



Draft Environmental Assessment

Stone Creek Floodplain Mitigation Project

Eagle County, Colorado

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FEMA

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This document was prepared by

URS Group, Inc.
12120 Shamrock Plaza, Suite 300
Omaha, NE 68154

and

12420 Milestone Center Drive, Suite 150
Germantown, MD 20876

Prepared for

FEMA Region VIII
Denver Federal Center
Building 710, Box 25267
Denver, CO 80255-0267

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Reviewers, please NOTE:

The attached document is a Draft: This document is intended to be a working document. We encourage and anticipate comments on all aspects of the report.

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Acronyms and Abbreviations

ACHP	Advisory Council of Historic Preservation
APE	Area of Potential Effects
BMP	Best Management Practice
CDPHE	Colorado Department of Public Health and Environment
CDOW	Colorado Division of Wildlife
CDWR	Colorado Division of Water Resources
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CLOMR	Conditional Letter of Map Revision
CMP	corrugated metal pipe
CSU	Colorado State University
EA	Environmental Assessment
EDR	Environmental Data Resources, Inc.
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EVMD	Eagle-Vail Metropolitan District
EVPOA	Eagle-Vail Property Owners Association
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
LOMR	Letter of Map Revision
MBTA	Migratory Bird Treaty Act
msl	mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act of 1996 (as amended)
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
PDM	Pre-Disaster Mitigation
P.L.	Public Law
PUBF _x	Palustrine, unconsolidated-bottom, semi-permanently flooded wetlands, created by excavation
R4SBC _x	Riverine, seasonally flooded wetlands, created by excavation
ROW	Right-of-way
SHPO	State Historic Preservation Officer
SWMP	Storm Water Management Plan

Acronyms and Abbreviations

UNCC	Utility Notification Center of Colorado
USACE	U.S. Army Corps of Engineers
U.S.C.	U.S. Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

SECTION ONE INTRODUCTION**1.1 BACKGROUND AND HISTORY**

Eagle County, through the Colorado Division of Emergency Management, has requested Federal Emergency Management Agency (FEMA) Pre-Disaster Mitigation (PDM) Program funding to implement mitigation measures that reduce the flooding hazard to residential structures. The objective of the mitigation measures is to preserve the natural channel as an amenity while reducing the susceptibility of the structures to flooding.

Eagle-Vail is an unincorporated mountain community near the ski towns of Avon and Vail, Colorado, in Eagle County, along Interstate 70 and the Eagle River at an elevation of approximately 7,600 feet above mean sea level (msl). It is a residential community with approximately 1,400 homes and a population of 4,322 individuals (U.S. Census Bureau 2011b). The community is jointly managed by the Eagle-Vail Metropolitan District (EVMD) and the Eagle-Vail Property Owners Association (EVPOA). Appendix A, Exhibit 1 shows the location of Eagle-Vail.

Stone Creek, a tributary to the Eagle River, is a relatively small perennial creek draining a total watershed area of 5 square miles and located adjacent to the Eagle-Vail subdivision and the Eagle Vail Golf Course in Eagle-Vail. Stone Creek flows in a northerly direction toward the Eagle River. Slope within the watershed is steep and averages approximately 875 feet per mile (16 percent).

During the development of the Eagle-Vail Golf Course and Eagle-Vail subdivision in the early 1970's, a diversion was constructed on Stone Creek to remove the flood flows from much of the subdivision and convey flood flows more directly to the Eagle River. However, the diversion channel, hereafter referred to as the Stone Creek Bypass Channel, does not function as intended because the diversion structure is not effective at diverting water. Although the bypass channel has sufficient conveyance capacity, the bottom elevation is set too high to allow flows to be transported downstream. As a result, flood flows remain in the Stone Creek channel. Downstream of the diversion, the creek is referred to as "Golf Club Creek" on the subdivision plat (Appendix A, Exhibit 2). Because the Stone Creek Bypass Channel does not transport water, it is presently a dry swale.

Trout Pond is connected to the Stone Creek Channel approximately 1,500 feet upstream of the diversion structure (Appendix A, Exhibit 3). Trout Pond receives water from the Eagle River via a buried 36 inch pipe and Stone Creek. Water from Eagle River is used to keep trout pond full so that the water can be used to irrigate the golf course. Water from Stone Creek is diverted to Trout Pond via an irrigation gate that feeds into a buried pipe, which leads to an open channel that enters Trout Pond. The Trout Pond outlet empties into culverts underneath Cottonwood Drive that join an open channel, which enters Stone Creek approximately 300 feet southwest of the outlet. Immediately upstream of the confluence of the Trout Pond outlet channel and Stone Creek (approximately 1,300 feet upstream of the diversion structure) a spillway directs overbank flows onto the golf course and away from residential structures.

The Flood Insurance Rate Map (FIRM) (Panel 0837C0651D, effective date December 4, 2007) for Stone Creek along the Eagle-Vail subdivision used basic mapping techniques that did not accurately reflect the actual Stone Creek channel and floodplain. Subsequently, a detailed

floodplain study was completed in 2009, demonstrating how the community may be affected by a 100-year flood event associated with Stone Creek. Following the completion of the Stone Creek flood study, Eagle County submitted a Letter of Map Revision (LOMR) to FEMA in 2009 to improve the accuracy of the floodplain mapping along Stone Creek and correct floodplain discrepancies. FEMA approved the LOMR on June 4, 2010.

The 2009 study and subsequent LOMR indicated that several structures are at risk for flooding. Currently, 12 residential structures are located in Zone AE (100-year floodplain) and an additional 65 structures are located in the Shaded Zone X (500-year floodplain). Flooding in Eagle-Vail would likely be rapid due to rainfall on top of snowmelt in the relatively small, steep mountain drainage basin. Therefore, a flood event would not likely allow sufficient time for response to protect structures from flood damage.

FEMA has proposed funding the project through the PDM Program. As a Federal action, the proposed project is subject to the National Environmental Policy Act of 1969 (NEPA) (42 U.S. Code [U.S.C.] §§ 4321–4327). The Council on Environmental Quality's (CEQ's) implementing regulations for NEPA (Title 40, Code of Federal Regulations [CFR] Parts 1500–1508) require an investigation of the potential environmental impacts of a proposed Federal action and an evaluation of alternatives as part of an Environmental Assessment (EA). The FEMA regulations that establish the agency-specific process for implementing NEPA are set forth in 44 CFR Part 10. This EA was conducted in accordance with both CEQ and FEMA NEPA regulations.

SECTION TWO PURPOSE AND NEED

The purpose of FEMA's PDM Program is to substantially reduce the risk of future damage, hardship, loss, or suffering in communities from natural disasters, such as flooding, by providing the affected communities with cost-share funds to reduce future losses. The purpose of the action is to reduce the flood hazards for the Eagle-Vail Subdivision.

The LOMR completed in 2009 indicated that during a 100-year flood event on Stone Creek, 12 residences located along the creek have the potential to be flooded. The hydrologic study associated with the LOMR was of sufficient detail to identify individual structures that could be affected. The flow rate during a 100-year flood event is estimated at 250 cubic feet per second (cfs). However, the existing road crossings for Stone Creek/Golf Club Creek do not have sufficient capacity to convey flows associated with the 100-year flood event. The Stone Creek Bypass Channel was originally designed to have a capacity of at least 300 cfs, which would convey flows associated with 100-year flood event. However, the elevation of the bypass channel needs to be lowered so it can accommodate flows before the capacity of the creek channel and road crossings is exceeded.

Eagle County has determined a need to reduce flood hazards for the Eagle-Vail subdivision residential community. Potential flood mitigation measures would need to reduce potential flooding, while preserving the natural characteristics of Stone Creek/Golf Course Creek.

SECTION THREE ALTERNATIVES

The CEQ has developed regulations for the preparation of environmental impact documents in compliance with NEPA. The CEQ requires an investigation and evaluation of practicable alternatives as part of the NEPA process. The following subsections describe alternatives considered but not retained for further evaluation, as well as alternatives that were considered and retained for evaluation in the EA.

3.1 ALTERNATIVES NOT RETAINED

The following alternatives were initially considered for flood protection within and along the Eagle-Vail subdivision. However, these alternatives were determined to be infeasible for the reasons stated and were removed from consideration.

3.1.1 Improvement of Downstream Channel

This alternative would improve the conveyance capacity of the portion of Stone Creek/Golf Club Creek between the Trout Pond and the Eagle River such that it could convey the 100-year storm event. This alternative was not retained for further consideration because it was determined that the conveyance of flood flows is limited by the capacity of the culverts at the various road crossings and not by the channel capacity of the existing stream channel. Therefore, increasing the downstream channel capacity would not reduce the potential for flooding along the creek.

3.1.2 Construction of Upstream Detention

This alternative would involve the construction of a reservoir and dam on Stone Creek upstream of Eagle-Vail. Land for flood water storage is not readily available in the area. The majority of the land within the Stone Creek drainage upstream of Eagle-Vail is U.S. Forest Service land. Because of the steep terrain, a dam would need to be more than 10 feet high to back enough water to prevent flooding downstream. A dam of this size would be considered a jurisdictional dam by the Colorado State Engineer's Office. Based on the complications associated with land ownership, dam safety, land uses, permitting, environmental impacts, and costs associated with the construction of a jurisdictional dam, this alternative was not retained for further consideration.

3.2 ALTERNATIVES CONSIDERED

The following three alternatives were retained for further evaluation:

- Alternative 1 – No Action
- Alternative 2 – Stone Creek Bypass Channel Restoration (Proposed Action)
- Alternative 3 – Increase the Conveyance Capacity of Culverts Between Trout Pond and Eagle River

3.2.1 Alternative 1 – No Action

With the No Action Alternative, no action would be taken to provide protection from future flood events on Stone Creek along the Eagle-Vail subdivision.

3.2.2 Alternative 2 – Stone Creek Bypass Channel Restoration (Proposed Action)

The overall goal of the project is to reduce potential flooding of the adjacent residential structures. Capacity and conveyance of the Stone Creek Bypass Channel would be improved by upgrading the diversion control structure and excavating, regrading, and realigning the channel. The upgraded diversion structure would split the 100-year - flood flows (approximately 250 cfs) between the Stone Creek Bypass Channel and Golf Club Creek. Approximately 80 cfs would be conveyed by Golf Club Creek; remaining flows (approximately 170 cfs) would be conveyed by the Stone Creek Bypass Channel. Upstream of the diversion point, a spillway would be modified to divert Stone Creek flood flows onto the golf course, and the Trout Pond outlet capacity would be increased by installing an additional culvert under Cottonwood Drive. The Proposed Action would require ground disturbance consisting of excavation and backfill along Stone Creek and the Stone Creek Bypass Channel. This alternative would involve improvements within six project segments along Stone Creek and the Stone Creek Bypass Channel, which are numbered from downstream to upstream (See Appendix A, Exhibit 3). The proposed improvements include:

- Segment 1 Excavation/Realignment of the Stone Creek Bypass Channel Upstream of the U.S. Highway 6 Crossing
- Segment 2 Excavation and Regrading of the Open Channel Segment of the Stone Creek Bypass Channel
- Segment 3 Conversion of the Stone Creek Bypass Channel Piped Segment to an Open Channel
- Segment 4 Replacement of the Diversion Structure and Grading within the Stone Creek Bypass Channel
- Segment 5 Replacement and Upgrade of the Spillway within Stone Creek
- Segment 6 Increase the Discharge Capacity of Trout Pond to Stone Creek

Appendix A, Exhibit 3 shows the locations of disturbance by project segment. In total, the project area is approximately 0.8 acre. Overall, approximately 1,000 cubic yards of soil would be excavated and any excess soil would be stockpiled at the existing golf course soil stockpile area for future golf course projects. The disturbed areas (approximately 16,000 square feet) would be revegetated with a native grass mixture or golf course turf grasses. Appendix A, Exhibits 4 through 7 show the locations of the improvement areas. The six project segments are discussed in more detail in the following paragraphs.

