One way Wildlife gates – How and Why

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"The most famous fence in the United States is the expanded border wall pushed by former President Donald Trump. Intended to prevent illegal immigration, the barrier also keeps wildlife from moving between the United States and Mexico." ***(Robbins, 2022)***

1 - Introduction

The widespread introduction of fencing for farmland, roadside barriers and property privacy has created a double edge sword for wildlife. While keeping animals out of undesirable areas helps reduce harmful contact between human venture and wildlife there are often unintended consequences and the widespread use of wildlife fencing has been shown to be harmful to natural migration routes and diurnal patterns of wildlife. From the low and fast flight patterns of grouse, who often fly into paige wire, to the impact on insect populations being trapped by spiders who can conveniently build webs in the squares of woven fencing *(Robbins 2022)*, human infrastructure has an impact on the wider ecosystem.

1.1 Animal harms

Standard wildlife exclusion fencing in North America is 8ft tall, with wooden post supports and square paige wire structure. This type of fencing is adept as a cost effective barrier but does not present an impermeable wall.

Because the fencing runs over the ground, any animal that has a natural tendency to dig can easily circumvent this type of fence through burrowing. Other animals like bears and ungulates have been proven to attempt to transit under a fence line once an established burrow is made. This can contribute to mortality due to entrapment or panicking.

Large animals who are able to enter a fenced enclosure area are often then trapped inside the undesirable part of the enclosure with no means of escape. Aside from the obvious harms to the property owner's operations, the animal itself is unable to function according to its natural and evolutionary characteristics. These animals must be provided corridors to water bodies and traditional migration routes in order to be able to continue thriving in their natural environments.

When fencing is linked together and stretches for long distances, the impacts can become even more severe including reduced fitness levels, unnatural/increased predation, and reduced genetic diversity of obstructed populations

1.2 Transit mechanisms

Operators of Highways, rail lines and other corridors that bisect environmentally sensitive areas are now realizing the impact of impeding access to migratory and natural transit routes and are taking action to mitigate damages through the use of overpass and underpass tunnels, allowing wildlife a transit mechanism to cross unimpeded. These have been met with some success but are hugely expensive – though it has been shown that the costs of these structures are largely justified when weighed against the costs savings in damages to human property and animal life.

A wildlife overpass bridge installation at Banff Ab.

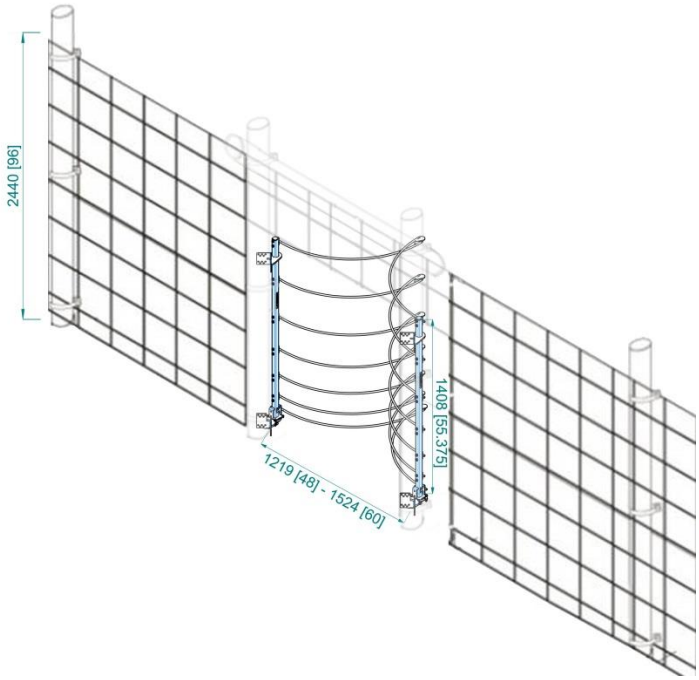
The use of expensive over/underpasses is not a practical solution for fenced property owners. Aside from the cost, these structures permit two way transits, negating the purpose of exclusionary fencing.

A release gate is an effective way to allow for unwanted entrants to return to the other side of a penetrated fence line and exclude return traffic.

2 - Release gates – Function and use

The release gate functions in a similar manner to a reed valve or coronary valve. Two sets of curves tines are mounted vertically on spring closed hinges. The tines curve away from the entrapment side of the fence to the outside. In one direction, flow is freely permitted and a funnel shaped structure encourages traffic passage. In the other direction, flow is obstructed and the structure is shaped in a way to discourage transit attempts.

