

**CATEGORICAL EXCLUSION WORKSHEET:
RESOURCE CONSIDERATIONS**

Hydrology

Derby Mesa Project

Eagle/Holy Cross Ranger District

White River National Forest

Input provided by Katie Buchan (March 2020), updates by Mark Weinhold (June 2020)

Affected Environment

The Proposed Action activities are located within Deer Creek-Derby Creek sixth level sub-watershed (HUC 140100011203). Deer Creek is tributary to Derby Creek; Derby Creek is a tributary to the Colorado River. Within the watershed irrigation ditches divert significant amounts of water for downstream consumptive uses. This watershed is not considered a municipal watershed (USFS 2002). The Forest Plan requires that management activities maintain and protect identified beneficial uses (FSH 2509.25, Ch. 20).

Stream Health

Stream health is measured by physical habitat and aquatic biology. Habitat condition is quantified by channel features such as streambed sediment, pool depths, streambank stability and wood frequency (where applicable). Where site specific data exist, this is done by comparison to a minimally disturbed reference reach. For this project, there is only one perennial stream reach, which is buffered from project activities, so a broader approach using the National Watershed Condition Assessment (WCA) and the Watershed Conservation Practice Handbook (WCP, FSH 2509.25) is used. The WCP is a region 2 supplement to ensure all state and federal laws and regulations are met. All projects must “maintain or improve” existing stream health. The WCA is a coarse-level metric used to assess cumulative impacts from a variety of management actions to determine existing watershed condition at the sub-watershed scale. The Deer Creek-Derby Creek watershed is rated Functioning Properly in the WCA, and only rated fair for water quantity and poor for road and trail conditions and aquatic biota. This is mainly due to 1) water diversions 2) road/trail densities and the proximity of roads/trails adjacent to waterbodies (figure 1), 3) condition and presence of aquatic biota (USDA, 2011). The project area is on a relatively dry mesa with exposed bedrock near the ground surface. As such the drainage density is very low; there is only one perennial stream within the project boundary and very few intermittent channels.

Water Quality

There are no known water quality problems that exist within the project areas. No streams are listed on the 303(d) list of water quality limited waters (CDPHE 2020). No recent monitoring has occurred for fecal coliform, nutrients or temperature. All watersheds in the project boundary have some non-point sediment sources due to the proximity of roads to streams, cattle grazing, dispersed recreation and illegal vehicle routes.

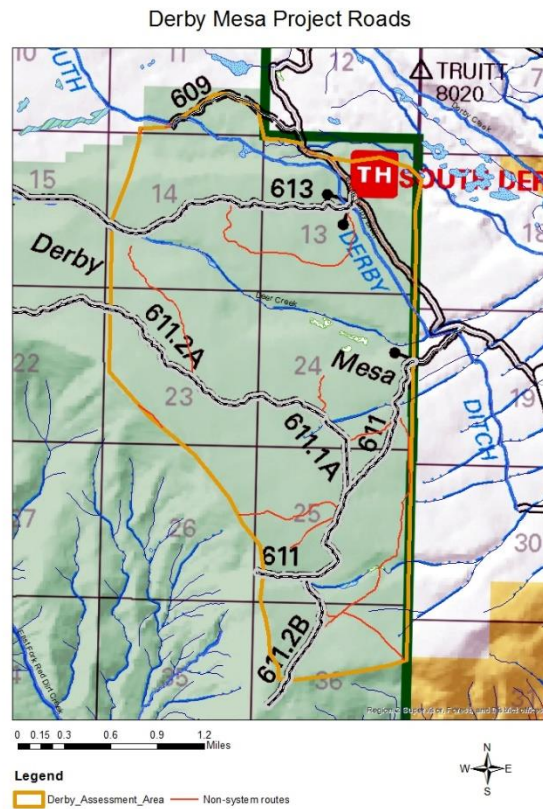


Figure 1. Project area map

Table 1 displays existing road/trail density by watershed as well as an estimate of past timber harvest using the FACTS database. Past vegetation treatments have occurred in the project area, representing approximately 15% disturbance of the Deer Creek-Derby Creek watershed. When a watershed approaches a disturbance level of 25 percent, detectable changes in water yield and peak flows could result in scour, bank instability and other stream channel adjustments (USDA 2006; Troendle and King 1985; Troendle *et. al.* 1998).

Road/trail densities greater than 1 mile/mile² but less than 2.4 miles/mile² are rated fair or functioning at risk due to a moderate probability that the hydrologic regime is substantially altered by the density and distribution of roads within the watershed (USDA, 2011). When more than 25 percent of road/trail miles are within 300 feet of water there is a higher probability of hydrologic connection and connected disturbed area; this results in a trend toward impaired hydrologic function.

Table 1: Road/trail density and past harvest history Deer Creek-Derby Creek on National Forest System (NFS) lands.

