

Batey-Bould Off-Road Motorcycle Trail System Assessment

Newport Ranger District

Colville National Forest

Region 6

September 2016



Batey-Bould Trail Assessment

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Introduction

The Batey-Bould Off-Road Motorcycle Trail system is located in the NE corner of Washington State on the Newport Ranger District, Colville National Forest. The trail system is located along the main stem of Calispel Peak Creek and Tacoma Creek with MC306 as the main “trunk” of the trail system. All of the trails connect to this main trail which is 20.6 miles long. The soil type is primarily decomposed granite and exposed rock from glacial activity. There is a significant amount of loess (wind-blown silt) and glacial till in some areas and deep beds of silt in the flat, low-lying areas along trails MC306 and MC310.

The trail system is well-designed for the most part and moderately popular with off-road motorcycle riders from the nearby area. The trail system is challenging, with no significant mileage designated for beginning riders. As such, the clientele is mostly advanced riders using trail bikes or motocross bikes equipped for trail riding. The trail system does not currently appear to draw riders from any further than Spokane, WA, less than 2 hours away, but there is potential to draw more interest with motorcycle events like races and “poker runs”, which usually draws more rider interest and therefore volunteer assistance with maintenance.

This report was generated from a three-day trail assessment performed in September 2016. The Batey-Bould trail system has been maintained lightly by the United States Forest Service (USFS) over the past 10 years or so and has received regular log-out work by unaffiliated volunteers. This has led to the trail system being used, but due primarily to declining maintenance budgets, has not regularly assessed by land managers, leaving a narrow set of problems unaddressed. The following report addresses three main areas of concern; safety, sustainability and the general condition of the trail bridges and puncheons.

Safety of Trails

Safety on USFS trail systems is assessed by comparison of existing conditions to the National Quality Standards for Trails (FSH 2353.15, exhibit 01.). These standards apply to all National Forest Service trails and to all associated trail structures. They address health and cleanliness, safety and security, condition of facilities, responsiveness, and resource setting. “Critical” standards require action as soon as possible, “if any of these standards is not met, the resulting conditions pose a high probability of immediate and permanent injury to persons or property. If any of the critical standards cannot be met due to budget or other constraints, take action as soon as practicable to correct or mitigate the problem. Corrective or mitigating measures may include closing the trail, portions of the trail, or associated trail structures to public use.” (Trail Fundamentals, pg. 31). The Trails Management Handbook (FSH 2309.19) tells us that none of the National Quality Standards should be allowed to deteriorate to the point that they cause a “critical” standard to not be met.

National Quality Standards for Trails are listed below with an asterisk (*) indicating a “critical” standard.

Key Measure: HEALTH AND CLEANLINESS

1. Visitors are not exposed to human waste along trails.
2. The trail and trailside are free of litter.
3. The trail and trailside are free of graffiti.

Key Measure: RESOURCE SETTING

1. *Effects from trail use do not conflict with environmental laws (such as the Endangered Species Act, National Historic Preservation Act, and Clean Water Act).
2. Resource management adjacent to and along the trail corridor is consistent with ROS objectives and desired conditions of adjacent management areas.
3. Trail opportunities, trail development, and trail management are consistent with Recreation Management System (ROS, SMS, and BBM) objectives and the applicable land management plan.
4. The trail, use of the trail, and trail maintenance do not cause unacceptable damage to other resources.
5. Trail use does not exceed established trail capacity.

Key Measure: SAFETY & SECURITY

1. *Hazards do not exist on or along the trail.
2. Applicable laws, regulations, and special orders are enforced.

Key Measure: RESPONSIVENESS

1. *When a trail is signed as accessible, it meets current agency policy and accessibility guidelines.
2. Information is posted in a clear and professional manner.
3. Visitors are provided opportunities to communicate their expectations for and satisfaction with NFS trails.

