Highway 353 or upstream from the mouth of Muddy Creek, most of the bedload carried by the river through the study reach is postulated to be derived from lateral erosion of the unconsolidated sand and gravel of the Parker-Temple Lake terrace, and from the places the river is impinging on the Pinedale recessional terrace shown in figure 5. These terraces can be eroded both by Muddy Creek and by the East Fork River downstream from the mouth of Muddy Creek. Some bedload also is contributed as small alluvial fans emanating from gullies eroded into the steep slopes and walls of the Wasatch bedrock as shown in figure 6. All of these sources would produce sediment in the sand and gravel size range observed in the trapped bedload.

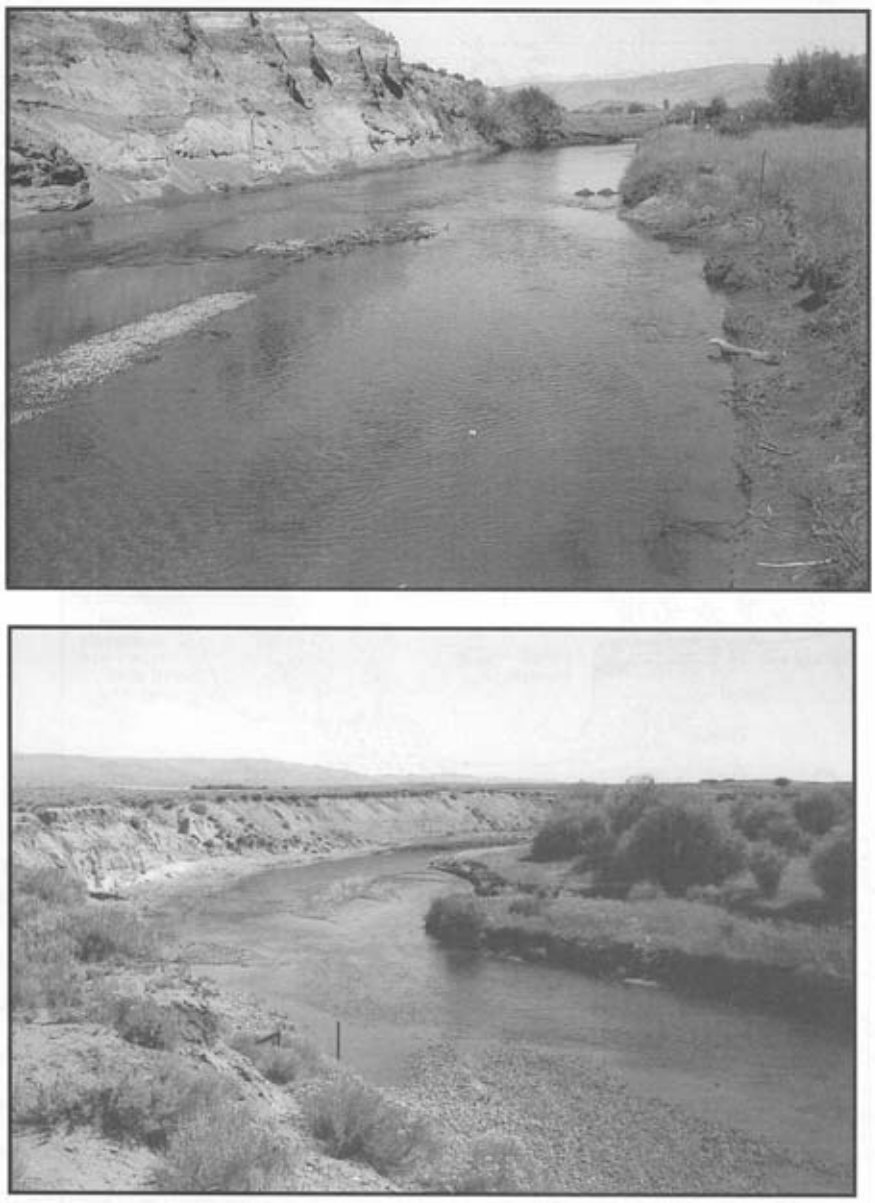


Figure 5. East Fork River in the vicinity of the bedload project site. ***A,*** Looking downstream, Wasatch Formation cliff at left, flood plain on right. ***B,*** Looking upstream, Pinedale recessional terrace on left, flood plain on right, gravel-covered streambed with central gravel bar. ***C,*** View of valley from top of Wasatch cliff; flow is toward left; project site in background where white trailer is located near road.

C

Figure 5. (Continued)

