3.6 Fisheries and Aquatic Resources

The following is a summary description of the existing affected environment for aquatic resources in Quitchupah Creek and lower Water Hollow Creek. A full description is presented in the Final Aquatic Resources Technical Report, Quitchupah Creek Road EIS (JBR, 2001c). Quitchupah Creek is classified as supporting cold water aquatic wildlife under beneficial use class 3A. Additional water resources information, including existing water quality data, is in **Section 3.2**.

FLOW RATES

Flow rate measurements were taken at two different times of the year for the Quitchupah stations and once in Water Hollow Creek. At the Quitchupah stations, the first set of flow rate measurements coincided with the fish electroshocking and macroinvertebrate sampling in July 1999 and the second set of flow rate measurements were taken in early October 1999 when flow rates were expected to be near the lowest of the year. The single flow rate measurement in Water Hollow Creek coincided with the fish electroshocking and macroinvertebrate sampling in November 2000. **Table 3.6-1** displays the flow rates from the sampling periods. The locations of the aquatic sampling stations are presented in **Figure 3-1**. For additional flow information, see **Section 3.2** Water Resources.

Table 3.6-1 Flow Rate Measurements for Aquatic Sampling Stations

Stations	Flow Rates (cfs)	
	July	October or November
Quitch-01	3.0 cfs	6.26 cfs*
Quitch-02	7.86 cfs	6.00 cfs
Quitch-03	0.81 cfs	0.70 cfs
Quitch-04	0.13 cfs	0.10 cfs
WH-01	not taken	0.50 cfs

* Increase in flow presumably caused by decrease in irrigation upstream of station and flow from Muddy Creek return canal into Quitchupah Creek (not flowing during July flow rate measurement).

FISH SAMPLING

Fish were only captured at the three lowest stations (Quitch-01, Quitch-02, and Quitch-03). No fish were captured at the highest stations, WH-01 and Quitch-04. A large natural waterfall barrier (>40 feet high) occurs in Quitchupah Creek upstream of both Quitch-03 and the confluence of Water Hollow, but downstream of Quitch-04. The waterfall presumably prevents fish from reaching the upper parts of the creek (Quitch-04) and associated tributaries above this point. However, the waterfall would not affect fish ability to reach WH-01 from QC-03, and it is not known why fish were not observed at WH-01 during the fish sampling in 2001. USFS personnel reported observing fish in Water Hollow in 2002.

A baseline fisheries study was conducted on Quitchupah, Water Hollow, and East Spring Canyon Creeks. A total of five stations were selected (Quitch-01 through Quitch-04 and WH-01) and sampled via electrofishing. The greatest diversity (4 species) and highest numbers of fish (142) were found at the lowest station (Quitch-01). Speckled dace were the most common fish caught, occurring at three stations and in the highest number. In addition, speckled dace were the only species captured at stations Quitch-02 and Quitch-03. Additional electroshocking conducted by USFS personnel on Quitchupah Creek below the confluence with Water Hollow Creek, as well as Water Hollow Creek upstream from this confluence in August 2003 recorded only a few speckled dace. These same stretches were sampled again (electroshocked) in September 2004, with similar results; speckled dace were found to be more common in the Quitchupah Creek stretch than in Water Hollow Creek (Whelan, 2005 and 2004).

The UDWR noted finding bluehead sucker in Quitchupah Creek below the Project Area, at the confluence with Ivie Creek (Walker, 2005). Bluehead sucker were noted to be 'rare'. The bluehead sucker is on UDWR's Utah Sensitive Species list. Two other fish species listed on UDWR's Utah Sensitive Species List, the flannelmouth sucker and the leatherside chub, were caught during the surveys at the lowest station (Quitch-01).

