



United States
Department of
Agriculture

Forest
Service

March 31st, 2014



Swan River Stream Restoration

Environmental Assessment

**Dillon Ranger District
White River National Forest**

Summit County, Colorado



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PURPOSE AND NEED FOR ACTION

The purpose of this proposal is to reconnect surface continuity between the three main tributaries within the Swan River watershed; this would restore over 15 miles of hydrologic function. Reconnecting the tributaries would provide an opportunity to restore a meta-population of native cutthroat which would create a need to prevent non-native brook trout from migrating upstream into newly created habitat. Associated with this project is also the need to address a variety of recreation uses within the project area such as hiking, mountain biking, and ATV use as well as impacts to stream health from current road and stream crossings.

This action is needed because:

- Historic dredge boat mining on private, town, county, and National Forest System(NFS) lands degraded the mainstem Swan River up to the confluences of the North Fork, Middle Fork, and South Fork Swan River tributaries.
- Surface continuity between these three tributaries has been completely lost due to dredge mining. Fish migration can no longer occur between these three tributaries.

Recreation along the Tiger Road is very high and includes both summer and winter activities. Recreation would increase due to the implementation of this project. There is a need to address parking use in the project area as well as current roads within the project area that are impacting stream health of the Swan River; specifically the access road across the Swan River into Muggins Gulch.

Future conditions would include a healthy, functioning stream and riparian corridor on the private, county, town, and NFS properties which would provide surface continuity and fish migration between the three main tributaries. Tributaries are on National Forest System lands.

Collaboration with multiple stakeholders has been ongoing for the past three years. Restoration and collaboration is a high priority for the White River National Forest. The stream design has been completed and public access easements with two private landowners are being secured. An environmental analysis is now needed to help guide implementation. Public involvement, collaboration with state and local governments and private entities, as well as partnership support, has all been vital to the success of this planning effort. Collaboration spanning over three years has been instrumental in completing this planning effort. Partners to date include: Rock Island Land Co., LLC, Good Times Adventures, LCC, Trout Unlimited, Blue River Watershed Group, Friends of the Dillon Ranger District, Colorado Watershed Conservation Board, Colorado Parks and Wildlife, Everest Materials, Town of Breckenridge, as well as Summit County government. Without the support and engagement from the above entities, this project would not be possible.

This action responds directly to the following goals and objectives outlined in the Forest Plan:

Goal 1 - Ecosystem Health, Objective 1a: Improve and protect watershed conditions to provide the water quality and quantity and soil productivity necessary to support ecological functions and intended beneficial uses (See Forest Plan, page 1-3).

Goal 1 - Ecosystem Health, Objective 1a, Strategy 1a.2: Annually identify priority watersheds for improvements in water quality and watershed condition and designate watersheds for special protection of human health, public uses, and aquatics ecosystem values. Where appropriate, prioritize watersheds for treatment in collaboration with federal, state, tribal, and private land owners. (See Forest Plan, page 1-3).

Goal 1 - Ecosystem Health, Objective 1a, Strategy 1a.3: Over the life of the plan, use collaboration with State and local governments and other interested parties, available tools, authorities, and strategies that appropriately consider state law and the interest of holders of existing water rights to achieve desired conditions for aquatic and stream-base resources. Prioritize needs based on resource values, risks, and opportunities. (See Forest Plan, page 1-3).

Goal 1 - Ecosystem Health, Objective 1b: Provide ecological conditions to sustain viable population of native and desired nonnative species and to achieve objectives for Management Indicator Species (MIS). (See Forest Plan, page 1-3).

Goal 1 - Ecosystem Health, Objective 1c, Strategy 1c.10: Link subpopulations of cutthroat trout to create meta-populations. Expand and improve occupied habitat through activities such as removing exotic trout species from cutthroat habitat, constructing barriers to prevent invasion or reinvasion of exotic species into occupied habitat, increasing deep pool habitat, enhancing quantity of large wood debris and other physical habitat features. (See Forest Plan, page 1-6).

Goal 2 - Multiple Benefits to People, Objective 2a, Strategy 2a.6: Through the active promotion of partnerships with state and local governments, private parties, and organizations, encourage, establish, and sustain a diverse and well-balanced range of recreational services and facilities on the forest. (See Forest Plan, page 1-10).

Goal 5 – Public Collaboration, Objective 5a: Work cooperatively with individuals and organizations, local, state, tribal, and federal governments to promote ecological, economic, and social health and sustainability across landscapes. (See Forest Plan, page 1-15).

Environmental consequences on lands and activities administered by other Federal, State and local jurisdiction resulting from the proposed action have been disclosed in this Environmental Assessment (EA). Through consultation, other Federal, State and local jurisdictions have assisted in the disclosure of environmental consequences and development of alternatives to the proposed action.

The Forest Service decision relates only to lands administered by the Forest Service and will be documented in the Decision Notice. Decisions by other jurisdictions to issue or

not issue approvals related to this proposal may be aided by the disclosure of Impacts available in this document.

PROPOSED ACTION AND ALTERNATIVES

This EA includes two alternatives, the No Action and the Proposed Action.

No Action

The "No Action" alternative is required by the National Environmental Policy Act (NEPA) (40 CFR 1502.12). This alternative provides a point of reference for evaluating the environmental effects of Alternative 2.

The No Action alternative represents the current condition. The status of the dredge piles and Swan River would remain the same. The Tiger parking lot would not be increased in size and the Muggins Gulch road would remain in its existing condition with no new utility authorization. The broader goals of reconnecting the three tributaries of the Swan River watershed would not be met. No ground disturbance would occur with the No Action alternative.

Proposed Action

The proposed action would include a variety of project elements including: 1) stream, riparian, and upland restoration activities, 2) road projects including decommissioning, expansion of an existing parking lot, and creation of a new road and trail, 3) fish barrier construction, and 4) a hiking trail near the Swan River; all project elements are within a mixed ownership of private, county, town, and NFS lands. Stream and riparian restoration as well as new trail construction on private lands would be within public access easements granted to the USDA Forest Service.

Stream, riparian, and upland restoration activities would occur within a 100 acre valley. Two new miles of stream channel with a 20-25 foot bank-full width would be created. Riparian restoration would occur on approximately 45 acres with upland restoration occurring on approximately 44 acres. New stream habitat would be approximately 26 acres. Heavy equipment would be used to mass excavate the dredge piles within the 100 acre valley and equipment would also be used to create the channel widths and restore riparian and upland habitats. Equipment would also be used to create the fish migration barrier on Tiger Road near Muggins Gulch, which would prevent non-native brook trout from migrating upstream into newly created habitat designated for native cutthroat trout. For a detailed description of stream restoration activities, see "Swan River Restoration Preliminary Design Plan Report" which can be found in the project file at the Dillon Ranger District.

The Proposed Action would also create a new road and stream crossing in Muggins Gulch near its confluence with the Swan River. This would remove a stream crossing through the Swan River that is impacting stream health and the riparian area. Eliminating this crossing would help achieve broader restoration goals. The action would also include

the authority for private road use and utility location in the new road associated with private development in the Muggins Gulch watershed. Additional road projects include decommissioning the current road and stream crossing through the Swan River into the Muggins Gulch area as well as minor road improvements and temporary bridge installation on an existing road that connects FS Rte. 6.2 to FS Rte. 355. This connection route is located approximately one mile upstream from where the current Georgia Pass road (FS Rte. 355) crosses the Swan River through private property. The connection route already exists and there currently is a ford that crosses the Middle Fork Swan River. At a minimum, a temporary bridge spanning approximately 15-20 feet would be installed at the ford crossing to provide a connection route for temporary traffic detours during summer construction, which could last up to four summer seasons. The analysis will also cover the potential to make this a permanent stream crossing. Ground based equipment would be used for both the temporary and permanent crossing. Total ground disturbance for both the temporary and permanent crossing would be less than ¼ acre with little to no tree removal.

The Tiger Trailhead parking lot along Tiger Road would be increased in size to better accommodate vehicle use and parking as the current size does not meet the demand for parking at the site. In addition, the lot will be used to access the newly created hiking trail along the stream. Total ground disturbance would be roughly 0.5 acres (21,000 square feet). The increased capacity would allow an additional ten vehicles with trailers and 34 standard vehicles (e.g., pickup trucks). Heavy equipment would be used for grading. The action would also include the removal of sage brush with minimal tree loss. Soils and vegetation removed for the new parking lot would be reused for stream and riparian restoration.