Archaeology

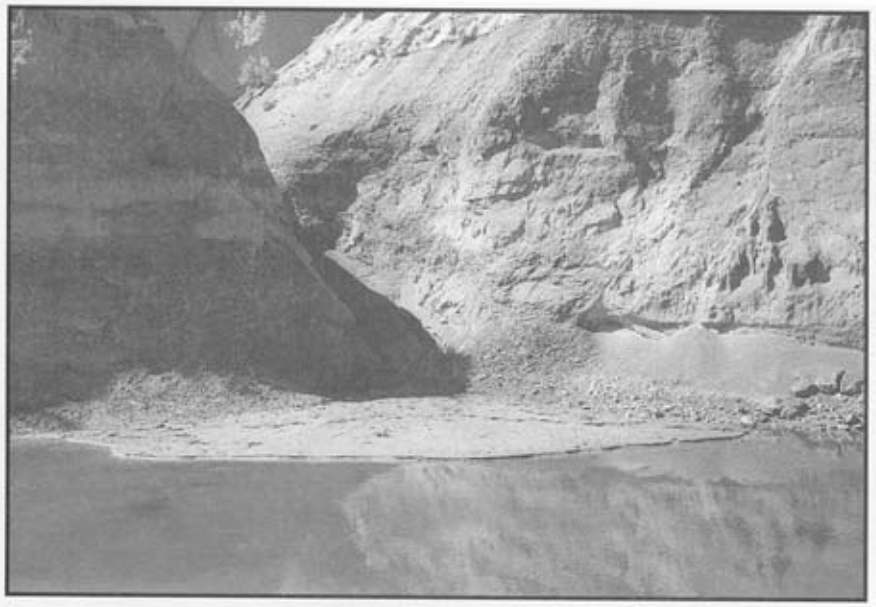
Archaeology is an important part of geomorphic history. This is especially true as it relates to the history of alluvial terraces and the sources of bedload.

Several Paleo-Indian hearths have been exposed by lateral erosion of the Parker-Temple Lake terrace. One is shown in the section near Fremont Butte (fig. 7A). Three were eroded from the streambank within a few meters of the bedload trap. Each consisted of a bowl-shaped pit 23 cm deep and 75 cm across the top. They are lined with rounded rocks very close to 60 mm in diameter, now completely blackened by carbonized fuel. Some of the blackened rocks show a caliche film over the carbon coating. These people apparently built fires in the rock-lined holes, heated the rocks, then placed tubers over the rocks for roasting. No bones of any kind were found in or near the hearths. The hearths found were all close to the river and were built in the surface 1 to 1.5 m above present streambed. Similar hearths found in eastern Wyoming have been dated at about 3,000 B.P. (Frison, 1988).

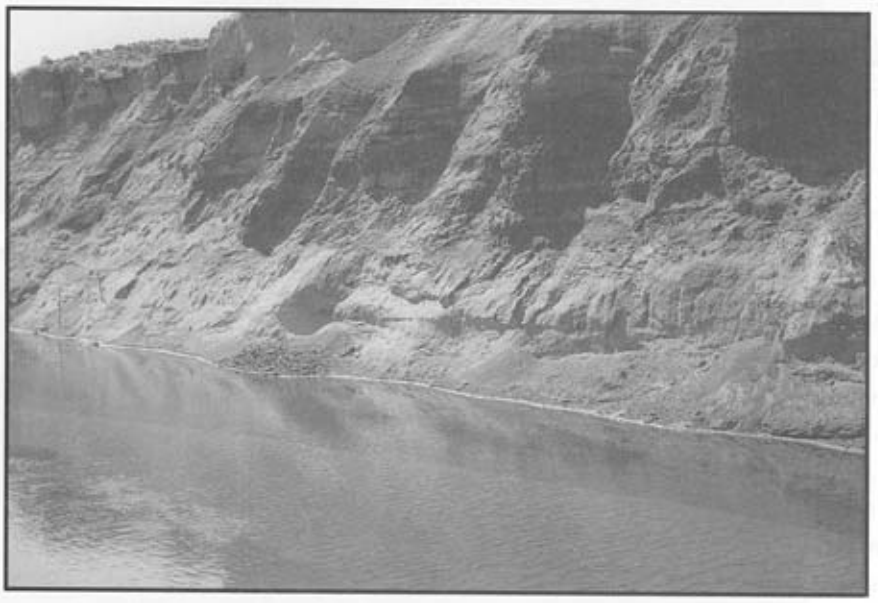
Surface finds of points and blades are not diagnostic as to stratigraphic level. One obsidian blade found near the bedload project site, apparently washed from deposits of the Parker-Temple Lake terrace, closely resembled those from the Finley site, but was of the Yuma rather than the Folsom type (Howard and Hack, 1943). The Finley site is in the Kilpecker dunes near Eden, about 100 km south of the project site.

All the hearths found along East Fork River have been covered subsequent to use by 10 to 20 cm of alluvium or colluvium. They are, therefore, younger than the end of the deposition of the Parker-Temple Lake outwash but are old enough to have received some depositional cover. This terrace, important as a source of East Fork River bedload, is thus of Holocene age but older than 3,000 years B.P.

More interesting anthropologically are the numerous flakes and cores found scattered on the ground surface of unglaciated Cora Butte, located about 12 km northwest of Pinedale (fig. 1). This hill is one of several in the vicinity, including Mount Airy (southwest of Pinedale, fig. 1), that is underlain by the Wasatch Formation, leveled on the top and capped with 2 to 3 m