Key Measure: CONDITION OF FACILITIES

1. Annual/Routine Maintenance. The trail and its structures are serviceable and in good repair throughout their designed service life.
2. Deferred Maintenance. Trails that are in disrepair due to lack of scheduled maintenance, are in violation of applicable safety codes or other regulatory requirements (such as applicable accessibility guidelines), or are beyond their designed service life are repaired, rehabilitated, replaced, or decommissioned, as appropriate.
3. Capital Improvement. New, altered, or expanded trails meet Forest Service design standards and are consistent with standards and guidelines in the applicable land management plan.
(FSH 2353.15, exhibit 01.).

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For the purposes of this section, we are only concerned with the “Safety and Security” measure regarding hazards on the trail. This measure also applies to associated trail structures and it is only bridges and puncheon which raise real safety concerns for the trail system. First however, the trails themselves, while challenging in several areas, conform to the Forest Service standards for this type of trail system.

MC306 is an enjoyable trail and is laid out in a way that conforms to “Trail Class 2 Designed for Motorcycles”. Many obstacles, but natural and “placed” exist on the trail system, but none of them are greater than 18” in height. The grades and tread width generally conform to TC2 standards as well. It should be confirmed in INFRA Trails that the trail records show the trails are *managed* as TC2. It seems likely that they were designed as TC3 trails, but can no longer meet that standard. Since the desired user experience is consistent with the trail’s current condition (with a few exceptions), Trail Class 2 is an appropriate standard. TC2 trails are “challenging and require advanced skills” (FSH2309.18, Chapter 10, Exhibit 01).

Designed Use MOTORCYCLE		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Tread Width	Single Lane	Typically not designed or actively managed for motorcycles, although use may be allowed	8” – 24”	18” – 36”	24” – 48”	Typically not designed or actively managed for motorcycles, although use may be allowed
	Double Lane		48”	48” – 60”	60” – 72”	
	Structures (Minimum Width)		36”	48”	48”	
Design Surface²	Type	Native, with limited grading May be continuously rough Sections of soft or unstable tread on grades < 5% may be common and continuous	Native, with some onsite borrow or imported material where needed for stabilization and occasional grading Intermittently rough Sections of soft or unstable tread on grades < 5% may be present	Native, with imported materials for tread stabilization likely and routine grading Minor roughness Sections of soft tread not common		
	Protrusions	≤ 6” May be common and continuous	≤ 3” May be common, but not continuous	≤ 3” Uncommon and not continuous		
	Obstacles (Maximum Height)	18” May be common or placed for increased challenge	12” Common and left for increased challenge	3” Uncommon		
Design Grade²	Target Grade		10% – 25%	5% – 20%	3% – 10%	
	Short Pitch Maximum		40%	25%	15%	
	Maximum Pitch Density		20% – 40% of trail	15% – 30% of trail	10% – 20% of trail	
Designed Use MOTORCYCLE		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Cross Slope	Target Cross Slope		5% – 10%	5% – 8%	3% – 5%	
	Maximum Cross Slope		15%	10%	10%	
Design Clearing	Height		6’ – 7’	6’ – 8’	8’ – 10’	
	Width (On steep side-hills, increase clearing on uphill side by 6” – 12”)		36” – 48” Some light vegetation may encroach into clearing area	48” – 60”	60” – 72”	
	Shoulder Clearance		6” – 12”	12” – 18”	12” – 24”	
Design Turn	Radius		3’ – 4’	4’ – 6’	6’ – 8’	

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The following two photos show deeply incised sections of MC306 which were assessed for safety concerns. The paver blocks have been installed to harden the trail, but this has not been successful because paver blocks “float” and move around in the mud if not installed “wall to wall” in the rut. Importing 3” minus crushed aggregate (not bar run, it needs to be angular rock) would help harden the trail more successfully. The exposed paver blocks should be removed, but *they do not present an unreasonable risk* compared to other challenges on similar trails.



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All of the trails in the system conform to Trail Class 2 standards for motorcycle trails. There are many challenging sections of trail throughout the system, but with good signage to make sure trail users are aware of the relative level of challenge ahead, and adherence to the National Quality Standards for Trails, especially in regard to constructed features, there is no concern that trail users will be subjected to risks they have not chosen to confront.