Lastly, the proposed action would create a new hiking trail from the Tiger Road crossing near Muggins Gulch on Summit County/Town of Breckenridge land up to the South Fork Swan/Georgia Road crossing (FS Rte. 355) on private land. Parking on private land would be under the USDA Forest Service easement and managed by the USFS. The trail would be approximately 1.75 miles in length with a width no more than 24 inches. The trail would be a new creation on the dredge rock with no soil disturbance or tree removal. The trail would be designated for summer and winter non-motorized, non-mechanical use only, with camping and use of firearms prohibited.

Alternatives Considered but Eliminated from Detailed Study

The NEPA process requires that alternatives evaluated in detail be reasonable. Reasonable alternatives include those that are practical or feasible from a technical and economic standpoint and those that use common sense. A discussion of the alternatives considered and the rationale for eliminating them are presented below.

An alternative was developed to provide a parallel route along Tiger Road from the Tiger Trailhead to FS Rte. 354 (NF Swan road) to allow ATV and snow-mobile traffic. This would have potentially decreased user conflicts on Tiger Road with full size vehicles. However the alternative was dropped from further analysis due to the following reasons: 1) there would be unacceptable visual impacts from building a parallel route, 2) there is

no way of determining if proper snow conditions for snow-mobile use would be maintained in the spring, 3) construction of the route would impact steep slopes and small gullies with potential unstable soils, and 4) tree removal would have led to adverse impacts to lynx habitat.

Figure 1: Project Location

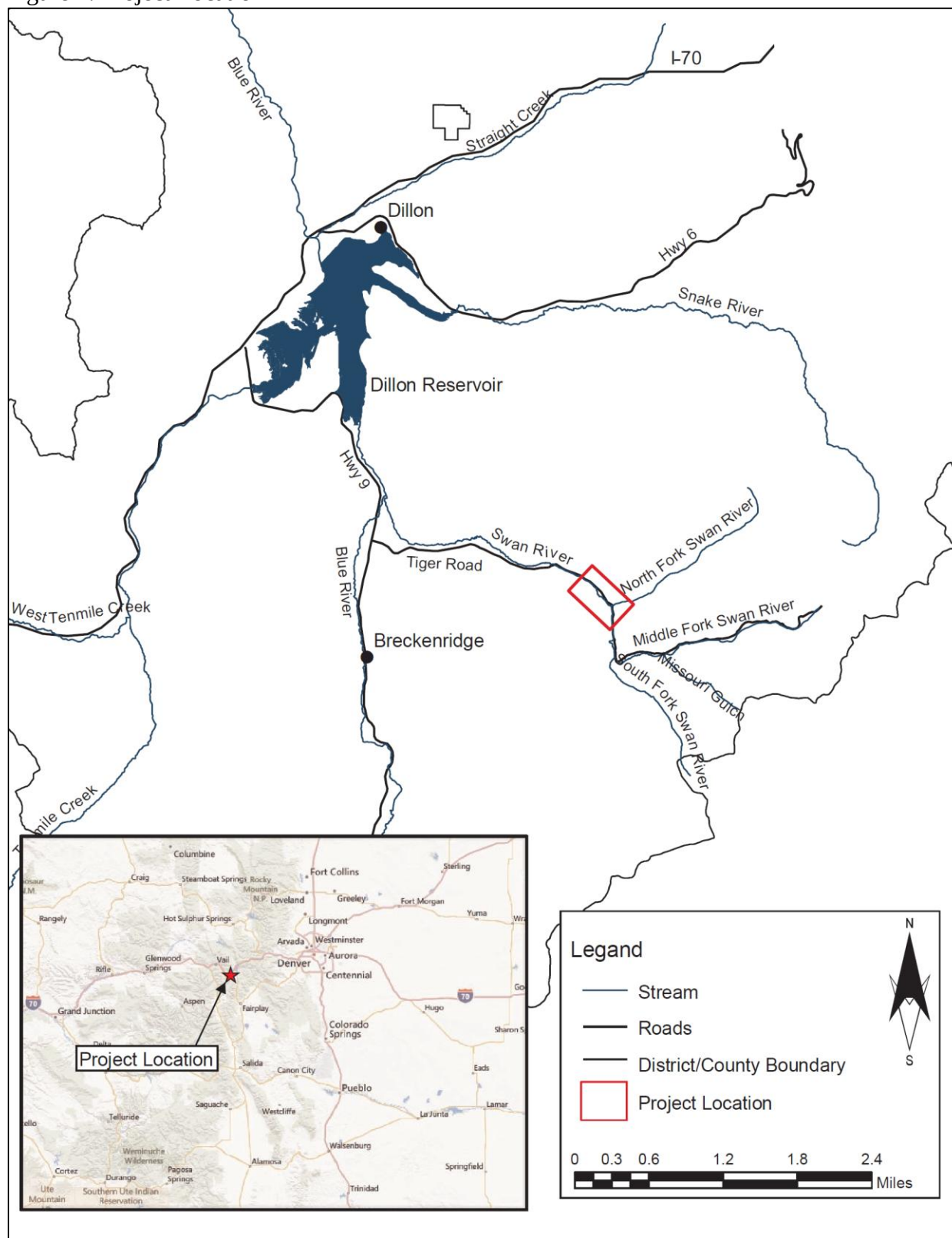


Figure 2: Proposed Action



ENVIRONMENTAL EFFECTS

Botany

Introduction

This section discusses two categories of management status plants including; 1) Threatened, Endangered and Proposed (TEP) Species and 2) Regional Forester's Sensitive Species (RFSS). The purpose of this report is to assess the potential effects of implementing the alternatives, determine their consistency with Forest Plan Standards and Guidelines and determine their compliance with the Endangered Species Act. A Biological Assessment/Biological Evaluation has been prepared for this project and is available in the project file (Proctor 2013a).

Species Considered and Species Analyzed

Pre-field Review: A Geographic Information System (GIS) exercise was conducted in and near the Project Area (PA) to prepare a pre-field review and this analysis. The pre-field review considered the elevation range, eco-region types, vegetation cover types and riparian features present within the PA as well as existing habitat models and any management status plants that were known to occur in the vicinity to determine which management status plant species to evaluate for this analysis.

TEP Plants: No plant species federally listed as Threatened, Endangered, or Proposed (TEP) have known occurrences or suitable habitat within the PA and none were observed during the field reconnaissance specific to this project (Proctor 2012, Proctor 2013b). Because no TEP plant species or their suitable habitat occur in the action area TEP plant species were not carried forward past the pre-field review portion of the analysis and will not be discussed further in this document.

RFSS Plants: Eleven Region 2 sensitive plant species were thought to have potential habitat within the area of influence of the proposed action and were carried forward into field reconnaissance portion of this analysis (Table 1).

Field Reconnaissance: Surveys were adequate to determine that R2 species are absent from the area of influence of the proposed action. The PA was surveyed at a focused intensity by John Proctor (forest botanist) for the 11 target species in July of 2012 and in July and August of 2013. The PA had only marginally suitable habitat for the 11 target species. None were found.

Environmental Effects

No Action: Because none of the proposed activities would be implemented under this alternative, the No Action alternative would have No Direct or Indirect Effects on the 11 RFSS carried forward to analysis.

Proposed Action:

Because surveys were adequate to determine that R2 species are absent from the area of influence of the proposed action the Proposed Action alternative would have No Direct or Indirect Effects on the 11 RFSS carried forward to analysis.

Cumulative Effects:

The alternatives would not directly or indirectly impact any of the 11 species carried forward in this analysis. Therefore implementation of the alternatives would not result in any cumulative impacts.

Table 1: Biological Determinations by Alternative for the 11 Sensitive Plant Species Evaluated.

SCIENTIFIC NAME	<i>No Action</i>	<i>Proposed Action</i>
<i>Astragalus leptaleus</i>	No Effect	No Effect
<i>Botrychium ascendens</i>	No Effect	No Effect
<i>Botrychium lineare</i>	No Effect	No Effect
<i>Botrychium paradoxum</i>	No Effect	No Effect
<i>Carex diandra</i>	No Effect	No Effect
<i>Cypripedium parviflorum</i>	No Effect	No Effect
<i>Eriogonum exilifolium</i>	No Effect	No Effect
<i>Festuca hallii</i>	No Effect	No Effect
<i>Machaeranthera coloradoensis</i>	No Effect	No Effect
<i>Parnassia kotzebuei</i>	No Effect	No Effect
<i>Rubus arcticus ssp. acaulis</i>	No Effect	No Effect

Cultural Resources

Existing Conditions

Area of Potential Effect (APE)

For the purpose of cultural resource evaluation, the proposed undertaking's area of potential effect (APE) is the boundary of the project area's FS access easement (175') plus a 200-foot buffer zone, as well as the parking lot expansion and Muggins Gulch reroute/utility authorization. The APE was evaluated to determine whether cultural resources were present, and, if present, the effect of the Proposed Action on those resources.