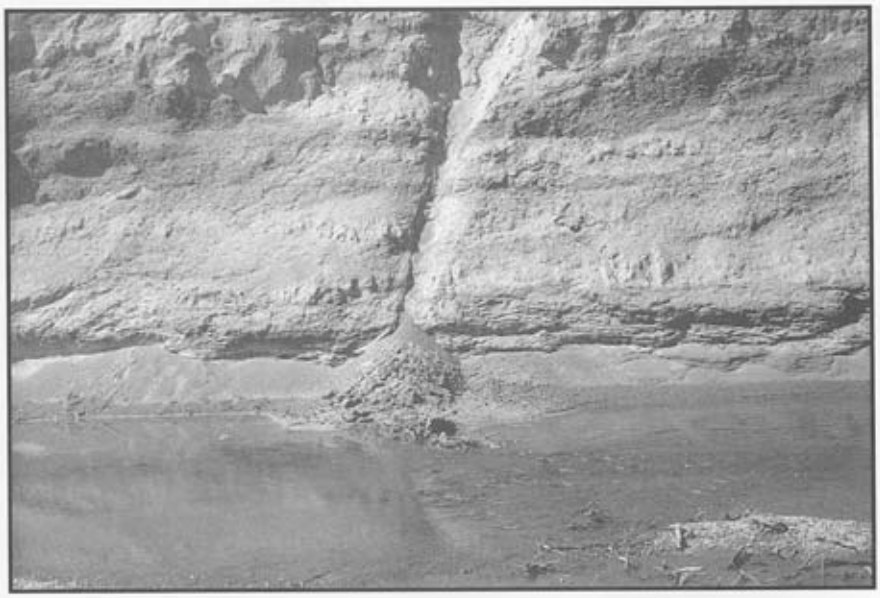


A



B

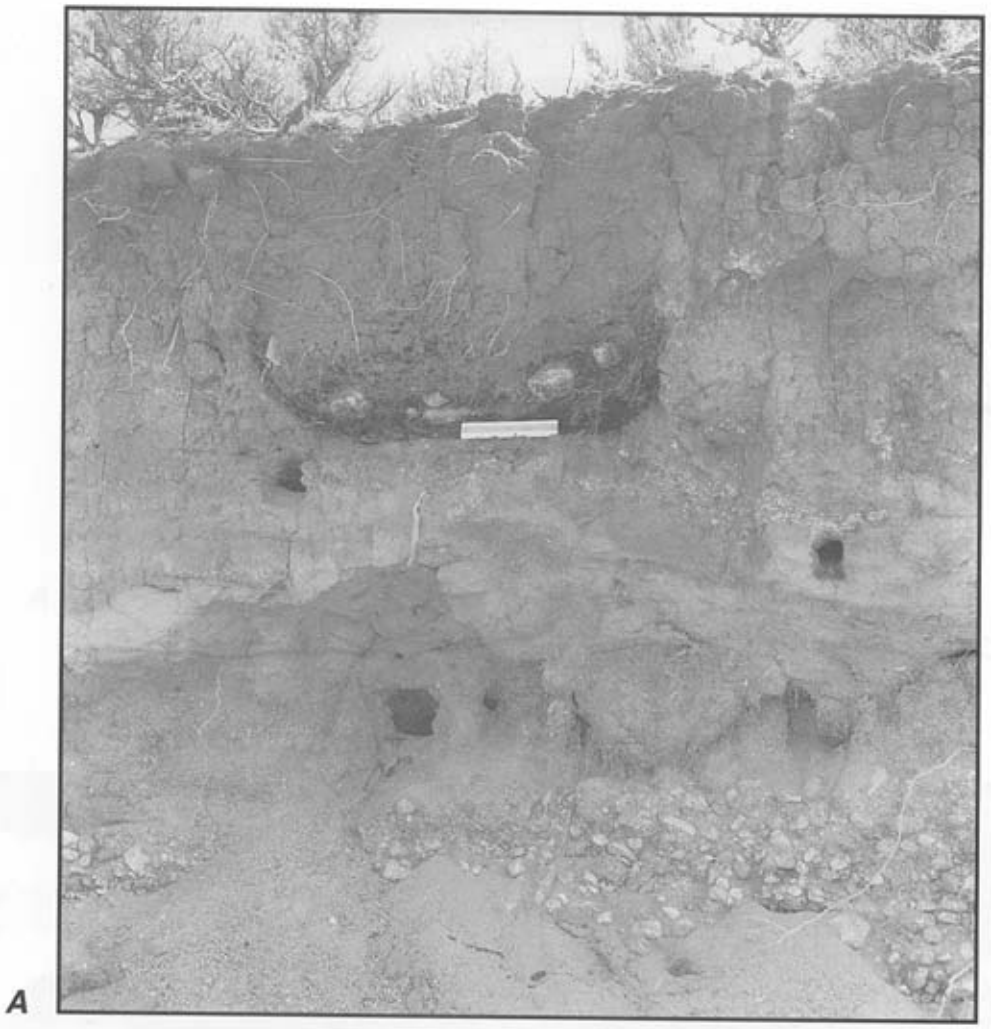
Figure 6. Wasatch beds that supply source sediment when eroded. ***A***, Small alluvial fan at mouth of minor gully in cliff of Wasatch Formation. ***B,*** Sloughing of Wasatch cliff. ***C***, Rill and small alluvial fan on Wasatch cliff. ***D***, High-water mark about 1.5 meters above water surface, showing minor bank erosion at times of high flow.



