Jump to Navigation

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Hunting Creek-Berryessa fault system, Wilson section (Class A) No. 35a

Last Review Date: 2000-04-28

Compiled in cooperation with the California Geological Survey

citation for this record: **Bryant, W.A., compiler, 2000, Fault number 35a, Hunting Creek-Berryessa fault system, Wilson section, 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 02:51 PM.**

Synopsis	**General:** The Hunting Creek-Berryessa is an active (Holocene) dextral strike-slip fault system associated with the larger San Andreas fault system. The Hunting Creek-Berryessa fault system extends from the vicinity of Wilson Valley south-southeast to the Cedar Roughs area west of Lake Berryessa. In this compilation, the fault zone is divided from north to south into the Wilson [35a], Hunting Creek [35b], and Lake Berryessa [35a] sections. The Wilson section probably transfers dextral slip to the Bartlett Springs fault system [29]. The Hunting Creek-Berryessa fault system is expressed as a zone of discontinuous fault traces as

	much as 3.5 km wide. The Hunting Creek-Berryessa fault system locally is delineated by geomorphic evidence of Holocene dextral strike-slip displacement, predominantly along the Hunting Creek fault, which comprises the Hunting Creek section (Bryant, 1982 #5307; 1983 #5308). An investigation by Steffen, Robertson, and Kirsten, and Woodward-Clyde Consultants (1983 #5310) demonstrated latest Pleistocene and probable Holocene displacement along traces of the Hunting Creek fault. The investigation by Steffen and others (1983 #5310) inferred a late Pleistocene dextral slip rate of 0.09–0.4 mm/yr, based on apparent vertical separation of a late Pleistocene to Holocene colluvium. Bryant (1983 #5308) argued that the geomorphic expression of the Hunting Creek fault indicated a dextral slip rate of at least 1 mm/yr. **Sections:** This fault has 3 sections. The Hunting Creek-Berryessa fault system is divided into three sections in this compilation. From north to south, the sections are Wilson [35a], Hunting Creek [35b], and Lake Berryessa [35b]. The section boundaries are based in general on a change in geomorphic expression of the faults. The medial Hunting Creek section is delineated by geomorphic evidence of Holocene dextral slip. Both the Wilson and Lake Berryessa sections lack ephemeral geomorphic features indicative of Holocene offset, but are delineated by geomorphic evidence of late Quaternary displacement and they locally offset late Quaternary deposits. Steffen and others (1983 #5310) divided the Hunting Creek fault into 3 segments: from north to south they are the Rieff Road segment, the Dunnigan Hill segment, and the Mysterious Valley segment. There is insufficient data to confirm whether these are seismogenic segments.
Name comments	**General:** The name Hunting Creek-Berryessa fault zone was first used by the Working Group on Northern California Earthquake Potential (1996 #1216) to associate a number of discontinuous dextral and dextral reverse, generally northwest-striking faults in the north-central Coast Ranges, west of Lake Berryessa and east of Clear Lake. Named faults comprising the Hunting Creek-Berryessa fault zone include the Wilson, Kennedy, and Hunting faults first mapped by Lawton (1956 #5237), and the Hunting Creek fault first mapped in part by Averitt (1945 #5306), Herd (written commun., 1981 #5309, in Bryant, 1982 #5307), and Bryant (1982 #5307). Bryant (1982 #5307) first suggested the name Hunting Creek fault. Faults southeast of the Hunting Creek fault include the Putah Creek, Pope Creek, and Maxwell faults, all of which were first named by Wagner (1975 #5312). Additional

