

FINAL ENVIRONMENTAL ASSESSMENT

for

BRIGHAM FACE WILDLIFE MANAGEMENT AREA Evans and Mathias Canyons Debris-Retention Basins Project

SUBMITTED TO:



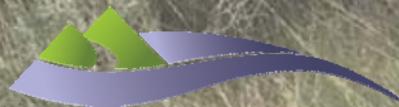
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Wildlife and Sport Fish Restoration Program
Region 6 (Mountain/Prairie Region)
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Draft Environmental Assessment

Brigham Face Wildlife Management Area Evans and Mathias Canyons Debris Basins Project Perry Flood Control District

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Abstract

The US Fish and Wildlife Service (USFWS) and the Utah Division of Wildlife Resources (DWR) are evaluating an amendment to the Wildlife Restoration Grant for the Brigham Face Wildlife Management Area (WMA). The amendment would allow the Box Elder County / Perry Flood Control Special District (Flood District) to construct debris-retention basins at the mouth of Mathias and Evans Canyons on property within the WMA. The basins are needed to protect public safety, public infrastructure, and existing and future development from the risk of a large, potentially catastrophic debris flow or flood occurrence, for instance following wildfire or a major storm event. The Flood District has completed geotechnical analysis and preliminary designs supporting the proposed action. In this Environmental Assessment (EA), the USFWS and DWR evaluate and disclose environmental impacts of the proposed action and propose mitigation measures to avoid and minimize the potential impacts. The EA is being prepared in compliance with the National Environmental Policy Act, including consideration of alternatives and provision of opportunities for public comment.



PERRY
FLOOD
CONTROL
DISTRICT



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Chapter 1: Purpose and Need

1.1 Introduction

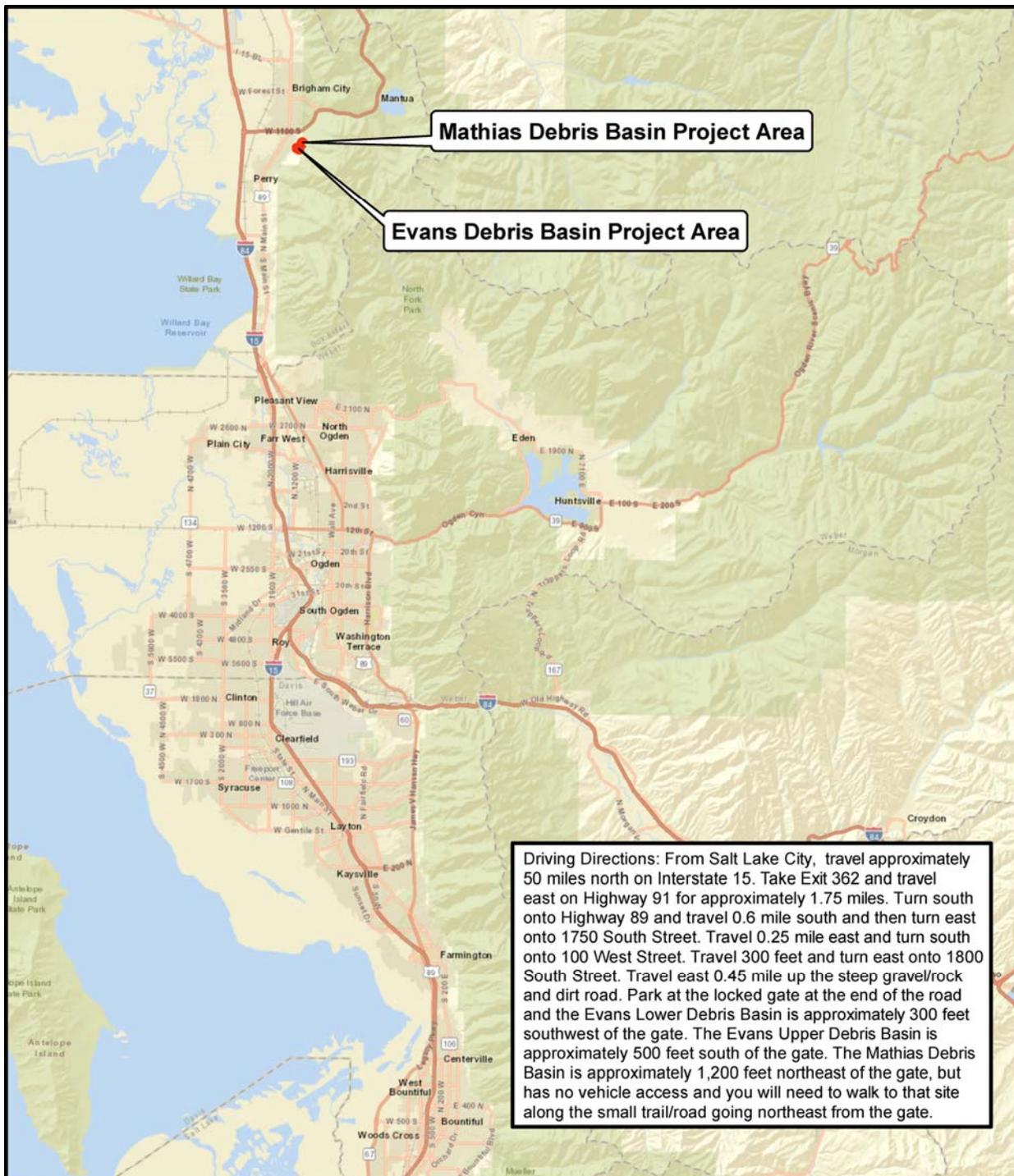
The Box Elder County / Perry Flood Control Special District (Flood District) is a local government entity in Box Elder County, Utah, charged with managing stormwater in areas within and surrounding Perry City, Utah. Perry is located on a foothill bench between the Wasatch mountain range and the Great Salt Lake in northern Utah (Figure 1). The Flood District has identified a need to construct debris-retention basins for two canyons located above Perry City. The locations of the proposed debris-retention basins are within the Brigham Face Wildlife Management Area (WMA), which is owned and managed by the Utah Division of Wildlife Resources (DWR). The Flood District has submitted applications to DWR, requesting easements for constructing the debris-retention basins within the WMA (Figure 2).

The WMA land owned by DWR in the area of the proposed debris-retention basins was acquired in part with federal grant funds from the Wildlife and Sport Fish Restoration Program (WSFR) administered by the US Fish and Wildlife Service (FWS). The WSFR program regulations require that the State Fish and Wildlife agency obtain prior approval from the FWS Regional Director for any proposed disposal, exchange, transfer, or encumbrance of real property originally acquired with federal grant funding from the WSFR Program. This prior approval constitutes a major federal action pursuant to the National Environmental Policy Act of 1969 (NEPA) and requires the preparation of an Environmental Assessment (EA) to determine the impacts of the action on the human environment. The UDWR and WSFR have prepared this draft EA to identify and assess the potential impacts from the proposed action in compliance with NEPA requirements.

1.2 Purpose and Need

The Flood District's purpose is to protect public safety, public infrastructure, and existing and future development from the risk of a large, potentially catastrophic debris flow or flood occurrence, for instance following wildfire or a major storm event. The drainages for Evans and Mathias Canyons are illustrated in Figure 3. Perry City is built on an alluvial fan area below the mouths of the two canyons. The Mathias Canyon drainage basin is approximately 671.5 acres (1.05 square miles) in size. The Evans Canyon drainage basin is approximately 509.2 acres (0.80 square miles).

To assess the debris-flow hazard potential from each canyon, the Flood District contracted a geological consultant, GeoStrata, Inc., (GeoStrata) to conduct a debris flow volume analysis. GeoStrata estimated the potential debris discharge volumes for each canyon and found that both canyons have sufficient quantities of potentially mobilizable sediment and debris to pose a threat to existing and planned development in Perry City below the canyons within the depositional zone. GeoStrata recommended construction of debris-retention basins, locating the basins as near as possible to the mouth of each canyon and nearest to the debris fan apex as possible (GeoStrata 2015). Once a debris flow leaves the apex of the existing debris fan and moves through the



Mathias Debris Basin Project Area

Evans Debris Basin Project Area

Driving Directions: From Salt Lake City, travel approximately 50 miles north on Interstate 15. Take Exit 362 and travel east on Highway 91 for approximately 1.75 miles. Turn south onto Highway 89 and travel 0.6 mile south and then turn east onto 1750 South Street. Travel 0.25 mile east and turn south onto 100 West Street. Travel 300 feet and turn east onto 1800 South Street. Travel east 0.45 mile up the steep gravel/rock and dirt road. Park at the locked gate at the end of the road and the Evans Lower Debris Basin is approximately 300 feet southwest of the gate. The Evans Upper Debris Basin is approximately 500 feet south of the gate. The Mathias Debris Basin is approximately 1,200 feet northeast of the gate, but has no vehicle access and you will need to walk to that site along the small trail/road going northeast from the gate.



Imagery Source: USA Topo Maps (ESRI Online)
 Coordinate System: NAD 1983 UTM Zone 12N
 Projection: Transverse Mercator
 Datum: North American 1983

**Perry Flood Control District
 Evans and Mathias Debris Basins
 Project Location Map**

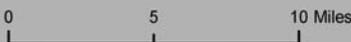


Figure 1. Perry Flood Control District Evans and Mathias Debris Basins Project Location Map.

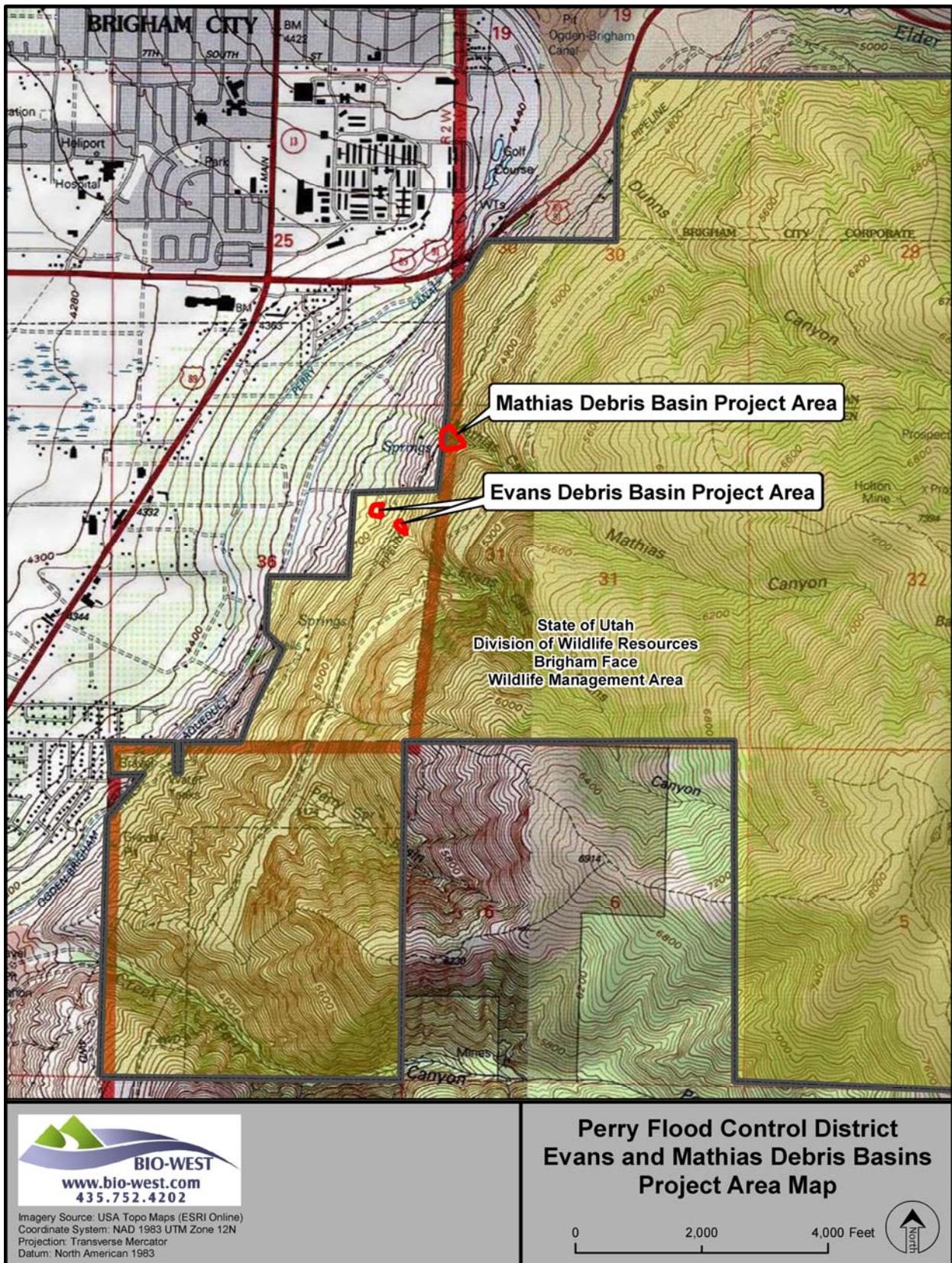


Figure 2. Perry Flood Control District Evans and Mathias Debris Basins Project Area Map.

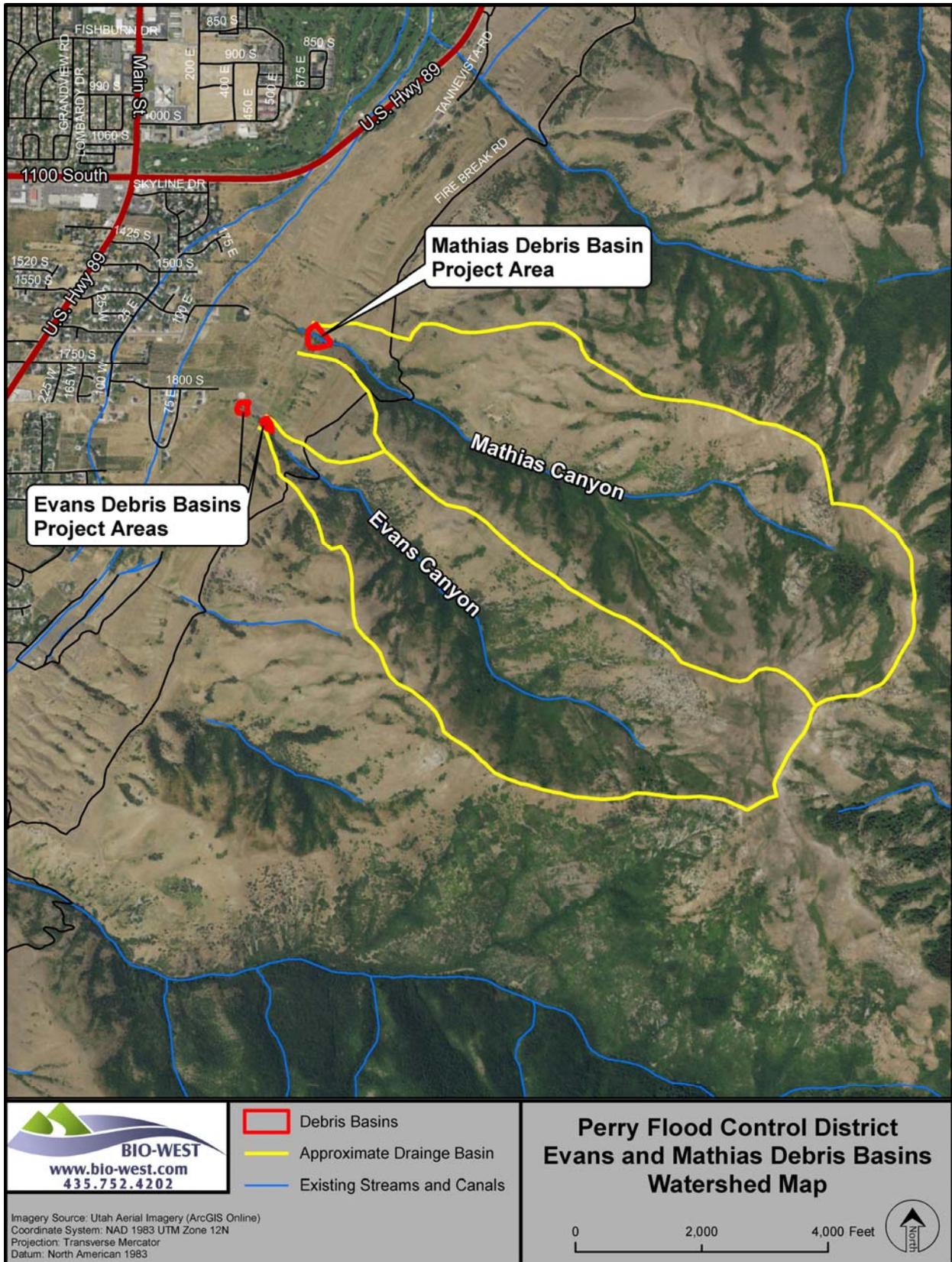


Figure 3. Perry Flood Control District Evans and Mathias Debris Basins Watershed Map.

(Figure 4). Given the topography of the existing drainages above the apex, and the ability of the steep canyon walls to contain debris flows, a greater volume of debris can be contained in the canyons within a smaller footprint compared to debris-retention basins located below the apex.

1.3 Proposed Action

Figure 2 illustrates the locations of debris-retention basins proposed by the Flood District. At Mathias Canyon, there is an existing concrete irrigation water diversion structure at the mouth of the canyon. That structure would be removed and replaced with an earthen embankment and adequately sized debris-retention basin for the estimated potential debris flow. At the Evans Canyon location, the Flood District has an existing debris-retention basin that was determined to be inadequately sized to contain the debris flow potential from the canyon. Therefore, the Flood District proposes to expand the size of the existing basin and also to construct a second basin upstream from the existing basin to provide additional debris flow containment capacity.

1.4 Decision to be Made

Based on the analysis provided in this EA, including consideration of public comment and potential environmental effects, the USFWS will decide if the proposed action might interfere with the purpose for which the land was acquired, necessitating modifications to the proposed action, or if preparation of an Environmental Impact Statement might be needed. This EA is being prepared in compliance with NEPA implementation procedures (40 CFR 1500-1508) and USFWS implementing guidelines (505 FW 1.7 and 550 FW 1).

1.5 Scoping

Scoping is the process of identifying relevant issues to be evaluated in the NEPA process. Scoping requires review of environmental laws and regulations that may be relevant to a proposed project, including appropriate coordination and consultation with federal and state agencies that have jurisdictional responsibilities. Scoping also requires providing opportunity for public comment to identify potentially relevant issues to be evaluated (see Chapter 4 regarding opportunities for public comment).

1.5.1 Issues Carried Forward

Known regulatory requirements, interagency coordination needs, and relevant issues identified for this project are listed below.

- ***Geology, Soils, and Prime and Unique Farmland.*** A concern recognized by the Flood District is that the debris-retention basins would require construction of earthen dams to contain a debris flow. It was therefore necessary to assess geologic and soil characteristics of the area and to obtain professional recommendations for debris-retention basin construction materials and methods. Findings of geologic and soil investigations are reviewed to assess the suitability of the sites for construction of the debris basins and potential risks of seismic activity and erosion. In addition, the Farmland Protection Policy Act aims to minimize the impact of federal programs on unnecessary and irreversible conversion of farmland to nonagricultural uses.

