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United States Department of the Interior



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FEB 17 2016

Mr. Oscar Martinez, District Ranger
Pikes Peak Ranger District
Pike and San Isabel National Forests
601 South Weber Street
Colorado Springs, Colorado 80903

Dear Mr. Martinez,

This letter transmits the U.S. Fish and Wildlife Service's (Service) biological opinion concerning the USDA Forest Service's (USFS) proposed Bear Creek Watershed Restoration Project on the Pikes Peak Ranger District of the Pike and San Isabel National Forests in El Paso County, Colorado, in accordance with section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et seq.). The proposed Bear Creek Watershed Restoration Project is a joint project between the USFS, El Paso County, and the City of Colorado Springs.

In this biological opinion, the Colorado Ecological Services Field Office (FWS) finds that the proposed action may affect the greenback cutthroat trout (*Onchorhynchus clarkii stomias*) (greenback) and that these actions carried out pursuant to the proposed Bear Creek Watershed Restoration Project are not likely to jeopardize the continuing existence of the species. Critical habitat has not been designated for the greenback; therefore, none will be affected.

We base this biological opinion on the USFS biological assessment (BA), received April 6, 2015, which was replaced with a revised BA on July 20, 2015, as well as any subsequent clarifying correspondence, including electronic mail received August 20, August 27, and November 21, 2015; January 5 and February 3, 2016 (F. Quesada, USFS; J. Valladares, USFS).

Other Federally Listed Species - Mexican Spotted Owl

The project area contains stands of mixed conifer forest and occurs within Mexican spotted owl (MSO) Critical Habitat Unit SRM-C-1a. The project area contains approximately 2,740 acres of mixed conifer forest stands, of which approximately 500 acres contain potential roost/nest habitat. MSO have not been documented in the project area and its vicinity during earlier surveys or during recent surveys that were conducted in the adjacent North Cheyenne Canyon. Based on site evaluations by the Service in the project area, we do not believe the proposed project treatment areas provide suitable MSO nesting conditions due to the open nature of the canyon and the smaller sized trees. The proposed action may affect some areas of MSO foraging

habitat but is not expected to adversely affect the MSO. The Service concurs with your determination that the proposed action may affect but is not likely to adversely affect the MSO and its critical habitat.

CONSULTATION HISTORY

The Service has been coordinating with the USFS and Colorado Parks and Wildlife (CPW) since 2008 regarding the greenback population in Bear Creek. On July 19, 2008, the Service provided a letter to the USFS Pikes Peak Ranger District in which we expressed our concerns regarding risks from increased sedimentation and potential contamination issues to the greenback population in Bear Creek from ongoing motorcycle use on National Forest System Trail (NFST) 667. We advised the USFS to work with other agencies to conduct management actions that would provide increased protection for this species. Our letter specifically identified short-term protective measures, including bridges at water crossings, and long-term solutions to address the erosion and sedimentation issues. We requested that the re-routing of the section of the motorized trail where erosion had been identified be included in an analysis as a long-term solution.

Following our 2008 letter, the proposed management of the Bear Creek basin has been discussed and coordinated between the USFS, CPW, FWS, and other stakeholder groups (motorcycle, hiking, mountain biking, and horseback riding) in the Bear Creek area. The Bear Creek Roundtable was established to provide a forum for stakeholders to coordinate and to discuss various management options. The following list of USFS projects identifies projects that have received section 7 consultation within the project area. Projects were described in greater detail in the BA (USFS 2015) and are provided in Appendix A of this biological opinion.

Habitat Improvement Projects

- Bear Creek Habitat Improvement and Jones Park Motorized Trail (NFST 667) Bridge Installation (2008)
- Trail Maintenance Improvement and Bridge Installation Project on the Bear Creek Motorcycle and Hiking Trail (2011)
- Bear Creek Sediment Mitigation Project (NFST 666 and 667) (2012)
- Bear Creek Trail Maintenance (NFST 667) (2014)
- Bear Creek Sediment Mitigation Project (NFST 666 and 667) (2014)
- High Drive Flood Repair Project at Bear Creek (2015)

Recreation Projects

- “The Captain” Endurance Mountain Bike Race (2012)
- “The Captain” Endurance Mountain Bike Race (2013)
- North Cheyenne Motorized Loop Trail (2013)
- Outfitting and Guiding Priority 10-Year Special Use Permits (2014)

Forest Health Projects

- Catamount Forest Health and Hazardous Fuels Reduction (2012).

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The goal of the Bear Creek Watershed Restoration Project is to improve the habitat conditions for the greenback population in Bear Creek by addressing the sedimentation issues that threaten this population while also maintaining a variety of trail use recreational opportunities within the Bear Creek watershed. The proposed action includes a number of activities, including trail realignment and obliteration, drainage improvement, road management, stream restoration, and administrative trail closures. Implementation of the proposed action is expected to start in 2016, with phases being conducted over an extended period of 5 years or more.

The Bear Creek population of greenbacks is extremely important as there are only two populations of greenbacks remaining in the wild. Bear Creek contains the only remaining greenback stream while the other greenback population is present in Zimmerman Lake in the Poudre River drainage. Zimmerman Lake was stocked by CPW in 2014 with fish collected from Bear Creek and raised in Federal and State fish hatcheries. Additional fish have been collected from Bear Creek and are currently being raised in Federal and State fish hatcheries. Greenbacks have occupied Bear Creek for over 100 years and have likely adapted to the specific habitat conditions within the stream. This population is the most genetically diverse as compared to the hatchery populations and Zimmerman Lake (Krieger, pers. comm. 2014). The successful recovery of the greenback depends on the persistence of the Bear Creek population.

The Bear Creek Watershed Restoration Project is a collaborative project between the USFS, El Paso County, and the City of Colorado Springs. These agencies are adjacent land managers in the Bear Creek watershed, connected by an existing recreation trail systems and by Bear Creek. The USFS manages 2.1 miles of stream in the upper and mid-elevation of Bear Creek and the City of Colorado Springs manages 1.86 miles in the lower section of Bear Creek along High Drive. El Paso County recently acquired lands on 2.67 miles of stream in the upper and middle section of the drainage from Colorado Springs Utilities.

The USFS is the lead federal agency for this section 7 consultation, which includes all lands within the project area. Each agency is responsible for administering the proposed action and the project conservation measures on their respective lands within the project area. A Memorandum of Understanding (MOU) was developed between the USFS, El Paso County, and City of Colorado Springs to document the framework of cooperation between the agencies. The MOU was signed on September 16, 2015 and is included in Appendix B of this biological opinion.

The main objectives of the proposed project are to:

- Improve stream habitat for the greenback, including spawning habitat and overwintering pool habitat,
- Provide a sustainable recreational trails system that maintains motorized (single track) and non-motorized recreation opportunities,
- Reduce sedimentation from trails, roads, tributaries and from hillslope/rill/gully erosion,
- Re-establish a stable stream dimension, pattern, and profile that transports sediment,

- Reduce risk of aquatic invasive species becoming established,
- Recover and improve riparian vegetation,
- Manage appropriate visitor uses within the Bear Creek watershed.

Trail System Improvements

The proposed action would provide improvements to the Bear Creek watershed by rerouting many of the trails away from Bear Creek and by improving conditions of the remaining trails. Specific details on proposed trails management are provided in Appendix C of this biological opinion.

- A number of changes are proposed to the trails system in the Bear Creek watershed. The most significant trail system improvement in the proposed action would occur on Trail 667, in which the existing single-track motorized trail that is currently present along the upper area of Bear Creek (Old Trail 667) will be decommissioned. The new Trail 667 will be rerouted away from Bear Creek, generally outside of the watershed and completely out of the Water Influence Zone (WIZ) of Bear Creek. Portions of the new trail will be constructed along the side slope of Kineo Mountain. This change to Trail 667 would result in 3.7 miles of motorized trail moved away from Bear Creek (2.5 miles on El Paso County land and 1.2 miles on National Forest System lands).
- Another significant proposed trail change would occur in the lower area of Bear Creek along the existing Trail 666 (nonmotorized), in which a section of trail would be decommissioned (0.55 miles) and rerouted outside the WIZ to join up with Trail 667 at a location further east. Other trails within the project area will undergo smaller revisions, as described in Appendix C.
- Additionally, approximately 9.2 miles of non-system trails (i.e., social trails) that are within, or leading into, the Bear Creek drainage will be closed, with the exception of the Mount Buckhorn and Palmer trails, which will be converted to system trails. Of these non-system trails to be closed, approximately 3.9 miles are currently within the Bear Creek WIZ.
- For existing system trails that will remain open, maintenance, reconstruction, storm water drainage improvements or re-alignment will be performed as needed to minimize erosion risk and sediment production and to provide for a more sustainable trail system.
- Bridges would be installed on trails at stream crossings that span bankfull flows. All stream crossings would be designed and constructed to provide for passage of flow and sediment, withstand expected flood flows, and allow free movement of resident aquatic life.

In summary, the proposed action would result in a reduction of 2.5 miles (96 percent) of motorized trails, 0.3 miles (25 percent) of non-motorized system trails, and 3.9 miles (100 percent) of non-system trails within the WIZ of Bear Creek. Approximately 0.1 miles of motorized trail (consisting of one trail crossing) and 0.9 miles of non-motorized trail will remain within the WIZ of Bear Creek. The overall length of existing of motorized trails (16.7 miles) would be slightly reduced to 15.5 miles following the completion of the proposed action. The

overall length of non-motorized trails (7.8 miles) would be slightly increased to 8.2 miles following the completion of the proposed action.

Upland Watershed Improvements

Other watershed improvements to reduce erosion and sedimentation in the Bear Creek drainage include gully stabilization, vegetation and structure placement. Structures would be placed on slopes that are actively eroding to help stabilize and vegetate these slopes. Structures would generally be used in combination with other techniques such as planting of trees and shrubs, use of matting materials, and re-contouring to restore hydrologic function.

High Drive Improvements

The proposed action will implement actions that improve the 0.7 mile-long section of High Drive that parallels Bear Creek within the project area. Improvements to the remainder of High Drive (upper sections) will be addressed through the FEMA High Drive Project, which is concurrent to this project and will address the identified erosion and sedimentation issues on the upper sections of High Drive. The FEMA High Drive project will receive a separate section 7 consultation.

The following activities will be implemented by the proposed action:

- Convert High Drive to administrative use only for motorized traffic. Non-motorized use will continue to be allowed.
- Implement the recommendations of the High Drive Report (CH2MHill 2013) as further refined in the High Drive preliminary plans developed by the City of Colorado Springs (2015) to reduce sedimentation from High Drive into Bear Creek on the portion of the road that parallels Bear Creek.
 - Identify missing/buried culverts.
 - Repair or install new culverts where missing/buried culverts are found.
 - Place roadside markers on each side of the road to identify culvert locations and alignments.
 - Remove sediment from all culverts, and modify to minimize future sediment deposition.
 - Redefine roadside ditches and increase the ditch capacity at roadway transition areas to minimize flow across the road.
 - Remove sediment berms along the road shoulders, install guardrail if needed for safety.
 - Install local sediment traps.
 - Increase culvert sizes, as needed, to minimize bypass flows at strategic locations.
 - Install additional culverts or steepen existing culverts if culvert plugging continues to occur.
 - Install stabilized ditches and stabilized rundown channels where needed. Utilize concrete, riprap, and other features where determined necessary and capable of withstanding the impacts from ditch grading equipment.
 - Stabilize erosive upland areas via seeding with desired local native plants from approved seed mixes, plantings, or erosion control features
 - Stabilize erosive gullies, where needed, based on the improved drainage system and corresponding flows.

- Decrease the road width where determined necessary and feasible and re-establish natural vegetation over the disturbed areas of the roadway shoulder.
- Create new ditches to facilitate movement of water off the road surface.

In-stream Restoration

The proposed in-stream restoration activities would improve stream fish habitat by deepening existing pool habitats, removing excess sediment, and reconstructing habitat features that would encourage further pool development through natural hydrology. The proposed action would also provide improvements to the stream ecosystem through riparian area improvements, woody debris management, stream bank stabilization and vegetation, boulder cluster placement, log weirs. No riffle areas would be treated. In-stream restoration would occur throughout the 3.4 miles of Bear Creek that are occupied by greenback, but would be limited to a combined total of 1.7 miles of the linear stream length.

A full stream survey and detailed plan of implementation will be approved by a USFS fisheries biologist prior to implementation. This implementation plan will include site specific plans including location of pools to be enhanced, placement and description of structures (boulder or wood cross vanes) to be placed, and location and description of treatment for bank stabilization. If the implementation plan identifies actions or impacts that were not considered in this consultation, then FWS will be contacted to determine if consultation should be reinitiated.

Lower Stream Section - The lower stream section is the 0.7 mile portion of Bear Creek that is adjacent to High Drive. This segment of the stream receives higher amounts of sedimentation due to erosion and drainage issues of the road prism and would require more intensive management actions. In-stream work would include enhancement of pools, including: 1) construction of in-stream structures such as cross vanes (rocks and logs) to concentrate stream flows to scour sediment from pools; 2) pool enhancement through armor removal and sediment removal, where appropriate; and 3) stream bank stabilization. The proposed in-stream work is anticipated to disturb up to 4,200 sq. feet of channel wetted perimeter during the course of this project, which represents approximately 12 percent of the total usable area of this stream reach.

A total of 72 boulder or log cross vanes may be constructed. Given the dimensions of the pools, as determined during 2013 Basinwide Stream Habitat Survey (USFS 2013), installation of a single cross vane is expected to result in 22 square feet of disturbance within the wetted perimeter of the stream. Pool enhancement through channel armor removal will likely result in disturbance of approximately 30 percent of the area of a pool, and will be focused near the nexus of scour in the upstream segment of the habitat. Assuming the average pool dimensions noted above, each armor removal site will likely result in slightly more than 20 square feet of disturbance within the wetted perimeter. Mechanical removal of channel armor is expected to occur in 11 pools within the lower stream reach.

Stream bank stabilization will consist of log bank full benching, toe wood stabilization, and boulder toe slope stabilization. The restoration of eroded stream banks would entail the realignment or placement of rock to decrease sheer forces along banks, placement of logs to stabilize outside meanders, and re-vegetation using sod mats or willow plantings. Stream bank stabilization will consist of selective adjustment and placement of individual rocks within the stream channel. Approximately one square foot of disturbance within the wetted perimeter of

the channel would occur for each linear foot of stream bank treated. Approximately 1,135 linear feet of river bank may be stabilized within the project reach.

In addition to the proposed in-stream habitat structures and improvements, approximately 200 feet of stream would be realigned around an existing alluvial fan, which is located at the base of a large gully, in order to disconnect the stream from the sedimentation resulting from the gully. The new channel will be constructed dry. When water is diverted from the old channel to the new one, fish will be captured by hand/bucket and moved to the new channel.

Specific in-stream restoration goals and techniques in the lower stream section include:

- Restoring degraded sections of the stream as part of whole watershed restoration program.
- Increasing the number of pools and restoring pool depths to provide overwintering habitat for trout.
- Realigning existing rocks and logs or place rock or logs to aid in the formation of plunge pool habitat.
- Stabilizing eroding stream banks and reducing lateral stream migration with nearby trees, rocks, sod mats and other native riparian vegetation.
- Reducing the width to depth ratios to align with reference stream conditions.
- Creating a riparian buffer and bankfull bench to reduce hillslope and trail sediment delivery into Bear Creek.
- Reestablishing vegetated bankfull benches and toe slope stabilization.
- Providing floodplain access for flood flows.

Placement of mechanized equipment in the stream channel or on the stream bank will be avoided, whenever possible. Where the stream is within the reach of the excavator arm, equipment will be kept outside of the stream. A mini excavator or tracked skid-steer will be utilized in stream treatment segments that are beyond the reach of an excavator. Tracking within the stream is expected to be limited to a total of 250-300 ft.

Upper Stream Section - The upstream segment encompasses the section of Bear Creek that is adjacent to the trail system from Jones Park down to the Bear Creek Trailhead. Restoration in this segment would be limited to about 1 mile (29 percent) of the stream length and would be done by hand. The proposed in-stream work is anticipated to disturb up to 3 percent of the channel wetted area of the stream reach. Restoration activities would include movement and placement of rock and log materials to improve in-stream conditions, including increasing pool habitat and facilitating movement of sediment through the stream system.

Fish Barrier Maintenance/Construction

The proposed action will provide maintenance to the existing barrier on City of Colorado Springs land, if necessary, and will include construction of an additional barrier, if needed. If the current fish barrier needs to be improved, maintenance will occur in the form of a constructed concrete barrier.

