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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.

Ione Valley fault (Class A) No. 1334

Last Review Date: 1998-07-22

citation for this record: **Sawyer, T.L., and Lidke, D.J., compilers, 1998, Fault number 1334, Ione Valley 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 02:15 PM.**

Synopsis	This down-to-the-west fault zone bounds the western front of the Shoshone Mountains, south of U.S. Highway 50. A series of echelon scarps on piedmont-slope deposits in eastern Ione Valley and a few scarps along and near the range front in Smith Valley provide evidence for young fault movement. Reconnaissance photogeologic mapping of the fault zone and limited analysis of fault-facet morphology are the principle sources of data.
Name comments	Refers to faults mapped by Dohrenwend and others (1992 #283; 1996 #2846) along the western front of the Shoshone Mountains. Vitaliano (1963 #2927) mapped a short Quaternary fault at the range front south of West Union Canyon. dePolo (1998 #2845) referred to these faults as the Ione Valley fault system and a slight modification of that name is used herein. The fault zone extends from east of Patterson Station on U.S. Highway 50, south along the range front and eastern side of Ione Valley and southern Smith

	Valley, to the south end of the Shoshone Mountains near State Route 89. **Fault ID:** Refers to faults T4A and T4B of dePolo (1998 #2845).
County(s) and State(s)	LANDER COUNTY, NEVADA NYE COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Location based on 1:250,000 scale maps of Dohrenwend and others (1992 #283) and unpublished map of the Tonopah 1:250,000-scale map by J.C. Dohrenwend published at 1:100,000-scale by Dohrenwend and others (1996 #2846). These maps are based on photogeologic analysis of 1:58,000-nominal-scale, color-infrared photography transferred directly to 1:100,000-scale topographic maps enlarged to scale of photographs. As a final step, these maps were reduced and compiled at 1:250,000-scale.
Geologic setting	This down-to-the-west fault zone bounds the western front of the Shoshone Mountains, a gently northwest-tilted horst block that began to be uplifted along the bounding normal faults [1334] and [1335] in late Oligocene. The main period of uplift, however, occurred in late Pliocene and early Pleistocene (Ferguson and Cathcart, 1954 #2926; Bonham, 1970 #2928). According to (Bonham, 1970 #2928), Neogene offset along the northern part of the fault is a minimum of about 425 m as determined from offset of the early Miocene Toiyabe Quartz Latite. The fault zone has not been studied in detail and other insights and estimates concerning Quaternary offsets have not been reported.
Length (km)	76 km.
Average strike	N16°E
Sense of movement	Normal *Comments:* Bonham (1970 #2928) showed this fault as having normal movement on his map and cross sections. He noted that this and other faults in the northern part of the Shoshone Range only show evidence of dip-slip movement. West-facing scarps on

	piedmont and piedmont-slope deposits adjacent to the range front, as well as the down-to-the-west, range-front character of much of the fault, (Dohrenwend and others, 1992 #283) suggest that mostly normal, dip-slip offset has occurred along this section of the fault.
Dip Direction	W; NW *Comments:* Not specifically reported, but probably steep; Bonham (1970 #2928) shows the fault dipping about 75–80° in his cross section A-A'.
Paleoseismology studies	
Geomorphic expression	This north-trending range front fault separates Ione Valley from the Shoshone Mountains but bends to the northeast at the northern part to separate the Smith Creek Valley from the Shoshone Mountains. Fault scarps are discontinuously present along the piedmont slope (Dohrenwend and others, 1992 #283; 1996 #2846). Scarps on younger deposits include those between about Spanish Creek and Mission Creek and a relatively continuous scarp that extends southwest from the mouth of Mission Creek onto the piedmont slope. Kleinhampl and Ziony (1985 #2851) also reported that late Quaternary deposits were displaced along the piedmont faults. dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 122 m (98-146 m).
Age of faulted surficial deposits	Dohrenwend and others (1992 #283; 1996 #2846) shows scarps on Pleistocene and late Pleistocene surficial deposits. Kleinhampl and Ziony (1985 #2851) also reported late Quaternary deposits displaced along the piedmont faults.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Timing of the most recent prehistorical faulting event is not well constrained. Mapping by Dohrenwend and others (1996 #2846) show discontinuous parts of the fault as being late Pleistocene. However, more detailed mapping by Dohrenwend and others (1992 #283) shows only short discontinuous scarps on Quaternary deposits along the range front and adjacent piedmont slope. Age-category assignment based on Dohrenwend and others

	(1996 #2846).
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 0.231 mm/yr based on an empirical relationship between his preferred maximum basal facet height and vertical slip rate. The size of the facets (tens to hundreds of meters, as measured from topographic maps) indicates they are the result of many seismic cycles, and thus the derived slip rate reflects a long-term average. However, the late Quaternary characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) suggest the slip rate during this period is of a slightly lesser magnitude. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.
Date and Compiler(s)	1998 Thomas L. Sawyer, Piedmont Geosciences, Inc. David J. Lidke, U.S. Geological Survey
References	#2928 Bonham, H.F., Jr., 1970, Geologic map and section of a part of the Shoshone Mountains, Lander and Nye Counties, Nevada: Nevada Bureau of Mines and Geology Map 38, scale 1:62,500. #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. #2846 Dohrenwend, J.C., Schell, B.A., Menges, C.M., Moring, B.C., and McKittrick, M.A., 1996, Reconnaissance photogeologic map of young (Quaternary and late Tertiary) faults in Nevada, *in* Singer, D.A., ed., Analysis of Nevada's metal-bearing mineral resources: Nevada Bureau of Mines and Geology Open-File

	Report 96-2, 1 pl., scale 1:1,000,000. #2926 Ferguson, H.G., and Cathcart, S.H., 1954, Geology of the Round Mountain quadrangle: U.S. Geological Survey Geologic quadrangle Map GQ-40, scale 1:125,000. #2851 Kleinhampl, F.J., and Ziony, J.I., 1985, Geology of Northern Nye County, Nevada: Nevada Bureau of Mines and Geology Bulletin 99A, 172 p. #2927 Vitaliano, C.H., 1963, Cenozoic geology and section of the Ione quadrangle, Nye County, Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-255, scale 1:62,500.