3.2.2.1 Segment 1 – Excavation/Realignment of the Stone Creek Bypass Channel Upstream of the U.S. Highway 6 Crossing

Segment 1 is immediately upstream of the U.S. Highway 6 bypass channel crossing, which also serves as a golf cart path crossing (Appendix A, Exhibit 4). Photographs 1 and 2 (Appendix B) depict the environmental setting at Segment 1. The channel in this area is not well defined and would be excavated and graded to improve conveyance capacity to convey at least 170 cfs. Segment 1 would also require realignment of approximately 2,600 square feet of golf cart path, and approximately 80 linear feet of 18-inch corrugated metal pipe (CMP) would be removed (Appendix A, Exhibit 4). The channel work would include excavating approximately 300 cubic yards of soil and grading approximately 135 linear feet of the channel. Once the channel work

has been completed, the golf cart path would be reconstructed in the bottom of the channel, and the disturbed area (approximately 3,000 square feet) would be revegetated with golf course turf grasses. Appendix A, Exhibit 4 shows the limits of disturbance for this improvement area. A brick retaining wall located along the south side of the golf cart path may need to be modified or partially removed to achieve the cart path realignment.

3.2.2.2 Segment 2 – Excavation and Regrading of the Open Channel Segment of the Stone Creek Bypass Channel

Segment 2 is approximately 700 feet upstream of Segment 1 and is an open channel segment that would be excavated and re-graded (Appendix A, Exhibit 5). Photograph 3 (Appendix B) depicts the environmental setting at Segment 2. The channel in this area is not well defined and would be reshaped to achieve the desired cross section, as shown in Appendix A, Exhibit 5. This segment is approximately 150 feet in length, and approximately 170 cubic yards of soil would be excavated. Excavated soil would be hauled to the golf course stockpile area. Following completion of construction activities, approximately 4,000 square feet of disturbed area would be revegetated with a combination of native grasses and golf course turf grasses.

3.2.2.3 Segment 3 – Conversion of the Stone Creek Bypass Channel Piped Segment to an Open Channel

Segment 3 is approximately 100 feet upstream of Segment 2 (Appendix A, Exhibit 5). Proposed activities include the removal of three obsolete CMPs, shown in Appendix B, Photograph 4 shows the existing CMPs. This area would then be excavated, graded, and converted to an open channel as shown on Appendix A, Exhibit 5. Approximately 90 cubic yards of soil would be excavated and approximately 900 square feet of disturbed area would be revegetated with a native grass mixture.

3.2.2.4 Segment 4 – Replacement of the Diversion Structure and Grading within the Stone Creek Bypass Channel

Segment 4 is shown in Appendix A, Exhibit 6 and Appendix B, Photographs 5 through 8. At the Stone Creek diversion, two existing approximately 18-inch CMP culverts have partially collapsed and restrict water flow. The existing damaged culverts would be removed, and a concrete headwall with a 51-inch by 31-inch CMP would be installed to limit the discharge to Golf Club Creek to a maximum of 80 cfs. Immediately upstream of the diversion structure, the Bypass Channel would be excavated to an elevation (level) that would convey approximately 170 cfs during a 100-year flood event. The construction process would involve the removal of two oval CMPs, the construction of a concrete headwall, installation of a new oval CMP, excavation of approximately 500 cubic yards of soil, the placement of approximately 100 cubic yards of backfill, and regrading approximately 180 linear feet of channel. Side slopes would be approximately 3:1 (horizontal: vertical) as shown in Appendix A, Exhibit 6.

Approximately 7,300 square feet of disturbed areas would be revegetated with a combination of native grass mixture and golf course turf grasses. Cofferdams or small pumps would be used to dewater the construction area during this phase of the project. Appendix A, Exhibit 6 shows the extent of construction in this improvement area.

3.2.2.5 Segment 5 – Replacement and Upgrade of the Spillway within Stone Creek

Approximately 1,300 feet upstream of the diversion at Segment 4, an existing spillway would be removed and a new spillway would be constructed to direct overbank flows onto the golf course and away from residential structures. Flood flows directed onto the golf course would return to the creek approximately 300 feet upstream of Segment 4. Appendix A, Exhibit 7 shows the location of the existing and new spillway. Photograph 9 in Appendix B shows the existing spillway. The new spillway would be constructed with approximately 26 tons of rock and would be placed at a slightly lower elevation than the existing structure. A notch for the low-flow main channel would be approximately 10 feet wide by 2 feet deep. Beyond the capacity of the notch, water would overtop the spillway and flow onto the golf course. The flow of the main channel would be limited to approximately 80 cfs. The quantity of excavated material necessary to lower the spillway sill and define the notch for the low-flow channel would be determined during final engineering. The excavated material would be placed in an eroded area adjacent to the spillway or stockpiled at the golf course stockpile area. Disturbed areas would be revegetated with golf course turf grasses.

3.2.2.6 Segment 6 – Increase the Discharge Capacity of Trout Pond to Stone Creek

This project segment is located approximately 1,500 feet upstream of the diversion, where discharges from Trout Pond are conveyed under Cottonwood Drive (Appendix A, Exhibit 7). Photographs 10 through 12 (Appendix B) depict the environmental setting at Segment 6. With the Proposed Action, a new culvert would be installed beneath Cottonwood Drive parallel to the existing 42-inch outlet pipe. The new culvert would be a 35-inch by 58-inch arched pipe. Placement of the new culvert would involve the removal and replacement of approximately 590 square feet of asphalt, the excavation of approximately 200 cubic yards of soil, and the placement of approximately 155 cubic yards of backfill. Exhibit 6 in Appendix A shows the proposed location of the new culvert. Approximately 1,000 square feet of disturbed area would be revegetated with a native grass mixture.

3.2.3 Alternative 3 – Increase the Conveyance Capacity of Culverts between Trout Pond and Eagle River

The overall goal of Alternative 3 is to reduce potential flooding of the adjacent residential structures by increasing the capacity of downstream culverts on Golf Club Creek. The construction scope for Segments 5-6 would be the same as Alternative 2. The capacity at the existing diversion structure would be increased by replacing the two damaged culverts with 3 new culverts. Downstream from the existing diversion structure, flood flows up to and including the 100-year flood event would be conveyed within the channel of Golf Club Creek. The conveyance capacity of the three existing road crossings downstream of the diversion would be increased to handle a 100-year flood event (approximately 250 cfs). Open trenching with complete road closure would be used to install the new culverts. Appendix A, Exhibit 7 shows the segment locations associated with Alternative 3. The six project segments for Alternative 3 are discussed in more detail in the following paragraphs, and are ordered from downstream to upstream. The improvements for Alternative 3 include:

- Segment 1 Add Culverts at Deer Boulevard Road Crossing
- Segment 2 Add Culverts at Lower Stone Creek Drive Road Crossing

Segment 3	Add Culverts at Upper Stone Creek Drive Crossing
Segment 4	Increase the Conveyance Capacity of Culverts at the Diversion Structure
Segment 5	Replacement and Upgrade of the Spillway within Stone Creek
Segment 6	Increase the Discharge Capacity of Trout Pond to Stone Creek

3.2.3.1 Segment 1 – Add Culverts at Deer Boulevard Road Crossing

Approximately 4,000 feet downstream of the diversion structure, two arched CMP culverts would be added to increase the conveyance capacity. Appendix A, Exhibit 8 shows the project area for Segment 1. Photograph 13 in Appendix B shows the existing conditions within the segment. The new culverts would be the same size as the existing culverts (54-inch by 37-inch arched CMP culverts) located at the Deer Boulevard road crossing. Placement of the new culverts would involve the removal and replacement of approximately 600 square feet of asphalt, the excavation of approximately 200 cubic yards of soil, and the placement of approximately 150 cubic yards of backfill. Approximately 1,000 square feet of disturbed area would be revegetated with golf course turf grasses.

3.2.3.2 Segment 2 – Add Culverts at Lower Stone Creek Drive Road Crossing

Approximately 2,000 feet downstream of the diversion structure, two arched CMP culverts would be added to the existing culverts to increase the conveyance capacity. Appendix A, Exhibit 8 shows the project area for this segment. Photograph 14 in Appendix B shows the existing conditions at the site. The new culverts would be the same size as the existing culverts (42-inch by 29-inch arched CMP culverts) located at the lower Stone Creek Drive road crossing. Placement of the new culverts would involve the removal and replacement of approximately 600 square feet of asphalt, the excavation of approximately 200 cubic yards of soil, and the placement of approximately 150 cubic yards of backfill. Approximately 1,000 square feet of disturbed area would be revegetated with golf course turf grasses.

3.2.3.3 Segment 3 – Add Culverts at Upper Stone Creek Drive Road Crossing

Approximately 1,200 feet downstream of the diversion structure, two arched CMP culverts would be added to the existing culverts to increase the conveyance capacity. Appendix A, Exhibit 8 shows the project area for this segment. Photograph 15 in Appendix B shows the existing conditions at the site. The new culverts would be the same size as the existing culverts (42-inch by 29-inch arched CMP culverts) located at the Upper Stone Creek Drive road crossing. Placement of the new culverts would involve the removal and replacement of approximately 600 square feet of asphalt, the excavation of approximately 200 cubic yards of soil, and the placement of approximately 150 cubic yards of backfill. Approximately 1,000 square feet of disturbed area would be revegetated with a native grass mixture.

3.2.3.4 Segment 4 – Increase the Conveyance Capacity of Culverts at the Diversion Structure

At the Stone Creek diversion, the two existing approximately 18-inch CMP culverts have partially collapsed and inhibit water flow. Appendix A, Exhibit 8 shows the location of the culverts. Photograph 16 in Appendix B shows the existing condition of the culverts. These culverts would be removed and replaced with three new 48-inch CMP culverts. The construction

process would involve the excavation of approximately 300 cubic yards of soil and regrading approximately 100 linear feet of channel. Side slopes would be approximately 3:1. Approximately 1,500 square feet of disturbed areas would be revegetated with golf course turf grasses. Cofferdams or small pumps would be used to dewater the construction area during this phase of the project. Appendix A, Exhibit 8 shows the extent of construction in this improvement area.

3.2.3.5 Segment 5 – Replacement and Upgrade of the Spillway within Stone Creek

The improvements would be identical to those in Segment 5 of Alternative 2. The existing spillway would be removed and a new spillway would be constructed to direct overbank flows onto the golf course and away from residential structures. Flood flows directed onto the golf course would return to the creek upstream of Segment 4. The spillway would be constructed with approximately 26 tons of rock and would be constructed at a slightly lower elevation. A notch for the low-flow main channel would be approximately 10 feet wide by 2 feet deep. Beyond the capacity of the notch, water would overtop the spillway and flow onto the golf course. The flow of the main channel would be limited to approximately 80 cfs. Appendix A, Exhibit 8 shows the general location of Segment 5. Photograph 9 shows the existing conditions at the existing spillway. The quantity of soil that would be removed during the lowering of the spillway sill and defining the notch for the low-flow channel would be determined during final engineering. The excavated material would be placed in an eroded area adjacent to the spillway or at the golf course stockpile area. Flood flows directed onto the golf course would return to the creek upstream of Segment 4. Disturbed areas would be revegetated with golf course turf grasses.

3.2.3.6 Segment 6 – Increase the Discharge Capacity of Trout Pond to Stone Creek

The improvements would be identical to those in Segment 6 of Alternative 2. A new culvert would be placed beneath Cottonwood Drive parallel to the existing 42-inch outlet pipe from Trout Pond. The new culvert would be a 35-inch by 58-inch arched pipe. Placement of the new culvert would involve the removal and replacement of approximately 590 square feet of asphalt, the excavation of approximately 200 cubic yards of soil, and the placement of approximately 155 cubic yards of backfill. Approximately 1,000 square feet of disturbed area would be revegetated with a native grass mixture. Appendix A, Exhibit 8 shows the general location of Segment 6. Appendix B, Photographs 10 through 12 show project area associated with this activity.

