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Quaternary Fault and Fold Database of the United States

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Eastern Pine Forest Range fault zone, northern section (Class A) No. 1495a

Last Review Date: 1998-07-19

citation for this record: **Sawyer, T.L., compiler, 1998, Fault number 1495a, Eastern Pine Forest Range fault zone, northern section, 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	**General:** This relatively long, fault zone is comprised of range-bounding normal faults along the prominent east and northeast fronts of the Pine Forest Range, lesser faults east of Lone Mountain and along low hills at Denio Summit, and distributed piedmont faults throughout much of northernmost Black Rock Desert valley, north of Granite Creek. The fault zone has approximately 900 m of late Cenozoic vertical displacement and bounds the westward-tilted Pine Forest Range fault block. Reconnaissance photogeologic mapping of the fault zone and detailed and regional geologic mapping are the sources of data. **Sections:** This fault has 2 sections. Although not studied in detail, the geometry of the fault zone suggests two sections. Faults in the northern section [1495a] are widely distributed throughout the northernmost Black Rock Desert valley and includes a northwest-

	striking that fault bounds the north end of the Pine Forest Range at the front of Mahogany Mountain, and a discontinuous fault along the east side of low hills at Denio Summit and east of Lone Mountain. In contrast, faults in the southern section [1495b] mark the east front of Mahogany Mountain and bounds the prominent east front of the Pine Forest Range from Cherry Creek to Windy Point, southeast of Sentinel Peak.
Name comments	**General:** Refers to faults mapped by Willden (1964 #3002), Slemmons (1966, unpublished Vya 1:250,000-scale map), and Dohrenwend and Moring (1991 #281); includes the Eastern Pine Forest Range fault and Northern Pine Forest Range fault of dePolo (1998 #2845). The fault zone bounds the northeast and entire eastern fronts of the Pine Forest Range, continues northward east of Denio Summit and along the east front of Lone Mountain, and extends though northernmost Black Rock Desert valley to the Nevada/Oregon border. The faults may continue northward into Oregon, although they have not been mapped as such. **Section:** This section is widely distributed throughout northernmost Black Rock Desert valley and includes faults bounding the northeastern front of Mahogany Mountain, and low hills at Denio Summit and east of Lone Mountain. Known as the Northern Pine Forest Range fault of dePolo (1998 #2845). **Fault ID:** Refers to fault V11 and V12A of dePolo (1998 #2845).
County(s) and State(s)	HUMBOLDT COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Fault locations generally based on 1:250,000-scale maps of Dohrenwend and Moring (1991 #281) and Slemmons (1966, unpublished Vya 1:250,000-scale map); mapping by Dohrenwend and Moring (1991 #281) is from analysis of 1:58,000-nominal-scale color-infrared photography transferred directly to 1:100,000-scale topographic maps enlarged to scale of the photographs. Mapping by Slemmons (1966, unpublished Vya 1:250,000-scale map) is from analysis of 1:60,000-scale AMS photography transferred to mylar overlaid onto a 1:250,000-scale

	topographic map using proportional dividers. Range-front fault between about Pole Creek to south of Bishop Canyon was compiled from 1:24,000-scale geologic map of Smith (1973 #4472).
Geologic setting	This relatively long, fault zone is comprised of range-bounding normal faults along the prominent east and northeast fronts of the Pine Forest Range, lesser faults east of Lone Mountain and along low hills at Denio Summit, and distributed piedmont faults throughout much of northernmost Black Rock Desert valley, north of Granite Creek (Willden, 1964 #3002; Slemmons, 1966, unpublished Vya 1:250,000-scale map; Dohrenwend and Moring, 1991 #281). The fault zone has approximately 900 m of late Cenozoic vertical displacement (Willden, 1964 #3002) and bounds the westward-tilted Pine Forest Range fault block (Stewart, 1978 #2866).
Length (km)	This section is 28 km of a total fault length of 60 km.
Average strike	N6°E (for section) versus N5°E (for whole fault)
Sense of movement	Normal *Comments:* Reported to be normal faults (Willden, 1964 #3002; Slemmons, 1966, unpublished Vya 1:250,000-scale map; Dohrenwend and Moring, 1991 #281).
Dip Direction	E; W
Paleoseismology studies	
Geomorphic expression	Several of the piedmont faults in northernmost Black Rock Desert valley are expressed as dissected scarps on Pleistocene, possibly late Pleistocene, piedmont-slope deposits; some bound an approximately 3-km-long piedmont graben north of Little Wilder Creek (Dohrenwend and Moring, 1991 #281). Range-front and hill-bounding faults juxtapose Quaternary piedmont-slope deposits and Tertiary volcanic rocks. Northwest-striking faults at the north end of the Pine Forest Range bound the front of Mahogany Mountain and are marked by northwest-trending fault scarps on Pleistocene piedmont-slope deposits at Thacker Canyon and north of Diamond Spring (Dohrenwend and Moring, 1991 #281). In this same area, dePolo (1998 #2845) reports a preferred maximum basal fault facet of 146 m (122–171 m). North of Lone

	Mountain, several probably older faults mapped by Dohrenwend and Moring (1991 #281) are marked by topographic lineaments on Tertiary rocks. These lineaments are subparallel to scarps bounding the graben north of Little Wilder Creek and one is aligned with a scarp on piedmont-slope deposits, suggesting but not proving young movement.
Age of faulted surficial deposits	Late Pleistocene; Pleistocene; Tertiary. Dohrenwend and Moring (1991 #281) mapped several faults in northernmost Black Rock Desert valley that offset Pleistocene, possibly late Pleistocene, piedmont-slope deposits. Faults at the north end of the Pine Forest Range juxtapose piedmont-slope deposits and Tertiary volcanic rocks and older bedrock.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Although timing of most recent event is not well constrained, reconnaissance photogeologic mapping by Dohrenwend and Moring (1991 #281) shows evidence for a Quaternary time at several locations and possibly for a late Quaternary time at two widely separated locations.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* dePolo (1998 #2845) reported a reconnaissance vertical slip rate of 0.267 mm/yr for the fault bounding the north end of the Pine Forest Range (his Northern Pine Forest Range fault) 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 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.

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. #281 Dohrenwend, J.C., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Vya 1° by 2° quadrangle, Nevada, Oregon, and California: U.S. Geological Survey Miscellaneous Field Studies Map MF-2174, 1 sheet, scale 1:250,000. #4472 Smith, J.G., 1973, Geologic map of the Duffer Peak quadrangle, Humboldt County, Nevada: U.S. Geological Survey Miscellaneous Investigations Map I-0606, 1 sheet, scale 1:48,000. #2866 Stewart, J.H., 1978, Basin-range structure in western North America—A review, *in* Smith, R.B., and Eaton, G.P., eds., Cenozoic tectonics and regional geophysics of the western cordillera: Geological Society of America Memoir 152, p. 1-31, scale 1:2,500,000. #3002 Willden, R., 1964, Geology and mineral deposits of Humboldt County, Nevada: Nevada Bureau of Mines and Geology Bulletin 59, 154 p., scale 1:250,000.