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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.

Willow Creek fault (Class A) No. 1532

Last Review Date: 1999-01-22

citation for this record: **Adams, K., Sawyer, T.L., and Anderson, R.E., compilers, 1999, Fault number 1532, Willow Creek 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 02:50 PM.**

Synopsis	This group of faults includes a short group of plateau-bounding faults along the southeast side of Squaw Valley that bound the southeast border of the late Cenozoic Midas Trough, a regional-scale northeast-striking graben or tectonic trough. Plateau-bounding faults are expressed as bedrock- Quaternary alluvium contact at the base of high topographic escarpments on the south side of Squaw Valley and of hills to the west. The unnamed faults are expressed as south-facing scarps on the southeast side of Sixmile Hill. As these unnamed faults extend southwest into the Winnemucca AMS sheet, they are expressed as both southeast- and northwest-facing scarps on Quaternary surficial deposits or erosion surfaces and as scarps juxtaposing Quaternary alluvium against bedrock. Intra-plateau faults are delineated by topographic lineaments consisting of linear segments of stream valleys, aligned saddles and sidehill benches, and small topographic escarpments. Reconnaissance photogeologic and bedrock

	mapping of the faults are the sources of data. Trench investigations and detailed studies of scarp morphology have not been completed.
Name comments	Referred to as the Willow Creek fault by dePolo (1998 #2845). The faults extend from near the Humboldt-Elko County line northeastward across Rock Creek northwest of Silver Cloud Mine. **Fault ID:** Includes western part of fault MD12 of dePolo (1998 #2845).
County(s) and State(s)	LANDER COUNTY, NEVADA ELKO COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Fault locations are primarily based on 1:250,000-scale maps of Dohrenwend and Moring (1991 #284) which were produced by analysis of 1:58,000-nominal-scale color-infrared photography transferred directly to 1:100,000-scale topographic quadrangle maps enlarged to scale of the photographs. Additional faults were compiled from 1:250,000-scale map of Slemmons (1966, unpublished McDermitt 1? x 2? sheet) mapping from analysis of 1:60,000-scale AMS photography transferred to mylar overlaid onto a 1:250,000-scale topographic map using proportional dividers. Locations were checked against 1:250,000-scale bedrock map of Coats (1987 #2861).
Geologic setting	This group of faults bound the north side of the Sheep Creek Range (Slemmons, 1966, unpublished McDermitt 1? x 2? sheet; Dohrenwend and Moring, 1991 #284). The fault extends southwest toward a larger group of northeast-striking faults that disrupt the west margin of the volcanic plateau that forms the Sheep Creek Range (Stewart and Carlson, 1978 #3413). In that area the faults appear to interact with, or form a part of, the Western Sheep Creek Range fault [1149]. Faults along southeast side of Squaw Valley bound the southeast border of the late Cenozoic Midas Trough, a regional-scale northeast-striking graben or tectonic trough.

Length (km)	33 km.
Average strike	N47°E
Sense of movement	Normal *Comments:* Normal sense of movement based topographic expression.
Dip Direction	NW; SE
Paleoseismology studies	
Geomorphic expression	Dohrenwend and Moring (1991 #284) show the north-facing plateau-bounding faults as juxtaposing Quaternary alluvium against bedrock. No scarps on alluvium are mapped.
Age of faulted surficial deposits	late Quaternary; early to middle Pleistocene; Quaternary, Tertiary. Many of the unnamed faults in this group displace only Tertiary rocks (Coats, 1987 #2861; Dohrenwend and Moring, 1991 #284). However, Slemmons (1966, unpublished McDermitt 1? x 2? sheet) indicates possible faulted late Quaternary alluvium. Some of the unnamed faults extending southwest into the Winnemucca AMS sheet are mapped by Dohrenwend and Moring (1991 #282) as northwest- and southeast-facing scarps formed on deposits or erosion surfaces of Pleistocene age (0.01-1.5 Ma).
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* The timing of most recent event is not well constrained. The age assignment here is based on mapping of Dohrenwend and Moring (1991 #282; 1991 #284); however, Slemmons (1966, unpublished McDermitt 1? x 2? sheet) suggests a late Quaternary time based on reconnaissance photogeologic mapping.
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 preferred reconnaissance

	vertical slip rate of 0.001 mm/yr based on the absence of scarps on alluvium and absence of basal facets. The late Quaternary characteristics of this fault zone (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)	1999 Kenneth Adams, Piedmont Geosciences, Inc. Thomas L. Sawyer, Piedmont Geosciences, Inc. R. Ernest Anderson, U.S. Geological Survey, Emeritus
References	#2861 Coats, R.R., 1987, Geology of Elko County, Nevada: Nevada Bureau of Mines and Geology Bulletin 101, 112 p., scale 1:250,000. #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. #282 Dohrenwend, J.C., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Winnemucca 1° by 2° quadrangle, Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-2175, 1 sheet, scale 1:250,000. #284 Dohrenwend, J.C., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the McDermitt 1° by 2° quadrangle, Nevada, Oregon, and Idaho: U.S. Geological Survey Miscellaneous Field Studies Map MF-2177, 1 sheet, scale 1:250,000. #3013 Stewart, J.H., and Carlson, J.E., 1976, Geologic map of north-central Nevada: Nevada Bureau of Mines and Geology, Map 50, scale 1:250,000. #3413 Stewart, J.H., and Carlson, J.E., 1978, Geologic map of Nevada: U.S. Geological Survey, Special Geologic Map, 1, scale 1:500,000.

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