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Quaternary Fault and Fold Database of the United States

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Fish Slough fault zone (Class A) No. 48

Last Review Date: 1999-07-28

Compiled in cooperation with the California Geological Survey

citation for this record: **Bryant, W.A., compiler, 1999, Fault number 48, Fish Slough 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 03:07 PM.**

Synopsis	Prominent down-to-west normal fault zone along the eastern side of Volcanic Tablelands. The Fish Slough fault zone extends from east of the town of Bishop north to the alluvial fan of Milner Creek, where it may join with White Mountains fault zone [47] in a complex manner. Evidence of Holocene displacement was reported east of Bishop, based on well defined west-facing scarps on Holocene alluvium (Bateman, 1965 #5587; Envicom, 1976 #5609; Bryant, 1984 #5597). Strands of the Fish Slough fault zone vertically offset 0.76-Ma Bishop tuff at least 150 m and probably have an unknown amount of dextral slip, as indicated by the prominent left-stepping pattern of surface faults. Envicom (1976 #5609) estimated a late Quaternary slip rate of about 0.2

	mm/yr (minimum) for the Fish Slough fault zone, based on the 150-m vertical offset of 0.76 Ma Bishop tuff.
Name comments	Fault first mapped by Bateman (1965 #5587) and referred to as the Fish Slough scarp. Bryant (1984 #5597) introduced the term Fish Slough fault zone, which is used herein. **Fault ID:** Refers to number 208 (Fish Slough fault) of Jennings (1994 #2878).
County(s) and State(s)	INYO COUNTY, CALIFORNIA MONO COUNTY, CALIFORNIA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:62,500 scale. *Comments:* Location based digital revisions to Jennings (1994 #2878) mapping. Original mapping by Bateman (1965 #5587), Crowder and Sheridan (1972 #5594), and Bryant (1984 #5597) is at 1:62,500.
Geologic setting	The Fish Slough fault zone is a prominent, north-striking zone of normal, west-dipping faults with an unknown component of dextral slip. The fault zone is located near the eastern edge of the Volcanic Tablelands, a low volcanic plateau underlain by 0.76-Ma Bishop tuff (Bateman, 1965 #5587). The Fish Slough fault zone is the easternmost of a system of north-striking, left-stepping en echelon normal-dextral faults [46] that offset the surface of the Volcanic Tablelands. Bateman (1965 #5587) reported that the Fish Slough fault zone is characterized by as much as 120 m of down-to-the-west post-760 ka vertical displacement. Sheridan (1975 #1205) and Envicom (1976 #5609) estimated that at least 150 m of vertical displacement has occurred in this same time period.
Length (km)	23 km.
Average strike	N3°E
Sense of movement	Normal *Comments:* Prominent west-facing scarps as much as 120 m high characterize normal displacement along the Fish Slough fault zone. Left-stepping en echelon pattern of surface faults indicates

	an unknown amount of dextral slip (Bateman, 1965 #5587; Bryant, 1984 #5597).
Dip Direction	W *Comments:* Not determined, but probably high angle. Dip direction from Bateman (1965 #5587).
Paleoseismology studies	Bishop airport site [48-1]: Envicom (1976 #5609) excavated on trench along the southern extent of the Fish Slough fault zone. The trench was excavated across a 1.2 m-high west-facing scarp near the northwest corner of the Bishop airport. The trench exposed faulted fluvial deposits of probable latest Pleistocene to Holocene age. A distinct coarse sand and gravel bed had about 1.5-2 m of apparent vertical separation. Although a component of strike-slip displacement is suggested by a slight difference in thickness of the sand and gravel bed across the near vertical fault, the amount of lateral (dextral) slip is unknown.
Geomorphic expression	Principal trace of Fish Slough fault zone is marked by a prominent, well defined west-facing scarp that at least 120 m high on the 0.76 Ma erosional surface (Bryant, 1984 #5597). Ephemeral geomorphic features generally are not present along the base of this large west-facing escarpment, although Holocene displacement is suggested by locally ponded alluvium and closed depressions. The southern traces of the Fish Slough fault zone displaces latest Pleistocene and Holocene terrace deposits. These traces are expressed as well defined west-facing scarps as much as 2 m high (Bryant, 1984 #5597).
Age of faulted surficial deposits	Holocene alluvial and floodplain deposits, latest Pleistocene and Holocene terrace deposits, but primarily the Pleistocene Bishop tuff (0.76 Ma) (Bateman, 1965 #5587; 1984 #5592; Bryant, 1984 #5597).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Based on inferred Holocene age of offset terrace and alluvial deposits (Bateman, 1965 #5587; 1984 #5592; Bryant, 1984 #5597).

Recurrence interval	
Slip-rate category	Between 0.2 and 1.0 mm/yr *Comments:* Envicom (1976 #5609) estimated that the Fish Slough fault zone is characterized by a vertical slip rate of about 0.2 mm/yr. This is based on the estimated 150 m vertical offset of 0.76 Ma Bishop tuff. A lateral (dextral) component of slip would increase the net slip rate.
Date and Compiler(s)	1999 William A. Bryant, California Geological Survey
References	#5587 Bateman, P.C., 1965, Geology and tungsten mineralization of the Bishop district, California: U.S. Geological Survey Professional Paper 470, 208 p., scale 1:62,500. #5592 Bryant, W.A., 1984, Faults in the Volcanic Tableland, Mono and Inyo Counties: California Division of Mines and Geology Fault Evaluation Report FER-162, microfiche copy in Division of Mines and Geology Open-File Report 90-14, 5 p., scale 1:62,500. #5597 Bryant, W.A., 1984, Northern Owens Valley, Fish Slough, and White Mountains frontal faults, Inyo and Mono Counties: California Division of Mines and Geology Fault Evaluation Report FER-153, microfiche copy in California Division of Mines and Geology Open-File Report 90-14, scale 1:62,500. #5594 Crowder, D.R., and Sheridan, M.F., 1972, Geologic map of the White Mountain Peak quadrangle, Mono County, California: U.S. Geological Survey Geologic quadrangle Map GQ-1012, scale 1:62,500. #5609 Envicom, 1976, Seismic safety element for the general plan, Inyo-Mono Association of Governmental Entities: Unpublished report for Inyo and Mono Counties, California, 129 p., 2 appendices. #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. #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. #1205 Sheridan, M.F., 1975, Tectonic displacement of the Bishop Tuff: California Geology, v. 28, no. 5, p. 107-108.