MACROINVERTEBRATE SAMPLING

A range of between 10 to 16 different species of macroinvertebrates were found at the five stations sampled on Quitchupah, Water Hollow, and East Spring Canyon Creeks; station Quitch-01 had the lowest diversity and station Quitch-03 had the highest diversity of species. Quitch-04 (East Spring Canyon Creek) had the highest grams/square meter of the five stations. Not surprisingly, the highest number of macroinvertebrates was of those species with high tolerance quotients. The high tolerance quotients are a strong indication that the majority of species in Quitchupah Creek are accustomed to stressed environmental conditions. The Biotic Condition Index (BCI) data for these stations indicate that they are at or near their potential, and that given the existing stream and watershed conditions, these stations are about as good as expected. However, there is potential that the aquatic macroinvertebrate community could be degraded below current levels by eliminating the few intolerant and moderately tolerant taxa present, reducing the numbers of taxa, or by reducing their biomass. The Shannon-Weaver Index (used to measure the diversity of a community) results are typically higher than found within the project site when the community is in better condition. However, the lower results can easily be attributed to the minimum number of samples (3) taken.

Station Quitch-03 contains 16 taxa, many of which have low tolerance quotients. The lowest station Quitch-01 exhibits very few sensitive taxa. In fact, the single specimens of *Drunella doddsi* and *Isoperla* could have drifted down from above and are probably not indicators of established populations.

Station Quitch-04 contained many taxa that are indicators of a more lentic or slow flowing water habitat. Organisms such as the micro caddisfly family Hydroptilidae, the Odonata, *Argia* and *Cordulagaster* and the tiny clam shrimp, Ostracoda, indicate that the system is not a fast flowing creek. The system contains the relatively rare aquatic insects *Cordulagaster* (dragonfly) and *Oxyethira* (caddisfly).

WH-01 had four taxa that were not present in the Quitchupah stations. For three of these, their presence was essentially a factor of the season of collection (Baumann, 2000).

The results of the 1999 and 2000 sampling were compared with results from the 1980 to 1982 sampling (Winget, 1983) where applicable. No sampling had occurred previously in Water Hollow Creek and therefore no comparisons are made for station WH-01.

The Quitchupah Creek drainage was in about the same aquatic condition in1999 as it was in 1980-1982. Comparable stations showed similar diversity and BCI values. The organisms were essentially the same and the species that were different exhibit similar tolerance quotients. Water Hollow Creek is in worse condition when compared to Quitchupah Creek, but is still in relatively good condition (Baumann, 2000).

SEDIMENT SAMPLING

During the data collection effort, sediment mobility and active erosion/deposition that affects habitat features was evident. A flash flood, with a peak just over bank full, occurred during the sampling, and the following day, one of the pools that had been selected for sampling was no longer present. The stream as a whole appears to be very active, and habitat features appear to undergo frequent modifications.

Riffles or runs were the most common feature observed; pools were much less prevalent in number, and where noted, were generally small, shallow, poorly formed, and did not tend to span the width of the channel. It appeared that many of the identified pools were low flow features only, and would not be identifiable in a high flow event. Perhaps related to the poor quality and low number of pools, and the active frequent modifications that the channel undergoes, pools with identifiable tails typical of salmonid spawning sites were minimal.

The most notable conclusion from the sampling was that, out of the 37 samples collected at the Quitchupah stations, all had greater than 30 percent fines (less than 6 Millimeters (mm)). Previous study of sediments in the bed of Quitchupah Creek has shown similar results. Over a two-year period in the early 1980s, Winget (1983) collected four stream bed sediment samples from two locations on Quitchupah Creek. One location was below the mouth of East Spring Canyon Creek, and the other was just upstream of the confluence with the North Fork. Information on sampling methodology, site selection, or other collection details is not available, but the particle size distribution data presented in the report indicate high levels of fine sediments at both stream locations. An examination of Winget's (1983) data show that, for the eight samples, the range in the percent smaller than 4.75 mm was 31 to 74 percent, and the average was 56 percent. The riffle samples from latest study showed essentially the same, with a range from 32 to 72 percent and an average of 50 percent.

Comparisons between the four stations could not be readily made due to the varying number of samples and due to the varying habitat types sampled within each reach. However, based upon the range of fines reported for only the riffle samples collected from each station, there was not an identifiable difference between stations. The prevalence of fines at the sampling stations is indicative of high sediment transport in the stream system.

