

Stream Channel Stability

Field work associated with NEPA preparation of re-issuance of grazing allotment permits on the Gallatin NF has involved a considerable amount of stream channel stability measurements in existing allotments. The Pfankuch method of channel stability (Pfankuch, D.J., 1975. Stream Reach Inventory and Channel Stability Evaluation. USFS/USDA, Lolo NF, Missoula, Montana) forms the basis for the channel stability score monitoring item. The Rosgen Stream typing system is also quite useful (Rosgen, D.L., 1996. Applied River Morphology. Wildland Hydrology, Pagosa Springs, CO). An example allotment for which channel stability and channel typing measurements have been measured is the Upper Shields Allotments (Smith Creek, Bennett Creek, Three Peaks, Meadow Creek, and Shields River) in 2004 and 2005.

Stream channel stability conditions and PFC ratings for the Upper Shields Allotments

Stream	Location TRS	Stream types	Existing CSR	Reference CSR	CSR departure	PFC rating
<i>Bennet Creek Allotment</i>						
Bennett Cr ^{98,05}	5N 10E S30 NW	A4	74	74	0	PFC ^b
Bennett Cr ^{98,05}	5N 10E S30 NE	A4	81	74	7	PFC ^b
Deep Cr ^{99,05}	5N 10E S26SE	B3	91		0	PFC
Serrett Cr ⁰⁵	5N 10E S26NE	Ephem.				PFC ^b
<i>Three Peaks Allotment</i>						
Goat Cr ⁹⁸	5N 9E S12SE	A4/G4	80	63	17	FAR ^a
Trib. Smith Cr ⁹⁸	5N 9E S1SE	A4	55	55	0	PFC ^a
Trib. Smith Cr ⁹⁸	5N 9E S1E	G4	59	59	0	PFC ^a
Trib. Smith Cr ⁰⁴	5N 10E S6NESW	B4	ND	ND	ND	PFC ^b
Trib. Smith Cr ⁰⁴	5N 10E S6SESW	A4	ND	ND	ND	PFC ^b
Smith Cr ⁹⁸	5N 10E S6N	B4	102	85	17	FAR ^a upward
EF Smith ⁹⁸	5N 10E S6SW	B4	84	76	8	PFC ^a
Smith Cr ⁰⁴	5N 10E S6NNW	B4				FAR upward
<i>Meadow Creek Allotment</i>						
Meadow Cr ⁹⁸	5N 10E S16 SW	A2/A3	57	53	4	PFC ^a
<i>Shields River Allotment</i>						
Crandall Cr ^{98,04}	5N 10E S18 meadow reach	C3b	86 fair	56	30	FAR
Crandall Cr ⁰⁴	5N 10E S18 timber reach	B3	stable site, no CS problems based on observation			PFC
Dougout Cr ⁰⁴	5N 10E S17 above road reference reach	C4	stable site, no CS problems based on observation			PFC ^a
Dougout Cr ⁰⁴	5N 10E S17 above road in logged area	B3a inside a G4	68 good	50	18	NF
Dougout Cr ⁰⁴	5N 10E S17 below road	B3a	stable site, minor CS problems based on observation			PFC
Fawn Cr	5N 10E	Not measured since these drainages have very limited suitable livestock range and very low livestock use. All streams meet PFC.				
Turkey Cr	5N 10E					
Scotfield Cr	5N 10E					
Clear Cr	5N 10E					
Buck Cr ⁹⁸	5N 11E 20	B3/B4	73 excellent			PFC ^a

Shields River ⁰⁴	5N 11E S17	B3/B4	residual instability due to historical roading/logging water yield increase and sediment impacts. Limited livestock grazing impacts			PFC
trib. Shields River ⁰⁴	5N 10E S18NE meadow	C4	Has converted from a stable E4 to a C4 (increased width) due to historical roading/logging impacts with some livestock bank trampling			NF
trib. Shields River ⁰⁴	5N 10E S18NE (upstream meadow)	B4	Past riparian harvest, limited grazing, high LWD frequencies			PFC
Smith Creek Allotment						
Bitter Cr ⁹⁸	6N 10E S31	A3/B3a	79	66	13	FAR ^a upward
Sixteenmile Cr ^{98,04}	6N 9E S25NW below ATV crossing	A4	69	61	8	FAR downward
Sixteenmile Cr ⁰⁴	6N 9E S26 above ATV crossing	B4	69	54	14	FAR
Trib. Smith Cr ⁹⁸	6N 9E S25 SESW	A5/A6	80	73	7	PFC
Trib. Smith Cr ⁹⁸	6N 9E S36 SENW	B4a	64	56	8	PFC
Trib. Smith Cr ⁰⁴	6N 9E S31 SW	E4/E6	45 good	45	0	PFC
Smith Creek ⁰⁴	6N 10E S31 SW above road	C3b	89 poor	54	33	FAR upward
Smith Creek ⁹⁸	6N 10E S31 SW	B6	95 fair	85 fair	10	PFC ^a

^a Estimated proper functioning condition based on stream type and CSR ratings.

^b Estimated proper functioning condition based on visual observation (fields notes only, no PFC forms)

Similar stream channel stability monitoring was done in 2004 and 2005 for the Wapiti Allotment on the Hegben Lake District in preparation for the Wapiti allotments NEPA for allotment reissuance. During 2004-2006 extensive stream channel monitoring has been completed for the 11 North Bridgers allotments: Blacktail, Middle Fork, Troy, Elkhorn, Alexander, Elk Ridge, Mill Creek, North Cottonwood, Flathead, Brackett Creek, Alexander, and Battle Ridge with the DEIS release scheduled for September 2007.