Floodplain Fencing

Some Practical Design Concepts for Landholders

Design considerations for fencing in floodplain areas

Rapidly flowing flood waters can destroy houses, bridges, roads … and fences! So is it possible to design a fence that will withstand flood waters? The answer is no - but it is possible to design one that will suffer minimal damage and that will be easy to repair once the flood waters recede. **This brochure presents design options for low-maintenance, flood damage resistant fencing.**

Key design principles

Fence damage from flood waters is usually caused by the build up of flood debris against the fence (sometimes called flood wrack). The accumulated debris provides a wide surface area for the flowing water to push against - and the fence fails. If there was no debris in the flood water to create a wall of flood wrack against the fence the water would most likely pass though the fence and cause little harm (strands of wire offer little resistance to flow). Therefore floodplain fencing should be designed to minimise the collection of flood wrack. This brochure provides two options for floodplain fencing.

Photo 1: The fence protecting this wetland has been designed to be flood resistant. Very strong end assemblies of recycled railway iron support a minimal framework of three electrified plain wires powered by a stand-alone solar-powered energizer.

Floodplain fencing - option 1

In this design (see page 2) each section of fence is wired separately so that if one panel does fail it will not pull the rest of the fence with it. The plain wire is much easier to recover post-flood than barb wire, and the simple three wire panels can be replaced quickly and cheaply should the need arise.

Stand-alone solar power units provide a cheap and easy way of powering-up floodplain fences that are located in areas remote from mains power. Prices start from about $350 for a 2km unit (see photo. 1). Remember - quality construction and good earthing are vital to get the maximum performance out of your electric fence.

Floodplain fencing - option 2

This design (see page 3) involves constructing separate panels of fencing that are attached to hinged end assemblies. This enables the whole fence panel to be folded to ground level, allowing flood waters to pass harmlessly over the prone fence.

Photo 2: End assemblies are the most expensive part of a fence to install. A flood channel crosses this fence from left to right, & this length has been wired as a separate "sacrificial" section (note the end assemblies each side of the channel). Each section of the fence between the posts have been wired separately (note the wiring at the post in the foreground).