Watershed	Drainage Area (ac) NFS lands	Miles open road/trail	Road/trail density (mi/mi ²)	Road/trail proximity within 300' of water (%)	Past Harvest History(%)
6th- Deer Creek- Derby Creek	8976	18.2	1.3 (fair)	90% (poor)	Approximately 15%
Derby Mesa Project Area	3377	7.56	1.4 (fair)	18% (fair)	n/a

Cause-Effect Relationships

Direct and Indirect Effects: Direct and indirect effects would be caused by the mechanical removal of vegetation, construction and use of skid trails and landings, mechanical site preparation, slash pile burning, prescribed broadcast burning, maintenance and/or reconstruction of existing roads, and construction of temporary roads. The direct and indirect effects resulting from these activities would include soil compaction, reduction in fine organic surface material, soil scorching in areas, surface and sub-surface flow path alterations, runoff increases, erosion, and sedimentation.

Timber harvest removal activities would reduce basal area and disturb the soil. This could result in a reduction in evapotranspiration, infiltration, and storage of water which can lead to increased runoff. Harvesting impacts the understory regeneration and removes the tree boles, increasing water yields.

Prescribed burning removes a target vegetative layer and can cause soil heating. Burning under appropriate fuel moisture and soil moisture conditions reduces the intensity and minimizes any localized effect.

The use of and improvement of non-system routes and creation of temporary routes could increase the erosion and sedimentation potential of these roads (Foltz et al. 2009; Perez and MacDonald 2017a) which would increase the connected disturbed area (*e.g.*, high runoff areas that allow excess sediment to enter a stream). Increased connected disturbed areas would increase sedimentation to the stream network. The potential net result of increased runoff and sedimentation is degraded stream/riparian health and water quality. The existing road/trail density and proximity to water can magnify this increase by more efficiently routing water to stream channels through interception of subsurface flows and by extending the channel network (Wemple and Jones 2003). Returning non-system routes and temporary roads to a hydrologically self-maintaining state by actively decompacting, recontouring where appropriate, revegetating and barricading them would help to minimize this interaction.

Stream Health

Sedimentation, Pool Depth and Water Quality

Timber harvest, road maintenance/reconstruction, skid trail construction and high severity burn are used as indicators to evaluate the effects to stream health. Several design features limit the potential extent and likelihood of effects to stream and wetland health. These include limiting the amount of temporary roads and avoiding crossings of stream channels, limiting burning

intensity and coverage, maintaining Water Influence Zone (WIZ) buffers and avoiding unstable geology. In particular, the utilization of these buffers minimizes ground disturbance near streams and wetlands and serves as a mechanism to filter and trap mobile sediment or nutrients from disturbed ground, as well as maintain shade, infiltration capacity, nutrient balance, organic cover, etc. in the WIZ. No significant increase in sediment delivery or runoff to streams is anticipated from project activities since Deer Creek and Derby Creek are the only perennial streams and both will be buffered from project activities with water influence zone buffers.

Channel Stability

Streambank stability could be affected by changes in water yield and peak discharge from vegetation removal during timber harvest or burning, construction of permanent/temporary roads and loss of organic cover in soils. However, there are no proposed new road stream crossings, planned vegetation harvest is below 25% and low severity prescribed fire is planned; thus no increase in water yield and peak discharge are expected to impact stream banks.

Wood Frequency

Timber harvest, road construction and high intensity burning within the WIZ can result in a decrease of large wood frequency and associated pool habitat. No harvest, high intensity fire or road construction is proposed within the WIZ; thus no change in wood frequency is expected to occur.

Wetlands

Wetlands are present within the project area, but the proposed activities would avoid wetlands and not impact their function. A map of known wetlands has been provided.

Since there would be no significant effects to the metrics described above, there would be no significant direct or indirect effects to stream health and wetlands. Thus the project activities are consistent with the water and riparian standards in the Forest Plan.

Cumulative Effects: The spatial scale for considering cumulative effects to Derby Creek and Deer Creek are the watershed boundaries for the respective streams; the temporal scale is within 5-10 years after project activities are complete. Past, present and reasonably foreseeable actions largely center on water diversions for use on private land, cattle grazing, vegetation management and recreation use. As discussed previously, the proposed activity's contribution towards cumulative effects in sediment delivery, water yield and changes to peak flows would be minimal. Since there are no significant direct or indirect effects, there would be no cumulative effect and long term stream and wetland health is expected to be maintained.

Regulatory Framework

Management Guidance: A variety of laws, executive orders, regulations, and policies guide management of water resources on all National Forest System (NFS) lands.

- The Organic Act (16 USC 475) recognizes maintenance of favorable conditions of flow as one purpose of the NFS. This includes retaining the "sponge and filter" quality of watersheds which absorb and store water, and naturally regulate runoff (USDA, 2006).

