

ISSUE BRIEF

INSTALLING TURBO FLADRY: AN INFORMATIONAL GUIDE

Turbo fladry is a relatively simple fencing tool designed to protect livestock from wolves. This informational guide explains how turbo fladry works, what materials are needed, where they can be purchased, and how to install fladry yourself. If you would like to try fladry but need additional help, there are many agencies and organizations that can provide support.



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Turbo fladry blowing in the wind during installation on a calving pasture in Idaho.

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TURBO FLADRY EXPLAINED

What is turbo fladry and why should I consider it?

- Turbo fladry is a useful tool that livestock producers can deploy to deter wolves from entering animal enclosures. It is most appropriate for use during periods when livestock are particularly vulnerable to predation, such as calving season. This tool is effective and portable, requires relatively little planning to install, and can be reused. It usually consists of bright-red nylon flags that are sewn onto a long strand of woven plastic and metal wire, called poly wire, that is capable of conducting an electrical current. This wire can be suspended between permanent or temporary posts so that the flags flap in even the slightest breeze.
- Nonelectrified fencing of this type is simply called fladry. Because wolves are wary of unfamiliar objects in their environment, fladry can deter wolves for up to several weeks due to its novelty and the movement of the flags. When fladry is electrified, it is called turbo fladry. Turbo fladry can deter wolves for two or three months because of both the motion of the flags and the shock wolves will receive if they eventually become bold enough to approach and touch the electrified poly wire.¹ We focus on turbo fladry in this guide because it is a longer-lasting deterrent.
- Fladry can be made using different flag dimensions and spacing along the poly wire. Standard flagging is typically 18 inches long, 3 inches wide, and spaced 18 inches apart. In the dozens of pastures we have encircled with turbo fladry using that configuration, we have so far not experienced a single livestock loss

or injury due to wolves. Some who have used fladry recommend a larger flag size of 19–27 inches long and around 4 inches wide, with flags spaced out across the wire at 18- to 24-inch intervals.² Each of these sizes and configurations has proved effective and can be useful in different situations.

- Flags can be made out of different types of materials. In a later section of this guide, “Materials and Equipment,” we provide advice on choosing the best flagging material for your project.
- Turbo fladry can be used as a stand-alone fence but is ideally installed parallel to a permanent fence, thereby creating a double barrier. Hanging the fladry line 28–30 inches from the ground can help to contain adult cattle when there is no permanent fence, and it helps prevent electrical shorts or “leakage” that can result from the flags contacting vegetation on the ground.³ In winter, when there may be changing levels of snow accumulation, the fladry line height should be adjusted on the posts so that the bottom of the flags remains above the snow.

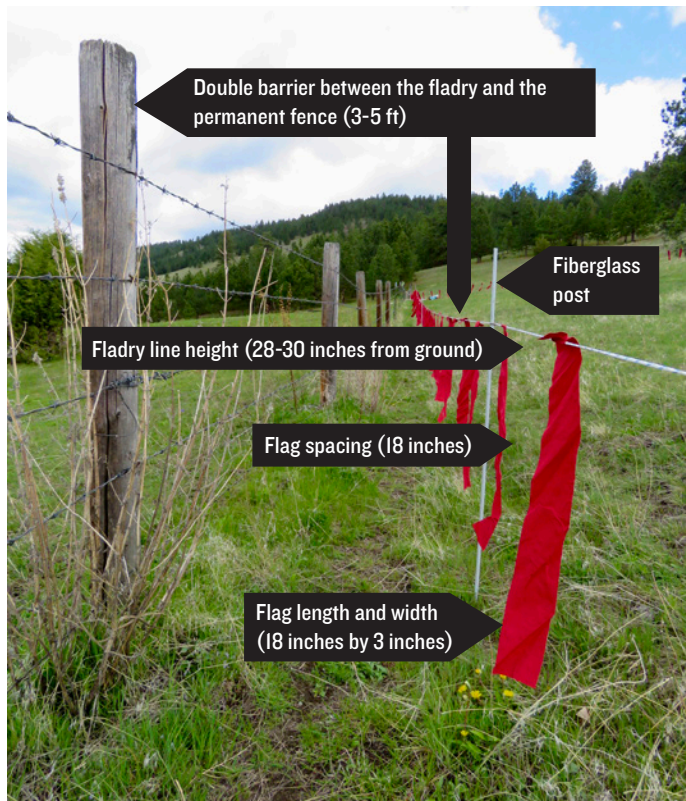


Turbo fladry hung above the snow level on a calving pasture in Montana.

