

### *C. Proposed Action and Action Alternatives*

In this section, we discuss the effects of the project alternatives on environmental resources. For each resource, we first describe the affected environment, which is the existing condition and baseline against which we measure effects. We then discuss and analyze the specific environmental issues.

Only the resources that would be affected, or about which comments have been made by interested parties, are included in detail in this draft EA. At this time no new construction or modifications to the project are planned. Therefore, we have determined, based on our review of Parowan's license application, and as a result of our scoping process including agency and public comments, that geology and soils, aesthetics, recreation and land use, and socioeconomics would not be affected by the continued operation of the project and, therefore, will not be analyzed in detail in this EA.

#### 1. Aquatic Resources

##### *Affected Environment*

##### *Water Quantity*

The project's diversion dam collects water from Parowan Creek immediately below the confluence with Bowery Creek at an elevation of about 6,275 feet. Parowan Creek at the diversion dam drains an area of about 50 square miles. Lands within the Parowan Creek subbasin upstream of the diversion dam are largely within the Dixie National Forest with a small amount of private lands scattered throughout the area. The average elevation of the subbasin is about 8,900 feet. Parowan Creek drains into the greater Bonneville Basin, which is a closed basin (letter by Willie R. Taylor, Director, Office of Environmental Policy and Compliance, USFWS, Washington, DC, July 1, 2003).

Surface water in Parowan Creek derives mostly from rainfall and snowmelt runoff. Snow is the dominant form of precipitation in the subbasin from October through April. Average total annual precipitation in the subbasin varies by elevation and temperature ranging from 12.4 inches at the project powerhouse (6,000 feet) in the hot and arid, lowest portion of the subbasin to 35.8 inches near Brian Head Station (9,770 feet) in the cooler and wetter, upper portion of the subbasin. Parowan calculates the average total annual precipitation at the diversion dam to be about 30.4 inches.

There are numerous springs in the project area fed by snowmelt originating

in the upper subbasin. Additionally, the Parowan Creek bed is largely gravel and green vegetation carpets the landscape on both sides of the creek indicating that there is some sub-surface flow through the alluvium.

Parowan Reservoir Company,<sup>3</sup> at its Yankee Meadows Reservoir located on Bowery Creek about 7 creek miles upstream of the project diversion dam, largely regulates inflow to the immediate area of the project diversion dam intake. Parowan Reservoir Company impounds snowmelt runoff in the spring and releases it throughout the latter part of the summer to satisfy irrigation water supply needs. Under an unregulated flow condition, the annual hydrograph would show low or no flows occurring from November through March and again in July, peak flows in May and June, and transition flows in April and August through October (figure 1). Under the existing, regulated condition, the annual hydrograph is flat with flows ranging from a low of around 6.0 to 7.0 cfs from September through March to 8.0 to 10.0 cfs from April through August. Parowan calculates the existing average annual inflow at the diversion dam to be about 8.0 cfs.

Although the existing average monthly inflows at the diversion dam are much below the hydraulic capacity of the project (24 cfs),<sup>4</sup> peak flow data for the period of record 1964 to 1987 on Center Creek (USGS gage no. 10241470),<sup>5</sup> a tributary to Parowan Creek about 0.5 miles upstream of the diversion dam, shows that flows upwards of 200 cfs occur in the project area, although infrequently.<sup>6</sup>

Figure 3. Natural and regulated inflow at the project diversion dam as calculated by Parowan. "Regulated inflow" is a calculation of surface flow at the diversion based on the generation record. "Natural inflow" is a theoretical projection of the hydrograph based on the drainage area, mean annual precipitation, and main channel slope. The project does not account for surface flow that infiltrates the stream gravel before reaching the diversion dam;

<sup>3</sup> Parowan Reservoir Company is a separate company that controls flows the flows for irrigation and for Parowan City to use at the Center Creek Project. Yankee Meadows Reservoir is an irrigation storage reservoir owned and operated by the Parowan Reservoir Company.

<sup>4</sup> Because the flow on average is much below the hydraulic capacity of the project, Parowan normally diverts all the flow in Parowan Creek at the diversion dam.

<sup>5</sup> Flow data accessed from the USGS Web site ([http://waterdata.usgs.gov/nwis/peaks/?site\\_no=10241470&agency\\_cd=USGS](http://waterdata.usgs.gov/nwis/peaks/?site_no=10241470&agency_cd=USGS)) on June 27, 2003.

<sup>6</sup> Parowan calculates that a 200-cfs flow at the diversion dam has a recurrence interval of about 10 years.

therefore, the projection somewhat overestimates surface flow at the project. (Source: staff)

##### *Water Quality*

Parowan Creek upstream of the project area flows largely through the Dixie National Forest. The drainage area is high elevation, remote, and sparsely populated. The Utah Water Quality Board classifies Parowan Creek in the project area as a Category 1 High Quality Water protected for secondary contact recreation (Class 2B), coldwater species of game fish and other cold water aquatic life (Class 3A), and agricultural uses, including irrigation of crops and stock watering (Class 4).<sup>7</sup>

There are no recent water quality data for Parowan Creek to our knowledge, however, because Parowan Creek largely flows through a sparsely populated area upstream of the project, we expect that the water quality of Parowan Creek in the project area is good.

##### *Fisheries*

Parowan Creek upstream of the project diversion dam contains a self-sustaining population of rainbow trout and brown trout; however, there are no known fish populations downstream of the project diversion dam. (letter by Willie R. Taylor, Director, Office of Environmental Policy and Compliance, USFWS, Washington, DC, July 1, 2003). A BLM habitat assessment of Parowan Creek conducted in 1982<sup>8</sup> describes Parowan Creek as possessing Agood habitat" overall but that trout habitat is limited to Parowan Creek upstream of the project diversion dam. The BLM assessment states that although the bypassed reach is dewatered during the summer months, the stream banks are stable and there is a "fair" amount of cover.

##### *Environmental Impacts and Recommendations*

##### *Project Operation*

Parowan has a Utah state water right (#75-27) to divert up to 24.0 cfs, the hydraulic capacity of the project, out of Parowan Creek, Center Creek, and Bowery Creek and its tributaries to be used for power generation. Parowan's right to this water is for non-consumptive use; therefore, after using it for power generation, Parowan returns the diverted creek flows to an irrigation canal downstream of the powerhouse so as not to adversely affect downstream

<sup>7</sup> Utah Administrative Code, R317-2, Standards of Quality for Waters of the State, effective March 1, 2003.

<sup>8</sup> Parowan included a copy of the BLM habitat assessment in Appendix E-7 of the license application.