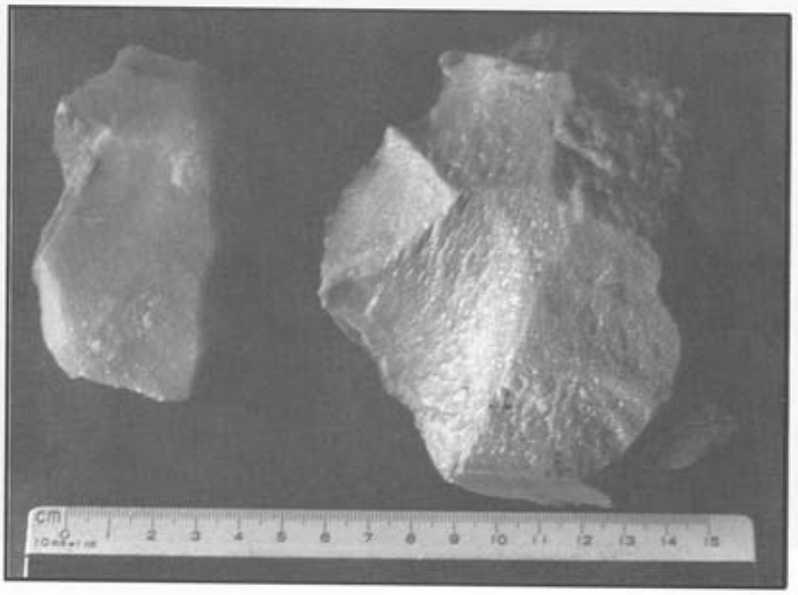
C

D

Figure 6. (Continued)



A



B

Figure 7. ***A,*** Paleo-Indian hearth in Parker-Temple Lake terrace. Hearth is covered with about 0.5 meter of colluvium or alluvium (ruler is 15 centimeters long). ***B,*** Crude artifacts made of yellowish-green quartzite found on surface hillslopes of Cora Butte.

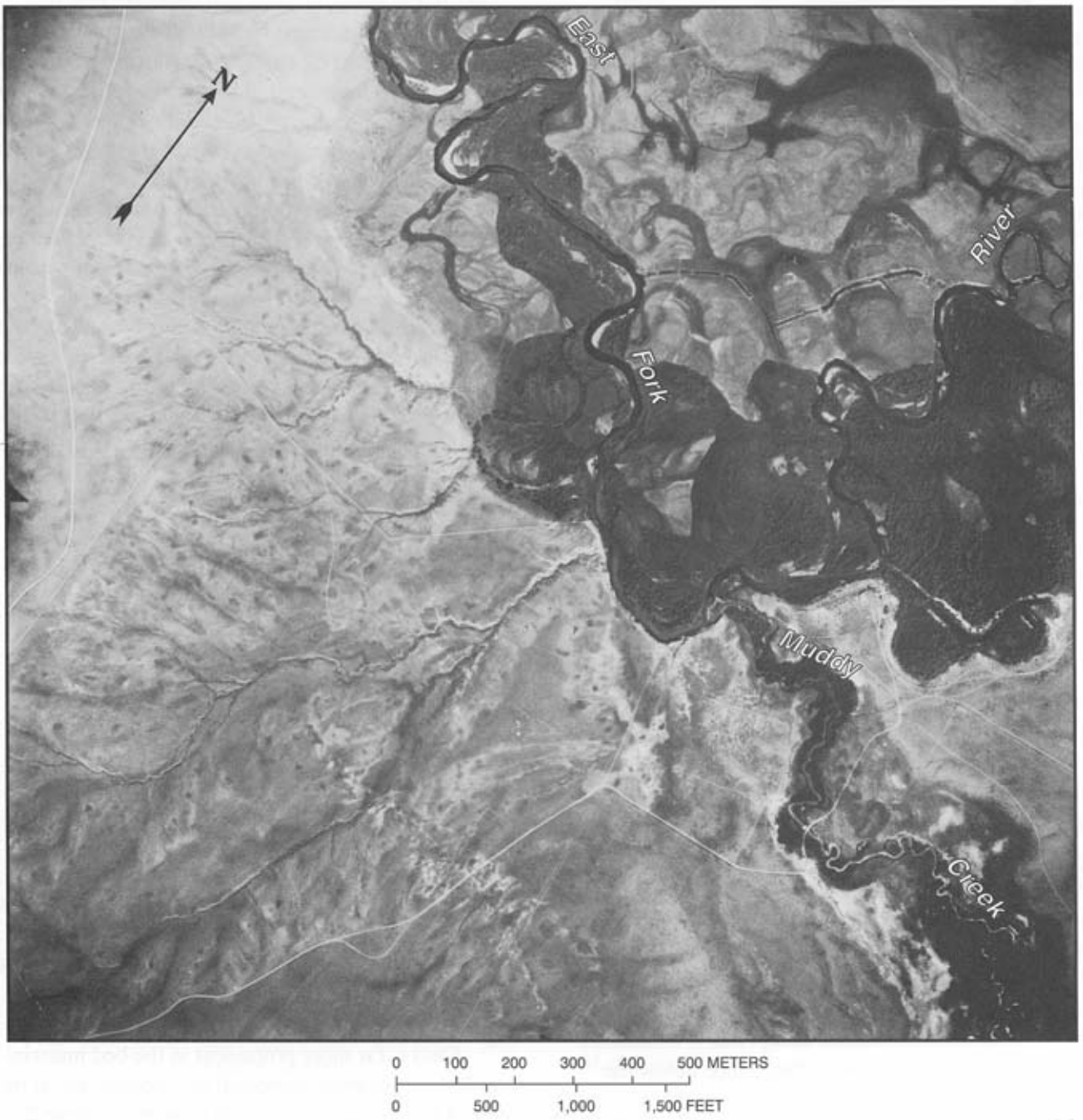
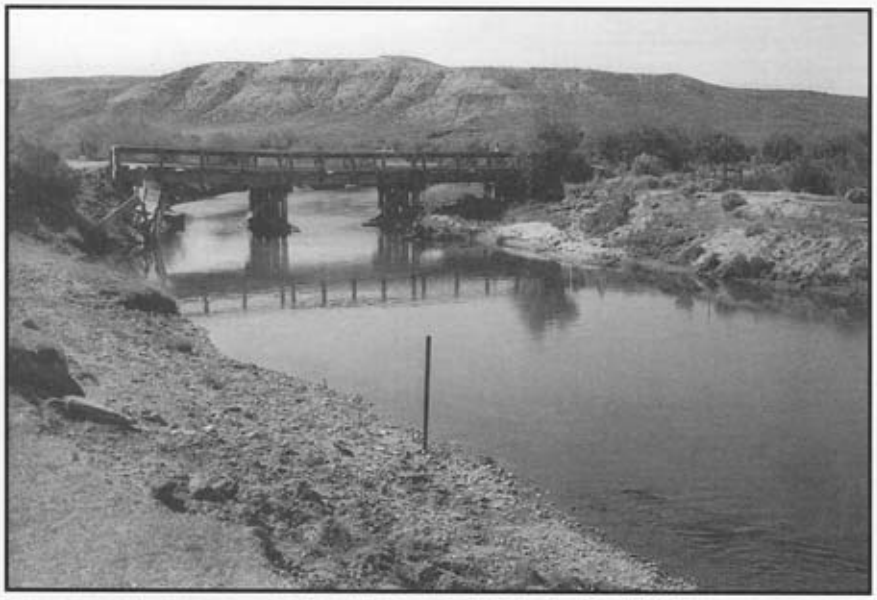


