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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.**

## Fox Range fault zone (Class A) No. 1608

**Last Review Date: 1999-03-02**

***citation for this record:*** **Adams, K., and Sawyer, T.L., compilers, 1999, Fault number 1608, Fox Range 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 02:35 PM.**

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| **Synopsis** | This discontinuous zone of arcuate normal faults bounds the western front of the Fox Range from the mouth of Fox Canyon south to near Smith Canyon, and includes short intermontane faults east of Reynard and north of Packard Mine. The Fox Range is an east tilted block that bounds the east side of the Smoke Creek Desert basin. The range-bounding faults, which juxtapose Quaternary deposits against older bedrock, are expressed as the abrupt west-facing front of the Fox Range and by scarps on latest Quaternary piedmont-slope deposits adjacent to the range front. Regional geologic mapping and reconnaissance photogeologic mapping are the sources of data. Trench investigations and detailed studies of scarp morphology have not been conducted. |
| **Name comments** | Refers to faults mapped by Bonham (1969 #2999), Slemmons (1974, unpublished Lovelock 1? X 2? sheet), and Dohrenwend and others (1991 #285) along the eastern side of the Smoke Creek |

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| | Desert flanking the Fox Range. dePolo (1998 #2845) referred to this structure as the Fox Range fault zone,the name that is used herein.<br><br>**Fault ID:** Refers to fault LL6 of dePolo (1998 #2845). |
| **County(s) and State(s)** | WASHOE COUNTY, NEVADA |
| **Physiographic province(s)** | BASIN AND RANGE |
| **Reliability of location** | Good<br>Compiled at 1:100,000 scale.<br><br>*Comments:* Fault locations are primarily based on 1:250,000-scale map of Dohrenwend and others (1991 #285) which 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 scale of the photographs. Locations were checked against 1:250,000-scale photogeologic map of Slemmons (1974, unpublished Lovelock 1? X 2? sheet) and 1:250,000-scale bedrock map of Bonham (1969 #2999). |
| **Geologic setting** | This arcuate, discontinuous zone of normal faults bounds the western front of the Fox Range from the mouth of Fox Canyon south to near Smith Canyon, and includes short intermontane faults east of Reynard and north of Packard Mine (Dohrenwend and others, 1991 #285). The Fox Range is an east tilted block that bounds the eastern side of the sediment-filled Smoke Creek Desert basin (Stewart, 1978 #2866). |
| **Length (km)** | 31 km. |
| **Average strike** | N11°E |
| **Sense of movement** | Normal<br><br>*Comments:* Shown as normal faults by Dohrenwend and others (1991 #285). Bell and Slemmons (1982 #2410) indicate a possible right-lateral component to movement. |
| **Dip Direction** | W |
| **Paleoseismology studies** | |

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| **Geomorphic expression** | The fault zone is mainly expressed by an abrupt west-facing range front with scarps on late Quaternary piedmont slope deposits and by the juxtaposition of Quaternary deposits against older bedrock (Dohrenwend and others, 1991 #285). Inghram and others (1980 #5653) measured seven scarp profiles along the northern half of the Fox Range fault zone; they report a maximum vertical displacement of 2.5 m and maximum scarp-slope angles of 20?-30?. dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 207 m (183-232 m). The southern part of this section of the fault zone lies beneath Pyramid Lake. |
| **Age of faulted surficial deposits** | Faults displace latest Quaternary, late Quaternary, and undifferentiated Quaternary alluvium and juxtapose these deposits against bedrock (Bonham, 1969 #2999; Dohrenwend and others, 1991 #285). |
| **Historic earthquake** | |
| **Most recent prehistoric deformation** | latest Quaternary (<15 ka)<br><br>*Comments:* Although timing of most recent event is not constrained by radiometric dating, the morphology of the scarps suggest the most recent event is Holocene. Inghram and others (1980 #5653) estimate that the most recent event occurred 2 ka using the Wallace method, and prior to a few hundred years ago by using a soil cohesion method. They conclude the most recent event occurred between 500 and 1,000 years ago. Bell and Slemmons (1982 #2410) indicate that two Holocene events have occurred along the northern Fox Range fault zone based on scarp morphology and geomorphic expression of faults in post-Lahontan sediments. Furthermore, they suggest the most recent event occurred within the past 3,000 yr. Reconnaissance photogeologic mapping of Slemmons (1974, unpublished Lovelock 1? X 2? sheet), Dohrenwend and others (1991 #285), and Dohrenwend and others (1996 #2846) also indicate the scarps are latest Quaternary. |
| **Recurrence interval** | |
| **Slip-rate category** | Less than 0.2 mm/yr<br><br>*Comments:* No detailed data exists to determine slip rates for this fault. dePolo (1998 #2845) assigned a reconnaissance vertical slip |

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| | rate of 0.389 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 lesser magnitude. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault. |
| **Date and Compiler(s)** | 1999<br>Kenneth Adams, Piedmont Geosciences, Inc.<br>Thomas L. Sawyer, Piedmont Geosciences, Inc. |
| **References** | #2410 Bell, E.J., and Slemmons, D.B., 1982, Tectonic activity in the Smoke Creek Desert, northwestern Nevada: Geological Society of America Abstracts with Programs, v. 14, no. 4, p. 148.<br><br>#2999 Bonham, H.F., 1969, Geology and mineral deposits of Washoe and Storey Counties, Nevada: Nevada Bureau of Mines and Geology Bulletin 70, 140 p., 1 pl., scale 1:250,000.<br><br>#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.<br><br>#285 Dohrenwend, J.C., McKittrick, M.A., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Lovelock 1° by 2° quadrangle, Nevada and California: U.S. Geological Survey Miscellaneous Field Studies Map MF-2178, 1 sheet, scale 1:250,000.<br><br>#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.<br><br>#5653 Inghram, B.J., Klimberg, D.M., and Metcalf, L.A., 1980, The Fox Range fault scarp—Age determination by soil cohesion and Wallace methods, in, Eighteenth Annual Engineering Geology and Soils Engineering Symposium, Proceedings, p. 99- |

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| | 113.<br><br>#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. |