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Quaternary Fault and Fold Database of the United States

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Hite fault system, Kooskooskie section (Class A) No. 845b

Last Review Date: 2003-10-03

citation for this record: **Personius, S.F., and Lidke, D.J., compilers, 2003, Fault number 845b, Hite fault system, Kooskooskie 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 03:15 PM.**

Synopsis	**General:** The Hite fault system is a complex zone of faulting that parallels the northeast-trending western flank of the Blue Mountains uplift in northeastern Ore and southeastern Washington; the fault system may overlie the suture zone betwe accreted terranes in the Blue Mountains and the stable craton. Sense of slip on structures included in this zone has been described as normal, left-lateral, and rig lateral strike slip, but recent work is most consistent with a left-lateral oblique (d to-the-west or northwest) sense of slip. Most structures in the Hite fault system a found exclusively in rocks of the Miocene Columbia River Basalt Group, so determination of Quaternary activity is difficult. **Sections:** This fault has 4 sections. The Hite fault system was originally divided i four sections in this compilation; from northeast to southwest, these were the Hit section, the Kooskooskie section, the Thorn Hollow section, and the Agency sect the Hite section and the Kooskooskie section were combined by DOGAMI in the ORActiveFaults compilation

	(http://www.oregongeology.org/arcgis/rest/services/Public/ORActiveFaults/MapS
Name comments	**General:** The Hite fault system is a complex zone of faulting that parallels the northeast-trending western flank of the Blue Mountains uplift. The Hite fault was named after U.S. Soil Conservation Service scientist Thomas Hite (Kuehn, 1995 #3478). Faults included in the system herein include the Hite, Thorn Hollow, and Kooskooskie faults (Kienle and others, 1979 #3728); most faults have been mapp Swanson and others (1981 #3496). **Section:** This section consists of the westernmost of three fault strands referred to Kooskooskie faults, which were included in the Hite fault system by Kienle and o (1979 #3728). Herein referred to as the Kooskooskie fault, this strand is one of se north-trending faults that lie to the west of the Hite fault. The fault was named aft village of Kooskooskie, Washington, which is located east of the fault near its sou end. **Fault ID:** Some of these structures are included in fault number 76 of Geomatrix Consultants, Inc. (1995 #3593).
County(s) and State(s)	WALLA WALLA COUNTY, WASHINGTON UMATILLA COUNTY, OREGON
Physiographic province(s)	COLUMBIA PLATEAU
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Fault traces are from 1:125,000-scale mapping of Kienle and others (#3728), approximately 1:210,000-scale figure of Piety and others (1990 #3733), a 1:100,000-scale mapping of Weldon and others (2002 #5648).
Geologic setting	The Hite fault system is a complex zone of faulting that parallels the northeast-tre western flank of the Blue Mountains uplift in northeastern Oregon and southeaste Washington; the fault system may overlie the suture zone between accreted terran the Blue Mountains and the stable craton (Reidel and others, 1994 #3539). Sense on structures included in this zone has been described as normal, left-lateral, and lateral strike slip (Newcomb, 1970 #3761; Kienle and others, 1979 #3728; Tolan Reidel, 1989 #3765). Most structures in the Hite fault system are found exclusive rocks of the Miocene Columbia River Basalt Group (Walker, 1973 #3756; Swans others, 1981 #3496; Walker and MacLeod, 1991 #3646; Schuster and others, 199 #3760), so determination of Quaternary activity is difficult.
Length (km)	This section is 19 km of a total fault length of 140 km.
Average strike	N0°E (for section) versus N20°E (for whole fault)

Sense of movement	Left lateral, Normal *Comments:* Sense of slip on the Kooskooskie fault has been described as normal, lateral, or left-lateral strike slip (Newcomb, 1970 #3761; Glass, 1977 #3792; Kier others, 1979 #3728; Swanson and others, 1980 #3574; 1981 #3496; Tolan and Re 1989 #3765). However, more recent work on faults in and near the Kooskooskie s indicates left-lateral oblique (down-to-the-northwest) slip (Piety and others, 1990 #3733; Kuehn, 1995 #3478); this sense of slip probably characterizes the entire H fault system (Reidel and others, 1994 #3539).
Dip	85°-90° W *Comments:* Near vertical dip measurements of 85–90° indicate vertical to steeply dipping fault attitudes (Kienle and others, 1979 #3728).
Paleoseismology studies	
Geomorphic expression	The Kooskooskie fault forms a straight, north-trending depression expressed as vegetation and drainage alignments and breaks in slope in rocks of the Columbia Basalt Group, from Mud Creek in the north to Henry Canyon on the south (Glass #3792; Kienle and others, 1979 #3728; Piety and others, 1990 #3733). Possible o drainages suggest left-lateral displacement (Glass, 1977 #3792; Piety and others, #3733).
Age of faulted surficial deposits	The Kooskooskie fault offsets Miocene Columbia River basalts, but no clear evid of faulting in Quaternary deposits has been described (Glass, 1977 #3792; Kienle others, 1979 #3728; Swanson and others, 1980 #3574; 1981 #3496; Piety and oth 1990 #3733). A 6-m-high, late Holocene(?) fluvial terrace lies unfaulted across th of the fault at Mill Creek (Piety and others, 1990 #3733).
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* Glass (1977 #3792) conducted airphoto and limited field reconnaissa along the Kooskooskie fault; he concluded that the geomorphic expression sugge that the fault was active, but gave no age constraints. Kienle and others (1979 #3 briefly described the geomorphic expression of the Kooskooskie fault, but made n mention of the age of most recent faulting. Piety and others (1990 #3733) describ m-high, late Holocene(?) fluvial terrace that lies unfaulted across the trace of the Mill Creek, but concluded that the presence of this terrace did not rule out the possibility of late (<125 ka) or latest (<15 ka) Quaternary displacement. Pezzopa (1993 #3544) and subsequent compilations (Geomatrix Consultants Inc., 1995 #3

	Madin and Mabey, 1996 #3575; Weldon and others, 2002 #5648) infer that the Kooskooskie fault has been active in the middle or late Quaternary (<700-780 ka)
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* No detailed fault slip data have been documented, but vertical displac across the Kooskooskie fault in Miocene Columbia River basalts is about 100 m (and others, 1979 #3728; Swanson and others, 1980 #3574; Piety and others, 199(#3733); such offset yields low rates of long-term slip.
Date and Compiler(s)	2003 Stephen F. Personius, U.S. Geological Survey David J. Lidke, U.S. Geological Survey
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