Figure 13. Aerial view of East Fork River valley upstream from the site of the bedload trap. Muddy Creek enters from the southeast in lower part of the photograph. Project site is approximately 600 meters north of area shown at top of photograph.

A



B

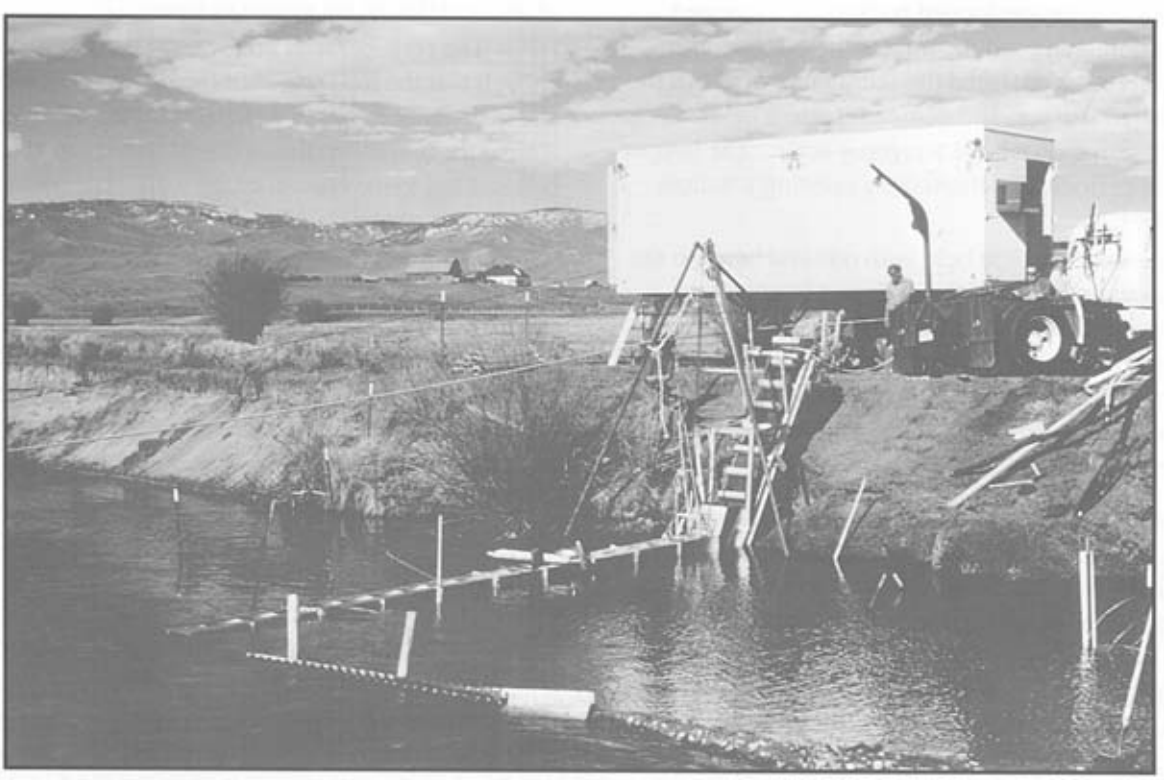
Figure 14. Research site before installation of the bedload trap. ***A,*** Looking southwest, showing location of site (at vehicles); flow is left to right. ***B,*** Looking upstream; wood bridge is 65 meters upstream from the trap site.