Monitoring and Maintenance

Monitoring of impacts and effectiveness are the responsibility of each land owner (i.e. monitoring on City land will be conducted by City personnel or contractors hired by the City; monitoring on NFS land will be conducted by USFS personnel or contractors hired by the USFS; monitoring on County land will be conducted by County personnel or contractors hired by the County). The proposed action includes the following monitoring activities:

- Utilize a variety of monitoring methods, (e.g., evaluate in-stream sediment load [V* protocol], photo points, visual inspection) to determine the effectiveness of trail and in-stream restoration. Conduct monitoring after year one of implementation, and intermittently as needed (e.g., after major rain events).
- Monitor adherence to project design standards and conservation measures during implementation of the proposed management actions.
- Utilize a variety of monitoring methods at various scales (e.g., basin-wide assessments and V* protocol) to determine the need for re-treatment or additional management actions.
- Maintenance of these projects would consist of an inspection, followed by the repair of any deficiencies found. Inspection is expected annually for the first couple of years and will become less often as the watershed stabilizes. This work includes vegetation of eroded areas, debris removal (from weirs), reshaping or reinforcement of existing structures and the addition of rock or other woody material to stabilize existing structures, especially on stream bank stabilization structures.
- This proposed action covers necessary repair work in the future as long as work is similar to work currently proposed. Repair work should be kept to a minimum. If the repair work requires actions or impacts that were not considered in this consultation, then FWS will be contacted and consultation will be reinitiated.
- Utilize a variety of monitoring methods (e.g., visual inspection, photo points, patrol, trail cameras) to determine effectiveness of trail closures and rehabilitation, and compliance with requirement to remain on the trail system, particularly within Jones Park.
- If monitoring demonstrates a lack of compliance or on-going resource damage, employ measures to protect resources or greenback habitat.
- The USFS, City of Colorado Springs, and El Paso County will meet jointly with the FWS as necessary to review activities and document compliance with this biological opinion.

Regulations and Enforcement

The proposed action includes establishment of a number of regulations on NFS lands, City of Colorado Springs and El Paso County lands, as follows:

- Institute a Forest Order/rule prohibiting public access off system routes in the Bear Creek Basin on NFS lands and El Paso County lands, with the exception of small areas surrounding the summit of peaks on the northern and southern boundary of the basin. Continue the existing ban of off-trail travel on City of Colorado Springs lands.
- Institute a Forest Order prohibiting over-snow vehicle use on NFS lands in the Bear Creek Basin. Continue existing ban of over-snow vehicle use on City of Colorado Springs and El Paso County lands.
- Institute a Forest Order prohibiting camping, open fires, and recreational shooting on NFS lands in the Bear Creek Basin. Continue the existing ban on camping, open fires, and recreational shooting on City of Colorado Springs lands and El Paso County lands.

- Institute a Forest Order/rule banning people and domestic animals (i.e. dogs, horses, pack animals, etc.) from entering or being in Bear Creek and its tributaries on NFS lands and City of Colorado Springs lands. Continue the existing ban on entering Bear Creek on El Paso County lands.
- Institute a Forest Order requiring that domestic animals be on leash or harnessed on Trail 666 (Bear Creek) and the proposed new Mount Buckhorn Trail within the Bear Creek Basin.
- The USFS, City of Colorado Springs, and El Paso County will cooperatively develop an enforcement plan to identify a variety of methods to implement Forest Supervisor Orders on NFS lands and rules and regulations on City and El Paso County lands.
- The USFS, City of Colorado Springs, and El Paso County will cooperatively develop a signage plan to ensure consistency across multiple jurisdictions.
- The USFS, City of Colorado Springs, and El Paso County will cooperatively develop a monitoring plan to determine the effectiveness of trail and in-stream restoration and compliance with rules, regulations, and Forest Supervisor Orders.

Special Uses

The proposed action will eliminate the four military helicopter landing zones in the Bear Creek watershed.

Conservation Measures

Conservation measures are actions outlined in the project description that the project proponent will implement in order to reduce the environmental impacts of the action or promote the recovery of threatened and endangered species. The Service considers the beneficial effects of these conservation measures during the jeopardy and adverse modification analyses.

Conservation measures (also known as Project Design Standards for this consultation) are part of the proposed action and their implementation is required under the terms of this consultation.

For All Actions

- In order to protect the greenbacks during the most sensitive life stages (spawning, egg development and hatching, and early rearing period), all management action that cause direct sediment delivery to the stream would not occur during the time period from May through August.
- Avoid soil-disturbing actions during periods of heavy rain or wet soils. Apply travel restrictions to protect soil and water.

Upland Improvements (Trail System, Upland and High Drive Improvements)

- Special attention must be focused on trail drainage near Bear Creek for those trails that will remain open. Where possible, the movement of water on trails will be directed from water bars and rolling dips off trails into vegetation or filter strips, where sediment can be filtered prior to entering the creek.
- For existing trails that will be closed, access will be physically blocked, the trail surface will be decommissioned, and cut and fill slopes will be adjusted to minimize erosion risk and sediment production.

- Utilize most appropriate methods to minimize sediment entry into streams (e.g., silt fencing, wattles, and weed-free straw). Apply erosion control measures to disturbed areas with only certified weed-free products.
- In order to minimize stream bank disturbance, stream access points will be clearly delineated during project implementation by an agency representative with natural resource knowledge.
- Minimize trail length perpendicular to the stream at crossings that may direct sediment toward streams. Minimize trail lengths parallel to the stream near bridge crossings.
- Design and construct all stream crossings to provide for passage of flow and sediment, withstand expected flood flows, and allow free movement of resident aquatic life. Design and construct stream crossings to minimizing constrictions from potential flood flows while keeping streambeds and banks resilient.
- Construct short inclines leading to bridges to inhibit sediment movement onto the structure or into the stream, where feasible. Where inclines are not feasible, implement other measures to inhibit sediment movement onto the structure.
- Special attention must be focused on road drainage and maintenance of High Drive. Prohibit the side-casting of soils directly into stream channels from High Drive.
- Complete repairs to the High Drive drainage system prior to or concurrently with the proposed in-stream improvements at locations in which these activities may have negative effects to greenback habitat.

In-stream Restoration

- In-stream work would not occur during the period from May through August.
- Placement of mechanized equipment in the stream channel or stream bank will be avoided, when possible.
- Inspect all heavy equipment before entering the project area.
- Prevent the introduction or spread of noxious weeds. Equipment must be clean and free of all mud and debris prior to entering the project area.
- Prevent the introduction or spread of aquatic nuisance species. Clean, disinfect, and rinse all equipment (e.g., personal protective equipment, heavy equipment, waders, hand tools, etc.) prior to use within Bear Creek.
- Fuel storage areas will be identified by an agency representative and bermed or appropriately designed to contain spills. Refuel and store fuel and equipment outside of the floodplain within previously disturbed areas, such as roadway or pullouts.
- Equipment will be inspected for leaks before entering the project area and daily before and after construction activity. Equipment will be immediately removed from the WIZ if a *problem* is detected, and will not return to use until in good working condition. The contractor will be required to have spill containment equipment available on site during the course of construction.
- A fisheries biologist will inspect the onsite work on a daily basis during the in-stream work. When in-stream work is occurring, the stream will be visually inspected every 2 hours downstream for dead fish and the FWS will be contacted if dead or injured fish are found within the project area.
- In-stream work would be conducted in an upstream to downstream direction, when practicable, in order to avoid sedimentation impacts to pool areas already treated.

- Turbidity will be monitored during implementation and work will stop if turbidity is above 300 NTU until the water clears to an acceptable level below 250 NTU.
- Immediately prior to implementation of in-stream work, a worker will wade through the specific habitat improvement sites to encourage fish movement away from these sites in order to avoid or reduce direct injury to fish that may be present.
- While stream habitat work is being conducted, the area, including High Drive, will be closed to the public and enforced.
- Equipment will not move to the next pool or segment until all work in the active segment is complete. Exceptions can be made after onsite inspection by the USFS fisheries biologist or hydrologist if it is found that working more than one section is most beneficial to habitat enhancement and does not add significant risk to the fish.
- Ingress and egress routes will be marked by the project lead after consultation with a fisheries biologist or hydrologist and will be perpendicular to the direction of flow. Ingress and egress routes will be rehabilitated to prevent sedimentation immediately following completion of work in the segment. Examples of rehabilitation include seeding, willow planting and placement of natural materials such as rock or wood.
- Tracking of equipment down the stream channel will be avoided as much as possible. Tracking may be used after approval by the fisheries biologist or hydrologist where multiple pools or eroding stream banks can only be accessed by one route. Where tracking is required, all efforts will be made to keep tracking to a single pass. Any disturbance due to tracking in the channel bed will be immediately repaired by moving native materials to replicate the surrounding stream bed.

Fish Barrier Maintenance/Construction

- During construction, the stream would be piped around the barrier in such a way that water will not come into contact with uncured concrete.

Re-vegetation

- During trail rehabilitation and watershed restoration, restore organic ground cover to minimize long-term maintenance needs.
- Remove all temporary stream crossings (including all fill material in the active channel), restore the channel geometry, and re-vegetate the channel banks.
- A re-vegetation plan will be developed for the project area with the objectives of stabilizing cut and fill slopes, and accelerating recovery of disturbed areas.
- Re-vegetate disturbed areas with only certified weed-free products. Locally sourced plant seed is desired, but may be modified as approved by an agency botanist.

Additional conservation measures are provided in Appendix D of this biological opinion. The Service has sequentially numbered the conservation measures in Appendix D to provide for easier reference.

ACTION AREA

The action area includes the immediate area involved in the action and also includes all areas to be affected directly or indirectly by the Federal action (50 CFR § 402.02). The action area is defined by measurable or detectable changes in land, air, and water or to other measurable factors that will result from the proposed action. In other words, the action area is not limited to

the “footprint” of the action, but rather encompasses the biotic, chemical, and physical impacts to the environment resulting directly or indirectly from the action.

The action area for the proposed project includes the footprint of the proposed project, which roughly encompasses the Bear Creek and North Cheyenne Creek drainages above Gold Camp Road, as well as additional 0.5 miles around the perimeter of the project area. The action area contains an extensive trail system that provides motorized and non-motorized recreation opportunities. The proposed project is located within the administrative boundary of the Pike National Forest in El Paso and Teller Counties, Colorado. The project area is located approximately 8 miles west-southwest of downtown Colorado Springs on the east flank of Pikes Peak at approximately 6,800 to 11,400 feet in elevation. The project area encompasses NFS lands (8,152 ac), and properties owned by El Paso County (1,148 ac), the City of Colorado Springs and administered by Colorado Springs Utilities (173 ac) or managed by the Parks, Recreation, and Cultural Services Department (805 ac), and private lands (72 ac) for a total of 10,352 acres.

STATUS OF THE GREENBACK CUTTHROAT TROUT

The Service listed the greenback cutthroat trout as an endangered species in 1967 (32 FR 4001). The Service downlisted the greenback to a threatened status in 1978 because of recovery efforts that removed non-native trout from suitable habitat, established captive broodstocks, reintroduced greenbacks, developed stable populations, and initiated catch-and-release fisheries (43 FR 16343).

Distribution

Until recently, delineations of subspecies of cutthroat trout in the southern Rocky Mountains were believed to follow geographic boundaries within several states, with greenback cutthroat trout (*Oncorhynchus clarkii stomias*) on the east side of the Continental Divide and Colorado River cutthroat trout (*O. c. pleuriticus*) on the west side. Rio Grande cutthroat trout (*O. c. virginialis*) occur within the Rio Grande drainage; their range and genetic identity do not appear to be in question.

Through the recent genetic (Metcalf et al. 2012) and meristic (Bestgen et al. 2013) studies that identified the native ranges of cutthroat in Colorado, we now know that greenbacks are native only to the headwaters of the South Platte River drainage in Colorado. Greenbacks were previously considered to be native also to the Arkansas River drainage (Behnke 1992). The original distribution of the greenback within the South Platte drainage is not precisely known due to its rapid decline in the 1800s. The loss of high-quality trout stream habitat through logging, livestock over-grazing, water diversions, mining, and municipal and industrial pollution is considered a contributing factor to the historical decline of the range of greenback. It is assumed that the original distribution included all mountain and foothill habitats of the drainage systems, including lower elevations than it occupies today (Behnke and Zarn 1976). The subspecies may have extended as far east as present day Greeley, Colorado, during the mid-1800s (WNTI 2007).

At this time, greenbacks are present in the wild only in Bear Creek, occupying 3.4 miles of stream, and in Zimmerman Lake. Bear Creek is located on the eastern side of Pikes Peak in the

Arkansas River drainage, and therefore, outside its native range. The Bear Creek population is believed to be present at this location due to the stocking of ponds in 1882 at a guest hotel in the upper reaches of Bear Creek. Upper Bear Creek was likely fishless due to its location above a series of waterfalls (Metcalf et al. 2012). Zimmerman Lake is located at the headwaters of the Cache la Poudre River in the South Platte River drainage and was stocked in 2014 and 2015 with hatchery fish collected from Bear Creek. Greenbacks are also present in the Leadville National Fish Hatchery and several State hatcheries. At this time, other reintroduction projects are being planned for sites in the South Platte River drainage with hatchery fish collected from Bear Creek.

Taxonomy

When the greenback was first listed, morphology and meristic analyses were a prominent genetic determinant for cutthroat trout subspecies, based on phenotypic expression that included spotting patterns, number of scales, coloration, number of basibranchial teeth, etc. (Policky et al. 2003). Some of the first genetic analysis completed was University of Montana's electrophoresis work (Kanda and Leary 1999a, 1999b, 1999c, 2000). More recently, techniques for genetic analysis have focused on mitochondrial DNA and nuclear DNA. With regard to taxonomy, Behnke (2004) has argued that genetics should not be the sole factor in determining taxonomic distinctions, and that morphological traits may sometimes be distinguishing factors.

In a 2007 study, Metcalf et al. used molecular markers from the mitochondrial and nuclear genomes to analyze individuals from greenback and Colorado River cutthroat trout. Phylogenetic analysis of the combined cytochrome oxidase I (COI) and nicotinamide adenine dinucleotide dehydrogenase 2 (ND2) mitochondrial gene sequences (n=1530 base pairs) revealed two divergent lineages within the ranges of greenback and Colorado River cutthroat trout consisting of 10 unique haplotypes. Metcalf et al. (2007) determined that these two lineages corresponded with the two described subspecies. However, the divergent evolutionary lineages defined by mitochondrial and nuclear DNA markers did not separate geographically on either side of the Continental Divide as expected. Results from that study identified five populations with what the authors believed were Colorado River cutthroat trout genetic markers on the east side of the Continental Divide and one population with what they believed were greenback genetic markers occurring on the West slope of Colorado in what should be Colorado River cutthroat habitat.

A recently published genetic study conducted by researchers from the University of Colorado - Boulder (Metcalf et al. 2012) compared mitochondrial DNA of extant cutthroat trout populations from Colorado with cutthroat trout museum specimens collected in the late 1800s, thereby providing an understanding of the native ranges of cutthroat trout in Colorado prior to major fish stocking efforts. Several significant conclusions resulted from this study, namely that the greenback is native only to the South Platte River drainage and that a different subspecies was native to the Arkansas River drainage. This subspecies, the yellowfin cutthroat trout (*O. c. macdonaldi*), is considered to be extinct (Metcalf et al. 2012; Wiltzius 1985). Another significant conclusion of the Metcalf et al. study (2012) is the identification of two distinct lineages of cutthroat trout on the West Slope of Colorado, one of which is the Colorado River cutthroat trout and the other is a newly identified lineage, which we temporarily refer to as the green lineage cutthroat, based on the map provided in the Metcalf et al. 2007 report in which these fish were shown in a green color. The common and scientific name will be described for

the green lineage cutthroat in the near future. This study identified an additional cutthroat lineage; this lineage was located in the San Juan River drainage and is also considered to be extinct. Populations of the Colorado River cutthroats that are present on the east side of the Continental Divide are presumably due to stocking from West Slope sources in the past. Populations of the green lineage cutthroat trout are also present on the east side of the Continental Divide although uncertainty remains of the origin of these fish.

A concurrent meristic study of cutthroat trout in Colorado (Bestgen et al. 2013) complemented the 2012 genetic study. The meristic study was conducted by researchers at the Larval Fish Laboratory at Colorado State University, and included cutthroat trout specimens collected from all major drainages in Colorado, Wyoming, Utah, and New Mexico. Both meristic and genetic analyses were conducted on these specimens in a “double-blind” fashion in which neither group of researchers was aware of the origin of the specimens. The meristic study was completed in the spring of 2013 and a final report was presented to the Greenback Cutthroat Recovery Team in 2014. The observed meristic differences supported the genetic study while also providing an even greater refinement of cutthroat trout groups than previously identified through the genetic study.

Habitat

Greenbacks, like other cutthroat trout, generally require clear, cold, well oxygenated water (McGrath 2004). In general, trout require different habitat types for different life stages: juvenile (protective cover and low velocity flow, such as side channels and small tributaries); spawning (riffles with clean gravels); over-winter (deep water with low velocity flow and protective cover); and adult (juxtaposition of slow water areas for resting and fast water areas for feeding, with protective cover from boulders, logs, overhanging vegetation or undercut banks) (Behnke 1992). Both water quality and quantity are important. High sediment loads, pollution, and diversion of streams for agricultural or municipal purposes can all adversely affect greenback habitat (see *Threats* section below).

Diet

Greenbacks are opportunistic feeders utilizing a wide range of prey organisms, including macroinvertebrates, but a large percentage of the diet can be also be terrestrial insects (McGrath 2004), which can comprise about half of the diet of trout populations (Saunders and Fausch 2007). Fausch and Cummings (1986) found that greenbacks in Hidden Valley Creek, Rocky Mountain National Park (8,825 ft elevation) fed opportunistically on a wide variety of organisms. Analysis of stomach contents revealed that terrestrial invertebrates comprised a relative constant proportion of the diet through September but the proportion of terrestrial invertebrates in the diet declined rapidly in October as temperatures declined. None of the stomachs contained young-of-the-year greenbacks (Fausch and Cummings 1986). Stomach contents of a greenback in Lytle Pond on Fort Carson identified a 4.5 inch tiger salamander (*Amystoma tigrinum*) (USFWS 1998).