Historic archaeological sites in the project vicinity include mining sites, town site locations, railroad grades, placer mining features, ditches and other water control

features, roads and other historic sites related to the early mining and settlement of the area. A cultural resource inventory conducted in 2013 identified no historic properties within the APE. Consultation with the State Historic Preservation Office was completed August 6, 2013.

Environmental Effects

No Action:

None of the proposed activities would be implemented under this alternative; the No Action alternative would have No Direct or Indirect Effects on cultural resources.

Proposed Action:

Since there are no historic properties within the APE, there would be no direct effects from the proposed action. It is possible that there could be an inadvertent discovery due to ground-disturbing activities such as rock removal, realignment of the river channel, and construction of access roads or crossings. Effects could include damage and/or destruction of undiscovered historic properties. To protect undiscovered sites, new archaeological sites found or located as a result of project implementation shall require that the activity cease within the area until the Forest Archaeologist evaluates the site and proposes mitigation.

Recreation

Existing Condition

Summer Trail Uses

Within the project area, there are few developments for recreation use. The highest used site in the summer is the Tiger Trailhead. The site functions as a dispersed campsite and parking area for recreation access. The site consists of an approximately one acre level, bare ground area. There is a buck and rail fence that follows the Tiger Road from the junction with the Rock Island Road and terminates at the east end of the parking area. The main purpose of this fence is to deter camping between the road and the stream. This area is mostly land administered as Summit County Open Space. A buck and rail fence also encloses a ¼ acre area that contains three campsites with stone firerings. For OHV use, this trailhead is a launching point for ATVs, UTVs, and motorcycles accessing the roads that follow the three forks of the Swan River. It also is used for access to the Golden Horseshoe (via the Rock Island Road). Trailers or pickup trucks hauling OHVs are driven to the trailhead by visitors, parked and then the OHVs are offloaded. Some vehicles are parked along the Tiger Road, adjacent to the fence. Because of the width of the road, there are no safety concerns with vehicles parking there in the summer. OHV enthusiasts put on their gear and pack up for a day of riding in the area. Groups coming together to drive high-clearance 4-wheel drive vehicles (e.g., jeeps) often congregate at this site before heading out. A common OHV loop is up the North Fork Road to Garibaldi Gulch, Deer Creek, then down the Middle Fork Road.

Because this is a portal for motorized use to the national forest, a 2-panel travel management kiosk is located at the Tiger Trailhead. It provides information about motorized travel and includes a panel with a map of both motorized and non-motorized routes in the area. Starting in 2014, a District 2-person OHV crew will be monitoring use at this trailhead on a regular basis. They will inspect spark arresters, OHV registration, and noise emissions and will provide information to visitors about responsible recreation. To access the OHV routes on the national forest, OHVs are ridden from the Tiger Trailhead to the roads that access the three forks of the Swan River. The Tiger Road is under easement to Summit County Government for management and maintenance. In this situation, State law that prohibits unlicensed vehicles on County Roads applies. There are established pull-outs located near Muggins Gulch and the North Fork Swan Road that are occasionally used for OHV trailer parking. The large open area where the South Fork Road originates is on private property and has been used for OHV parking in the past, but is currently posted as closed to the public.

There is an outfitter located in Silverthorne that rents ATVs and UTVs to the public. UTVs differ from ATVs in that they have side-by-side seats for two or more people and there is a steering wheel. The customers also rent a truck and trailer that is used to haul the OHVs to the trailhead. Typically, outfitters who offer this service also guide their customers and are permitted by the Forest Service; however, that is not the case for this operation. Because the equipment is not delivered to the National Forest by the outfitter, a special use authorization is not required. Some outfitters in the Denver metro area also rent OHVs and trailers to customers who drive them to this trailhead.

There have been no Forest Service surveys conducted to determine OHV use estimates for this area. Based on anecdotal reports and observations by District employees, average daily and annual summer estimates representing use originating from this trailhead have been determined and are summarized in the following table.

Table 2: Average daily and annual summer estimates representing use originating from the Tiger Trailhead

Type of Vehicle	Average Daily Weekday Use (# vehicles)	Average Daily Weekend Use (# vehicles)	Annual Use (June – October) (# vehicles)
Off Highway Motorcycle	10	20	710 + 720 = 1430
All-Terrain Vehicle (ATV)	5	15	355 + 540 = 895
Utility Terrain Vehicle (UTV)	5	7	355 + 252 = 607
4-WD vehicles (jeeps)	5	10	355 + 360 = 715
TOTAL			3,647

Annually, OHV use typically does not start until after the gates on the forks of the Swan roads are opened. This typically occurs mid- to late June when snowdrifts have melted.

Summer OHV use continues until closed by snow (usually in late October). Wheeled vehicles are prohibited on these roads beginning November 23rd annually.

Some mountain bike riders start out at the Dredge Trailhead, ride up the Tiger Road to the North Fork Road, then on the Colorado Trail back to the Dredge. Other riders continue up the Middle or North Fork roads. Similar to the OHV use, some mountain bikes are transported to the Tiger Trailhead, offloaded, then ridden up the roads or to the Colorado Trail. The annual mountain bike use originating from this trailhead is estimated to be about 500 riders.

Much of the camping at the trailhead is associated with OHV use. Campers use the three designated sites or park RVs in the parking area. There are no human waste facilities at the trailhead. A majority of the camping is with self-contained RVs. Litter accumulation occurs, but not at an unacceptable level. During times of fire restrictions, campfires are not allowed at this site. Vehicles are driven on the Tiger Road to access the dispersed campsites along the three Swan roads. At the south end of the project area, camping is prohibited on Summit County Open Space (South Fork - Parkville) and on private property (Middle Fork).

Fishing

public fishing in the river in the project area is currently low. The tributaries of the Swan River provide habitat for mostly healthy populations of brook trout in the Middle fork and South forks. The public participates in catch and release fishing for cutthroat trout in the North fork. The lower Swan River (non-national forest) provides habitat for brown's trout and brook trout, but access is limited by private property. There are no fishing opportunities for persons with disabilities in the immediate area however; facilities do exist on the Blue River near Breckenridge.

Winter Uses

The Tiger Trailhead is used as an area for a Summit County snow plow to turn around when plowing the Tiger Road. Consequently, the plowing allows for winter recreationists to park at the trailhead. Much of the use is persons riding snowmobiles (an estimated 2,000 people). Similar to summer OHV use, snowmobiles are ridden on the Tiger Road to the three Swan roads which are groomed by a permitted Outfitter / Guide who operates out of a developed facility on private property located on the Tiger Road near the junction with the Middle Fork Road. The Tiger Road is plowed by the outfitter to his facility. This creates a conflict as the snowmobilers parked at the Tiger Trailhead have to ride their snowmobiles on the plowed road to access the Swan Roads. Snowmobiles are driven on the shoulder to avoid areas of exposed ground. When the parking area is full, some vehicles are parked on the Tiger Road adjacent to the buck and rail fence. Although not an issue in the summer, plowing of the road in the winter results in a relatively narrow corridor, therefore, parking in this area does create a safety hazard.

Customers of Good Times Adventures are taken on 1-, 2- or 3-hour guided snowmobile tours on the groomed routes. Over 20,000 visitors participate in this activity. A guided

dog sledding tour operation is also centered at this location which serves about 10,000 people each winter.

An estimated 500 cross-county skiers use this trailhead to access nearby backcountry areas. Some use the routes groomed by the outfitter.

Environmental Effects

No Action Alternative

Recreation uses would continue in the same manner as they have in the past. Fishing use would continue to be low and snowmobile conflicts would continue on the Tiger Road. The winter parking congestion at the Tiger Trailhead would continue.

