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Natural Resources Conservation Service

Biology Fact Sheet

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Guidelines for Use of Snake-Friendly Erosion Control Blankets

Snakes are unique and beneficial creatures. They are found in many types of habitat and play important roles in Indiana's ecosystems. As carnivores, they prey on a variety of species including birds, small mammals, snails, fish, lizards, and even other snakes. Their presence, or absence, can be an indication of how healthy an eco-system is.

Snake entrapment due to entanglement in the plastic netting used in Erosion Control Blankets (ECB) is a concern to the Natural Resources Conservation Service (NRCS) in Indiana. Impacts to populations could be substantial, and such losses are avoidable.

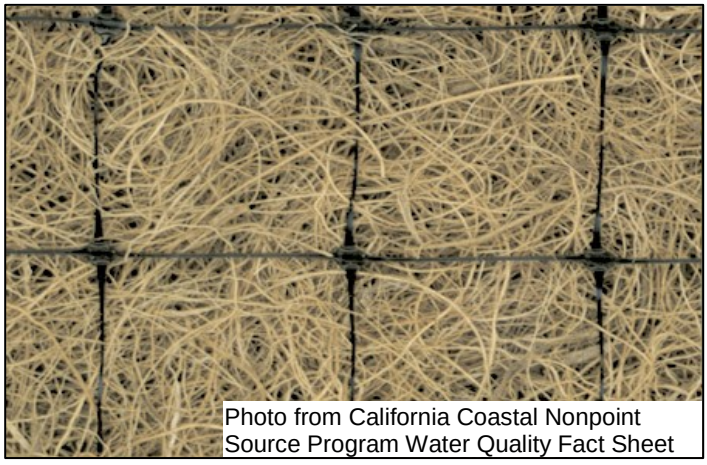
Snake entangled in ECB plastic netting

EROSION CONTROL BLANKETS

An Erosion Control Blanket is a manufactured product composed of natural or synthetic fibers bound together to form a continuous mat, usually held together with netting. A natural-fiber mat consisting of straw, coconut fibers, or wood fibers, and bound with plastic netting, is a very widely used type of ECB. The netting is often stitched to the mat, either with a synthetic or natural-fiber thread.

Erosion Control Blankets are available with netting on one or both sides, as well as net-less blankets composed of material such as wood fibers. The netting used in ECBs can be made of either natural (jute and coconut fibers) or synthetic materials. Natural-fiber netting is environmentally preferable because they are biodegradable. Synthetic plastic netting usually consists of plastic resin melted and formed into a continuous mesh, with fixed joints between the strands. Alternatively, plastic may be formed into yarn or strands that are woven into netting. The plastic netting is normally cheaper than the natural-fiber netting. ECB netting comes in a variety of mesh sizes; ½-inch and 1-inch openings being the most common.

Erosion Control Blanket with plastic netting



Close-up of extruded plastic netting

THE ISSUE FOR SNAKES

Plastic netting without independent movement of individual strands can entrap medium to large snakes and other wildlife moving through the area, leading to dehydration, and eventually mortality.

Even ECB classified as “temporary” and designed to degrade after a period of time are a threat. The length of time it takes for netting to begin to degrade depends on the netting composition and environmental conditions. Plastic erosion control netting has been found intact on project sites up to eight years after installation.

In the past, snakes have become entangled in NRCS projects using ECB in Indiana. These experiences prompted proactive efforts to minimize impacts in critical areas where endangered species are involved.

The Fish Creek Watershed in Northwest Indiana, for example, has been identified as crucial wetland habitat for several Threatened and Endangered Species including the federally-listed Copperbelly Water Snake. NRCS projects in the Fish Creek Watershed and other areas potentially inhabited by other declining species are designed specifically to provide protection and additional habitat for the protected species. **It is imperative that NRCS projects incorporate the most snake-friendly practices under these conditions to protect endangered species.**

SNAKE-FRIENDLY DESIGNS & PRACTICES

The following factors are considered safer Erosion Control Blankets for snakes and other wildlife.