Reproduction

Spawning is generally initiated in the spring when water temperatures reach 41-47° F. Field studies conducted on factors limiting cutthroat trout recruitment success into translocation streams in RMNP, and several national forests, suggest that low water temperatures (averaging

46° F or below in July) may have an adverse effect on greenback fry (young fish) survival and recruitment (Coleman and Fausch 2007a, b). They also found that stream flows may influence recruitment and growth of cutthroat fry. Coleman and Fausch (2007a, b) found that streams that accumulate 1652-2192° F days cumulatively during the growing season afforded the best opportunity for cutthroat trout recruitment and translocation success. In the Big Thompson River (Forest Canyon), Rocky Mountain National Park at 10,498 ft, cutthroat fry were observed emerging on August 26 (USFWS 1998).

Harig and Fausch (2002) developed a model, based on a comparative field study, which predicted that cold summer water temperature, narrow stream width, and lack of deep pools limited translocation success of the greenback. Young and Guenther-Gloss (2004) evaluated the model developed by Harig and Fausch (2002), and found a positive correlation between the three model components and greenback abundance. High quality riparian habitat may allow them to spawn at lower elevation sites that would otherwise be too warm.

Threats to the Greenback Cutthroat Trout

At the time of development of the 1998 Recovery Plan, the main reasons cited for the subspecies' decline were hybridization, competition with non-native salmonids, and overharvest (USFWS 1998). New threats have arisen, or have become more prevalent, that were not thoroughly addressed in the 1998 Recovery Plan. These include the effects of fire and firefighting with chemical retardants; increased human population growth within the range of the subspecies along with potential for new water depletions; new introductions of non-native species; fragmentation and genetic isolation of small populations; and the effects of global climate change. Below we summarize threats to the greenback. Our most recent 5-year review for the greenback, published in the Federal Register on May 27, 2009, provides a more detailed analysis regarding threats.

Introduction of Non-native Fish Species. The number one reason for the historic decline of the greenback was the introduction of non-native salmonid fish species (Behnke 1992). The 1998 Recovery Plan states that, “. . . no action had more long-term impacts on the endemic trout subspecies than the introduction of non-native salmonids, which hybridized and competed with native fishes” (USFWS 1998). Nonnative fish species also pose a predatory threat to greenback.

Brook trout (*Salmo trutta*) (a fall-spawning, cold hardy char) apparently outcompete the greenback for common food sources early in life in most stream habitats. Brook trout spawn in the fall, while greenbacks spawn in the late spring or early summer (McGrath 2004). Because brook trout spawn in the fall, they hatch earlier in the year than greenbacks, and the brook trout young are then larger and better able to compete for resources than the greenbacks that hatch later in the summer (USFWS 1998). An evaluation of greenback sites determined that non-native trout, most commonly brook trout, occurred within approximately 25 percent of greenback population sites examined by McGrath (2004). Peterson et al. (2004) found that age-0 Colorado River cutthroat trout survival was 13 times greater, and age-1 survival 1.5 times greater, when brook trout were removed. The mortality rates of young cutthroat trout exposed to brook trout are also often high enough to result in recruitment failure (Dunham et al. 2002a, Shepard et al. 2002, McGrath 2004, and M.K. Young, unpublished data, in Young 2009, p.34). However, it

should be noted that McGrath and Lewis (2007) found that prey consumed by greenbacks and brook trout differed significantly at five of six sites where the species were sympatric.

Other non-native salmonids considered as threats to greenbacks include: rainbow trout, brown trout, and Yellowstone cutthroat trout. The greenback hybridizes with several introduced fish species, such as the rainbow trout, which also spawns in the spring. Rainbow and brook also prey on young greenbacks. Brown trout prey on all sizes of greenback. Adult brook trout also have been observed attacking and showing aggression toward greenbacks (McGrath 2004), but adult greenbacks and brook trout do coexist in some stream habitats where immigration of adult greenbacks occurs. McGrath and Lewis (2007) only found one greenback while investigating the stomach contents of 323 brook trout. Observational data suggest the competition dynamic appears to be different in lake habitats, and greenbacks may compete successfully with brook trout in some lake habitats under restricted harvest regulations.

Although non-native salmonid species continue to present a threat to greenback populations, management activities, such as maintenance and construction of stream barriers, have ensured that few populations co-exist with cutthroat populations.

Mining. Early mining and ore processing activities in Colorado for gold and other precious metals produced waste piles and mine tailings that contained heavy metals and acid-generating compounds. These piles were, and in many cases continue to be, leached by flowing water, resulting in increased acidity, decreased pH, and heavy metal concentrations downstream. Water draining from historic mine tunnels and adits (horizontal passages leading into mines) also may contain high concentrations of heavy metals and with a low pH value (acidic). Larval greenbacks have been shown to be more sensitive to low pH than eggs and embryos, with a pH of 5 being a threshold for larvae in the absence of aluminum (WNTI 2007). Such pollution can negatively affect fishes through asphyxiation, chronic toxicity resulting in reduced resistance to infection and other stresses, ecological impacts due to destruction of food organisms, and interference with behavioral patterns. In addition to impacts resulting from mining activities, some waters within the range of greenbacks are impacted by naturally high levels of heavy metals.

Today, mining activities are not as prevalent and are under environmental permitting and reclamation restrictions that minimize polluted runoff from mine sites. Progress has been made at managing mine waste, although the threat of accidental contamination through spills from abandoned mines remains. The Colorado DRMS estimates that, statewide, over 23,000 abandoned mines and 1,300 miles of streams impacted by past mining activities exist (Colorado DRMS 2009). While there may be some localized impacts to greenbacks due to past mining practices, there are many streams and lakes available for restoration.

Other Land Use Activities. Several types of land-use activities may negatively impact greenback habitat through the removal of riparian habitat that shades streams and maintains lower water temperatures, and through vegetation removal and trampling of streambanks, which causes bank erosion, producing stream sedimentation. Logging, grazing, road and trail construction and use, and recreational vehicle use near streams have the potential to cause a negative chain reaction by contributing to bank destabilization, which causes an increase in

erosion, sediment deposition, and in turn, a threat of higher turbidity and elevated water temperatures in lower elevation habitats. In addition to the direct effects of vegetation removal and trampling, these types of land management activities also can reduce the input of terrestrial insects, which constitute an important part of the trout diet, into the aquatic environment (Saunders and Fausch 2007).

Erosion materials may form a new substratum inconsistent with that required for spawning by greenback, and may smother redds (the nests of salmonid species) after the eggs are laid, cutting off oxygen needed for the eggs to hatch. Additionally, erosion of material into streams can fill in deep water areas, thereby reducing the available over-winter habitat. Because sediment loads are greatest during spring runoff and thus have their greatest negative effect on reproduction of spring-spawning native trout, accelerated erosion can favor populations of fall-spawning non-native brook and brown trout (Behnke 1992).

In general, activities that could negatively impact greenback habitat, such as grazing, logging, and road/trail construction, etc., occur on federally managed lands that are subject to section 7 consultation under the ESA and, therefore, develop conservation measures to minimize those effects. Land management agencies participating in the recovery program also use their authorities to improve habitat conditions.

Water Depletions and Water Storage Facilities. Water management and water storage actions have occurred within the range of the greenback since the 1880s, and continue to the present day. Continued rapid development is expected along Colorado's East Slope as the human population continues to grow. The South Platte River drainage is one of the main sources of water for the East slope. In theory, demand for water within the range of greenback habitat is expected to increase commensurate with population growth. As a result, potential water diversions or depletions may occur that reduce stream flow, fragment stream habitat, restrict greenback movement along stream corridors, and adversely impact water quality, aquatic food chains, and watershed conditions. As an example of water management impacts, the 1982 failure of the Lawn Lake Dam within Rocky Mountain National Park (RMNP) resulted in impacts to over 6.2 miles of cutthroat stream habitat.

Most greenback populations occur in smaller tributaries at higher elevations, which are less likely for water development. Although many of the streams with greenback habitat do not have in-stream flow water rights or protections, waters within RMNP have in-stream flow protections or Federal reserved rights. The BLM also has established in-stream flow rights on some of its cutthroat streams, including those containing restored populations of cutthroats. Most requests for water diversions or depletions within the range of greenbacks would require section 7 consultation under the ESA, which would require measures to minimize impacts. Water depletions could become a greater threat in the future under expanded drought cycles and climate change.

Fragmentation. Artificial fish migration barriers have been constructed in many cutthroat trout streams on the Front Range and have had positive results for maintaining greenback populations by excluding non-native fish. Section 2.42 of the 1998 Recovery Plan recommends construction and improvement of artificial barriers as a management strategy to stop the invasion of

downstream non-native fish. Existing barriers provide a limitation to dispersal, resulting in most populations of greenback cutthroat trout being restricted to short, headwater stream segments. More than 90 percent of the stream segments occupied by cutthroat that were previously considered to be greenback are less than 3.1 miles in length, with an average length of 1.5 miles (Albeke 2008). Small, isolated populations and the lack of connectivity makes them vulnerable to stochastic events, such as drought, floods, fires and debris torrents and, in the long term, to loss of genetic variability through bottlenecks and the reduced potential for evolving in response to changing environmental conditions, such as climate change (Young 2009). Small stream populations that are tied to lake populations are likely less vulnerable to stochastic events due to the greater ability to repopulate disturbed areas.

Diseases – Whirling Disease. One of the primary diseases that threaten cutthroat trout is whirling disease, which is a parasitic infection caused by *Myxobolus cerebralis* that impacts young trout. The disease was introduced to the United States in the 1950s, and has been present in Colorado since the 1990s. These parasites enter through the nerve endings on the skin, and feed upon cartilage in the head and spinal area of young fish, resulting in pressure on the nerves and equilibrium loss (Whirling Disease Foundation 2009). The nerve pressure causes the fish to ‘whirl’, making them susceptible to predators and starvation. Young greenbacks are highly susceptible to whirling disease. Greenbacks less than 1 year of age had a mortality rate of greater than 25 percent when lightly exposed to the disease (Markiw 1990).

The disease can be spread through hatcheries use and/or release of contaminated water, stocking of infected fish, by mud on angler equipment, and by birds eating infected fish. However, live infected fish appear to be the main vector for the spread of the disease. Controlling or managing the disease has proven to be a challenge for fishery managers. While elimination of whirling disease has not been possible, Federal and State agencies have successfully implemented regulations that prevent the spread of exotic diseases, such as whirling disease. Hatchery operations also have been improved to prevent the spread of whirling disease. For example, the Leadville National Fish Hatchery completed a cleanup of the hatchery and its water sources and was certified whirling disease free in 2007.

Since cutthroat populations exist in relatively unaltered habitats, and many of the higher/colder elevation streams have low numbers of the required intermediate host, whirling disease does not appear to be a high threat to current cutthroat populations. Stream barriers can serve to protect native cutthroat populations from immigration by non-native trout that are whirling disease positive. However, the presence of the disease may limit future reproduction and reintroduction of salmonids in lower elevation lakes and streams. Additional information on whirling disease is provided in the greenback 5-year review (FWS 2009).

Diseases - Other. Several other diseases in Colorado have the potential to affect the greenback, including the New Zealand mud snail (NZMS) and the Zebra and quagga mussels. However neither of these diseases is currently known to infect cutthroat trout in Colorado at this time, but it is possible they could be transferred to greenback lakes or streams in the future. The extent of their potential impacts on greenback populations, should they spread into occupied streams, is unknown. Additional information on these diseases is provided in the greenback 5-year review (FWS 2009).

Fire and Fire Management Activities. Wildfires are a natural component of the ecological region occupied by the greenback. However, suppression of forest fires over the past 80 to 100 years in North America has resulted in many forest types with substantial fuel accumulations that are at risk of wildfires with greater intensity and severity than historically occurred. The added effects of drought and climate change add to the potential fire risk.

While managers do their best to control and or prevent wildland fires, unplanned fires do occur and can have negative impacts on aquatic species and their habitat. The direct effects of fire can be lethal to fish both from the increases in stream temperature, and from smoke and ash (both immediate ashfall and later erosional deposition) that can cause an increase in ammonia and respiratory distress, respectively. Minshall and Brock (1991) believe that increased water temperatures during the fire can kill fish in small (first and second order) streams but doubt that larger streams get hot enough to kill organisms. Mortality in second and third order streams could be caused by smoke and ash (Minshall et al. 1989). Additionally, indirect adverse effects can result from the loss of streamside and forest vegetation and include erosion and loss of bank stabilization, causing increased turbidity and stream temperatures. Given the short length of many cutthroat streams in Colorado, large scale fires have the potential to extirpate individual greenback populations.

Fire retardant chemicals used for fire-fighting also present a threat to cutthroats because they are known to be toxic to aquatic wildlife. Lethal levels of fire retardants have been documented in studies on rainbow trout (Buhl and Hamilton 2000). Depending on the size of the retardant drop and the stream characteristics, ammonia concentrations from the retardant can remain lethal for at least 0.62 miles downstream of the retardant drop (Norris and Webb 1989). Larger, better-connected fish populations are more resilient (Rieman et al. 1995; Dunham et al. 2003) and in these cases, individuals from downstream may migrate back into the headwater system to spawn, re-establishing the population in that area. No known drops of fire retardant have occurred on greenback streams. However, given the smaller-sized streams that greenbacks typically occupy with their reduced potential for dilution of fire retardant, combined with the general inability to be naturally repopulated due to isolated populations and downstream barriers, the effects of a retardant drop on an individual greenback stream could be severe. Fish populations in lakes may be less impacted by retardants due to the volume of water in the lakes, and multiple water sources for some lakes.

An additional threat to greenback populations from fire management is the potential to introduce whirling disease into greenback streams by the aerial application of water during firefighting activities. Contamination could occur in this manner if the water was drafted from a stream or lake containing whirling disease. Interim guidelines have been developed for fire personnel to help them avoid the spread of whirling disease and other aquatic diseases (USFS 2007).

Since recovery efforts began in the 1970s, no known greenback population has been negatively impacted by fire activities. Many of the reintroduction sites are at high elevations with low fuel loads and minimal fire threats. Additional information on threats from fires and fire management is provided in the greenback 5-year review (FWS 2009).

Contaminants. The Western Airborne Contaminants Assessment Project was completed by the National Park Service in 2008 (Landers et al. 2008). From 2002 to 2007, researchers conducted analysis of the concentrations and biological effects of airborne contaminants in air, snow, water, sediments, lichens, pine needles, and fish in eight national parks, including RMNP. The study found high levels of endosulfans and dacthal in snowpack depositions and also in fish samples in RMNP. Mercury levels in fish samples were fairly low, although mercury level increased with increasing age of fish. Poorly developed testes and/or intersex trout were found in five of the nine lakes tested in RMNP, indicating that endocrine and reproductive disruption is occurring (Landers et al. 2008). As part of this study, a sample from a male greenback collected in Twin Lakes in the 1800s also was examined and found to be an intersex fish, showing that this is not a new phenomenon, and likely does not pose a significant threat to greenback recovery.

Utilization and Management. Unregulated fishing was a major cause in the historic reduction of greenback (USFWS 1998). Since the subspecies was reclassified as a threatened species in 1978, sport angling for the greenback has been regulated under section 4(d) of the ESA. The CPW regulates the taking of greenback for commercial, recreational, scientific, or educational purposes as long as it is consistent with State law and the 4(d) rule. The 4(d) rule allows sport angling under applicable State law. Zimmerman Lake, which was stocked by CPW with greenbacks in 2014, is open to catch and release fishing while Bear Creek has been closed by CPW to angling since January 1, 2008. Additional information on the management of greenbacks is provided in the greenback 5-year review (FWS 2009).

Global Climate Change. According to the Intergovernmental Panel on Climate Change (IPCC 2007) “Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.” Average Northern Hemisphere temperatures during the second half of the 20th century were very likely higher than during any other 50-year period in the last 500 years and likely the highest in at least the past 1,300 years (IPCC 2007). It is very likely that over the past 50 years cold days, cold nights, and frosts have become less frequent over most land areas, and hot days and hot nights have become more frequent (IPCC 2007). It is likely that heat waves have become more frequent over most land areas, and the frequency of heavy precipitation events has increased over most areas (IPCC 2007).

The IPCC (2007) predicts that changes in the global climate system during the 21st century are very likely to be larger than those observed during the 20th century. For the next two decades, a warming of about 0.2°C per decade is projected (IPCC 2007). Afterwards, temperature projections increasingly depend on specific emission scenarios (IPCC 2007). Various emissions scenarios suggest that by the end of the 21st century, average global temperatures are expected to increase 0.6 to 4.0°C with the greatest warming expected over land (IPCC 2007). Localized projections suggest the southwest may experience the greatest temperature increase of any area in the lower 48 States (IPCC 2007). The IPCC predicts that it is very likely hot extremes, heat waves, and heavy precipitation will increase in frequency (IPCC 2007). There also is high confidence that many semi-arid areas like the western United States will suffer a decrease in water resources due to climate change (IPCC 2007). Milly et al. (2005) project a 10 to 30 percent decrease in precipitation in mid-latitude western North America by the year 2050 based on an ensemble of 12 climate models.

As a recently emerging issue, warming temperatures associated with current climate change theories were not specifically discussed in the 1998 Recovery Plan, although the task of monitoring populations is generally outlined in Recovery Plan Tasks 1.1 and 2.6. As part of the monitoring protocol, one of eight study sites in the Service's Fishery Resources Status and Trends, Global Climate Change Component (1993) was in greenback habitat. The goal of this program was to determine the effects of global climate change on fishes in selected regions of the United States. As such, water temperatures and spawning dates for high elevation greenback populations were collected at eight sites as baseline data for this study (FWS 1993). Temperature monitoring has continued and has been expanded to many cutthroat populations within RMNP.

