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Quaternary Fault and Fold Database of the United States

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Beaverhead fault, Mollie Gulch section (Class A) No. 603b

Last Review Date: 2010-11-09

Compiled in cooperation with the Idaho Geological Survey

citation for this record: **Haller, K.M., Wheeler, R.L., and Adema, G.W., compilers, 2010, Fault number 603b, Beaverhead fault, Mollie Gulch 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 03:02 PM.**

Synopsis	**General:** Detailed mapping and reconnaissance studies of scarp morphology are the sole source of data for this fault; a segmentation model has been proposed based on these data. No detailed site studies, such as trenching, have been conducted. **Sections:** This fault has 6 sections. Haller (1988 #27) defined six segments of Beaverhead fault; however, because of reconnaissance nature of this study, the same boundaries are used in this compilation to define the extent of our sections.

Name comments	**General:** Although Beaverhead fault was mapped and discussed by numerous authors as early as 1928 (Shenon, 1928 #77), Skipp (1985 #291) may be one of the earliest to name this structure. The fault extends from east of town of Tendoy, Idaho, on the north end where range front steps to east southward to northern margin of Snake River Plain. **Section:** Defined as Mollie Gulch segment by Haller (1988 #27). This section extends from north of Peterson Creek southward to west of Jakes Canyon. **Fault ID:** Refers to number 112 ("unnamed fault") in Witkind (1975 #320).
County(s) and State(s)	LEMHI COUNTY, IDAHO
Physiographic province(s)	NORTHERN ROCKY MOUNTAINS
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Location of the scarps is based on 1:250,000-scale maps of Haller (1988 #27; original mapping at 1:24,000 or 1:62,500 scale), further constrained by satellite imagery and topography at scale of 1:24,000. Reference satellite imagery is ESRI_Imagery_World_2D with a minimum viewing distance of 1 km (1,000 m).
Geologic setting	This part of east-central Idaho and southwest Montana is made of Precambrian and Paleozoic rocks that were shortened by folding and faulting and was thrust northeastward during the late Mesozoic. Mid- to late Cenozoic extension broke the thrust complex into northwest-trending basins and ranges and continues today. The Beaverhead fault is a high-angle, down-to-the-southwest, range-front, normal fault that separates the Beaverhead Mountains to the northeast from the Lemhi River and Birch Creek valleys on the southwest. Densmore and others (2005 #7016) suggest that maximum throw across the Beaverhead fault is 4-6 km.
Length (km)	This section is 15 km of a total fault length of 121 km.
Average strike	N46°W (for section) versus N39°W (for whole fault)
Sense of	

Sense of movement	Normal
Dip Direction	SW
Paleoseismology studies	
Geomorphic expression	Scarps are generally poorly expressed and high on mountain front, few scarps are reported on alluvium (Haller, 1988 #27; Crone and Haller, 1991 #186).
Age of faulted surficial deposits	
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Scarps are preserved on steep (25?) colluvial slopes, which led Haller (1988 #27) to propose that faulting may have occurred between 10-15 ka (postglacial time).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Long-term slip rate for this section is probably lowest for Beaverhead fault as reflected in low topographic relief, maximum 0.98 km (Haller, 1988 #27).
Date and Compiler(s)	2010 Kathleen M. Haller, U.S. Geological Survey Russell L. Wheeler, U.S. Geological Survey, Emeritus Guy W. Adema, Idaho Geological Survey
References	#186 Crone, A.J., and Haller, K.M., 1991, Segmentation and the coseismic behavior of Basin and Range normal faults—Examples from east-central Idaho and southwestern Montana, *in* Hancock, P.L., Yeats, R.S., and Sanderson, D.J., eds., Characteristics of active faults: Journal of Structural Geology, v. 13, p. 151-164. #7016 Densmore, A.L., Dawers, N.H., Gupta, S., and Guidon, R., 2005, What sets topographic relief in extensional footwalls?: Geology, v. 33, no. 6, p. 453-456.

	#27 Haller, K.M., 1988, Segmentation of the Lemhi and Beaverhead faults, east-central Idaho, and Red Rock fault, southwest Montana, during the late Quaternary: Boulder, University of Colorado, unpublished M.S. thesis, 141 p., 10 pls. #77 Shenon, P.J., 1928, Geology and ore deposits of the Birch Creek district, Idaho: Idaho Bureau of Mines and Geology Pamphlet 27, 25 p. #291 Skipp, B., 1985, Contraction and extension faults in the southern Beaverhead Mountains, Idaho and Montana: U.S. Geological Survey Open-File Report 85-545, 170 p. #320 Witkind, I.J., 1975, Preliminary map showing known and suspected active faults in Idaho: U.S. Geological Survey Open-File Report 75-278, 71 p. pamphlet, 1 sheet, scale 1:500,000.