Proposed Action

The expansion of the trailhead by 0.5 acres would improve parking. In both the winter and summer, vehicles would use this area instead of parking along the road. The safety hazard of parking on the Tiger Road in the winter would be eliminated. Increasing the size of the trailhead is not expected to lead to increased use. If the parking area is full, current users do not turn around and go home or to another location; they find a place to park.

There would be an increase in fishing activities. Visitors to and residents of Summit County would travel to this area for the purpose of fishing. Persons camping in nearby dispersed campsites would also likely fish on the restored river segment. Visitors would use the parking areas provided to access the new fishing trail. It is difficult to estimate the amount of anticipated recreation use, however, based on the fishing that takes place in other parts of the county (such as the Blue River and Ten Mile Creek), there would be an estimated 10 persons per day fishing on a weekday and 25 persons on a weekend day. This use would take place primarily during the summer season (June through September); however, a small amount of use would occur outside of that season.

Although access for persons fishing will be improved by providing a hiking trail, there would be no improvement in access for persons with disabilities. The facilities on the Blue River would continue to be the closest and best opportunity for that activity. With the establishment of a popular fishing opportunity, there would be a need to increase patrols for education and enforcement of both Federal and State regulations. The local Colorado Parks and Wildlife (CPW) officer would add this location to the patrol schedule, specifically to check for fishing licenses and compliance with State fishing regulations. The District OHV crew will be in this area on a regular basis and would be available to assist with making visitor contacts and enforcing Federal regulations. The District Law Enforcement Officer also patrols this area.

Also, with the increased use there would be increased incidents of littering as well as abandoned fishing line. Visitor contacts by Forest Protection Officers would include requests to pack out all garbage. With no nearby toilet facilities, there may be an increase

in human waste. FPO and CPW contacts would also include information about proper human waste disposal in the forest.

The fishing access trail would not be marked in the winter, however, with any trail that is used in the summer, there is a possibility that some people may use the fishing trail for cross-country skiing and snowshoeing in the winter. Because of the narrow trail tread, the trail would not necessarily provide an improved winter opportunity. The area is already open to non-motorized uses. Instead of dispersal, the use may be concentrated along the trail corridor because the local public may be familiar with the trail location.

Cumulative effects

The scope of the cumulative effects upon recreation resources includes the area adjacent to the three forks of the Swan River, the Golden Horseshoe, and the project area. The Golden Horseshoe is an approximately 8,000 acre area managed jointly with the Town of Breckenridge and Summit County.

Because the increased size of the Tiger Trailhead parking area is not expected to result in an increase in use, there would be no cumulative effects. The areas that this trailhead serves would not be impacted by a larger trailhead.

Because of an expected increase in fishing by the public in the project area, this use would also be expected to overflow into the forks of the Swan. New visitors to the area would explore the upper reaches of these streams. This could result in more dispersed camping as visitors may want to spend more than one day in the area. With increased camping, there would be additional incidents of litter and unattended or abandoned campfires. There are no fishing opportunities in the Golden Horseshoe, therefore, there would be no cumulative effects within the Golden Horseshoe area.

With the expected need for concentrated law enforcement patrols, there would be increased opportunities to contact visitors at the Tiger Trailhead. This would increase the number of contacts with persons recreating in the Golden Horseshoe and forks of the Swan and potentially improve compliance with regulations such as those that involve campfire safety, travel on designated routes, and firewood cutting.

Wildlife

Introduction

This is the Wildlife Report for the Swan River Restoration Project, located in the Dillon Ranger District, White River National Forest, Summit County, Colorado. This report includes an analysis for Region 2 Sensitive Species and Management Indicator Species as well as federally threatened, endangered, and proposed species. The proposed project is simple and straightforward in that there would be no effects on any of these species from the proposed project.

There has not been prior informal or formal consultation with the USFWS on the proposed project. An updated list of federally threatened (FT), endangered (FE), proposed, and candidate species that occur on the Dillon Ranger District, White River

National Forest (WRNF) was received from the USFWS on 12/5/13 as part of the Level One Team Streamlining process.

Environmental Effects

No Action

There would be no changes to the existing conditions through the no action alternative and therefore no impacts to any threatened, endangered, sensitive or MIS species.

Proposed Action

Threatened and Endangered Species

Canada lynx is the only federally listed species that has the potential to occur in and around the proposed project area. No lynx habitat or lynx prey habitat would be manipulated or affected through the proposed action. For these reasons, the proposed action would have **NO EFFECT** on Canada lynx.

Region 2 Terrestrial Sensitive Species

The current list (11/19/2012) of Region 2 Terrestrial Sensitive Species was reviewed. A small amount of sagebrush would be removed for portions of the proposed project which could disturb nesting songbirds, and potentially the Brewer's sparrow. A field review would be adequate enough to determine if this species is present, and if so, timing restrictions may be necessary to avoid impacts to nesting Brewer's sparrows. Individuals may be impacted through construction activities associated with the re-route of Muggins Gulch Road and the expansion of the Tiger Run parking lot. These disturbances would be temporary and, if nesting sparrows are suspected through a field visit, could be avoided entirely through the Forest Plan recommendations for timing.

The proposed project would not occur in habitats that are suitable for other Regionally Sensitive Species; therefore no impacts are anticipated for these species.

MIS species

The only MIS species that could potentially occur in or near the proposed project area are elk. The proposed project would not have any impact on this species. This project would have no impact to elk at the local level, the DAU 13 level, or at Forest wide MIS level.

Soils

This section describes how implementation of the Swan River restoration project would affect soil resources (or lack thereof) in the project area. This analysis is somewhat unconventional in that for the majority of the project area, past mining activities removed all soil from the site, leaving behind a rocky (predominantly alluvial sand, gravel and cobble) substrate that is not capable of supporting vegetation. For the purposes of the proposed action, this analysis will focus largely on detailing how a suitable growth medium can be imported and augmented to provide a substrate that meets regulatory standards and thresholds for human and aquatic health, in addition to providing necessary

nutrients, water-holding capacity, and physical structure for plant species selected for the overall site restoration.

The proposed Swan River Restoration Project can affect soil resources through the importation and creation of a growth medium that is not from naturally occurring, *in situ* processes. Soil importation/creation can introduce potential contaminants to the local environment in the form of heavy metals, microbiological pathogens, and weed seeds if attention is not paid to these material constituents and the import sources/production processes.

Indicators

The specific analysis indicators used to evaluate the effects of the proposed action on soil quality include:

- Heavy metal content of imported/created soil media
- Soil-borne pathogen levels of imported/created soil media
- Weed-seed viability within imported/created soil media

Temporal Scope

This analysis focuses on a timeframe ranging from the 1890s until 2024; this timeframe allows the analysis to incorporate historical information, recent monitoring studies and extends into the reasonably foreseeable future. Soil and soil amendment (i.e. compost, biochar) analyses will be required as sources and producers are identified throughout the project implementation, starting in 2014.

Affected Environment

Soil and Geologic Resources

The project area lies about 80 miles west of Denver, Colorado near the town of Breckenridge. The geographical scope for the watershed resources analysis includes the proposed restoration area (approximately 100 acres) and the sub-basin within Swan River Watershed that is upstream from the restoration area. Figures 3 and 4 provide a general overview of the terrain and vegetative cover of the project area and its environs.

Figure 3: General vicinity map of project area (in yellow); note the dominance of bare-ground/rock cover



