Jump to Navigation

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.

Emigrant Peak fault zone (Class A) No. 1329

Last Review Date: 1994-05-27

citation for this record: **Reheis, M.C., compiler, 1994, Fault number 1329, Emigrant Peak fault zone, 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 02:15 PM.**

Synopsis	The Emigrant Peak fault zone is a group of parallel faults and short fault segments that are mostly down-to-the-west, north-striking normal faults. These faults are present along and in the northwest flank of the Silver Peak Range that borders the east side of the northern part of Fish Lake Valley. The faults are marked by prominent west-facing scarps on alluvium and bedrock. Most of the faults have been mapped in detail at 1:24,000 scale and scarp profiles and other scarp data have been collected but that data has not been published and the faults have not been trenched. Post-Pliocene displacement across the fault zone is estimated to range between about 400–1000 m. Western faults of the zone show evidence for Holocene activity. A recurrence interval of
Name comments	Named by Reheis (1988 #1601); previously shown but unnamed on a geologic map by Robinson and others (1976 #1617). Piety (1995 #915) later referred to the zone as the Emigrant Peak faults and dePolo (1998 #2845) referred to it as the Emigrant Peak fault

	zone. The fault zone was mapped by Reheis (1991 #1603) and Reheis and others (1993 #648; 1995 #3823) at 1:24,000 scale, and by Reheis and Noller (1991 #1195) and Dohrenwend and others (1992 #289) at 1:100,000 scale. These faults are also shown on a compilation of Quaternary faults by Piety (1995 #915). The Emigrant Peak fault zone extends from near Emigrant Peak southward to about 3 km south of Fish Lake along and in the northwest flank of the Silver Peak Range. **Fault ID:** Referred top as EPK by Piety (1995 #915) and G1 by dePolo (1998 #2845).
County(s) and State(s)	ESMERALDA COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Mapped by Reheis (1991 #1603) and Reheis and others (1993 #648; 1995 #3823) at 1:24,000 scale and at 1:100,000 scale by Reheis and Noller (1991 #1195). Location of fault traces herein is from Reheis and Noller (1991 #1195). Location of the southern part of the fault is from 1:24,000-scale maps and from 1:100,000 scale maps (Reheis and Noller, 1991 #1195; Dohrenwend and others, 1992 #289).
Geologic setting	The Emigrant Peak fault zone is in part a range-bounding structure that separates the northwestern part of the Silver Peak Range from the northern part of Fish Lake Valley. The fault zone is comprised of several high-to moderate-angle, down-to-west, normal faults, with minor dextral component locally, in part bounding the northwest side of Silver Peak Range; the most recently active faults, however, are mostly within Pleistocene and Holocene alluvium along the east margin of Fish Lake Valley. The minimum post-Pliocene displacement across the fault zone is 410 m (Reheis and McKee, 1991 #1609) but unpublished drill-hole data suggest the total displacement is at least 1 km.
Length (km)	36 km.
Average strike	N10°E
Sense of	Normal

movement	*Comments:* The west dip and down-to-the-west offset along these north-striking faults indicates they are principally normal faults; the north-northwest-striking fault that bounds the south end of the section is nearly perpendicular to the other faults and has left-lateral offset. Although most of the faults apparently have normal offset, at least one of three parallel fault strands within bedrock near Icehouse Canyon has mainly dextral offset indicated by slickensides (Reheis, 1991 #1603).
Dip	42° to >70° W *Comments:* Dip depends on fault location. In central part of section, easternmost fault is inactive and has measured dips of 42° and 48°; next fault west has dips of 50° and 55°; next fault west has dips ranging from 48–67°; next fault west has one measured dip of 70°; the westernmost fault, presently active, has an unknown dip but is presumed to dip at least 70° (Reheis, 1991 #1603).
Paleoseismology studies	
Geomorphic expression	In general the fault is expressed as low scarps (maximum about 9m) on late Pleistocene and Holocene alluvial fans; however, a prominent scarp as much as 33 m high marks the westernmost fault at the northern end of the fault zone. To the south, faults mainly form scarps on bedrock.
Age of faulted surficial deposits	Early Holocene, Pleistocene, and bedrock of Pliocene, Miocene, Mesozoic and Paleozoic age.
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Based on mapping (Reheis, 1991 #1603), the youngest faulted deposit is the middle alluvium of Marble Creek; this unit contains a 1.2-ka tephra within the map area and is dated at 1.09–1.67 ka from several radiocarbon and tephra sites elsewhere in Fish Lake Valley (Reheis and others, 1995 #3823). Many of the faults in the southern part of the fault are confined within bedrock, particularly a basalt flow dated at 4.8 Ma by