Potential Impacts To Fisheries

The Environmental Consequences of each Alternative, in regard to fisheries, are discussed below. First, regulatory consequences are described and then potential impacts to the resource itself. Water Hollow samples were generally similar to Quitchupah Creek samples. Any differences would not be expected to be statistically meaningful.

REGULATORY

Regulatory issues regarding potential aquatic impacts would be limited to those relating to wetlands issues (COE 404 process), and water quality issues (Clean Water Act as implemented by the Utah Division of Water Quality). The permitting for this project would require an individual 404 permit to mitigate loss of wetlands and filling in "Waters of the U.S." The sensitive fish species present are not afforded protection required under the ESA for Federally listed threatened or endangered species. The common speckled dace is not protected by law.

POTENTIAL IMPACTS

Impacts to, and issues on, resources related to aquatic resources are described in the Vegetation and Wetlands (**Section 3.4**) for impacts to wetlands and riparian zones; in the Water Resources (**Section 3.2**) impacts to water quality, flood plains, and related subjects; and in the Wildlife Resources (**Section 3.5**) impacts to species such as amphibians are discussed.

NO ACTION - ALTERNATIVE A

Selection of the No Action Alternative would not result in any change in direct, indirect, or cumulative impacts to aquatic resources in the Project Area. The new road would not be constructed in the Quitchupah Creek drainage or the adjacent Water Hollow Bench area. The existing road would remain as a sediment source to the stream, and the existing environment in the Quitchupah Creek drainage would

continue for the near future. There would be no relief of grazing in the riparian zone.

QUITCHUPAH CREEK ROAD ALIGNMENT - ALTERNATIVE B

Quitchupah Creek is currently an active stream that conveys significant amounts of sediment and dissolved solids, as reflected by the fish and macroinvertebrate species present in its waters, particularly in the lower reaches of the Project Area. Speckled dace are found in all the lower stream reaches, conditioned to the sediment laden waters and salinities. The high tolerance quotient and generally low biotic index in the macroinvertebrates community indicates an aquatic environment that is under stress. **Table 3.6-2** gives a summary of the macroinvertebrate community by station to indicate the poor condition of the aquatic ecosystem in Quitchupah Creek.

Table 3.6-2 Macroinvertebrate Community Indicators

Station	CTQa[1]	Percent of BCI[2]	Condition of Ecosystem	1980-81 CTQa	1980-81 BCI
01	87	86	Poor	78/97	103/82
02	77	97	Fair	82/92	95/102
03	67	112	Good	-	-
04	99	74	Poor	-	-
WH-01	75	100	Good	-	-

1. Community Tolerance Quotients is average of community tolerance, high numbers indicate pollutant tolerance species dominate community.
2. Percentage of predicated stream condition, low percentage indicates poor condition of aquatic ecosystem.

As described further in water resources (**Section 3.2**), there would be some potential for increases in sedimentation and destabilization of Quitchupah Creek. Under unexpected circumstances (such as if a culvert were to fail during a greater-than-design event) where a pulse of sediment could be introduced, the highly tolerant species present in the stream system would be expected to absorb such an occurrence, as they do currently (for example, when tributaries dump heavily-laden storm water runoff into the stream).

Impacts to the aquatic resources as a result of increased traffic, transport of coal materials, fuels, etc. would not be expected during the normal course of use. In the event of a truck accident, coal and fuels could inadvertently be introduced to the stream. Should such an event occur in the vicinity of station Quitch-04, where the more unusual and specialized macroinvertebrates were found, any degradation of the habitat would likely impact them by rendering their habitat unsuitable. Under Alternative B the 8.9 miles of road are all in close association with the stream so the risk of a spill to the stream would exist anywhere along this proposed road. Aquatic habitat fragmentation could occur as a result of required crossings of the Proposed Road, therefore all culverts in fish habitat would be designed to allow for fish passage and 100-year flood events (**Appendix B** - BMPs).
The removal of livestock grazing from 4.7 miles of stream would protect the riparian zone and allow the plant community to expand and stabilize the streambanks and shade the water improving the aquatic habitat in the middle stretch of Quitchupah Creek and all of Convulsion Canyon.

