

Evidence of a Possible 32-Mile-Wide Thrust Fault, Wind River Basin, Fremont County Wyoming

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Crowheart Butte is where, in 1866, Shoshone Chief Washakie fought and killed the Crow Chief, Big Robber, in a man-to-man fight. Some say that after his victory, Washakie carved the heart from Big Robber's chest and ate it. (All of the cited locations are shown on Figure 1.)

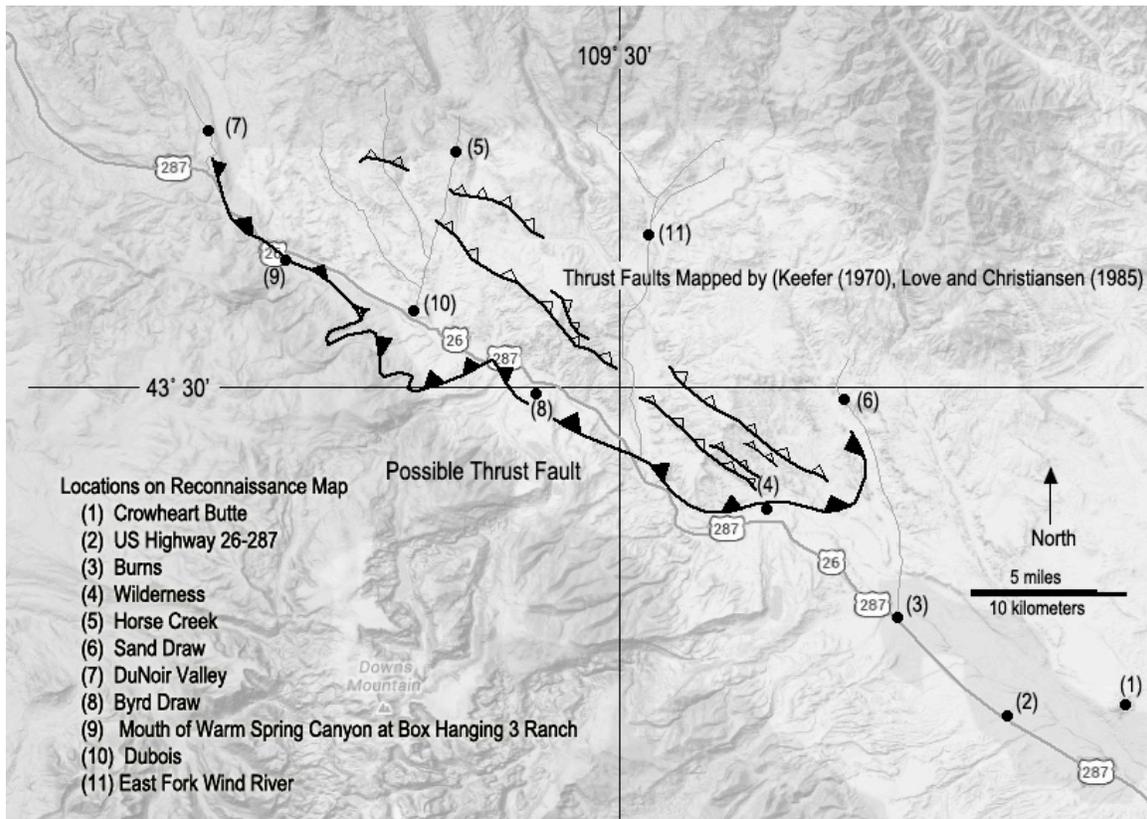


Figure 1

As one travels US Highway 26-287 northwest from Crowheart Butte to Burris and then to Wilderness, he or she cannot fail to notice the dramatic change in structure and stratigraphy on the east side of the road. East of Crowheart and Burris the upper Wind River Formation, as throughout the rest of the southwestern and northwestern edges of the Wind River Basin, is composed of horizontal beds of buff to olive-colored volcanoclastic sandstone and mudstone. At Wilderness, the drab-colored, flat-lying upper Wind River Formation disappears and is dramatically replaced by folded and thrust red, yellow, black, and white Paleozoic, Mesozoic, and Cenozoic Indian Meadows and lower Wind River Formations. Love (1987) described in detail this fold-thrust fault area and the faults are clearly shown by Keefer (1970) and by Love and Christiansen (1985) on their geologic maps of the Wind River Basin and Wyoming, respectively.

But no one seems to have noticed that the thrust faults that Keefer (1970) and Love and Christiansen (1985) mapped in the area north of Wilderness and southeast and northwest of Horse Creek (shown with open saw teeth on Figure 1) are what appear to me to be relatively small thrust faults in the hanging wall of a 32 mile-wide thrust between on the southeast, Sand Draw and on the northwest, Dunoir Valley. (Shown by large black saw teeth on Figure 1.) The reason for this is probably because the hanging wall of the fault is so massive and because the boundary of the fault is almost everywhere covered by Quaternary deposits and doesn't show up on Google Earth or any of the air photos of the area I have studied.

One exception is opposite the mouth of Byrd Draw where near vertical beds of faulted upper Mesozoic rocks, most notably Cloverly and Morrison Formations, together with overlying Indian Meadows and lower Wind River Formations are exposed sporadically along the south side of the Wind River. A second exception is where Chugwater Formation is exposed in and near the entrenched meander bed at the mouth of Warm Spring Canyon on Box Hanging 3 Ranch.