	Stewart and others (1974 #1656), but a few of these extend into Pleistocene deposits (Reheis and others, 1995 #3823).
Recurrence interval	<1000 yr (<10 ka) *Comments:* Assuming that age assignments of offset surfaces (Reheis, 1991 #1603) are correct, and that the scarps 1.0-2.2 m high on the middle alluvium of Marble Creek formed during one event, then scarps of about 25 m on the early Holocene alluvium of Leidy Creek indicate a recurrence interval of less than 1000 yr during the Holocene.
Slip-rate category	Between 0.2 and 1.0 mm/yr *Comments:* Age of the alluvium of Leidy Creek is 6–10 ka from dating elsewhere in Fish Lake Valley (Reheis and others, 1995 #3823) and scarps on this unit between South and Middle Washes (Reheis, 1991 #1603) are as much as 25.7 m, yielding a minimum Holocene slip rate of 2.6–4.3 mm/yr. The age of the alluvium of Indian Creek is about 50-130 ka and scarps on this unit are as much as 33.1 m, yielding a minimum slip rate of 0.25-0.66 mm/yr. The minimum Pleistocene slip rate for only the westernmost fault based on offset of the Bishop ash (Reheis and McKee, 1991 #1609) is 0.15 mm/yr, and the minimum slip rate since 2 Ma across three of the four main faults is 0.2 mm/yr. Based on the data from Reheis regarding the Indian Creek alluvium, dePolo (1998 #2845) calculated a preferred vertical slip rate of 0.76 mm/yr using a preferred vertical offset of 38 m and a preferred age of 50 ka. Clearly the reported slip rates vary greatly; the slip-rate category is based on the longer term rate.
Date and Compiler(s)	1994 Marith C. Reheis, U.S. Geological Survey, Emeritus
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. #289 Dohrenwend, J.C., Schell, B.A., McKittrick, M.A., and Moring, B.C., 1992, Reconnaissance photogeologic map of young faults in the Goldfield 1° by 2° quadrangle, Nevada and California: U.S. Geological Survey Miscellaneous Field Studies Map MF-2183, 1 sheet, scale 1:250,000.

#915 Piety, L.A., 1995, Compilation of known and suspected Quaternary faults within 100 km of Yucca Mountain, Nevada and California: U.S. Geological Survey Open-File Report 94-112, 404 p., 2 pls., scale 1:250,000.

#1601 Reheis, M.C., 1988, Quaternary activity on the Emigrant Peak fault zone, Fish Lake Valley, west-central Nevada: Geological Society of America Abstracts with Programs, v. 20, no. 3, p. 223.

#1603 Reheis, M.C., 1991, Geologic map of late Cenozoic deposits and faults in the western part of the Rhyolite Ridge 15' quadrangle, Esmeralda County, Nevada: U.S. Geological Survey Miscellaneous Investigations Map I-2183, 1 sheet, scale 1:24,000.

#1609 Reheis, M.C., and McKee, E.H., 1991, Late Cenozoic history of slip on the Fish Lake Valley fault zone, Nevada and California, *in* Late Cenozoic stratigraphy and tectonics of Fish Lake Valley, Nevada and California—Road log and contributions to the field trip guidebook, 1991 Pacific Cell, Friends of the Pleistocene: U.S. Geological Survey Open-File Report 91-290, p. 26-45.

#1195 Reheis, M.C., and Noller, J.S., 1991, Aerial photographic interpretation of lineaments and faults in late Cenozoic deposits in the eastern part of the Benton Range 1:100,000 quadrangle and the Goldfield, Last Chance Range, Beatty, and Death Valley Junction 1:100,000 quadrangles, Nevada and California: U.S. Geological Survey Open-File Report 90-41, 9 p., 4 sheets, scale 1:100,000.

#648 Reheis, M.C., Sawyer, T.L., Slate, J.L., and Gillespie, A.R., 1993, Geologic map of late Cenozoic deposits and faults in the southern part of the Davis Mountain 15' quadrangle, Esmeralda County, Nevada: U.S. Geological Survey Miscellaneous Investigations Map I-2342, 1 sheet, scale 1:24,000.

#3823 Reheis, M.C., Slate, J.L., and Sawyer, T.L., 1995, Geologic map of late Cenozoic deposits and faults in parts of the Mt. Barcroft, Piper Peak, and Soldier Pass 15' quadrangles, Esmeralda County, Nevada, and Mono County, California: U.S. Geological Survey Miscellaneous Investigations Map I-2464, 2 sheets.

#1617 Robinson, P.T., Stewart, J.H., Moiola, R.J., and Albers,

	J.P., 1976, Geologic map of the Rhyolite Ridge quadrangle, Esmeralda County, Nevada: U.S. Geological Survey Geologic quadrangle Map GQ-1325, 1 sheet, scale 1:62,500.