Coleman and Fausch (2007a) monitored six headwater streams containing what were previously considered to be greenback populations in RMNP and the Arapaho-Roosevelt National Forest. Their results showed that recruitment of native cutthroat trout in Colorado is limited by cold water temperatures that reduce growth and recruitment. Based on these results, we can hypothesize that, at least for the short term, an increase in water temperature could be beneficial for greenback reproduction and recruitment. The recovery program has a good baseline data set for water temperature and the potential to identify population changes within sub-alpine habitats in the future that should provide for the evaluation of the effects of changing water temperatures on cutthroat trout populations.

Studies have indicated that global warming has the potential to adversely affect river systems that support greenback (Defenders of Wildlife 2002; Ficke et al. 2007). In general, threats from climate change could affect fish populations through reduction of precipitation, increase in fire, and increase in stream temperature. Higher temperatures in lentic systems (lakes) also could increase evaporation and result in lowered lake levels (Ficke et al. 2007). Defenders of Wildlife and The Natural Resources Defense Council performed a 2002 study that modeled the effects of increased air and water temperatures in trout habitat. The report suggests that species of trout and salmon could lose 5 to 17 percent of their existing habitat by the year 2030, 14 to 34 percent by 2060, and 21 to 42 percent by 2090 (Defenders of Wildlife 2002). Although relative impacts to the greenback are unknown, these studies suggest that native cutthroat trout may experience a significant decline in habitat within the next 25 years due to climate change, with highest concern for trout populations in southern and southwestern States. However, a slight increase in water temperature also could be beneficial in extending the growing season and increasing fish production in high elevation greenback streams where spawning and incubation are delayed due to current cold temperatures, as described by Coleman and Fausch (2005). While it appears reasonable to assume that cutthroats may be affected, we lack sufficient certainty to know how climate change will affect the subspecies. Additional information on climate change is provided in the greenback 5-year review (FWS 2009).

1998 Recovery Plan

Prior to the acquisition of recent genetics data, it was believed that existing populations almost exceeded the recovery goal provided in the 1998 Recovery Plan, with approximately 166.7 ha (412 acres) of lakes and 227.7 km (142 miles) of stream habitat occupied. The Recovery Plan

(USFWS 1998) defines a recovery population as an occupied stream segment of greater than 1.2 miles or containing 500 or more fish greater than 4.7 inches in total length. Given the new information that significantly altered our understanding of the identity of the greenback and its revised native range, based primarily on Metcalf et al. 2012, the Service recognizes the need to revise the Recovery Plan. In the meantime, the Greenback Recovery Team is currently preparing a Greenback Recovery Outline that will provide interim guidance until the Recovery Plan is revised.

ENVIRONMENTAL BASELINE

The environmental baseline is the past and present effects of all Federal, State, or private actions and other human activities in the action area, the anticipated effects of all proposed Federal actions in the action area that have already undergone formal or early section 7 consultation, and the effects of State or private actions that are contemporaneous with the consultation in progress.

Existing Trail and Road System within the Action Area

Bear Creek. Existing motorized (single track motorcycle) and non-motorized trails (hiking, horseback riding, and mountain biking) provide access for recreational activities in the Bear Creek drainage. High Dive also provides vehicle access to the lower portion of Bear Creek, although it is currently closed to public motorized use. A total of 16.7 miles of motorized trails and 7.8 miles of non-motorized trails are present within the Bear Creek drainage. A total of 3.2 miles of motorized roads (High Drive) are present within the Bear Creek drainage. Trails within the Bear Creek drainage, particularly those within the WIZ, have resulted in increased erosion and sedimentation into Bear Creek, which is negatively affecting stream habitat for the greenback.

Maintenance of the motorized and non-motorized trails in the Bear Creek drainage has been conducted since 2008 for the purposes of addressing the existing sediment issues and potential contamination issues for greenbacks in Bear Creek. A discussion of ongoing and past sediment mitigation projects is provided in the *Consultation History* section of this biological opinion, with greater details provided in Appendix A. These projects have been designed to mitigate sediment movement generated from the trail system. However, these actions only target various problematic locations and do not address the overall and long-term sustainability of the trail system within the Bear Creek drainage. Sedimentation from these trails continues to negatively affect stream habitat.

In addition to the system trails, human use in this area has resulted in the creation of non-system trails (i.e., social trails), including approximately 3.9 miles of non-system trails located in the WIZ of Bear Creek in the area from Josephine Falls down to the entrance of Bear Creek Canyon Park. Repeated use along the creek has denuded stream banks and the slopes between the road and stream. Small man-made rock dams and other in-stream modifications in Bear Creek are common, and have led to the over-widening of the stream channel.

High Drive - The surface of this road is an unpaved, mostly aggregate material that erodes from vehicle wear, rain, snow, and freeze/thaw conditions. Much of the drainage system adjacent to High Drive is currently not functional due to accumulated sediment (CH2MHill 2013, p.7). Many culverts are buried or non-functioning, ditch capacity is reduced, and upland areas are eroding. Routine maintenance is not sufficient to improve the overall drainage system. Obstructed culverts and filled roadside ditches form a pathway for sediment transport to stream channels. These combined flows have exceeded the capacity of the drainage infrastructure, resulting in erosive forces that cause additional erosion and sediment buildup in the ditches and into Bear Creek. This road system has been a major source of sediment to the lower section of Bear Creek, as evidenced by severe damage to High Drive and various trails that occurred during rain events in the September 2013 flood (RMFI 2013; CH2MHill 2013). Portions of the trail system and the road base and drainage system along the upper portion of High Drive were repaired as a result of emergency restoration efforts (see *Consultation History*). However, the drainage system along the lower portion of High Drive remains non-functional and continues to transport sediment into Bear Creek. The FEMA High Drive Improvement Project is concurrent to this project and will address the identified erosion and sedimentation issues on the upper sections of High Drive and will receive a separate section 7 consultation. High Drive continues to be a source of sediment into the lower section of the stream following storm events.

North Cheyenne Creek. North Cheyenne Creek is less impacted by the transportation system and human recreation than Bear Creek. Recreational trail activities may have some localized effects of increased erosion and sedimentation of the creek at these sites. However the trails cross the creek, either with bridges or at sites that are located more than 0.7 miles upstream of the upper limits of the cutthroat trout population in this creek and downstream impacts to this population are not considered to be a concern.

Existing Forest Conditions within the Action Area

The action area is predominantly covered by forested stands that range between 6,800 and 11,400 feet in elevation. The forested cover types within the montane zone consist of sapling-pole and mature stands of ponderosa pine, Douglas-fir, white fir, limber pine, quaking aspen and Gambel oak, while subalpine stands generally consist of bristlecone pine, Engelmann spruce, and limber pine, with a component of quaking aspen. The stands within the project area are distributed on all aspects with slopes of about 5 to 70 percent. Steep slopes (i.e., >40 percent) are primarily north to southeastern facing and make up about 34 percent of the project area. Non-forested cover types comprise about 8 percent of the project area and include rock outcrops or barren areas. With the exception of coarse woody debris and plant litter, vegetative ground cover is limited in the project area as soils are rocky, shallow, and coarse textured with thin organic layers (USFS 2015). Existing willow and other deciduous vegetation has a discontinuous distribution because stream courses have a high gradient or are located within relatively confined drainages that are absent of floodplains, or in which floodplain width is constricted, which reduces the opportunity for willow growth.

The Bear Creek drainage is considered to be at risk of a large-scale wildfire event due to dense forests with heavy fuels loads on steep slopes. Such an event has the potential to result in widespread destabilization of slopes in the project area and large runoff-producing storms that

would likely transport available sediment and debris from the slopes and along channel bottoms, further degrading stream habitats conditions.

Existing Stream Conditions within the Action Area

Bear Creek is a small, headwater stream that is approximately 4.1 miles in length. It begins as a series of small tributaries in a high mountain meadow, referred to as Jones Park, then descends steeply through a rocky canyon with a series of cascades and waterfalls. Downstream of the falls, the stream maintains a relatively constant gradient, until it exits the canyon near the Gold Camp Road in Colorado Springs. The lower 0.7 miles of the occupied stream closely parallels High Drive. A natural barrier in the stream, consisting of a series of cascades, is located near the caretaker's cabin near Gold Camp Road. This barrier maintains the greenback population by preventing the invasion of non-native fish (i.e., brook trout) from downstream.

The geology of the project area is comprised primarily of very erosive gneissic granitic soils associated with the Pikes Peak Batholith, interspersed with areas of exposed bedrock. These granitic soils are particularly vulnerable to rill and gully erosion if protective ground cover is removed. The Bear Creek drainage is greatly influenced by sedimentation issues, primarily due to the naturally occurring decomposed granite within the drainage but also by sediment coming from the road (High Dive) and from many recreation trails and associated use close to the stream. Large amounts of sediment were deposited in the lower section of Bear Creek following the September 2013 flood. The current rate of sediment inputs from these features appears to exceed the capacity of the stream system to transport these materials.

A basin-wide assessment that was conducted in 2011 by Fin-Up Habitat Consultants, Inc. (Gallagher 2011) demonstrates that many features of the aquatic habitat in the Bear Creek watershed had declined in 2011, as compared with the basin-wide assessment that was conducted in 1994. In-stream conditions, such as pool area, maximum pool depth, and average pool depth, have declined significantly over this time period. Glide habitat (i.e., shallow, gravel-filled features) have increased significantly because of sediment aggradation within Bear Creek. These glides do not have deep water pools and do not have insect production that is typically found in riffles. During this time period, the amount of large woody material had increased and the extent of eroding stream bank remained stable, but cover declined in each reach (Winters et al. 1994, Gallagher 2011). Stream channels are also over-widened at trails cross stream crossings, which could restrict movement of fish during low flow periods. Each of these changed conditions reflects a lack of sufficient stream velocities to scour and transport the quantity of sediment in the channel and retain pool area and depth (USFS 2015). A basin-wide assessment was scheduled to occur in 2015 but was not completed due to high water flows that precluded a comparison to the earlier basin-wide assessments in 1994 and 2011.

For the purposes of identifying a reference stream to compare Bear Creek conditions to other similar streams in the area, Fin-Up Habitat Consultants, Inc. conducted an aquatic habitat analysis in 2014 of South Ruxton Creek, which is a small, headwater stream located immediately west of Bear Creek (Gallagher 2015 *in* USFS 2015). Because of the limited disturbance that has occurred upstream from the reservoir, and based on other geomorphic considerations, South Ruxton Creek was determined to be a suitable candidate for a reference stream for comparison

with other streams on the Pikes Peak massif. Sediment measurements (i.e., V*) were collected in 2014 in South Ruxton Creek and Bear Creek. This method provides a measure of sediment deposited in a pool feature compared to the total residual capacity of the pool. The fraction of pool filling serves as an index of the supply of mobile sediment in gravel-bed channels. In South Ruxton Creek, the residual pool volume that was filled with sediment varied from 7.1 to 14.2 percent. In Bear Creek, the measurements of residual pool value that was filled with sediment ranged from 36.6 to 82.7 percent, indicating limited available pool habitat. When a pool fills with sediment, average pool depth, maximum pool depth, and pool area are reduced, limiting available habitat for fish (Gallagher 2015 in USFS 2015). These analyses of stream habitat conditions confirm that sedimentation of Bear Creek is negatively impact the greenback population.

Existing Fish Populations in the Action Area

Bear Creek. The greenback population in Bear Creek basin occupies about 4.1 miles of stream, of which the lower 3.4 miles are considered fully occupied and the remaining stream is considered transitional habitat due to limited stream flow in the upper reach. This occupied habitat consists of approximately 2 miles along the lower section of Bear Creek, which extends from the stream barrier up to Josephine Falls, and then an upper section of 1.42 miles from Josephine Falls up to the transitional zone above Jones Park.

Habitat quality in Bear Creek is considered to be impacted by a reduction in residual pool depth, frequency of riffles, and the extent of riparian vegetation. With a reduction in residual pool depth, thermal refugia for fish has decreased during overwintering periods, as well as during periods of reduced flow and increased water temperatures due to drought. Sedimentation of riffle areas has resulted in declined habitat conditions due to the deposition of fine sediments that have negatively affected habitat quality by smothering eggs and limiting macroinvertebrate production by filling interstitial spaces between larger substrates. The lower 0.7 miles of stream that borders High Drive has been severely impacted by sedimentation resulting from storm events that filled much of the pool habitat.

CPW has conducted electro-fishing studies in 2008, 2011, and 2014 at five different sites along Bear Creek, although all sites were not evaluated in each of those years (Nehring 2015). Based on 2014 data, the estimated average of fish of all sizes is 659 fish per mile (Nehring 2015). In general, CPW data indicate a slight decline in fish per mile during the period from 2008 to 2014. According to CPW (Nehring 2015), two sampling sites located below the waterfall (i.e., lower section) contain an average of 440 fish per mile, of which, about 84 percent are adults (i.e., > 120mm). Above the waterfall (i.e., upper section), two sampling sites contain a higher average number of fish, at 461 fish per mile, but adults only comprise 62 percent of the population. For comparison, population estimates in 2008 in the lower section were an average of 781 fish per mile and the upper section was not evaluated. Population estimates in 2011 were an average of 582 fish per mile in the lower section and an average of 426 fish per mile in the upper section. No other fish species are present in occupied greenback habitat due to the downstream barrier that prevents brook trout in the lower portion of Bear Creek from moving upstream. Based on CPW electro-fishing results from 2014 (Nehring 2015), we estimate that the greenback population is approximately 2,240 fish of all sizes (average of 659 fish/mile x 3.4 miles).

Bear Creek has been closed by CPW to all fishing activities since January 1, 2008 and remains closed.

Whirling disease is not considered to be present in Bear Creek. The greenback population does not show sign of infection and the aquatic oligochaete host of this parasite (i.e., *Tubifex tubifex* worms) in Bear Creek has not been identified in Bear Creek. Furthermore, the gravel substrate that occurs in Bear Creek is less conducive to supporting the whirling disease than streams with fine sediments where it is more commonly found.

North Cheyenne Creek. North Cheyenne Creek was surveyed for cutthroat trout in 2003 and found to provide excellent habitat according to Doug Krieger, CPW Area Fisheries Manager. The stream was barren due to the presence of several waterfalls that had precluded upstream migration of fish. In 2004, CPW stocked fish from Graneros Creek into a 2.5 mile section of North Cheyenne Creek. According to CPW, genetic testing has confirmed that these fish are Colorado River cutthroat. CPW has found that the population is now self-sustaining, but management emphasis is on protecting the habitat rather than the fish population. Pending a new status determination, all cutthroat populations on the Pike and San Isabel National Forests will continue to be federally listed and managed as threatened species. This species is also managed as an aquatic Management Indicator Species (MIS) on the Pike and San Isabel National Forests.

Conservation Role of the Action Area

Bear Creek, above the barrier, provides for the entire life cycle of the Bear Creek greenback population. As discussed earlier in this biological opinion, Bear Creek contains the only remaining greenback population in a stream. The only other greenback population in the wild is present in Zimmerman Lake, which is located in the Poudre River drainage.

EFFECTS OF THE PROPOSED ACTION

The proposed action is expected to significantly improve the ecological function of Bear Creek and the habitat conditions for its greenback population through a reduction in sediment delivery to the stream system by rerouting trails away from the creek, stabilizing trails and High Drive, stabilizing stream banks and hill slopes, enhancing riparian vegetation, improving in-stream habitat, and improving recreational management. Additional benefits would be provided to greenbacks in Bear Creek by the maintenance/construction of the in-stream barrier, if necessary in the future. We recognize, however, that these actions will also result in some short-term impacts to the greenbacks present in Bear Creek.

Trails and Upland Management

Improvements to the trail system, and ultimately the Bear Creek ecosystem, would be achieved through trail realignment, improved trail drainage, bridge removal or construction, and system/non-system trail rehabilitation. The proposed action will reduce the length of trails, the number of stream crossings, and the extent of ground disturbance within the WIZ along 3.4 miles

of Bear Creek. Under the proposed action, approximately about 6.5 miles (78 percent) of existing trails within the WIZ of Bear Creek would be decommissioned. This achievement would result from a reduction of 2.5 miles (96 percent) of motorized trails, 0.3 miles (25 percent) of non-motorized system trails, and 3.9 miles (100 percent) of non-system trails within the WIZ (USFS 2015). This removal and rehabilitation of many of the existing trails and associated ground disturbances within the WIZ is anticipated to result in a substantial reduction in sediment delivery to Bear Creek. Maintenance of existing trails that will remain will further decrease the sediment entering Bear Creek.

A reduction in the sediment delivery to Bear Creek is expected to provide a significant benefit to the greenbacks in terms of feeding (i.e., reduction in sediment that can fill in interstitial areas in riffle areas where macroinvertebrate production occurs), sheltering (i.e., reduction in sedimentation of pool habitats, especially winter pools), and breeding (i.e., reduction in sediment that can alter and smother spawning sites (i.e., redds)). A reduction in erosion and sedimentation in the creek will also reduce turbidity levels, which will improve trout health and survival.