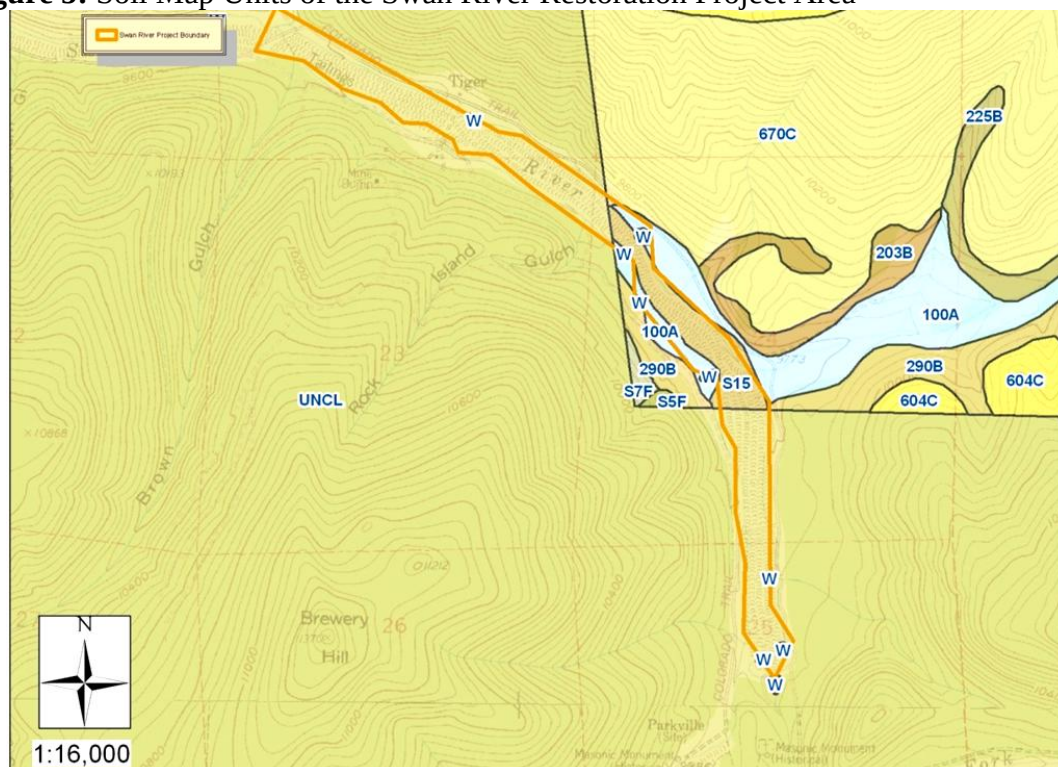
Figure 4: Closer view of general land cover types in and around project area boundary (in yellow)



Soil Resources/Inventory

Figure 5 depicts the areas mapped for portions of the project area that are on National Forest lands; for the bulk of the analysis area (in orange), soil mapping information is on private land and found on the NRCS Summit County Soil Survey. Areas mapped as “UNCL” on the unpublished Holy Cross Area Soil Survey (USFS, 1993) are those found on private land, with data available for use and management decisions on the NRCS Web Soil Survey (Soil Survey Staff, 2014). The soil map unit “S15” that represents the main channel body for this portion of the Swan River is a miscellaneous land type (i.e. a non-soil map unit) called “Placer Diggings”; this is useful information in that the soil survey recognized there is essentially no soil in place where dredging operations occurred. The soil map units surrounding the S15 polygon shown in Figure 3, particularly map unit 100A (Cryaquolls-Borohemists) and 290B (Leighcan family), represent soil types that could likely be found in the area if mining had not occurred. For the riparian area represented by map unit 100A, a mix of productive mineral (Cryaquolls) and organic (Borohemists) wetland soils could reasonably be expected to occur. These areas would likely be surrounded by less productive soils found in Map Unit 290B; for this unit, rocky, low-fertility soils (loamy-skeletal Typic Dystrocypts of the Leighcan family) usually form on slopes of decomposing bedrock and support a lower density and diversity of vegetative growth.

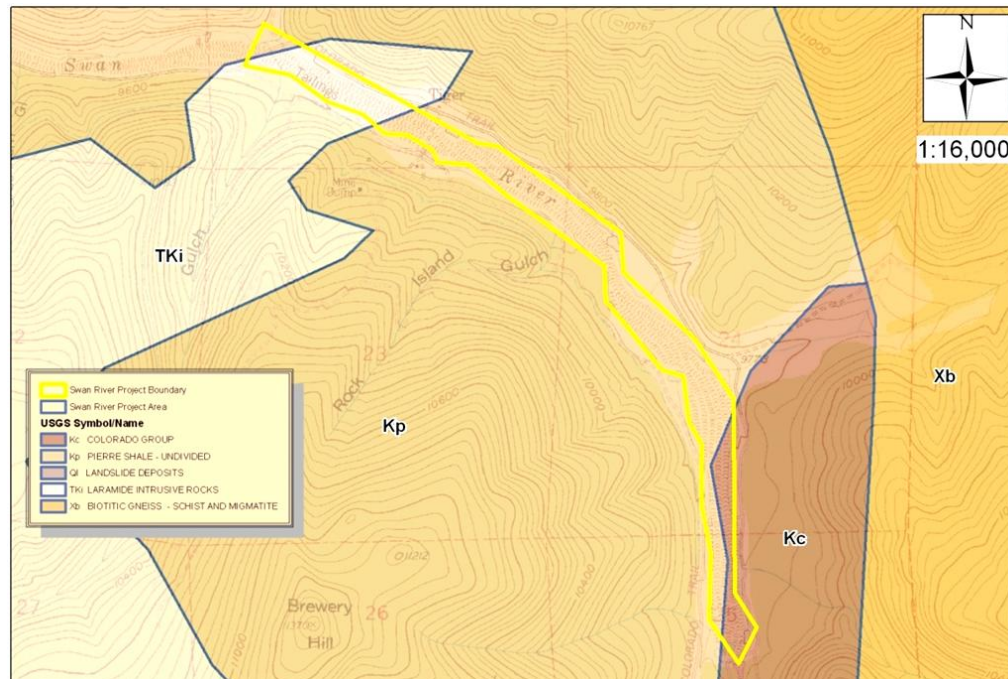
Figure 5: Soil Map Units of the Swan River Restoration Project Area



Geologic Resources/Inventory

Figure 6 shows the diverse age-range and lithological influences of the project area and surrounding environment; younger Quaternary (last 10,000 years) and Tertiary (35-55 million year old) deposits blanket the current ground surface that is underlain by much older Cretaceous (~ 75-150 million year old) and Precambrian (~ > 500 million year old) bedrock deposits. Cretaceous-aged Pierre shale (Kp) and Colorado Group (Kc) deposits are mapped to underlay much of the project area, which is beneficial from the perspective of maintaining water in the restored channel and local groundwater deposits.

Figure 6: Bedrock Geology of the Swan River Restoration Project Area; adapted from Tweto (1983).



Environmental Effects

No-Action Alternative

Under the no-action alternative, the proposed floodplain, channel and wetlands restoration work not occur. The current condition of a lack of a soil substrate capable of supporting vegetative growth would not change, such that the area would continue to be barren and incapable of providing wildlife habitat or refuge.

Proposed Action

Soil Quality/Quantity

Design plans for the proposed action call for the importation of approximately 65,000 cubic yards of mineral soil material to revegetate nearly 45 acres of upland and 44 acres of riparian habitat. The volume required could be revised based on both the area that is deemed necessary for soil importation and the soil application rate developed based on field-based observations and calculations. To apply a 3-inch thick layer of soil evenly

across a surface area of 1 acre, 400 cubic yards per acre are required. This thickness may be appropriate for establishing native grass populations in selected areas, but for deeper-rooted shrubs and riparian species, a 6-inch (or more) thick layer may be deemed necessary to create a suitably-deep layer for re-vegetation. In this case, application rates would be in the 800 cubic yards per acre (or more) range and would require associated increases in material and transport costs.

Currently identified soil sources include excavated soil from the Excel Energy Ptarmigan substation and substrate by Everest Materials, LLC. Compost would be locally available from the Summit County Resource Allocation Park (SCRAP) facility near Keystone, Colorado. Several biochar sources can currently be found on the Front Range of Colorado, including Biochar Solutions Inc. in Lafayette (Jonah Levine) and Biochar Now LLC (James Gaspard) in Loveland.

Project design criteria and thresholds for heavy metals contained in Table 3 will be applied to ensure materials meet regulatory standards pertinent to the purpose and need of the revegetation component of the proposed action. Soil and/or compost material applied to the Swan River Restoration site shall be compared with this table to reach suitability determinations; deviations from these standards must be approved by the Project Manager in conjunction with the Forest Soil Scientist.

- 1) Soil and soil amendments shall be free of weed seed and may be subjected to weed viability testing, as deemed necessary by project resource specialists. Weed monitoring and treatment will occur subsequent to project implementation.
- 2) Weed treatment, contracted or otherwise, may be necessary pending vegetation monitoring of restored riparian and upland areas.
- 3) Soil and soil amendments shall pass relevant vector attraction and pathogen reduction standards set forth in the United State Environmental Protection Agency's 503 Biosolids regulations and may be subjected to laboratory analyses for these parameters.