SECTION FOUR AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

4.1 PHYSICAL RESOURCES

4.1.1 Affected Environment

4.1.1.1 *Geology and Soils*

Eagle-Vail is located along the Eagle River on the western slope of the Rocky Mountains at an elevation of approximately 7,600 feet above msl. The project area is within the Southern Rockies Level III Ecoregion (Chapman et al. 2006). The Southern Rockies are composed of high elevation, steep, rugged mountains. The region includes the Colorado Mineral Belt, a broad area stretching northeast from the San Juan Mountains in southwestern Colorado to the Colorado Front Range near Boulder. This semiarid region has rolling to irregular terrain of hills, ridges, and footslopes, with elevations generally 6,000 to 8,500 feet. The geology in this area is generally comprised of sandstone, siltstone, shale, and limestone substrates (Chapman et al. 2006).

The Farmland Protection Policy Act (7 U.S.C. 4201 et seq.) requires Federal agencies to minimize the extent to which their programs contribute to the unnecessary conversion of prime farmland, unique farmland, and land of statewide or local importance to non-agricultural uses.

A Natural Resources Conservation Service (NRCS) database search identified three soil types in the project area (NRCS 2011):

- Coulterg loam, 12- to 15-percent slope
- Jerry-Millerlake loams, 1- to 6-percent slope
- Jerry-Millerlake loams, 25- to 45-percent slope

The Coulterg series consists of very deep, well-drained soils that formed in slope alluvium or alluvium derived from calcareous and gypsiferous shale, and from sandstone, siltstone, and limestone. Coulterg soils are on mountain slopes, hills, and alluvial fans (NRCS 2011).

The Jerry series consists of deep and very deep, well-drained soils that formed in alluvial and colluvial sediments or residuum derived mainly from sandstone, shale, breccia, and tuff. These soils are on upland hills, mountain slopes, ridges, benches, and mesa tops (NRCS 2011).

The Millerlake series consists of deep, well drained soils that formed in slope alluvium and other sediments derived from sedimentary rock. These soils are on fan aprons, terraces, and lower mountain slopes (NRCS 2011).

The NRCS database indicates that none of the three soil types within the project area are designated as prime, unique, or statewide importance for farmland soil (NRCS 2011).

4.1.1.2 *Air Quality and Climate Change*

The National Ambient Air Quality Standards (NAAQS), established by the U.S. Environmental Protection Agency (EPA), define the allowable concentrations of pollutants that may be reached but not exceeded in a given time period to protect human health (primary standard) and welfare (secondary standard) with a reasonable margin of safety. These standards include maximum

concentrations for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, and particulate matter (10 microns or less and 2.5 microns or less). Eagle County is considered an Attainment Area for all air quality parameters (EPA 2011a).

The CEQ has recently released guidance on how Federal agencies should consider climate change in their decisions. Guidance for NEPA documents suggest that quantitative analysis should be done if an action would release over 25,000 metric tons of greenhouse gases per year (CEQ 2010).

4.1.2 Environmental Consequences

None of the alternatives have the potential to affect geology, prime farmland, or climate change.

4.1.2.1 Alternative 1 – No Action

The No Action Alternative would have no effect on geology or soils within the project area.

No construction activities would occur under the No Action Alternative; therefore, the alternative would have no impact on air quality in the project area.

4.1.2.2 Alternative 2 – Stone Creek Bypass Channel Restoration (Proposed Action)

As shown on Exhibit 2 in Appendix A, construction activities would occur at six locations in the project area. Overall, the construction activities would be expected to disturb less than 1 acre of land, and upon completion of construction, the disturbed areas would be revegetated with a native grass mixture or turf grasses that are compatible with the operation of the golf course and local residents. During construction, sediment control structures (silt fence, straw bales, etc.) would be installed to reduce soil erosion and the movement of sediment into the adjacent streams. Prior to beginning any construction activities, the County would need to obtain a Grading Permit and a Floodplain Development Permit from the Eagle County Engineer's Office.

Machinery and construction equipment used to construct the project features would contribute to an increase in exhaust fumes and fugitive dust (particulates) during the construction period. The project would be completed in segments and the total disturbed area would be less than 1 acre. Therefore, these exhaust increases would be short term and minor.

4.1.2.3 Alternative 3 – Increase the Conveyance Capacity of Culverts between Trout Pond and the Eagle River

This alternative would disturb approximately 0.5 acre of soil during the installation of additional culverts at the four road crossings and upstream modifications to the diversion structure, spillway, and Trout Pond outlet. A large portion of the disturbed area would be in the existing road rights-of-way (ROWs). Upon completion of construction, disturbed areas that are not covered with asphalt or protected by riprap would be revegetated with a native grass mixture or turf grass that is compatible with the operation of the golf course. The level of impact to previously disturbed soil would be considered minor. A Grading Permit, a Floodplain development Permit, and a Permit to construct in the Public Way would need to be obtained from Eagle County prior to the start of project construction.

Impacts on local air quality would be short term and minor. Machinery and construction equipment used to install the culverts would contribute to an increase in exhaust fumes and

fugitive dust (particulates) during the construction period. Once construction activities cease, air quality in the area would return to pre-project conditions. Additionally, the amount of disturbance associated with upgrading the culverts would be small (less than 0.5 acre total); therefore, the amount of dust generated would be minimal.

4.2 WATER RESOURCES

4.2.1 Affected Environment

4.2.1.1 *Groundwater, Surface Water, and Floodplains*

No groundwater wells were observed in the project vicinity during the site visit and a search of the USGS Groundwater Watch for Eagle County showed no wells in the project vicinity (USGS 2011). Eagle-Vail does not rely on groundwater for municipal usage due to the regionally abundant snowmelt and availability of surface water from local streams and reservoirs.

Stone Creek, a tributary to the Eagle River, is a small perennial creek with a watershed of approximately 5 square miles and is considered a Water of the United States. The creek flows in a northerly direction toward the Eagle River before it splits into two channels, with low flows conveyed in Golf Club Creek and flood flows partially diverted into the Stone Creek Bypass Channel. Information supplied by Eagle County indicates that to their knowledge the Stone Creek Bypass Channel has never transported flood flows to the Eagle River (Eagle County 2010). The approximate length of reach through the development is 4,330 feet following Stone Creek to the Stone Creek Bypass Channel and the Stone Creek Bypass Channel to the Eagle River. An additional approximate 5,300 feet of channel forms the low-flow Golf Club Creek. Stone Creek joins the Eagle River via the Stone Creek Bypass Channel and Golf Club Creek. Exhibit 2 in Appendix A shows the relative locations of Stone Creek and the Eagle River to the project area. Increased stream flows in the Stone Creek due to snowmelt typically starts in March to April at lower elevations, peaks in May to June, and recedes throughout the summer months, resulting in the majority of the annual flow occurring during April, May, June, and July (USGS 2011). Stone Creek is not listed as an impaired stream (EPA 2011b).

The Eagle River drains an area of approximately 1,000 square miles comprised predominantly of mountainous forest and rangeland just west of the Continental Divide in northwestern Colorado. The watershed is contained almost entirely within the boundaries of Eagle County and the elevation of the watershed ranges from 6,150 feet above msl near the confluence with the Colorado River, to over 14,000 feet above msl closer to its headwaters. Streamflow in the Eagle River due to snowmelt typically starts in March and April at lower elevations, peaks in June, and recedes throughout the summer months, resulting in about 75 percent of the annual flow occurring during May, June, and July (USGS 2011). The Eagle River joins the Colorado River over 30 miles downstream near Dotsero, CO. The Eagle River is not listed as an impaired stream (EPA 2011b).

Executive Order (EO) 11988, Floodplain Management, requires Federal agencies to take actions to minimize occupancy of and modifications to floodplains. FEMA regulation 44 CFR Part 9, Floodplain Management and Protection of Wetlands, sets forth the policy, procedures, and responsibilities to implement and enforce EO 11988 and prohibits FEMA from funding construction in the 100-year floodplain (or 500-year floodplain for a critical facility) unless no practicable alternatives are available. To satisfy the requirements of EO 11988 and 44 CFR Part

9, FEMA employs an Eight-Step Decision-Making Process to evaluate projects that have potential to affect a floodplain. The FEMA Eight-Step Decision-Making Process for Floodplain/Wetland Management is provided in Appendix C. It involves considering alternatives to undertaking a project in a floodplain or minimizing impacts to the floodplain. NEPA compliance involves the same basic decision-making process to meet its objectives; therefore, the Eight-Step Decision-Making Process has been satisfied through the implementation of the NEPA process.

Eagle County participates in the National Flood Insurance Program (NFIP). The 100-year and 500-year floodplains for the project area are depicted in Appendix A, Exhibit 9. The 100-year floodplain has several areas with split flow and ranges from approximately 75 to 600 feet in width. There are 12 structures located within the Stone Creek 100-year floodplain (Eagle County 2010), as shown in Appendix A, Exhibit 9.

4.2.1.2 Wetlands (Executive Order 11990)

EO 11990, Protection of Wetlands, requires Federal agencies to take action to minimize the loss of wetlands. Activities disturbing jurisdictional wetlands require a permit from the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act.

FEMA regulation 44 CFR Part 9, Floodplain Management and Protection of Wetlands, sets forth the policy, procedures, and responsibilities to implement and enforce EO 11990 and prohibits Federal agencies from funding construction in a wetland unless no practicable alternatives are available. To satisfy the intent of EO 11990 and 44 CFR Part 9, FEMA employs an Eight-Step Decision-Making Process to evaluate projects that have potential to affect a wetland. The FEMA Eight-Step Decision-Making Process for Floodplain/Wetland Management is provided in Appendix C. It involves considering alternatives to undertaking a project in a wetland and minimizing impacts to wetlands. NEPA compliance involves the same basic decision-making process to meet its objectives; therefore, the Eight-Step Decision-Making Process has been satisfied through the implementation of the NEPA process.

The U.S. Fish and Wildlife Service (USFWS) Wetlands Mapper (USFWS 2011a) shows several wetlands in or near the proposed project area. The wetlands have been classified as PUBFx and R4SBCx (USFWS 2011a). PUBFx wetlands are palustrine (e.g., shallow ponds, marshes, swamps, sloughs) with an unconsolidated bottom (e.g., muddy, silty). These wetlands are semi-permanently flooded and were created by excavation. R4SBCx wetlands are riverine (e.g., river, creek, stream), intermittent streambeds that are seasonally flooded and have been created by excavation.

4.2.2 Environmental Consequences

None of the alternatives would affect groundwater.

4.2.2.1 Alternative 1 – No Action

With the No Action Alternative, no construction activities would occur to modify the management of flows within the project area (Stone Creek, Stone Creek Bypass Channel, and Golf Club Creek). Therefore, this alternative would have no effect on surface water, flooding, designated floodplains, or wetlands in Eagle-Vail. The 12 structures in the identified 100-year floodplain would still have the potential to flood during a 100-year event.

4.2.2.2 *Alternative 2 – Stone Creek Bypass Channel Restoration (Proposed Action)*

The upgraded diversion structure would split the 100-year-flood flows (approximately 250 cfs) between the Stone Creek Bypass Channel and Golf Club Creek. Approximately 80 cfs would be conveyed by Golf Club Creek; remaining flows (approximately 170 cfs) would be conveyed by the Stone Creek Bypass Channel. The Proposed Action would also include excavations at four locations within the Stone Creek Bypass Channel to provide the required conveyance capacity during the 100-year flood event. As indicated above, the culverts at Highway 6 road crossings on Golf Club Creek and the Stone Creek Bypass Channel have the capacity to convey the flows associated with a 100-year flood event. Additionally, the Proposed Action would not have any impact on Eagle River flood stages because the total volume of water that would be conveyed post-project by Golf Club Creek and the Stone Creek Bypass Channel would be the same as is currently discharged to the river.