- While it can be larger or smaller, the ideal maximum pasture size for turbo fladry is around 40 acres, or about 1 mile in perimeter. Larger enclosures can be more difficult to install, maintain, and electrify at an adequate voltage.
- Fladry can be used to protect many types of livestock but has most commonly been used to reduce predation of cattle and sheep.



Young calves are particularly vulnerable to predation.



What animals does it deter?

- Studies have shown that turbo fladry is an effective wolf deterrent.⁴ Turbo fladry designed with smaller spacing between flags has also been studied as a potential coyote deterrent. Results suggest that some coyotes overcome their fear of fladry faster than others.⁵ Additional research is needed to test whether turbo fladry can effectively protect livestock from other carnivorous species.

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A camera trap image of a wolf walking along a turbo fladry fence in Minnesota.

Why does it work to deter wolves?

- Turbo fladry works because wolves are “neophobic”—meaning that they are instinctively fearful of anything new or unfamiliar, such as flags flapping in the wind.⁶ Electrification of the poly wire helps reinforce their fear and avoidance of the flags.⁷ Many other types of wild animals may cross over or under fladry with little hesitation.
- The installation height of the wire also influences the effectiveness of turbo fladry. When a strand of poly wire is hung 28–30 inches from the ground, it corresponds closely to the shoulder level of an average-size wolf. Hanging fladry at this height reduces the chances of wolves slipping under it and brings the flags closer to their eye level.

How effective is it?

- Turbo fladry is a highly effective tool. A study conducted by the National Wildlife Research Center in partnership with USDA–Wildlife Services, NRDC, and participating ranchers reported that “no depredation events occurred at any participating livestock operation while turbo fladry was installed.”⁸ Fladry has been used successfully by ranchers across many states with wolf presence, including Montana, Idaho, Wyoming, California, Oregon, Minnesota, and Wisconsin.

How long can I leave it up?

- Reports indicate turbo fladry is highly effective for up to 75 days and is usually installed during the time livestock are most vulnerable, such as calving or lambing season.⁹ Some practitioners suggest that turbo fladry is effective for up to 90 days. We recommend that turbo fladry

be deployed for a strategic window of time and taken down after 75–90 days of use. If used correctly, it can be reinstalled for similar periods in subsequent years. If used for longer than the recommended window, wolves could become accustomed to the sight of the flagging and may be emboldened to find ways to cross through it, thereby reducing its effectiveness in that area—and harming the reputation of the tool.

Where should turbo fladry be installed to protect livestock?

- Ideally, turbo fladry should be installed 3–5 feet from a permanent fence line (to create a double barrier and to keep the flags from contacting or becoming tangled in the permanent fence). It should fully enclose the livestock pasture. If possible, fladry should be installed along the outside perimeter of a livestock containment fence; this helps prevent livestock from damaging the fladry or shorting the electrical circuit. However, if necessary, fladry can also be effectively installed on the inside.

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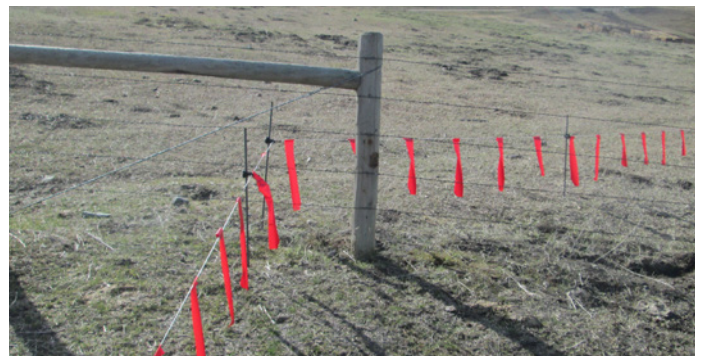
Fladry was installed along the inside perimeter of this permanent fence because the land on the outside of the fence is publicly owned.