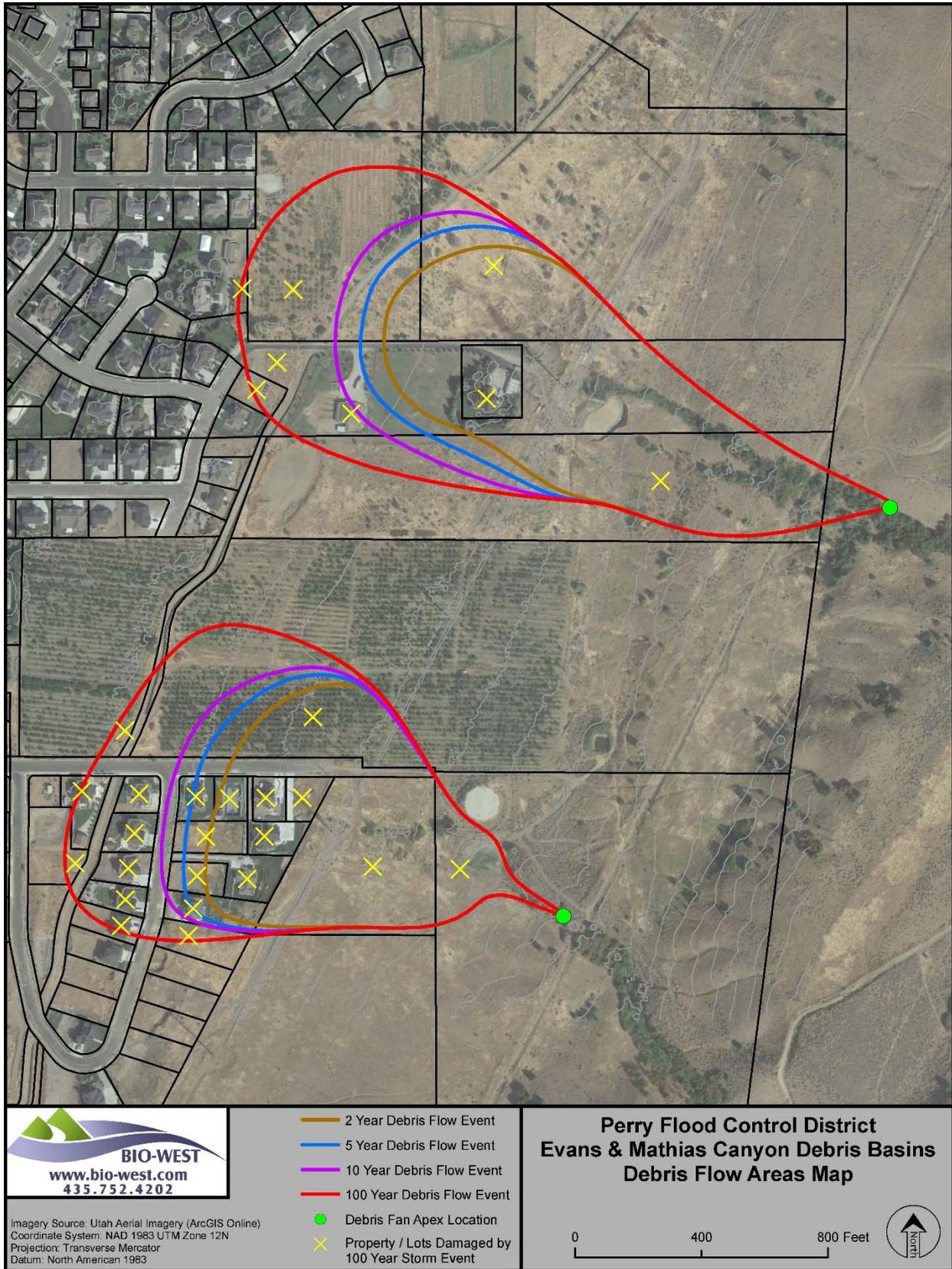


Figure 4. Perry Flood Control District Evans and Mathias Canyons Debris Flow Areas Map.

- ***Wetlands and Stream Alteration.*** Under Section 404 of the Clean Water Act, jurisdictional wetlands and regulated Waters of the United States are afforded certain protections. Section 404 is administered by the US Army Corps of Engineers (USACE). Because wetlands or Waters of the United States are present (Appendix A), the project will require the granting of a Nationwide Wetland Permit from the USACE. Modification of the streams flowing from each canyon will also require a Stream Alteration Permit from the Utah Division of Water Rights (DWRi).
- ***Water Quality.*** The Utah Department of Environmental Quality (DEQ) regulates pollutant discharges to waters. Ground disturbance and construction activity can be a source of pollutants. The DEQ requires submission of a Utah Pollutant Discharge Elimination System (UPDES) permit application for construction activities that disturb one or more acres of natural ground surface.
- ***Biological Resources.*** The WMA provides habitat for mule deer, upland game birds, neotropical migratory birds, aquatic species including amphibians, and other wildlife. Construction would create temporary disturbance to wildlife and would convert some habitat to developed uses. It was therefore important to evaluate the effects and determine appropriate avoidance, minimization, and mitigation measures. Additionally, the Endangered Species Act requires federal agencies to ensure that their actions do not jeopardize the continued existence of species listed as endangered or threatened, nor result in adverse modification of critical habitat (Appendix B).
- ***Land Use.*** In addition to habitat values, DWR also manages the WMA for recreation and has other previously approved developed uses for utility corridors. A relevant issue for the project is assessing compatibility of the debris basins with other land uses.
- ***Visual Resources.*** Construction of the debris basins would visually alter the landscape. The extent of disturbance and appropriate avoidance, minimization, and mitigation are evaluated.
- ***Cultural and Paleontological Resources.*** Section 106 of the National Historic Preservation Act and the Utah Antiquities Act provide protections for historic (archaeological and architectural) resources. The project area was inventoried for potential historic resources (Commonwealth 2018) and none were found (Appendix C). In addition, fossilized remains of life found in geologic formations are protected from destruction under the federal Paleontological Resources Preservation Act and by Utah State Code. The Utah Geological Survey (UGS) provides information regarding potential fossil occurrence and ways to protect these resources from inadvertent destruction (see Appendix C).
- ***Air Quality and Noise.*** Construction activity would generate air emissions and create temporary noise disturbance. The DEQ requires submission of a Fugitive Dust Control Plan permit application for construction activities that have the potential to generate airborne dust. The extent of disturbance and appropriate avoidance, minimization, and mitigation are evaluated.

1.5.2 Issues Dismissed

The issues listed below were dismissed from detailed evaluation because they were determined to be not present or to be unaffected by the proposed action.

- ***Social and Economic Impacts.*** The debris-retention basins would provide protection to infrastructure and private development in Perry City, providing positive social and economic benefits. Construction activity would contribute minimally to local economic activity. The debris-retention basins would not impact private property, community facilities or services, or disrupt normal business patterns.
- ***Environmental Justice.*** Title IV of the Civil Rights Act of 1964 provides that “no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.” Executive Order 12898 (February 11, 1994) built on Title IV, requiring federal agencies to identify and address disproportionately high and adverse human health and environmental effects, including the interrelated social and economic effects or their programs, policies and activities on minority and low-income populations in the United States. The proposed action would not involve relocations, would not have adverse impacts to community facilities or services, and would provide net social and economic benefits to the local population. The proposed action would not have disproportionate effects on any population, nor provide an unequal distribution of benefits.
- ***Water Rights.*** As a flood-control project, the debris-retention basins will not affect existing water rights. Under normal conditions, water will not be retained within the debris-retention basins. Existing water-diversion structures will be protected and/or restored as part of the project.

Chapter 2: Alternatives

2.1 Proposed Action

The proposed action is to construct and maintain debris-retention basins near the mouth of each canyon to capture sediment and debris in the event of a potentially catastrophic debris flow or flood. The proposed debris-retention basins project areas are at an elevation of approximately 4,500 feet to 5,000 feet in the foothills of the Wasatch Mountains. Access to each site for construction equipment will utilize the existing Evans Canyon Road (1800 South) at the WMA boundary. This unpaved road leads upslope to an unpaved natural gas pipeline access road that will be utilized to access Mathias Canyon. Minor grading of the existing road surfaces may be required to facilitate safe equipment access. A small equipment staging area, less than 1 acre in size, could be established near the Evans Canyon lower basin if determined necessary.

2.1.1 Evans Canyon Debris-Retention Basins

Figure 5 illustrates the proposed debris-retention basins for Evans Canyon—enlargement of an existing basin and the addition of a second basin at the mouth of the canyon. The existing basin receives discharge from Evans Canyon and also receives overflow discharge through a storm drain/irrigation diversion pipe from Mathias Canyon. The outflow from the basin enters a storm drain pipe that flows to the Perry City drainage system. The existing basin is inadequately sized to contain the debris flow potential from Evans Canyon (GeoStrata 2015) and is located slightly below the apex of the alluvial fan. The existing basin would be enlarged by excavating material on the south end of the basin to increase its capacity from 0.60 acre-feet to 1.84 acre-feet. The total project area disturbance for enlargement of the existing debris-retention basin is 0.6 acres.

Construction of the additional debris-retention basin in Evans Canyon upstream of the existing basin would require clearing and grubbing existing woody riparian vegetation and excavating the existing ground to create the desired basin volume. The proposed basin would have a volume of 0.62 acre-feet and cover an area of 0.4 acres. Excavated material from both basins would be used to construct the earthen embankment for the upper basin, which would have an upstream height of 15 feet, a downstream height of 30 feet, and would be approximately 120 feet in length. All excavated material will be used in the earthen embankments, and no hauling of material offsite is anticipated. An outlet structure would be installed in the embankment, allowing normal stream flow to pass through the embankment. Utilizing the topography of the canyon walls, the upper basin is able to contain a greater volume of debris with a much smaller disturbance footprint.

2.1.2 Mathias Canyon Debris-Retention Basin

Figure 6 illustrates the location and configuration of the proposed debris-retention basin at the mouth of Mathias Canyon. There is an existing concrete storm drain/irrigation diversion structure on the site but no debris basin to contain debris flows. The existing diversion structure has a screw gate, allowing an adjustable portion of the flow to enter a storm drain/irrigation pipe. The pipe supplies water to irrigation points of use, with excess flow being delivered to the existing Evans Canyon debris basin. The existing concrete structure at Mathias Canyon would be removed to construct the debris basin and earthen embankment. The new outlet structure constructed for the embankment would continue to allow for a portion of the flow to be directed to the existing storm drain/irrigation delivery pipe system.

To construct the debris-retention basin, woody riparian vegetation within the footprint of the proposed debris basin would be cleared and grubbed. Then the excavation of the existing ground would be completed to create the desired depth and volume of the debris basin, which is 4.78 acre-feet. Excavated material would be used to create the earthen embankment approximately 15 feet high on the upstream side, 30 feet high on the downstream side, and 300 feet in length. All excavated material will be used in the earthen embankment and no hauling of material offsite is anticipated. The total project area disturbance for the Mathias Canyon Debris Basin is 2.0 acres.

2.1.3 Construction Details for Embankments

All three debris basin sites are accessible via existing roads. Typical earthwork grading and excavation equipment will be used including track hoes (excavators), dozers, graders, loaders, dump trucks, and rollers. Concrete trucks and pumps will be used to pour the new outlet structures.

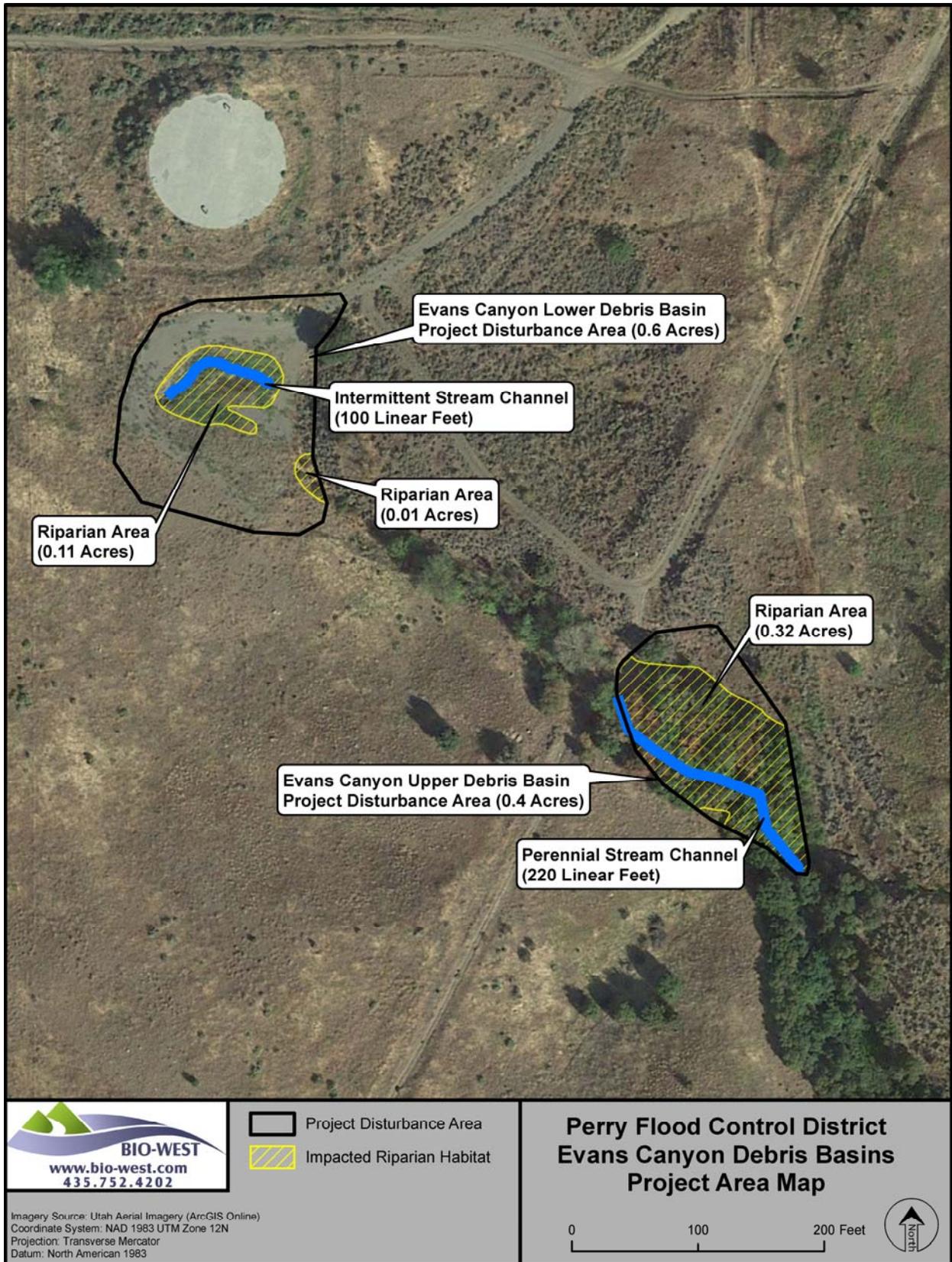


Figure 5. Perry Flood Control District Evans Canyon Debris Basins Project Area Map.

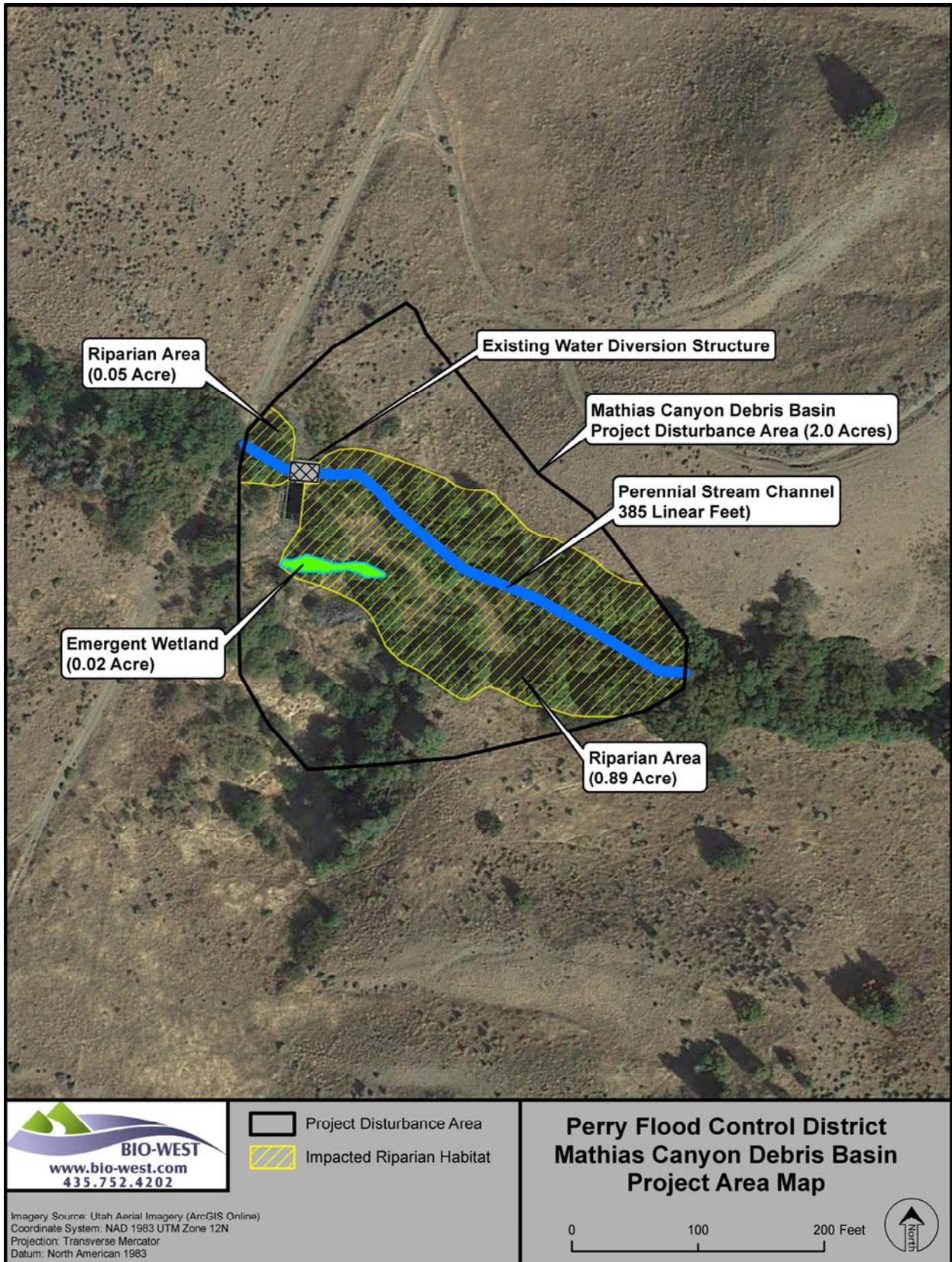


Figure 6. Perry Flood Control District Mathias Canyon Debris Basin Project Area Map.