Safety for Bridges and Puncheon

There is one bridge and one puncheon that present unacceptable hazards to trail users. There is no “temporary” fix available to the USFS trails specialist to make these two structures serviceable. The other three listed below, are less concerning, but still need addressed very soon.

Tacoma Creek Bridge (Survey #25)

Location: 48°29'26.8"/-117°29'26.6

Condition: “0” rating. **Failed**, out of service. Almost all of the original structural elements are missing. The original 16-18’ bridge has been “replaced” by tree tops and logs that allow a user to cross with significant risk of falling through the logs.

Recommendation: This trail bridge should be closed to the public and, if possible, a reroute provided to reduce the temptation to use the structure. There is suitable material on site to use for stringers and an Alaskan saw-milled deck to replace this bridge in-kind.



Tacoma Creek “Bridge” 9/20/2016

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Spike Puncheon (Survey #22)

Location: 48°28'13.7"/-117°27'32.3

Condition: "0" rating. **Failed**, out of service. Most of the structural elements are missing. Those that remain have exposed spikes and rebar protruding such that they could injure a trail user if they slipped while crossing the puncheon.

Recommendation: Remove the puncheon. Resource damage will likely result from this action, but it should be minimal if the puncheon can be replaced with a 24" culvert or a turnpike with several 6" pipes within one season. Even when "dry" the deck (pictured) is very slippery and could easily cause an accident.



User-created deck, Spike Puncheon, 9/20/2016



Spike Puncheon, 9/20/16

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Bad Bridge (Survey #13)

Location: 48°26'43.8"/-117°25'38.3"

Condition: "1" rating, **imminent** failure, due to sag, advanced rot in structural members and exposed hardware.

Recommendation: Hammer in, or cut off, exposed spikes and rebar, monitor monthly and replace as soon as possible. This bridge might be put back into light service by "bridging over" the current deck with 4"x6" lumber. The bridge is 20' long and if an engineer concurs, bridging the deck will safely hold user traffic, but *will not* meet the snow load rating for the area.



Bad Bridge, 9/20/16



Bad Bridge 9/20/2016

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8' Bridge (Survey #26)

Location: (48°29'37.8"/-117°29'26.6")

Condition: "3" rating. **Serious** condition, due to advanced section rot.

Recommendation: Monitor monthly and replace as soon as possible. Due to the large stringer section loss, this bridge gets a "serious" condition rating, but it has three 14" stringers, so it is not likely to fail catastrophically under a user's weight.



8' Bridge, 9/20/16. Notice the stringer in contact with the ground. It should be placed on a larger mudsill to prevent premature decay.

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12' Bridge (Survey #21)

Location: 48*28'07.4"/-11727'20.4"

Condition: "4" rating, **poor** condition due to localized stringer failure and sag.

Recommendation: Since there are only two stringers for this bridge, a stringer failure is significant. The bridge should be monitored monthly and replaced as soon as possible. This bridge could be replaced in 1-2 days with on-site materials. Exposed hardware should be hammered in.



Localized failure. Larger mudsills would prevent these stringers from contacting the ground and rotting prematurely.

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12' Bridge, 9/20/16. Deck is worn and broken, but substructure is relatively solid.

General Recommendations for Puncheon and Trail Bridges:

- Almost all of the trail bridges in the system have a down-grade leading onto the structure from both directions. This causes soil to be pulled onto the deck and has accumulated up to 8" thick on some decks. This causes the deck and curb rails to rot prematurely.
- Spacer blocks (2" minimum) should be installed under the curb rails to facilitate cleaning the deck.
- There should be bridge tags on each bridge or puncheon with the trail number and mileage from the trail head. This number should be entered into INFRA to identify each structure, along with the completed inspection surveys. The number (eg. 306-0.35) is used in INFRA to identify and query the record.
- Many of the aging puncheons can be replaced with turnpike. This should be assessed in spring when flows are at peak.
- Several of the puncheons and bridges (older ones) have too-small mudsills. This should be corrected as they are rebuilt to keep the stringers off the ground and to create a slight uphill gradient onto the deck (to keep them clean).