© NRDC



On this sheep farm, turbo fladry had to be installed as a stand-alone fence. This is less effective at containing livestock, but no predation occurred at the site while fladry was deployed.

- At times, fladry may have to cross over or run through a permanent fence. In such a case, the poly wire may need to be insulated at potential points of contact or redirected using additional posts to prevent a short circuit caused by contact with another fence.



Turbo fladry can cross over or run through a permanent fence as long as care is taken to separate the fladry line from contact with the permanent fence materials.

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- Topography can also determine how and where turbo fladry can be installed. The key when using this type of fencing on rough or uneven terrain is to keep the line at a consistent height and parallel to the ground by adding additional posts as necessary.

MATERIALS AND EQUIPMENT

Materials needed for a turbo fladry fence

- For every mile of pasture perimeter (5,280 feet), you will typically need:
 - 1 mile of flagged poly wire (turbo fladry)
 - 1 electric fence charger/energizer with a minimum output of 1 joule
 - 1 ground rod set with clamps (typically three metal rods at least 6 feet in length each, preferably galvanized steel)
 - Galvanized steel wire for hooking up the energizer (insulated galvanized wire can be used to reduce leakage of electricity but is not always necessary)
 - 250–300 fiberglass posts and post insulators (3/8 inch by 4 feet), or self-insulating poly posts
 - 8–10 T-posts and T-post insulators
 - 1–3 electric fence gate handles
- Some specific equipment will be necessary for properly installing turbo fladry materials. Box 1, below, shows the typical equipment needed.

Fladry costs and purchasing options

- Jonco Industries is currently the only large-scale manufacturer of turbo fladry. The company estimates that the order cost for standard size deluxe nylon fladry is \$724.25 per quarter mile plus additional costs for shipping based on the order weight and shipping location. Fladry must be ordered well in advance of an anticipated installation date because it can take several weeks or more for Jonco to manufacture and ship an order.
- In some places, local manufacturers may be able to take custom fladry orders, though it's important to ensure quality in both materials and construction.
- There are various types of flag material available for purchase. Box 2, below, shows the different prices of available flag materials sold by Jonco. In most cases, deluxe nylon material is adequate. However, if you live in an area with extreme weather conditions, you might want to consider slightly heavier flagging material, such as polyester or vinyl. While heavier flags are more expensive than nylon, they are also more weather resistant and likely to remain intact, especially in high wind.¹⁰ Avoid purchasing fladry made with low-cost materials, which will lack durability and need to be replaced more frequently. In our experience, fladry that loses its color has still proven effective, but when the flags become significantly frayed, torn, or otherwise deteriorated, the materials will need to be retired.
- Standard fladry is typically durable enough to be used for multiple years.

BOX 1: EQUIPMENT NEEDED FOR INSTALLATION OF A TURBO FLADRY FENCE

General equipment:

- Post pounder
- Rubber mallet
- Wire cutter or sharp scissors for cutting poly wire
- Electrical tape for securing spliced ends of poly wire
- Garden hose reels or wooden reels for spooling the fladry
- Voltmeter or fault finder

Extra items—not essential, but handy:

- Gloves for handling fladry and posts
- Lengths of garden hose or other insulating material to use for poly wire that crosses over other fencing
- Corner insulator clips

Equipment that will increase efficiency of installation:

- Four-wheeler or ATV, or a snowmobile in snowy conditions
- A fladry spooler connected to a truck, ATV or snowmobile that can mechanically spool or unspool fladry from a reel



A fladry spooler connected to the back of an ATV or truck is the most efficient way to spool out fladry and can also be useful for respooling the fladry line when taking the fladry fence down.

© USDA Wildlife Services

BOX 2: TYPES AND COSTS OF FLADRY SOLD BY JONCO INDUSTRIES (AS OF OCTOBER 2020)

The following estimates are for Jonco's standard fladry (18-inch long flags spaced 18 inches apart):

- One quarter mile deluxe 420D nylon flags = \$724.25
- One quarter mile polyester 600D flags (UV coated) = \$731.40
- One quarter mile 18-oz. vinyl flags (vinyl-coated polyester with scrim) = \$765.15



The three types of fladry materials sold by Jonco Industries have different weights and textures.