A report prepared by AGECE Geotechnical Engineering Consultants (AGECE) (2016, pp. 10–13) provides detailed recommendations to meet industry standards for construction of embankments, excavation/earthwork, material suitability, use of imported materials, compaction, and shrinkage. Prior to placement of embankment material, the topsoil, vegetation, and other deleterious materials will be removed from proposed retention basin embankment areas. The proposed embankment slopes will be constructed no steeper than 2 feet horizontal to 1 foot vertical and will be protected from erosion by vegetation. Fill for embankments will be placed on properly prepared subgrade and keyed into the slope as appropriate where slopes meet or exceed 5 feet horizontal to 1 foot vertical. The crest width of the proposed embankments will be 15 feet.

The above-grade embankments may be classified by the State of Utah as small dams. According to State Code, dams less than 20 acre-feet in capacity and not considered high-hazard (i.e., failure does not endanger human life) are considered small dams and can be approved through a simplified application procedure. The Flood District will submit a small dam application and obtain approval from the Dam Safety Division prior to construction.

2.1.4 Operation and Maintenance

The basins would be designed to retain debris flows and would not function to retain water under normal circumstances as stream flows will be piped through the embankments and into existing irrigation and flood control infrastructure. After construction, the Flood District will perform maintenance annually or after debris-flow events to remove any accumulated sediments and debris (e.g., rocks, wood, other vegetation transported by the flow). The debris is typically hauled away and disposed of off-site by the contractor hired to perform the work. After a debris-flow event, a contractor would mobilize to remove the material as soon as feasible, typically within a few weeks. Weed control is also performed as recommended by the DWR, typically as part of scheduled maintenance activities. Access for operation and maintenance can be accomplished using existing unpaved access roads.

2.1.5 Design Characteristics to Avoid and Minimize Impacts

The project design features that would be included in construction documents, and which are intended to help avoid and minimize impacts are listed below.

- All disturbed areas will be seeded at the end of construction with a native grass, forb, and shrub seed mixture to restore habitat value, prevent the spread of noxious weeds, and reduce soil erosion.
- Currently, the DWR closes roads within the WMA from January 1 through the second Saturday in April of each year. The Flood District will construct a gate at the Evans Canyon road, which provides access to both Evans and Mathias Canyons, to prohibit access during construction. This gate will remain after construction is completed to prevent unauthorized motorized access to the WMA. The Flood District would also work with DWR to close other nearby access locations as appropriate to limit disturbance to wildlife and important habitat areas.
- The contractor will be required to prevent and control soil erosion during construction. A stormwater pollution prevention plan (SWPPP) will be included in the plans and a UPDES

Permit from the DEQ will be obtained. Erosion control best management practices (BMPs) will be installed prior to initiation of construction activities to ensure project related debris, materials, and sediment do not enter nearby receiving water sources.

- The contractor will be responsible for the control of, and preventing the spread of, noxious weeds. The Flood District will work with DWR and Box Elder County to develop noxious and invasive weed control strategies as part of an Integrated Pest Management Plan. Integrated weed management will take place in areas of proposed construction, grading, and disturbance prior to construction in order to reduce weed management efforts following project implementation. Weed control activities will follow the recommendations provided by DWR and the Box Elder County Weed Supervisor.
- The contractor will be required to secure a Fugitive Dust Control Plan from the Utah DEQ and implement air quality BMPs to control and minimize fugitive dust during construction activities.
- No nesting vegetation (which can include trees, shrubs, and herbaceous vegetation such as grasses and forbs) clearing will occur during the typical avian nesting/brood-rearing period, which is April 1–August 31. If any vegetation clearing is required during this nesting/brood-rearing period, a qualified wildlife biologist will perform a nest-clearance survey immediately prior (within 3 days) to construction activities. If actively nesting and/or brood-rearing birds are found within or reasonably near (<200 feet) the vegetation clearance area, clearance and construction activities will be postponed until breeding activity is completed (as assessed by a qualified wildlife biologist), or may proceed if the necessary permit is obtained from the USFWS.
- If a suspected historic, archaeological, or paleontological item, feature, or site is encountered during construction, construction operations will be immediately stopped and the Flood District will notify the Utah Division of State History or the State Paleontologist of the discovery and will follow the recommended procedures.
- A new bio-engineered stream channel will be properly sized and constructed through the basins to convey all natural water flows. Riparian vegetation in the form of grasses, forbs, and shrubs will be allowed to grow along the channel similar to the existing Evans Canyon Debris Basin. Some wetland areas will likely form throughout the bottom of the debris-retention basins naturally.
- The contractor will be required to comply with all permit conditions issued for the project.

2.1.6 Required Permits

The following permits may be required prior to implementing the proposed action:

- **Dam Safety Permit.** The DWRi, Dam Safety Division, regulates design and construction of dams in the State of Utah. Because the debris-retention basins would require the construction of above-grade embankments, these structures may be regulated as dams. If the dams are classified as small dams by the State of Utah, the Flood District would be required to submit

a small dam application and obtain approval from the Dam Safety Division prior to construction.

- ***Stream Alteration Permit.*** The DWRi State Engineer regulates natural stream channels in the State of Utah. Because the debris-retention basins would require alteration of the existing stream channels, a State Stream Alteration Permit would be required. The Flood District will be required to submit an application and obtain approval from the State Engineer prior to construction.
- ***Clean Water Act Permit.*** The USACE regulates jurisdictional wetlands and waters of the United States. Because construction of the debris-retention basins would require disturbing no more than 500 feet of the existing perennial and intermittent stream channels and the nearby emergent wetlands at each canyon, a Section 404 Clean Water Act Nationwide Permit would be required for each project. The Flood District will be required to submit an application and obtain approval from the USACE prior to construction.
- ***Utah Pollutant Discharge Elimination System Permit.*** The DEQ regulates pollutant discharges to surface waters. Because construction of the debris-retention basins would require ground disturbance greater than 1 acre, a UPDES Permit and associated SWPPP would be required. The Flood District will be required to submit an application and obtain approval from the DEQ prior to construction.
- ***Fugitive Dust Control Permit.*** The DEQ regulates air emissions throughout the State of Utah. Because construction activities associated with debris-retention basins have the potential to generate fugitive dust, a Fugitive Dust Control Permit would be required. The Flood District will be required to submit an application and obtain approval from the DEQ prior to construction.

2.2 No-Action Alternative

Under this alternative, the Flood District would not be granted easements for constructing the debris-retention basins within the WMA. There would be no ground disturbance or resource impacts. However, the No-Action Alternative would not meet the need to protect public safety, public infrastructure, and existing and future development from the risk of a large, potentially catastrophic debris flow or flood occurrence.

2.3 Other Alternatives Considered

The Flood District has considered a range of potential alternatives for addressing the project need. In a geology technical report, GeoStrata (2015) provided the Flood District with a broad assessment of potential methods for reducing debris-flow hazards. Potential methods they describe from a publication by Hungr et al. (1987) are:

1. avoidance—not allowing development or occupation of debris-flow-hazard areas either permanently or at times of imminent danger
2. source area stabilization—stabilizing slopes above the channel with erosion control features or other mechanical features

3. transportation-zone modification—mechanical design features to reduce the volume of a debris flow above the outlet, such as debris-straining structures located in the channel
4. defense measures in the depositional zone—structures that capture and contain debris flows at or below the apex

Method 1 is not a practicable solution for the debris-flow risks associated with Evans and Mathias Canyons because permanent residential developments and infrastructure (e.g., powerlines, culinary and irrigation water facilities, roads) already exist in the depositional zones of the two canyons. Methods 2 and 3 are also not practicable because these methods would require equipment operation and personnel access in the source zones of the two canyons where the topography is very steep. These methods would also be highly impactful to habitat in the WMA due to the large area that would be disturbed, and would be difficult to mitigate and maintain due to the steep topography of the canyons. Therefore, GeoStrata recommended implementation of method 4, constructing debris-retention basins in the depositional zone.

Due to the unpredictability of debris-flow movements within the depositional zone, the best location for debris catch basins is to locate them as near to the fan apex as possible—near the mouth of each canyon (GeoStrata 2015). Once a debris flow leaves the apex of the existing debris fan and moves through the depositional zone, it will spread out and begin to create its own channel(s) across a larger area. Given the topography of the existing drainages above the apex, and the ability of the steep canyon walls to contain debris flows, a greater volume of debris can be contained in the canyons within a smaller footprint compared to debris-retention basins located below the apex. For this reason, debris-retention basins further down slope in the depositional area (potentially outside of the WMA) have not been considered.

The location and size of the proposed basins are maximally efficient in that the berms for each basin can be constructed with on-site excavated materials (i.e., they do not require imported fill material), and the location of the basins at the apex would take advantage of the canyon topography to maximize containment of a potential debris flow. The study by GeoStrata (2015) recommended 15 acre-feet of containment at each canyon; however, because the basins would be located at the apex, the constructed (disturbed) area for each basin would not need to be this large because debris could continue to accumulate up-canyon beyond the constructed/maintained physical area of each basin.

Chapter 3: Affected Environment and Environmental Consequences

3.1 Geology, Soils, and Prime and Unique Farmland

3.1.1 Existing Conditions

The Flood District contracted with GeoStrata to provide a geologic characterization of the project area and to complete a debris flow study of the two canyons (GeoStrata 2015). The Flood District subsequently contracted with AGEK to obtain a geotechnical investigation of the proposed debris basin sites and recommendations for construction (AGEK 2016).

As reviewed by GeoStrata (2015), the surface sediments and geology of the project setting are mapped by Crittenden and Sorensen (1985) as Holocene-to-Pleistocene sediments on the valley floor below the mouths of Mathias and Evans Canyons, and upper Proterozoic sedimentary, metamorphic rocks (Zm, Zi, Zcc, Zpc, Zkc), and a few Holocene-to-Pleistocene landslide deposits (Qls) within Mathias and Evans Canyons. Holocene and Pleistocene sediments include lacustrine deposits of gravel, sand and silt (Qb) deposited by Lake Bonneville; fan alluvium deposited during the Holocene to upper Pleistocene (Qf), and landslide deposits (Qls).

GeoStrata (2015) evaluated a representative set of cross sections in each canyon to estimate the quantity of existing deposits within the defined drainage channel of each canyon that could ultimately trigger or contribute to a debris-flow event. GeoStrata found that the Mathias Canyon drainage basin is approximately 671.5 acres with a total defined channel length of 5,392 feet. The main channel contains alluvial and colluvial deposits, consisting of sand, gravel, and cobbles 6–12 inches in size. Bedrock is not exposed within the majority of the channel due to thickness of the overlying vegetation and sediment. Evans Canyon is approximately 509.2 acres with a defined channel length of 7,844 feet. The properties of the main channel are variable, with some areas containing exposed bedrock and other areas having depth and composition of accumulated sediment similar to Mathias Canyon.

In terms of earthquake risk, the report by AGECEC (2016) notes that the Wasatch Fault is mapped to extend through the WMA, but did not find evidence that fault surface traces extend through the proposed debris basin sites.

The Natural Resources Conservation Service (NRCS) Soil Survey (USDA NRCS 2018) that covers the project area was reviewed prior to on-site soils examinations. The soil type mapped within the project area is Kilburn gravelly sandy loam, 10–60 percent slopes (Map Symbols KnE, KnF, Kng). The soil survey provides the following description:

The Kilburn series consists of very deep, somewhat excessively drained, moderately rapidly permeable soils. These soils formed in alluvium and colluvium derived dominantly from gneiss, schist, and quartzite on fan terraces, lake terraces, stream terraces, and deltas. Slopes range from 0 to 60 percent. The series exhibits slow to rapid runoff with moderately rapid permeability. The soils are used for irrigated cropland, orchards, rangeland, and urban areas. Typical vegetation on present range is mainly bluebunch wheatgrass (*Pseudoroegneria spicata*), sand dropseed (*Sporobolus cryptandrus*), Indian ricegrass (*Achnatherum hymenoides*), needle and thread grass (*Hesperostipa comata*), big sagebrush (*Artemisia tridentata*), and oakbrush (*Quercus gambelii*).

Upland soils examined in the field during the site visit were found to be generally loam with a high percentage of sand and rock and gravel material. As such, upland soils within the project area are predominantly consistent with the soil types listed in the series descriptions. Soils observed at the wetland associated with Mathias Canyon and soils adjacent to surface waters typically have more organic matter and silt present. Riparian-wetland areas exhibited a dark-black, saturated surface with fine sediment and muck present between large rock cobble materials. These soils characteristics are typical of hydric soil that has formed in remnant stream

channels and/or springs that maintain an active groundwater connection with the existing perennial stream channel.

3.1.2 Proposed Action Impacts and Mitigation

AGEC (2016) evaluated earthquake risk associated with the proposed debris basins and evaluated the suitability of on-site sand and gravel for use in constructing the embankments. AGEC concluded that due to the long return period of surface fault rupture, and assuming that the embankments are not planned to impound water, earthquake hazard would not be of significance for the proposed construction. Additionally, the stability of embankments was evaluated in accordance with Utah Administrative Code by considering two seismic events, the operating basis earthquake and the maximum credible earthquake. Based on the proposed design and AGEC's recommendations for construction, they found that the embankments would meet State of Utah requirements. AGEC also concluded that liquefaction is not a potential hazard at these sites based on location and soil characteristics.

AGEC excavated test pits to determine the depth and type of subsurface materials that would be excavated at each debris basin site. They concluded that sand and gravel excavated at the sites would be appropriate for construction of the debris basin embankments. AGEC found subsurface water perched on the bedrock in some of the test pit sites. Fluctuations in the subsurface water level are expected over time. However, AGEC did not conduct an evaluation of subsurface water level fluctuations. Some riparian-wetland habitats would be expected to develop over time as a result of surface flow through the newly constructed stream channels and through subsurface flows that are intercepted as a result of constructing the debris-retention basins.

Construction of the Evans and Mathias Canyons Debris-Retention Basins would create temporary disturbance on a total of approximately 3 acres of land. Any activities that reduce or eliminate vegetation have the potential to result in soil erosion until vegetation is re-established. Therefore, temporary and permanent erosion-control BMPs would be installed by the contractor as part of construction activities to minimize runoff and prevent soil erosion. Stormwater runoff would be contained within the active construction site, and all areas that are disturbed during construction would be permanently revegetated using native seed mixes of grasses, forbs, and shrubs.

Another important consideration related to soils is farmland conversion. The Farmland Protection Policy Act aims to minimize the impact of federal programs on unnecessary and irreversible conversion of farmland to nonagricultural uses. Under the act, certain lands are identified as prime or unique farmlands based on soil characteristic and use. The program is overseen by the NRCS. The Web Soil Survey (USDA NRCS 2018) was reviewed to determine if prime or unique farmlands are present in the project area. The four soil types in the vicinity of Evans and Mathias Canyons are:

- FHG: Foxol-Elzinga association, steep (NRCS rating: Not prime farmland)
- KnE: Kilburn gravelly sandy loam, 10 to 20 percent slopes (NRCS rating: Farmland of unique importance)

- KnF: Kilburn gravelly sandy loam, 20 to 30 percent slopes (NRCS rating: Not prime farmland)
- KnG: Kilburn gravelly sandy loam, 30 to 60 percent slopes (NRCS rating: Not prime farmland)

Of the four soil types listed, only one (KnE) is designated as Farmland of Unique Importance. This soil type occurs only at the lower Evans Canyon debris retention basin, but this area was converted to nonagricultural uses when the basin was originally constructed. Because the lower debris retention basin footprint will remain the same under the proposed action, no undisturbed areas of KnE soil type will be affected by the project. Based on these characteristics, the proposed action would not affect prime or unique farmlands.

3.1.3 No-Action Impacts

Under the No-Action Alternative, there would be no construction ground disturbance associated with the proposed debris-retention basins.

3.2 Water Resources

3.2.1 Existing Conditions

US Geological Survey topographic mapping (USGS 1992), the NRCS Soil Survey (USDA NRCS 2018), and the USFWS National Wetlands Inventory (USFWS 2018) all show perennial streams in Evans and Mathias Canyons that disappear before reaching the valley floor. Both perennial and intermittent stream channels can be found within the project area. The Evans Canyon debris-retention basins include approximately 100 linear feet of intermittent stream channel in the lower basin and approximately 220 linear feet of perennial stream channel in the upper basin. The Mathias Canyon debris-retention basin includes approximately 385 linear feet of perennial stream channel.

Based on a field visit in June 2018 (Appendix A), and review of aerial photography, neither canyon has a defined channel at the point where existing residential development begins. There are also irrigation points of diversion at both canyons. The perennial portion of the Mathias Canyon stream channel likely flows year-round with flowing water reaching the existing concrete stormwater/irrigation diversion structure at the mouth of the canyon. At Evans Canyon, there was no water present in the channel at the location of either of the proposed debris basins in June 2018, but there was flowing water above the location of the upper proposed debris basin. This flow was being diverted into an irrigation pipe near the top of where the upper debris basin would be constructed. There is likely sufficient flow with spring snow melt for the intermittent channel to have flowing water through the locations of the Evans Canyon debris basins.

There is one small (0.02 acre) jurisdictional wetland, located within the footprint of the proposed Mathias Canyon debris basin. This is the only jurisdictional wetland identified in the project area. It is a small palustrine emergent wetland located within a depression that appears to be a remnant stream channel feature or possibly a small spring in Mathias Canyon.

There are no FEMA-designated floodplains associated with either canyon (FEMA 2010); therefore, the project would not involve placement of fill in a floodplain and would not increase flood hazards related to designated floodplains.

3.2.2 Proposed Action Impacts and Mitigation

Construction of the proposed debris-retention basins would directly impact perennial and intermittent stream channels within the project area. At Mathias Canyon, approximately 385 linear feet of stream channel would be impacted. At Evans Canyon, approximately 220 linear feet of perennial stream channel and 100 linear feet of intermittent stream channel would be impacted. New bio-engineered conveyance channels would be constructed in place of the existing stream channels. These channels would naturally revegetate with riparian species following construction. Following revegetation, it is unlikely that there would be any permanent negative effects to surface water resources under the proposed action alternative.

The proposed action would allow for the continued delivery of irrigation water associated with both canyons during and after construction. During construction, existing stream flow would be diverted into a bypass pipe at each site to convey water flows around and/or through the construction zone to prevent soil erosion and minimize potential impacts to water quality. The contractor would be required to secure a UPDES Permit for the project and prepare a project-specific SWPPP that would be in effect throughout construction. Following construction, delivery of irrigation water associated with both canyons would be provided via newly constructed outlet works that would connect with existing irrigation delivery systems.

The existing jurisdictional wetland associated with Mathias Canyon would be directly impacted by construction activities. The existing grade at the location of the existing wetland would be excavated down to the proposed constructed grade for the debris basin. Following grading work, it is anticipated that subsurface flows would be permanently intercepted in the vicinity of the existing wetlands and new emergent wetlands would form on the basin slopes and bottom. The extent of anticipated wetland areas that would form is unknown but is expected to be at least as large as the existing jurisdictional wetlands, depending upon the amount of flow and extent of soil saturation.

Wetland Permitting Requirements

Because construction of the debris-retention basins would require disturbing less than 500 linear feet of the existing perennial stream channel and the nearby emergent wetland at Mathias Canyon and disturbing less than 500 linear feet of the existing perennial and intermittent stream channels at Evans Canyon, a Section 404 Clean Water Act Nationwide Permit would be required for the project. The Flood District will be required to submit an application and obtain approval from the USACE prior to construction. Permit conditions may include mitigation for any loss of stream channel length and wetland area.