A

B

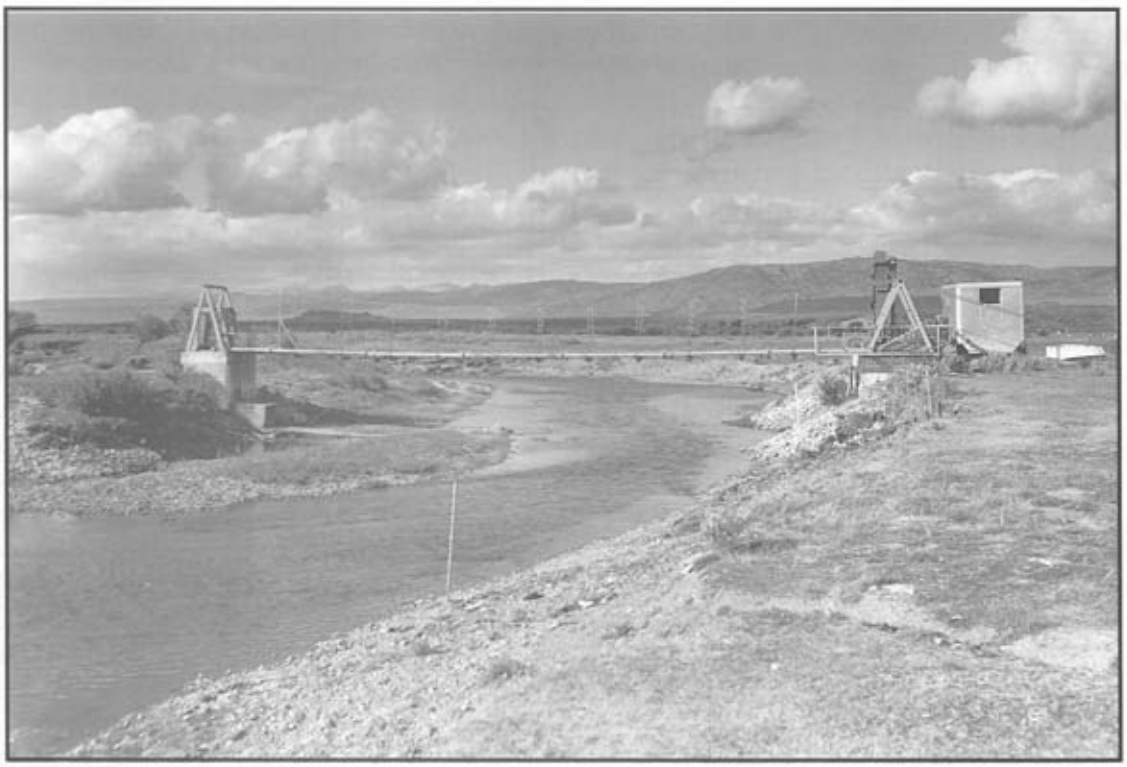
Figure 15. Site of the bedload trap at low flow and high flow. ***A,*** Looking downstream at low flow, showing the low gravel bar left of center of the channel and just upstream from the trap. At far left can be seen the levee built to prevent the water from flowing into the diversion channel, the spoil from which rises above the flat lower surface. ***B,*** Looking upstream at a stage at which high flow inundates the flood plain.

A

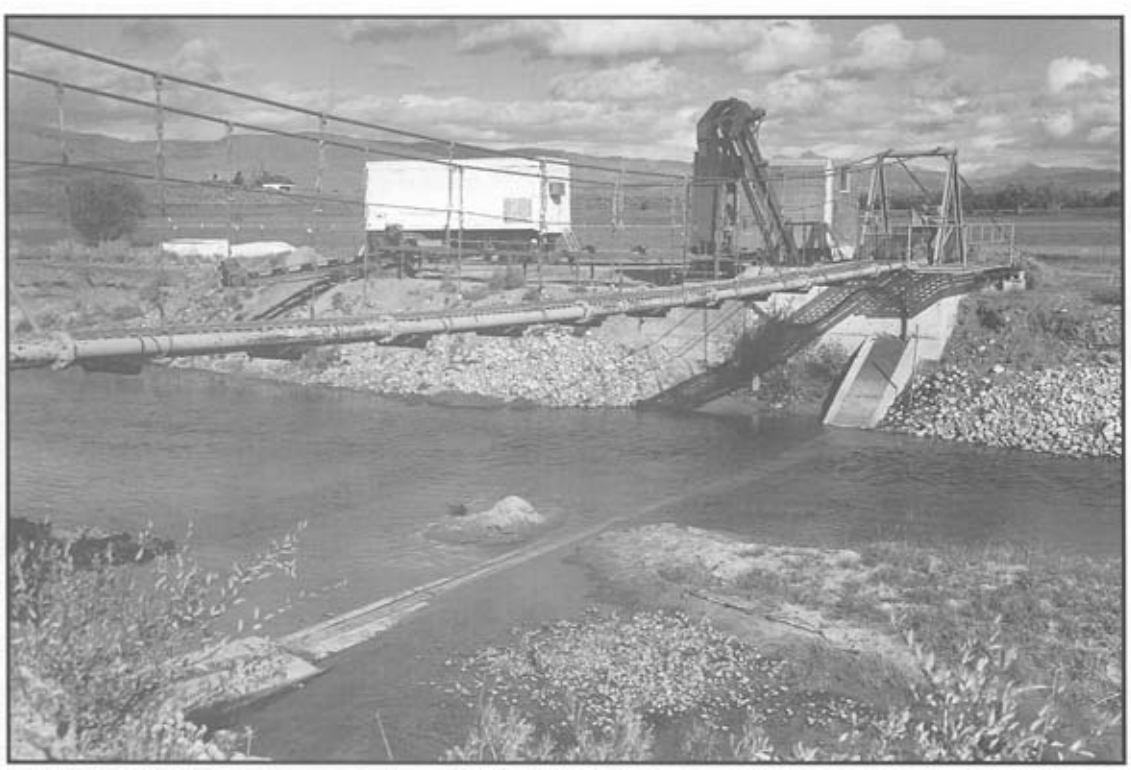


B

Figure 20. The initial unsuccessful bedload trap installed at the same location where the successful machine was constructed later. ***A,*** The long metal tube containing the endless belt could not be lowered into the streambed because the excavation continually sloughed. ***B,*** The metal tube did not reach all the way across the channel to the left bank.



