

Appendix K
ROUTE CLOSURES AND TYPICAL BARRIERS
Ironwood Forest National Monument
Travel Management Plan

The types of barriers would be used to implement the route designations established concurrently with RMP land use allocations are described in this Appendix. The type of barrier that will be used at a particular location would depend on the route designation and management objectives, and site specific conditions. Some barriers would include gates that are intended to accommodate administrative vehicle passage, and others are intended to allow passage only by non-motorized travelers. The first 200 ft of decommissioned routes will generally be restored or revegetated to disguise the clearance through the vegetation and the tracks to avoid attracting continued use.

Physical vehicle barriers will be used where travel management route designations cause a change in access from motorized to non-motorized use, or to keep motorized vehicle use on the designated motorized routes. The key designations that will be implemented within the first 3 to 5 years will focus on the following changes in use:

- Primitive Road to Non-Motorized Trail: These barriers will typically block all vehicles and accommodate passage for non-motorized, non-mechanized public and administrative use (foot or horse); typically includes minimal space at the barrier site for parking and maneuvering or turning around, and appropriate signing.
- Primitive Road to Administrative Road: These barriers will typically block all vehicles, and accommodate passage by administrative vehicles, and non-motorized mechanized public use (foot, horse, mountain bicycle,).
- Primitive Road to Restoration Treatment: These barriers will block all vehicle use, and discourage use of the route for any access purpose after restoration treatment (soil ripping, mulching, or revegetation); includes appropriate signing, no parking or maneuvering space is required.
- Primitive Road to Off Road: These barriers will typically help road users stay on the designated roadway, and prevent new vehicle traffic lanes from becoming established along, or beyond, a designated motorized route.

Typically, the barrier types with the least impact and most economical will be installed, and if it proves to be ineffective, then it may be replaced with a more substantial barrier.

Table H-1. Typical Vehicle Barriers:

Barrier type	Description/Specification	Construction/Installation	Remarks
Boulders (See Figure 1)	Boulders set in line 40" apart, keyed into the ground approximately 12"; minimum 1,000 lbs ea.; 30 to 40" size, blocky dimension.	Requires heavy equipment to transport to site, handle and place. (back hoe, or front end loader)	Accommodates passage by non-motorized users. Not an effective barrier for motorcycles.
Fence, barb wire (Figure 2)	Standard four-strand rangeland fence meeting wildlife fence specifications (bottom and top barbless wire, middle two barbed wire).	T posts driven into ground. Angle iron stretch and end panels require excavation and concrete backfill. See typical BLM drawings and specifications.	Use where passage for access beyond barrier is not required. Effective along roadsides to keep use on road, or at end of route. Requires gate or gap for safe passage by all users.
Fence, Ungated passage	Fence with 40" passage gap	Gap between two end panels in fence. Requires excavation of end panel posts and backfill with concrete.	Accommodates passage for non-motorized use. Not an effective motorcycle barrier. Allows unimpeded movement of cattle.
Vehicle Gate, with integrated pedestrian gate (Figure 3)	Locking vehicle gate with integrated pedestrian gate, variable overall width (16 ft. min.). 4'x4' pedestrian gate. Vehicle gate secured with chain and lock(s). Pedestrian gate unlocked.	Requires excavation and back fill with concrete to set hinge and lock posts.	Placed on existing or new fence. Locking vehicle gate accommodates administrative vehicle passage; pedestrian gate allows non-motorized passage. Not an effective motorcycle barrier. Provides barrier to movement of cattle.
Fence, barb wire cable reinforced (Figure 4)	Standard four-strand rangeland fence meeting wildlife fence specifications, reinforced with two ½" galvanized steel cable strands along the two center wire strands.	Requires heavy steel track stretch and end panels to support cable; closer spacing of T posts, and cable hanging hardware. Rail posts/panels require excavation and backfill with concrete; requires heavy equipment to handle. Stretch panels at 1,320' spacing, or at horizontal and vertical angles.	Requires access by heavy equipment to construction site. Barrier effective for all vehicles. Provides barrier to movement of cattle.
Post and Cable (Figure 5)	4" diameter steel tube posts set in ground, 12' to 16' spacing, supporting one or two 3/8"-1/2" steel cable(s) across the span.	Overall height 48" tall 4" wide galvanized steel tubing concreted 20" below ground level, with 28" above ground. 4" from the top of the steel post is a 3/8" steel cable. 25' maximum distance from post to post. Object markers must be installed to prevent accidents.	Cable may present a hazard.
'Normandy' Steel Barrier (Figure 6)	Panels made of steel rail jacks with 20' rail welded across top; panels welded end to end, set on the ground.	20' long steel tracks welded to two supporting cross-jacks made of 5.5' pieces of rail. Panels fabricated off-site, and welded end to end in the field. Material is 33 lbs./ft. rail, and each panel weighs approx. 1,260 pounds	Requires heavy equipment to transport, handle and place the panels. Requires welding in the field to connect the panels. Effective for all vehicles. Blocks movement of cattle.
Vegetation-	Burying upright dead	Burying upright dead	Requires small hand tools