EPA's National Pollutant Discharge Elimination System (NPDES) Program requires a permit for all construction activities that disturb more than 1 acre. The Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Division administers the NPDES Program in Colorado. Based on preliminary engineering, the area of disturbance for the Proposed Action has been estimated to be approximately 0.77 acre. Therefore, a NPDES permit is not anticipated to be required for this project. However, if the final design indicates that more than 1 acre would be disturbed, Eagle County would need to obtain a NPDES permit from the CDPHE prior to beginning any construction activities. As part of the permitting process, the County would also need to prepare a Storm Water Management Plan (SWMP). Regardless of whether a NPDES permit is required, Best Management Practices (BMPs) would be used to prevent or minimize soil erosion and the movement of sediment during the construction of project features. In addition, a Dewatering Permit from the CDPHE would also need to be obtained prior to the construction of a new diversion structure.

The project would allow the floodplain to extend along the Stone Creek Bypass Channel as it was intended when the Eagle-Vail subdivision was developed. From the Trout Pond discharge downstream to the diversion structure, the Proposed Action would direct additional flood flows onto the golf course and away from the residential structures. Downstream from the diversion, the Proposed Action would contain flows up to and including the 100-year flood event within the Golf Club Creek channel and the Stone Creek Bypass Channel, essentially eliminating any potential for flood damage downstream from the diversion structure. Once completed, the Proposed Action would remove 10 of the 12 structures from the designated floodplain (Appendix A, Exhibit 9). Per 44 CFR § 60.3 (b)(1), the Proposed Action would require the County to obtain a Floodplain Development Permit from the local Floodplain Administrator for construction in a floodplain.

Following completion of the project, a second LOMR to redefine Stone Creek floodplain based on the Proposed Action construction activities would be submitted to FEMA. The Proposed Action would not contribute to further development in the floodplain, as the subdivision is completely built-out and existing building ordinances restrict construction within the 100-year floodplain.

By preparing this EA, FEMA is meeting the requirement of EO 11988 to determine the effects of its actions on the natural and beneficial functions of floodplains. As required by EO 11988, an initial public notice was published in the Eagle Valley Enterprise on March 17 and March 24,

2011. A final public notice will be published in the Eagle Valley Enterprise as part of the Draft EA public review process.

The Proposed Action would affect approximately 0.05 acres of wetlands/Waters of the United States. Appendix A, Exhibit 10 shows the wetlands potentially affected by this action. As required by EO 11990, Eagle County looked at several alternatives, but no practical alternative was identified that completely avoids the wetlands. Therefore, Eagle County would need to obtain a Section 404 Permit from the USACE for this project. Based on the type of work associated with this project and communications with the USACE, three Nationwide permits which may be required to complete the project include a Nationwide #13 (Bank Stabilization) for the block spillway, a Nationwide #14 (Linear Transportation Projects) for the new diversion structure, and a Nationwide #43 (Stormwater Management Facilities) for the new outlet pipe from Trout Pond. Additionally, a Regional General Permit #37 (Stream Stabilization in Western Colorado) may also be required. Prior to initiating construction Eagle County would need to obtain all required permits from the USACE and the State.

Eagle County is in the process of obtaining a flood conveyance agreement with EVMD, which owns the golf course. The written flood conveyance agreement would officially allow the additional flood flows to flow over land on the golf course. This flood conveyance agreement would need to be executed prior the initiation of construction. EVMD are proponents of the Proposed Action and have already written a letter of support and agreement for post-project maintenance associated with the Proposed Action.

4.2.2.3 *Alternative 3 – Increase the Conveyance Capacity of Culverts between Trout Pond and the Eagle River*

With Alternative 3, flood flows upstream of the existing diversion would be managed the same as discussed for Alternative 2. Flood flows would be directed onto the golf course and away from the houses located adjacent to the stream. Downstream from the existing diversion structure, flows up to and including the 100-year flood event would be conveyed within the channel of Golf Club Creek. Minor flooding adjacent to the creek within the golf course may occur with this alternative.

The culvert at the Highway 6 road crossing on Golf Club Creek has the capacity to convey the flood associated with a 100-year flood event. Additionally, Alternative 3 would not have any impact on Eagle River flood stages as the total volume of water that would be conveyed post-project by Golf Club Creek would be the same as currently discharged to the river.

EPA's NPDES Program requires a permit for all construction activities that disturb more than 1 acre. The CDPHE Water Quality Control Division administers the NPDES Program in Colorado. Based on preliminary engineering data, the area of disturbance for Alternative 3 has been estimated to be approximately 0.50 acre. Therefore, a NPDES permit is not anticipated to be required for this project. However, if the final design requires that more than 1 acre would be disturbed, Eagle County would need to obtain a NPDES permit from the CDPHE prior to beginning any construction activities. As part of the permitting process, the County would also need to prepare a SWMP. Regardless of whether a NPDES permit is required, BMPs would be used to prevent or minimize soil erosion and the movement of sediment during the construction of project features. In addition, a Dewatering Permit from the CDPHE would also need to be obtained prior to the construction of a new diversion structure.

This alternative would reduce the size of the floodplain by allowing flood flows up to and including the 100-year flow event to be conveyed within the Golf Club Creek channel without ponding upstream of the road crossings. The increased discharge conveyance from Trout Pond would reduce flooding associated with Trout Pond. Flood flows upstream of the diversion dam would be routed to the golf course and away from the residential structures located adjacent to the stream. The conveyance capacity of the culverts and at the three downstream road crossings would be increased to accommodate a 100-year flood event (approximately 250 cfs). Post-project, 10 of the 12 structures would be removed from the designated floodplain. Following completion of the project, a second LOMR to redefine the Golf Club Creek floodplain based on Alternative 3 construction activities would be submitted to FEMA. Alternative 3 would not contribute to further development in the floodplain, as the subdivision is completely built-out and existing building ordinances restrict construction within the 100-year floodplain.

As discussed, Alternative 3 includes construction in the 100-year floodplain. However, by preparing this EA, FEMA is meeting the requirement of EO 11988 to determine the effects of its actions on the natural and beneficial functions of floodplains. As required by EO 11988, an initial public notice was published in the Eagle Valley Enterprise on March 17 and March 24, 2011. A final public notice will be published in the Eagle Valley Enterprise as part of the Draft EA public review process. As per 44 CFR § 60.3 (b)(1), Alternative 3 would require the County to obtain a Floodplain Development Permit from the local Floodplain Administrator for construction in a floodplain.

Alternative 3 would affect approximately 0.1 acre of wetlands/Waters of the United States. Appendix A, Exhibit 11 shows the wetlands potential affected by this action. As per EO 11990, Eagle County looked at several alternatives, but no practical alternative was identified that completely avoids wetlands. Therefore, Eagle County would need to obtain a Section 404 Permit from the USACE for this project. As with Alternative 2, these project activities would likely require Nationwide Permits, including Nationwide #13 (Bank Stabilization) for the block spillway and a Nationwide #43 (Stormwater Management Facilities) for the new outlet pipe from Trout Pond and the new culverts. Eagle County would need to coordinate with the USACE to verify and obtain the correct 404 permits (Individual or Nationwide).

Eagle County is in the process of obtaining a flood conveyance agreement with EVMD, which owns the golf course. The written flood conveyance agreement would officially allow the additional flood flows to flow over land on the golf course. This flood conveyance agreement would need to be executed prior the initiation of construction. EVMD are proponents of the Proposed Action and have already written a letter of support and agreement for post-project maintenance associated with the Proposed Action.

4.3 BIOLOGICAL RESOURCES

4.3.1 Affected Environment

4.3.1.1 Vegetation

Vegetation within the project area consists primarily of manicured lawns, golf course fairways and greens (turf), landscaping plants, and some trees, which occur (primarily along Stone Creek/Golf Club Creek). Due to the unnatural conditions associated with golf course turf management, the vegetation would be considered low value habitat for wildlife.

4.3.1.2 *Wildlife and Fish*

Wildlife resources in the project area are limited to species that are tolerant of an urban environment and include songbirds, reptiles, amphibians, and small mammals. Additionally, an occasional deer may be seen in the project area.

Within the project area, Stone Creek (Golf Club Creek) is a low-flow channel (approximately 10 to 15 cfs). Higher flows occur during heavy precipitation events and snowmelts. Aquatic life in this stream consists primarily of benthic invertebrates and small fish (in the lower reaches of Golf Club Creek). The Stone Creek Bypass Channel is located above the ordinary high water mark. Additionally, no documentation is available to suggest the Stone Creek Bypass Channel has ever conveyed water (Eagle County 2010); therefore, it does not provide any habitat for aquatic species.

Trout Pond is periodically stocked with trout and provides a limited sport fishery for local fishermen. Holland Pond (Appendix A, Exhibit 6) is quite shallow and as such is not capable of supporting a fish population.

The Migratory Bird Treaty Act (MBTA), 16 U.S.C. 703, was enacted in 1918. It prohibits the taking of any migratory birds, their parts, nests, or eggs, except as permitted by regulations. The USFWS consults on issues related to migratory birds. Vegetation within the project area includes trees, which could provide habitat for migratory birds.

4.3.1.3 *Threatened and Endangered Species and Critical Habitat*

The USFWS online database (USFWS 2011b) indicates that the following federally listed species have the potential to occur in Eagle County:

- Canada lynx [*Lynx canadensis*] – threatened
- Mexican spotted owl [*Strix occidentalis lucida*] – threatened
- Mountain plover [*Charadrius montanus*] – proposed threatened
- Humpback chub [*Gila cypha*] – endangered
- Colorado pikeminnow [*Ptychocheilus lucius*] – endangered
- Bonytail chub [*Gila elegans*] – endangered
- Razorback sucker [*Xyrauchen texanus*] – endangered
- Uncompahgre fritillary butterfly [*Boloria acrocynema*] – endangered
- Ute ladies' tresses [*Spiranthes diluvialis*] – threatened

Table 4-1 describes the habitat requirements and preferences for each of these species.

The Colorado Division of Wildlife (CDOW) maintains a list of 74 species of mollusks, fish, amphibians, reptiles, birds, and mammals with “State Endangered,” “State Threatened,” or “State Special Concern” status (CDOW 2011b). The species list was reviewed to determine any species with the potential to occur within the project area and/or be adversely affected by any of the alternatives. Colorado has no State-level recognition or protection for plant species (Colorado State University [CSU] 2011). The CDOW’s species profiles and Natural Diversity

Information Source maps (CDOW 2011a) were used to determine which State-listed species have the potential to occur within Eagle County. These species are also included in Table 4-1.

4.3.2 Environmental Consequences

4.3.2.1 *Alternative 1 – No Action*

The No Action Alternative would not have any direct effects on vegetation, terrestrial wildlife, aquatic species, or threatened and endangered species or their habitat. However, if a flood were to occur, vegetation, wildlife, and aquatic species could be temporarily disturbed by flood waters and sedimentation.

4.3.2.2 *Alternative 2 – Stone Creek Bypass Channel Restoration (Proposed Action)*

The Proposed Action would have short-term, minor impacts on vegetation within the project area. No long-term negative impact on vegetation is anticipated with this project because of the proposed revegetation. The Proposed Action would result in the removal of shrubs and ground cover plants, such as grasses. The project has been designed to avoid or minimize impacts to trees. Eagle County would work with the golf course to minimize any impacts to golf course vegetation by implementing protective measures, such as placing plywood sheets down prior to driving on the golf course. All disturbed areas not on the golf course would be revegetated with native grass mixtures. If any golf course vegetation would be damaged during construction activities, Eagle County would work with the golf course management to restore the area to pre-project conditions.

The Proposed Action is not expected to have any impact on terrestrial wildlife within the project area. While project activities may cause noise that could disturb wildlife, the short-term displacement of individuals would not adversely impact any populations.

Aquatic species could also be impacted by the Proposed Action; however, these impacts are anticipated to be short-term and minor. The use of BMPs to minimize sedimentation runoff into the stream during construction activities would minimize potential impacts to aquatic species. Once construction activities have ceased and revegetation has been completed, water turbidity would be expected to return to pre-project levels.

FEMA determined that the Proposed Action would have no effect on any of the nine federally listed species. This determination was based on habitat requirements and documented distribution of the nine federally listed species. The determination was provided to the USFWS field office in Grand Junction in a letter dated June 16, 2011 (Appendix D).

