Provo River Restoration Project,
Heber City, Utah

Client: Mr. Kirt Carpenter
Central Utah Water Conservancy District
355 West 1300 South
Orem, Utah 84058
(801) 226-7125

Anderson Consulting Engineers, Inc.
Civil • Water Resources • Environmental

James M. Montgomery Consulting Engineers, Inc. (JMM) was contracted by the Central Utah Water Conservancy District to perform a conceptual design study to restore the Provo River to a more natural, stable and self-sustaining Condition. Additional considerations in the design included:

- wetland mitigation from the construction of Jordanelle Reservoir;
- enhanced fishery habitat for the Bonneville Cutthroat Trout; and
- maintenance and habitat improvement for the T & E list Spotted Frog and Ute's Lady Tress.

Anderson Consulting Engineers (ACE) staff, while previously affiliated with Lidstone & Anderson, Inc., were subcontracted to perform geomorphic and sediment transport portions of the conceptual study. The study reach of the Provo River was a 10-mile section in the Heber Valley. It is located immediately downstream of Jordanelle Reservoir. This reach of the Provo River has been highly disturbed and is presently in an unstable condition. Numerous diversion structures have been constructed in the river channel with abrupt drops ranging up to 10 feet. In addition, the river discharge has been augmented by transmountain diversions nearly doubling the natural flows. In most areas, the channel has been confined by levees. As a result of these disturbances, the bed is highly mobile and there are some areas of severe degradation. In other channel segments there are deposition problems.

ACE's task was to conduct necessary geomorphic and sediment transport analyses to properly formulate and evaluate potential channel improvement schemes. The analyses included: an evaluation of existing channel problems, determination of channel forming discharges under both the existing conditions and the proposed operation of Jordanelle Reservoir, evaluation of sediment transport rates and bed material mobility, development of guidelines for proposed channel profile, planform and cross-sectional geometry, and recommendations on alternatives to eliminate existing diversion structures.

Hydraulic analyses were conducted to support geomorphic analyses, sediment transport analyses and restoration design. Existing and proposed floodplain configurations were modeled using the U.S. Army Corps of Engineers HEC-2 Water Surface Profile program. A geomorphic investigation of the Provo River and related river systems was conducted to provide an understanding of the pre-disturbance morphology and to develop stable channel design parameters for restoration of the river fish habitat and riparian system. Finally, sediment transport analyses were conducted to determine the quantity and sizes of bed material transported by the post-Jordanelle hydrologic regime.