Gate height and width can vary depending on the targeted species however a 4-5ft wide aperture at 4.5-5.5ft opening height has proven to work well for ungulates and medium sized animals. *(BC RMB 1996)*



Installation Example

Similar to large scale transit structures, users of release gates have found the costs justified when weighed against the costs savings in damages to human property and animal wellness.

2.1 Positioning/behaviour

The design of an effective release gate must be such that it is easy for an animal to locate and operate, robust enough to withstand "testing" by large and small animals, as well as stand up to months of unmonitored use. Though it is still recommended that the gates be inspected to ensure they are operating as intended from time to time. Gates should be at intervals of approximately 0.5 km throughout the length of a fence line *(Golder Associates, 2013)*

Additional to the strength of the unit, care must be taken in the design to ensure there is no unintentional injury to the animals passing through the gates. Ungulates with horns/antlers pose entanglement issues and larger animals who panic while passing through may also cause injury to themselves on the gate structure. *(L.E. Sielecki, 2007)*

The installation site should be carefully chosen. Animals will habitually tend to certain spots on a property and this can be leveraged to increase the effectiveness of the gate. If a property has a natural route present either as a path to wilderness or an aquifer, etc, it is suggested to try to install the release gate along this natural path of travel.

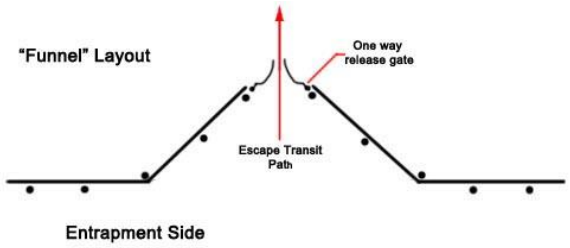
2.2 Headers

It is a good practice to install a header above the gate to prevent animals from attempting to "test" the gate by jumping over the top tines and below the fencing. This will help to prevent injury and a well installed

header will also help to stabilize the support posts and prevent twisting from repeated opening/closing of the gates. Special adjustable headers are available to achieve this purpose.

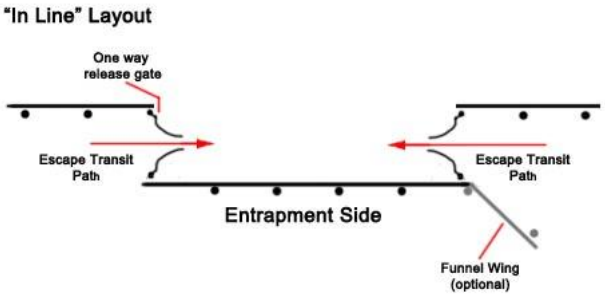
2.3 Funnel placement

When it is desired to release animals out broadside through a fence line, it has been discovered that setting the release gate slightly back in a funnel type installation will help to guide the animals into the gate and provides a more natural environment for them. *(BC RMB 1996)*



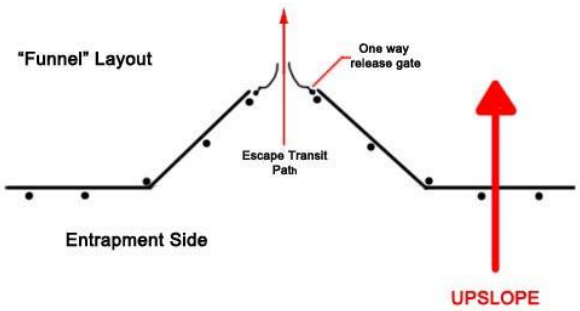
2.4 Inline placement

Animals often "test" a fence line by travelling along the length looking for weak spots and escape routes. This tendency can be exploited by creating a jog out and placing the release gates inline with the direction of fence travel. It is also often easier to orient the gates upslope while using this method. *(BC RMB 1996)*



2.5 Upslope/downslope

Most animals by nature are generally more hesitant when travelling downhill. Upslope travel is more comfortable and therefore when installing a one way gate on a slope it is preferred to install the gate so that it will release to the uphill side.



Example of roadside "inline" upslope installation with headers (L.E. Sielecki, 2007)

3 - Summary

The American west is currently estimated to have 620,000 miles of fencing *(Robbins, 2022).* As society expands its reach further and further into competition with natural wildlife, the proliferation of fencing will become more prevalent. It is only reasonable to assume steps need to be taken to mitigate adverse and unintended consequences for wildlife and landowners.

Proper and efficient use of one way release gates and other deterrents are a cost effective way to augment wildlife exclusion systems. Developing options that can be widely implemented by property and fence line owners to reduce ecological and environmental harms should be an industry priority. By providing benefits to the end users operations and producing cost savings to repay their upfront costs, further incentivisation to implement these systems can be created and produce win-win results for operators, manufacturers and wildlife alike.

References:

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