White**  
Trim is manufactured for house siding and is sold at most home improvement stores in 12 ft. sections. (12 ft. yields 48 markers)
- **Reflective Tape (optional)**  
All-weather foil. Preferably white and/or silver.

### TOOLS

- **Miter Saw & Fine-Toothed Blade** and/or
- **Tin Snips,**
- **Tape Measure,**
- **Scissors** (if using reflective tape), and
- **Safety Equipment**  
-safety glasses, hearing protection, dust mask, etc.

## QUANTITY OF MATERIALS NEEDED

### Quick Calculation:

Length of fence to be marked, divided by 3, equals the approx. number of markers needed.

**Fence**    **ft. / 3 =**    **# markers needed**

- Approximately 1,760 markers per mile.

This will result in extra markers; to be used for future replacement needs.

## CONSTRUCTION

### Two Easy Steps:

- 1.** If using reflective tape, apply the tape to the uncut sections of undersill; to the flat side. Or, if using a wider tape (2-3" wide) apply it so that it wraps over the top and down the flat side.
- 2.** Cut the undersill into 3-inch sections *or* to a length that will fit in-between the barbs on the wire (older fences may have less space between barbs).  
If using a miter saw, use a fine-toothed blade (200 teeth) or a vinyl siding blade to reduce splintering. Multiple sections of undersill can be stacked and cut at once.



*Caution: Follow manufacturer's guidelines for safety when operating power equipment.*

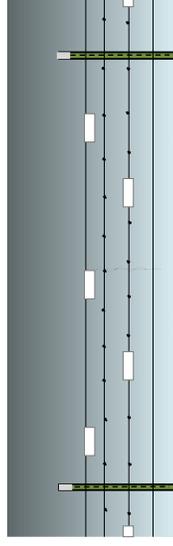
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## INSTALLATION

- Markers quickly snap into place on the wire.  
-if installing on a smooth wire, use an exterior grade glue to keep them in place.
- Placement generally takes 1-2 hrs. per mile.



Markers should be placed approximately every 6 feet apart on the top and on the third wire; in an alternating pattern.



*Example:* on a 20' post spacing there will be 3 markers on the top wire and 2 markers on the 3rd wire down.

**Note:** when using reflective markers, ensure that the reflective side alternates so that both sides of the fence have reflective marking.

## MAINTENANCE

Periodically check the fence line for damaged or missing markers. Replace as necessary.