Floodplain Compliance with Executive Order 11988

Executive Order 11988, Floodplain Management (May 24, 1977), directs federal agencies to avoid to the extent possible adverse impacts associated with floodplains and to avoid direct or indirect support of floodplain development. Because there are no FEMA-designated floodplains in the project area, the proposed action would be compliant with Executive Order 11988.

3.2.3 No-Action Impacts

Under the No-Action Alternative, the proposed debris-retention basins would not be constructed. Therefore, there would be no modification of the existing stream channel characteristics or hydrology.

3.3 Biological Resources

The project area is located on the mountain foothills at the northern end of the Wasatch Mountains. The area immediately downslope of the project area to the west is primarily weedy pastureland that is rapidly being developed into new residential homes and associated roads and other infrastructure. Upslope of the project area to the east is relatively undisturbed, state- and federally owned mountain forestland. A site visit was completed in June 2018 to assess habitat characteristics and determine presence of suitable habitat for special status species (Appendix B).

3.3.1 Existing Aquatic Habitat

The Evans basin drainage appears to have perennial stream flow at the upper basin area and intermittent stream flow at the lower basin area. The Evans basin drainage within the project area did not contain sufficient water to support fish at the time of the site visit. The majority of the Evans basin water is diverted into an irrigation canal upslope and just outside of the project area. The small amount of water that was in the Evans basin drainage in the project area at the time of the site visit was either diverted or absorbed into the rocky substrate before the surface water flow reached the lower basin area. Surface water appeared again in the floor of the existing lower basin at Evans Canyon for a short distance before entering irrigation and flood control infrastructure.

The Mathias basin project area had perennial stream flow that at the time of the site visit appeared sufficient to potentially support small fish, amphibians, and other aquatic organisms, but is not connected with any other consistently flowing natural waterbodies downstream. Flow from the Mathias Canyon Drainage is captured at the lower end of the project area and diverted downslope into the drainage and irrigation system associated with Perry City and Brigham City.

In their Habitat Management Plan for the WMA, the DWR's assessment is that neither the Mathias nor Evans Canyon drainages have sufficient flows to support a fishery. Further to the south and outside of the project area but within the WMA, Perry Canyon Creek supports a cutthroat and brown trout fishery (DWR 2010).

3.3.2 Existing Vegetation Communities

In the Evans basin drainage, within the area of the upper debris-retention basin footprint, Siberian elm (*Ulmus pumila*), bigtooth maple (*Acer grandidentatum*), and western poison ivy (*Toxicodendron rydbergii*) dominate the riparian corridor. Intermediate wheatgrass (*Thinopyrum intermedium*) dominates the drier side slopes of the area. The drainage has experienced significant human disturbance in the past, evident from existing and remnant irrigation diversion works. The presence of intermittent water and a woody tree and shrub community provides valuable wildlife habitat within the Evans basin drainage. Riparian vegetation appears to continue upslope through the bottom of the drainage, and grassy side

slopes also continue upgradient within the depositional area, until the slopes are steep enough to exhibit exposed bedrock.

The riparian area within the mouth of the Mathias Canyon basin drainage has a more diverse native plant community when compared to Evans Canyon. The Mathias Canyon basin drainage is dominated by woody box elder (*Acer negundo*), choke cherry (*Prunus virginiana*), hawthorn (*Crataegus douglasii*), bigtooth maple, water birch (*Betula occidentalis*), coyote willow (*Salix exigua*), elderberry (*Sambucus nigra*), redosier dogwood (*Cornus sericea*), and narrow leaf cottonwood (*Populus angustifolia*). This drainage has evidence of human disturbance associated with existing and remnant irrigation diversion works. There are also woody debris piles that appear to have been cleared from the channel in the past. The presence of perennial surface-water stream-flow, a significant native, woody-riparian vegetation corridor, and the presence of the large, adjacent, undeveloped state and federal lands makes the Mathias basin a higher-quality native wildlife habitat area. As with Evans Canyon, the riparian corridor continues upslope of the proposed debris basin footprint, and the side slopes of the depositional area are vegetated with grasses until the slope becomes steep enough to exhibit exposed bedrock.

Some noxious weed species were identified during the project area site visit. These include Dyer's woad (*Isatis tinctoria*) Canada thistle (*Cirsium arvensis*), quack grass (*Elymus repens*), and Russian olive (*Eleagnus angustifolia*). Although these noxious weed species are present, their numbers are relatively low and their infestations small.

3.3.3 Known and Probable Wildlife Species Occurrences

The WMA was acquired by DWR to preserve crucial big game winter range. On an average winter, 200–300 deer, 50 elk, and 30–50 moose can be found on the property (DWR 2010). An attempt was made in the 1960s to establish a big horn sheep population, but a sustainable population was not attained. Mountain goats were introduced in the 1990s and goats are still present on this range (contiguous with US Forest Service property). Upland game birds include an introduced population of chukar and Rio Grande turkeys.

The western slope of the Wasatch Range is a migration corridor for raptors; thousands are counted annually (DWR 2010). Resident and migratory raptors such as red-tailed hawk (*Buteo jamaicensis*) and Swainson's hawk (*Buteo Swainsoni*) likely hunt for prey within the WMA. Bald eagles are commonly sighted within and near the WMA; however, there is no suitable habitat within the project portion of the WMA. The narrow riparian bands associated with Evans and Mathias Canyons provide suitable habitat for neotropical migratory birds.

There is no suitable habitat for greater sage grouse in the project area and there are no designated Sage Grouse Management Areas overlapping with the project area (DWR 2018a).

3.3.4 Threatened and Endangered Species

The USFWS does not list any threatened or endangered species for the project area (USFWS 2019), and DWR has no records of occurrence for any federally listed species or state-listed sensitive species within 0.5 mile of the project area (DWR 2018b). The Endangered Species Act requires federal agencies to ensure that their actions do not jeopardize the continued existence of

species listed as endangered or threatened, nor result in adverse modification of critical habitat. The FWS Utah Ecological Services Field Office was contacted to obtain an official list of potentially occurring, federally listed species for the project area (Appendix B). The Utah Field Office does not identify any listed species as potentially occurring in the project area and no critical habitat for any listed species.

3.3.5 Proposed Action Impacts and Mitigation

Construction of the proposed debris-retention basins would temporarily disturb wildlife use within and immediately adjacent to the project areas throughout the duration of construction activities. Maintenance of the proposed debris-retention basins would also create periodic but short-duration disturbance to wildlife use. Although construction activities may displace existing wildlife use temporarily, most animal species in the project area would be able to return after project completion. Some mortality of less mobile species would be expected as a result of construction, but not in quantities that would damage local wildlife populations. Currently, the DWR closes roads within the WMA from January 1 through the second Saturday in April of each year. The Flood District would construct a gate at the Evans Canyon road to prohibit access during construction and would work with DWR to close other nearby access locations as appropriate to limit disturbance to wildlife.

Construction of the proposed debris-retention basins would directly impact approximately 3 acres of existing upland and riparian-wetland habitats. A majority of this disturbance, approximately 1.7 acres, involves upland habitat types that would be temporarily disturbed until these areas revegetate with native upland grasses, forbs, and shrubs following seeding. Construction would temporarily impact up to 1.3 acres of woody riparian habitat within the footprints of the proposed debris-retention basins. This would be a minor conversion, with existing woody riparian habitats further up each canyon remaining unaffected by the proposed action. Construction would permanently convert a portion of this woody riparian area to grasses, forbs, and shrub-scrub riparian habitats from the proposed embankments. Following construction, riparian-wetland habitat types would be expected to re-establish along and adjacent to the associated stream channels within the debris-retention basins themselves. Trees would be allowed to grow upstream of the embankments within each basin when they do not interfere with the function of the debris-retention basins or pose a hazard for clogging diversion structures. As such, the project would not constitute a significant decrease in available habitat for any species.

No suitable or potentially suitable habitat exists for any federally or state-listed species within the project areas (see the letter from FWS Utah Ecological Services Field Office, 11/1/2019, in Appendix B). Therefore, the project does not have potential to adversely affect federally protected species. A “no effect” determination for listed species has been made by a qualified wildlife biologist for the proposed action alternative (Appendix B).

The Migratory Bird Treaty Act of 1918 as amended (MBTA) makes it illegal to “pursue, hunt, take, capture, kill, attempt to take, capture or kill” any migratory bird or their eggs and nests without first obtaining a permit from the USFWS (16 USC. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755). This includes creating enough disturbances (e.g., noise, vibrations, visual disturbance) to cause a bird to abandon nests or fledglings. Most bird species within the United States are protected under the MBTA and/or state law.

To comply with the MBTA, the following mitigation measures would be implemented during construction in the project area:

- Require that no nesting vegetation (which can include trees, shrubs, and herbaceous vegetation such as grasses and forbs) clearing occur during the typical nesting/brood rearing period of April 1–August 30.
- Have a qualified wildlife biologist perform a nest-clearance survey immediately prior (within 3 days) to commencement of construction activities if any vegetation clearing is required during the nesting/brood-rearing period.
- If actively nesting and/or brood-rearing birds are found within or reasonably near (≤ 200 feet) the vegetation clearance area, clearance and construction should be postponed until breeding activity is completed (as assessed by a qualified wildlife biologist), or may proceed if the necessary permit is obtained from the USFWS.

3.3.6 No-Action Impacts

Under the No-Action Alternative, there would be no temporary disturbance to wildlife and available habitat, and no permanent loss of woody riparian habitat.

3.4 Land Use and Recreation

3.4.1 Existing Conditions

The WMA is open to the public for hunting, motorized recreation, and non-motorized recreation. Mountain biking, motorcycle, and OHV riding are allowed on designated roads. The primary purpose of the WMA is to provide winter range for mule deer as well as habitat for other wildlife. To enhance use by deer in the winter, the WMA is closed to motorized travel from January 1 to the second Saturday in April of each year. There are informal motorized and non-motorized trails in various parts of the WMA; addressing unauthorized use is an objective of DWR's habitat management plan (DWR 2010).

The Flood District has an existing easement with DWR for the existing lower Evans Canyon debris basin. Other easements that DWR has granted for the project area portion of the WMA are for the Questar natural gas pipeline and two electric powerlines operated by Rocky Mountain Power.

The access route to the existing Evans Canyon debris basin is from 1800 South Street in Perry (see Figure 3). There is an unmaintained gravel road up the hill from termination of the paved street and a gate at the WMA boundary along the south side of the gravel road. There is also a steep, informal two-track route that continues up the hill past the location of the gate, connecting with a two-track road associated with the Questar gas line corridor. This two-track traverses the hill slope and provides access to the proposed location of the Mathias Canyon debris basin to the north (see Figure 6) and to the upper Evans Canyon debris basin to the south (see Figure 5). A portion of the pipeline corridor between the locations of the two debris basins crosses private property outside of the WMA. There are gates on each end at the WMA boundary. Further upslope there is a fire break road traversing the mountain range within the WMA, but there is no

established connection to the fire break road from the project area. There are no designated public-access roads within the project area portion of the WMA; therefore, the only allowed public access to the project areas is by foot travel.

3.4.2 Proposed Action Impacts and Mitigation

Construction would require accessing the debris-retention basins using the existing access road from 1800 South and the gas-line road. Construction equipment and crews would need to access the debris-retention basins through the existing WMA gates. Gates would be secured and kept closed during construction. Gates would not be modified or removed as part of the project. Flood District inspection and maintenance personnel would need to access the debris-retention basins periodically using the access gates to perform periodic maintenance activities. No new access would be constructed; therefore, the project does not have potential to increase illegal use by motorized and non-motorized users.

Project construction may temporarily disrupt recreational use, such as hunting, in the immediate vicinity of the debris basins; however, recreation use is light in this portion of the WMA, and long-term use would not be adversely affected. Periodic maintenance of the debris-retention-basins would create ongoing disturbance but would be of short duration.

3.4.3 No-Action Impacts

Under the No-Action Alternative, there would be no temporary disruption of land use and recreation activity within the WMA.

3.5 Visual Resources

3.5.1 Existing Conditions

Located along the western front of the Wasatch Range, the project areas lie at the easternmost expression of the Basin and Range Province. The basin in this case is the Bear River Valley, which represents a deep, sediment-filled structural basin flanked by uplifted blocks of the Wasatch Range to the east, and the Promontory Mountains to the west. The Great Salt Lake and mountain ranges to the west dominate the skyline background. Foreground and middleground landscapes to the north, south, and west include agricultural and suburban residential developments. The Wasatch Mountains dominate foreground and middleground views to the east and extend to elevations ranging from 7,800 to 8,000 feet.

The steep terrain of the project area is generally open and highly visible from Perry City, US Highway 89, and US Interstate 15. Human modifications to the existing visual landscape within the WMA are located below the Lake Bonneville shoreline terrace at approximate elevation of 5,100 feet. These modifications include the existing electric transmission lines, access roads, irrigation canals, and diversion structures. However, these modifications are subordinate to the natural landscape and appear as linear features across the relatively undisturbed landscape. Above the terrace, the undisturbed Wasatch Range provides a natural mountainous background of grassy hillsides with woody vegetation lining the bottom of the canyon drainages. Nearby gravel pits to the north and south in the foothill areas are the primary disturbances in this portion of the natural landscape.

3.5.2 Proposed Action Impacts and Mitigation

Visual disruption caused by the proposed action would be greatest during construction, while earthmoving equipment is active and there are fresh unvegetated ground disturbances. The two embankments would create highly visible, block-form features at the mouth of each canyon that would lack vegetation when first constructed. The embankments would permanently interrupt the natural v-shaped ravine created by the incised perennial drainage channels at each canyon mouth with a featureless and smooth face that will eventually blend in with the surrounding terrain following successful revegetation.

Embankments and other disturbances would be seeded with a native grass-forb mixture. Once vegetation becomes established on the embankments, the visual effect will be greatly reduced. No new access roads would be created. Therefore, the proposed action would have minimal long-term visual impacts within the project area.

3.5.3 No-Action Impacts

Under the No-Action Alternative, there would be no visual disruption of the viewshed.

3.6 Cultural and Paleontological Resources

3.6.1 Existing Conditions

Section 106 of the National Historic Preservation Act and the Utah Antiquities Act provide protections for historic (archaeological and architectural) resources. The project area was inventoried for potential historic resources (Commonwealth 2018) and none were found (Appendix C).

Fossilized remains of life found in geologic formations are protected from destruction under the federal Paleontological Resources Preservation Act and by Utah State Code. The UGS provides information regarding potential fossil occurrence and ways to protect these resources from inadvertent destruction. However, UGS mapping resources do not identify the project area as having fossil-yielding potential (see letter from UGS, Appendix C).

3.6.2 Proposed Action Impacts and Mitigation

Database searches and field investigations did not identify any cultural resources for the project area, and coordination with the UGS determined that the project location has low potential for yielding fossils. Therefore, the proposed action is unlikely to affect these resources.

If a suspected historic, archaeological, or paleontological item, feature, or site is encountered during construction, construction operations will be immediately stopped and the Flood District will notify the Utah Division of State History or the State Paleontologist of the discovery and will follow the recommended procedures.

3.6.3 No-Action Impacts

Under the No-Action Alternative, there would be no potential to damage any previously unknown cultural or paleontological resources.

3.7 Air Quality and Noise

3.7.1 Existing Conditions

The project area is located within a nonattainment area for the 24-hour fine particle (PM_{2.5}) National Ambient Air Quality Standards (DEQ 2019).

Ambient noise in the project area is minimal and is associated mostly with vehicle traffic on US Highway 89 and nearby residential neighborhoods.

3.7.2 Proposed Action Impacts and Mitigation

Construction of the debris-retention basins would create a short-term minimal increase in emissions, fugitive dust, and ambient noise. These impacts would be minor and short-term, lasting only as long as it takes to complete construction activities. Because construction activities associated with the debris retention basins have the potential to generate fugitive dust, a Fugitive Dust Control Permit would be required by the DEQ. The Flood District would submit an application for the permit and obtain approval from the DEQ prior to construction. The contractor would be required to implement air-quality BMPs to control and minimize fugitive dust during construction activities. Following successful revegetation, the debris basins would create no long-term increase in pollutant emissions or ambient noise.

3.7.3 No-Action Impacts

Under the No-Action Alternative, there would be no temporary air quality or ambient noise impacts.

3.8 Cumulative Effects

Historic disturbances to the project area (prior to purchase of the land by DWR) were associated with grazing and installation of irrigation water diversions. Following acquisition by DWR, additional disturbances include a permitted natural gas line, two electric transmission lines, and the existing Evans Canyon debris basin. There is also evidence of unauthorized motorized vehicle trails on hillsides near Evans and Mathias Canyons and there are some woody debris piles at the mouth of Mathias Canyon, apparently having been cleaned out of the channel at the existing irrigation diversion at some recent time.

Continued suburban and urban development in Perry City and the nearby communities of Brigham City and Willard is anticipated for the foreseeable future. As the local population grows, recreation use of the WMA is also likely to increase in the form of activities such as hunting, hiking, and motorized and non-motorized sports. There are no other foreseeable easements that would be requested for the project area portion of the WMA.

A natural disturbance that periodically disrupts habitat value of the WMA is wildfire. A fire occurred on the north end of the WMA in 2007. Fire creates an opportunity for DWR to reseed burn areas with desirable species as resources are available. Following past burns, organizations such as the Intermountain Forest and Range Experiment Station and the Box Elder Wildlife Federation have helped seed and plant burn areas with desirable forage species (DWR 2010).

Collectively, human-created disturbances in the project area portion of the WMA reduce habitat value by creating intermittent displacement of wildlife from construction and maintenance activities. These disturbances and actions also increase potential for erosion and introduction of invasive vegetation species.

Construction and operation of the proposed debris-retention basins would add incrementally to the disturbances to wildlife and the habitat value of the WMA at the wildland-urban interface. However, these disturbances would be concentrated near the existing and future urban development and would not significantly degrade the overall habitat value of the WMA, and the more-remote portions of the WMA would be unaffected. Measures to reduce erosion potential and to avoid invasive species introductions presented in this EA would reduce the adverse effects. Revegetation of the debris-retention basins would also create an opportunity to provide a minor improvement in browse habitat for mule deer within the project area over existing conditions.

Chapter 4: Consultation and Coordination

Opportunity for public comment was provided through advertisement of a public open house and 30-day comment period. The notice was published in the local newspaper, *The Box Elder Journal*, on January 9, 2019. Notices were also posted at the Perry City offices and at local parks. The public open house was scheduled for January 16, 2019, following the regularly scheduled Flood District board meeting. No members of the public attended the open house; however, the meeting provided an opportunity for the Flood District board and the Perry City Mayor to discuss scoping issues with representatives of DWR and the EA preparers. No public comments were received during the 30-day comment period which extended through February 15, 2019.

Agencies consulted in preparation of the EA were:

- Utah Division of Wildlife Resources, Natural Heritage Program
- Utah State Historic Preservation Officer
- Perry City

This EA document was also be made available for a 30-day public comment period, ending February 8, 2020. No public comments were received.