Trail and stream bank stabilization work is expected to cause some short-term ground disturbances that may result in slight increases in erosion and sedimentation in Bear Creek. These effects are anticipated to result in low levels of increased sedimentation to the creek, which may impact pool and riffle habitat, and short-term increases in turbidity, which can affect fish health. However, these impacts are anticipated to be short term and minor and the use of conservation measures would minimize the movement of soils during implementation and following storm events. Several of the more significant conservation measures for this activity include the prohibition of all management actions that cause direct sediment delivery to the creek during the period from May through August as well as the use of appropriate sediment control measures in areas of ground disturbances. Revegetation of disturbed areas, such as those resulting from trail construction and trail closures, will further decrease erosion, thereby reducing sedimentation impacts to greenbacks in Bear Creek.

The decommissioning and restoring of trails would also create site conditions that facilitate the recovery of vegetation within the Bear Creek drainage. Complete vegetative recovery on all rehabilitated sites is not anticipated, especially on severely damaged and steep slopes. However, stabilization of disturbed soils adjacent to Bear Creek would aid in the recovery of herbaceous and deciduous woody riparian vegetation. Riparian vegetation would help maintain stream channel profiles by protecting banks with soil-binding roots and by shielding banks from erosion. Riparian vegetation would also provide large woody material for recruitment, nutrients for aquatic and terrestrial prey, and cover that regulates fluctuations in water temperature (USFS 2015).

An additional benefit of the proposed trail reroutes away from Bear Creek is a reduction of humans and dogs near the stream by eliminating the number of live stream crossings and by restricting human access in the Bear Creek basin. This reduced contact with the stream would diminish the risk of accidental introduction of aquatic nuisance species (e.g., whirling disease) into the stream system.

Overall, these proposed trail projects and stream bank stabilization would result in a long term benefit to the Bear Creek system by fewer trails within the WIZ of the creek, improved trail drainage, less disturbed or barren ground, and reduced trail contact with the creek. These long term benefits are expected to greatly outweigh the short-term impacts resulting from ground disturbances. Sediment delivery to the creek would ultimately be reduced as sources of erosion are eliminated or stabilized and hydrologic connectivity with the creek is reduced (USFS 2015).

High Drive Improvement Project

The proposed improvements to High Drive and its drainage system along the lower section of Bear Creek (i.e., where High Drive parallels Bear Creek for approximately 0.7 miles) is also expected to result in a significant reduction in erosion and sediment delivery to the creek by addressing the drainage issues along the road and by reestablishing a functional culvert and ditch system. The conversion of High Drive from motorized use to administrative motorized use would also eliminate heavy vehicle traffic that further contributes to the accumulation of sediment in drainage features. Additionally, road maintenance will no longer be able to side cast soils directly into Bear Creek, further reducing the input of sediment into the stream. These actions along lower High Drive will complement the ongoing FEMA project that is occurring on the upper reaches of High Drive. The combination of these management actions would make the portion of High Drive that drains into Bear Creek more resilient to erosion during rain events.

However, road and drainage improvements would entail ground disturbances and the use of heavy equipment in close proximity to Bear Creek, increasing the risk of sediment entering occupied greenback habitat. These effects are anticipated to result in low levels of increased sedimentation to the creek, which may impact pool and riffle habitat, and short-term increases in turbidity, which can affect fish health. However, these impacts are anticipated to be short term and minor and the use of conservation measures would minimize the movement of soils during implementation and following storm events. Several of the more significant conservation measures for this activity include the prohibition of all management actions that cause direct sediment delivery to the creek during the period from May through August as well as the use of appropriate sediment control measures in areas of ground disturbances. Revegetation of disturbed areas will further decrease erosion, thereby reducing sedimentation impacts to greenbacks in Bear Creek.

Summary of Combined Impacts of Trails, Upland, and High Drive Management – We fully expect that the proposed trails system and upland management and the High Drive management will provide a significant reduction in sediment delivery to Bear Creek, ultimately benefitting in-stream habitat for the greenback. We recognize, however, that these actions will likely result in short-term ground disturbances that may result in slight increases in erosion and sedimentation in Bear Creek, although this amount is difficult to quantify. Based on the ground disturbances that could occur along Bear Creek and the conservation measures that will minimize erosion and sedimentation, we estimate that these activities and their associated sedimentation into Bear Creek will result relatively minor impacts to the fish in this section. Therefore, given that project activities will occur along 3.4 miles of the stream and the average number of fish per mile in Bear Creek is 659 fish (of all sizes) per mile, we estimate that the increased sedimentation impacts resulting from ground disturbances within the Bear Creek WIZ along the entire length of

the occupied stream (3.4 miles) would result in a 1 percent loss of fish per mile, for a total of up to 22 fish of all sizes. Our estimate that only 1 percent of the fish in Bear Creek would be impacted by these activities is based on the project commitment that sedimentation into the stream from disturbed areas would be minimized by sediment control measures (e.g., silt fences, wattles, straw) and other conservation measures to minimize sedimentation. We fully expect that the proposed trails, upland, and road management activities will result in a net improvement in the sediment conditions within Bear Creek.

We consider that project maintenance activities that are necessary and consistent with the proposed action will be covered by this biological opinion during the period of project implementation and for 3 years following project completion. After this time, maintenance activities that may affect greenbacks would require reinitiation of this consultation.

In-stream Restoration

Under the proposed action, in-stream restoration work would provide long-term, significant improvements to the habitat and function of the aquatic system in Bear Creek through pool enhancement, stream bank stabilization, and improved in-stream sediment transport. However, we anticipate that relatively minor, short-term impacts and disturbances to the stream system and the greenbacks would also result from this activity.

Approximately 12 percent of the lower section (along 0.7 mile) and 3 percent of the upper section (along 1 mile) of the creek is proposed for treatment along a total of 1.7 miles. Work will primarily occur in pool habitats; all riffle areas will be avoided by in-stream work. Existing pools would be enhanced through the placement or adjustment of rock or log structures (i.e., cross vanes) that would allow the current to scour sediment from pools. Some existing pools would also be enhanced by the removal of armoring cobble and the removal of accumulated sediment. Work in the lower stream section will include the construction of approximately 72 boulder or log structures (cross vanes) and the removal of stream armoring from approximately 11 pools.

Improvements to the pool habitat are expected to significantly improve stream habitat conditions for the greenback. Pools provide important habitats for cutthroat trout and receive disproportionately higher use, as compared to use of riffles, during summer (Young 1996, Young et al. 1997a in Young 2009). Deeper pools provide crucial thermal refugia in winter and summer. As daytime foraging sites, the heads of pools usually provide the greatest energetic returns in small to medium-sized streams because macroinvertebrate production in upstream riffles is often high and has not been cropped by other fish. The reduced velocity in pools also requires less energy for fish to maintain position (USFS 2015). These in-stream pool enhancements are anticipated to benefit the greenbacks in terms of sheltering, feeding, reproduction, and overall survival.

In-stream sedimentation issues will also be improved by stream bank stabilization work. Approximately 1,135 linear feet of the stream bank will be stabilized in the lower stream section. In-stream sedimentation issues will also be improved by the proposed action to reroute approximately 200 feet of stream around an eroded gully with an adjoining alluvial fan, which is

contributing sediment to the creek in the lower section. Through the proposed plan to stabilize erosive stream banks and reroute the stream around the alluvial fan, greenbacks will benefit from a reduction in stream channel instability and excess deposition of sediment, resulting in an improvement to the survival and reproduction conditions for the greenbacks in Bear Creek.

Work within the stream channel would be minimized as much as possible and would only occur in select areas of the stream where the work would be expected to provide a benefit. Work will consist of selective placement and adjustment of individual rocks and logs, as opposed to large scale disturbances within the stream channels. Additional ways to minimize impacts from work within the stream channel are provided in Appendix D.

However, this stream restoration work, which will ultimately benefit the greenbacks in Bear Creek, is expected to also result in some relatively minor, short-term disturbances to the stream conditions and to the greenbacks. Impacts are expected to result from alteration of stream conditions, potential alteration of available food, disturbance and potential injury or death of individual fish, and potential introduction of contaminants to the stream.

Impacts to Stream Habitat Conditions

Existing sediment within the stream channel could be disturbed and redistributed during the enhancement of pools and the manipulation of rocks and logs. Greenback habitat located downstream of the treatment areas would be impacted if disturbed sediment fills in pool habitats, interstitial spaces in riffles, affecting macroinvertebrates and reproduction.

The magnitude of these negative effects would vary based on the proximity and intensity of the in-stream treatments. Sediment displacement would be most pronounced at sites treated with equipment (i.e., mini excavator or tracked skid steer), as proposed in the lower stream section. Project design and conservation measures provide for the minimization of in-stream impacts from equipment use though. Use and travel of equipment within the stream will be minimized and is expected to involve approximately 300 feet of the lower section, representing approximately 8 percent of the lower section. In-stream work in the lower section will proceed in an upstream- to-downstream direction in order to avoid sedimentation of areas already treated. The proposed in-stream work is likely to result in some low-level sedimentation impacts in pool habitats, although the extent of this impact is difficult to quantify.

Impacts to Food Resources

The proposed in-stream work has the potential to affect foods source for greenbacks by disturbing macroinvertebrates that are present in the stream substrate. However, impacts to macroinvertebrates are expected to be minimal because riffle areas, the primary areas of macroinvertebrate productivity, will be avoided by in-stream work. Other food sources, such as terrestrial insects, are expected to increase in the long term as a result of increased riparian vegetation along the stream. In-stream restoration work is not expected to result in long term effects to macroinvertebrates. Analyses of macroinvertebrate populations following other in-stream restoration projects determined there was no significant change to macroinvertebrate communities (Ernst et al. 2012; Pant 2014). Impacts to food resources for the greenbacks from the in-stream work are expected to be minimal.

Impacts to Reproduction

Conservation measures would reduce the negative effects of in-stream work on the reproductive success of this species by prohibiting management actions that cause sediment delivery to the stream during the spawning, egg development and hatching, and early rearing period of May through August. This conservation measure would protect greenback redds (i.e., spawning sites) and alevins (i.e., young fish with a yolk-sac). After this period, sediment displaced during restoration would not be expected to affect greenback reproduction as alevins would have completed emergence from the gravel and become free-swimming fry (Krieger, pers. comm. 2014 *in* USFS 2015). Because of the prohibition of in-stream work during the reproductive period and other measures to minimize sedimentation, the impacts to greenback reproduction from the proposed action are expected to be minimal.

Risk of Disturbance and Direct Injury

In-stream restoration work in Bear Creek has the potential to disturb and injure greenbacks due to the presence of people and equipment within the stream. However, conservation measures will reduce in-stream disturbances by minimizing the use of equipment within the stream where possible and by restricting in-stream restoration activity to only one site at a given time, under most situations. Greenbacks in Bear Creek have demonstrated a propensity to move in response to environmental stress (i.e., drought, flooding, high sediment load), and recolonize sites when conditions stabilize (Krieger, pers. comm. 2014 *in* USFS 2015). It is anticipated that these fish would have a similar behavioral response to disturbance generated by in-stream restoration. The conservation measure that specifies that project personnel would wade into the stream at treatment sites prior to implementation of in-stream work would encourage fish movement away from in-stream work sites, thus minimizing potential injury to fish.

Even with the implementation of the management practices to minimize impacts to this species, in-stream restoration has the potential to result in the direct harm to individual greenback cutthroat trout, particularly in the lower section due to the use of in-stream equipment and more intensive work. Greenbacks in Bear Creek are relatively small, and as such, smaller fish (i.e., 3 inches) may not be as mobile during in-stream restoration (Krieger, pers. comm. 2014 *in* USFS 2015). There is a possibility that fish would be unable to relocate during in-stream work, and individuals may suffer abrasion, suffocation, or may be buried by streambed sediment.

Additionally, increased sediment and turbidity could directly impact the greenbacks by affecting foraging ability and by damaging gills. Fortunately, Bear Creek contains very little organic matter and there is a low risk of fine silt that would otherwise damage the respiratory systems of fish (Krieger, pers. comm. 2014 *in* USFS 2015). The substrate in Bear Creek is dominated by medium to coarse gravel that settles relatively quickly (estimated <20 feet, following streambed disturbance), as compared to fine sediments that can remain suspended longer in the water column (USFS 2015). Furthermore, project conservation measures specify that turbidity will be monitored during implementation and work will stop if turbidity is above 300 NTU until the water clears to an acceptable level below 250 NTU. This level of turbidity may result in some short term impacts to feeding but is well within the natural range of turbidity in Bear Creek, which can often reach 900 NTU following rain events. This level of turbidity is not expected

result in injury to fish or affect reproduction (J. Valladeres, pers. comm. 2016). Suspended sediment concentrations that reach 3,000 mg/l can cause gill trauma and/or temporary changes in blood physiology (Bash et al. 2001). Lethal effects can occur if suspended concentrations reach 22 mg/l at any one time, or remain at concentrations of 3,000 mg/l for 3 hours (Newcomb and Jensen 1996). While there is a relationship between suspended solids (measured in mg/l) and NTUs, the correlation is highly variable because of differences in many NTU factors, including particle size and water temperature. Oregon Department of Environmental Quality (2001) developed a regression analysis between suspended solids and NTUs. If a similar relationship exists with Newcomb and Jensen's data, their 3-hour lethal range of 3,000 mg/l would equate to a NTU reading of between 833 and 1,500 mg/l. The project commitment to not exceed 300 NTU for this project would result in a level well below the lethal range identified by Newcomb and Jensen (1996). Considering these stream conditions and the project conservation measures, impacts from suspended sediments are anticipated to be relatively minor and short-term.

Additionally, rescue of individual fish from the new section of channel (200 feet in length) to be constructed around the alluvial fan will result in the need to handle approximately 10 fish (Reach~5526 feet, 200 feet of diverted channel = 3 percent of Reach; Population of Reach ~220 fish = ~7-10 fish rescued/handled). Handling will include collecting by hand net, transferring to a bucket of water, and then releasing fish back into the new stream channel. According to the BA (USFS 2015), all fish are expected to survive this activity, although we have identified this activity as a potential adverse effect in the event that handling may injure the fish.

Contamination Risk

In-stream work also has the potential to increase the risk of contamination of Bear Creek from invasive species and equipment; this risk could potentially decrease the survival of the greenbacks. However, the proposed action has been developed to greatly minimize these risks. For instance, project design and conservation measures require that all equipment be cleaned and inspected before entering the project area. The potential also exists for spills of gasoline and other fluids to occur from equipment present in or near Bear Creek, however implementation of the conservation measures will greatly minimize this potential risk. Because of the conservation measures that greatly minimize the potential for contamination by invasive species and spills, the impacts to greenbacks from potential contamination risks are expected to be insignificant and discountable.

Summary of Combined Impacts from In-stream Restoration – We fully expect that the proposed in-stream restoration work will provide a significant improvement to stream habitat for the greenbacks in Bear Creek. We recognize, however, that these actions will likely result in short-term disturbances within the stream that may also result in slight increases in sedimentation, although this amount is difficult to quantify. Therefore, for impacts resulting from in-stream work along 1.7 miles of stream, based on estimates from CPW fisheries biologists (USFS 2015) and on the conservation measures to minimize the in-stream disturbances, we estimate a 2 percent loss of fish per mile, for a total of up to 22 fish of all sizes (based on an average of 659 of fish of all sizes per mile in Bear Creek). Additionally, for impacts resulting from fish handling and salvage operations along the 200 feet of rerouted stream channel, we estimate a loss of up to 10 fish. The total estimated loss of fish from in-stream restoration work is estimated to be 32 fish.

Fish Barrier Maintenance/Construction

The stream barrier at the lower end of the project area is essential for maintaining the greenback population from invasion of downstream non-native fish. The barrier consists of a series of natural cascades that are in good condition and is unlikely to fail. However, the proposed action will provide for maintenance of the existing barrier or construction of a new concrete barrier if necessary in the future. Due to the project commitment that the stream would be diverted around the concrete while it is curing, potential maintenance or construction of the barrier is expected to have minimal impacts on greenback and its habitat. Additionally, the barrier is located at the lower extent of this species' range in Bear Creek and any sediment displaced by these actions would primarily be deposited downstream of occupied habitat. Based on these factors, the impacts to greenbacks from potential future fish barrier maintenance/construction activities are expected to be insignificant and discountable.

Recreation Management

The proposed action will limit camping in the Bear Creek drainage, thereby reducing the potential for human-caused fires within the area. The proposed action will also limit off-trail travel, which should result in an improvement of slope and stream bank stability as well as a reduction of the potential for human-contact with the stream, and ultimately, a reduction in the potential for whirling disease to enter Bear Creek. Although we consider these management changes that limit camping and off-trail travel in the Bear Creek drainage to be a positive effect that will reduce risks of wildfire and aquatic disease, we do not anticipate that these changes will result in a significant improvement in stream conditions for the greenback in Bear Creek. Therefore, the benefits to greenbacks from management of camping activities and off-trail travel are expected to be insignificant and discountable.

Special Uses

The proposed elimination of the four military helicopter landing zones in the Bear Creek watershed will likely result in a slight decrease in the area of disturbed ground, providing a minor benefit through decreased erosion and sedimentation.

Summary

The proposed action is expected to result in significant long-term benefits for the greenback population in Bear Creek by reducing the future delivery of sediment into the creek and by improving in-stream habitat conditions. Future transport of sediment to the creek would be greatly reduced by rerouting trails away from Bear Creek WIZ, including approximately 78 percent (approximately 6.5 miles) of existing trails within the WIZ of Bear Creek. Additionally, 100 percent (approximately 3.9 miles) of non-system trails (i.e., social trails) within the Bear Creek WIZ will be closed. Remaining trails will be improved, reconstructed, or re-aligned to minimize erosion and sediment production. Numerous improvements will be made to High Drive where it borders the lower 0.7 mile of Bear Creek in order to make High Drive more resilient to erosion from storm events. We anticipate that ground disturbances from these activities will result in a short-term, minor level of sedimentation throughout Bear Creek (3.4

miles). We estimate that these impacts from trail, upland and road management, which would be minimized by project conservation measures, would result in up to 1 percent loss of fish per mile during the project, for a total of up to 22 fish of all sizes.

