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Quaternary Fault and Fold Database of the United States

As of January 12, 2017, the USGS maintains a limited number of metadata fields that characterize the Quaternary faults and folds of the United States. For the most up-to-date information, please refer to the interactive fault map.

Blacktail fault, northwest section (Class A) No. 644a

Last Review Date: 2010-11-10

Compiled in cooperation with the Montana Bureau of Mines and Geology

citation for this record: **Haller, K.M., compiler, 2010, Fault number 644a, Blacktail fault, northwest section, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, https://earthquakes.usgs.gov/hazards/qfaults, accessed 12/14/2020 02:03 PM.**

Synopsis	**General:** In general, published information about the nature, timing, or extent of displacement is limited. Published maps have significant differences even in the location of the fault. One trench was excavated across the more recently active part of the range-front fault, but a younger fan surface about 1 km to the east has short scarp. **Sections:** This fault has 2 sections. The informally named sections are based on distinctly different faulting histories; segments have been discussed in the literature but it is not clear if

	the intent was to define seismogenic segments. The northwesternmost 12 km of the Blacktail fault [644a], described in Stickney and Bartholomew (1987 #85) as inactive and is the only part that has a recognizably different faulting history. The rest of the fault discussed by Stickney and Bartholomew (1987 #85) as the Cottonwood Creek scarp includes the three segments shown in the Montana Bureau of Mines and Geology digital data (Stickney and Bartholomew, written commun. 1992 #556); they are named the Northwest, Southeast, and Cottonwood segments. Detailed studies have not been completed to identify differences in timing of faulting events, and thus these parts of the fault are discussed collectively as a single section [644b]. Ostenaa and Wood (1990 #318) suggest the presence of more than one segment based on discontinuities in the fault trace and slightly better preserved scarps along the southeastern part of the fault, but they also acknowledge the absence of firm supporting evidence.
Name comments	**General:** The original source of the name Blacktail fault is probably Scholten and others (1955 #69), who described it as extending at least 24 km northwestward from near Deer Creek. Pardee (1950 #46) shows the Blacktail fault on a map and discusses it in the section on faults along the Beaverhead-Jefferson basin, but it is not given a name. The fault as shown in this compilation is based on descriptions provided by Stickney and Bartholomew (1987 #85) and the Montana Bureau of Mines and Geology digital data (Stickney and Bartholomew, written commun. 1992 #556) and extends from 1.5 km northwest of U.S. Highway 91 southeast to 1 km southeastward of Teddy Creek. **Section:** This informally named section extends from 1.5 km northwest of U.S. Highway 91 southeastward to 1.5 km northwest of Sheep Creek. **Fault ID:** Refers to feature number 13 (Blacktail fault) of Witkind (1975 #317), number 5 (Blacktail fault) of Stickney and Bartholomew (1987 #85), and Blacktail fault of Stickney and Bartholomew (1987 #242; written commun. 1992 #556).
County(s) and State(s)	BEAVERHEAD COUNTY, MONTANA
Physiographic province(s)	NORTHERN ROCKY MOUNTAINS
Reliability of	Poor

location	Compiled at 1:250,000 scale. *Comments:* Location of fault inferred from description of Stickney and Bartholomew (1987 #85), further constrained by satellite imagery and topography at scale of 1:250,000. Reference satellite imagery is ESRI_Imagery_World_2D with a minimum viewing distance of 1 km (1000 m).
Geologic setting	High-angle, down-to-the-northeast, range-front normal fault bounds the northeast side of the Blacktail Range. The amount of structural throw is not known; Scholten and others (1955 #69) indicate a throw of more than 750 m based on the height of the range-front escarpment. Hurlow (1995 #1063) indicates about 1 km of structural relief across fault. Mueller and Krol (2008 #7019) conclude that some of the total offset across the range-front system is accommodated by the subparallel Jake Canyon fault, which is truncated in the subsurface by the Blacktail fault.
Length (km)	This section is 12 km of a total fault length of 40 km.
Average strike	N50°W (for section) versus N50°W (for whole fault)
Sense of movement	Normal *Comments:* (Pierce and Morgan, 1990 #222; Ostenaa and Wood, 1990 #318)
Dip Direction	NE
Paleoseismology studies	
Geomorphic expression	No scarps are recognized along this section of the fault (Bartholomew and others (1999 #7141). The morphology of the range front is significantly more subdued than that to the southeast.
Age of faulted surficial deposits	
Historic earthquake	
Most recent prehistoric	undifferentiated Quaternary (<1.6 Ma)

deformation	*Comments:* Stickney and Bartholomew (1987 #85) describe a 12-km-long part of the Blacktail fault as being inactive based on their classification scheme; that is they considered it to have been inactive since about 130 ka. The timing of the most recent event is inferred here to be possibly Quaternary based on the young movement to the southeast [644b]. Reconnaissance studies suggest possible Pleistocene displacement (M.J. Bartholomew, written commun. 1997).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Inferred low slip rate is based on the lack of evidence of slip in the past 130 k.y.
Date and Compiler(s)	2010 Kathleen M. Haller, U.S. Geological Survey
References	#1063 Hurlow, H.A., 1995, Late Pliocene or younger paleostress directions from fractured clasts, Sixmile Creek Formation, lower Red Rock Valley, SW Montana: Geological Society of America Abstracts with Programs, v. 27, no. 4, p. 16. #7019 Muller. P.D., and Krol, M.A., 2008, Re-interpretation of the range-bounding faults of the Blacktail Mountains, SW Montana—Implications for Cenozoic tectonic history: Geological Society of America Abstracts with Programs, v. 40, no. 1, p. 52. #318 Ostenaa, D., and Wood, C., 1990, Seismotectonic study for Clark Canyon Dam, Pick-Sloan Missouri Basin Program, Montana: U.S. Bureau of Reclamation Seismotectonic Report 90-4, 78 p., 1 pl. #46 Pardee, J.T., 1950, Late Cenozoic block faulting in western Montana: Geological Society of America Bulletin, v. 61, p. 359-406. #222 Pierce, K.L., and Morgan, L.A., 1990, The track of the Yellowstone hotspot—Volcanism, faulting, and uplift: U.S. Geological Survey Open-File Report 90-415, 68 p., 1 pl. #69 Scholten, R., Keenmon, K.A., and Kupsch, W.O., 1955, Geology of the Lima region, southwestern Montana and adjacent

	Idaho: Geological Society of America Bulletin, v. 66, p. 345-404. #242 Stickney, M.C., and Bartholomew, M.J., 1987, Preliminary map of late Quaternary faults in western Montana: Montana Bureau of Mines and Geology Open-File Report 186, 1 pl., scale 1:500,000. #85 Stickney, M.C., and Bartholomew, M.J., 1987, Seismicity and late Quaternary faulting of the northern Basin and Range province, Montana and Idaho: Bulletin of the Seismological Society of America, v. 77, p. 1602-1625. #556 Stickney, M.C., and Bartholomew, M.J., 1992 written commun., Preliminary map of late Quaternary faults in western Montana (digital data): Montana Bureau of Mines and Geology (digital version of MBMG Open-File Report 186), 1 pl., scale 1:500,000. #317 Witkind, I.J., 1975, Preliminary map showing known and suspected active faults in western Montana: U.S. Geological Survey Open-File Report 75-285, 36 p. pamphlet, 1 sheet, scale 1:500,000.