The CDOW was contacted regarding this project and indicated that the Boreal toad, the river otter, and the Canada lynx have the potential to occur within the project vicinity. The agency also stated that they had no concerns regarding the potential impacts of the proposed action on any of these species. Therefore, the Proposed Action is not anticipated to have an adverse impact on State-listed species of concern.

4.3.2.3 *Alternative 3 – Increase the Conveyance Capacity of Culverts between Trout Pond and the Eagle River*

Alternative 3 would have a short-term minor impact on vegetation within the project area. No long-term negative impact on vegetation is anticipated with this project due to the proposed

revegetation efforts. The alternative would result in the removal of shrubs and ground cover plants, such as grasses. The project has been designed to avoid and minimize impacts to trees. Eagle County would work with the golf course to minimize any impacts to golf course vegetation by implementing protective measures, such as placing plywood sheets down prior to driving on the golf course. All disturbed areas not on the golf course would be revegetated with native grass mixtures. Areas disturbed on the golf course would be revegetated with turf grass currently used on the golf course.

Alternative 3 is not expected to have any impact on terrestrial wildlife within the project area. While project activities may cause noise that could disturb wildlife, the short-term displacement of individuals would not adversely impact any populations.

Aquatic species could also be impacted by Alternative 3; however, these impacts are anticipated to be short-term and minor. The use of BMPs to minimize sedimentation to the stream during construction activities would limit potential impacts to aquatic species. Once construction activities have ceased and revegetation has been completed, water turbidity would be expected to return to pre-project levels.

FEMA has determined that Alternative 3 would have no effect on any of the nine federally listed species. This determination was based on habitat requirements and documented distribution of the nine federally listed species.

As discussed for Alternative 2, the CDOW indicated that the Boreal toad, the river otter, and the Canada lynx have the potential to occur within the project vicinity. The agency also stated that they had no concerns regarding the potential impacts of this alternative on any of these species. Therefore, the Alternative 3 is not anticipated to have an adverse impact on State-listed species of concern.

4.4 CULTURAL RESOURCES

The National Historic Preservation Act (NHPA) of 1966, (Public Law [P.L.] 89-665; 16 U.S.C. 470 et seq.) as amended, outlines Federal policy to protect historic properties and promote historic preservation in cooperation with States, Tribal governments, local governments, and other consulting parties. The NHPA established the National Register of Historic Places (NRHP) and designated the State Historic Preservation Officer (SHPO) as the entity responsible for administering State-level programs. The NHPA also created the Advisory Council on Historic Preservation (ACHP), the Federal agency responsible for overseeing the Section 106 process and providing commentary on Federal activities, programs, and policies that affect historic properties.

Section 106 of the NHPA and its implementing regulations (36 CFR Part 800) outlines the procedures for Federal agencies to follow to take into account the effects of their actions on historic properties. The Section 106 process applies to any Federal undertaking that has the potential to affect historic properties, defined in the NHPA as those properties that are listed in or eligible for listing in the NRHP. Although buildings and archaeological sites are most readily recognizable as historic properties, a diverse range of resources are listed in the NRHP, including roads, landscapes, and vehicles. Under Section 106, Federal agencies are responsible for identifying historic properties within the Area of Potential Effects (APE) for an undertaking, assessing the effects of the undertaking on those historic properties, if present, and considering ways to avoid, minimize, and mitigate any adverse effects. Because Section 106 of the NHPA is

a process by which the Federal government assesses the effects of its undertakings on historic properties, it is the primary regulatory framework that is used in the NEPA process to determine impacts on cultural resources.

FEMA has conducted formal Section 106 consultation with the SHPO for the Proposed Action, and the assessment of impacts to cultural resources from the Proposed Action presented below is based upon the results of the Section 106 process. FEMA has not conducted formal Section 106 consultation for Alternative 3. However, the environmental consequences of Alternative 3 were assessed by an archaeologist meeting the Secretary of the Interior's Professional Qualification Standards. If Alternative 3 is selected, FEMA will complete Section 106 consultation for the revised undertaking.

4.4.1 Affected Environment

An assessment of the project's potential to affect historic properties within the APE for the Proposed Action was conducted by an archaeologist and an architectural historian, who were both qualified under the Secretary of the Interior's Professional Qualification Standards (36 CFR Part 61) in their respective disciplines. A records search of COMPASS, Colorado's On-line Cultural Resource Database, revealed that no previously recorded cultural resources are located in the APE for the Proposed Action. This information was supplemented by a desktop search of readily available resources to identify any cultural resources of interest in the project area. In April 2011, the archaeologist visited the project area to document a building over 50 years of age, per SHPO requirements, located within the APE for the Proposed Action. At that time, digital photographs of this building were taken (Appendix E). Data collected online and during the site visit were reviewed by the archaeologist and the architectural historian to determine if historic properties were present in the APE for the Proposed Action.

For above-ground resources, FEMA has determined the APE for the Proposed Action to consist of the footprint of the proposed project and the residential parcels immediately adjacent to the proposed project to account for indirect effects. For archaeological resources, FEMA has determined the APE for the Proposed Action to consist of the areas where ground disturbance associated with the Proposed Action could potentially occur. The size of the APE accounts for the limited nature of the undertaking and the fact that the disturbance will take place on and near ground level.

4.4.1.1 Aboveground Resources

The project area was historically utilized as agricultural land and, in the early 1970's, a residential golf course community subdivision was developed. Desktop resources revealed that the residential buildings in the project area consist of single- and multi-family dwellings constructed in the 1970s and 1980s. The dwellings are slab-on-grade, one- or two-story, and reflect a vernacular rustic style. These resources do not appear to possess the exceptional importance required for properties less than 50 years of age to be eligible for listing in the NHRP, either as individual resources or collectively as a historic district.

In previous coordination with the SHPO, the Eagle County Engineering Department, in a letter dated December 1, 2009, identified one building over 50 years of age in the vicinity of the project – a barn located on the Eagle-Vail Golf Course property. The barn falls within in the APE for aboveground resources for the Proposed Action. As noted above, during the April 2011

site visit, the barn was documented. The building is a single-story, front-gable barn oriented north-northwest to south-southeast, located approximately 20 feet south of the second hole tee on the Eagle-Vail Golf Course. According to the Eagle Vail Golf Club Web site, “the red barn near Hole #2 green served as feed and tack storage, a testament to the valley’s agricultural heritage” (Eagle Vail Golf Club 2011). The Web site stated that the barn was constructed in the 1930s, which is consistent with the barn’s appearance. The barn does not appear to reflect unique design, and has been completely removed from its historic context, as the setting has changed from agricultural to residential and no other built resources contemporary to the barn remain extant. Based on this information, FEMA has determined that the barn is not eligible for listing in the NRHP, and that no aboveground historic properties are located within the APE for the Proposed Action. A Colorado SHPO Survey Architectural Inventory Form for this barn (5EA2879) was prepared and submitted on June 10, 2011 by FEMA to the SHPO (Appendix E). In a letter dated June 16, 2011 (Appendix D), the SHPO concurred with FEMA’s findings and determinations.

4.4.1.2 Archaeological Resources

As noted above, no previously recorded archaeological resources were identified in COMPASS in the APE for the Proposed Action. While the location of the project area along a small perennial stream is consistent with a moderate potential for prehistoric sites and sites related to the early historic settlement (e.g., mining, ranching, and a rural settlement) of Colorado, the project area has been thoroughly disturbed by modern development (residential subdivision and golf course), and it is a dynamic geomorphological setting, with active erosion and deposition. Therefore, the potential for intact, NRHP-eligible archaeological resources to be present in the APE for the Proposed Action is low. Based on this information, FEMA has determined that no archaeological historic properties are located within the APE for the Proposed Action. In a letter dated June 16, 2011 (Appendix D), the SHPO concurred with FEMA’s findings and determinations.

4.4.2 Environmental Consequences

4.4.2.1 Alternative 1 – No Action

The No Action Alternative would have no impact on cultural resources. No historic properties, either aboveground or archaeological, were identified within the project APE. Therefore, FEMA has determined that no historic properties would be affected by the No Action Alternative.

4.4.2.2 Alternative 2 – Stone Creek Bypass Channel Restoration (Proposed Action)

No historic properties, either aboveground or archaeological, were identified within the project APE. Therefore, FEMA has determined that no historic properties would be affected by the Proposed Action. In a letter dated June 16, 2011 (Appendix D), the SHPO concurred with FEMA’s determination.

If unexpected discoveries are made during the course of project execution, FEMA will proceed in compliance with State and Federal laws protecting cultural resources, including Section 106 of the NHPA, and all work shall cease in the immediate vicinity of the find until appropriate parties are consulted and a treatment plan is established.

4.4.2.3 Alternative 3 – Increase the Conveyance Capacity of Culverts between Trout Pond and the Eagle River

Alternative 3 is located in the same general area as the Proposed Action, and accordingly the affected environment is similar. The Alternative 3 project area from the diversion structure downstream to U.S. Highway 6 crosses a modern residential development (a golf course and 1970s to 1980s single- and multi-family dwellings) and an active geomorphological setting. Modern culverts convey flows in Golf Club Creek under modern roads.

As noted above, the project area was historically utilized as agricultural land and in the early 1970s. a residential golf course community subdivision was developed. Desktop resources revealed that the Fleck Ditch (5EA1691.1), constructed between 1889 and 1907, is located immediately west of the project area for this alternative, a finding that is consistent with the regional agriculture context. The Colorado SHPO has recommended this site as ineligible for listing in the NRHP. Desktop resources revealed that the residential buildings in the project area consist of single- and multi-family dwellings constructed in the 1970s and 1980s, none of which appear to be eligible for listing in the NRHP.

In consideration of the character of the project area and the results of Section 106 consultation with the SHPO for the Proposed Action, no historic properties are expected to be affected by Alternative 3. While effects to historic properties are not expected, if Alternative 3 is selected, FEMA is required to conduct Section 106 consultation with the SHPO and any additional consulting parties. If unexpected discoveries are made during the course of project execution, FEMA will proceed in compliance with State and Federal laws protecting cultural resources, including Section 106 of the NHPA, and all work shall cease in the immediate vicinity of the find until appropriate parties are consulted and a treatment plan is established

4.5 SOCIOECONOMICS RESOURCES AND ENVIRONMENTAL JUSTICE

4.5.1 Affected Environment

4.5.1.1 Socioeconomics

The 2005–2009 American Community Survey (U.S. Census Bureau 2011b) reports that approximately 4,300 people reside in the community of Eagle-Vail. The average household size is approximately four persons. Everyone over 25 years of age is a high school graduate, and approximately 64 percent of those over 25 years of age hold a bachelor’s degree or higher. Approximately 66 percent of the population is male; approximately 34 percent is female. The median age is approximately 31 years and approximately 88 percent of the population is over the age of 18. Almost 22 percent of the population over age 5 speaks a language other than English at home.

Approximately 3,200 workers out of a labor population of approximately 3,700 are private wage or salary workers. Arts, entertainment, and recreation, and accommodation and food services are the major industries in the community, employing approximately 1,400 people. Retail trade and educational services and healthcare/social assistance each employ approximately 600 people (U.S. Census Bureau 2011b).

The median income for a household in Eagle-Vail was estimated at \$95,321, and the median income for a family was estimated at \$77,379. The per capita income for the community was estimated at \$38,210 (U.S. Census Bureau 2011b).

4.5.1.2 Environmental Justice (Executive Order 12898)

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs Federal agencies to “make environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.”

Based on the 2005–2009 American Community Survey (U.S. Census Bureau 2011b), Eagle-Vail has a population of 4,322, of which approximately 96 percent are white with minority populations consisting of approximately 4 percent of some other race Hispanics or Latinos (of any race) are approximately 7 percent of the population. The composition of Eagle County is similar, with 92 percent being white. However, approximately 28 percent are Hispanic or Latino (U.S. Census Bureau 2011a). No substantial concentrations of minority populations are present in the vicinity of the project area.