In addition to the trail and road improvements, in-stream restoration work in Bear Creek will be conducted on approximately 12 percent of the lower stream section and approximately 3 percent of the upper section of Bear Creek. Restoration work will focus on stabilizing stream banks and improving pool habitat conditions while avoiding riffle areas. Implementation of the proposed action will, however, result in some impacts in the form of short-term increased erosion and sedimentation and the disturbance of greenbacks. Resulting impacts would be minimized by the project conservation measure that all activities that may result in sediment entering Bear Creek must occur outside the spawning and rearing season (May through August). Additional project conservation measures have been developed to avoid and minimize sedimentation and any possible contamination. We anticipate that impacts resulting from in-stream restoration, including sedimentation and disturbance and injury of fish, will result in a minor level of impacts within 1.7 miles of Bear Creek. We estimate that these impacts, which would be minimized by project conservation measures, would result in a 2 percent loss of fish per mile, for a total of up to 22 fish of all sizes. Our estimate that only 2 percent of the fish in Bear Creek would be impacted by in-stream restoration activities is based on the expectation that most fish will move away from in-stream activities, resulting in minimal direct impacts, and relatively minor levels of in-stream sedimentation will occur due to the small area of anticipated disturbance at work sites within the stream. Additionally, for impacts resulting from fish handling and salvage operations along the 200 feet of rerouted stream channel, we estimate a loss of up to 10 fish. The total estimated loss of fish from in-stream restoration is estimated to be 32 fish.

Additionally, the existing fish barrier may be maintained or a new one may be constructed, if necessary. Finally, management of recreational and other activities, including limiting camping and off-trail travel, will further minimize disturbances and reduce the potential for human-caused fires in the Bear Creek drainage. Monitoring will be conducted to evaluate effectiveness of trail and in-stream restoration with maintenance conducted where appropriate.

We estimate that the combined project incidental take is approximately 54 fish of all sizes (22 fish from trails/road work + 22 fish from in-stream work + 10 fish from fish handling/rescue), which represents approximately 3 percent of the estimated population of 2,240 greenbacks in Bear Creek.

We consider that project maintenance activities that are necessary and consistent with the proposed action will be covered by this biological opinion during the period of project implementation and for 3 years following project completion. After this time, maintenance activities that may affect greenbacks would require reinitiation of this consultation.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future

Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Few projects are expected to occur within the relatively small Bear Creek drainage and the area of Pikes Peak that is uphill of the Bear Creek drainage. Public use of the recreational trails in the area is anticipated to increase over time given the expected human population growth within the communities located near Pikes Peak. Interrelated activities within or near the project area may result in increased use of trails in the Bear Creek drainage. The South Slope Watershed, which consists of approximately 9,000 acres of land located south of Pikes Peak administered by Colorado Springs Utilities, is adjacent to the Bear Creek drainage. A trail is proposed, known as the Lake Moraine Trail, which would link the South Slope Watershed to the City of Colorado Springs through the project area. This proposed Lake Moraine connector trail would link to the new 667 trail, then the 701 trail, and then to the 668 trail along North Cheyenne Creek. This trail and its connecting routes would avoid the WIZ area along Bear Creek and is not expected to negatively affect the greenback population. The trail system in North Cheyenne Creek would occur well above the range of the cutthroat population in this stream, and the proposed trail reroutes would be designed and constructed for improved sustainability; therefore, increased trail use along North Cheyenne Creek is not expected to negatively affect the cutthroat population in this stream as well.

An additional potential project that may occur within the project area is the proposed treatment on City of Colorado Springs and El Paso County lands to address the tussock moth infestation that is occurring on Douglas-fir trees in the area around Pikes Peak. The spray includes bacteria that would affect the moths but is not considered to be toxic to the environment. This tussock moth project is not likely to directly affect the greenbacks in Bear Creek, although it would affect moths and butterflies in the area, potentially affected a portion of the trout's food source derived from terrestrial invertebrates; the potential effects of this project are being evaluated through consultation with our office.

Aside from the potential Lake Moraine connector trail and the tussock moth spraying project, we are not aware of any additional future State, local, or private actions expected to occur within the action area that would not require some type of Federal permitting or review due to potential impacts to waterways, wetlands, or the habitats of federally listed species.

CONCLUSION

As part of this formal consultation, we evaluate whether or not a proposed action would jeopardize the continued existence of a species. "Jeopardize the continued existence of", is defined as, "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." (50 CFR § 402.02)

After reviewing the current status of the greenback, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the greenback.

We base our conclusion on the following: the proposed action is expected to greatly improve the habitat conditions for the greenback population in Bear Creek through a reduction in sediment delivery to the creek and improved stream habitat conditions through in-stream restoration. We anticipate that the removal of 78 percent (6.5 miles) of the existing trails along the Bear Creek WIZ as well as 100 percent (3.9 miles) of the non-system trails (i.e., social trails) along the Bear Creek WIZ should result in a significant reduction in sediment input into the stream. Improvements to the drainage system along High Drive will also significantly reduce sediment input into the stream. Additionally, in-stream restoration will occur in 15 percent of the stream, resulting in improved conditions in approximately 70 pools. We anticipate that these actions will greatly enhance the survival for greenbacks in Bear Creek by providing deeper pools that correlate with greater over-winter survival. A reduced sediment load in the stream system will also provide for improved conditions at spawning sites (i.e., redds) and improved food resources in riffles areas, where most of the macroinvertebrate production occurs.

In order to achieve the long term benefits of the project, we recognize that some short-term impacts will occur in the form of increased ground disturbance, short-term sedimentation of the stream, and potential injury to the greenbacks in Bear Creek. However, the in-stream work will occur in only 15 percent of the stream channel within the 3.4 miles of occupied stream. Conservation measures will minimize sedimentation and disturbance impacts and are designed to avoid contamination impacts. The anticipated area of disturbance represents a relatively small portion of the occupied stream. The disturbances will be short-term and will be conducted outside the greenback spawning and rearing season and, therefore, should have relatively minimal effects to reproduction. Based on an estimated loss of 1 percent of the fish from trail and road management activities ($1 \text{ percent} \times 659 \text{ fish/mile} \times 3.4 \text{ miles} = 22 \text{ fish}$) and an estimated loss of 2 percent of the fish from in-stream restoration work ($2 \text{ percent} \times 659 \text{ fish/mile} \times 1.7 \text{ miles} = 22 \text{ fish}$) plus 10 fish from handling/rescue work, we estimate that the project would result in the incidental take of approximately 54 fish (of all sizes), which represents approximately 3 percent of the estimated population of 2,240 greenbacks in Bear Creek. This estimated incidental take of 3 percent of the population is expected to be a short-term impact and is not expected to result in an appreciable change in the population trend for this subspecies. The population is well represented by several age classes throughout the stream corridor, indicating that annual reproduction is occurring in the stream, and is expected to continue to providing the opportunity for the population to increase in the future. We anticipate only minimal impacts to reproduction because in-stream activities and activities that may result in direct sediment delivery to the stream will occur outside the reproduction period. The anticipated benefits from the proposed action are expected to provide a long-term benefit to the species that will outweigh the short-term impacts. We believe that the proposed action will provide an improved ability for Bear Creek to provide for enhanced survival and reproduction conditions in the future.

In summary, Bear Creek contains the only remaining greenback stream population. The fish population is currently impacted by excessive sediment issues within the stream channel that threaten over-winter fish survival due to shallow pools and threaten food resources and reproduction due to sediment accumulation in all habitats. The proposed action is expected to significantly improve the sediment issue within Bear Creek, thereby improving fish survival and reproduction.

Critical habitat has not been designated for the greenback.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined as “an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, such as breeding, feeding, or sheltering.” Harass is defined as “...an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering.” Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of an incidental take statement.

In general, an incidental take statement anticipates the amount of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize the impacts of the take and sets forth terms and conditions that must be complied with in order to implement the reasonable and prudent measures.

The measures described below are non-discretionary, and must be undertaken by each agency (USFS, City of Colorado Springs, El Paso County) so that they become binding conditions of project approval issued to the USFS for the exemption in section 7(o)(2) to apply. Each agency has the continuing duty to regulate the activity covered by this incidental take statement. If any of the agencies fails (1) to assume and implement the terms and conditions, or (2) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the project approval, the protective coverage of section 7(o)(2) may lapse on that agency’s respective land. In order to monitor the impact of incidental take, each agency must report the progress of the action or its impact on the species to the Service as specified in the incidental take statement.

The Service anticipates that take of greenbacks will result in the form of harm. Take in the form of harm is anticipated to result from in-stream work and sedimentation effects that impact fish habitat and may injure or kill individual fish. While the Service recognizes that the proposed action will also result in disturbances to fish due to in-stream work and the presence of workers or small equipment in the stream, we consider these impacts to be relatively minimal because the disturbances will be short term, the fish are expected to move upstream or downstream away from the disturbance site, and sediment-contributing activities will occur outside the reproduction period.

In this biological opinion, the Service determined that the anticipated take is not likely to result in jeopardy to the species.

AMOUNT OR EXTENT OF TAKE:

Take is anticipated due to short-term impacts resulting from increased sedimentation of the stream, in-stream habitat alteration, and potential injury of greenbacks due to in-stream work that is likely to contribute to disruption of normal behavior patterns, including feeding and sheltering. Our estimate for the amount of incidental take is based on the average number of fish per mile in Bear Creek (659 fish of all sizes per mile) and the estimated level of disturbance and impact to these fish. For the impacts resulting from increased sedimentation due to ground disturbances within the Bear Creek WIZ from trails, upland, and road management activities along the entire length of the occupied stream (3.4 miles), we estimate a 1 percent loss of fish per mile, resulting in a total loss of up to 22 fish of all sizes from these activities. For impacts resulting from in-stream restoration activities along 1.7 miles of stream, based on estimates from CPW fisheries biologists (USFS 2015), we estimate a 2 percent loss of fish per mile, also for a total of up to 22 fish of all sizes. For impacts resulting from fish handling and salvage operations along the 200 feet of rerouted stream channel, we estimate a loss of up to 10 fish. Therefore, we anticipate an incidental take of up to 54 fish of all sizes as a result of the implementation of the proposed action.

We recognize that it is difficult to evaluate the project's impacts to the fish, given the difficulty in detecting injured or dead fish due to the small size of many of the fish and due to stream current; therefore, we would consider that incidental take for this project would be exceeded if more than 15 percent of the stream channel is impacted by in-stream restoration work (12 percent of lower stream section and 3 percent of upper stream section). For trails, upland, and road improvement activities, we would consider that incidental take would be exceeded if the area of disturbance extends beyond that described in the USFS BA (USFS 2015). Additionally, our estimate that 1 percent of the fish in Bear Creek could be impacted by trails, upland, and road improvement activities is based on the project commitment that potential sedimentation into the stream from disturbed areas would be minimized by sediment control measures (i.e., silt fences, straw waddles). Therefore, we would consider that incidental take for this project would be exceeded if areas of disturbed ground resulting from the trails, upland, or road work result in unmitigated movement of sediment into the stream.

Critical habitat has not been designated for the greenback; therefore, none will be affected.

Effect of Take

Adverse effects resulting from the implementation of the proposed projects is likely to result in short-term negative effects to the greenbacks present in Bear Creek, although this project is expected to result in an overall long-term benefit to the greenback. In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species.

Reasonable and Prudent Measures

The reasonable and prudent measures, and implementing terms and conditions, minimize the effects of incidental take that might otherwise result from the action. In addition to the

conservation measures already proposed as part of the project description, the Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of the greenback:

1. Each agency (USFS, City of Colorado Springs, and El Paso County) will ensure that the proposed action is successfully implemented on its respective land.
2. Each agency (USFS, City of Colorado Springs, and El Paso County) will monitor the extent of habitat impacted to ensure that it does not exceed the authorized area or the authorized take limits on its respective land.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, each agency (USFS, City of Colorado Springs, and El Paso County) must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline the required reporting/monitoring. These terms and conditions are non-discretionary.

Prior to Implementation

1. Each agency (USFS, City of Colorado Springs, and El Paso County) shall ensure that the proposed action and its conservation measures (also known as Project Design Standards) is formally adopted and implemented on its respective land.
2. The conservation measures for the project already specify that the USFS, City of Colorado Springs, and El Paso County will meet jointly with the FWS as necessary to review activities and document compliance with the biological opinion. We are adding the additional requirement that these agencies shall meet with the FWS **prior to** project implementation to coordinate final project plans, including monitoring, for the first year of project activities. CPW and relevant contractors shall also be invited to attend this meeting.
3. Prior to project implementation, the detailed In-stream Implementation Plan and the full stream survey **shall be provided to the FWS**.
4. Prior to project implementation, the spill response plan **shall be provided to the FWS**.
5. Prior to entering the stream channel in Bear Creek for the first time, the **onsite USFS fisheries biologist shall inspect** the heavy equipment (i.e., mini excavator or tracked skid-steer) to confirm that this equipment is clear of mud and other potential contaminant sources.

During Implementation

6. In the event that a dead greenback is encountered during project implementation, the fish shall be provided to the onsite fisheries biologist and ultimately provided to CPW (Josh Nehring, 719-227-5224, or Front Desk, 719-227-5200, 4255 Sinton Road, Colorado Springs). The dead fish will be preserved on ice (not frozen) and provided to CPW within 48 hours, or preferably, preserve the whole fish in 80 percent alcohol and provide it to CPW within 1 week. For fish that are larger than ~6 inches, a small incision (0.4 inches) shall be made with a sterile knife on the right abdominal wall to allow for the

alcohol to penetrate into the body cavity. The Colorado Field Office of the FWS (303-236-4773) shall also be notified within 24 hours if a dead greenback is encountered.

Monitoring and Reporting

7. If monitoring efforts indicates there is a lack of compliance or on-going resource damage, agencies **shall coordinate further with the FWS** regarding measures to address these issues.
8. The USFS shall conduct a basin-wide assessment in Bear Creek no later than 2 years following the completion of the in-stream work in order to evaluate in-stream conditions in Bear Creek. In the event that water flows in Bear Creek during that year are too high to adequately conduct a basin-wide assessment, the USFS and FWS shall coordinate and agree upon a suitable timeframe for completion of the basin-wide assessment.
9. Additional basin-wide assessments shall continue into the future at a schedule mutually agreed upon by the USFS and the FWS.
10. The conservation measures for the project already specify that the USFS, City of Colorado Springs, and El Paso County will meet jointly with the FWS as necessary to review activities and document compliance with the biological opinion. We are adding the additional requirement that these agencies shall meet jointly with the FWS annually for the first 5 years of the implementation of this proposed project to discuss the year's previous activities and the upcoming activities, project monitoring results, and to document compliance with this biological opinion. Following these first 5 years, the agencies will continue to meet annually as determined by the Service.
11. Monitoring reports will be provided annually to the FWS by each agency by December 1 during each year of project implementation and for 3 years following project completion, or until areas disturbed by project activities have stabilized. Monitoring reports will include a description of the activities that were implemented during the year, results of the monitoring activities, and project plans for the upcoming year. Monitoring reports will include the area and amount of upland and in-stream treatment areas for the year as well as a full description of sediment control measures that were used in areas of surface disturbances. In addition, the report shall contain a discussion of 1) any problems encountered in implementing the terms and conditions; 2) recommendations for modifying the stipulations to enhance the conservation of the greenbacks; and 3) any other pertinent information.

The Service believes that the proposed action will result in incidental take of no more than 54 greenbacks in Bear Creek. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action.

CONSERVATION RECOMMENDATIONS:

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We encourage the USFS fisheries biologists to work with CPW fisheries biologists during their electro-fishing studies to develop greenback population estimates in Bear Creek. CPW generally conducts electro-fishing population estimates in Bear Creek every 3 years. The next electro-fishing population survey by CPW is likely to occur in 2017.

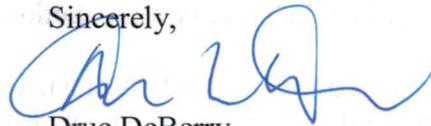
REINITIATION NOTICE:

This concludes formal consultation for the Bear Creek Watershed Restoration Project in El Paso County, Colorado. As required by 50 CFR § 402.16, reinitiation of formal consultation is required if:

1. The amount or extent of incidental take is exceeded;
2. New information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion;
3. The agency action is subsequently modified in a manner that causes an adverse effect to the listed species or critical habitat that was not considered in this opinion; or
4. A new species is listed or critical habitat designated that may be affected by the action.

If the Service can be of any additional assistance, please contact Leslie Ellwood of the Colorado Field Office by telephone at (303) 236-4747 or by email to leslie_ellwood@fws.gov.

Sincerely,



Drue DeBerry
Acting Colorado Field Supervisor

ec: L. Ellwood (COFO – Lakewood)
J. Nehring (CPW)

Project/USFS/USFS_PSICC_Bear Cr Watershed Restoration_BO

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Appendix A

Consultation History within the Project Area

Bear Creek Habitat Improvement and Jones Park Motorized Trail (NFST 667) Bridge Installation (2008)

This management action entailed the installation of three wooden bridges on NFST 667 at Bear Creek crossings, and the rehabilitation of an eroded section of the trail. Trail rehabilitation consisted of bank reshaping, reseeding, placement of erosion matting and tree branches, and anchoring of logs. A letter received from the FWS, dated September 26, 2008, documented concurrence with the biological assessment determinations that the proposed action *may affect, but is not likely to adversely affect* the greenback cutthroat trout and Mexican spotted owl.