Table 3: Relevant Comparisons for Metals Concentrations of Imported Soil/Soil Amendments for the Swan River Restoration Project

Metal	EPA 503.13 Pollutant Concentrations (mg/kg)	CDPHE Residential Standards (mg/kg)	EPA Background Metal Concentrations in Western US Soils (mg/kg); 50th percentile	Common Range for Soils (mg/kg)- Lindsay, 1979
Ag/Silver	NA	390	0.7	.01-5
Al/Aluminum	NA	77000	58000	10,000 - 300,000
As/Arsenic	41	NA	6	1-50
Ba/Barium	NA*	15000	620	NA
Cd/Cadmium	39	70	0.5	.01-.70
Co/Cobalt	NA*	23	9.8	NA
Cu/Copper	1500	3100	22	2-100
Hg/Mercury	17	0.85	NA	0.1-0.3
Ni/Nickel	420	NA	NA	NA
Pb/Lead	300	400	18	2-200
Se/Selenium	100	390	0.3	0.1-2
Zn/Zinc	2800	NA	NA	NA

This analysis largely focuses on the conversion of over 100 acres of currently bare ground (dominated by cobble-sized rock deposits from past dredge mining activities) to a complex of riparian and upland vegetation through restoration efforts that are the main goal of the project. It is important to note that the overall footprint of land covered in the decision tied to this analysis will be lower than the aforementioned 100 acre estimate; actual acreage of National Forest land applicable for the analysis is smaller given private inholdings and easements that fall within the larger overall project area.

Cumulative effects

Past mining actions have had a decidedly dramatic effect on soil resources of the area, resulting in a virtually complete loss of the soil base within the riparian zone of this portion of the Swan River. Soil is a very slowly renewable resource as estimations for rates of soil formation range from .0056 cm to .00078 cm a year (Alexander, 2006). Globally, rates of soil formation are not keeping pace with erosion, leading to widespread soil loss that is due in part to past mining activities (Wakatsuki and Rasyidin, 1992). In this sense, mining-induced erosion is an irreversible and irretrievable commitment of resources (in this case, by putting soils back into the project area, soils had to be taken from someplace else). The proposed action seeks to offset the effects of past and present actions by mitigating past soil losses through the importation of locally-sourced mineral and organic soil materials that will ultimately create a new medium for the area.

Water Resources/Hydrology

This section describes how implementation of the Swan River restoration project would affect streams, riparian areas, runoff and wetlands.

Stream restoration work affects stream morphology, stream health and riparian habitat quality. Because proposed restoration activities would increase vegetative cover and create new open water, runoff and water yield would also be affected.

Indicators

The specific analysis indicators used to evaluate the effects of the proposed Swan River restoration project include:

- Stream Health (evaluated in categories)
- Riparian habitat conditions (evaluated as acres exhibiting desired conditions)
- Water yield and runoff (calculated in acre-feet)
- Water quality (evaluated as the ability of waterbodies to support designated beneficial uses)
- Wetlands impacts (evaluated as acres affected)

Temporal Scope

This analysis focuses on a timeframe ranging from the 1890s into to 2024. This timeframe allows the analysis to incorporate historical information, recent monitoring studies and extends into the reasonably foreseeable future.

Affected Environment

Watersheds and streams

The project area lies about 80 miles west of Denver, Colorado near the town of Breckenridge. The geographical scope for the watershed resources analysis includes the proposed restoration area (approximately 100 acres) and the sub-basin within Swan River Watershed that is upstream from the restoration area. This sub-basin includes all of the terrain that drains to the Swan River upstream from the Tiger Road crossing (not including Brown Gulch or Muggins Gulch) and comprises 14,679 acres. Elevations within this watershed range from 9,600 to over 13,900 feet. The watershed has a history of dredge mining that severely impacted stream morphology and riparian habitat quality in the early 1900s. Historic dredge boat mining on private, town, county and NFS properties degraded the mainstem Swan River up to the confluences of the North Fork, Middle Fork, and South Fork Swan River tributaries. Surface continuity between these three tributaries has been completely lost due to dredge mining. Fish migration can no longer occur between these three tributaries.

Climate and precipitation

The climate within the project area is similar to the climate in Breckenridge, Colorado, about 6 miles to the south-west at an elevation of 9,600 feet MSL. Annual average precipitation for Breckenridge is 19.5 inches (Western Regional Climate Center).

Average annual precipitation within the analysis watershed is approximately 28.9 inches (US Geological Survey StreamStats).

Hydrology and stream flow

Stream flow data for the Swan River are limited because there are no permanent gauges and no long-term gauging record exists. Ecological Resource Consultants completed a flow frequency analysis for the Swan River restoration reach (ERC Preliminary Design Report, 2013). The results indicate that flow rates expected within the restoration reach range from approximately 2 cfs to nearly 400 cfs and that flows are expected to be at or less than 58 cfs 95% of the time. Under current conditions surface water flow is discontinuous throughout portions of the proposed restoration area because stream water flows subsurface into void spaces created by dredge mining.

Water quality/ water use classification

The surface waters in the project area are assigned the following beneficial uses by the Colorado Water Quality Control Commission:

Aquatic life - Class 1 Cold Water;
Water Supply;
Recreation 1a; and
Agriculture.

Municipal water supply

There is a municipal water supply located downstream from the project area boundary. Dillon Reservoir is a 257,000 acre-foot municipal water supply operated by the Denver Water Department. A Source Water Protection Plan (SWPP) for this municipal water supply watershed was completed in 2010 with input from the White River National Forest. BMPs developed for the SWPP include protecting water supply infrastructure, managing sediment inputs and preventing unwanted ignition of fire. Additionally, in 2009 the US Forest Service signed a Memorandum of Understanding with the Colorado Department of Public Health and Environment that emphasizes source water protection.

Current Conditions

Stream health

Stream health is defined as the condition of a stream compared to the condition of a minimally disturbed reference stream (FSH 2509.25 zero code; CDPHE, 2002). Stream health is normally categorized as robust, at-risk, or diminished using numerical criteria for fine sediment loading, percentage of unstable banks, residual pool depths, and wood loading. Detailed stream health surveys were not completed for the Swan River within the proposed restoration reach because standard protocols for stream survey used on the White River National Forest are not applicable to conditions observed within the existing dredge piles. Within the restoration reach the Swan River has poorly defined bed and banks and largely lacks features such as pools and riffles that are important for making an assessment of stream health under standard protocols.

Reference conditions for the Swan River were defined based on observations made in reaches of the Swan River that were spared from dredge mining. Reference conditions for the Swan River include the following:

- a single-thread, meandering channel running through a meadow;
- Bankfull dimensions approximately 25 feet wide and 1.5 feet deep;
- Pool spacing 5-7 times bankfull width;
- Sinuosity greater than 1.2

Because existing conditions within the Swan River do not resemble reference conditions, the proposed restoration reach is considered to have diminished stream health.

Riparian habitat condition

The water influence zone (WIZ) is defined as “the land next to water bodies where vegetation plays a major role in sustaining long-term integrity of aquatic systems; it includes the geomorphic floodplain (valley bottom), riparian ecosystem, and inner gorge” (FSH 2509.25 – the R2 Watershed Conservation Practices Handbook).

The functional WIZ within the proposed restoration area is constrained by the presence of dredge piles and the Tiger Road. The definable WIZ is limited to a narrow strip of vegetation lining areas intermittently flooded by surface water. Field inventories conducted in 2013 identified 5.47 acres of riparian vegetation, primarily willows growing in swaths adjacent to open water ranging in width from 0 to over 100 feet. Within the inventoried WIZ riparian vegetation is limited by a lack of soil due to dredge mining and existing willows are growing out of a cobble, gravel and sand mix.

Water yield and runoff

The amount of water produced from a watershed and delivered to stream channels, referred to as water yield or runoff, is affected by vegetation within the watershed. Vegetation affects evapotranspiration, canopy interception, snow deposition in openings and the amount of solar radiation reaching the ground surface. These in turn affect the overall water balance for the watershed and the timing of runoff.

For this project water yield values were modeled using a water balance approach that is described in *An Approach to Water Resources Evaluation of Non-Point Silvicultural Sources* (WRENSS; EPA, 1980). Using empirically derived relationships, the model incorporates information on precipitation, vegetation type, cover density, and aspect to estimate the amount of water that is used by vegetation and the excess that becomes available for runoff. WRENSS models are useful in evaluating how past and future vegetation management has affected and will affect water yield.