HOW TO INSTALL TURBO FLADRY

There are many variables to consider in deciding the best approach to turbo fladry installation. Each fladry practitioner will have his or her own tips and tricks for how to do it most efficiently. Below we provide general step-by-step instructions. However, there is always room for creativity and adjustments based on the specific context of the property, livestock, and conflict.

1. Assess project: Start by assessing the pasture, including size, terrain, vegetation, condition of any preexisting perimeter fence, and number of gates or important access points for the pasture. These details will determine the cost, time, and number of people needed to install turbo fladry. Access to water and other necessities for livestock are also important to plan for.

2. Anchor fladry: After assessing the pasture and collecting the necessary materials, begin installation by identifying a starting point at a corner or gate. This could be on the inside or outside of a preexisting permanent fence, depending on the terrain and the area that needs to be surrounded with fladry. Pound a T-post into the ground at that first corner or gate to create the first anchor point. This anchor should be placed 3–5 feet away from the permanent fence line, and 2–3 feet wider than any gate.

3. Spool out fladry: Attach a T-post insulator to the T-post at a height of 28–30 inches from the ground. Tie the end of the fladry's poly wire to the insulator. If starting at a gate, save some extra slack in the end of the poly wire to help with later gate construction. Begin unspooling the fladry on the ground parallel to the permanent fence. When you reach corners, bends, or significant terrain variations, pound additional T-posts into the ground to create anchors that can maintain line tension as you continue to spool out additional fladry. At each new anchor point, pull the fladry line taut (while leaving enough slack in sections with gates—see step 5 below) and tie the poly wire to insulator clips on the T-posts. Pastures that have long, straight lines of permanent fence across relatively flat ground will be the easiest to work with and require less attention and troubleshooting to ensure consistent tension and height of the fladry line. With more variable terrain, you will need extra slack in the fladry line and extra T-posts.



Poly wire should be tied off to an insulator on a T-post at the starting point for installation.



Depending on the type of spools available and how accessible a pasture is to ATVs or larger vehicles, spooling fladry out by hand using a wooden reel or garden hose may be necessary or most efficient.

4. Install posts and clip fladry to insulators: After spooling out the fladry, head back along the line to install the supporting fiberglass or plastic posts at intervals of around 30 feet. To protect the top of fiberglass and plastic posts from damage during installation, you can use a rubber mallet to pound them into the ground or a plastic cap or wooden board to cover the top of the post while



A plastic insulator clip holds fladry on the fiberglass post.

cap or wooden board to cover the top of the post while pounding. Use insulated clips to attach the fladry to these posts. Although fiberglass posts are poor conductors of electricity, adding insulated clips can help improve insulation and keep the fladry line secured. Maintain the same 28- to 30-inch height of the fladry line from the ground by adjusting the height of the insulators on the posts.



A T-post is useful to maintain line height and tension across uneven terrain where a fiberglass or plastic post would not provide enough strength.

We have found that working section by section is the most efficient method of installation, especially if there are only a few people to help with installation. As a rule of thumb, T-posts should be used at any point where the fladry needs more tension. Often this translates to about 250 feet between T-posts along straight fence lines, with additional posts at sharp angles or corners. T-posts should also be added in any areas of particularly wet or soft ground, to maintain the height and tension of the fladry line.

5. Build gates: To maintain access to the enclosure, gates can be built into the fladry line in the same areas where there are preexisting gates or openings in the permanent fence. Begin by installing two T-posts positioned 2 or 3 feet wider than the permanent fence gate. Choose one side that you want to position a handle and latch for opening and closing the fladry gate. Cut the fladry poly wire close to the area where you want the gate handle and latch to be located, and then pull a bit of extra slack from each end of the line. This will leave you with one short tail end of poly wire that will become the latch, and one long tail end that will cover the length of the gate opening and will be connected to an insulated gate handle.

Tie off the shorter end of the fladry line to an insulator on the T-post at the side where you want to create the latch, leaving a 10–12-inch tail end of poly wire. Using that tail, tie a small loop with a strong knot. Trim off any excess poly wire or use electrical tape to secure the remaining tail end once the knot is tied.