Trail Maintenance Improvement and Bridge Installation Project on the Bear Creek Motorcycle and Hiking Trail (2011)

This management action entailed measures to reduce sediment movement into Bear Creek and to reduce the risk of introducing aquatic non-native species or petroleum products into the stream. This project included the construction and maintenance of sediment retention structures and the transplanting of vegetation. A letter received from the FWS, dated June 1, 2011, documented concurrence with the biological assessment/biological evaluation determination that the proposed action *may affect, but is not likely to adversely affect* the greenback cutthroat trout.

Bear Creek Sediment Mitigation Project (NFST 666 and 667) (2012)

This management action entailed measures to reduce sediment contributions into Bear Creek in order to improve habitat for the federally threatened greenback cutthroat trout. Management actions were focused on portions of the highly disturbed trail corridor that receive high levels of recreational use. This project included the maintenance and/or reconstruction of structures installed in 2010 on NFST 667 and 666, as well as new installations. Connected actions included sediment mitigation on portions of the trail that occur on property administered by Colorado Springs Utilities. A letter received from the FWS, dated August 9, 2012, documented concurrence with the biological evaluation determination that the proposed action *may affect, but is not likely to adversely affect* the greenback cutthroat trout on National Forest System land.

Bear Creek Trail Maintenance (NFST 667) (2014)

This management action entailed the maintenance and/or reconstruction of trails damaged during rain events that occurred in September of 2013. The proposed trail maintenance occurred within a 0.4 mile section of Trail 667. This section of trail was actively eroding as a result of this damage. Within this area, only about 300 feet of trail were repaired and stabilized by placing rock or rip-rap into washed out areas. A letter received from the FWS, dated June 6, 2014, documented concurrence with the biological assessment determination that the proposed action *may affect, but is not likely to adversely affect* the greenback cutthroat trout on National Forest System lands.

Bear Creek Sediment Mitigation Project (NFST 666 and 667) (2014)

This management action entailed general trail maintenance and the construction of four new sediment mitigation structures on NFST 667 and 666. These structures were needed in order to

reduce sediment contributions into Bear Creek from trails damaged during rain events of September 2013. A letter received from the FWS, dated August 29, 2014, documented concurrence with the biological evaluation determination that the proposed action *may affect, but is not likely to adversely affect* the greenback cutthroat trout on National Forest System land.

High Drive Flood Repair Project at Bear Creek (2015)

This project entails emergency repairs to High Drive in response to damage sustained during rain events in September of 2013. Management actions are designed to reduce sediment contributions to Bear Creek by improving the drainage system. Drainage system improvements include the installation of local sediment traps, sediment removal, increased culvert and ditch capacity, removal of berms, and the repair or installation of additional culverts. The Federal Emergency Management Agency (FEMA) is in the process of conducting emergency consultation with the FWS.

Recreation Projects

“The Captain” Endurance Mountain Bike Race (2012)

This management action entailed the issuance of a special use permit for the performance of an endurance mountain bike race. This event included two mountain bike races occurring simultaneously. Each race included up to 100 participants and was conducted on about 33 miles of roads and trails that traversed the drainages of Bear, North Cheyenne, Buffalo Canyon, and South Cheyenne creeks. A letter received from the FWS, dated May 14, 2012, documented concurrence with the biological evaluation determination that the proposed action *may affect, but is not likely to adversely affect* the greenback cutthroat trout. Connected actions also occurred on property administered by Colorado Springs Utilities. The Race Director for the event prepared and submitted a letter to FWS in April requesting concurrence on the determination that these connected actions would not result in “take” of the greenback cutthroat trout.

“The Captain” Endurance Mountain Bike Race (2013)

This management action entailed the issuance of a special use permit for the performance of an endurance mountain bike race. This event included two mountain bike races occurring over a two day period. Each race included up to 250 participants and was conducted on about 8 miles of roads and trails that traversed the drainages of North Cheyenne, Buffalo Canyon, and South Cheyenne creeks. A letter received from the FWS, dated May 24, 2013, documented concurrence with the biological evaluation determination that the proposed action *may affect, but is not likely to adversely affect* the greenback cutthroat trout.

North Cheyenne Motorized Loop Trail (2013)

This management action entailed a modification of a Forest Order for motorized access on select system trails in the North Cheyenne and Bear Creek watersheds. Trails proposed for re-opening to motorized use included NFST 720 and portions of NFST 668 and 701. Connected actions included the re-opening of the portion of the trail loop that occurred on property administered by Colorado Springs Utilities. A letter received from the FWS, dated July 11, 2013, documented concurrence with the biological assessment determination that the proposed action *may affect, but is not likely to adversely affect* the greenback cutthroat trout on National Forest System lands.

Outfitting and Guiding Priority 10-Year Special Use Permits (2014)

In 2008, the Forest Service revised the policy for managing outfitting and guiding permits, requiring reoccurring (i.e., temporary) outfitter and guide permits to be converted to 10-year priority (i.e., term) permits. This proposal entails converting 23 temporary and four new Outfitting and Guiding Special Use Permits to 10-year priority permits. These permits would authorize outfitter and guides to operate guided recreational activities at various locations throughout the Pikes Peak Ranger District for a period of 10 years. Proposed operations include: hiking, backpacking, trail rides, mountain biking, kayaking/canoeing, hunting, camping, rock climbing, rappelling, orienteering, snowshoeing, backcountry skiing, winter mountaineering, winter survival training, and avalanche clinics. A letter received from FWS, dated June 26, 2014, documented concurrence with the biological assessment determinations that the proposed action *may affect, but is not likely to adversely affect* the Mexican spotted owl, Preble's meadow jumping mouse, and greenback cutthroat trout.

Forest Health Projects

Catamount Forest Health and Hazardous Fuels Reduction (2012)

The Catamount project is located about 20 miles west of Colorado Springs in El Paso and Teller Counties. The project area encompasses approximately 98,757 acres, of which 69,804 acres are National Forest System lands and 28,953 acres are in other land ownerships. The Bear Creek and North Cheyenne Creek watersheds occur within this project area. This project entails the creation of openings, thinning, prescribed burning, and other fuel reduction treatments on about 21,100 acres. The objective of these treatments is to move forested ecosystems towards historical conditions by reducing fuels and the associated risk of large-scale, high-intensity wildfire, improving forest health, vigor, and resistance to fire, insects, and disease, and by reducing the risk of severe flooding and sedimentation. A letter received from the FWS, dated April 25, 2012 documented concurrence with the biological assessment/evaluation determinations that the proposed action *may affect, but is not likely to adversely affect* the Mexican spotted owl and its critical habitat, Preble's meadow jumping mouse, and greenback cutthroat trout. Management actions within occupied greenback cutthroat trout watersheds have not been implemented as of the completion date of this biological evaluation.

Appendix B

**Memorandum of Understanding between
El Paso County and the City of Colorado Springs
and the USDA, Forest Service
Pike and San Isabel National Forests
Cimarron and Comanche National Grasslands**



FS Agreement No. 15-MU-11021209-075
Cooperator Agreement No. _____

MEMORANDUM OF UNDERSTANDING
Between
EL PASO COUNTY
AND
THE CITY OF COLORADO SPRINGS
AND
USDA, FOREST SERVICE
PIKE AND SAN ISABEL NATIONAL FORESTS
CIMARRON AND COMANCHE NATIONAL GRASSLANDS
(PSICC)

This MEMORANDUM OF UNDERSTANDING (MOU) is hereby made and entered into by and between El Paso County, by and through the Board of County Commissioners of El Paso County, Colorado, a duly organized county and political subdivision of the State of Colorado (County), hereinafter referred "County" and the City of Colorado Springs, a home rule city and Colorado municipal corporation (City) hereinafter referred "City" and the USDA, Forest Service, Pike and San Isabel National Forests, Cimarron and Comanche National Grasslands, (PSICC), hereinafter referred to as the "U.S. Forest Service." The County and City may collectively be referred to as "Cooperators".

Background: The U.S. Forest Service, County, and the City are adjacent land managers in the Bear Creek watershed, connected by an existing recreation trail system and Bear Creek, which contains a unique population of federally threatened greenback cutthroat trout (*Oncorhynchus clarki stomias*). The U.S. Forest Service and City have worked cooperatively for several years to protect the greenback cutthroat trout, while providing appropriate recreational opportunities. The County recently acquired lands in the watershed from Colorado Springs Utilities.

Title: Bear Creek Watershed Restoration Project

I. PURPOSE: The purpose of this MOU is to document a framework of cooperation between the parties to (1) collectively plan, permit and implement the Bear Creek Watershed Restoration Project and (2) carry out their own related activities in a coordinated and mutually beneficial manner to ensure protection of the federally threatened greenback cutthroat trout in accordance with the following provisions.

II. STATEMENT OF MUTUAL BENEFIT AND INTERESTS:

The Bear Creek Watershed Restoration Project is a collaborative project between the U.S. Forest Service, the County and the City. The goal of the project is to protect the greenback cutthroat trout, whose sole population in the wild is in Bear Creek, while providing for appropriate recreational opportunities. This collaboration will require compliance with the National Environmental Policy Act (NEPA), Endangered Species Act (ESA) and National Historic Preservation Act (NHPA).



Working cooperatively on NEPA, ESA and NHPA compliance will streamline permitting for all parties. Such cooperation will also help ensure consistent management of the greenback cutthroat trout and recreational opportunities.

As lead agency, the U.S. Forest Service retains final responsibility for the content of all NEPA documents. In meeting this responsibility, the U. S. Forest Service will follow all applicable statutory and regulatory requirements.

In consideration of the above premises, the parties agree as follows:

III. COUNTY SHALL:

- A. Work cooperatively with the U.S. Forest Service on its NEPA process by sharing information and providing feedback on proposed alternatives.
- B. Complete cultural surveys on existing and proposed trails through a 3rd party cultural resource contractor.
- C. Jointly consult with U.S. Forest Service, City and U.S. Fish and Wildlife Service (USFWS) on ESA compliance under Section 7.
- D. Jointly consult with U.S. Forest Service, City and the Colorado State Historic Preservation Office (SHPO) on NHPA compliance.
- E. Implement the final mitigation measures, conservation measures, and terms and conditions as developed by the SHPO and the USFWS necessary to comply with NEPA, ESA, and the NHPA with regard to the Bear Creek Watershed Restoration Project on lands owned by the County.
- F. Implement the final NEPA actions with regard to the Bear Creek Watershed Restoration Project on lands owned by the County,
- G. Be subject to the covenants, restrictions, terms and conditions set forth in the Quitclaim Deed conveying the Property from the City of Colorado Springs to El Paso County.
- H. Work cooperatively with the U.S. Forest Service and City on proposed improvements on County owned property considered in the NEPA process.
- I. Have the right to negotiate with the USFS, State Historic Preservation Office, and U.S. Fish and Wildlife Service, as may be applicable, terms and conditions during the NEPA process that are necessary for the County's use and management of County-owned property.

IV. THE CITY SHALL:

- A. Work cooperatively with the U.S. Forest Service on its NEPA process by sharing information and providing feedback on proposed alternatives.
- B. Complete cultural surveys on existing and proposed trails through a 3rd party cultural resource contractor.
- C. Jointly consult with U.S. Forest Service, County and U.S. Fish and Wildlife Service (USFWS) on ESA compliance under Section 7.



- D. Jointly consult with U.S. Forest Service, County and the SHPO on NHPA compliance.
- E. Implement the final mitigation measures, conservation measures, and terms and conditions as developed by the SHPO and the USFWS necessary to comply with NEPA, ESA, and the NHPA with regard to the Bear Creek Watershed Restoration Project on lands managed by the City.
- F. Implement the final NEPA actions with regard to the Bear Creek Watershed Restoration Project on lands managed by the City.
- G. Work cooperatively with the U.S. Forest Service and County on proposed improvements on City owned property considered in the NEPA process.

V. THE U.S. FOREST SERVICE SHALL:

- A. Work cooperatively with the County and the City on its NEPA process.
- B. Complete a Biological Assessment evaluating effects to threatened and endangered species within the Bear Creek Watershed.
- C. Lead ESA consultation under Section 7, to include actions on lands managed by the County and the City.
- D. Jointly consult with the County, City, and the SHPO on NHPA compliance.
- E. Implement the final mitigation measures, conservation measures, and terms and conditions as developed by the SHPO and the USFWS necessary to comply with NEPA, ESA, and the NHPA with regard to the Bear Creek Watershed Restoration Project on lands managed by the U.S. Forest Service.
- F. Implement the final NEPA actions with regard to the Bear Creek Watershed Restoration Project on lands managed by the U.S. Forest Service.
- G. Work cooperatively with the County and City on proposed improvements on National Forest System lands considered in the NEPA process.
- H. Work cooperatively with the County and City regarding the development of any terms and conditions during the NEPA process that are applicable to the management of their respective lands.

VI. IT IS MUTUALLY UNDERSTOOD AND AGREED BY AND BETWEEN THE PARTIES THAT:

- A. The intent of all parties is that by working cooperatively, alternatives and final actions will be mutually agreeable to, and implementable by, all parties.
- B. Each land manager has the authority to act independently to implement management actions it believes are most appropriate for the land it manages.
- C. Parties can withdraw from this MOU with 30 days written notice.



D. **PRINCIPAL CONTACTS.** Individuals listed below are authorized to act in their respective areas for matters related to this agreement.

Principal Cooperator Contacts:

El Paso County Contact	El Paso County Administrative Contact
Name: Tim Wolken Address: 2002 Creek Crossing City, State, Zip: Colorado Springs, CO 80905 Telephone: 719-520-6981 FAX: 719-520-6389 Email: timwolken@elpasoco.com	Name: Tim Wolken Address: 2002 Creek Crossing City, State, Zip: Colorado Springs, CO 80905 Telephone: 719-520-6981 FAX: 719-520-6389 Email: timwolken@elpasoco.com

City of Colorado Springs Program Contact	City of Colorado Springs Administrative Contact
Name: Karen Palus Address: 1401 Recreation Way City, State, Zip: Colorado Springs, CO 80905 Telephone: 719-385-6501 FAX: 719-385-6599 Email: kpalus@springsgov.com	Name: Karen Palus Address: 1401 Recreation Way City, State, Zip: Colorado Springs, CO 80905 Telephone: 719-385-6501 FAX: 719-385-6599 Email: kpalus@springsgov.com

Principal U.S. Forest Service Contacts:

U.S. Forest Service Program Manager Contact	U.S. Forest Service Administrative Contact
Name: Janelle Valladares Address: 3028 E. Main Street City, State, Zip: Canon City, CO 81212 Telephone: 719-269-8704 FAX: 719-269-8719 Email: jvalladares@fs.fed.us	Name: Rick Maestas Address: 2840 Kachina Dr City, State, Zip: Pueblo, CO 81007 Telephone: 719-553-1443 FAX: 719-553-1435 Email: rmaestas02@fs.fed.us



- E. NOTICES. Any communications affecting the operations covered by this agreement given by the U.S. Forest Service or Cooperators is sufficient only if in writing and delivered in person, mailed, or transmitted electronically by e-mail or fax, as follows:

To the U.S. Forest Service Program Manager, at the address specified in the MOU.

To Cooperators, at Cooperators's address shown in the MOU or such other address designated within the MOU.

Notices are effective when delivered in accordance with this provision, or on the effective date of the notice, whichever is later.

- F. PARTICIPATION IN SIMILAR ACTIVITIES. This MOU in no way restricts the U.S. Forest Service or Cooperators from participating in similar activities with other public or private agencies, organizations, and individuals.

- G. NONBINDING AGREEMENT. This MOU creates no right, benefit, or trust responsibility, substantive or procedural, enforceable by law or equity. The parties shall manage their respective resources and activities in a separate, coordinated and mutually beneficial manner to meet the purpose(s) of this MOU. Nothing in this MOU authorizes any of the parties to obligate or transfer anything of value.

Specific, prospective projects or activities that involve the transfer of funds, services, property, and/or anything of value to a party requires the execution of separate agreements and are contingent upon numerous factors, including, as applicable, but not limited to: agency availability of appropriated funds and other resources; cooperator availability of funds and other resources; agency and cooperator administrative and legal requirements (including agency authorization by statute); etc. This MOU neither provides, nor meets these criteria. If the parties elect to enter into an obligation agreement that involves the transfer of funds, services, property, and/or anything of value to a party, then the applicable criteria must be met. Additionally, under a prospective agreement, each party operates under its own laws, regulations, and/or policies, and any Forest Service obligation is subject to the availability of appropriated funds and other resources. The negotiation, execution, and administration of these prospective agreements must comply with all applicable law

Nothing in this MOU is intended to alter, limit, or expand the agencies' statutory and regulatory authority.

- H. MEMBERS OF U.S. CONGRESS. Pursuant to 41 U.S.C. 22, no U.S. member of, or U.S. delegate to, Congress shall be admitted to any share or part of this agreement, or benefits that may arise therefrom, either directly or indirectly.

- I. FREEDOM OF INFORMATION ACT (FOIA). Public access to MOU or

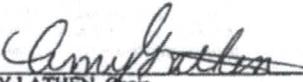


agreement records must not be limited, except when such records must be kept confidential and would have been exempted from disclosure pursuant to Freedom of Information regulations (5 U.S.C. 552).