	unnamed northwest-striking faults associated with the Hunting Creek-Berryessa fault system were first mapped by Taliaferro (1943 #5311) and Fox and others (1973 #5253). **Section:** The name is proposed in this compilation. This section extends from the southern end of the Bartlett Springs fault system [29] southeast to the vicinity of Twin Sisters in Yolo County. The Wilson section consists of the Quaternary portions of the Wilson, Kennedy, and Hunting faults, first mapped and named by Lawton (1956 #5237). **Fault ID:** Refers to numbers 121 (Hunting fault) and 122 (Hunting Creek fault) of Jennings (1994 #2878) and number C5 (Hunting Creek-Berryessa fault zone) of Working Group on Northern California Earthquake Potential (1996 #1216).
County(s) and State(s)	YOLO COUNTY, CALIFORNIA LAKE COUNTY, CALIFORNIA
Physiographic province(s)	PACIFIC BORDER
Reliability of location	Good Compiled at 1:48,000 scale. *Comments:* Location of fault from Qt_flt_ver_3-0_Final_WGS84_polyline.shp (Bryant, W.A., written communication to K.Haller, August 15, 2017) attributed to mapping by Lienkaemper (2010) and original mapping by Lawton (1956 #5237) at 1:48:000 scale.
Geologic setting	The Hunting Creek-Berryessa fault system is a significant dextral to dextral reverse fault zone that is associated with the larger San Andreas fault system. The fault zone is located in the northern Coast Ranges of California and extends from the vicinity of Wilson Valley south-southeast to the Cedar Roughs area west of Lake Berryessa. Herd (written commun., 1981 #5309, in Bryant, 1982 #5307) inferred that dextral slip is carried from the Green Valley fault zone [37] along the Hunting Creek-Berryessa fault system and then north to the Bartlett Springs fault system [29]. A structural link between the Green Valley fault zone [37] and the southern part of the Hunting Creek-Berryessa fault system is conjectural, due to the discontinuous pattern of faulting that characterizes the Hunting Creek-Berryessa fault system. This discontinuous pattern of faulting is exacerbated by massive

	landslides along much of the projected fault trend between the Cedar Roughs area at the southern end of the Hunting Creek-Berryessa fault system and the Wooden Valley area at the northern end of the Green Valley fault zone [37]. Dextral slip is transferred to the Bartlett Springs fault system [29] along a zone of dextral reverse faults that include the Hunting, Wilson, and Kennedy faults of Lawton (1956 #5237). The amount of cumulative dextral slip along the Hunting Creek-Berryessa fault system is unknown. Lawton (1956 #5237) reported that the Hunting fault might vertically offset the Mesozoic Sulfur Creek Formation as much as 1.2 km, based on assumptions of the stratigraphic relationships between serpentinite units (Mesozoic Franciscan Complex) and the Mesozoic Sulfur Creek Formation. Lower Cretaceous sedimentary rocks of the Little Valley Formation may be vertically separated about 300 m along the Wilson fault, based on cross section I-J of Lawton (1956 #5237); the amount of dextral displacement is not documented.
Length (km)	This section is 20 km of a total fault length of 56 km.
Average strike	N41°W (for section) versus N35°W (for whole fault)
Sense of movement	Right lateral *Comments:* Lawton (1956 #5237) characterized displacement on the Hunting fault as predominately reverse, with Mesozoic Franciscan Complex rocks faulted against Pliocene-Pleistocene rocks of the Cache Formation. Lawton inferred that displacement on the Wilson and Kennedy faults is predominantly up-to-east vertical. However, there is probably a component of dextral displacement on all of the faults. This is best demonstrated at the southern end of the Hunting fault where geomorphic features such as linear troughs and dextrally deflected drainages indicate a significant component of dextral strike-slip offset (Bryant, 1982 #5307).
Dip	60° W. to 90° *Comments:* Lawton (1956 #5237) mapped most of the Wilson fault as having variable, but steep to vertical dips based on surface exposures. The southern strand of the Wilson fault exposed in Davis Creek strikes N. 10° W.–N. 30° W. and dips steeply to the west. Lawton (1956 #5237) reported that the Hunting fault dips between 60° and 70° to the west. It is probable, but not documented, that faults that strike more northerly are