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Sustainability

For the purposes of this report, we are concerned only with the sustainability of the trail, not the surrounding natural resources. Generally speaking, those resources are outside the scope of this report. That being said, any recommendations to improve trail sustainability will also likely improve soil and water quality. As an example, the photo below shows a good location for a puncheon with poor execution. The stringers are touching the mud and the whole feature is too low and won't drain. This puncheon collects water and holds it for days after a rain. When people ride across this feature, mud is thrown into the creek on both sides.



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Other areas of MC306 present challenges created by user reroutes that are not risky, but inconvenient and more difficult than the “more difficult” rating of the trail leads users to expect. User reroutes often result from lack of maintenance. When trails are not logged out in a timely manner in spring, the first users to arrive will remove the down logs they can, and ride over or around the rest. Tread problems, especially on turns, often encourage riders to use too much throttle and seek alternate lines to negotiate the turn. See below:



The turn shown above is entirely user-created in very poor soil. The constructed turn is 60 feet away to the left of the current turn. Erosion under paver blocks made them unstable and likely cause the users to avoid them. This turn is in a good location, with an appropriate side slope angle, but was poorly constructed without any inslope to allow cornering under power without lateral wheel slip.



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In all, the Batey-Bould trail system includes 38.5 miles of trail. Two of those trails, MC310 and MC 312 are rated as “easier”. MC312 is on an old roadbed and is very easy. MC312 leads to “more difficult” trails which could be realigned and reconstructed somewhat to justify an “easy” rating. This would be a good way to provide beginner-appropriate trails as close to the trail head as possible. Those two trails are MC307 and MC308 with MC308 being just a little more challenging than MC307. Both trails need small realignments at their north ends where they reconnect with MC306 due to steep, eroding switchbacks. Creating easier trails close to the trail head makes it possible for beginners or less-able riders to challenge themselves at an appropriate level without requiring them to struggle down a more difficult trail to get to easier terrain.

MC310 can only be reached by road or by a “more difficult” trail and therefore should not be rated as “easier”. In its current condition, MC310 should be rated as “more difficult” if it is kept in the system. It is recommended however, that MC310 be dropped from the system and officially closed. About one-third of the trail is laid out through a large, flat, marshy area that cannot be drained well. The quality of the trail is poor and there are no viewpoints or other interesting features to justify the high maintenance it will require to keep it to standard.

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Two photos below illustrate the flat, marshy nature of MC310.



MC306 has a black diamond option that is not on the map and is not signed correctly on the ground. This segment is “most difficult” and is much more challenging than the rest of MC306. It is mostly laid out on rock and is quite sustainable. There are no puncheons, bridges or other structures that would need maintenance or inspections. It is a good trail and could be renamed to conform to the naming convention used for other trails in the area by calling it MC313. Renaming the trail will help differentiate it from the rest of MC306, which will help users realize that it has a very different character. It should be clearly signed with a black diamond at both ends.

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The following map shows the “most difficult” MC306 option in red with the main 306 shown in gray.



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A steep, challenging section on the “most difficult” MC306 option. The trail goes up the middle and turns slight left above the rocks. The rocky area climbs at 80-100%.



Challenging, but not risky to a prepared rider.

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MC309, Tacoma Peak, and MC311, Boulder Mountain are very challenging and should be marked on the ground with a black diamond for a “most difficult” rating. Both trails are in good shape and need only brushing to keep sightlines open to increase safety. There are three puncheons on MC311 that are unnecessary. All three can be replaced with fords, if good rock can be borrowed from the area (recommended), or with turnpikes with culverts. All three are deteriorating and in need of replacement, but they are not hazardous.

The following photo shows one of three unnecessary puncheons on MC311. Stream flow is low enough for a turnpike instead of puncheon which will last longer and are cheaper to replace.