Chapter 5: List of Preparers and Reviewers

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Commonwealth Heritage Resources

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John Rasmussen	Archaeologist

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Scott Walker	Northern Region Habitat Manager
Pam Kramer	Habitat Biologist

US Fish and Wildlife Service

Amanda Horvath	Fish and Wildlife Biologist
Jacqueline Trout	Fish and Wildlife Biologist

Chapter 6: References

- [AGEC] AGECE Applied GeoTech, Inc. 2016. Geotechnical Investigation Proposed Evans and Mathias Canyon Debris Basin Sites, Perry, Utah. Report prepared for Jones and Associates, South Ogden, Utah, March 18.
- [Commonwealth] Commonwealth Heritage Resources. 2018. A Cultural Resource Inventory of Three Detention Basins in Perry, Box Elder County, Utah. Report prepared for BIO-WEST, Inc., Utah State Antiquities Project No. U18HP0838, December 4.
- Crittenden M. D. Jr., and Sorensen, M. L. 1985. Geologic Map of the Mantua Quadrangle and Part of the Willard Quadrangle, Box Elder, Weber, and Cache Counties, Utah, United States Geological Survey Miscellaneous Investigations Series Map I-1605, scale 1;24,000.
- [DEQ] Utah Division of Environmental Quality. 2019. Area Designations: PM2.5 State Implementation Plan Development. Location: <https://deq.utah.gov/legacy/pollutants/p/particulate-matter/pm25/areas.htm>. Accessed: 2/25/2019.
- [DWR] Utah Division of Wildlife Resources. 2018a. Utah Sage Grouse Management Areas [mapping feature service]. Location: https://services.arcgis.com/ZzrwjTRez6FJiOq4/arcgis/rest/services/Utah_SageGrouse_SGMAs/FeatureServer. Accessed: 5/14/2018.
- [DWR] Utah Division of Wildlife Resources. 2018b. Letter from Sarah Lindsey, Information Manager, Utah Natural Heritage Program to Bob Thomas, Wildlife Specialist, BIO-WEST, Inc. regarding Species of Concern Near the Perry Debris Basins. Dated 10/15/2018.
- [DWR] Utah Division of Wildlife Resources. 2010. Brigham Face Wildlife Management Area Habitat Management Plan, approved January 4.
- [FEMA] Federal Emergency Management Agency, US Department of Homeland Security. 2010. Flood Insurance Rate Map, Box Elder County, Utah and Incorporated Areas, Map Number 49003C2260D, September 29.
- [GeoStrata] Geostrata, Inc. 2015. *Debris Flow Hazard Assessment Proposed Evans and Mathias Canyons Debris Basin, Perry, UT*. Report prepared for the Perry Flood Control District, Perry UT.
- Hungr, O., Morgan, G.C., VanDine, D.F., and Lister, D.R. 1987. Debris flow defenses in British Columbia, in Costa, J.E., and Wieczorek, G.F., editors, *Debris flows/avalanches: Geological Society of America, Reviews in Engineering Geology, Volume VII*, p. 201-222.
- [USDA NRCS] US Department of Agriculture, Natural Resources Conservation Service, Soil Survey Staff. 10/03/18. Box Elder County Utah, Eastern Part. Location: <https://websoilsurvey.nrcs.usda.gov/app/>
- [USFWS] US Fish and Wildlife Service. 2/18/2019. Information for Planning and Consultation (IPaC). Location: <https://ecos.fws.gov>.
- [USFWS] US Fish and Wildlife Service. (Letter from 11/01/2019; added to Appendix B)

[USFWS] US Fish and Wildlife Service. 11/05/2018. National Wetlands Inventory website.
Location: <http://www.fws.gov/wetlands/>.

[USGS] US Geological Survey. 1992. Willard Utah Quadrangle [map]. 1:24,000. 7.5 Minute Series.
Washington, DC: USGS.

**APPENDIX A: AQUATIC RESOURCES INVENTORY
REPORT**

Perry Flood Control District Aquatic Resources Inventory Report Box Elder County, Utah



Prepared for:

Perry Flood Control District
3005 South 1200 West
Perry, Utah 84302

Prepared by:

BIO-WEST, Inc.
1063 West 1400 North
Logan, Utah 84321

December 2018

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DEFINITIONS

Depth-to-soil saturation: The depth at which the pores between soil particles are filled with water.

Drainage patterns: A network of intermittent or perennial channels formed by local geological and soil characteristics.

Hydric soils: Soils that are flooded, ponded, or saturated long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile. These conditions can develop from continuous saturation during as little as 5 percent of the growing season.

Ordinary high-water mark: On the shoreline of a body of water, the line or marking established by the fluctuations of water and indicated by physical characteristics such as a clear and natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, and/or other indicators appropriate for the surrounding area.

Waters of the United States: “All waters that are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; All interstate waters including interstate wetlands; All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce... Wetlands adjacent to waters (other than waters that are themselves wetlands) identified above.” (Definition taken from 33 CFR, Part 328.3). “Adjacent” is defined as bordering, contiguous, or neighboring.

Wetlands: “Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” (Definition taken from 33 CFR, Part 328.3).

Limits of jurisdiction in nontidal waters:

1. In the absence of adjacent wetlands, the jurisdiction extends to the ordinary high-water mark, or
2. when adjacent wetlands are present, the jurisdiction extends beyond the ordinary high-water mark to the limit of the adjacent wetlands.
3. When the water of the United States consists only of wetlands, the jurisdiction extends to the limit of the wetland (taken from 33 CFR, Part 328.3).

1.0 INTRODUCTION

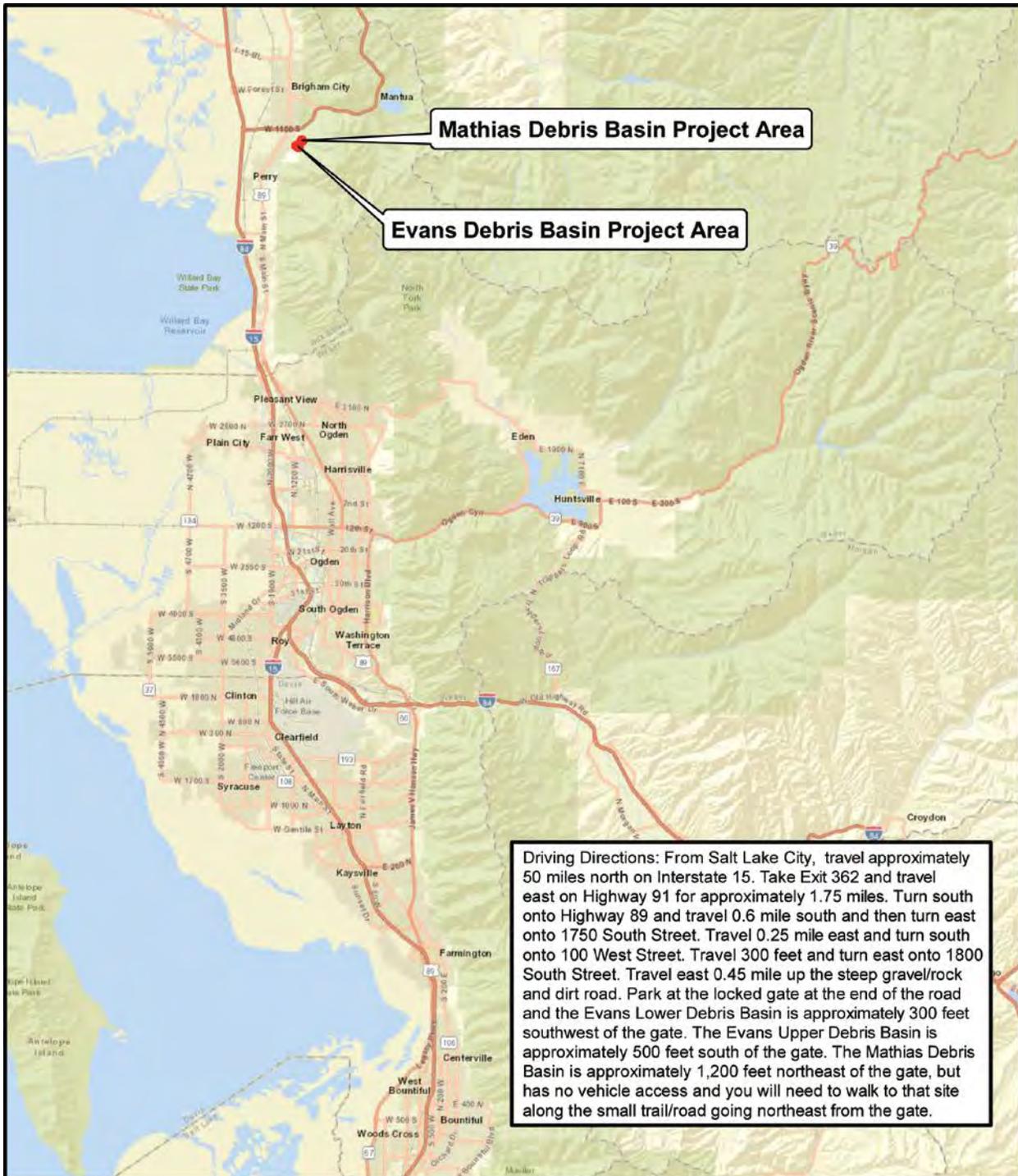
BIO-WEST, Inc. (BIO-WEST) was contracted by the Perry Flood Control District to conduct an aquatic resources inventory at the proposed locations for the Evans and Mathias Canyons Debris Basins, Perry City, Box Elder County, Utah (Figure 1). The survey area assessed included three separate but nearby sites totaling 3 acres in area. The three sites consist of an existing basin at the mouth of Evans Canyon (0.6 acre), a proposed debris basin farther up Evans Canyon (0.4 acre), and a proposed debris basin at the mouth of Mathias Canyon (2 acres). The two Evans Canyon basin sites are located approximately 300 feet apart, and the Mathias Canyon debris basin site is located approximately 1,600 feet to the north (Figure 2). The survey area is located in Section 36 of Township 9 North, Range 2 West, and Section 31 of Township 9 North, Range 1 West. The approximate coordinates for the Evans Canyon sites are lat. 41.475950° N and long. -112.008726° W. The approximate coordinates for the Mathias Canyon site are lat. 41.479813° N and long. -112.006003° W.

2.0 METHODS

A survey area visit was conducted on June 19, 2018, to delineate wetlands and surface water boundaries. Wetland boundaries were identified in accordance with the *US Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). In addition, the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Research and Development 2008) was used for regional specificity. In areas where one or more wetland parameters may have been absent or misleading, mapping was completed using hydrophytic vegetation dominance, depression landscape position, and/or persistent hydrological indicators, as specified by the manual.

Sample points were established within the survey area to examine and record existing conditions. These sample points were established as pairs along the wetland survey area boundary, with one sample point representing the wetland and the other representing the upland. Existing hydrological, soil, and vegetative conditions were examined and recorded at all sample points. Wetland boundaries were delineated based on observations at each sample point (Appendix A).

The Arid West Region Wetland Determination Forms (Appendix B) were used to record conditions at sample points. BIO-WEST personnel recorded the vegetative species and their relative abundance in the vicinity of each sample point according to procedures outlined in the *US Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). Vegetative strata were used to determine the sampling-plot radius using the sampling point as the center. Trees within a 30-foot radius of each sample point were recorded. Saplings, shrubs, herbaceous species, and woody vines within a 5-foot radius of each sample point were recorded. Those plant species considered dominant within each stratum were used to determine wetland or upland classification. Species comprising 20 percent or more of the total areal cover per stratum were considered dominant, following the guidelines of the US Army Corps of Engineers' (USACE's) 50/20 rule (Environmental Laboratory 1987). The wetland-indicator status of dominant plants was noted according to the USACE's *North American Digital Flora: National Wetland Plant List* (Lichvar et al. 2016).



 <p>BIO-WEST www.bio-west.com 435.752.4202</p>	<p>Perry Flood Control District Evans and Mathias Debris Basins Project Location Map</p>
<p>Imagery Source: USA Topo Maps (ESRI Online) Coordinate System: NAD 1983 UTM Zone 12N Projection: Transverse Mercator Datum: North American 1983</p>	<p>0 5 10 Miles</p> 

Document Path: G:\Wetland Projects\Perry UT Debris Basins\DebrisBasinsLocationMap.mxd

Map Date: 12/5/2018

Figure 1. Survey area location map.

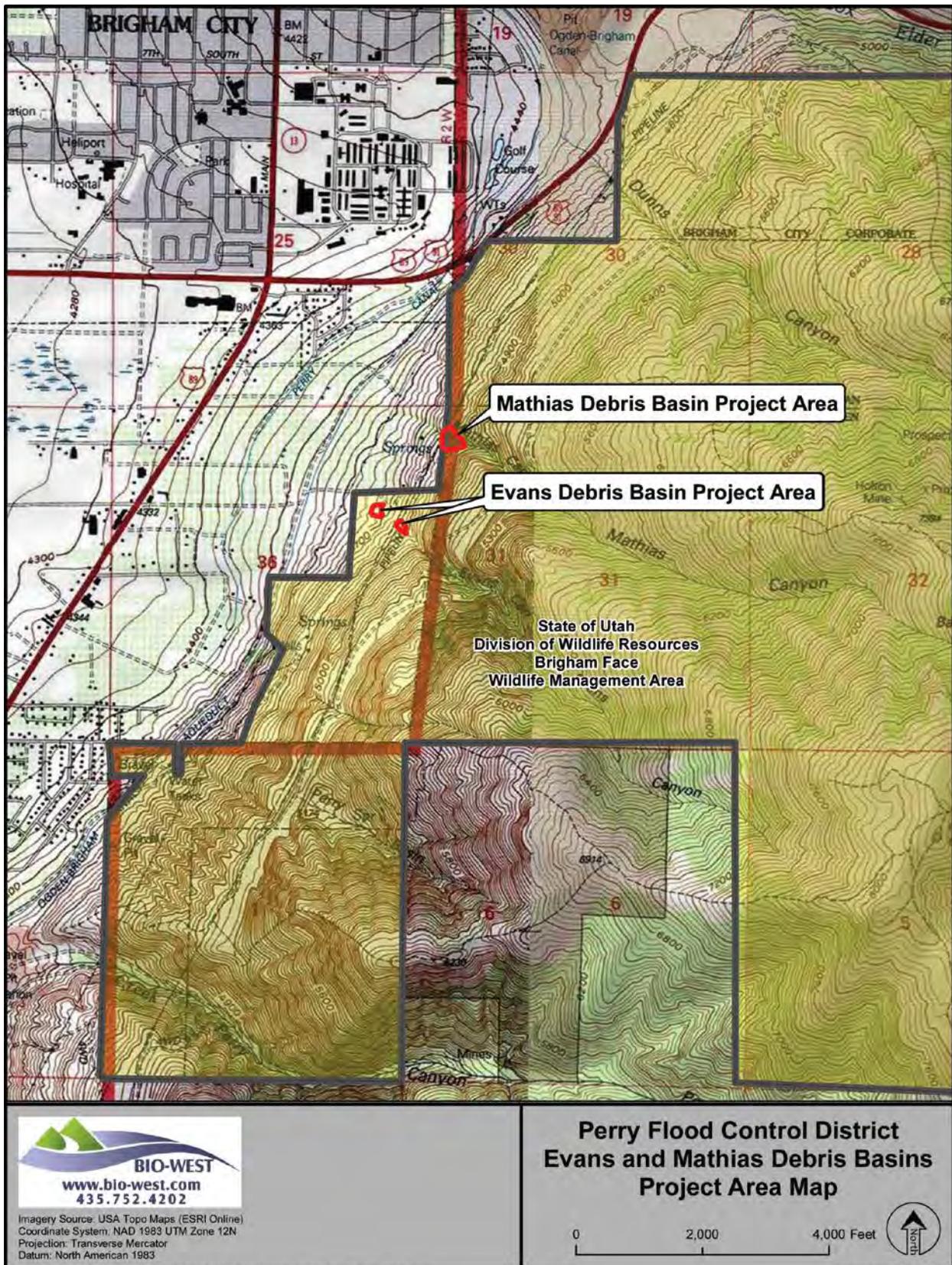


Figure 2. US Geological Survey topographic map.

The vegetation-indicator status estimates the probability of a particular plant species occurring in wetland environments. Of the dominant plant species recorded, more than 50 percent must have a vegetation-indicator status of facultative (34–66 percent probability of occurring in wetlands), facultative wetland (67–99 percent probability of occurring in wetlands), or obligate wetland (more than 99 percent probability of occurring in wetlands) for a sample point to be classified as having hydrophytic vegetation for wetland delineation purposes.

The presence or absence of hydrological indicators was examined and recorded at each sample point. The determination of wetland hydrology was based on the presence of at least one positive primary indicator or two positive secondary indicators of a prolonged period of saturation. Primary indicators include surface water, high water table, saturation, watermarks (nonriverine), debris deposits (nonriverine), sediment deposits (nonriverine), surface soil cracks, inundation visible on aerial imagery, water-stained leaves, salt crust, biotic crust, aquatic invertebrates, hydrogen sulfide odor, oxidized rhizospheres along living roots, and the presence of reduced iron or recent iron reduction in plowed soils. Secondary indicators include watermarks (riverine), sediment deposits (riverine), drift deposits (riverine), drainage patterns, dry-season water table, thin muck surface, crayfish burrows, saturation visible on aerial imagery, shallow aquitard, and hydrophytic results from the facultative-neutral test. Environmental changes and the topographic position of the sample points relative to observed water table were also noted.

Soil pits were dug at each sample point to a depth of at least 18 inches to characterize soil profiles and soil/water conditions. At least one positive hydric soil indicator was required at each sample point to classify a soil as hydric. For example, soils in prolonged anaerobic conditions undergo chemical reduction, thereby producing lighter soil colors. During the field survey, the colors of the soil profile matrix and mottles were identified using Munsell soil color charts (Kollmorgen Instruments 1990). Soil horizon, texture, moisture content, and depth-to-soil saturation and/or standing water were noted. The presence or absence of particulate organic matter, organic matter staining, concretions, redox concentrations, and gleying was also noted.

Standard wetland delineation procedures require the comparison of soil profiles observed in the field with the soil descriptions referenced in the Natural Resource Conservation Service (NRCS) Soil Survey (USDA NRCS 2018). The Box Elder County, Utah, Eastern Part soil survey was accessed using the NRCS Web Soil Survey website (USDA NRCS 2018) and referenced during the survey area visit (Appendix C).

Two sample points were established to characterize existing hydrologic, soil, and vegetative conditions in the survey area. Photographs representative of the sample points and survey area were taken during the site visits (Appendix D). Wetland boundaries were determined using sample points and vegetative communities.

The approximate locations of delineated wetland boundaries and sample points were surveyed using a submeter-accurate GPS. The survey data were downloaded into a GIS program to produce mapping (Appendix A) that shows the delineated wetland boundaries, estimated wetland acreage, photo point, and sample point locations.

Non-wetland waters of the United States were mapped using indicators of the ordinary high-water mark (OHWM).

3.0 GENERAL CONDITIONS

The survey area was inspected on June 19, 2018, and summer conditions were encountered. The majority of the grasses and forbs were visible and identifiable to species. The survey area contains a reach of perennial stream channel in Mathias Canyon and an irrigation water diversion structure. The survey area also contains a perennial stream channel reach and a separate intermittent stream channel reach and irrigation water diversion structure in Evans Canyon. The survey area contains extensive woody riparian vegetation along the stream channels and the Mathias Canyon area contains one small herbaceous wetland seep. The survey area vegetation communities include scrub-shrub riparian uplands, herbaceous emergent wetlands, and dry upland weedy grassland situated on steep mountain slopes. The herbaceous emergent wetland appears to be a remnant channel of the perennial stream in Mathias Canyon. Both streams within the survey area are diverted with human-made irrigation structures. The upper reach of the Mathias Canyon stream channel contains a higher-quality woody riparian forest and scrub-shrub area, although this area does not meet the criteria for wetlands.

