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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.

Loma Pelada fault (Class A) No. 2113

Last Review Date: 2016-03-30

Compiled in cooperation with the New Mexico Bureau of Geology & Mineral Resources

citation for this record: **Personius, S.F., and Jochems, A.P., compilers, 2016, Fault number 2113, Loma Pelada 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 02:21 PM.**

Synopsis	The Loma Pelada fault offsets sediment of the Sierra Ladrones Formation (Upper Santa Fe Group) along much of its length, and also offsets Quaternary alluvium at its northern end. Offsets of 13 m in late Pleistocene alluvium and 35 m in middle (?) Pleistocene alluvium have been measured near Cañada Colorado, indicating that the Loma Pelada fault has undergone recurrent movements in the middle and late Pleistocene. No detailed studies have been performed on this fault.
Name comments	The Loma Pelada fault is the southern extension of the Coyote Springs fault [2114], and extends roughly north-south along the eastern flank of the Sierra Ladrones and northern Lemitar

	Mountains (Machette, 1982 #1401; Machette and McGimsey, 1983 #1024). The fault was originally mapped and named by Denny (1940 #1292) for Loma Pelada, a series of low foothills now known as the Sierra Ladrones. A fault in the same position was named the Pelado fault by Kelley (1977 #1106), but most geologic maps continue to use the name Loma Pelada fault (Machette, 1978 #1400; Machette and McGimsey, 1983 #1024; Chamberlin and others, 2001 #7474; Connell and McCraw, 2007 #7475). Machette (1978 #1400), Machette and McGimsey (1983 #1024), Connell and McCraw (2007 #7475), and Read and others (2007 #7473) in places interchange "Peleda" and "Pelada"; but we retain the original spelling of "Pelada" from Denny (1940 #1292). The active trace of the fault extends from Cañada Vivorosa on the south to 2 km south of Cañon del Alamito on the north (Machette, 1978 #1223, 1978 #1400). A few kilometers west of the Loma Pelada fault, faults with inferred Quaternary movement have been mapped along the eastern flank of the Ladrones Mountains (Nobel, 1950 #1410; Black, 1964 #1286; Haederle, 1966 #1300; Nimick, 1986 #1409). No unequivocal evidence, such as offset alluvial deposits, has been described along these rift-bounding faults, so the active margin of the Rio Grande rift in this area may have stepped basinward to the Loma Pelada fault. **Fault ID:** Fault number 9 of Machette (1982 #1401) and fault number 8 of Machette and McGimsey (1983 #1024).
County(s) and State(s)	VALENCIA COUNTY, NEW MEXICO SOCORRO COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Fault traces are from 1:24,000-scale mapping of Machette (1978 #1400), Chamberlin and others (2001 #7474), Connell and McCraw (2007 #7475), and Read and others (2007 #7473).
Geologic setting	The Loma Pelada fault forms the active western margin of the Rio Grande rift along the eastern flank of the Sierra Ladrones and northern Lemitar Mountains.
Length (km)	44 km.

Average strike	N8°W
Sense of movement	Normal
Dip	60–85° E. *Comments:* Dip measurements are from Machette (1978 #1400) and Connell and McCraw (2007 #7475).
Paleoseismology studies	
Geomorphic expression	The Loma Pelada fault is well expressed as fault scarps and offsets in lower Pleistocene Sierra Ladrones Formation basin-fill deposits. Machette (1978 #1223, 1978 #1400) and Machette and McGimsey (1983 #1024) estimated surface displacements of 35 m in middle (?) Pleistocene deposits and 13 m in late Pleistocene. Additionally, Connell and McCraw (2007 #7475) estimated surface displacements of 2–12 m in middle (?) Pleistocene deposits near the northern end of the fault in the La Joya NW 7.5-minute topographic quadrangle.
Age of faulted surficial deposits	Machette (1978 #1223, 1978 #1400), Machette and McGimsey (1983 #1024), and Connell and McCraw (2007 #7475) mapped fault scarps on alluvial fan deposits of middle (?) and late Pleistocene age. Younger deposits are possibly offset an unknown amount.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Machette and McGimsey (1983 #1024) mapped fault scarps on late Pleistocene deposits along the Loma Pelada fault and there may be evidence for rupture in low lying (Holocene) deposits, but these deposits have not been studies in any detail.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Low slip-rate category assigned based on 13 m offset of late Pleistocene deposits (<130 ka).

Date and Compiler(s)	2016 Stephen F. Personius, U.S. Geological Survey Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources
References	#1286 Black, B.A., 1964, The geology of the northern and eastern parts of the Ladron Mountains, Socorro County, New Mexico: Albuquerque, University of New Mexico, unpublished M.S. thesis, 117 p., 1 pl., scale 1:31,250. #7474 Chamberlin, R.M., Cather, S.M., Nyman, M., W., and McLemore, V.T., 2001, Geologic map of the Lemitar 7.5-minute quadrangle, Socorro County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 38, scale 1:24,000. #7475 Connell, S.D., and McCraw, D.J., 2007, Preliminary geologic map of the La Joya NW quadrangle, Socorro County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 140, scale 1:24,000. #1292 Denny, C.S., 1940, Tertiary geology of the San Acacia area, New Mexico: Journal of Geology, v. 48, p. 73-106. #1300 Haederle, W.F., 1966, Structure and metamorphism in the southern Sierra Ladrones, Socorro County, New Mexico: Socorro, New Mexico Institute of Mining Technology, unpublished M.S. thesis, 56 p., 2 pls. #1106 Kelley, V.C., 1977, Geology of Albuquerque basin, New Mexico: New Mexico Bureau of Mines and Mineral Resources Memoir 33, 60 p., 2 pls. #1400 Machette, M.N., 1978, Geologic map of the San Acacia quadrangle, Socorro County, New Mexico: U.S. Geological Survey Geologic quadrangle Map GQ-1415, 1 sheet, scale 1:24,000. #1401 Machette, M.N., 1982, Quaternary and Pliocene faults in the La Jencia and southern part of the Albuquerque-Belen basins, New Mexico—Evidence of fault history from fault-scarp morphology and Quaternary geology, *in* Grambling, J.A., and Wells, S.G., eds., Albuquerque Country II: New Mexico Geological Society, 33rd Field Conference, November 4-6, 1982, Guidebook, p. 161-169.

	#1024 Machette, M.N., and McGimsey, R.G., 1983, Map of Quaternary and Pliocene faults in the Socorro and western part of the Fort Sumner 1° x 2° quadrangles, central New Mexico: U.S. Geological Survey Miscellaneous Field Studies Map MF-1465-A, 12 p. pamphlet, 1 sheet, scale 1:250,000. #1223 Machette, M.N., compiler, 1978, Preliminary geologic map of the Socorro 1° by 2° quadrangle, central New Mexico: U.S. Geological Survey Open-File Report 78-607, 1 sheet, scale 1:250,000. #1409 Nimick, K.G., 1986, Geology and structural evolution of the east flank of the Ladron Mountains, Socorro County, New Mexico: Albuquerque, University of New Mexico, unpublished M.S. thesis, 98 p., 3 pl., scale 1:12,000. #1410 Nobel, E.A., 1950, Geology of the southern Ladron Mountains, Socorro County, New Mexico: Albuquerque, University of New Mexico, unpublished M.S. thesis, 72 p. #7473 Read, A.S., Cather, S.M., Chamberlin, R.M., Connell, S.D., Hook, S.C., and Karlstrom, K.E., 2007, Preliminary geologic map of the Ladron Peak quadrangle, Socorro County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 142, scale 1:24,000.