A



B

Figure 22. The bedload trap on East Fork River. ***A,*** View downstream showing suspension bridge, concrete wells on each bank, and control trailer on right bank. ***B,*** View from left bank at low flow. The concrete trough in the streambed is partly emergent in the foreground; the slot into which sediment falls is closed by the metal gates. ***C, D, E, F,*** and ***G,*** on following pages.

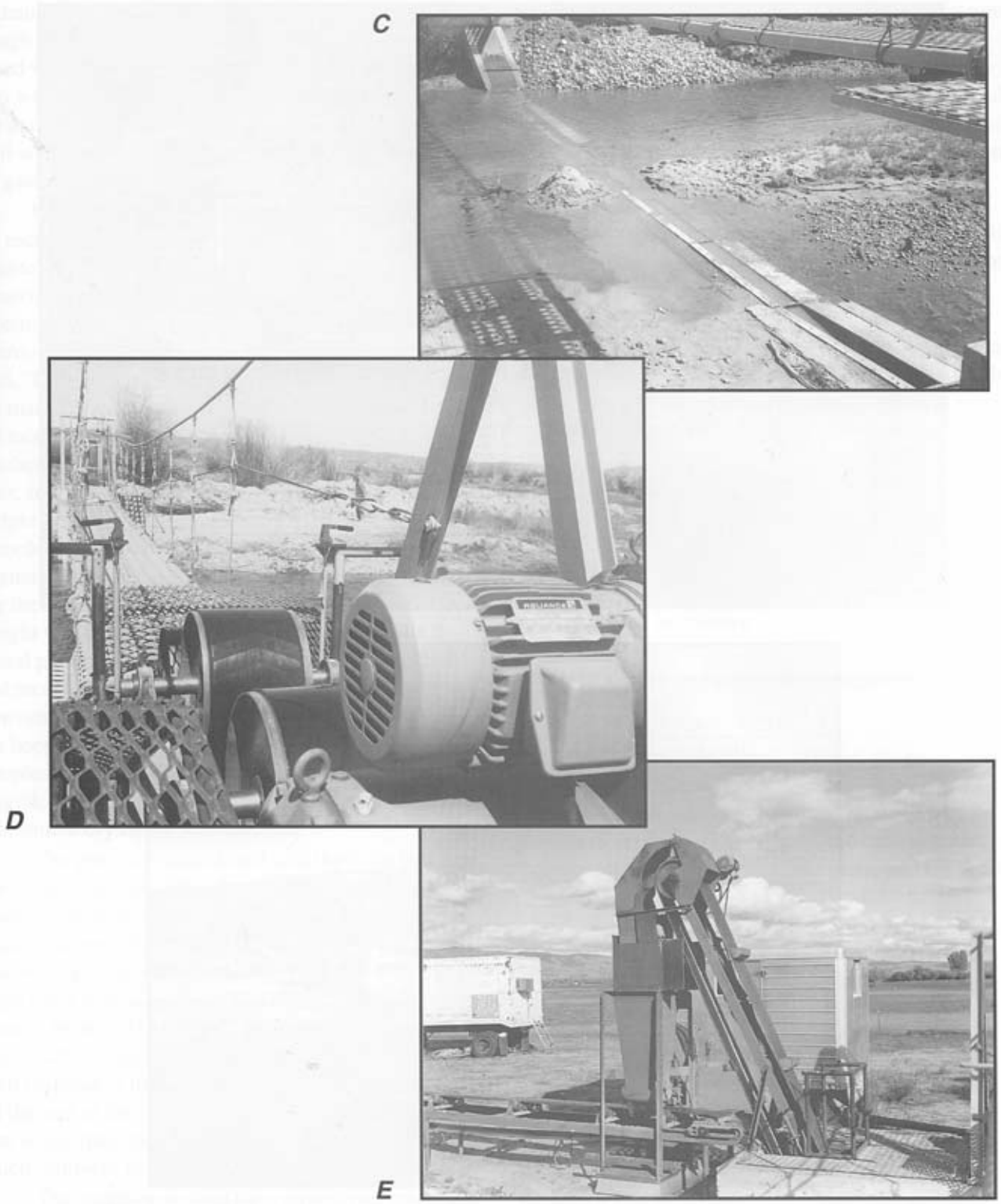
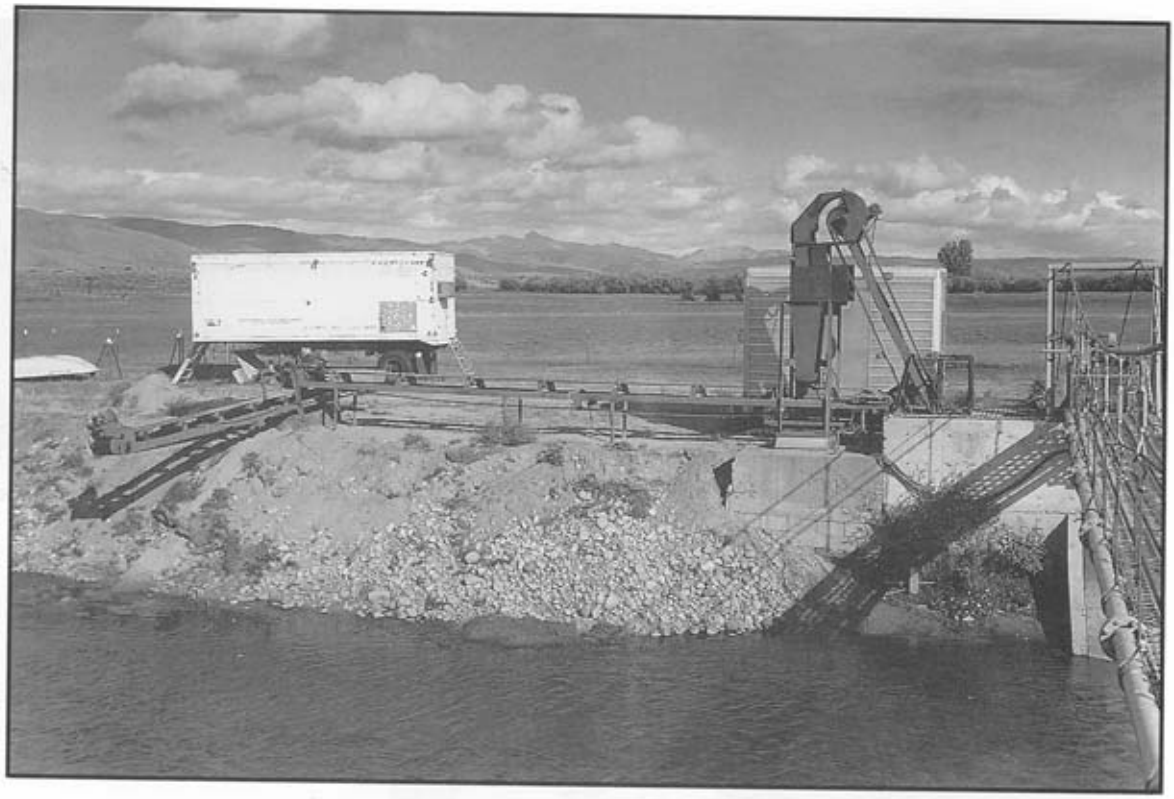
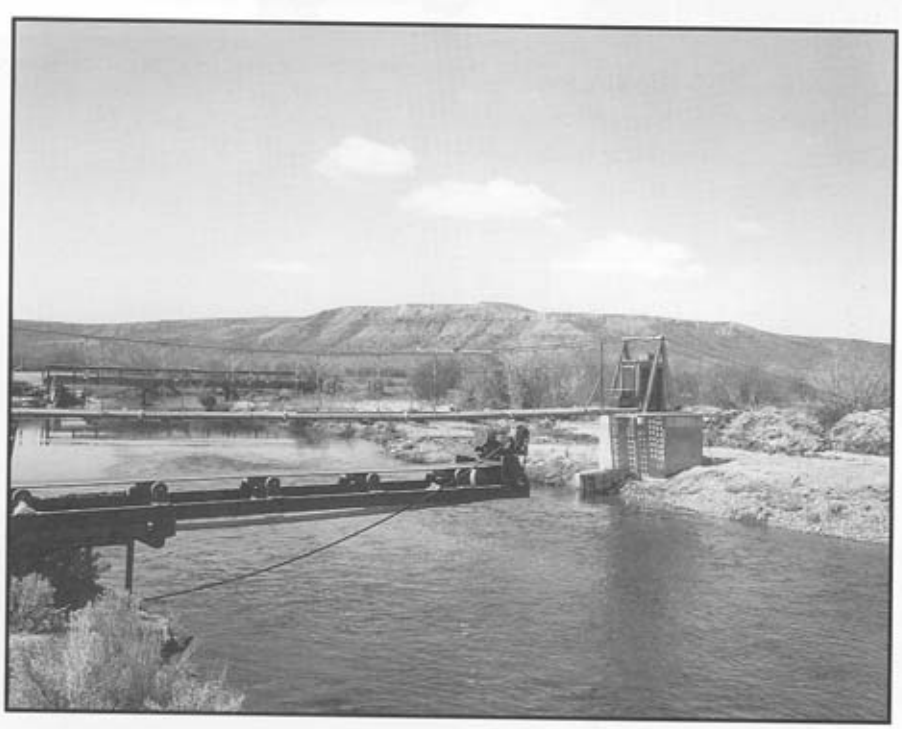


Figure 22. The bedload trap on East Fork River (continued). ***C,*** Trough in streambed seen from left bank at low flow; the nearest gate is open, but all other gates are closed. ***D,*** View from right bank along the length of the suspension bridge. In the foreground is the main motor and in the middle ground are two of the drums that drive the endless belt. The belt returns to the left bank on rollers under the walkway of the bridge. ***E,*** The near-vertical endless belt with lift buckets; these reach into the deep well on right bank, from which they lift sediment to the hopper for weighing; the hopper is the tapered vertical tube in center of photograph.



F



G

Figure 22. The bedload trap on East Fork River (continued). ***F***, The endless belts leading first downstream from the weighing hopper, and the orthogonal belt extending over the river for returning bedload to the channel. ***G***, View from right bank looking upstream; the endless belt in the foreground carries sediment back to the river after it is weighed and sampled.