4.0 FINDINGS

4.1 Vegetation

Plant communities found in the survey area include riparian scrub-shrub uplands, herbaceous emergent wetland, and weedy upland grassland. The scrub-shrub riparian upland area is dominated by coyote willow (*Salix exigua*), redosier dogwood (*Cornus sericea*), water birch (*Betulas occidentalis*), elderberry (*Sambucus nigra*), Siberian elm (*Ulmus pumila*), chokecherry (*Prunus virginiana*), big tooth maple (*Acer grandidentatum*), and box elder (*Acer negundo*). The herbaceous emergent wetland is dominated by sword leaf rush (*Juncus ensifolius*), seep monkey flower (*Mimulus guttatus*), and common reed (*Phragmites australis*). The weedy upland grassland area is dominated by intermediate wheatgrass (*Thinopyrum intermedium*), cheatgrass (*Bromus tectorum*), and western wheatgrass (*Pascopyrum smithii*). Below is a list of plant species observed in the survey area (Table 1).

4.2 Soils

Soils were examined in the field during the survey area visit. The soils encountered were generally loam with a high percentage of sand and rock and gravel material. The NRCS Soil Survey (USDA NRCS 2018) of the survey area was reviewed and used as a reference while on site (Appendix C). The soil type mapped within the survey area was Kilburn gravelly sandy loam, 10–60% slopes (Map Symbols KnE, KnF, KnG). The Kilburn series is not listed by the NRCS as a hydric soil type in Utah (USDA NRCS 2018).

Table 1. Plant species identified in the survey area.

COMMON NAME	SCIENTIFIC NAME	INDICATOR STATUS ^a
big tooth maple	<i>Acer grandidentatum</i>	FACU
box elder	<i>Acer negundo</i>	FACW
Canada goldenrod	<i>Solidago lepida</i>	FAC
Canada thistle	<i>Cirsium arvensis</i>	FACU
cheat grass	<i>Bromus tectorum</i>	UPL
choke cherry	<i>Prunus virginiana</i>	FAC
common dandelion	<i>Taraxacum officinale</i>	FACU
common ragweed	<i>Ambrosia artemisiifolia</i>	FACU
common reed	<i>Phragmites australis</i>	FACW
coyote willow	<i>Salix exigua</i>	FACW
curly dock	<i>Rumex crispus</i>	FAC
elderberry	<i>Sambucus nigra</i>	FACU
intermediate wheatgrass	<i>Thinopyrum intermedium</i>	UPL
Kentucky bluegrass	<i>Poa pratensis</i>	FAC
poison ivy	<i>Toxicodendron rydbergii</i>	FACU
quack grass	<i>Elymus repens</i>	FAC
rabbit brush	<i>Ericameria nauseosa</i>	UPL
Redosier dogwood	<i>Cornus sericea</i>	FACW
redtop	<i>Agrostis gigantea</i>	FAC
reed canary grass	<i>Phalaris arundinacea</i>	FACW
Russian olive	<i>Eleagnus angustifolia</i>	FAC
seep monkey flower	<i>Mimulus guttatus</i>	OBL
Siberian elm	<i>Ulmus pumila</i>	UPL
sword leaf rush	<i>Juncus ensifolius</i>	FACW
intermediate wheatgrass	<i>Thinopyrum intermedium</i>	UPL
teasle	<i>Dipsacus fullonum</i>	FAC
Utah juniper	<i>Juniperus osteosperma</i>	UPL
water birch	<i>Betula occidentalis</i>	FACW
western wheatgrass	<i>Pascopyrum smithii</i>	FAC

^a FAC=facultative species, FACU=facultative upland species, FACW=facultative wetland species, OBL=obligate wetland species, UPL=upland species.

The Box Elder County, Utah, soil survey (USDA NRCS 2018) provides the following soil series description:

The Kilburn series consists of very deep, somewhat excessively drained, moderately rapidly permeable soils. These soils formed in alluvium and colluvium derived dominantly from gneiss, schist and quartzite on fan terraces, lake terraces, stream terraces and deltas. Slopes range from 0 to 60 percent. The series exhibits slow to rapid runoff with moderately rapid permeability. The soils are used for irrigated cropland, orchards, rangeland and urban areas. Typical vegetation on present range is mainly bluebunch wheatgrass (*Pseudoroegneria spicata*), sand dropseed (*Sporobolus cryptandrus*), indian ricegrass (*Achnatherum hymenoides*), needle and thread grass (*Hesperostipa comate*), big sagebrush (*Artemisia tridentata*), and oakbrush (*Quercus gambelii*).

Upland soils within the survey area are predominantly consistent with the soil types listed in the series descriptions. Soils observed at the wetland sample point and soils adjacent to other surface waters typically have more organic matter and silt present. The wetland sample point exhibited a dark-black, saturated surface with fine sediment and muck present in between large rock cobble materials. These soil characteristics are typical of hydric soil that has formed in remnant stream channels that maintain an active groundwater connection with the existing perennial stream channel.

4.3 Hydrology

Survey area hydrology is influenced most strongly by the stream channels and the geographic position on the steep mountain slopes. The spring snow melt contributes to significant increases in the flow within the streams, and this is the time the intermittent stream channel is most likely flowing consistently. The perennial stream channels are likely tied into groundwater draining down gradient toward the valley floor. Wetland hydrology indicators observed at the wetland sample point included surface water flooding, surface soil saturation, and a high groundwater water table.

The US Fish and Wildlife Service's (USFWS's) National Wetlands Inventory (NWI) does not indicate wetlands within the survey area (Appendix E) (USFWS 2018). The NWI does indicate a stream channel within the survey area at Mathias Canyon. The NWI does not indicate a stream channel within the survey area at Evans Canyon; however, the NWI does indicate a stream channel within Evans Canyon approximately 600 feet up the mountain from the survey area.

The NRCS Soil Survey (USDA NRCS 2018) indicate the blue line stream features through both Canyons exactly as the NWI map does.

4.4 Wetlands and Non-wetland Waters of the United States

Within the 3-acre survey area investigated, 0.02 acre was identified as palustrine emergent wetland, 385 linear feet of perennial stream channel was identified in Mathias Canyon, 220 linear feet of perennial stream channel was identified in Evans Canyon, and 100 linear feet of intermittent stream channel was identified in Evans Canyon (Appendix A).

The emergent wetland is permanently-to-seasonally flooded, depending on the nearby perennial stream channel flow. The emergent wetland exhibited a dominant hydrophytic vegetation community composed sword leaf rush. The emergent wetland exhibited surface water flooding, saturated soils, and a high groundwater table. Soils within the emergent wetland exhibited a dark black-colored mucky surface layer, indicating high organic matter due to wet conditions. The emergent wetlands appear to have formed in a small remnant stream channel feature that is still connected via subsurface flow to the nearby perennial stream channel.

The OHWM of the mapped streams was delineated using field indicators and the sub-meter GPS. The primary field indicator used was a change from a wetland vegetated substrate to an unvegetated rock and cobble bottom with surface water flow. Areas that appeared dried up or close to drying up were identified as intermittent stream channel because of the field visit date in late June. Areas that illustrated significant flow during the site visit in late June were identified as perennial streams. It is possible that the entire stream length of Evans Canyon in the survey area could dry up later in the summer and therefore the entire length could be intermittent. Based on field observations, it is unlikely that the stream in Mathias Canyon ever dries up completely. Both stream channels are diverted completely into human-made downstream irrigation systems, and the natural stream channels do not continue down into the valley floor from the survey area.

5.0 SUMMARY AND CONCLUSIONS

During the survey area investigation, 0.02 acre of wetland were delineated within the 3-acre survey area (Appendix A). The wetland area is a small palustrine emergent wetland located within a remnant stream channel feature in Mathias Canyon. The survey area investigation also delineated 385 linear feet of perennial stream channel in Mathias Canyon, 220 linear feet of perennial stream channel in Evans Canyon, and 100 linear feet of intermittent stream channel in Evans Canyon. The wetland and open waters are immediately diverted at the lower end of the survey area. The water presumably enters the irrigation system and goes to the valley floor. The survey area waters and wetlands could be considered isolated if they do not exhibit a significant nexus to other downstream known jurisdictional waters.

The USACE has final jurisdiction over determining whether a waterbody or wetland is a jurisdictional water of the United States.

6.0 REFERENCES CITED

Environmental Laboratory. 1987. US Army Corps of Engineers wetlands delineation manual. Vicksburg (MS): US Army Waterways Experiment Station. Technical Report Y-87-1.

[Kollmorgen Instruments] Kollmorgen Instruments Corporation. 1990. Munsell soil color charts. Revised 2000. New Windsor (NY): Kollmorgen Instruments Corporation.

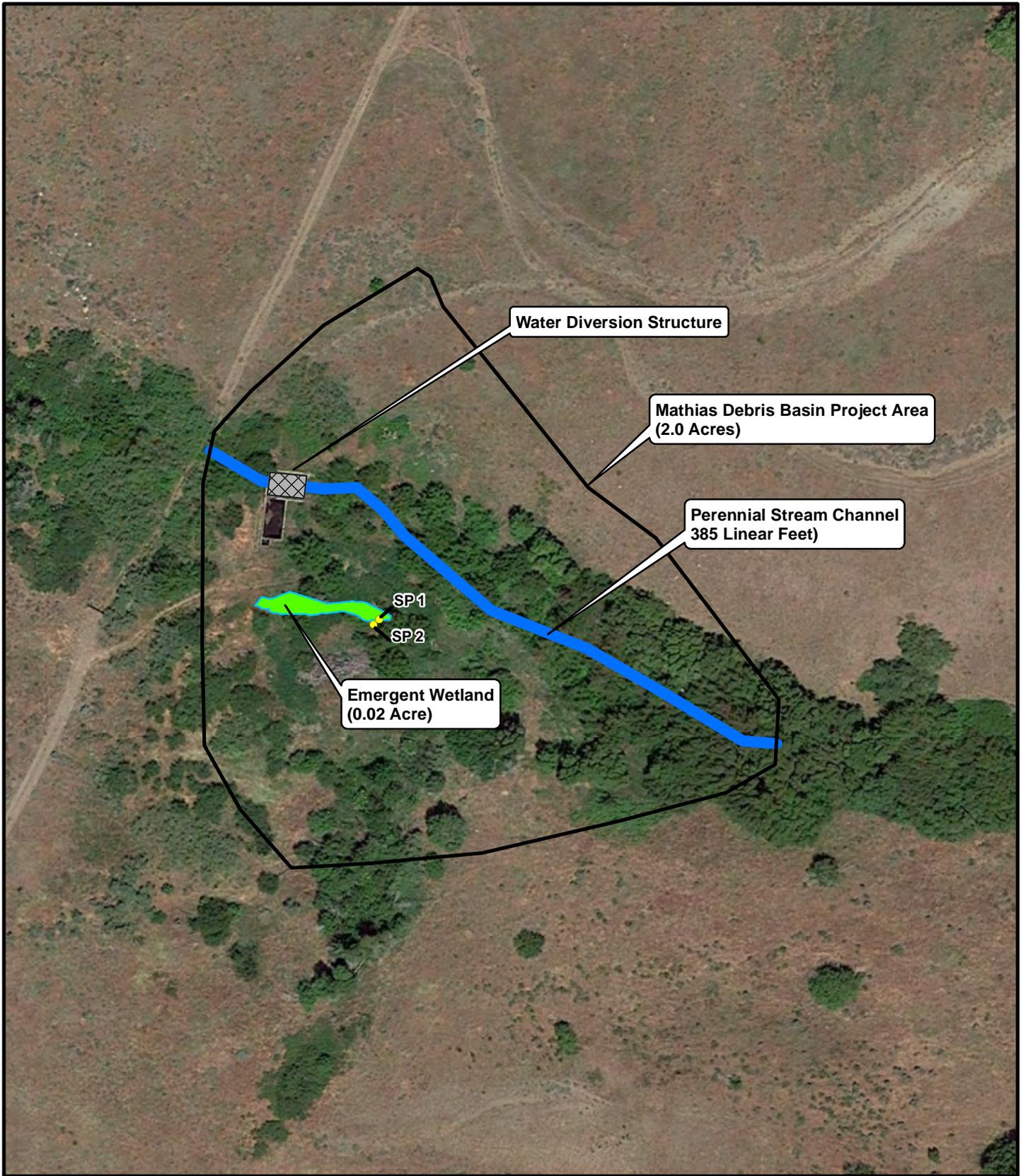
Lichvar, R.W., D.L. Banks, N.C. Melvin, and W.N. Kirchner. 2016. US Army Corps of Engineers North American Digital Flora: National Wetlands Plant List, (https://wetland_plants.usace.army.mil). Hanover (NH): US Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory; and Chapel Hill (NC): BONAP.

[Research and Development] US Army Engineer Research and Development Center. 2008. Regional supplement to the Corps of Engineers wetland delineation manual: arid west region. Hanover (NH): US Army Engineer Research and Development Center. 93 p. plus appendices.

[USDA NRCS] US Department of Agriculture, Natural Resources Conservation Service, Soil Survey Staff. 10/03/18. Box Elder County Utah, Eastern Part. Location: <https://websoilsurvey.nrcs.usda.gov/app/>

[USFWS] US Fish and Wildlife Service. 11/05/2018. National Wetlands Inventory website. Location: <http://www.fws.gov/wetlands/>.

APPENDIX A: WETLAND DELINEATION MAPS

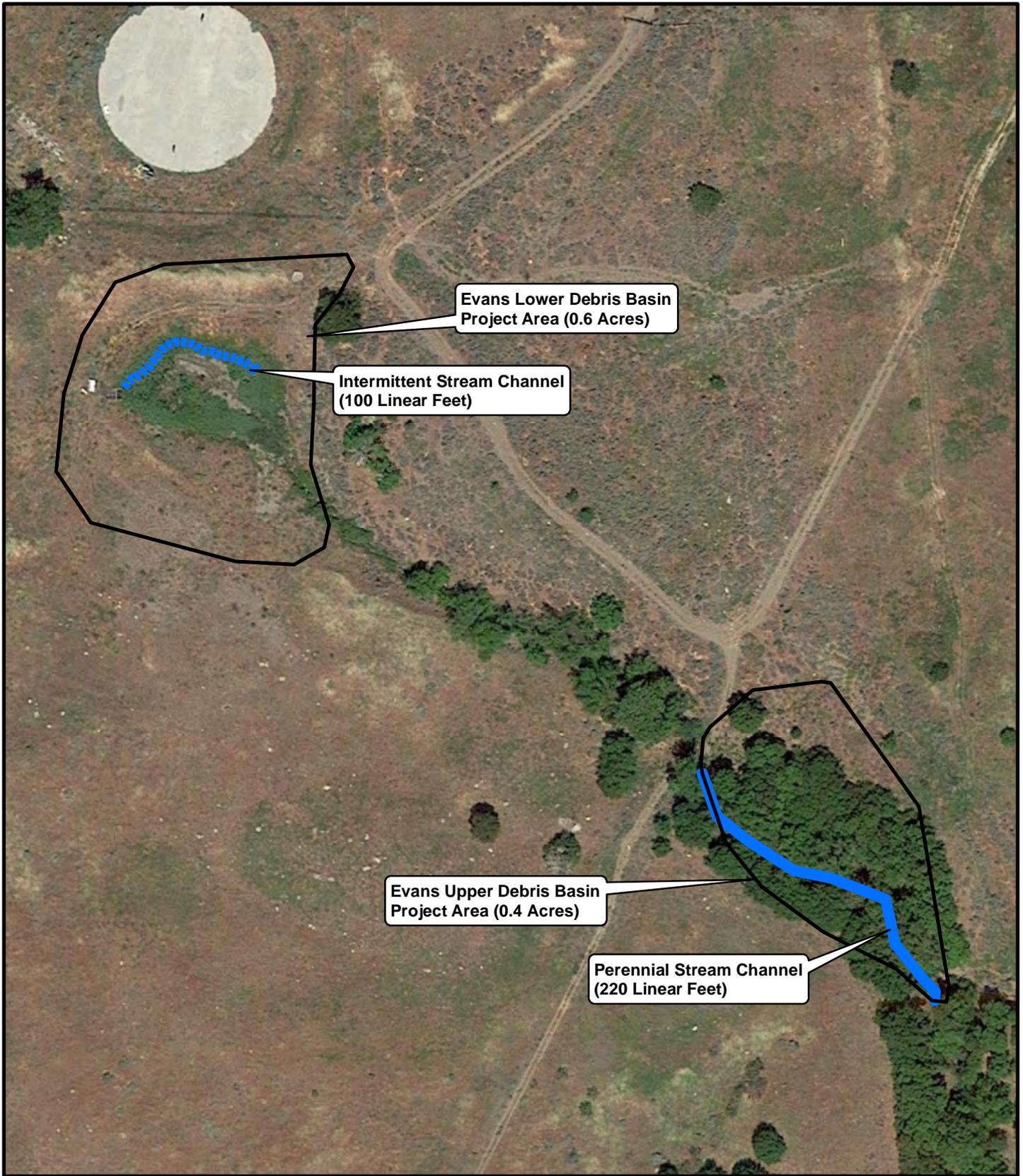


Imagery Source: WMTS Service
 Coordinate System: NAD 1983 UTM Zone 12N
 Projection: Transverse Mercator
 Datum: North American 1983

● Sample Point

**Perry City Flood Control District
 Aquatic Resources Inventory Map
 Mathias Debris Basin**





Imagery Source: WMTS Service
Coordinate System: NAD 1983 UTM Zone 12N
Projection: Transverse Mercator
Datum: North American 1983

**Perry City Flood Control District
Aquatic Resources Inventory Map
Evans Debris Basin**



**APPENDIX B: WETLAND DELINEATION
DATA SHEETS**

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Perry Flood Control District Debris Basins City/County: Perry, Box Elder Sampling Date: June 19, 2018
 Applicant/Owner: Perry Flood Control District State: UT Sampling Point: 1
 Investigator(s): B. Thomas Section, Township, Range: Section 31 of Township 9 North, Range 1 West
 Landform (hillslope, terrace, etc.): Remnant Channel Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR): D Lat: 41.479626857 Long: 112.005742387 Datum: WGS 84
 Soil Map Unit Name: KnF - Kilburn gravelly sandy loam, 20-30% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: old remnant stream channel that is still connected through the underground alluvial cobble and gravel to the groundwater seepage flow from the existing perennial stream channel.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: _____ Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5' radius</u>)				
1. <u>Juncus ensifolius</u>	<u>50</u>	<u>Yes</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Mimulus guttatus</u>	<u>5</u>	<u>No</u>	<u>OBL</u>	
3. <u>Phragmites australis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>60</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	_____	_____	_____	
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
% Bare Ground in Herb Stratum <u>40- rocky</u> % Cover of Biotic Crust _____				

Remarks:
 The seep itself contains only herbaceous plants but just surrounding it are many woody riparian species that were not included in the sample point.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Perry Flood Control District Debris Basins City/County: Perry, Box Elder Sampling Date: June 19, 2018
 Applicant/Owner: Perry Flood Control District State: UT Sampling Point: 2
 Investigator(s): B. Thomas Section, Township, Range: Section 31 of Township 9 North, Range 1 West
 Landform (hillslope, terrace, etc.): Edge of old channel Local relief (concave, convex, none): Convex Slope (%): 2
 Subregion (LRR): D Lat: 41.479617140 Long: 112.005755294 Datum: WGS 84
 Soil Map Unit Name: KnF - Kilburn gravelly sandy loam, 20-30% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Immediate upland edge of the old remnant channel.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33</u> (A/B)
4. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5'</u>)				Prevalence Index worksheet:
1. <u>Salix exigua</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>	Total % Cover of: _____ Multiply by: _____
2. _____	_____	_____	_____	OBL species _____ x 1 = _____
3. _____	_____	_____	_____	FACW species _____ x 2 = _____
4. _____	_____	_____	_____	FAC species _____ x 3 = _____
5. _____	_____	_____	_____	FACU species _____ x 4 = _____
<u>20</u> = Total Cover				UPL species _____ x 5 = _____
				Column Totals: _____ (A) _____ (B)
				Prevalence Index = B/A = _____
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators:
1. <u>Bromus tectorum</u>	<u>70</u>	<u>Yes</u>	<u>UPL</u>	<input type="checkbox"/> Dominance Test is >50%
2. <u>Thinopyrum intermedium</u>	<u>20</u>	<u>Yes</u>	<u>UPL</u>	<input type="checkbox"/> Prevalence Index is ≤3.0 ¹
3. _____	_____	_____	_____	<input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
4. _____	_____	_____	_____	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>90</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>10</u> % Cover of Biotic Crust _____				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Remarks:

APPENDIX C: SOIL SURVEY MAP

Soil Map—Box Elder County, Utah, Eastern Part
(Evans and Mathias Canyon)



Soil Map may not be valid at this scale.