- The Clean Water Act (33 USC 1251 etc.), as amended, intends to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Required are 1) compliance with State and other federal pollution control rules, 2) no degradation of in-stream water quality needed to support designated uses, 3) control of non-point source water pollution such as by using conservation or best management practices, 4) federal agency leadership in controlling non-point pollution from managed lands, and 5) rigorous criteria for controlling discharge of pollutants into waters of the United States.
- The National Forest Management Act prevents watershed condition from irreversible damage and protects streams and wetlands from detrimental impacts to ensure land productivity. *Timber must be harvested only where soil, slope, and watershed conditions are not irreversibly damaged... and streams, lakes, and wetlands, and other water bodies are protected from detrimental impacts.* The overall goal of managing the National Forest System is to sustain the multiple uses of its renewable resources in perpetuity while maintaining long-term productivity of the land (FSH 2509.25).
- Executive Order 11988 directs federal agencies to take action to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains.
- Executive Order 11990 requires federal agencies to avoid to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands. Where practicable, direct or indirect support of new construction in wetlands must be avoided. Federal agencies are required to preserve and enhance the natural and beneficial values of wetlands.
- The Land and Resource Management Plan (LRMP) for the White River National Forest (USDA, 2002) sets standards, guidelines and management directives related to management of water resources on NFS lands. The LRMP incorporates the Watershed Conservation Practices (WCP) Handbook (FSH 2509.25), which provides measures to meet legal requirements including the Clean Water Act.

Extraordinary Circumstances: Floodplains, wetlands, or municipal watersheds;

Extraordinary Circumstances Determination:

Would not have extraordinary circumstances associated with the Proposed Action.

Explain Determination:

Floodplains, wetlands, and municipal watersheds are present, but the degree of the potential effects on these resources is expected to be minimal since no activities are proposed within a 100 ft. buffer of these areas.

There would be no long-term adverse impacts to floodplains or the ecological processes that maintain them since they are all buffered from ground disturbing activities. Similarly no wetlands would be destroyed or lost since the project is designed to avoid them. Finally, the project area is not part of any municipal watershed.

Spatial Data

Some additional spatial data concerning wetlands was mapped by the Colorado Natural Heritage Program. These data, as well as a .pdf map of the known wetlands, are included in the project folder. All other spatial data are corporate layers in the White River National Forest GIS directories.

Design Features

#1	Manipulate drainage from temporary roads and other disturbed areas using natural topography, rolling dips, waterbars, ditch-relief culverts, etc., to disconnect disturbed areas from streams.
#2	Limit construction of new temporary roads to a total of five miles, all of which would be decommissioned upon project completion. No road crossings of Deer Creek or any perennial tributaries is permitted.
#3	Build temporary roads to shed water rather than concentrating water on the road surface or in ditches. Where practical, and as seasonal conditions warrant, install cross drains in roads to disperse runoff into filter strips and minimize connected disturbed areas.
#4	For temporary roads that will be operated for more than one season, install additional waterbars near stream crossings at the end of the operating season to prevent sediment delivery to streams during the off-season.
#5	Design stream crossings to maintain channel dimensions per the requirements of the Watershed Conservation Practices Handbook (FSH 2509.25). Do not use culverts less than 18-in diameter to cross any stream channel. Install stream crossings on straight and resilient stream reaches, as perpendicular to flow as practicable.
#6	Do not install culverts during spring runoff, or during periods of heavy precipitation.
#7	Rehabilitate temporary roads when project is complete by: Ripping and seeding the road surface; Removing all culverts; Removing all fill from stream channels, and re-contouring stream banks to the original geometry; Installing additional cross drains and/ or outsloping to reestablish natural drainage patterns;
#8	Locate and construct log landings to minimize the amount of excavation needed and to reduce the potential for soil erosion. Design landings to drain water to undisturbed soils rather than retaining water or draining to streams. After use, treat landings to disperse runoff, prevent surface erosion, and encourage revegetation.
#9	Keep logging slash and debris out of ditches and drainage channels.
#10	Retain live and dead trees within 100 feet of perennial and intermittent streams, lakes, and inventoried ponds, except within designated stream crossings, or as otherwise specified to meet safety requirements.
#11	Locate all landings and skid trails at least 100 feet away from perennial and intermittent streams.
#12	Keep heavy equipment out of streams except to cross at designated points, build crossings, or do restoration work, or if protected by at least 1 foot of packed snow or 2 inches of frozen soil.
#13	Keep ground vehicles out of wetlands unless protected by at least 1 foot of packed snow. Do not disrupt water supply or drainage patterns into wetlands.
#14	Locate vehicle service and fuel areas on gentle upland sites at least 100 feet away from streams to prevent pollutants from contaminating water.

#15	For re-construction of Forest System Roads, apply road surfacing near stream crossings as needed to minimize sediment delivery to streams.
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References

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