Eagle-Vail has a poverty rate of 18 percent for families and 6.4 percent for individuals; Eagle County has a poverty rate of 5.2 percent for families and 9.4 percent for individuals. The community’s poverty rate is above the national average for families, while the County’s rate is below the national average (U.S. Census Bureau 2011a, 2011b). No substantial concentrations of families or individuals below poverty level are present in the vicinity of the project area.

4.5.2 Environmental Consequences

4.5.2.1 Alternative 1 – No Action

The No Action Alternative would have no direct impact on the economics of Eagle-Vail, as the risk of flooding would not change from present conditions. However, if a flood were to occur, there would be a negative economic impact to those whose homes were affected and to the community as a whole if infrastructure was damaged and needed repair. These negative economic impacts would affect everyone in the community, including low-income and minority populations.

4.5.2.2 Alternative 2 – Stone Creek Bypass Channel Restoration (Proposed Action)

The Proposed Action would reduce the risk of injury or death of people living and working in the vicinity of Stone Creek. Additionally, the Proposed Action would reduce the potential for future flood events in the area and minimize any damages associated with flood events. Property damage, injuries, and deaths result in expenditure of public and personal funds, and these expenditures would be reduced with the Proposed Action. This would be considered a beneficial economic effect.

The proposed project would have a beneficial effect on all people living and working in the vicinity of the project area, including low-income and minority populations. No adverse impacts would result from the Proposed Action; therefore, the Proposed Action would comply with EO 12898.

4.5.2.3 Alternative 3 – Increase the Conveyance Capacity of Culverts between Trout Pond and the Eagle River

Alternative 3 would have similar impacts on the socioeconomics of the area as Alternative 2 because the activities associated with Alternative 3 would reduce impacts associated with flooding within the same general area and to the same extent as Alternative 2.

4.6 COMMUNITY RESOURCES

4.6.1 Affected Environment

4.6.1.1 Public Health and Safety

Historic flooding of Stone Creek has not been documented or measured (Eagle County 2010). However, as a result of the steep slopes within the project vicinity, flooding would likely be rapid and allow for minimal warning time. Therefore, human safety is a concern and the ability to respond to the hazard and critical access routes for emergency equipment would be limited.

4.6.1.2 Traffic and Circulation

The project is located in a residential development along a golf course; therefore, access to much of the project area is limited. Appendix A, Exhibits 2 and 3 show the street layout in the vicinity of the project area. U.S. Highway 6 is located along the northern edge of the subdivision. The highway is a paved two-lane roadway. Traffic from the highway accesses the subdivision via Stone Creek Drive. Roads in the vicinity of the project area include Deer Boulevard, Stone Creek Drive, Coyote Court, Lupine Lane, Cottonwood Drive, and Trout Pond Lane. These roads are paved two-lane roads that provide access to residential areas and, with the exception of Deer Boulevard, do not extend beyond the subdivision. Deer Boulevard, Stone Creek Drive, and Cottonwood Drive are curvilinear with limited intersecting streets. Some of the intersecting streets are only a couple of blocks in length and homes along them frequently have only one access route. Traffic volume on these roads is low and consists primarily of residential vehicles.

4.6.1.3 Public Services and Utilities

Public services and utility providers for the Eagle-Vail area are listed below.

- Electricity: Holy Cross Energy
- Water/Sewer: Eagle River Water & Sanitation District
- Natural Gas: Sourcegas
- Law Enforcement: Eagle County Sheriff's Department; Colorado State Patrol
- Fire Protection: Eagle River Fire Protection District

4.6.1.4 Noise

Sounds that disrupt normal activities or otherwise diminish the quality of the environment are considered noise. Noise events that occur during the night (10 p.m. to 7 a.m.) are more irritating than those that occur during normal waking hours (7 a.m. to 10 p.m.).

The project area is located within a subdivision constructed along a golf course. Noise in the project area is currently associated with car traffic, climatic conditions (e.g., wind and thunder), nature (e.g., birds), and other typical urban type noises (children playing, lawn mowing, yard and house maintenance activities, etc.). No sensitive noise receptors (i.e., hospitals, daycares, nursing homes) are in the vicinity of the proposed project area.

4.6.2 Environmental Consequences

4.6.2.1 Alternative 1 – No Action

Because the No Action Alternative would not involve any new construction activities, the alternative would have no direct impact on public health and safety, traffic and circulation, and public services and utilities in the project and surrounding areas. However, if a flood were to occur, health and safety of local residents, the movement of traffic, and services and utilities would all have the potential to be negatively affected by flood waters. The No Action Alternative would have no effect on noise levels within the project area.

4.6.2.2 Alternative 2 – Stone Creek Bypass Channel Restoration (Proposed Action)

The Proposed Action would have a long-term positive effect on the health and safety of local residents by reducing the likelihood of flooding in the project area. Confining future flood flows to the Stone Creek, Stone Creek Bypass, and Golf Club Creek channels would reduce the potential for damages and loss of life associated with a flood event.

The Proposed Action would have short-term, minor, negative impacts on traffic within the project area. These impacts would include the ingress and egress of construction equipment and movement of the equipment from one construction area to another. In addition, increasing the discharge from Trout Pond by installing a second culvert would result in restricted vehicle access to the two homes upstream from the road crossing during the installation activities. This restriction is anticipated to be 1 to 2 days in duration. Homeowners in the vicinity of the construction activities would be notified prior to any road closures. Once construction activities have been completed, traffic flow within the subdivision would return to pre-project conditions. This action also has the potential for a long-term positive effect on traffic by preventing flood flows from overtopping roads.

The Proposed Action would have a long-term, beneficial effect on public services (e.g. roads) and utilities in the Eagle-Vail area. By confining flood flows to the existing channels, the Proposed Action would prevent the flooding of local utilities and services, thereby, reducing the likelihood of service interruption and road closures. Colorado law requires anyone who engages in any type of excavation to provide advance notice to the underground facility owners to minimize the risk of damaging any type of underground utility. The notice must be at least 3 business days prior to any excavation (Utility Notification Center of Colorado [UNCC] 2010). Therefore, the UNCC would need to be contacted at least 3 days prior to any excavation activities associated with this alternative. UNCC can be reached by calling 8-1-1 or 1-800-922-1987 (UNCC 2010).

The Proposed Action would require machinery and power tools to construct the project features. Use of these items would increase noise levels within and adjacent to the project area during the construction period. No sensitive noise receptors (i.e., hospitals, daycares, nursing homes) are in

the vicinity of the proposed project area. To minimize noise impacts, construction activities would be limited to daytime hours (7 a.m. to 9 p.m.). All equipment would have standard noise-reducing components, such as mufflers, to minimize noise levels. With these noise control measures, noise impacts in the project area would be temporary and minor. Once construction activities have been completed, noise levels in the project area would return to pre-project levels.

4.6.2.3 Alternative 3 – Increase the Conveyance Capacity of Culverts between Trout Pond and the Eagle River

This alternative involves adding culverts located at four road crossings (Deer Boulevard, Stone Creek Drive [2], and Cottonwood Drive) downstream of the existing diversion structure. Travel would be restricted at each of the road crossings during the installation of the additional culverts and the resurfacing of the disturbed street. Travel restrictions are expected to range between 2 and 4 days at the Deer Boulevard and Stone Creek Drive road crossings and 1 to 2 days at the Cottonwood Drive road crossing. Affected homeowners would be notified about the road closures prior to the beginning of construction activities. Once construction activities have been completed, traffic flow within the subdivision would return to pre-project conditions. This action also has the potential for a long-term positive effect on traffic by preventing flood flows from overtopping roads.

Alternative 3 would have the same long-term, beneficial effect on public services and utilities in the Eagle-Vail area as Alternative 2. Additionally, UNCC would also need to be notified 3 days prior to beginning construction activities.

Noise impacts and mitigation would be the same as those discussed for Alternative 2.

4.7 HAZARDOUS SUBSTANCES / WASTES

4.7.1 Affected Environment

In general, a substance is classified as hazardous if it has the potential to damage the environment and/or be harmful to humans and other living organisms. The presence of a hazardous substance within, in the vicinity, and/or upgradient of a proposed project is important in determining the viability of a proposed project because remediation costs associated with hazardous substances could affect the feasibility of the project.

For a flood control/flood mitigation type project such as being proposed by Eagle County, items of concern would include:

- Presence of a hazardous substance within or in the immediate vicinity of the proposed project area.
- The presence of an upgradient leaking underground storage tank or leaking above ground storage tank that is not considered to be “closed” or “no further action needed.”
- The presence of an upgradient solid waste landfill.

To determine if any facilities in the vicinity or upgradient of the proposed project area have known and documented environmental issues or concerns, Environmental Data Resources, Inc. (EDR) was contracted in March 2011 to conduct an electronic data search for the project area.

The search centered on the location where the Stone Creek Bypass Channel diverts from Stone Creek (Lat: 39.6191, Long: -106.4886). The search included 73 Federal and State environmental databases and the search radii ranged from 0.25 mile to 1 mile around this location (EDR 2011).

The databases contain no records of any hazardous waste contamination within or adjacent to any of the areas that would be disturbed by proposed activities. In addition, the EDR Report did not identify any solid waste landfills or leaking underground storage tanks (closed or active) within the search area.

Thirty-seven orphan sites (inadequate address to map the location) are listed in the EDR report. Based on site reconnaissance and further address investigation, none of the orphan sites appear to be located in or near the project area.

4.7.2 Environmental Consequences

Based on the review process and criteria discussed above, no sites were identified that would potentially impact the Proposed Action project area. Based on this information, none of the alternatives have the potential to be adversely affected by past activities at a site.

4.8 CUMULATIVE IMPACTS

Section 1508.7 of the CEQ regulations defines a cumulative impact as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions.” Cumulative impacts are not wholly different from direct or indirect impacts of an action; they are merely a way of placing seemingly isolated or insignificant direct and indirect impacts in context with respect to overall impacts, both over time and in an area larger than that evaluated, for direct and indirect impacts. Cumulative impacts are discussed in terms of being additive, synergistic, or reductive.

Only environmental resources that are adversely affected by the project have the potential to contribute to cumulative impacts. Resources with only short-term and minor impacts associated with construction were not evaluated for cumulative impacts. The following resources would be affected by the Proposed Action and were evaluated for cumulative impacts.

- Surface Water
- Floodplains
- Wetlands

Construction activities for the Eagle Vail Golf Club Sustainability Project began in April 2011 and are scheduled to be completed by Spring 2012 (Eagle Vail Golf Club 2011). The goals are to speed the pace of play, reduce the level of difficulty, and reduce future maintenance costs. Construction activities include:

- rebuild/re-elevate/relocate tee boxes
- replace retaining wall
- replace/remove bunkers
- remove/reconstruct greens
- remove silt from waterways

- construct/improve cart paths
- remove trees

As part of the sustainability project the golf course will be relocating a tee box located near the north side of the Stone Creek Bypass Channel culvert (near Segment 1 of Alternative 2) further to the west, removing a retaining wall, and regrading the slope to a more natural incline. These activities are located North of Highway 6 and the Proposed Action project area. The improvements would allow the flood waters in the Stone Creek Bypass Channel to have a more direct path to the Eagle River.

Wetlands and Floodplains would not be affected by the Golf Club Sustainability Project so there would not be cumulative impacts. The Proposed Action and the Golf Club Sustainability Project would not occur concurrently. Any effects of the sustainability project on water quality due to removal of silt from waterways would be considered temporary. The proposed Action would implement BMPs to minimize water quality impacts. Based on the information above, FEMA has made a determination of no cumulative impacts.

4.9 COORDINATION, PERMITS, AND MITIGATION

The following section lists Federal, State, and local agencies that were contacted and consulted during the preparation of this EA and indicates any additional coordination and permits that are required prior to implementation.

Based on the affected environments and environmental consequences evaluated in Section 4, no other agency correspondence, coordination, permits, or mitigation (except those described below) will be required for either action alternative.

U.S. Fish and Wildlife Service

FEMA determined that Alternative 2 and Alternative 3 would have “No Effect” on threatened or endangered species and would not require additional coordination or permits regarding threatened and endangered species and migratory birds, unless project activities change. FEMA informed the USFWS of their determination in a letter dated June 16, 2011.