restoration (Figure 7)	organic material to create an aesthetic visual barrier.	organic material to create an aesthetic visual barrier.	
Fence, Steel Post and Rail (Figure 8)	Steel tube posts with steel tube rail (s) welded across span.	Galvanized or unfinished steel round or square tubing posts concreted, with a minimum height of 3' aboveground. Galvanized steel tubing welded to steel posts end to end to create fence.	½ ton truck is recommended for delivery with a pneumatic hammer, auger, welder, bolts, hardware, and basic hand tools.
Bollards (Figure 9)	6" steel pipe filled with concrete, capped; set in line at 40" spacing.	Requires excavation and back fill with concrete. Removable locking bollard may be used for vehicle access. Cap prevents water seepage and freeze/thaw damage.	Accommodates non-motorized passage. Not effective motorcycle barrier. Does not impede movement of cattle.
Rock Edge (Figure 10)	Stone and rock ranging in size from 12" to 24" placed in a strip along the edge of a designated roadway.	Rocks placed aboveground, does not require excavation, or disturbance of the soil.	Creates a hard edge along the travelway to help keep vehicle use on the road; prevent parking turnouts or off road use. Not effective motorcycle barrier.
Channel Post Line (Figure 11)	Channel posts pile driven into the ground in-line at 40" spacing, with object markers	Requires very little disturbance and no excavation.	Accommodates non-motorized passage. Not effective for motorcycle. (Materials: Posts 5 ½' 3.25 lb)
Wire Gate (Figure 12)	Wire Gate; Typical wire and stay gate on fenceline.	Requires excavation and back fill with concrete.	Not an effective barrier.
Steel Pipe Gate (Figure 13)	Steel Pipe Gate, heavy steel tube and concrete construction, with multi user lock box.	Requires excavation and back hoe to install; welding for field assembly.	Vandal resistant, designed to accommodate up to 4 separate locks.

Figure H-1. Boulder Barrier:

Boulders placed on the ground at the top of a bank. Allows passage by all non- motorized users. Effective on vehicles wider than 40” overall width; ineffective on motorcycles. Note: Boulder set on the ground are relatively easy to move or roll out of the way with a winch or lever. Key boulders in an excavated pit to a depth approx. $\frac{1}{4}$ of its vertical dimension.



Figure H-2. Fence, Barb Wire:

Typical rangeland fence made of four or five strands of barbed wire and smooth wire; constructed according to wildlife fence specifications. Effective along road sides to promote traffic staying on roadways.



Figure H-3. Vehicle Gate Integrated Pedestrian Gate:

Locking 12' Vehicle gate with attached 4' Pedestrian unlocked gate. Allows Passage by all non-motorized users, while allowing administrative access; ineffective on motorcycles



Figure H-4. Fence, Barb Wire Cable Reinforced:

Typical rangeland fence made of four or five strands of barbed wire and smooth wire; constructed according to wildlife fence specifications. Added to the fence is a minimum of 3/8" Steel Cable to mitigate fence cutting. Effective along road sides to promote traffic staying on roadways.



Figure H-5. Post and cable Barrier:

4” steel pipe posts with cable across span. Posts require excavation, and backfilling with concrete. May present a safety hazard to users due to low visibility of the cable. Requires object markers on the posts and on the cable span.