OPTION 1: FLEXIBLE ELECTRIC FENCE

Photo 3

Photo 4

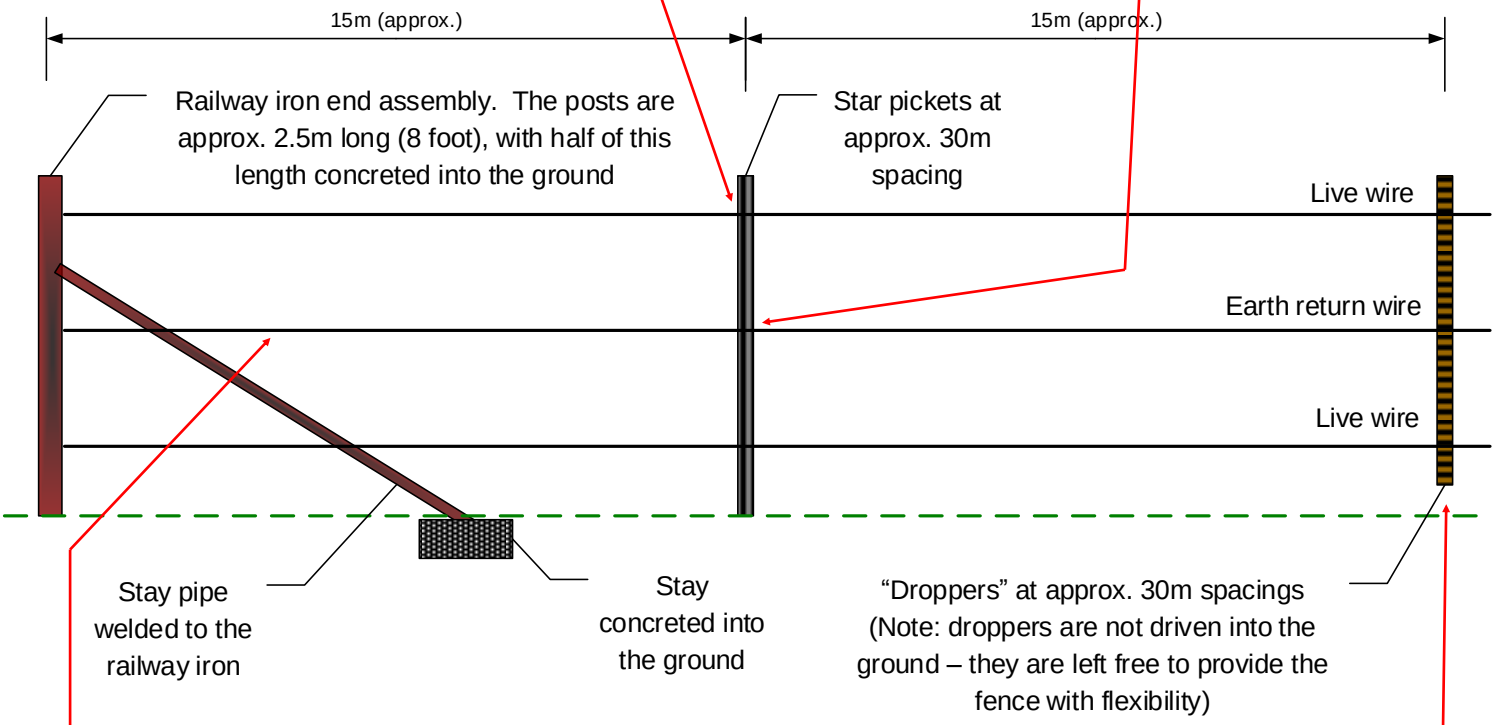

Photo 5

Photo 6

Photos 3-6: *Wires are not run through the star pickets themselves but are attached to the pickets on the down-stream side of expected flood flows (photos 3 & 4 above). The wire will be more likely to release from the picket if it is struck by debris, rather than pulling the star picket out. Photo. 5 (bottom left) shows a close-up of a galvanized earth spike. Proper earthing of electric fencing is vital to ensure maximum performance and a minimum of three, inter-connected 2m long earth spikes should be fitted. Photo. 6 (bottom right) shows how flexible the fence is where droppers are used - this allows debris to flow through the fence with less likelihood of it snagging the wires. This type of fence is ideal for situations where flood flow direction is unpredictable.*