Colorado State Historic Preservation Officer

FEMA determined that no historic properties, either above-ground or archaeological, are located within the APE for the Proposed Action and that no historic properties would be affected by the Proposed Action. In a June 16, 2011 letter, the SHPO concurred with FEMA’s findings and determinations (Appendix D). No additional coordination with the SHPO is required for the Proposed Action (Alternative 2).

FEMA has not initiated Section 106 consultation with the SHPO for Alternative 3. If this alternative is selected, FEMA will complete Section 106 consultation prior to the release of funds for the project.

Colorado Division of Wildlife

The CDOW indicated that the Boreal toad, the river otter, and the Canada lynx have the potential to occur within the project vicinity. The CDOW has no concerns regarding the potential impacts of the proposed action on any of these species (Appendix D). Therefore, neither action

Affected Environment and Potential Impacts

alternative would be expected to have an adverse impact on State-listed species of concern. No additional coordination with the CDOW would be required.

Colorado Department of Public Health and Environment

If the final design involves disturbing more than 1 acre of land, a NPDES permit would be required from the CDPHE. This would apply to both Alternative 2 and Alternative 3.

Both Alternative 2 and Alternative 3 would require a dewatering permit from this agency.

Eagle County

Both Alternative 2 and Alternative 3 would require a Floodplain Development Permit from the Eagle County Floodplain Administrator.

In addition, both action alternatives would require a grading permit and a Permit to Construct in a Public Way from Eagle County.

Eagle-Vail Metropolitan District

Eagle County would need to enter into an agreement with the Eagle-Vail Metropolitan District to allow the conveyance of flood flows over the golf course.

Eagle County shall comply with the following project conditions and mitigation measures:

- BMPs will be selected, implemented, monitored, and maintained to control erosion and sediment, reduce spills and pollution, and provide habitat protection.
- Any change to the approved scope of work will require re-evaluation for compliance with NEPA and other laws and EOs.
- In the event that potentially significant cultural resources are discovered during project activities, and in compliance with State and Federal laws protecting cultural resources, including Section 106 of NHPA, work in the immediate vicinity shall cease, the area shall be secured, and the Colorado SHPO and FEMA shall be notified.
- All construction equipment will be cleaned and inspected by the operator prior to its arrival on site to reduce the potential spread of noxious or invasive plant species.

Affected Environment and Potential Impacts

Table 4-1: Federal and State-Listed Species That Have the Potential to Occur in Eagle County

Common Name	Scientific Name	Federal Status	State Status	Habitat	Habitat found in Project Area
<u>Birds</u>					
Mexican spotted owl	<i>Strix occidentalis lucida</i>	Threatened	Threatened	Residents of old-growth or mature forests that possess complex structural components (uneven aged stands, high canopy closure, multi-storied levels, high tree density). Canyons with riparian or conifer communities are also important components.	No
Mountain plover	<i>Charadrius montanus</i>	Proposed Threatened	Special Concern	Inhabits prairie grasslands, arid plains, and fields. Nesting plovers choose shortgrass prairies grazed by prairie dogs, bison and cattle, and overgrazed tallgrass and fallow fields.	No
Plains Sharp-Tailed Grouse	<i>Tympanuchus phasianellus jamesii</i>	Not Listed	Endangered	Use rolling hills with scrub oak thickets and grassy glades. As an equivalent to sagebrush, they use scrub oaks, serviceberries, and willows.	No
Burrowing owl	<i>Athene cunicularia</i>	Not Listed	Threatened	Primarily found in grasslands and mountain parks, usually in or near prairie dog towns. The burrowing owl also uses well-drained steppes, deserts, prairies, and agricultural lands.	No
<u>Fish</u>					
Humpback chub	<i>Gila cypha</i>	Endangered	Threatened	Prefers deep, fast-moving, turbid waters often associated with large boulders and steep cliffs.	No
Colorado pikeminnow	<i>Ptychocheilus lucius</i>	Endangered	Threatened	Thrives in swift flowing muddy rivers with quiet, warm backwaters.	No
Bonytail chub	<i>Gila elegans</i>	Endangered	Endangered	Typically lives in large, fast-flowing waterways of the Colorado River system.	No
Razorback sucker	<i>Xyrauchen texanus</i>	Endangered	Endangered	Found in deep, clear to turbid waters of large rivers and some reservoirs over mud, sand, or gravel.	No
<u>Plants</u>					
Ute ladies' tresses	<i>Spiranthes diluvialis</i>	Threatened	NA	The orchid occurs along riparian edges, gravel bars, old oxbows, high-flow channels, and moist to wet meadows along perennial streams that are below 7,000 feet in elevation. It typically occurs in stable wetland and seepy areas associated with old landscape features within historical floodplains of major rivers, as well as in wetlands and seeps near freshwater lakes or springs. It blooms, generally, from late July through August.	No
<u>Amphibians</u>					
Boreal toad	<i>Bufo boreas boreas</i>	Not Listed	Endangered	Restricted to areas with suitable breeding habitat in spruce-fir forests and alpine meadows. Breeding habitat includes lakes, marshes, ponds, and bogs with sunny exposures and quiet, shallow water.	Yes

Affected Environment and Potential Impacts

Table 4-1: Federal and State-Listed Species That Have the Potential to Occur in Eagle County

Common Name	Scientific Name	Federal Status	State Status	Habitat	Habitat found in Project Area
<u>Insects</u>					
Uncompahgre fritillary butterfly	<i>Boloria acrocne</i>	Endangered	NA	The uncompahgre fritillary butterfly is limited to 11 verified sites in the San Juan Mountains in southwest Colorado. All known populations are associated with large patches of snow willow (<i>Salix nivalis</i>) above 12,000 feet.	No
<u>Mammals</u>					
Wolverine	<i>Gulo gulo</i>	Not Listed	Endangered	Found in tundra, taiga, boreal, and alpine biomes and higher elevation, alpine areas that occur in an island-like fashion.	No
River otter	<i>Lontra canadensis</i>	Not Listed	Threatened	River otters once lived in streams, rivers, lakes, swamps, and coastal areas throughout Canada and the United States. Now they are gone from the central and eastern United States, and extinct or rare in Arizona, Colorado, Indiana, Iowa, Kansas, Kentucky, Nebraska, New Mexico, North Dakota, Ohio, Oklahoma, South Dakota, Tennessee, Utah, and West Virginia.	No
Canada lynx	<i>Lynx canadensis</i>	Threatened	Endangered	Preferred habitat of the lynx includes dense sub-alpine forest and willow-choked corridors along mountain streams and avalanche chutes, the home of its favorite prey, the snowshoe hare.	No

Federal status based on USFWS list for Eagle County (USFWS 2011b).

State status based on the CDOW's Species of Concern list (CDOW 2011b) and the Natural Diversity Information Source map index (CDOW 2011a).

NA = Not Applicable; CDOW does not maintain lists for plants or insects.

All habitat requirements from CDOW (2011c), except the Mexican spotted owl, Ute ladies' tresses, Uncompahgre fritillary butterfly, and the river otter.

Habitat requirements for the Mexican spotted owl are from USFWS (2011c).

Habitat requirements for the Ute ladies' tresses are from USFWS (2011d).

Habitat requirements for the Uncompahgre fritillary butterfly are from the USFWS (2011e).

SECTION FIVE SUMMARY

Three alternatives were evaluated in this EA: Alternative 1– No Action, Alternative 2 – Stone Creek Bypass Channel Restoration (Proposed Action), and Alternative 3 – Increasing the Conveyance Capacity of Culverts between Trout Pond and Eagle River. No significant adverse impacts on any environmental resources were identified in this draft EA. A summary of potential environmental impacts associated with the alternatives is provided in **Table 5-1**.

Table 5-1: Comparison of Alternatives by Environmental Resource

Environmental Resource	Alternative 1 – No Action	Alternative 2 – Stone Creek Bypass Channel Restoration (Proposed Action)	Alternative 3 – Increase the Conveyance Capacity of Culverts between Trout Pond and the Eagle River
PHYSICAL RESOURCES			
Geology and Soils	No impact.	No impact on geology. Less than 1 acre of soils would be disturbed during construction and BMPs would be employed to reduce soil erosion during construction. All disturbed areas would be revegetated once construction has been completed. An Eagle County Grading Permit would be required.	No impact on geology. Less than 1 acre of soils would be disturbed during construction and BMPs would be employed to reduce soil erosion during construction. All disturbed areas would be revegetated once construction has been completed. An Eagle County Grading Permit would be required.
Air Quality and Climate Change	No impact.	Short-term and minor impacts associated with increased dust and exhaust fumes are possible during construction. No climate change effects.	Short-term and minor impacts associated with increased dust and exhaust fumes are possible during construction. No climate change effects.
Prime Farmland	No impact.	No farmland present within the project area, no impact.	No farmland present within the project area, no impact.
WATER RESOURCES			
Groundwater	No impact.	No impact.	No impact.
Surface Water (Hydrology/Water Quality)	No effect.	The sill at the spillway would be lower to allow more water to flow onto the golf course during a flood event. The discharge capacity from Trout Pond would be upgraded to reduce potential flooding at Trout Pond. At the diversion structure, flood flows greater than 80 cfs would be directed to the Stone Creek Bypass.	Same as Alternative 2 Road crossings on Golf Club Creek would be upgraded to allow flows (~250 cfs) associated with the 100-year flood event to be conveyed without flooding surrounding residential structures.

Table 5-1: Comparison of Alternatives by Environmental Resource

Environmental Resource	Alternative 1 – No Action	Alternative 2 – Stone Creek Bypass Channel Restoration (Proposed Action)	Alternative 3 – Increase the Conveyance Capacity of Culverts between Trout Pond and the Eagle River
Floodplains	No effect.	Implementation of project features would result in Stone Creek and Golf Course Creek flows being limited to 80 cfs during flood events up to and including the 100-year event. The Bypass Channel would handle the remaining 170 cfs. The elevation of the 100-year floodplain would be reduced, resulting in 10 structures no longer being located within the designated floodplain.	Implementation of project features would result in limiting flows upstream of the diversion structure during a 100-year flood event being limited to 80 cfs. Downstream of the diversion structure, the conveyance capacity of road crossings would be increased so the flows associated with 100-year flood can be conveyed within the existing channel. The elevation of the 100-year floodplain would be reduced, resulting in 10 structures (12 residences) no longer being located within the designated floodplain.
Wetlands	No impact.	Approximately 0.05 acre of wetlands would be affected. Therefore, a Section 404 Permit would be required and the USACE would determine if mitigation is required. Nationwide permits would likely apply.	Approximately 0.1 acre of wetlands would be affected. Therefore, a Section 404 Permit would be required and the USACE would determine if mitigation is required. Nationwide permits would likely apply.
<u>BIOLOGICAL RESOURCES</u>			
Vegetation	No impact.	Less than 1 acre of vegetation would be disturbed during construction; this disturbance represents a short-term impact as the disturbed area would be revegetated once construction has been completed.	Same as Alternative 2.
Wildlife and Fish	No impact.	No impact on wildlife species. Implementation of BMPs to minimize sedimentation would limit potential impacts, which would be short term	Same as Alternative 2.
Threatened and Endangered Species and Critical Habitat	No impact.	No effect on federally listed (or proposed for listing) threatened and endangered species. No impact on State-listed threatened or endangered species.	Same as Alternative 2.
<u>CULTURAL RESOURCES</u>			
Aboveground Resources	No Historic Properties Affected.	No Historic Properties Affected.	Not Assessed.
Archaeological Resources	No Historic Properties Affected.	No Historic Properties Affected.	Not Assessed.