Figure H-6. ‘Normandy’ Barrier, Steel Rail Track:

Typically 20 ft. long panels made of railroad track welded to two supporting cross-jacks (made of two 5 ½ ft. pieces welded), set on the ground. Panels may be pre-fabricated off site and transported to project site. Requires truck or transport access, and heavy equipment to move, handle and place. Assembly of barrier panels requires welding in the field to connect adjacent panels. Barrier panel typically made of 90 lbs./yd rail (33 lbs./ft.), and weighs approximately 1,260 lbs.



Figure 6: Normandy Barrier Style

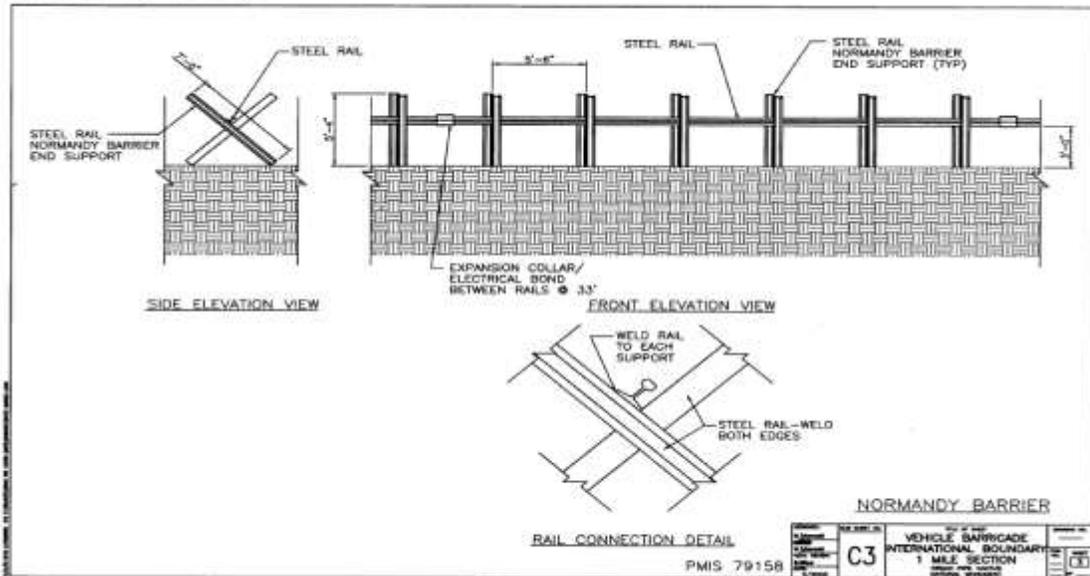


Figure H-7. Restoration Treatment- Revegetation, Ground Mulching:

This barrier treatment is aimed at disguising a route to prevent attracting further use for access purposes. It also creates an edge effect along routes to help keep road users on the designated route.



Figure H-8. Steel Pipe Barrier Panels:

Steel posts set in the ground with one or more steel rails welded across the span. Posts require excavation and backfill with concrete mix. Material may be round or square steel tubing, galvanized finish, or unfinished steel.



Figure H-9. Bollards with Object Marker:

Steel pipe 6" diameter, set in the ground and filled with concrete. Requires excavation and back filling with concrete. Removable bollards with a lock mechanism can be used to accommodate. Accommodates passage by all non-motorized travel. Not effective barrier for motorcycles.



Figure H-10. Rock Edge:

Stone and rock ranging in size from 12” to 24” placed in a strip along the edge of a designated roadway. Creates a hard edge along the travelway to help keep vehicle use on the road; prevent parking turnouts or off road use.



Figure H-11. Channel Post Line:

Channel posts pile driven into the ground in-line at 40” spacing, with object markers. Requires very little disturbance and no excavation. Accommodates non-motorized passage. Not effective for motorcycle. (Materials: Posts 5 ½’ 3.25 lb)



Figure H-12. Wire Gate:

Typical wire and stay gate on fenceline. Economical and easy to install. Not a secure barrier.



Figure H-13. Steel Pipe Gate with Pedestrian Bypass:

Typical BLM design for multiple locks. Vandal resistant heavy steel pipe construction; requires equipment to excavate posts and field welding to install. Lock box can accommodate up to 4 separate locks. Shown together with pedestrian, equestrian and bicycle passage, designed to block ATVs. This unit was installed where topography and rock outcrops can aid in providing a barrier effect. Some units may require installation of wing fence or barriers.