To understand the effects of the proposed action it is important to establish baseline and existing conditions for the watershed and to estimate water yields associated with these conditions. The analysis of water yield presented here focuses on a 14,679-acre watershed that includes the proposed restoration area plus all of the contributing watershed areas upstream from the project area, not including Brown Gulch or Muggins

Gulch, referred to here as the upper Swan Watershed. Vegetation management within this watershed has included timber harvest and traditional forest management but has also included the clearing of forest and other vegetation for the purposes of mining and road development all of which tend to increase water yield by the mechanisms described above. This analysis focuses on the land cleared for roads and mining and their effects on long-term runoff. Water yield estimates are presented for baseline conditions (no roads or mine clearings), existing conditions and, in the following text, proposed conditions.

The historic average annual water yield for baseline conditions in the Upper Swan Watershed is estimated to have been 14,679 acre-feet (Table 4). Existing conditions within the watershed include approximately 211 acres of lands cleared for roads maintained by the USFS and 100 acres of valley bottom lands (public and private) that were cleared for dredge mining. Accounting for these clearings, water yield under existing conditions is estimated to be increased by 58 acre-feet from road clearings and 121 acre-feet from dredge mining (Table 4). Thus, under existing conditions the Upper Swan Watershed produces approximately 14,858 acre-feet of water per year, assuming average precipitation.

Table 4: A comparison of estimated average annual water yield for the Upper Swan Watershed under baseline and existing conditions

Condition	Change in water yield (acre-feet)	Total water yield (AF)
Baseline (no clearings)		14,679
Baseline plus road clearings	+58	
Baseline plus dredge mining	+121	
Existing		14,858

Water Quality

Due to concerns about nutrient enrichment, a special water quality standard for total phosphorus has been assigned to Dillon Reservoir. Waste-load allocations for total phosphorus have been established for all point source discharges in the Dillon Reservoir watershed. The allowed point source allocations are based on the assumption that best management practices will result in pound for pound mitigation of all new non-point sources of phosphorus (CDPHE Reg. No. 71). All watersheds in the project area have existing non-point sources due to disturbance by past management. Existing sources include formerly mined areas, soil erosion along roads, trails, dispersed campsites, and off-road vehicle tracks. Urban development located near the project area is a major contributor of phosphorous loading in Dillon Reservoir (Lewis, et al, 1983 and 2001). Soil erosion from human disturbances is a potential non-point source because phosphorus is adsorbed onto sediment particles (EPA 1991). Disturbed areas are a source of phosphorus only if they are located next to streams and the eroded sediment can be transported into a channel. Under current conditions the entire 100-acre proposed restoration area is a potential source of phosphorous because it is bare and disturbed and the majority of precipitation falling on the site infiltrates down to groundwater.

Wetlands and Waters of the United States

Field inventories were conducted in 2013 to identify wetlands and Waters of the United States. Inventories were conducted using methods described in the US Army Corps of Engineers Wetland Delineation Manual (USACE, 1987), with additional direction from the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (USACE, 2010). The inventory covering an investigation area of approximately 100 acres identified 1.97 acres of open water and zero acres of wetlands. In all cases riparian areas adjacent to open water on dredge mined land lacked hydric soil indicators required for identification of wetlands. The sand, gravel, and cobble that comprise the dredge piles left behind after dredge mining simply do not meet the criteria for hydric soil.

Environmental Effects

No-Action Alternative

Under the no-action alternative, the proposed floodplain, channel and wetlands restoration would not occur. Existing conditions, as described above would persist for the foreseeable future.

Proposed Action

This analysis focuses on all the items previously discussed in the proposed action. In addition, the analysis specifically focuses on the hydrologic effects associated with the creation of the new stream channel and associated planting of vegetation along stream banks and in small riparian islands intended to function as wetlands. Two miles of new stream channel with a 20-25 foot bank-full width would be created. Ninety-one new meander bends would be created, each with a pool-riffle-glide complex of in-stream habitat features. Bank stabilization would include planting with willows along 8,100 linear feet of stream bank (approximately 0.8 acres). Willow planting would also occur in 105 circular planting plots (approximately 1.2 acres).

Stream health

Under the proposed action, stream health would be greatly improved. The new stream channel would be constructed to meet reference conditions for bed and bank characteristics and in-stream habitat features such as pools and riffles. The new channel would be a single-thread, meandering channel running through a meadow with bankfull dimensions 20 to 25 feet wide and 1.5 feet deep. Pool spacing would be 5-7 times bankfull width and sinuosity would be greater than 1.2. Creating reference conditions within the new stream channel would ensure an improvement from diminished stream health to robust stream health. In particular, the new channel is expected to meet the numerical metrics of robust stream health associated with bank stability, fine sediment loading, and residual pool depth. Wood frequency would remain low in the restored channel, however, this would not detract from the robust stream health rating because reference conditions for the new channel are based on a channel running through a meadow, and these types of streams are known to have low wood frequency. Within the proposed restoration area, the Swan River would be restored to an overall robust stream health rating.

Riparian habitat condition

Under the proposed action riparian areas would be improved through a combination of fine grading, soil amendment and planting with native trees, shrubs and grasses. These project components would create a functioning riparian ecosystem within the water influence zone (WIZ). The project would create an additional 2 acres of functional wetlands within the riparian area. The existing 5.47 acres of riparian area would be protected and maintained in its current condition.

Water yield and runoff

As described under existing conditions water yield and runoff produced from the Upper Swan Watershed was modeled using a water balance approach developed by the Environmental Protection Agency and referred to as WRENSS (EPA, 1980). To model the effects of the proposed action, evaporative losses associated with open water and with wetlands creation were also modeled.

The proposed project would create new open water within 2 miles of newly created stream channel. Bankfull widths in the new channel would vary between 20 and 25 feet, however, the stream is expected to reach bankfull width for only a short time during most years and may not reach bankfull width at all in some years. Considering this, the average channel width for open water calculations was estimated to be 20 feet. With these dimensions open water within the new channel would total 4.85 acres. Evaporative losses are estimated at 32.68 inches per year based on pan evaporation research conducted by the Colorado Climate Center conducted at Twin Lakes Reservoir near Leadville, CO at an elevation of 9,201 feet (Colorado Climate Center website accessed 2/24/2014). Assuming 32.68 inches evaporation loss over the new channel area, the total evaporative loss associated with the new channel would be 13.21 acre-feet. This equates to evaporative losses of 0.00125 acre-feet per linear foot of newly created stream channel. The actual evaporative losses associated with the restoration project would be less than this because 1.97 acres of existing open water would be filled and converted to meadow. The savings in water from this project component would be 5.37 acre-feet. The net change due to modifications to open water in the project area then would be 7.84 acre feet (Table 5).

Under the proposed action, riparian shrubs would be planted along the outside of meander bends and in circular plots that would total approximately 2 acres. These project components are referred to here as bank stabilization and wetlands creation. Vegetation on this acreage is expected to have access to stream water, and therefore is expected to transpire additional water beyond what would be available outside the influence of the stream. Evapotranspiration losses associated with willow plantings are estimated to be 3.6 feet per year. This assumption is based on published evapotranspiration rates for cottonwood/ willow riparian stands of 3.5 feet in Nevada (USGS, 2006), and 3.6 feet in New Mexico (USDA Forest Service, 2006b). Using an annual evapotranspiration rate of 3.6 feet the evapotranspiration losses associated with planting willows in banks and in circular plots would be 7.2 acre-feet (Table 5). Considering all components of the

proposed action together, the water yield from the Upper Swan Watershed is expected to be 14,771 acre-feet (Table 5).

Table 5: A comparison of the predicted average annual water yield from the Upper Swan Watershed under baseline, existing and proposed conditions

Analysis condition	Project component	Evaporative loss (AF)	Water yield (AF)
Baseline			14,679
Existing			14,858
	Creation of open water	7.84	
	Planting wetland vegetation	7.2	
Proposed			14,843

Water quality

Under the proposed action water quality would be maintained. Although turbidity in the Swan River would increase while equipment was working in the stream, this would only be a very short time period because most of the channel work can be completed in dry conditions. Turbidity begins to drop immediately after equipment exits running water and the Swan River would run clear within hours of the completion of construction activities. In the long-term, the establishment of riparian vegetation and the creation of a functioning ecosystem within the water influence zone would protect the Swan River from sediment inputs associated with existing disturbed areas and support the natural uptake of nutrients such as nitrogen and phosphorus.