Leave the longer tail end of the fladry strung out across the ground between the two T-posts. At the opposite side from the latch, pull the fladry line taut and wind the poly wire around an insulator on the T-post so that it holds line tension beyond the gate.

Pull the long tail end of fladry across the gate opening towards the new latch and tie that end to the gate handle, ensuring a strong connection is made between the poly wire and the eye of the handle. Depending on the amount of slack you are working with in this long tail end, you may need to cut a short section off of the poly wire or remove flags before tying it to the handle to ensure the fladry is stretched tight between the two T-posts when the handle is hooked onto the latch. This tension will be important for maintaining an electrical current across the gate.



Cut poly wire close to where the fladry gate opening will be.



Once the fladry line has been cut on one side of the gate opening, you will have one short tail end (held in this installer's right hand) and one long tail end (held in the left hand) to use in gate construction.



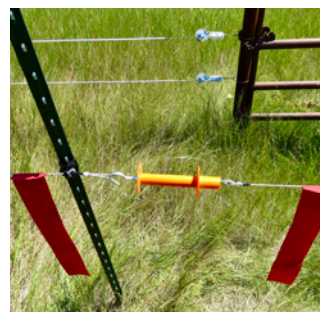
The gate latch is tied off to an insulator on the T-post to hold line tension and keep the loop in place.



Fladry can be tied off to T-post insulators using a figure-eight-style knot that holds the fladry in place.



The final stage in gate building will be to tie off the remaining long tail end of fladry to a gate handle near the latch.



An electric fence gate handle clipped to a poly wire latch creates the gate opening for the turbo fladry fence.



A finished fladry gate should maintain tension and line height consistent with the rest of the fence.

6. Check fladry line for consistency: Throughout the process of hanging the fladry and building gates at access points, we recommend frequent surveying of the fladry line to identify areas that could become weak points or short circuits for the electrical charge. This could include any place where the flow of electricity could be obstructed or where electricity could leak out of the fladry line because of contact with other conductive materials. This can result in insufficient voltage running through the fladry line. A splice in the poly wire can cause low voltage at one side of the fence and higher voltage at another side. (Box 3, below, explains a fladry splice.)

Another type of weak point could be an area where wolves may have an easier time going over or under the fladry line. Try to think like a wolf. For example, make sure the fladry is at a distance from unusual features of the landscape, like boulders or logs, that would make it easier for a wolf to find a path over the fladry line. Similarly, make sure there are no places where holes or dips in the ground would make it easier for a wolf to identify a clear path under the flagging. Add or adjust posts and line height to eliminate these weak points and “button up” the new fladry enclosure. It may also be necessary to cut down vegetation that comes into contact with the flags.

a fully enclosed fladry fence, the two ends of the fladry can be tied off to two staggered insulators on the original anchor T-post to create a “break” in the flow of electrical current. With a strong enough energizer, voltage should be sufficient for this design.

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This fladry installation began and ended at a corner gate, where the ends of the poly wire were tied off to staggered insulators on the T-post. In this setup, the energizer pushes power from one end of the fence to the other.

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An extra fiberglass post helps to pull the fladry line down at a low drainage spot in the pasture.

A fladry fence should ideally fully enclose a livestock pasture, leaving no gaps in the flagging. However, the poly wire does not need to make a fully closed or complete loop. A complete loop is created when the two tail ends of the poly wire are joined using a knot so that the energizer pushes electrical current in both directions around the fence line. This can increase voltage, but leaving the tails ends of the poly wire disconnected can make it easier to locate weak points or short circuits using a fault finder. To leave the poly wire disconnected while still creating

BOX 3: A NOTE ON CUTTING AND SPlicing FLADRY

Care must be taken at points where poly wire has been cut and needs to be spliced. A splice is where two severed ends of a fladry line need to be joined in a way that will still conduct electrical current consistently through the line. The key with splicing fladry is to ensure that the metal strands running through each side of the poly wire have sufficient contact. To rejoin severed fladry, we recommend double or triple knotting the poly wire and then taping the two tail ends to the main poly wire line using electrical tape. Another option is to tie a double or triple knot to rejoin the two sides of poly wire and then peel away the plastic strands at each tail end to expose the metal strands in the poly wire. Then twist the metal strands around each other to create a loop out of the two tails.