Table 5-1: Comparison of Alternatives by Environmental Resource

Environmental Resource	Alternative 1 – No Action	Alternative 2 – Stone Creek Bypass Channel Restoration (Proposed Action)	Alternative 3 – Increase the Conveyance Capacity of Culverts between Trout Pond and the Eagle River
<u>SOCIOECONOMIC RESOURCES AND ENVIRONMENTAL JUSTICE</u>			
Socioeconomics	No direct impact on the economics of Eagle-Vail. However, in the project area, negative economic impacts would occur to residents whose homes flood and to the community as a whole.	Potential for future flood damage would be reduced and this would reduce the potential that private and public funds would need to be used to repair flood damage. This would be a long-term beneficial economic impact.	Same as Alternative 2.
Economics/Environmental Justice	No disproportional adverse impact on any minority or low-income population.	The Proposed Action would have a beneficial effect on all people living and working in the vicinity of the project area, including low-income and minority populations. Therefore, the alternative would comply with EO 12898.	Same as Alternative 2.
<u>COMMUNITY RESOURCES</u>			
Public Health and Safety	No impact. However, if a flood were to occur, health and safety of local residents would have the potential to be negatively affected by flood waters.	Reducing the potential of flooding within the project area would have a long-term positive effect on public health and safety. The reduction of flooding would reduce the potential for damages and loss of life associated with floods.	Same as Alternative 2.
Traffic and Circulation	No impact. However, during future flood events traffic circulation within the subdivision could be restricted.	During future flood events, the Proposed Action would have a beneficial effect on traffic as flood flows would be contained within the stream channels and street flooding would be reduced if not eliminated. During the installation of additional culvert under Cottonwood Drive, vehicle access would be restricted for up to four residences.	Same as Alternative 2. Upgrading of culverts within the four existing road crossings would require traffic restrictions while the additional culverts are being installed.
Public Services and Utilities	No impact. Flood waters during future flood events could adversely affect public services and utilities.	Beneficial effect due to preventing road closures associated with flood events.	Same as Alternative 2.
Noise	No impact.	Short-term and minor noise impacts would be limited to the duration of construction activities. Construction would be limited to daylight hours (7 a.m. to 9 p.m.).	Same as Alternative 2.

Table 5-1: Comparison of Alternatives by Environmental Resource

Environmental Resource	Alternative 1 – No Action	Alternative 2 – Stone Creek Bypass Channel Restoration (Proposed Action)	Alternative 3 – Increase the Conveyance Capacity of Culverts between Trout Pond and the Eagle River
HAZARDOUS SUBSTANCES/ WASTE			
Hazardous Material / Hazardous Waste	No impact.	No impact. Review of environmental databases identified no sites that would potentially impact the subject property.	Same as Alternative 2.
CUMULATIVE IMPACTS			
Cumulative Impacts	Because the No Action Alternative involves no activities, it would not contribute to impacts associated with other projects.	No cumulative impacts.	Same as Alternative 2.

SECTION SIX AGENCIES CONSULTED**6.1 AGENCIES CONSULTED DURING THE PREPARATION OF THE ENVIRONMENTAL ASSESSMENT****Federal Emergency Management Agency, Region VIII, Denver, CO**

Mr. Steven Hardegen, Regional Environmental Officer (303) 235-4798

Mr. Richard Myers, Deputy Regional Environmental Officer (303) 235-4798

U.S. Fish and Wildlife Service, Grand Junction, CO

Mr. Al Pfister, Project Leader (970) 243-2778

Ms. Gina Glenne, Biologist (970) 243-2778

Ms. Ellen Mayo, Botanist (970) 243-2778

Mr. Kurt Broberdorp, Biologist (970) 243-2778

U.S. Army Corps of Engineers, Grand Junction, CO

Mr. Nick Mezei, Engineer (970) 243-1199

Colorado Division of Wildlife, Glenwood Springs, CO

Mr. Bill Andree, District Wildlife Manager (970) 255-6100

Colorado Historical Society, Denver, CO

Mr. Edward Nichols, State Historic Preservation Officer (303) 866-3682

Eagle County, Eagle, CO

Mr. Greg Schroeder, Senior Project Engineer (970) 328-3560

6.2 AGENCIES CONSULTED BY THE SUBAPPLICANT**Colorado State Historic Preservation Officer, Denver, CO**

Mr. Edwards Nichols, SHPO (303) 866-3682

Eagle County, Eagle, CO

Mr. Keith Montag, County Manager (970) 328-8607

Eagle-Vail Metropolitan District, Avon, CO

Mr. Richard MacCutcheon, Community Manager (970) 949-5400

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SECTION EIGHT LIST OF PREPARERS

This EA was prepared by URS Group, Inc., for FEMA Region VIII in Denver, CO.

URS Group staff includes:

- Mr. Quentin Bliss, Senior Environmental Planner
- Ms. Susan Volkmer, Environmental Planner
- Mr. Justin Williams, Environmental Planner
- Ms. Elizabeth Roberts, Senior Staff Archaeologist
- Mr. Brian Shaw, Architectural Historian

SECTION NINE PUBLIC INVOLVEMENT**9.1 PUBLIC NOTICES**

The initial public notice presented below was published in the Sterling Journal Advocate on November 19 and November 24, 2010. The final public notice, presented in Section 9.1.2, will be published in the Sterling Journal Advocate after public responses to the Draft EA have been received and incorporated.

9.1.1 Initial Public Notice

Public notification is hereby given by the Department of Homeland Security's Federal Emergency Management Agency (FEMA) of the intent to prepare an Environmental Assessment (EA) for a proposed project submitted by the Eagle County, Colorado to reduce future flood hazards within the Eagle-Vail subdivision of the community of Eagle-Vail. A portion of the funding would be provided by FEMA's Pre-Disaster Mitigation Program. This program assists State and local governments with implementing cost-effective hazard mitigation planning and project activities that complement a comprehensive mitigation program.

Eagle-Vail is an unincorporated mountain community near the ski towns of Avon and Vail, Colorado, in Eagle County, along Interstate 70 and the Eagle River. The community is jointly managed by the Eagle-Vail Metropolitan District (EVMD) and the Eagle-Vail Property Owners Association (EVPOA). Stone Creek, a south bank tributary to the Eagle River, is located adjacent to the Eagle-Vail subdivision (Lat: 39.6191, Long: -106.4886). The Project area has been heavily disturbed previously during the original development and construction in 1972. Eagle County submitted a Letter of Map Revision (LOMR) to FEMA in August 2009 to improve the accuracy of the floodplain mapping along Stone Creek and correct the floodplain discrepancies. The LOMR was approved on June 4, 2010. Currently, twelve (12) structures are located within the newly approved floodplain. Flooding in Eagle-Vail would likely be rapid due to rainfall on top of snowmelt in the steep mountain drainage basin. Therefore, it is expected that there would not be sufficient time to respond during a flood to prevent flood damages.

The President's Council on Environmental Quality (CEQ) has developed regulations to implement the National Environmental Policy Act (NEPA). These regulations require an investigation of the potential environmental impacts of a proposed federal action, and an evaluation of alternatives as part of the environmental assessment process. FEMA also has regulations that establish the agency-specific process for implementing NEPA. An EA will be prepared in accordance with both FEMA and CEQ NEPA regulations. Three alternatives will be considered in the EA:

The NO ACTION ALTERNATIVE, which considers the consequences of taking no action to protect the area along the channel/ditch from future floods.

The PROPOSED ACTION ALTERNATIVE would provide flood protection to properties along the segment of Stone Creek and the Stone Creek Bypass Channel by enlarging the existing bypass channel and upgrading existing culverts, diversion structure, and spillway.

The ALTERNATIVE ACTION would involve enlarging the segment of Stone Creek known as Golf Club Creek to handle the 100-year flood flows.

Other alternatives considered, but dismissed due to cost considerations and environmental impacts, include the acquisition and removal of structures located in the floodplain and the construction of new upstream detention.

The President of the United States has issued Executive Orders that require Federal Agencies to focus attention on the environment and on human health and safety when considering the funding of an action. Executive Order 11988 – Protection of Floodplains requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Executive Order 11990 – Protection of Wetlands requires Federal agencies to take action to minimize the loss of wetlands. With this public notice, FEMA is informing the public that the proposed action will occur within the 100-year floodplain of Stone Creek and impact wetlands along the creek.

During the NEPA review process FEMA will also evaluate potential impacts to other environmental resources and compliance with other laws and regulations, such as, the Endangered Species Act and National Historic Preservation Act and Executive Order 12898 – Environmental Justice.

A public comment period related to the alternatives as outlined above or other possible alternatives will end on April 8, 2011. In addition to this initial comment period, a final comment period will be opened for public review of the Draft EA.

Interested parties may obtain more detailed information about the alternatives from Eagle County by calling Greg Schroeder at 970.328.3560 or by email at greg.schroeder@eaglecounty.us. Additionally, comments or question regarding the NEPA compliance process can be directed to Richard Myers, FEMA Region VIII Deputy Regional Environmental Officer by calling 303.235.4926 or by email at Richard.myers@dhs.gov.

9.1.2 Final Public Notice

Notification is hereby given to the public that it is the intent of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) to provide funds to Eagle County, Colorado to reduce future flood hazards within the Stone Creek subdivision of the community of Eagle-Vail (39.6191, -106.4886). Currently, twelve (12) residential structures are located within the floodplain. Flooding in Eagle-Vail would likely be rapid due to rainfall on top of snowmelt in the steep mountain drainage basin. Therefore, it is expected that there would not be sufficient time to respond during a flood to prevent flood damages.

FEMA is required under the National Environmental Policy Act (NEPA) to consider all reasonable alternatives for achieving the intended purpose of the proposed project. The purpose of the proposed project is to reduce future flood hazards within the Stone Creek subdivision of the community of Eagle-Vail. In the Draft Environmental Assessment (EA), the following three alternatives were considered: (1) a No Action Alternative, which considered the consequences of taking no action, (2) Alternative 2, which would provide flood protection to properties along the segment of Stone Creek and the Stone Creek Bypass Channel by enlarging the existing bypass channel and upgrading existing culverts, diversion structure, and spillway, and (3) Alternative 3, which would provide flood protection to properties located along Stone Creek by upgrading culverts and spillway on Stone Creek and upgrading culverts on Golf Club Creek. Both

Alternative 2 and Alternative 3 have been designed to convey flows associated with the 100-year flood event.

The President of the United States has issued Executive Orders that require Federal agencies, when considering an action for funding, to focus attention on the environment and human health with respect to Floodplain Management, Executive Order 11988; Protection of Wetlands, Executive Order 11990; and Environmental Justice, Executive Order 12898. Compliance with Executive Orders, other environmental laws, and NEPA has been documented in the Draft EA. FEMA or the grant Applicant has coordinated with the following agencies: Federal Emergency Management Agency, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, Colorado Division of Emergency Management, Colorado Division of Wildlife, Colorado Historical Society, Eagle County, and. Eagle-Vail Metropolitan District.

Based on agency comments and the EA process, there do not appear to be any significant adverse environmental impacts on the human or natural environment associated with either action alternative. Therefore, an Environmental Impact Statement will not be prepared, and if no comments are received, a Finding of No Significant Impact (FONSI) will be signed fifteen (15) days from the date of this notice, and the project will proceed.

Interested parties may submit comments, request additional information, or request a copy of the FONSI by contacting FEMA's Region VIII Office at the Denver Federal Center, P.O. Box 25267, Denver, Colorado, 80225, or by calling 303.235.4798 between 8:00 a.m. and 4:30 p.m. Mountain Time, Monday through Friday. Comments or requests should be submitted in writing to Mr. Richard Myers, FEMA Region VIII Deputy Environmental Officer, by calling 303.235.4926, or by e-mail at richard.myers@dhs.gov.

The Draft Environmental Assessment is posted in the Eagle-Vail Administrative Office located at 538 Eagle Road, Eagle-Vail Colorado 81620. The office is open Monday through Friday 9 AM to 5 PM Mountain Time. The Eagle-Vail Administrative Office can also be contacted by calling (970) 748-8764. The Draft EA can also be viewed and downloaded from FEMA's website at <http://www.fema.gov/plan/ehp/envdocuments/ea-region8.shtm>.

9.2 PUBLIC COMMENTS

No comments were received during the initial public comment period.