OPTION 2: "DROP" FENCE


Photo 7

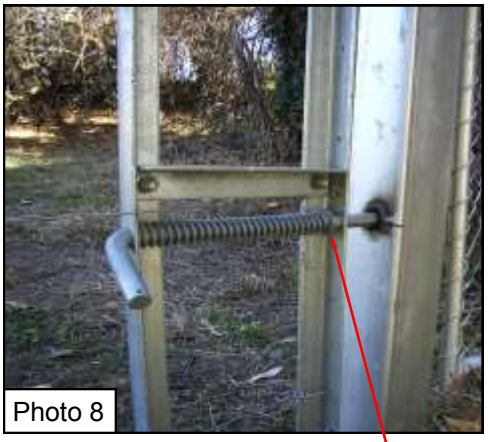
Photo 8

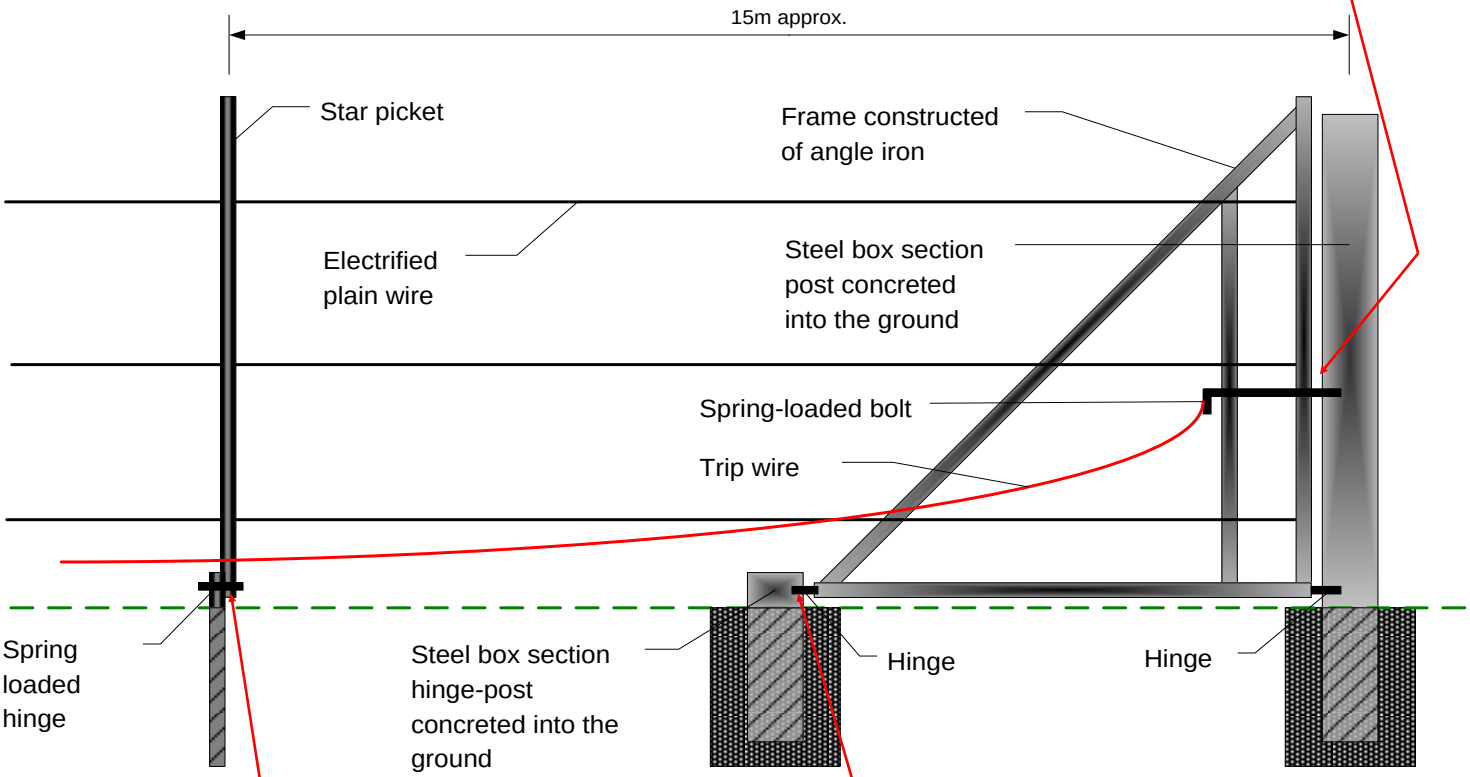


Photo 9


Photo 10

Photos 7-10: *The key component of the "drop-fence" is the hinged triangular end assembly (photo 7 top left). Photo. 8 (top right) shows a close-up of the locking bolt that holds the end assembly in place. A trip wire is attached to the spring-loaded bolt (not yet attached in the photo, but note the pre-drilled hole to attach the wire). When flood debris/ flood flows pull on the trip wire the bolt is pulled out of the post & the fence falls to the ground. Alternatively, if a flood is expected, the fence can be laid down manually. Photo. 9 (bottom left) intermediate star pickets are also hinged at ground level with spring loaded bolts. Photo. 10 (lower right) shows the hinge at the left hand end of the end assembly. This type of fence is best suited to sites where flood flows will reliably hit the fence at right angles (to trigger the trip wire).*

Photo 11: This fence has been positioned well away from overhanging trees. This has two benefits; firstly damage from falling limbs is greatly reduced, and secondly by moving the fence further back from the creek straighter runs of fence are possible. This reduces the number of expensive corner assemblies that are required.

Photo 12: Another reason not to use barb wire; it has a well-earned reputation as a killer of native wildlife. This bat has become entangled when the barb pierced its wing membrane.

Post & end-assembly options

Railway iron availability & prices can fluctuate considerably so exploring other options is worthwhile e.g. hardwood timber posts, concrete filled heavy-duty galvanized pipe or pre-fabricated concrete posts, although the latter are brittle & prone to damage if struck by large logs during floods. Experience has shown that concreting posts into the ground is the best option. Driven posts, with no concrete, tend to work loose over time in flood-prone areas.

Barb or plain wire?

Electrified plain wire is recommended for floodplain fencing. The number of wires & their configuration will depend on the type of animal the fence is intended to contain. (The fences displayed in this brochure are typical cattle fence setups). Barb wire tends to pick up flood wrack leading to fence failure. It is also difficult to clean up post-food, has a reputation for killing wildlife (see photo 12) and can lead to hide damage. A barb damaged hide will fetch less when an animal is finally processed at the abattoir.

Fence position

Fences need to be positioned with the long-term maintenance of the fenced area in mind e.g. if stock are to be used to crash graze the area then a sufficient width and well positioned gates will be required to make mustering easy. Fencing further back from a meandering creek line, rather than closely following the bank, means that the number of expensive corner assemblies can be greatly reduced.

Further Reading

1. Some fencing material manufacturers produce detailed fencing manuals that are available as free downloads from their websites.

2. A good general guide to floodplain land management issues:

Stanton, J. & O'Sullivan, J., 2006. *Stock and Waterways: A Manager's Guide.* Land & Water Australia, Canberra.

This publication can be downloaded from the Australian River Restoration Centre website. (This site also contains many useful fact sheets and manuals regarding the management of riparian land).

https://arrc.com.au/resources/managing-stock/

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Rick James

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