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A splice with the poly wire tail ends taped to the main line using black electrical tape.

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A splice with the metal strands in the poly wire tail ends exposed and twisted together.

7. Electrify fladry line: This is done using an energizer, which conducts electricity through the poly wire that the flags are attached to. We recommend an energizer with a minimum output of 1 joule per mile of fladry. If the pasture perimeter is longer than this, or if 1 joule is not enough to supply a sufficiently high voltage for wolf deterrence (we recommend at least 6,500 volts), multiple energizers, or an energizer with a larger output, will be necessary. Some energizers can be plugged directly into an outlet for power, while solar energizers can be used for more remote locations. When using a solar energizer for the first time or after a long period of storage, it should be set out in the sun for multiple days with the switch in the off position to ensure the battery is charged before it is hooked up to electrify a fence.

To hook up the energizer, first identify a convenient location at a corner post or gate close to a power outlet, or, if using a solar charger, identify an accessible area with plenty of sunlight. Certain types of energizers may need to be mounted off the ground on a strong post, while others can sit directly on the ground. Refer to the energizer manual for specific guidelines.

Install three 6–8-foot long grounding rods by pounding them into the ground 5–10 feet from the energizer and spaced around 10 feet apart from each other. The grounding system is critical for completing a full electrical circuit between the energizer, a wolf that makes contact with the fladry line, and the ground system (the soil will conduct the electrical current from the wolf to the ground rods, which will carry electricity back to the energizer to complete the circuit).

Once you’ve pounded in the ground rods, use one long strand of galvanized wire to connect the ground rods to each other and to the ground (negative) terminal on the energizer. The metal clamps that typically come with a ground rod set help to ensure a snug connection between the wire and the top of each ground rod. Use another strand of galvanized wire to connect the fladry poly wire to the hot (positive) terminal on the energizer; for a strong connection, either use an alligator clamp or wrap the connecting wire tightly around the fladry poly wire using multiple wraps. Once the connections are made between the ground rods and energizer, and between the poly wire and energizer, you are ready to turn the energizer on and electrify the fence.



The front and back of a solar energizer with a red wire leading from the hot terminal (the red knob) to the fladry poly wire and a steel wire leading from the ground terminal (the green knob) to the ground rods.



Some energizers come with alligator clamps on insulated wire that are useful for making strong hot and ground wire connections.

The ground rods on the right side of this image are connected to each other using wire and metal clamps and are connected to the energizer using a green alligator clamp.

Use a fault finder or voltmeter to test the poly wire both near the energizer and at the point on the fence farthest from the energizer to ensure a consistent voltage of at least 6,500 volts. If the voltage is below this, look for weak points along the line where electricity may be leaking out or where the flow of electricity may be hindered (like at a splice). A good fault finder will measure voltage, current and the direction of current flow to guide you towards the fault in the fence line. Grounding issues are a common explanation for low voltage across a fence line.

8. Maintain fladry: After the fladry is active, maintenance should be conducted once every week or so.



A turbo fladry installation on a Wyoming ranch near the Teton range.

OTHER CONSIDERATIONS

Maintenance

Turbo fladry requires maintenance to ensure maximum effectiveness. Periodic checks to resolve issues of coiling (when the flag wraps itself around the poly wire), line height consistency, and electrical faults can be integrated into a normal weekly or day-to-day routine.¹¹ Depending on the property, geographic region, and time of year, vegetation management or line height adjustment for snow may be important aspects of maintaining turbo fladry.

Severe flag coiling can create gaps in the fladry fence that may make it easier for wolves to pass under. Uncoiling flags can be an important part of maintenance depending on the type of flags and the weather, which influence the prevalence of coiling. There are also methods you can employ to prevent coiling, like tying knots at the top of some or all of the flags.¹²

Important considerations when using turbo fladry

Turbo fladry is not suitable for year-round use since it relies on neophobia. If wolves become accustomed to the sight of fladry, as they could if it were installed for many months at a time, their aversion will diminish. As mentioned previously, it is usually installed for a period of 75–90 days.

