

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](#).

Horse Butte fault (Class A) No. 3502

Last Review Date: 2016-10-07

Compiled in cooperation with the Idaho Geological Survey

citation for this record: Machette, M.N., compiler, 2003, Fault number 3502, Horse Butte fault, 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 02:51 PM.

Synopsis	This short fault cuts the northeast flank of Horse Butte, a 2.5-km-long block of middle Pleistocene basalt on the south margin of the Snake River Plain. The fault has an unspecified (but not major) amount of down-to-the-northwest throw within the underlying basalts, which have been dated by whole rock K-Ar at 0.45±0.22 Ma. If the fault extends further northwest and southeast, its trace is covered by a thick blanket of middle to late Pleistocene loess and basalt.
Name comments	Informal name applied here to a fault that cuts the northeast flank of Horse Butte, a basaltic block (butte) that rises about 100 m above the Snake River Plain. The fault is about 10 km north of

	Idahome, Idaho, and northeast of the Cottrell Mountains at the lower (northern) end of the Raft River Valley on the southern margin of the Snake River Plain.
County(s) and State(s)	CASSIA COUNTY, IDAHO
Physiographic province(s)	COLUMBIA PLATEAU
Reliability of location	Good Compiled at 1:100,000 scale. <i>Comments:</i> The fault and adjacent geology were mapped by Pierce and others (1983 #6538) at 1:48,000 scale. Fault trace was recompiled on topographic base at 1:100,000 scale for digitization.
Geologic setting	The Raft River Valley appears to be a Tertiary graben located over an east-dipping detachment fault. The valley is between the strongly uplifted Cottrell, Jim Sage, and Black Pine Mountains in southern Idaho and the Raft River Mountains in northern Utah. The range-bounding faults appear to sole into the detachment fault (Williams and others, 1982 #93, figure 5), were active mainly in late Miocene to Pliocene time (Williams and others, 1982 #93), and have no obvious expression in the Quaternary landscape. Mapping by Pierce and others (1983 #6538) at the northern end of the Raft River Valley shows that the southern Snake River Plain is underlain by a series of middle Pleistocene basalts that have a moderately thick (4-10 m) cover of middle to upper Pleistocene loess.
Length (km)	2 km.
Average strike	N37°W
Sense of movement	Normal <i>Comments:</i> As shown by Pierce and others (1983 #6538).
Dip Direction	NE <i>Comments:</i> As shown by Pierce and others (1983 #6538).
Paleoseismology	

studies	
Geomorphic expression	No information on the fault's geomorphology was included in the map discussion by Pierce and others (1983 #6538). The fault is mapped in middle Pleistocene basalt on the northwest flank of Horse Butte.
Age of faulted surficial deposits	The fault cuts Horse Butte, which is a 2.5-km-long block of middle Pleistocene basalt on the south margin of the Snake River Plain. The fault has an unspecified (but not major) amount of down-to-the-northeast throw within the underlying basalts (unit Qbrr, basalt of Radio Relay Butte, in Pierce and others, 1983 #6538), which have been dated by whole rock K-Ar at 0.45 ± 0.22 Ma (sample no. 76G027, Table 1 in Pierce and others, 1983 #6538).
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) <i>Comments:</i> Middle Quaternary movement is certain owing to offset of the basalt of Radio Butte, but younger (late Quaternary) movement is unlikely since the fault's trace does not extend onto lower ground that is underlain by a series of middle Pleistocene basalts that have a moderately thick (4- to 10-m-thick) cover of middle to upper Pleistocene loess. No morphometric analyses or detailed investigations have been conducted, thus the most recent paleoevent is poorly constrained.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr <i>Comments:</i> A low slip rate is suggested by the presence of modest (but unreported) height scarps on deposits that are of middle Pleistocene age.
Date and Compiler(s)	2003 Michael N. Machette, U.S. Geological Survey, Retired
References	#6538 Pierce, K.L., Covington, H.R., Williams, P.L., and McIntyre, D.H., 1983, Geologic map of the Cotterel Mountains and the northern Raft River Valley, Cassia County, Idaho: U.S. Geological Survey, Miscellaneous Investigations Series Map I-1450, 1 sheet, scale 1:48,000.

#93 Williams, P.L., Covington, H.R., and Pierce, K.L., 1982, Cenozoic stratigraphy and tectonic evolution of the Raft River basin, Idaho, *in* Bonnichsen, B., and Breckenridge, R.M., eds., Cenozoic geology of Idaho: Idaho Bureau of Mines and Geology Bulletin 26, p. 491-504.

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