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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.

Mount Callaghan faults (Class A) No. 1177

Last Review Date: 2000-08-30

citation for this record: **Lidke, D.J., compiler, 2000, Fault number 1177, Mount Callaghan 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 somewhat isolated and relatively short group of faults mostly occupies a small embayment along the eastern flank of the Toiyabe Range, near the southern end of Grass Valley. The faults form some east-facing scarps near the range front, and both east- and west-facing scarps and lineaments along the adjacent piedmont slope. There is evidence along this fault zone for at least one faulting event that probably is no older than late Pleistocene. The fault zone has not been studied in detail. The principle sources of data consist of geologic mapping, reconnaissance photogeologic, and reconnaissance geomorphic studies of fault scarps.
Name comments	Refers to faults mapped by Stewart and McKee (1968 #4369; 1977 #4351) and Dohrenwend and others (1992 #283) that are present along the western piedmont slope of the south end of Grass Valley and the eastern flank of the north-central part of the

	Toiyabe Range. dePolo (1998 #2845) referred to this group of faults as the Mount Callaghan fault swarm and that root name is used here as well. This group of northeast-striking faults is about 8 km in width and extends northeastward from east of Burton Spring to a few kilometers north of Skull Creek. **Fault ID:** Refers to faults that dePolo (1998 #2845) portrayed and labeled as MI14.
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 by 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	This group of northeast-striking faults juxtapose Paleozoic bedrock against Pleistocene fan deposits along the eastern range front of the Toiyabe Range, and includes scarps and lineaments that are present on Pleistocene fan deposits of the adjacent piedmont slope of Grass Valley (Stewart and McKee, 1968 #4369; 1977 #4351; Dohrenwend and others, 1992 #283). Scarps along the front are all east-facing features; however, both easterly and westerly facing scarps are present where the zone is expressed on piedmont-slope deposits. These opposing directions might reflect both east- and west-dipping faults and related small horst and grabens. There appears to be abundant evidence for Quaternary movement along the fault zone (Stewart and McKee, 1968 #4369; 1977 #4351; Dohrenwend and others, 1992 #283) and seems likely that offsets along this fault zone are related to continued Quaternary uplift of the Toiyabe Range relative to the adjacent Grass Valley. However, very little is known with certainty about the character of these faults and the nature and amounts of offsets along them.
Length (km)	17 km.

Average strike	N16°E
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	E; W *Comments:* Not reported, but probably steep, based on dip measurements of other Quaternary faults in localities nearby and elsewhere in the Basin and Range Province.
Paleoseismology studies	
Geomorphic expression	This group of northeast-striking faults is partly expressed by down-to-the-east faults along the range front of Toiyabe Range and by southeast-facing scarps (Stewart and McKee, 1968 #4369; 1977 #4351; Dohrenwend and others, 1992 #283). The fault zone is also partly expressed by both southeast- and northwest-facing scarps and other linear features that are present on Pleistocene, piedmont-slope deposits of the adjacent Grass Valley (Stewart and McKee, 1968 #4369; 1977 #4351; Dohrenwend and others, 1992 #283). The opposite facing directions of the scarps may suggest that small horst and graben features characterize parts of the fault zone. 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 ages no older than early Pleistocene to all of the faulted deposits and assigned late Pleistocene and questionable latest Pleistocene to Holocene ages to some of the faulted deposits.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* The timing of the most recent prehistoric faulting event is not tightly constrained. However, reconnaissance photogeologic mapping by Dohrenwend and others (1992 #283)

	indicate that the most recent prehistoric faulting event is no older than late Pleistocene (10-130 ka) and it may be as young as latest Pleistocene to Holocene (0-30 ka) in age.
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. #4369 Stewart, J.C., and McKee, E.H., 1968, Geologic map of the Mount Callaghan quadrangle, Lander County, Nevada: U.S. Geological Survey Geologic quadrangle Map GQ-730, 1 sheet, 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.