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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.

Boone Spring Hills fault zone (Class A) No. 1724

Last Review Date: 2001-07-17

citation for this record: **Anderson, R.E., compiler, 2001, Fault number 1724, Boone Spring Hills 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	The Boone Spring Hills fault zone is in a large area in the southeastern part of the Elko 1?x2? sheet that is devoid of major Quaternary range-front faults. Other fault groups in this area include [1712], [1713], [1720], and [1721]. Most faults in the Boone Spring Hills fault zone are probably small-displacement, down-to-the-west normal faults bounding slightly tilted Tertiary volcanic rock. Some of the Quaternary faults may also have traces in the Tertiary volcanic rock, but little is known of the structural significance of the faults. Well-defined topographic escarpments or sharp piedmont/hillslope breaks are generally lacking, and no scarps on Quaternary surficial deposits or erosion surfaces are mapped. No detailed study has been made, and neither the recurrence time or slip rate is known.

Name comments	Name from dePolo (1998 #2845) who applied it to a group of Quaternary faults that extend along the indistinct southwestern margin of the Antelope Range, northwestward into the Dolly Varden Mountains. As compiled herein, the fault zone is restricted to a subgroup of quasi-continuous northerly striking faults extending north through the Boone Spring Hills to within 2 km of Millick Canyon, at the south margin of the Dolly Varden Mountains. **Fault ID:** Referred to as fault EK14 by dePolo (1998 #2845).
County(s) and State(s)	WHITE PINE COUNTY, NEVADA ELKO COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Fault traces taken from the 1:250,000 scale map of Dohrenwend and others (1991 #286). That map was 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 southeastern part of the Elko 1 x2? quadrangle contains a large (approximately 1750 square-kilometer) area that lacks major range-bounding Quaternary faults (Dohrenwend and others, 1991 #286). Quaternary faults in that area are relatively short (<15 km, mostly <5 km), diversely oriented (mostly north-striking) block-bounding structures. The area includes all or parts of several ranges, mountains, and hills including the north-most Schell Creek Range, Antelope Range, Dolly Varden Mountains, southern Goshute Mountains, Kinsley Mountains, Currie Hills, Boone Spring Hills, and Ferber Hills. Most of these highlands are poorly defined physiographically and structurally, so the geologic setting of the Quaternary faults is not obvious, and placing them into groups with seismogenic significance is quite subjective. Other fault groups in this area include [1712], [1713], [1720], and [1721]. On the basis of photogeologic and field study, Barnhard (1985 #428) recognized no Quaternary scarps in this area whereas Dohrenwend and others (1991 #286), on the basis of photogeologic study, mapped 20 to 30 faults (the number depending on how the faults are connected). dePolo (1998 #2845)

	connected some faults across large gaps, but did not consider most of the faults in his statewide study of Quaternary faults, possibly suggesting they are of little significance. Tertiary volcanic rock is widely exposed in the Boone Spring Hills and adjacent parts of the Antelope Range and Dolly Varden Mountains, but little is known of the Quaternary geology. Most faults forming the Boone Spring Hills fault zone are probably small-displacement, down-to-the-west normal faults bounding slightly tilted Tertiary volcanic rock. Some of the Quaternary faults may have traces in the Tertiary volcanic rocks. Little is known of the structural significance of the faults.
Length (km)	15 km.
Average strike	N19°W
Sense of movement	Normal *Comments:* Inferred from location within an extensional tectonic province.
Dip Direction	W; N *Comments:* Inferred from physiography.
Paleoseismology studies	
Geomorphic expression	Dohrenwend and others (1991 #286) do not map scarps on Quaternary surficial deposits or erosion surfaces along this fault zone. They mapped the faults as morphologically similar to major range-front faults, but they are significantly less extensive with lower, shorter, and less continuous scarps. However, well-defined topographic escarpments or sharp piedmont/hillslope breaks are generally lacking along the Boone Spring Hills faults.
Age of faulted surficial deposits	No data is reported regarding the age of Quaternary deposits or surfaces displaced by these faults. We consider the deposits to be Quaternary (<1.6 Ma).
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* No data is reported regarding the age of Quaternary

	deposits or surfaces displaced by these faults. We consider the timing of faulting to be Quaternary (<1.6 Ma).
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 0.01 mm/yr for the fault based on the presence of scarps on alluvium and the absence of basal facets. The late Quaternary characteristics of this fault (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)	2001 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.