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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.

unnamed faults near Millican Valley (Class A) No. 841

Last Review Date: 2002-12-06

citation for this record: **Personius, S.F., compiler, 2002, Fault number 841, unnamed faults near Millican Valley, 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 03:15 PM.**

Synopsis	This northwest-trending group of faults offsets upper Miocene to Pleistocene volc rocks in south-central Oregon. They are located near the northwestern end of the Brothers fault zone, a 250– to 300-km-long zone of high-angle faulting that may surface manifestation of a regional-scale right-lateral shear zone. Individual faults this zone form escarpments 150–200 m high on Miocene through Pleistocene vol rocks. No fault scarps on Quaternary sediments have been described along these f
Name comments	These unnamed normal faults are located near Millican Valley in central Oregon (Walker and others, 1967 #3564; MacLeod and Sherrod, 1992 #3566; Pezzopane #3544; MacLeod and others, 1995 #3557; Geomatrix Consultants Inc., 1995 #359 Sherrod and Smith, 2000 #5165).
County(s) and State(s)	DESCHUTES COUNTY, OREGON
Physiographic	

Physiographic province(s)	COLUMBIA PLATEAU
Reliability of location	Good Compiled at 1:24,000 and 1:250,000 scale. *Comments:* Location of fault from ORActiveFaults (http://www.oregongeology.org/arcgis/rest/services/Public/ORActiveFaults/MapS downloaded 06/02/2016) attributed to 1:24,000-scale mapping of Tucker (1975 # 1:250,000-scale mapping of Walker and others (1967 #3564).
Geologic setting	This northwest-trending group of faults offsets late Miocene to Pleistocene volca rocks in south-central Oregon (Walker and others, 1967 #3564; Walker and MacL 1991 #3646; MacLeod and Sherrod, 1992 #3566; Pezzopane, 1993 #3544; MacL and others, 1995 #3557; Sherrod and Smith, 2000 #5165). They are located near t northwestern end of the Brothers fault zone, a 250- to 300-km-long zone of high- faulting that may be the surface manifestation of a regional-scale right-lateral she zone (Walker, 1969 #4296; Stewart and others, 1975 #3769; Lawrence, 1976 #35 Walker and Nolf, 1981 #4310, 1981 #4311).
Length (km)	40 km.
Average strike	N54°W
Sense of movement	Normal, Right lateral *Comments:* These faults are mapped as normal or high-angle faults by Walker an others (1967 #3564), Walker and MacLeod (1991 #3646), MacLeod and Sherrod #3566), Pezzopane (1993 #3544), MacLeod and others (1995 #3557), and Sherro Smith (2000 #5165). If they are part of the Brothers fault zone, then they may represent part of the surface manifestations of a regional right-lateral shear zone (Lawrence, 1976 #3506)
Dip Direction	SW; NE
Paleoseismology studies	
Geomorphic expression	These faults can be separated into two groups, a northwest group near Horse Ridg a southeast group near Pine Mountain. Individual faultsnear Horse Ridge form escarpments as much as 150 m high on upper Miocene to lower Pliocene volcanic rocks, and faults near Pine Mountain form escarpments as much as 200 m high or Pliocene through Pleistocene volcanic rocks (Walker and others, 1967 #3564; Wa and MacLeod, 1991 #3646; MacLeod and Sherrod, 1992 #3566; MacLeod and ot 1995 #3557; Sherrod and Smith, 2000 #5165). No fault scarps on Quaternary sediments have been described along these faults, but Weldon and others (2002 # map lineaments across Quaternary deposits based on interpretation of 1:100,000-

	DEMs of the area.
Age of faulted surficial deposits	These faults offset late Miocene to Pleistocene volcanic rocks (Walker and others 1967 #3564; Walker and MacLeod, 1991 #3646; MacLeod and Sherrod, 1992 #3 Pezzopane, 1993 #3544; MacLeod and others, 1995 #3557; Sherrod and Smith, 2 #5165), but fault scarps on Quaternary sediments have not been described.
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* Pezzopane (1993 #3544) and subsequent compilations (Geomatrix Consultants Inc., 1995 #3593; Madin and Mabey, 1996 #3575; Weldon and other 2002 #5648) classified the group of faults near Horse Ridge as active in the midd late Quaternary (<700–780 ka), and the group of faults near Pine Mountain as act the Quaternary (<1.6–1.8 Ma).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* No published slip data are available for the unnamed faults near Milli Valley. However, the most prominent faults near Pine Mountain at the southeaste of the zone are marked by 200-m-high escarpments on Plio-Pleistocene volcanic (Walker and others, 1967 #3564). Such slip data indicate low rates of long-term s
Date and Compiler(s)	2002 Stephen F. Personius, U.S. Geological Survey
References	#3593 Geomatrix Consultants, Inc., 1995, Seismic design mapping, State of Oreg Technical report to Oregon Department of Transportation, Salem, Oregon, under Contract 11688, January 1995, unpaginated, 5 pls., scale 1:1,250,000. #3506 Lawrence, R.D., 1976, Strike-slip faulting terminates the Basin and Range province in Oregon: Geological Society of America Bulletin, v. 87, p. 846-850. #3566 MacLeod, N.S., and Sherrod, D.R., 1992, Reconnaissance geologic map o west half of the Crescent 1° by 2° quadrangle, central Oregon: U.S. Geological S Miscellaneous Investigations Map I-2215, 1 sheet, scale 1:250,000. #3557 MacLeod, N.S., Sherrod, D.R., Chitwood, L.A., and Jensen, R.A., 1995, Geologic map of Newberry Volcano, Deschutes, Klamath, and Lake Counties, Or U.S. Geological Survey Miscellaneous Investigations Map I-2455, 2 sheets, scale 1:24,000 and 1:62,500.

#3575 Madin, I.P., and Mabey, M.A., 1996, Earthquake hazard maps for Oregon: of Oregon, Department of Geology and Mineral Industries Geological Map Serie GMS-100, 1 sheet.

#3544 Pezzopane, S.K., 1993, Active faults and earthquake ground motions in O Eugene, Oregon, University of Oregon, unpublished Ph.D. dissertation, 208 p.

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#3769 Stewart, J.H., Walker, G.W., and Kleinhampl, F.J., 1975, Oregon-Nevada lineament: Geology, v. 3, no. 5, p. 265-268.

#7795 Tucker E.R., 1975, Geology and structure of the Brothers fault zone in the central part of the Millican SE quadrangle, Deschutes, Oregon: Corvalis, Oregon University, unpublished thesis, scale 1:24,000.

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#4310 Walker, G.W., and Nolf, B., 1981, High Lava Plains, Brothers fault zone to Harney Basin, Oregon, *in* Johnston, D.A., and Donnelly-Nolan, J., eds., Guides to some volcanic terranes in Washington, Idaho, Oregon, and northern California: U Geological Survey Circular 838, p. 105-111.

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#5648 Weldon, R.J., Fletcher, D.K., Weldon, E.M., Scharer, K.M., and McCrory, 2002, An update of Quaternary faults of central and eastern Oregon: U.S. Geolog Survey Open-File Report 02-301 (CD-ROM), 26 sheets, scale 1:100,000.