Map Scale: 1:3,770 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge ticks: UTM Zone 12N WGS84



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

11/5/2018
Page 1 of 3

Soil Map—Box Elder County, Utah, Eastern Part
(Evans and Mathias Canyon)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Box Elder County, Utah, Eastern Part
Survey Area Data: Version 12, Sep 12, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 3, 2013—Nov 8, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
KnD	Kilburn gravelly sandy loam, 6 to 10 percent slopes	0.5	0.7%
KnE	Kilburn gravelly sandy loam, 10 to 20 percent slopes	14.4	19.6%
KnF	Kilburn gravelly sandy loam, 20 to 30 percent slopes	23.1	31.5%
KnG	Kilburn gravelly sandy loam, 30 to 60 percent slopes	35.3	48.2%
Totals for Area of Interest		73.3	100.0%

**APPENDIX D: SAMPLE POINT AND
REPRESENTATIVE SURVEY
AREA PHOTOS**



Mathias Canyon riparian area edge north side facing west.



Mathias Canyon Perennial Stream Channel.



Mathias Canyon Perennial Stream Channel.



Mathias Canyon riparian area.



Mathias Canyon water diversion structure facing upstream.



Mathias Canyon water diversion structure facing downstream.



Mathias Canyon wetland sample point.



Mathias Canyon upland sample point.



Evans Canyon Perennial Stream Channel.



Pipeline Road Through Evans Drainage Facing North.



Existing Evans Canyon Lower Basin.



Existing Evans Canyon Lower Basin Intermittent Stream Flow Area.



Existing Evans Lower Basin Canyon water diversion structure.

**APPENDIX E: NATIONAL WETLAND INVENTORY
MAP**



November 5, 2018

Wetlands

- | | | |
|--------------------------------|-----------------------------------|----------|
| Estuarine and Marine Deepwater | Freshwater Emergent Wetland | Lake |
| Estuarine and Marine Wetland | Freshwater Forested/Shrub Wetland | Other |
| | Freshwater Pond | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

**APPENDIX B: WILDLIFE AND THREATENED
AND ENDANGERED SPECIES REPORT**



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and Marine Biology

Environmental
Analysis
and Permitting

Geology/
Hydrogeology
and Remediation

Fisheries and Aquatic
Ecology

GIS Analysis
and Planning

Landscape
Architecture
and Environmental
Planning

Vegetation Resources

Watershed Sciences

Wetland Resources

Wildlife Resources

December 6, 2018

Mr. Greg Hansen
Perry Flood Control District
3005 South 1200 West
Perry, Utah 84302

Subject: Federally Listed Threatened, Endangered, and State Listed Sensitive Species Assessment at the Evans and Mathias Debris Basins Project Area, Perry City, Box Elder County, Utah

Dear Mr. Hansen,

BIO-WEST was contracted to conduct an assessment for the potential occurrence of federally listed threatened and endangered species, and state listed sensitive species at the Evans and Mathias Debris Basins Project Area, Perry City, Box Elder County, Utah (see attached Project Location Map). The overall project area assessed included three separate but nearby sites; an existing basin at the mouth of Evans Canyon, a proposed future debris basin further up Evans Canyon, and a proposed future debris basin at the mouth of Mathias Canyon (see Attached Project Area Map). The areas assessed included 0.6-acre surrounding the existing Evans Canyon basin, 0.4-acre surrounding the proposed future Evans Canyon debris basin, and 2.0-acres surrounding the proposed future Mathias Canyon debris basin. The two Evans Canyon basin areas are located approximately 300 feet apart and the Mathias Canyon debris basin area is located approximately 1,600 feet to the north. Representative photographs of the project area are attached to this letter.

Methods

BIO-WEST conducted a site visit and consulted with the Utah Division of Wildlife Resources (UDWR) to assess existing habitat and to determine the presence of suitable habitat for federally listed threatened and endangered and state listed sensitive species within the project area. BIO-WEST reviewed literature regarding habitat requirements and current and historic distributions of federally listed threatened and endangered species and state listed sensitive species for Box Elder County provided by the UDWR Conservation Data Center (<http://dwrcdc.nr.utah.gov/ucdc/>). Additionally, BIO-WEST requested information from UDWR regarding proximal occurrences of species of special concern (UDWR 2018, attached).

The entire project area was walked on June 19, 2018. During the site visit of the project area, a visual inspection was made to determine whether suitable and/or potentially suitable habitat for listed species was present. The information collected during the site visit was used in conjunction with the literature review and BIO-WEST's professional judgment to determine the potential for listed species or suitable habitat for those listed species to occur within the project area.

Results and Discussion

The project area is located on the mountain foothills at the northern end of the Wasatch Mountains. The area immediately downslope of the project area to the west is primarily weedy pastureland that is rapidly being developed into new residential homes and associated roads and other infrastructure. Upslope of the project area to the east is relatively undisturbed, state- and federally owned mountain forestland. The Evans basin drainage appears to have perennial stream flow at the upper basin area and intermittent stream flow at the lower basin area. The Evans basin drainage within the project area did not contain sufficient water to support fish at the time of the site visit. The majority of the Evans basin water is diverted into an irrigation canal upslope and just outside of the project area. The small amount of water that was in the Evans basin drainage in the project area at the time of the site visit was absorbed into the rocky substrate before the surface water flow reached the lower basin area. The Mathias basin project area had perennial stream flow that at the time of the site visit appeared to be sufficient to support small fish. The Mathias basin drainage flow is captured at the lower end of the project area and diverted downslope into the drainage and irrigation system associated with Perry City and Brigham City.

The Evans basin drainage within the project area was dominated by Siberian elm (*Ulmus pumila*), bigtooth maple (*Acer grandidentatum*), western poison ivy (*Toxicodendron rydbergii*), and intermediate wheatgrass (*Thinopyrum intermedium*). The drainage has experienced significant human disturbance in the past. The presence of intermittent water and a woody tree and shrub community provides some wildlife habitat within the Evans basin drainage. The Mathias basin drainage within the project area has a more diverse native plant community dominated by woody species including box elder (*Acer negundo*), choke cherry (*Prunus virginiana*), hawthorn (*Crataegus douglasii*), bigtooth maple, water birch (*Betula occidentalis*), coyote willow (*Salix exigua*), elderberry (*Sambucus nigra*), redosier dogwood (*Cornus sericea*), and narrow leaf cottonwood (*Populus angustifolia*). This drainage has experienced human disturbance in the past but not to the degree of disturbance of the Evans drainage. The presence of perennial surface water stream flow, a significant native woody riparian vegetation corridor, and the large adjacent undeveloped state and federal lands makes the Mathias basin a higher quality native wildlife habitat.

A total of 30 special status wildlife species potentially occur in Box Elder County, including three federally-listed species (Table 1) and 27 state-listed species (Table 2) (UDWR 2017). Tables 1 and 2 also identify if appropriate habitat for a given species is present within the project area and the likelihood of occurrence of that species in the project area based on its habitat requirements and known distribution as listed by the UDWR Resources Conservation Data Center (UDWR 2017), as well as information from UDWR regarding proximal occurrences as applicable (UDWR 2018).

The project area does not contain suitable habitat for any of the three federally-listed species, nor are they likely to occur in the general area of the site (Table 1). There are no records of any federally listed species within two miles of the project area (UDWR 2018). As such, the proposed project will have no effect on these species.

There are no records of any state listed species within ½ mile of the project area (UDWR 2018). The project area provides potentially suitable habitat for 4 state-listed species including the Bonneville cutthroat trout (*Oncorhynchus clarkia*), great plains Toad (*Bufo cognatus*), northern goshawk (*Accipiter gentilis*), and western toad (*Anaxyrus boreas*). These species could be present within the project area and

species-specific surveys would be required to definitively rule out their presence. If present, the Bonneville cutthroat trout would be limited to the Mathias drainage. There are recent documented occurrences of short-eared owl (*Asio flammeus*) and long billed curlew (*Numenius americanus*) within two miles of the project area (UDWR 2018). The project area may support incidental occurrences of short-eared owls; however, the project area does not provide the open grassland breeding habitat they prefer. As such, the proposed project will have no effect on this species. The project area does not provide habitat for long billed curlew and will have no effect on this species. There are documented historical occurrences of American white pelican (*Pelecanus erythrorhynchos*) within two miles of the project area (UDWR 2018). The proposed project will have no effect on this species.

Conclusion and Recommendations

Construction activities that disturb the project area are unlikely to cause effects to any federally listed threatened and endangered species. The project area does provide potentially suitable habitat for 4 state-listed species including the Bonneville cutthroat trout (*Oncorhynchus clarkia*), great plains Toad (*Bufo cognatus*), northern goshawk (*Accipiter gentilis*), and western toad (*Anaxyrus boreas*). These species could be present within the project area and species-specific surveys would be required to definitively rule out their presence.

The woody riparian tree and shrub habitat on the project area provides habitat for numerous common non-listed migratory bird species. BIO-WEST recommends that construction be avoided during nesting and brood-rearing season for protected migratory birds (spring and summer months) in order to comply with the Migratory Bird Treaty Act of 1918 as amended (MBTA) which makes it illegal to “pursue, hunt, take, capture, kill, attempt to take, capture or kill” any migratory bird or their eggs and nests without first obtaining a permit from the U.S. Fish and Wildlife Service (16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755). This includes creating enough disturbances (e.g., noise, vibrations, visual disturbance, etc.) to cause a bird to abandon a nest or fledglings. Most bird species within the United States are protected under the MBTA and/or state law.

To comply with the MBTA, the following mitigation measures should be implemented during construction in the project area:

- Require that no nesting vegetation (which can include trees, shrubs, and herbaceous vegetation such as grasses and forbs) clearing occur during the typical nesting/brood rearing period from April 1st through August 30th.
- Have a qualified wildlife biologist perform a nest clearance survey immediately prior (within three days) to construction activities if any vegetation clearing is required during the nesting/brood rearing period.
- If actively nesting and/or brood rearing birds are found within or reasonably near (≤ 200 feet) the vegetation clearance area, clearance and construction should be postponed until breeding activity is completed (as assessed by a qualified wildlife biologist).



BIO-WEST, Inc.

December 6, 2018

Page 4 of 8

Please feel free to contact me with any questions and/or comments you might have. BIO-WEST is also able to assist in any additional wildlife-related permitting requirements, such as migratory bird nest clearance surveys, that may be needed.

Sincerely,

Robert Thomas
Wildlife and Wetlands Specialist

Attachments:

Maps b
Photographs
UDWR Letter

Literature Cited

[MBTA] Migratory Bird Treaty Act of 1918. 16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755.

[UDWR] Utah Division of Wildlife Resources. 2018. Information request regarding species of concern near the Perry Debris Basins. Received 10/15/2018.

[UDWR] Utah Division of Wildlife Resources. 2017. County Lists of Utah's Federally Listed Threatened (T), Endangered (E), and Candidate (C) Species and State Listed Species. Utah Conservation Data Center. Location: <http://dwrcdc.nr.utah.gov/ucdc/>.

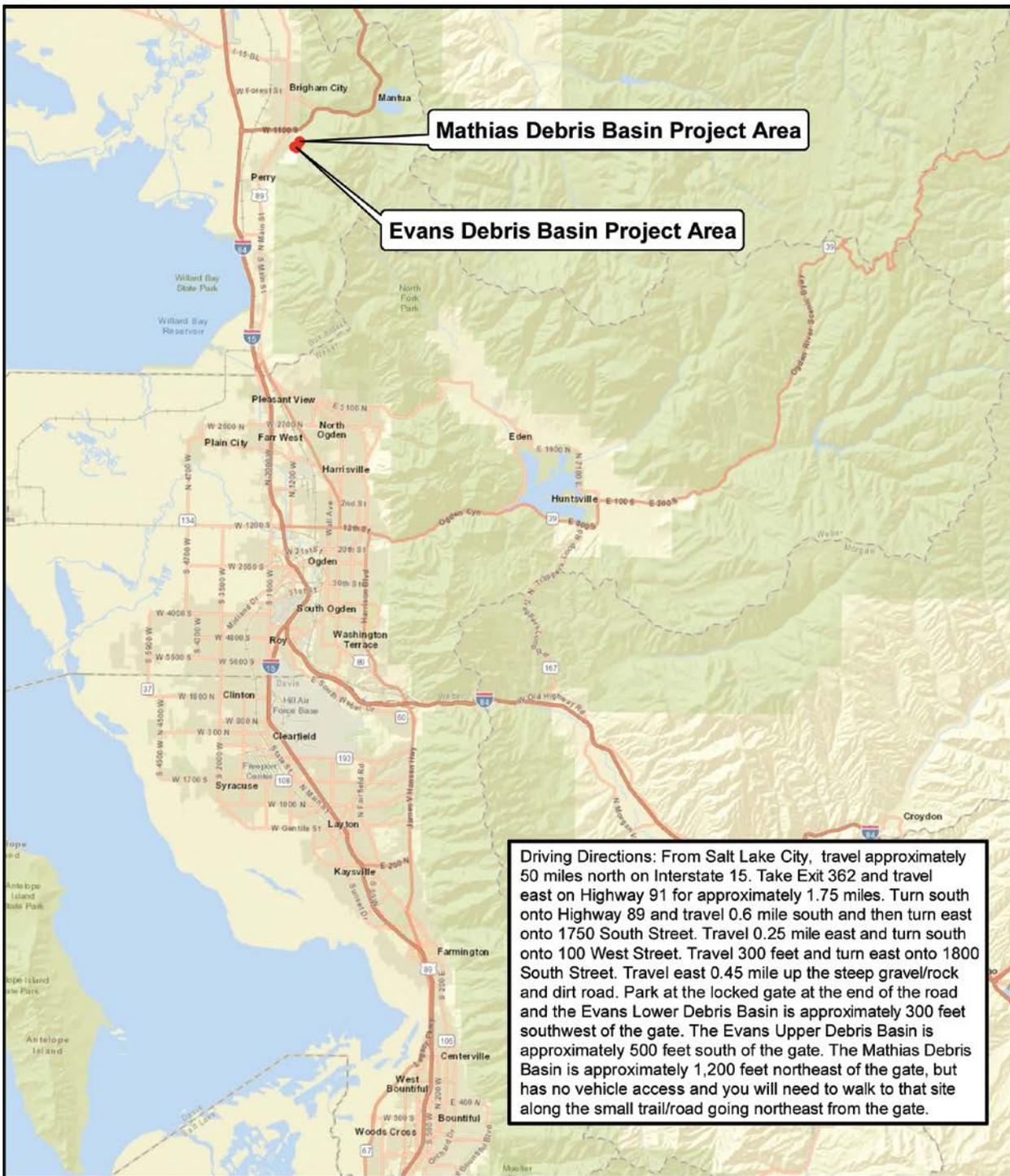
TABLE 1. Federally-listed threatened and endangered species potentially occurring in Box Elder County.

Common Name	Scientific Name	Status	Suitable Habitat in Project Area	Species Occurrence in Project Area
Gray wolf	<i>Canis lupus</i>	Endangered	No because the animal is not present in the region.	Considered extirpated by the U.S. Fish and Wildlife Service, historically present but no longer occurs in Box Elder County.
June Sucker	<i>Chasmistes liorus</i>	Endangered	Absent	Introduced into Box Elder County but not present in the project area.
Lahontan Cutthroat Trout	<i>Oncorhynchus clarkii henshawi</i>	Threatened	Absent	Introduced into Box Elder County but not present in the project area.

TABLE 2. State-listed sensitive wildlife species potentially occurring in Box Elder County.

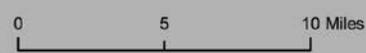
Common Name	Scientific Name	Status	Suitable Habitat in Project Area	Species Occurrence in Project Area
American white pelican	<i>Pelecanus erythrorhynchos</i>	SPC	Absent	Unlikely to occur, but there are historical occurrences documented within 2 miles of the project area (UDWR 2018).
Bald eagle	<i>Haliaeetus leucocephalus</i>	SPC	Absent	Unlikely to occur.
Bluehead Sucker	<i>Catostomus discobolus</i>	CS	Absent	Unlikely to occur.
Bobolink	<i>Dolichonyx oryzivorus</i>	SPC	Absent	Unlikely to occur.
Bonneville cutthroat trout	<i>Oncorhynchus clarkii</i>	CS	Potentially suitable in Mathias Drainage.	Species specific surveys would be required to rule out presence in the project area.
Burrowing owl	<i>Athene cunicularia</i>	SPC	Absent	Unlikely to occur.
California floater	<i>Anodonta californiensis</i>	SPC	Absent	Unlikely to occur.
Columbian Sharp-tailed Grouse	<i>Tympanuchus phasianellus columbianus</i>	SPC	Absent	Unlikely to occur.
Deseret Mountainsnail	<i>Oreohelix peripherica</i>	SPC	Absent	Unlikely to occur.
Ferruginous hawk	<i>Buteo regalis</i>	SPC	Absent	Unlikely to occur.
Grasshopper sparrow	<i>Ammodramus savannarum</i>	SPC	Absent	Unlikely to occur.
Great Plains Toad	<i>Bufo cognatus</i>	SPC	Potentially suitable.	Species specific surveys would be required to rule out presence in the project area.
Greater sage-grouse	<i>Centrocercus urophasianus</i>	SPC	Absent	Unlikely to occur.
Kit fox	<i>Vulpes macrotis</i>	SPC	Absent	Unlikely to occur.
Least Chub	<i>Notichthys phlegethontis</i>	CS	Absent	Unlikely to occur.
Lewis's woodpecker	<i>Melanerpes lewis</i>	SPC	Absent	Unlikely to occur.
Long-billed curlew	<i>Numenius americanus</i>	SPC	Absent	Unlikely to occur but there are documented occurrences within two miles of the project area (UDWR 2018).
Lyrate mountainsnail	<i>Oreohelix haydeni</i>	SPC	Absent	Unlikely to occur.
Mountain Plover	<i>Charadrius montanus</i>	SPC	Absent	Unlikely to occur.
Northern goshawk	<i>Accipiter gentilis</i>	CS	Potentially suitable	Species specific surveys would be required to rule out presence in the project area.
Northern Leatherside Chub	<i>Lepidomeda copei</i>	SPC	Absent	Unlikely to occur.
Northwest Bonneville Pyrg	<i>Pyrgulopsis variegata</i>	SPC	Absent.	Unlikely to occur.
Preble's Shrew	<i>Sorex preblei</i>	SPC	Absent	Unlikely to occur.
Pygmy Rabbit	<i>Brachylagus idahoensis</i>	SPC	Absent	Unlikely to occur.
Short-eared owl	<i>Asio flammeus</i>	SPC	Absent	May occur incidentally, not a nesting habitat type [however, there are documented occurrences within two miles of the project area (UDWR 2018)]
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SPC	Absent	Unlikely to occur.
Utah Physa	<i>Physella utahensis</i>		Absent	Unlikely to occur.
Western pearlshell	<i>Margaritifera falcata</i>	SPC	Absent	Unlikely to occur- believed extirpated from the State.
Western toad	<i>Anaxyrus boreas</i>	SPC	Potentially suitable.	Species specific surveys would be required to rule out presence in the project area.
Yellowstone Cutthroat Trout	<i>Oncorhynchus clarkii bouvieri</i>	SPC	Absent	Unlikely to occur.

