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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.

Ruby Valley fault zone (Class A) No. 1718

Last Review Date: 2000-06-28

citation for this record: **Rowley, P.C., and Anderson, R.E., compilers, 2000, Fault number 1718, Ruby Valley 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 02:26 PM.**

Synopsis	A major range-front fault zone that juxtaposes the uplifted eastern side of the Ruby Mountains against the basin beneath Ruby Valley. The zone consists of aligned north-northeast-striking, down-to-the-east range-front normal faults. The fault zone displaces sediment as young as late Pleistocene.
Name comments	Name from dePolo (1998 #2845) who applied it to a major range-front fault zone as mapped by Dohrenwend and others (1991 #286). The zone consists of aligned, north northeast-striking range-front faults that extend along most of the eastern side of the Ruby Mountains, from just south of Ruby Range Station to the southern end of the Ruby Range. It includes one prominent 10-km-long gap in the central part of the fault. **Fault ID:** Referred to as fault EK6 by dePolo (1998 #2845).
County(s) and	WHITE PINE COUNTY, NEVADA

State(s)	ELKO COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Compiled at 1:250,000 scale by Dohrenwend and others (1991 #286). Parts also shown at 1:125,000 (Howard and others, 1979 #4325). The fault locations of Dohrenwend and others (1991 #286), which are followed here, 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 the scale of the photographs.
Geologic setting	The Ruby Valley fault zone is a major range-front structure that juxtaposes the Ruby Mountains on the west against the basin beneath Ruby Valley on the east. The Ruby Mountains represents a horst block whose major displacement is on the eastern side. The fault zone was mapped as Quaternary by Howard and others (1979 #4325) and Dohrenwend and others (1991 #286). The range front parallels the fault.
Length (km)	78 km.
Average strike	N15°E
Sense of movement	Normal
Dip Direction	E *Comments:* Shown on cross section D-D', E-E', F-F', and G-G' of Sharp (1939 #2864) as a high-angle normal fault dipping east. Shown on cross section B-B' as dipping steeply E (Howard and others, 1979 #4325).
Paleoseismology studies	
Geomorphic expression	Dohrenwend and others (1991 #286) classified the fault zone both as a major range-front zone, with fresh tectonic features, that places bedrock against Quaternary sediment and as a fault zone that displaces Quaternary sediment and/or surfaces. Quaternary scarps along Ruby Valley fault zone were not recognized by Barnhard (1985 #428) in his map of fault scarps on

	unconsolidated sediments in the Elko 1:250,000-scale map. dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 207 m (183–232 m).
Age of faulted surficial deposits	The fault displaces sediment as young as late Pleistocene (Dohrenwend and others, 1991 #286)
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* On the basis of inferred ages of Quaternary surfaces or surficial deposits on which scarps are formed, Dohrenwend and others (1991 #286) estimated that some of the scarps are formed on late Pleistocene deposits.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* dePolo (1998 #2845) assigned a reconnaissance vertical displacement rate of 0.389 mm/yr based on an empirical relationship between his preferred maximum basal facet height and vertical displacement 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 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)	2000 Peter C. Rowley, U.S. Geological Survey, Retired R. Ernest Anderson, U.S. Geological Survey, Emeritus
References	#428 Barnhard, T.P., 1985, Map of fault scarps formed in unconsolidated sediments, Elko 1° x 2° quadrangle, Nevada and Utah: U.S. Geological Survey Miscellaneous Field Studies Map MF-1791, 1 sheet, 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. #286 Dohrenwend, J.C., Schell, B.A., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Elko 1° by 2° quadrangle, Nevada and Utah: U.S. Geological Survey Miscellaneous Field Studies Map MF-2179, 1 sheet, scale 1:250,000. #4325 Howard, K.A., Kistler, R.W., Snoke, A.W., and Willden, R., 1979, Geologic map of the Ruby Mountains, Nevada: U.S. Geological Survey Miscellaneous Investigations Map I-1136, 1 sheet, scale 1:125,000. #2864 Sharp, R.P., 1939, Basin and Range structure of the Ruby-East Humboldt Range, northeastern Nevada: Geological Society of America Bulletin, v. 50, p. 881-920.