Because of phosphorous limitations in Dillon Reservoir, rehabilitation would need to be accomplished without introducing phosphorous into the water. Under the proposed action, this would be accomplished by using compost rather than fertilizer. This would avoid the possibility of adding phosphorous to Dillon Reservoir because compost is very low in phosphorous, especially when compared with pelletized fertilizer.

If the proposed action were implemented, water quality would continue to support the existing beneficial uses.

Wetlands and Waters of the United States

Under the proposed action 1.97 acres of open water would be filled and reclaimed to riparian meadow, however 4.85 acres of new open water would be created, leading to a net increase of 2.88 acres of open water. Two acres of palustrine shrub-scrub wetlands would be created; none would be lost. This project is expected to meet the criteria for approval under Nationwide Permit #27.

Cumulative effects

The direct and indirect effects of the proposed action, described above, are primarily related to improvements in stream health and riparian conditions, and changes in water yield. Although the proposed action would cause a decrease in water yield from existing conditions it is clear that water yield would be increased compared to baseline conditions (Table 5).

Aquatics

Existing Conditions

The project area does not provide habitat for any threatened or endangered species. The North Fork Swan River does provide habitat for Colorado River cutthroat trout, a R2 Sensitive Species. Other known aquatic species within the project area include; rainbow trout, brown trout, and brook trout, with brook trout being the dominate species. Macroinvertebrates are also known to exist within the project area. Macroinvertebrates, brown trout, rainbow trout, and brook trout are considered Management Indicator Species (MIS) for the White River National Forest. Habitat within the project area is substantially degraded due to the dredge mining that occurred in the early 1900's and the species listed above are being impacted due to poor habitat conditions. The majority of the habitat does not have annual flow, leaving sections of stream to dry up. There is very little functioning riparian habitat which decreases the input of natural detritus which impacts macroinvertebrate populations which then decreases available food for fish. Furthermore, the dredged habitat disconnects surface continuity within the three main tributaries (North Fork, Middle Fork, South Fork) of the Swan River watershed and as a result fish are not able to migrate freely between the tributaries. There is no habitat or known populations of boreal toads or Northern leopard frogs within the project area.

Environmental Effects

No Action

There would be no impact to ESA, Sensitive species, or MIS from implementation of the no action alternative. MIS and Colorado River cutthroat trout at the local level would still be impacted due to habitat being left in poor conditions.

Proposed Action

There would be no impact to threatened or endangered species within the project area. The proposed action does not include any water depletion or include negative net decreases in water yield and as a result there would be no impact to threatened or endangered species in the lower Colorado River. There would also be no impact to any R2 Sensitive species. No Sensitive species are directly within the project area. The closest species is a population of Colorado River cutthroat trout in the NF Swan River, but restoration activities would not occur in occupied habitat and therefore there would be no impact.

The proposed action would provide a substantial benefit to local MIS populations. Habitat conditions would be greatly improved by providing increased rearing and spawning habitat, stable banks, increased number of pools, and healthy riparian conditions. The project would also reconnect the three main tributaries of the Swan River providing an opportunity to restore a meta-population of native cutthroat trout. Benefits for MIS populations would be mostly experienced at the local level, with little benefit to forest level trends.

Short term impacts would also occur as the project is being implemented. Restoration activities occurring in live water would displace resident trout, causing them to relocate to avoid stressors. Short term increases in turbidity are also likely and could decrease the ability for resident fish to feed and cause short-term impacts to macroinvertebrates by covering up gravel. However, all of the expected impacts are estimated to be short in duration (less than a few hours a day through a field season) and minimal in magnitude. These short term impacts are part of the overall project and would be greatly offset by the substantial long term benefits.

Cumulative Effects

Cumulative effects, as defined by the National Environmental Policy Act, are those that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. The following cumulative effects analysis includes the HUC6 Swan River watershed and addresses short-term (3-5 years) and long-term (10-20 years) effects.

Current ongoing projects include the Breckenridge Forest Health and Fuels Mitigation Project, with some units being within the project area. Additional projects within the watershed, both short term and long term, include additional road decommissioning and riparian enhancement projects from dispersed camping. Furthermore the Dillon Ranger District is finalizing a Restoration Strategy that will improve on a variety of resources, including vegetation treatments and abandoned mines. All of these projects have the potential to greatly benefit the overall watershed health and aquatic resources.

The proposed action would not have any negative cumulative impacts to aquatic resources. Impacts would be considered beneficial.

Determination of Effect and Rationale

There would be **No Effect** to threatened or endangered species or R2 Sensitive species for reasons listed above. Aquatic MIS occur throughout the project area. Potential effects to aquatic MIS would be the same effects as described for the species and habitat discussed previously in this document. As a result, it is likely that no measurable negative effects and therefore no negative change to macroinvertebrate communities or trout populations would occur as a result of implementing the proposed action, both at the site-scale and forest level. However, the proposed action has the potential to substantially improve and benefit MIS levels at the local level.

FOREST CONSISTENCY

The proposed action meets Forest Plan consistency for all resources. Please see the project file for more information for individual resources as well as design criteria and Best Management Practices. The project file can be found at the Dillon Ranger District Office.

AGENCIES AND PERSONS CONSULTED

FEDERAL, STATE, AND LOCAL AGENCIES

Summit County Government

Town of Breckenridge

Colorado Parks and Wildlife

OTHERS

Blue River Watershed Group

Trout Unlimited, Gore Range Chapter

Friends of the Dillon Ranger District

Colorado Watershed Conservation Board

Rock Island Land Company, LLC

Goodtime Adventures, LLC

Everest Materials, LLC

REFERENCES

- Colorado Dept. of Public Health and Environment (CDHPE)- Colorado Soil Evaluation Values. July 2011. <http://www.colorado.gov/cs/Satellite/CDPHE-HM/CBON/1251616113557>
- Lindsay, W.L. 1979. Chemical equilibria in soils. John Wiley and Sons. New York.
- Proctor, J. 2013a. Biological Assessment and Biological Evaluation of TES Plant Species for the Swan River Stream Channel Restoration Project. White River National Forest. On file at Supervisor's Office, Glenwood Springs, CO.
- Proctor, J. 2012. Survey documentation for TES Plant Species for the Swan River Stream Channel Restoration Project. White River National Forest. On file at Supervisor's Office, Glenwood Springs, CO.
- Proctor, J. 2013b. Survey documentation for TES Plant Species for the Swan River Stream Channel Restoration Project. White River National Forest. On file at Supervisor's Office, Glenwood Springs, CO.
- Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/>
- Tweto, O. 1983. Geologic Map of Colorado. U.S. Geological Survey and Colorado Geological Survey. Digitized 1:500,000 scale map. USDA Forest Service, 2006a. Watershed conservation practices handbook, FSH 2509.25 – R2 amendment 2509.25-96-1. Rocky Mountain Region (R2), Denver, CO.
- USDA, Forest Service, 2006b. Groundwater, Vegetation, and Atmosphere: Comparative Riparian Evapotranspiration, Restoration, and Water Salvage. USDA Forest Service Proceedings RMRS-P-42CD. Albuquerque, NM.
- USDA National Soil Erosion Research Laboratory, 1995. USDA Water Erosion Prediction Project (WEPP). NSERL Report No. 10. West Lafayette, IN.
- U.S. Forest Service, 1993. Holy Cross Soil Survey- Parts of Garfield, Grand, Mesa, Pitkin, and Summit Counties. Unpublished data.
- U.S. Forest Service, 2002. Land and resource management plan – 2005 revision. White River National Forest, Rocky Mountain Region.
- U.S. Forest Service Handbook, 2006. 2509.25 – Watershed Conservation Practices Handbook, zero code, Ch. 10, and Ch.20. Region 2 Amendment No. 2509.25-2006-2, Effective May 5, 2006

US Geological Survey, 2006. Water Budgets and Potential Effects of Land- and Water-Use Changes for Carson Valley, Douglas County, Nevada, and Alpine County, California. Scientific Investigations Report 2006-5305. Sacramento, CA.

Alexander, E. Rate of Soil Formation: Implications for Soil-Loss Tolerance. *Soil Science* 145:1, Jan, 1998. pp.37-45.

United States Environmental Protection Agency. 1993. A Guide to the Federal EPA Rule Land Application of Domestic Septage to Non-Public Contact Sites. EPA/832-B 92-005.

United States Environmental Protection Agency. 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites OSWER 9344.4-24.

Wakatsuki, T. and Rasyidin, A. Rates of weathering and soil formation. *Geoderma* 52 (1992): pp. 251-263.