APPENDIX 6

Historical Overview of Planning Area Wetland Resources

Transitioning from native to post-European settlement, early routes were primarily for transporting materials between mining towns like Cripple Creek and support communities like Canon City. Routes were horse trails, wagon trails and then later railroads; eventually becoming motorized roads. Many routes followed natural pathways along streams. Major routes cutting directly through riparian-wetlands went up Fourmile and Eightmile Creeks. Continued spur route development, primarily for ranching, created routes up Current Creek, Beaver Creek, Mack Gulch, upper Fourmile Creek area, High Creek area, and streams around and to the north of the Cripple Creek area. Each of these routes impacted stream and riparian health directly but also brought land use change that indirectly affected wetlands from change in the uplands (see also Hydrology section). Jeep routes came later cutting through and paralleling many smaller headwater tributaries.

Simultaneously throughout early settlement, water storage and irrigation projects in each main watershed were ongoing. For example, Wrights and Skagway Reservoirs were built, and the Canon Heights Irrigation and Reservoir Company Ditch and other irrigation ditches were constructed to support agriculture development that dewatered streams or converted wetland areas. Several streams were dewatered and disconnected from larger tributaries of the Arkansas River during critical periods in the year, limiting corridor continuity for wildlife and fish. Land use change in upland areas and along streams modified stream hydrology, leaving many planning area stream reaches and wet meadows either blown out or severely down-cut (see also Hydrology section). Down-cut streams drain associated wet meadows when the balance between vegetation buffering capacity and runoff hydrology has modified beyond what the stream type evolved under (Rosgen, 1996). This review of historical impacts is important because recreational travel is a cumulative potential disturbance that can further stress functionality of riparian, wetland, and aquatic ecosystems and the values they support.

Background on Route Impacts to wetlands

Reviewing specific impacts of routes on riparian/wetland resources is helpful to understand the impact analysis presented. This review is more specific to wetlands than to overall hydrologic/ water supply impacts (presented in the Hydrology section) but there is overlap. A road or route is a continuous unnatural topographic feature on the landscape that serves to capture and transport water at different rates than would otherwise occur if the route was not there. Over-land flow interception, changed infiltration rates due to compaction, and the ensuing creation of a route for water transport, all change runoff. This change is site specific to the local road, affecting nearby water supplies. Also, larger scale changes occur, including water delivery, the timing of runoff, and magnitude to down gradient areas. Increased changes to peak flow can yield channel damage because insufficient channel capacity requires channel modification; usually it must enlarge, creating stream imbalance. Stream stability is well

defined in the literature (Rosgen 1996) and is critical in meeting BLM land health standards (*see Public Land Health Standards, see Appendix 7*).

Changing runoff affects sediment/bed-load transport to and from channels that impact other resource values (see also Wildlife, Aquatic and Water Quality sections). Alteration can be difficult to observe because ecological changes are subtle through time as vegetation communities evolve to meet changed hydrology. This process is obvious in instances where change is rapid, depending upon severity of a specific catastrophic precipitation event, or where it reaches the threshold of road density. Wildlife disturbance from route traffic of species dependent on riparian habitat is another impact (discussed in the Wildlife, Terrestrial section).

In many instances new routes start as smooth fine soil pathways across vegetated lands. Without maintenance, the road usually erodes to a surface of larger substrate materials that do not erode (commonly large rocks) and routine travel becomes uncomfortable. At this stage, the tread begins to erode sideways, or new routes begin along side and the process is repeated; increasing maintenance costs and exacerbating other resource issues.

Much of the planning area shows a high amount of previous and current disturbance. Impacts from roads can be reduced or mitigated by diverting water with proper placement of numerous culverts, or using techniques such as out-sloping, water bars, road placement, etc. Techniques to disconnect the road from natural water flow paths to minimize road-water interaction were rarely considered historically or were inadequate, and should be designed during route construction.

Dirt routes that are traveled when wet are a severe problem to land management agencies. Impact severity or effectiveness of mitigation is further affected by season of use, type of use, amount of use, etc., when considering change to water cycle characteristics. For example, a melting snow pack might soak into a road somewhat but tracks through the snow serve as additional conduits for water delivery and sediment. "Best management practices" should be implemented for new road construction as well as maintenance of existing roads.