The enhanced and created wetlands would trap sediments generated in the upper watersheds of Convulsion Canyon, thus, aiding water quality. The 1.22 acres of new wetlands would provide additional habitat for species of macroinvertebrates that favor the slow-moving waters.

ALTERNATE JUNCTION AND ALTERNATE DESIGN - ALTERNATIVE C

Potential impacts to aquatic resources would generally be the same as for Alternative B, including the

protection of 4.7 miles of stream corridor. As described in Water Resources (**Section 3.2**), the proximity of the road to the stream, the number of required crossings, and the risk to the stream from implementation of Alternatives B and C are similar. The road under this alternative is in close proximity to the stream for 7 of the 9 miles, somewhat less of a risk for spills than the proposed road.

The enhanced and created wetlands would trap sediments generated in the upper watersheds of Convulsion Canyon, thus, aiding water quality. The 1.22 acres of new wetlands would provide additional habitat for species of macroinvertebrates that favor the slow-moving waters.

WATER HOLLOW ALTERNATE ALIGNMENT - ALTERNATIVE D

The Water Hollow Road alignment would be placed further away from Quitchupah Creek than either Alternative B or Alternative C. This would mean that any erosion that occurred as a result of road construction, or of failure of road features due to drainage or stability problems, would be less likely to affect Quitchupah Creek. Further, any spills of coal or fuels would be less likely to reach Quitchupah Creek than they would be under Alternative B or C. This alternative would avoid the majority of Quitchupah Creek, including its middle and lower reaches that are most susceptible to instability impacts. However, it is important to note that the existing two-track along Quitchupah Creek would remain open and in its current unstable state under this alternative, and would thus continue to contribute sediments to the stream. The applicant committed measure to install and maintain waters bars along the existing two-track road would help reduce sediment loading from that source. Water Resources (**Section 3.2**) discusses the net effect of building the Water Hollow alignment and leaving the two-track road. However, a spill at the Water Hollow crossing would affect this stream and reach Quitchupah Creek. This alternative would be in close proximity to the stream in Convulsion Canyon for about 2.1 miles where there would be a risk of spill to the stream. Livestock would be restricted from grazing along 4.7 miles of riparian area, which over time could improve aquatic habitat. Instream watering and riparian grazing in Quitchupah Creek on private lands will continue.

The enhanced and created wetlands would trap sediments generated in the upper watersheds of Convulsion Canyon, thus, aiding water quality. The 1.22 acres of new wetlands would provide additional habitat for species of macroinvertebrates that favor the slow-moving waters.

MITIGATION AND MONITORING FOR BUILD ALTERNATIVES

No mitigation or monitoring, beyond what is described in **Section 3.2** Water Resources, the BMPs (**Appendix B**), and the Environmental Protection Measures, are necessary for the Proposed Action or build Alternatives. The Water Hollow crossing would allow for fish passage through installation of a bridge.

IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES AND RESIDUAL ADVERSE IMPACTS

An improved road design would help to minimize sedimentation and salt loading into the drainages from the existing environment. Truck accidents could introduce coal and fuel into the streams even with mitigation and monitoring measures in place. This would produce residual adverse impacts to fisheries and aquatics from Alternatives B, C, or D.

CUMULATIVE EFFECTS

Past and present impacts to fisheries and aquatics include habitat degradation due to sediment loading and destabilization of Quitchupah Creek, creating the poor condition of the aquatic ecosystem. Increased public access to the Project Area as a result of the proposed road would produce cumulative impacts to fisheries and aquatic resources. These cumulative impacts would primarily occur from sediment loading/erosion impacts, salinity, or fuel spills generated by the public.

The increased flow of mine discharge water in North Fork has stabilized the flows in that tributary so fish would be able to inhabit more of the stream on a year-round basis. However, the irrigation diversions downstream of the North Fork junction can, during periods of dry years, deplete the flow of Quitchupah Creek so the aquatic habitat is degraded. The restoration of the 4.7 miles of riparian zones over time would improve the aquatic habitat.