Loose-weave netting: An important factor in snake-friendly netting is to have movable (not fixed or welded) joints between the twines, thus allowing the twines to move independently. This design allows each opening between the twines in the netting to be stretched as an animal passes through, thus reducing the potential for entrapment. Netting designs with movable joints may be called loose weave, leno weave, or gauze weave.

Mesh Size Small mesh sizes can entrap snakes: While little research has been done on the optimal mesh size in netting to avoid snake entrapment, NRCS recommends that if netting is not movable, openings be at least two inches wide. Snakes may be particularly vulnerable to entanglement in netting if they get stuck partway through, but cannot back out because their scales catch on the netting. Mesh netting with an opening that is either too small for snakes to attempt to pass through, or too large to impede the passage of snakes, are optimal to reduce the threat of entrapment. However, even small meshes may still entangle naturally small snakes and other small wildlife.

Close-up of jute netting

Natural-Fiber Materials: Biodegradable natural-fiber Erosion Control Blankets are more snake-friendly than synthetic products. Natural-fiber netting typically has less tensile strength than plastic netting, and thus may allow entrapped animals to break free. Unlike plastic netting, natural-fiber netting breaks down quickly.

Prompt Removal of Product: “Temporary” Erosion Control Blankets are commonly left in place permanently, particularly if vegetation has grown up through the netting. Prompt removal when no longer needed is recommended, if possible, without damaging the new vegetation.

Photo from California Coastal Nonpoint Source Program Water Quality Fact Sheet

Options That Do Not Require Netting: There are several choices of erosion control products that do not contain netting. These include net-less Erosion Control Blankets (for example, those made of wood fibers), loose mulch, hydraulic mulch, soil binders, and straw bales.

INDIANA GUIDELINES

When Threatened and Endangered Species are Potentially Present:

The following NRCS guidelines have been implemented to avoid snake entrapment in the plastic netting commonly used in Erosion Control Blankets in Indiana. Where Federal- or State-listed snake species are potentially present, these guidelines are required, and have been incorporated into the planning process used by NRCS personnel when working with landowners.

Erosion Control Blankets used on any type of NRCS project in locations with potential Threatened or Endangered snake species will:

1. Have net openings of 2-inch minimum width **or**,
2. Be constructed of a woven (leno weave) netting that allows openings to adjust to wide widths.
3. Be of a type that will not entangle snakes as approved by the NRCS State Biologist

Erosion Control Blankets such as North American Green *Bionet S150BN*, and Western Wood fibers *EXCEL SS-2 All Natural* (biodegradable jute/scrim netting with leno weave type mesh), or equivalent, are considered acceptable products.

The Threatened and Endangered snake species in Indiana that are covered by this policy presently include:

- Butler's Garter Snake
- Copperbelly Water Snake (T)
- Eastern Massasauga Rattlesnake (T)
- Kirtland's Snake
- Rough Green Snake
- Smooth Green Snake
- Timber Rattlesnake
- Western Cottonmouth
- Western Ribbon Snake

(T) = Federally Threatened

When Threatened and Endangered Species are Not Potentially Present:

In locations were Threatened and Endangered Species are not potentially present, it is still encouraged to use the snake-friendly Erosion Control Blankets as described above when feasible. However, when cost is a concern, double-sided straw netting with an approximate 60-day photo-degrading rating can be considered. Note that netting with a 12-month photo-degrading rating should be used on areas in need of protection during periods of the year when vegetative cover cannot be established.

REFERENCES

Kapfer, J.M. and R.A. Paloski. 2011. On the threat to snakes of mesh deployed for erosion control and wildlife exclusion. Herpetological Conservation and Biology. 6:1-9 (http://www.herpconbio.org/Volume_6/Issue_1/Kapfer_Paloski_2011.pdf).

California Coastal Nonpoint Source Program Water Quality Fact Sheet: *Wildlife-Friendly Plastic-Free Netting in Erosion and Sediment Control Products* (http://www.coastal.ca.gov/nps/Wildlife-Friendly_Products.pdf).