- J. TEXT MESSAGING WHILE DRIVING. In accordance with Executive Order (EO) 13513, "Federal Leadership on Reducing Text Messaging While Driving," any and all text messaging by Federal employees is banned: a) while driving a Government owned vehicle (GOV) or driving a privately owned vehicle (POV) while on official Government business; or b) using any electronic equipment supplied by the Government when driving any vehicle at any time. All cooperators, their employees, volunteers, and contractors are encouraged to adopt and enforce policies that ban text messaging when driving company owned, leased or rented vehicles, POVs or GOVs when driving while on official Government business or when performing any work for or on behalf of the Government.
- K. TERMINATION. Any of the parties, in writing, may terminate this MOU in whole, or in part, at any time before the date of expiration.
- L. DEBARMENT AND SUSPENSION. County, and City shall immediately inform the U.S. Forest Service if they or any of their principals are presently excluded, debarred, or suspended from entering into covered transactions with the federal government according to the terms of 2 CFR Part 180. Additionally, should County, and City or any of their principals receive a transmittal letter or other official Federal notice of debarment or suspension, then they shall notify the U.S. Forest Service without undue delay. This applies whether the exclusion, debarment, or suspension is voluntary or involuntary.
- M. MODIFICATIONS. Modifications within the scope of this MOU must be made by mutual consent of the parties, by the issuance of a written modification signed and dated by all properly authorized, signatory officials, prior to any changes being performed. Requests for modification should be made, in writing, at least 30 days prior to implementation of the requested change.
- N. COMMENCEMENT/EXPIRATION DATE. This MOU is executed as of the date of the last signature and is effective through January 1, 2019 at which time it will expire, unless extended by an executed modification, signed and dated by all properly authorized, signatory officials.

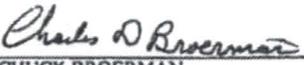


O. **AUTHORIZED REPRESENTATIVES.** By signature below, each party certifies that the individuals listed in this document as representatives of the individual parties are authorized to act in their respective areas for matters related to this MOU. In witness whereof, the parties hereto have executed this MOU as of the last date written below.



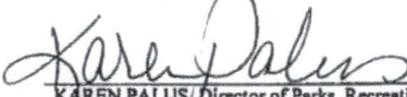
AMY LATHEN, Chair
El Paso County Board of Commissioners
8/18/2015
Date

ATTEST:

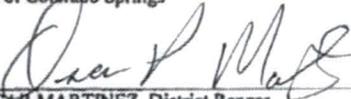


CHUCK BROERMAN 15332a
El Paso County Clerk and Recorder



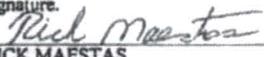


KAREN PALUS, Director of Parks, Recreation and
Cultural Services
City of Colorado Springs
8/18/15
Date



OSCAR MARTINEZ, District Ranger
U.S. Forest Service, Pikes Peak Ranger District
9/16/15
Date

The authority and format of this agreement have been reviewed and approved for signature.



RICK MAESTAS
U.S. Forest Service Grants Management Specialist
8/11/15
Date



Burden Statement

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0217. The time required to complete this information collection is estimated to average 3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call toll free (866) 632-9992 (voice). TDD users can contact USDA through local relay or the Federal relay at (800) 877-8339 (TDD) or (866) 377-8642 (relay voice). USDA is an equal opportunity provider and employer.

Appendix C

Description of Proposed Trails Management

Existing System Trails

- For existing system trails that remain open, perform maintenance, reconstruction, storm water drainage improvements or re-alignment as needed to minimize erosion risk and sediment production.
- For existing trails that will be closed, physically block access and decommission¹ the trail surface, cut, and fill slopes to minimize erosion risk and sediment production.
- Install bridges on trails at stream crossings that span bankfull flows.
- Improve ground based trail signage.
- Trail 622 (Seven Bridges)
 - Maintain entire length for non-motorized use (0.1 miles on El Paso County and 1.6 miles on National Forest System lands).
- Trail 622.A (Seven Bridges North Spur)
 - Convert 0.2 miles of trail on El Paso County land from non-motorized to authorize multiple use from the 667 re-route (along south side of Kineo) to 668.
 - Decommission 0.3 miles of trail on El Paso County land from the 667 reroute (along south side of Kineo) to the connection with 622.
- Trail 665 (Penrose)
 - Maintain entire length of 1.1 miles for multiple use between High Drive and the National Forest System boundary (1.1 miles on National Forest System lands).
- Trail 666 (Bear Creek)
 - Maintain 1.5 miles for non-motorized use from High Drive to the waterfall viewing point moving the trail out of the WIZ to the extent practical. (0.3 miles on City of Colorado Springs lands and 1.2 miles on National Forest System lands).
 - Decommission 0.55 miles of trail on National Forest System lands from the waterfall viewing point to Trail 667.
- Trail 667 (Jones Park)
 - Maintain 2.8 miles for multiple use from High Drive to the 667 re-route near Kineo Mountain and from the re-route of 667 (west portion) to the Colorado Springs Utilities South Slope property (0.3 miles on Colorado Springs Utilities and 2.5 miles on National Forest System lands).
 - Maintain 0.3 miles for non-motorized use from the gate at the western end of the trail to the Colorado Springs Utilities proposed Lake Moraine Trail (0.2 miles on Colorado Springs Utilities and 0.1 on National Forest System lands).

¹ Management actions may include reestablishing natural drainage patterns and stream channels, out-sloping and filling down cut trail surfaces, scattering debris on the trail, ripping the soil and planting vegetation on the trail bed, blocking the entrance to a trail, and posting closure signs. Complete decommissioning may require retreatment.

- Decommission 3.7 miles from the 667 re-route (near Kineo Mountain) to the re-route of Trail 667 (west portion) (2.5 miles on El Paso County and 1.2 miles on National Forest System lands).
- Trail 668 (Pipeline)
 - Maintain 3.1 miles for multiple use just north of the Frosty Park trailhead (at the intersection with 701) to the intersection with the 667 reroute (middle portion), moving the trail out of the WIZ to the extent practical (0.6 miles on El Paso County and 2.5 miles on National Forest System lands).
 - Decommission 0.2 miles on El Paso County land from the new re-route of 667 (middle portion) to the decommissioned section of 667 near Bear Creek.
- Trail 701 (Forester's)
 - Maintain 2.9 miles for multiple-use on National Forest System lands from the Frosty Park trailhead to the re-route of Trail 667 (near Trail 720.A).
 - Maintain 0.3 miles from re-route of Trail 667 (near Trail 720 heading SE) to new reroute of 667 heading NW. Re-number this section as 667.
 - Decommission 0.7 miles from the re-route of Trail 667 to the existing 667 (west portion) (0.5 miles on El Paso County and 0.2 miles on National Forest System lands).
- Trail 720 (Forester's Cutoff)
 - Decommission the entire length of 1.5 miles. (1.2 miles on El Paso County and 0.3 miles on National Forest System lands).
- Trail 720.A (Forester's Cutoff North Spur)
 - Decommission the entire 0.3 miles of the trail on El Paso County land.
- Intemann Trail
 - Maintain entire length of 0.1 miles of trail on City of Colorado Springs lands for non- motorized use between the project boundary and Gold Camp Road.
- Palmer Trail
 - Maintain entire length of 1.5 miles of the trail on City of Colorado Springs lands for non- motorized use.

*New Trails and Reroutes*²

- Install trail signs.
- Trail 667 (Jones Park)
 - Construct 1.2 miles of trail reroute for multiple-use from Trail 667 to Trail 622.A (Seven Bridges North Spur)(0.3 on El Paso County and 0.9 on National Forest System lands).
 - Construct 2.5 miles of trail reroute for multiple-use from Trail 668 (Pipeline) to Trail 701 (1.8 miles on El Paso County and 0.7 miles on National Forest System lands).
 - Construct 1.4 miles of trail reroute for multiple-use from Trail 701 to original existing western portion of Trail 667 (1.0 miles on El Paso County and 0.4 miles on National Forest System lands).

² Although new trail and reroute locations have been ground-verified, it may be determined during implementation that locations or mileages will be slightly different. These on-the-ground changes will be covered under this NEPA analysis but may require further input or consultation by project specialists.

- Mount Buckhorn Trail
 - Construct 0.5 miles of trail on National Forest System lands for non-motorized use from Trail 666 (Bear Creek) to Trail 667.
- Jones Park Trail
 - Construct 0.7 miles of trail on El Paso County land for non-motorized use from Trail 668 to Loud's Cabin.

Non-system Trails to be converted to National Forest System Trails

- Convert Buckhorn and Palmer non-system trails to National Forest System Trails.
 - Mount Buckhorn Trail (from trail 667 to trail 622): Include 1.2 miles of existing trail on National Forest System lands in official trail system for non-motorized use.
 - Palmer Trail: Include 0.7 miles of existing trail on National Forest System lands in official trail system for non-motorized use between the authorized sections of the Palmer trail on City of Colorado Springs lands.

Non-system Trails to be decommissioned

- Close, decommission, and physically block access to all non-system routes within the Bear Creek basin and those that lead into the basin.
 - 9.3 miles of non-system trails have been identified and locations recorded with GPS within or leading into the Bear Creek basin. Any un-inventoried non-system trails found during project implementation will also be decommissioned. This work is considered within the scope of this analysis, but may require additional surveys and coordination with the project engineer, hydrologist, wildlife biologist, and archeologist. (1.5 miles on City of Colorado Springs lands, 2.5 miles on El Paso County and 5.3 miles on National Forest System lands).

Appendix D

Conservation Measures (also known as Project Design Standards)

Conservation measures, as known as project design standards, for this project were provided in the BA (USFS 2015). The Service has sequentially numbered the project design standards to provide for easier reference.

This project will also incorporate reference materials not listed in detail in this document. These include: Forest Service Trail Construction and Maintenance Notebook, Forest Service Handbook 2509.25 - Watershed Conservation Practices Handbook, USDA National Best Management Practices for Water Quality Management on National Forest System Lands, and Forestry Best Management Practices to Protect Water Quality in Colorado.

Preconstruction

1. Ensure that all personnel understand and adhere to the Proposed Management Actions, the Project Design Standards, and Conservation Measures.
2. Inform personnel of the ecological concerns associated with federally listed species.
3. Inspect all heavy equipment before entering the project area.
4. Prevent the introduction or spread of noxious weeds. Equipment must be clean and free of all mud and debris prior to entering the project area.
5. Prevent the introduction or spread of aquatic nuisance species. Clean, disinfect, and rinse all equipment (e.g., personal protective equipment, heavy equipment, waders, hand tools, etc.) prior to use within Bear Creek.
6. Disinfect with one, or a combination of these procedures:
 - i. Live stream, boiling, or hot water >140°F with power-washer for 3 minutes on each area or for 10 minutes for any clusters of mussels.
 - ii. Quaternary ammonium compound (QAC) disinfectant solution BATH of a product (e.g., Quat4, GS 256, or Super HDQ) that has a minimum active ingredient concentration of 0.4% QAC for a minimum of 10 minutes or 0.8% QAC as a SPRAY fully covering equipment in disinfectant solution for a minimum of 10 minutes.
7. Fuel storage areas will be identified by an agency representative and bermed or appropriately designed to contain spills.
8. Refuel and store fuel and equipment outside of the floodplain within previously disturbed areas, such as roadway or pullouts.
9. Have a spill response plan in place that addresses chemical leaks or spills into Bear Creek. In the event of a spill, immediately notify the Colorado Department of Public Health and Environment (CDPHE) through the Colorado Environmental Release and Incident Reporting Line at (877) 518-5608.
10. Site-specific surveys for rare plants should occur prior to implementation of the project. If necessary, alignment of the trails and other work should be adjusted to prevent damage to rare plants and their habitats.
11. Continue to treat noxious weeds and other invasive plants in advance of project implementation. During activities, vehicles should be washed to prevent transport of noxious weed seeds into the area. Any weeds found after project completion should also be treated to prevent their spread.

12. Equipment will be inspected for leaks before entering the project area and daily before and after construction activity. Equipment will be immediately removed from the WIZ if a problem is detected, and will not return to use until in good working condition. The contractor will be required to have spill containment equipment available on site during the course of construction.
13. Existing on-site rock and logs will be utilized where available. Up to 100 trees per mile will be cut on site or in the vicinity to use for stream and trail rehabilitation work. Trees to be cut will generally be between 10 to 14 inches in diameter at breast height.
14. Access to the project area would occur on existing roads and/or trails to the extent practicable. Use of non-system trails and overland travel would also occur, but would primarily be accessed by personnel on foot. The equipment necessary to perform the proposed management actions would include, but is not limited to: back hoe, excavator, front-end loader, mini-track loader, compact excavator, ATVs, chainsaws, and various handheld tools.

Transportation System

(Trail realignment, new trail construction, improved road and trail drainage, and system and non-system trail rehabilitation)

15. The Forest Service, City of Colorado Springs, and El Paso County will cooperatively design and construct all implementation and management methods to ensure consistency across multiple jurisdictions.

In-stream Restoration

16. Protect greenback redds (i.e., spawning sites) and alevins (i.e., young fish with a yolk-sac) by prohibiting all management actions that cause direct sediment delivery to the stream during the spawning, egg development and hatching, and early rearing period of June through August.
17. Conduct in-stream treatments for each of the upstream and downstream segments in a downslope manner, when practicable.
18. Wade through habitat improvement sites immediately prior to implementation in order to encourage fish movement away from these sites.
19. Limit in-stream restoration to 1 linear mile per year; up to 1.7 of 4.1 miles of the occupied greenback range.
20. Restore degraded streams as part of whole watershed restoration programs that permanently cure causes of damage.
21. Follow reporting procedures by contacting U.S. Fish and Wildlife Service immediately by telephone at (303) 236-4773, if a greenback cutthroat trout is found dead or injured within the proposed project area or vicinity.
 - a. Visually inspect for dead fish downstream every two hours during implementation.
 - b. Notify and provide any specimens to the Aquatic Biologist with Colorado Parks and Wildlife.
22. A fisheries biologist must be on site daily during implementation. Biologist may not be on site throughout the entire day but at a minimum will inspect work daily and will be onsite during a majority of implementation.

Materials Utilized for Restoration

23. Use existing fill, rock, or trees from within the project area as part of the restoration work, where feasible.
24. Trees selected for felling should generally be less than 14 inches in diameter.
25. Damage to residual trees retained during implementation will be minimized, to the extent practicable.
26. Tree felling will not commence until a biologist provides clearance for the trees proposed for use.
27. Live or standing dead trees containing cavities will be not be felled, with the exception of the following provision: Trees containing cavities may be felled if the tree is preventing the successful accomplishment of the proposed action AND the cavity is not an active nest, roost, or den site.
28. Trees containing an active nest or nest cavity of any bird species will not be disturbed during the nesting season of April 1st - July 15th.
29. Mammals actively nesting, denning, roosting, or hibernating within trees, downed logs, burrows, or any other feature will not be disturbed. Any bats discovered during implementation will be reported to a biologist from the representative land agency.

Raptors/Birds of Prey

(EAGLES, FALCONS, HAWKS, OWLS, ETC.)

30. Surveys for select nesting raptors will be conducted in the proposed management areas prior to implementation.
31. If an active raptor nest site is discovered or suspected due to agitated behavior of a raptor, the feature or incident will be reported to a biologist from the representative land agency; appropriate protection measures may be implemented as determined by the biologist.
32. Spatial and temporal restrictions will be established for active nest sites. Operating restrictions will be adapted from guidelines outlined in the most recent version of the Colorado Division of Wildlife recommended nest buffer zones and seasonal restrictions for raptors.
33. Protect a peregrine falcon eyrie located in the Tenney Crag Area by prohibiting the use of mechanical equipment within ½ mile radius of the active nest during the period of March 15 through July 31.

Monitoring

34. Utilize a variety of monitoring methods, (e.g., V* protocol, photo points, visual inspection) to determine the effectiveness of trail and in-stream restoration. Conduct monitoring after year one of implementation, and intermittently as needed (e.g., after major rain events).
35. Monitor adherence to project design standards and conservation measures during implementation of the proposed management actions.
36. Utilize a variety of monitoring methods at various scales (e.g., basin-wide assessments and V* protocol) to determine the need for re-treatment or additional management actions.
37. Utilize a variety of monitoring methods (e.g., visual inspection, photo points, patrol, trail cameras) to determine effectiveness of trail closures and rehabilitation, and compliance with requirement to remain on the trail system, particularly within Jones Park.

- a. If monitoring demonstrates a lack of compliance or on-going resource damage, employ measures to protect resources or greenback cutthroat trout habitat.
 - b. The Forest Service, City of Colorado Springs, and El Paso County will meet jointly with the U.S. Fish and Wildlife Service as necessary to review activities and document compliance with the biological opinion.
38. Perform monitoring in accordance with Forest Service Handbook 2509.25 - applicable Watershed Conservation Practices Handbook standards, available at:
<http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?2509.25!r2>

Enforcement

39. The Forest Service, City of Colorado Springs, and El Paso County will cooperatively develop an enforcement plan to identify a variety of methods to implement Forest Supervisor Orders on National Forest lands and rules and regulations on City and El Paso County lands.
40. The Forest Service, City of Colorado Springs, and El Paso County will cooperatively develop a sign plan to ensure consistency across multiple jurisdictions.
41. The Forest Service, City of Colorado Springs, and El Paso County will cooperatively develop a monitoring plan to determine the effectiveness of trail and in-stream restoration and compliance with rules, regulations, and Forest Supervisor Orders.