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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.

Red Butte faults (Class A) No. 1173

Last Review Date: 2000-08-23

citation for this record: **Lidke, D.J., compiler, 2000, Fault number 1173, Red Butte faults, 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 02:16 PM.**

Synopsis	This group of faults form a wide north-northeast-striking zone that mostly occupies the piedmont slope of the eastern side of the northern part of the Antelope Valley and the western flank of the northern part of the Shoshone Mountains, south of the Reese River. Although numerous faults in this zone place bedrock against Pleistocene piedmont-slope deposits, none of these faults show the topographic expression characteristic of range-front faults. The majority of the scarps are west facing, and reconnaissance photogeologic mapping indicates abundant evidence for faulting events at least as young as late Pleistocene and perhaps evidence for Holocene events along these scarps. However, the faults of the Red Butte group have not been studied in detail. The principal sources of data consist of geologic mapping, reconnaissance photogeologic mapping, and reconnaissance geomorphic studies of fault scarps.
Name	Refers to a wide zone of north-northeast-striking faults along the

comments	shared flank of the eastern side of the Antelope Valley and western side of the northern end of the Shoshone Mountains, south of the Reese River. Stewart and McKee (1969 #4353; 1977 #4351) and Dohrenwend and others (1992 #283) mapped faults that form this wide zone of deformation. dePolo (1998 #2845) showed the general location of this group of faults and named it the Red Butte fault swarm; that root name is used here as well. The Red Butte faults cover an area about 15 to 20 km in width and extends from about 5 km north of Red Butte southwest to east of Little Antelope Spring. **Fault ID:** Refers to faults that dePolo (1998 #2845) portrayed and labeled MI5.
County(s) and State(s)	LANDER COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Location is from 1:250,000-scale map of Dohrenwend and others (1992 #283), which shows mapping based on photogeologic analysis of 1:58,000-nominal-scale, color-infrared photography transferred directly to 1:100,000-scale topographic maps enlarged to the scale of the photographs; these maps were then reduced and compiled at 1:250,000-scale.
Geologic setting	The Red Butte faults consist of numerous, north-northeast-striking faults that place bedrock against Pleistocene piedmont-slope deposits and other faults that form scarps on the piedmont-slope deposits of the Antelope Valley (Dohrenwend and others, 1992 #283). These faults may be related to continued Quaternary uplift of the Shoshone Mountains, relative to the adjacent Antelope Valley. The faults may represent a diffuse, southern continuation of the Shoshone Range fault zone [1148] that is directly to the northeast but expressed by a narrower band of northeast-striking faults along the more prominent front of the Shoshone Range.
Length (km)	29 km.
Average strike	N°34E

Sense of movement	Normal *Comments:* Not specifically reported; normal sense of slip is inferred from the presence of these faults within the Basin and Range Province that is primarily an extensional tectonic province characterized by normal faults.
Dip Direction	NW; SW
Paleoseismology studies	
Geomorphic expression	The faults form a wide zone of deformation along part of the western flank of the northern part of the Shoshone Mountains and along the adjacent eastern piedmont slope of the Antelope Valley. Faults in this section are expressed by bedrock/piedmont contacts and by scarps and some linear features developed on the Pleistocene piedmont-slope deposits (Stewart and McKee, 1969 #4353; 1977 #4351; Dohrenwend and others, 1992 #283). The range front shows a gentle topographic transition with the piedmont slope of the Antelope Valley, and according to mapping by Dohrenwend and others (1992 #283), none of the faults of this section show the topographic expression typical of range-front faults. dePolo (1998 #2845) reported that basal fault facets are absent along the range front adjacent to this fault zone, and he relates the absence of basal fault facets to relatively low Quaternary slip rates.
Age of faulted surficial deposits	Dohrenwend and others (1992 #283) assigned early, middle, or late Pleistocene ages to many of the deposits that are offset by the faults, but he also assigned late Pleistocene and latest Pleistocene to Holocene ages to some of the faulted deposits.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Although the timing of the most recent prehistoric faulting event is not tightly constrained, reconnaissance photogeologic mapping by Dohrenwend and others (1992 #283) suggests a latest Pleistocene to Holocene (10-30 ka) time for the most recent faulting event along some faults of this zone.
Recurrence	

interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* No detailed data exists to determine slip rates for this fault. dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.01 mm/yr for the fault based on the presence of scarps on alluvium and the absence of basal facets. The late Quaternary characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) support a low slip rate. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.
Date and Compiler(s)	2000 David J. Lidke, U.S. Geological Survey
References	#2845 dePolo, C.M., 1998, A reconnaissance technique for estimating the slip rate of normal-slip faults in the Great Basin, and application to faults in Nevada, U.S.A.: Reno, University of Nevada, unpublished Ph.D. dissertation, 199 p. #283 Dohrenwend, J.C., Schell, B.A., and Moring, B.C., 1992, Reconnaissance photogeologic map of young faults in the Millett 1° by 2° quadrangle, Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-2176, 1 sheet, scale 1:250,000. #4353 Stewart, J.H., and McKee, E.H., 1969, Geologic map of the west-central part of Lander County, Nevada: U.S. Geological Survey Open-File Report 69-270, 2 sheets, scale 1:62,500. #4351 Stewart, J.H., and McKee, E.H., 1977, Geology and mineral deposits of Lander County, Nevada: Nevada Bureau of Mines and Geology Bulletin 88, 106 p., 3 pls.