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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.**

## Fort Sage fault (Class A) No. 24

**Last Review Date: 2013-02-01**

## Compiled in cooperation with the California Geological Survey

***citation for this record:*** **Sawyer, T.L., Haller, K.M., and Bryant, W.A., compilers, 2013, Fault number 24, Fort Sage 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 02:58 PM.**

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| **Synopsis** | This fault was virtually unknown before the 1950 ML 5.6 Fort Sage Mountain earthquake (Real and others, 1978 #5280). Gianella's (1957 #301) study is the only detailed mapping of the fault (Wills, 1990 #5129). |
| **Name comments** | First mapped by Russell (1885 #3549) and named Fort Sage Mountain fault by Gianella (1957 #301). The name Fort Sage fault as used by Jennings (1994 #2878) is accepted herein.<br><br>**Fault ID:** Refers to number 62 (Fort Sage fault) of Jennings (1994 #2878). |
| **County(s) and** | |

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| **County(s) and State(s)** | LASSEN COUNTY, CALIFORNIA |
| **Physiographic province(s)** | BASIN AND RANGE |
| **Reliability of location** | Good<br>Compiled at 1:24,000 scale.<br><br>*Comments:* Location based on digital revisions to Jennings (1994 #2878) using original mapping by Gianella (1957 #301) at 1:75,428 scale and Wills (1990 #5129) at 1:24,000 scale. |
| **Geologic setting** | High-angle, normal fault along the western side of the Fort Sage Mountains, extending obliquely between two-strike-slip fault zones (Honey Lake [22] and Warm Springs Valley [23] fault zones). The 1950 Fort Sage Mountain earthquake (ML 5.6, Real and others, 1978 #5280) ruptured nearly the full extent of the approximately 8-km-long Fort Sage fault (Gianella, 1957 #301). |
| **Length (km)** | 17 km. |
| **Average strike** | N19°W |
| **Sense of movement** | Normal<br><br>*Comments:* Gianella (1957 #301) observed normal offset following the 1950 earthquake. |
| **Dip Direction** | W |
| **Paleoseismology studies** | |
| **Geomorphic expression** | Nearly continuous, somewhat degraded scarps on alluvium and 25-m-high scarp on granitic bedrock along the northern third of the fault (Wills, 1990 #5129). |
| **Age of faulted surficial deposits** | Holocene and Pleistocene piedmont-slope deposits (alluvium) and granitic bedrock. |
| **Historic earthquake** | Fort Sage earthquake 1950 |
| **Most recent prehistoric deformation** | latest Quaternary (<15 ka)<br><br>*Comments:* Timing of most recent paleoevent is between 4.9–6.3 |

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| | ka (Briggs and others, 2013 #8444). Latest Pleistocene to Holocene displacement is suggested by somewhat degraded scarps on undated alluvium (Wills, 1990 #5129). |
| **Recurrence interval** | *Comments:* Two paleoearthquakes on the Fort Sage Mountains fault (between 4.9–6.3 ka and about 20.5 ka), in addition to the historic Ml 5.6 in 1950 and 5.6 k.y. ago. |
| **Slip-rate category** | Less than 0.2 mm/yr<br><br>*Comments:* The fault maintains a position valleyward of the western front of Fort Sage Mountains, possibly suggesting a low slip rate. In addition, the small displacements reported from the 1950 earthquake and the prior coseismic surface rupture 5.6 k.y. ago, which was preceded by an earthquake about 20.5 ka with a surface displacement of 1.5 m (Briggs and others, 2013 #8444) substantiate the assigned slip rate category. |
| **Date and Compiler(s)** | 2013<br>Thomas L. Sawyer, Piedmont Geosciences, Inc.<br>Kathleen M. Haller, U.S. Geological Survey<br>William A. Bryant, California Geological Survey |
| **References** | #8444 Briggs, R.W., Wesnousky, S.G., Brune, J.N., Purvance, M.D., and Mahan, S.A., 2013, Low footwall accelerations and variable surface rupture behavior on the Fort Sage Mountains fault, northeast California: Bulletin of the Seismological Society of America, v. 103, p. 157–168, doi: 10.1785/0120110313.<br><br>#301 Gianella, V.P., 1957, Earthquake and faulting, Fort Sage Mountains, California, December, 1950: Bulletin of the Seismological Society of America, v. 47, p. 173-177.<br><br>#8109 Grose, T.L.T. and Mergner, M., 2000, Geologic map of the Chilcoot 15’ quadrangle, Lassen and Plumas counties, California: California Division of Mines and Geology Open-File Report OFR 00-23, map scale 1:62,500.<br><br>#2878 Jennings, C.W., 1994, Fault activity map of California and adjacent areas, with locations of recent volcanic eruptions: California Division of Mines and Geology Geologic Data Map 6, 92 p., 2 pls., scale 1:750,000.<br><br>#4860 Petersen, M.D., Bryant, W.A., Cramer, C.H., Cao, T., |

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| | Reichle, M.S., Frankel, A.D., Lienkaemper, J.J., McCrory, P.A., and Schwartz, D.P., 1996, Probabilistic seismic hazard assessment for the State of California: California Department of Conservation, Division of Mines and Geology Open-File Report 96-08 (also U.S. Geological Open-File Report 96-706), 33 p.<br><br>#5280 Real, C.R., Toppozada, T.R., and Parke, D.L., 1978, Earthquake epicenter map of California: California Division of Mines and Geology, Map Sheet 39, scale 1:1,000,000.<br><br>#3549 Russell, I.C., 1885, Geological history of Lake Lahontan—A Quaternary lake of northwestern Nevada: U.S. Geological Survey Monograph 11, 288 p.<br><br>#5129 Wills, C.J., 1990, Honey Lake and related faults, Lassen County: California Division of Mines and Geology Fault Evaluation Report FER-214, 17 p., 8, scale 1:24,000. |