Keefer's (1970) geologic map provides stratigraphic evidence that supports my interpretation of large scale faulting. At Sand Draw, where I believe the southeast corner of the thrust fault's hanging wall is located, Keefer's map shows a north-south, straight line arbitrary cutoff between horizontal beds of Wind River Formation (Twr) on the east side of Sand Draw and the gently north-dipping beds of "lower Eocene rocks undivided" (Tle) on the west side.

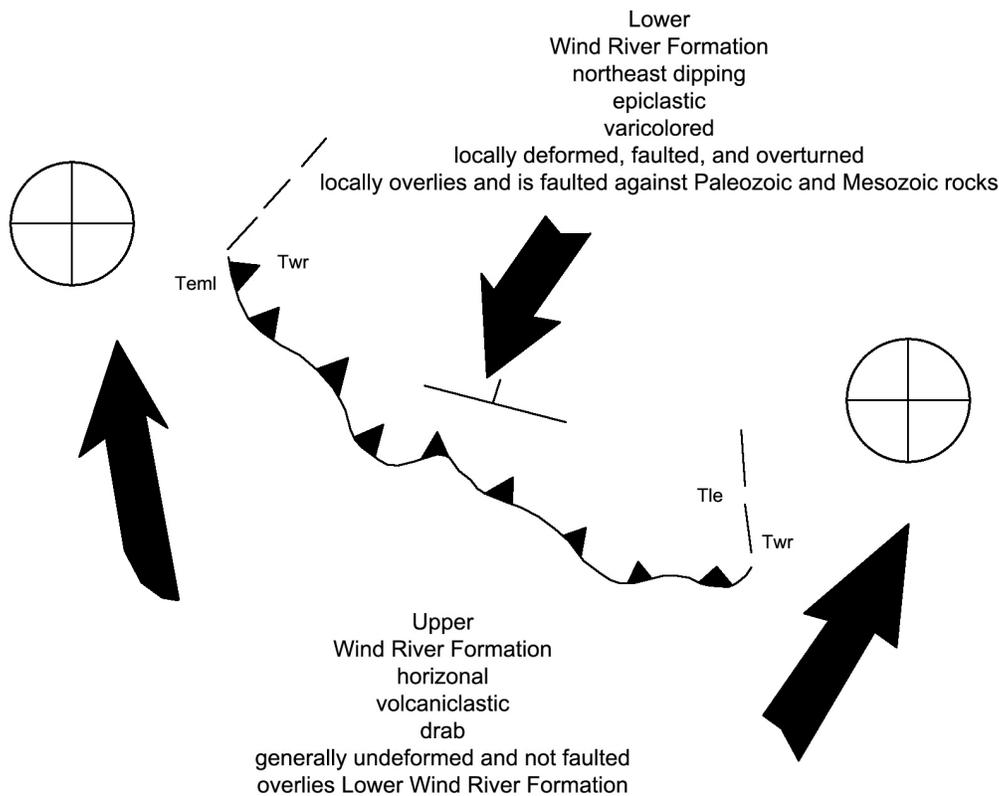


Figure 2

Likewise, on at the junction of Dunoir Creek and the Wind River, where I think the northwest edge of thrust fault's hanging wall is located, Keefer's map shows gently dipping Wind River Formation (Twr) on both the north side of the Wind River and the

east side of Dunoir Creek. But on both the south side of the Wind River and the west side of Dunoir Creek, his map shows horizontal layers of “middle and lower Eocene equivalent of Wind River and Aycross Formations” (Teml) (Figure 2). I contend that the horizontal layers that Keefer mapped as Wind River Formation and the horizontal layers that he mapped as “middle and lower Eocene equivalent of Wind River and Aycross Formations” are *upper* Wind River Formation. The gently north-tilted beds that Keefer mapped as “lower Eocene rocks undivided” and as Wind River Formation are *lower* Wind River Formation.

In summary, as outrageous as it may appear to others, I think that a 32 mile-wide hanging wall of faulted, mostly gently northeast-dipping (less than 10 degrees), varicolored, red, yellow, and green, epiclastic lower Wind River Formation cuts across horizontal, drab, buff and green, volcanoclastic upper Wind River Formation (Figure 2). The hanging wall is structurally complex, includes Paleozoic and Mesozoic rocks exposed at the surface but is dominantly composed of Eocene lower Wind River and Indian Meadows Formations. The hanging wall cuts through horizontal Eocene upper Wind River Formation, distinguished from lower Wind River Formation by being composed of drab volcanoclastic sandstone and mudstone. Lastly, I believe the fault at the base of this hanging wall underlies the numerous Wind River Basin thrust faults between Dunoir Valley and Sand Draw.

During the last years of his life, someone asked Chief Washakie if he really ate Big Robber’s heart. Youth does foolish things, he said. He didn’t say anything about old geologists

References Cited

- Keefer, W.R., 1970, Structural Geology of the Wind River Basin Wyoming: U.S. Geological Survey Professional Paper 495-D, 35p.
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