If turbo fladry is installed during the winter, the ground in some regions may be too frozen to pound in fiberglass posts. Where fiberglass isn't usable, we recommend using concrete-reinforcing rods (rebar), with compatible insulators, instead.

ENDNOTES

- Nathan Lance et al., "Biological, Technical, and Social Aspects of Applying Electrified Fladry for Livestock Protection From Wolves (*Canis Lupus*)," *Wildlife Research* 37, no. 8 (2010): 708, <https://doi.org/10.1071/WR10022>.
- Steve Primm, Bryce Andrews, and Amy Robinson, "Electrified Fladry for Deterrence of Gray Wolves (*Canis Lupus*): An Evolving Manual of Best Practices," People and Carnivores, 2018, <https://peopleandcarnivores.org/wp-content/uploads/FladryManual.pdf>.
- Ibid.
- Lance et al., "Biological, Technical." Julie Young et al., "When Strange Bedfellows Go All In: A Template for Implementing Non-Lethal Strategies Aimed at Reducing Carnivore Predation of Livestock," *Animal Conservation*, October 11, 2018, <https://doi.org/10.1111/acv.12453>.
- Julie Young, John Draper, and Stewart Breck, "Mind the Gap: Experimental Tests to Improve Efficacy of Fladry for Nonlethal Management of Coyotes" *Wildlife Society Bulletin* 43, no. 2 (June 2019): 265–271, <https://doi.org/10.1002/wsb.970>.
- Lucia Moretti et al., "The Influence of Relationships on Neophobia and Exploration in Wolves and Dogs," *Animal Behaviour* 107 (September 2015): 159–173, <https://doi.org/10.1016/j.anbehav.2015.06.008>.
- Young et al., "When Strange Bedfellows Go All In."
- Ibid.
- Ibid.
- Julie Young, Elizabeth Miller, and Anna Essex, "Evaluating Fladry Designs to Improve Utility as a Nonlethal Management Tool to Reduce Livestock Depredation: Evaluation of Fladry Designs," *Wildlife Society Bulletin* 39, no. 2 (June 2015): 429–33, <https://doi.org/10.1002/wsb.531>.
- Primm, Andrews, and Robinson, "Electrified Fladry." Young et al., "When Strange Bedfellows Go All In."
- Young, Miller, and Essex, "Evaluating Fladry Designs."
- The contact information for each Wildlife Services State Office can be found on the USDA "State Offices" web page: https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/SA_Program_Overview/SA_Contact.

Dry ground may not conduct electricity as efficiently as wetter ground. Consider adding additional ground rods or moving the grounding system and energizer to a low-lying area where the ground has more moisture.

Support for people interested in using turbo fladry

The financial costs and the labor required for installation, maintenance, and retrieval of fladry are not insignificant. However, a number of agencies and organizations offer support to livestock producers who are interested in turbo fladry but need help obtaining and installing it. The assistance available will depend in part on your location. Contact your county, state, or federal wildlife management agency to find out more. USDA-Wildlife Services is increasingly involved in helping ranchers install fladry across states with wolves and in some cases offers cost-share options for fladry supplies.¹³ Many nongovernmental organizations can also provide assistance with supplies and installation.

ADDITIONAL RESOURCES

Fladry best practices:

"Electrified Fladry for Deterrence of Gray Wolves (*Canis Lupus*): An Evolving Manual of Best Practices," <https://www.peopleandcarnivores.org/manuals-and-guides>.

Guides to reducing wolf predation:

"Wolves on the Landscape: A Hands-On Resource Guide to Reduce Depredations," <https://www.peopleandcarnivores.org/manuals-and-guides>; "Livestock and Wolves: A Guide to Nonlethal Tools and Methods to Reduce Conflicts," <https://defenders.org/publications/livestock-and-wolves-guide-nonlethal-tools-and-methods-reduce-conflicts>; "Reducing Conflict With Grizzly Bears, Wolves and Elk," <https://westernlandowners.org/lp/reducing-conflict-with-grizzly-bears-wolves-elk>.

Electric fencing how-to videos:

"We're on Your Side of the Fence," <https://www.youtube.com/user/ZarebaSystems/videos>.

"Gallagher Animal Management," <https://www.youtube.com/c/GallagherAMS/videos>.