	characterized by near vertical dips and those that strike more westerly have west to southwest dips, reflection local compression. Lawton (1956 #5237) reported that the Hunting fault dips between 60° and 70° to the west.
Paleoseismology studies	
Geomorphic expression	Fault traces within the Wilson section are generally delineated by geomorphic features indicative of Quaternary to late Quaternary dextral and dextral reverse displacement, but lack ephemeral geomorphic features indicative of Holocene displacement. The Hunting, Kennedy, and Wilson faults are delineated by broad saddles and benches on Mesozoic bedrock, a degraded large-scale northeast-facing escarpment, and large-scale linear drainages.
Age of faulted surficial deposits	Faults of the Wilson section offset rocks of the Mesozoic Franciscan Complex and Knoxville Formation (Lawton, 1956 #5237). Locally, rocks of the Pliocene-Pleistocene Cache Formation are offset by strands of the Hunting, Kennedy, and Wilson faults. Jeff Howard (personal commun. in Bryant, 1983 #5308) observed an undated Quaternary terrace deposit that is offset along a strand of the Wilson fault in Davis Creek, suggesting late Quaternary offset.
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* The most recent paleoevent has not been determined. Stream terrace deposits in Davis Creek are displaced along a strand of the Wilson fault (personal communication by J. Howard in (Bryant, 1983 #5308), suggesting late Quaternary offset.
Recurrence interval	
Slip-rate category	Between 1.0 and 5.0 mm/yr *Comments:* See slip rate discussion for section 35b.
Date and Compiler(s)	2000 William A. Bryant, California Geological Survey
References	#5306 Averitt, P., 1945, Quicksilver deposits of the Knoxville District, Napa, Yolo, and Lake Counties, California: California

Journal of Mines and Geology, v. 41, no. 2, p. 65-89, map scale 1:48,000.

#5307 Bryant, W.A., 1982, Hunting Creek fault, Napa, Lake, and Yolo Counties: California Division of Mines and Geology Fault Evaluation Report 137, microfiche copy in Division of Mines and Geology Open-File Report 90-10, 8 p., scale 1:24,000.

#5308 Bryant, W.A., 1983, Hunting Creek fault, Lake, Napa, and Yolo Counties: California Division of Mines and Geology, Supplement No. 1 to Fault Evaluation Report FER-137, microfiche copy in Division of Mines and Geology Open-File Report 90-10, 7 p.

#5253 Fox, K.F., Sims, J.D., Bartow, J.A., and Helley, E.J., 1973, Preliminary geologic map of eastern Sonoma County and western Napa County, California: San Francisco Bay Region Environment and Resources Planning Study: U.S. Geological Survey Miscellaneous Field Studies Map MF-483 (Basic Data Contribution 56), scale 1:62,500.

#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.

#5237 Lawton, J.E., 1956, Geology of the north half of the Morgan Valley and the south half of the Wilbur Springs quadrangles, California: Palo Alto, California, Stanford University, unpublished Ph.D. dissertation, 223 p., scale 1:48,000.

#8181 Lienkaemper, J.J., 2010, Recently active traces of the Bartlett Springs fault, California—A digital database: U.S. Geological Survey Data Series 541, 10 p., http://pubs.usgs.gov/ds/541/.

#4860 Petersen, M.D., Bryant, W.A., Cramer, C.H., Cao, T., 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.

#5310 Steffen, Robertson, Kirsten, and Woodward-Clyde

	Consultants, 1983, McLaughlin project —Seismic design criteria: Unpublished consulting report prepared for Homestake Mining Company, 80 p., 5 appendices. #5311 Taliaferro, N.L., 1943, Franciscan-Knoxville problem: American Association of Petroleum Geologists Bulletin, v. 27, no. 2, p. 109-219. #5312 Wagner, D.L., 1975, Geologic map and sections of the Walter Springs area, Napa County, California: San Jose, California State University, unpublished M.S. thesis, 68 p., scale 1:12,000. #1216 Working Group on Northern California Earthquake Potential (WGNCEP), 1996, Database of potential sources for earthquakes larger than magnitude 6 in northern California: U.S. Geological Survey Open-File Report 96-705, 40 p.