General Recommendations on Sustainability for Trails:

- Decommission and close MC 310 due to unsustainable layout
- There are two 24-30" dbh trees (one above and one below Rd 3116-073) that should be felled. They are on the back-slope causing a narrow section to erode as riders try to pass the trees.
- Remove loose paver blocks and geocell. What can't be easily removed should be buried with native soil mixed with crushed aggregate.
- Rebuild switchback (photos on page 14) located at 48°23'54.7"/-117°24'22.8"
- Perform slough and berm removal on side slope sections of MC306
- Brush summit segments trails 309 and 311 every three years.
- Reroute long, incised section of trail on a gentle grade (target 8-10%). Section begins just north of the small bridge located at 48°29'37.8"/-117°29'26.6"

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Batey-Bould Motorcycle Trail System Bridge and Puncheon Surveys

Condition codes: Failed-0, Imminent failure-1, Critical-2, Serious-3, Poor-4, Fair-5, Satisfactory-6, Good-7, 8-very good, 9-new or like new

Number	Location	Condition	Type	Trail	Recommend
1	48*22'02.5"/-117*22'31.6"	sat-6	bridge	306	
2	48*22'26.7"/-117*22'50.0"	good-7	bridge	306	
3	48*22'34.1"/-117*23'04.8"	sat-6	puncheon	306	
4	48*22'32.6"/-117*23'12.1"	good-7	puncheon	306	
5	48*23'50.2"/-117*24'18.3"	good-7	puncheon	306	
6	48*23'56.1"/-117*24'28.1"	good-7	puncheon	306	
7	48*23'59.0"/-117*24'32.6"	v. good-8	bridge	306	DS railing
8	48*24'12.4"/-117*24'41.8"	v.good-8	bridge	306	
9	48*24'21.0"/-117*24'43.3"	v. good-8	puncheon	306	
10	48*25'42.2"/-117*25'58.8"	poor-4	bridge	306	reroute to rd
11	48*26'03.2"/-117*25'55.6"	fair-5	puncheon	306	
12	48*26'16.9"/-117*25'33.8"	v. good-8	bridge	306	
13	48*26'43.8"/-117*25'38.3"	im. fail-1	bridge	306	temp. fix or close
14	48*27'25.2"/-117*26'23.3"	poor-4	puncheon	306	
15	just north of #14	poor-4	puncheon	306	replace w t-pike
16	500' north of 14	poor-4	puncheon	306	replace w t-pike
17	48*27'33.6"/-117*26'30.0"	good-7	puncheon	306	
18	48*27'37.4"/-117*26'28.7"	sat-6	puncheon	306	
19	48*28'09.9"/-117*26'53.6"	sat-6	puncheon	306	
20	48*28'05.0"/-117*27'15.8"	poor-4	puncheon	306	replace w t-pike
21	48*28'07.4"/-117*27'20.4"	poor-4	bridge	306	fix exposed hdw
22	48*28'13.7"/-117*27'32.3"	0-failed	puncheon	306	remove puncheon
23	48*28'23.3"/-117*27'32.6"	v. good-8	bridge	306	
24	48*29'13.7"/-117*27'55.1"	v. good-8	bridge	306	
25	48*29'26.8"/-117*29'26.6"	0-failed	bridge	306	Tacoma bridge
26	48*29'37.8"/-117*29'26.6"	serious-3	bridge	306	
27	48*30'58.7"/-117*29'49.0"	fair-5	puncheon	306	replace w t-pike
n/a	48*27'18.5"/-117*24'46.7"	good-7	bridge	310	
n/a	48*27'26.8"/-117*24'45.4"	good-7	bridge	310	
n/a	48*28'08.2"/-117*25'30.9"	sat-6	puncheon	310	
n/a	48*28'00.5"/-117*25'40.1"	fair-5	puncheon	310	needs t pike approach
n/a	48*27'42.3"/-117*27'16.6"	0-failed	puncheon	311	replace w t-pike
n/a	48*24'44.2"/-117*27'15.3"	2-critical	puncheon	311	replace w t-pike
n/a	48*27'45.9"/-117*26'52.6"	2-critical	puncheon	311	replace w t-pike