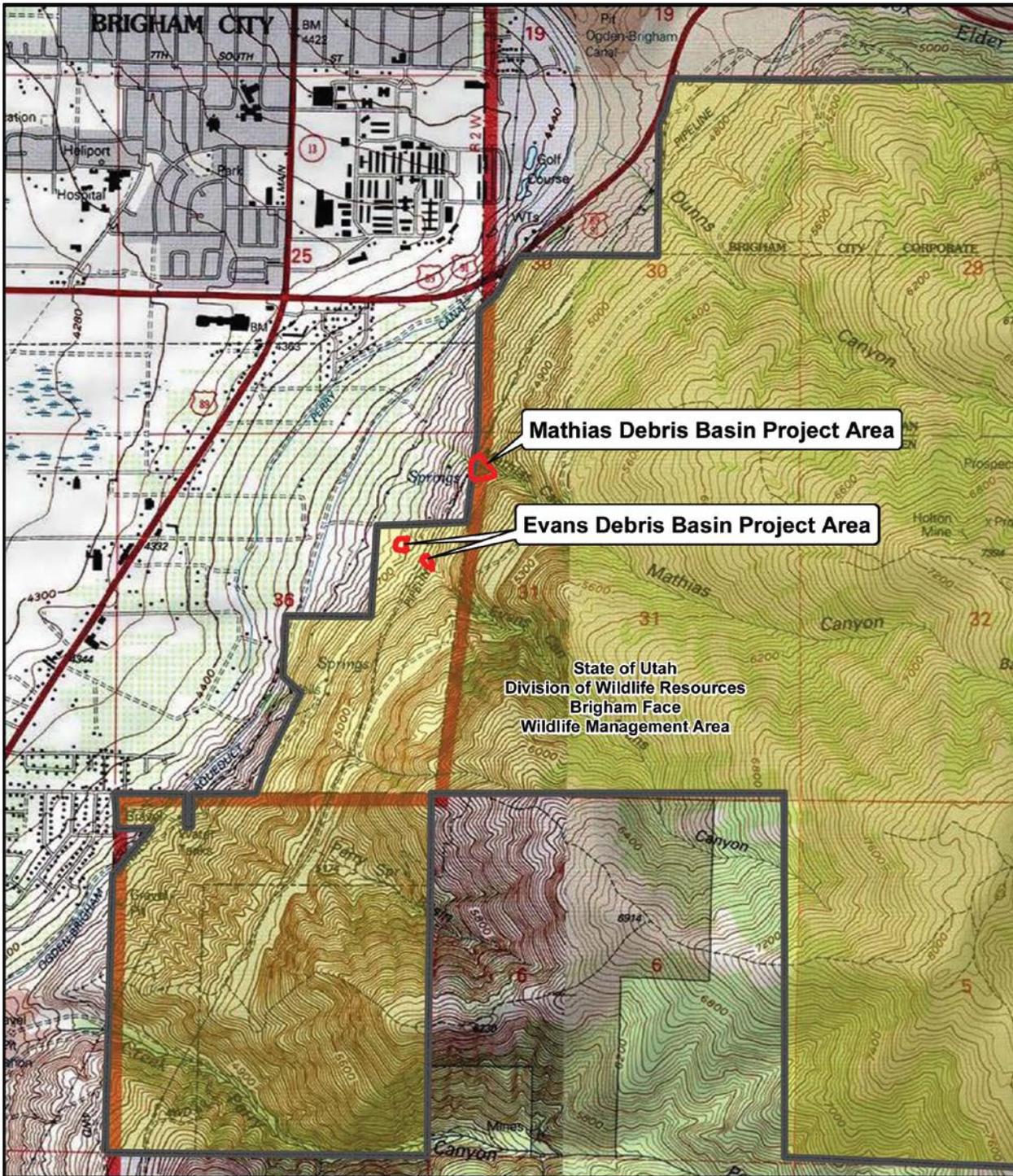
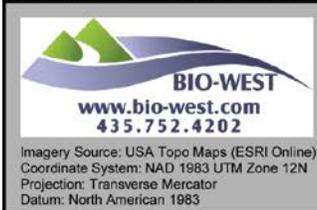
SPC = Wildlife species of concern; CS = Species receiving special management under a Conservation Agreement in order to preclude the need for Federal listing (UDWR 2017).



Imagery Source: USA Topo Maps (ESRI Online)
Coordinate System: NAD 1983 UTM Zone 12N
Projection: Transverse Mercator
Datum: North American 1983

**Perry Flood Control District
Evans and Mathias Debris Basins
Project Location Map**



BIO-WEST
www.bio-west.com
435.752.4202

Imagery Source: USA Topo Maps (ESRI Online)
Coordinate System: NAD 1983 UTM Zone 12N
Projection: Transverse Mercator
Datum: North American 1983

**Perry Flood Control District
Evans and Mathias Debris Basins
Project Area Map**





Mathias Drainage riparian area edge north side facing west.



Mathias Drainage Perennial Stream Channel.



Mathias Drainage Perennial Stream Channel.



Mathias Drainage riparian area.



Evans Drainage Intermittent Stream Channel.



Pipeline Road Through Evans Drainage Facing North.



Existing Evans Drainage Lower Basin.



Existing Evans Drainage Lower Basin Intermittent Stream Flow Area.



GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

State of Utah

DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER
Executive Director

Division of Wildlife Resources

MICHAEL D. FOWLKS
Division Director

October 15, 2018

Bob Thomas
Bio-West
1063 West 1400 North
Logan, UT 84123

Subject: Species of Concern Near the Perry Debris Basins

Dear Bob Thomas:

I am writing in response to your email dated October 5, 2018 regarding information on species of special concern proximal to the proposed Perry Debris Basins Project located in approximately Section 36 of Township 9 North, Range 2 West, in Perry, Box Elder County, Utah.

The Utah Division of Wildlife Resources (UDWR) does not have records of occurrence for any threatened, endangered, or sensitive species within a ½-mile radius of the project area noted above. However, within a two-mile radius there are recent records of occurrence for long-billed curlew and short-eared owl, and historical records of occurrence for American white pelican. All of the aforementioned species are included on the Utah Sensitive Species List.

The information provided in this letter is based on data existing in the Utah Division of Wildlife Resources' central database at the time of the request. It should not be regarded as a final statement on the occurrence of any species on or near the designated site, nor should it be considered a substitute for on-the-ground biological surveys. Moreover, because the Utah Division of Wildlife Resources' central database is continually updated, and because data requests are evaluated for the specific type of proposed action, any given response is only appropriate for its respective request.

In addition to the information you requested, other significant wildlife values might also be present on the designated site. Please contact UDWR's habitat manager for the northern region, Scott Walker, at (801) 476-2776 if you have any questions.

Please contact our office at (801) 538-4759 if you require further assistance.

Sincerely,

Sarah Lindsey
Information Manager
Utah Natural Heritage Program

cc: Scott Walker



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Utah Ecological Services Field Office
2369 West Orton Circle, Suite 50
West Valley City, UT 84119-7603
Phone: (801) 975-3330 Fax: (801) 975-3331
<http://www.fws.gov>
<http://www.fws.gov/utahfieldoffice/>

In Reply Refer To:

November 01, 2019

Consultation Code: 06E23000-2020-SLI-0110

Event Code: 06E23000-2020-E-00236

Project Name: Evans and Mathias Canyons Debris-Retention Basins

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
 - USFWS National Wildlife Refuges and Fish Hatcheries
 - Migratory Birds
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Utah Ecological Services Field Office

2369 West Orton Circle, Suite 50

West Valley City, UT 84119-7603

(801) 975-3330

Project Summary

Consultation Code: 06E23000-2020-SLI-0110

Event Code: 06E23000-2020-E-00236

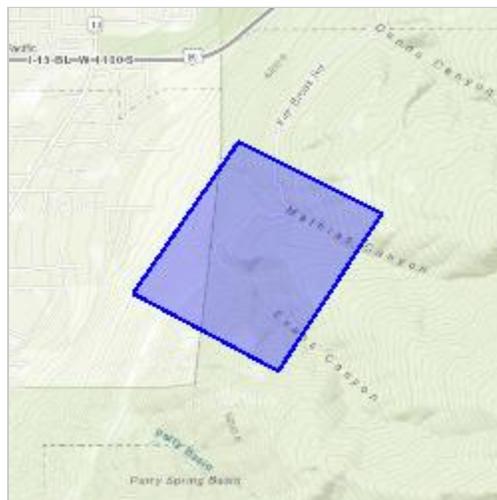
Project Name: Evans and Mathias Canyons Debris-Retention Basins

Project Type: DREDGE / EXCAVATION

Project Description: The Perry Flood Control District proposes to construct debris-retention basins to protect public safety, public infrastructure, and existing and future development from the risk of a debris flow. At Mathias Canyon, there is an existing concrete irrigation water diversion structure at the mouth of the canyon. That structure would be removed and replaced with an earthen embankment and adequately sized debris-retention basin for the estimated potential debris flow. At the Evans Canyon location, the Flood District has an existing debris-retention basin that was determined to be inadequately sized to contain the debris flow potential from the canyon. Therefore, the Flood District proposes to expand the size of the existing basin and also to construct a second basin upstream from the existing basin to provide additional debris flow containment capacity.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/41.47430934187504N112.00291226331632W>



Counties: Box Elder, UT

Endangered Species Act Species

There is a total of 0 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

-
1. The [Migratory Birds Treaty Act](#) of 1918.
 2. The [Bald and Golden Eagle Protection Act](#) of 1940.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Brewer's Sparrow <i>Spizella breweri</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9291	Breeds May 15 to Aug 10

NAME	BREEDING SEASON
<p>Clark's Grebe <i>Aechmophorus clarkii</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Jan 1 to Dec 31
<p>Golden Eagle <i>Aquila chrysaetos</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/1680</p>	Breeds Dec 1 to Aug 31
<p>Green-tailed Towhee <i>Pipilo chlorurus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9444</p>	Breeds May 1 to Aug 10
<p>Lesser Yellowlegs <i>Tringa flavipes</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679</p>	Breeds elsewhere
<p>Long-billed Curlew <i>Numenius americanus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5511</p>	Breeds Apr 1 to Jul 31
<p>Marbled Godwit <i>Limosa fedoa</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481</p>	Breeds elsewhere
<p>Olive-sided Flycatcher <i>Contopus cooperi</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914</p>	Breeds May 20 to Aug 31
<p>Sage Thrasher <i>Oreoscoptes montanus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9433</p>	Breeds Apr 15 to Aug 10
<p>Willet <i>Tringa semipalmata</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Apr 20 to Aug 5
<p>Willow Flycatcher <i>Empidonax traillii</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/3482</p>	Breeds May 20 to Aug 31

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

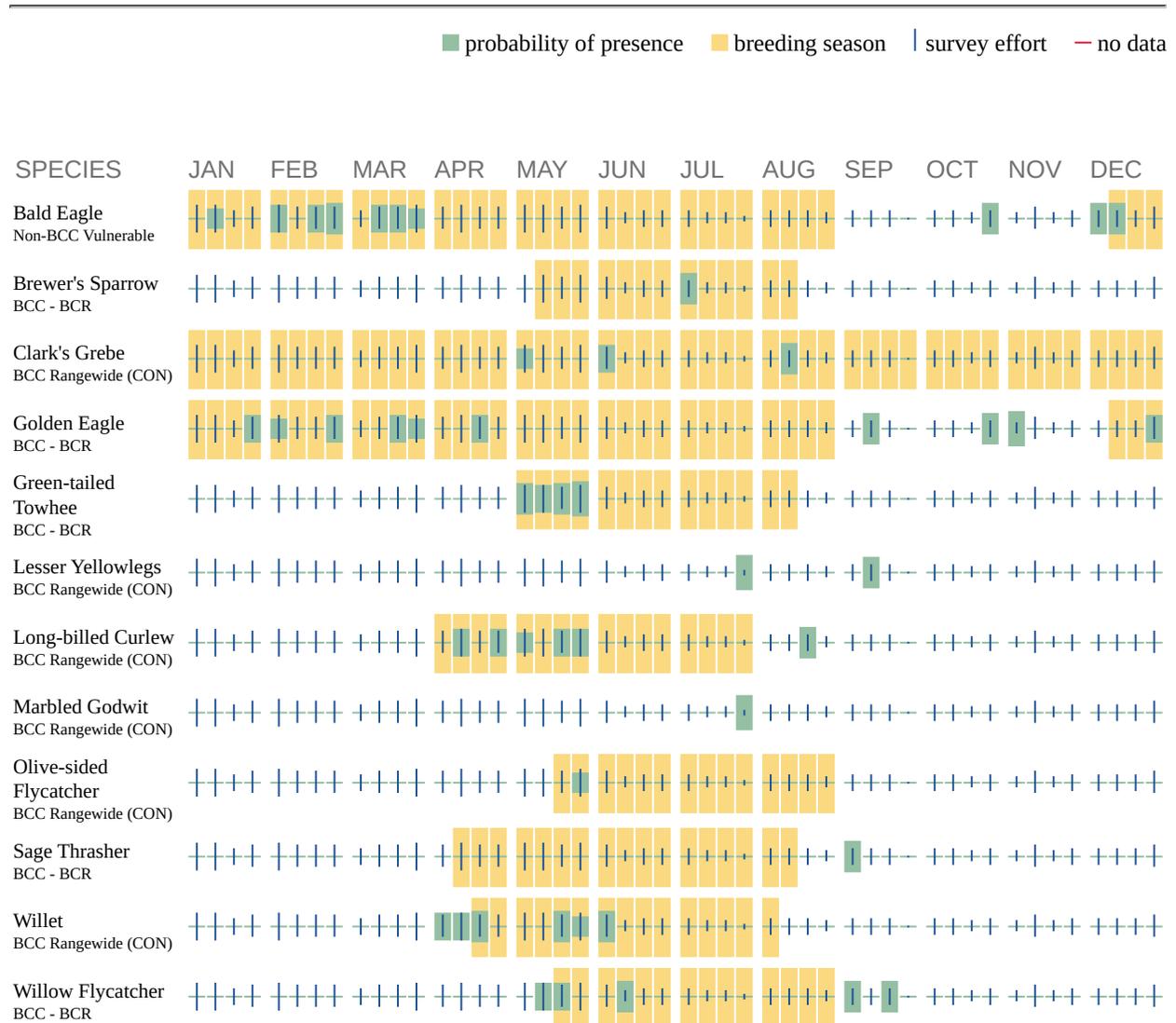
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

**APPENDIX C: CULTURAL RESOURCES SURVEY
REPORT**

COVER PAGE

**Must Accompany All Project Reports
Submitted to the Utah SHPO**



Report Title: A Cultural Resources Inventory of Three Detention Basins in Perry, Box Elder County, Utah
UDSH Project Number: U18HP0838s Org. Project Number: Report No. 2195
Report Date: December 4, 2018 County(ies): Box Elder
Report Author(s): John Rasmussen Principal Investigator: Wendy Simmons Johnson
Record Search Date(s): July 15, 2018 Field Supervisor(s): John Rasmussen
Intensive Acres Surveyed (<15m intervals): 4 Recon/Intuitive Acres Surveyed (<15m intervals): 0
USGS 7.5' Series Map Reference(s): Willard, Utah (1998)

Sites Reported	Count	Smithsonian Trinomials
Revisits (no updated site forms)	0	
Updates (updated site forms attached)	0	
New recordings (site forms attached)	0	
Total Count of Archaeological Sites in APE	0	
Historic Structures (structures forms Attached)	0	
Total National Register Eligible Sites	0	

*Please list all site numbers per category. Number strings are acceptable (e.g. "42TO1-13; 42TO15"). Cells should expand to accommodate extensive lists.

Checklist of Required Items for Submittal to SHPO

- "Born Digital" Report in a PDF/A format
 - SHPO Cover Sheet
 - File Name is the UDSH Project Number with no hyphens or landowner suffixes
- "Born Digital" Site forms in PDF/A format
 - UASF with embedded maps and photos
 - File name is Smithsonian Trinomial without leading zeros (e.g. 42TO13 not 42TO00013)
 - Photo requirements (including size and quality)
- Archaeological Site Tabular Data
 - Single spreadsheet for each project
 - Follows UTSHPO template (info here: <https://goo.gl/7SLMqj>)
- GIS data
 - Zipped polygon shapefile or geodatabase of survey (if different from APE) or other activity area with required field names and variable intensity denoted
 - Zipped polygon shapefile or geodatabase of site boundaries with the required field name

**A CULTURAL RESOURCE SURVEY OF
THREE DETENTION BASINS IN PERRY
BOX ELDER COUNTY, UTAH**

by

John Rasmussen
Archaeologist

Prepared for:

BIO-WEST
1063 West 1400 North
Logan, Utah 84321-2291

Prepared by:

Commonwealth Heritage Group, Inc.
3670 Quincy Avenue, Suite 203
Ogden, Utah 84403

Utah State Antiquities Project No. U18HP0838

Utah Public Lands Policy Coordination Office Permit No. 308

Cultural Resource Report No. 2195

December 4, 2018

ABSTRACT

In the summer of 2018, BIO-WEST of Logan, Utah requested that Commonwealth Heritage Group, Inc. (Commonwealth) complete a cultural resources inventory of three detention basins in Evans and Matthias Canyons, just east of Perry in Box Elder County, Utah. The project is located in T9N., R1W., Section 31 and T9N., R2W., Section 36 on USGS Quadrangle Willard, Utah (1998). During this survey, no cultural resource sites were located, and the only positive identification of cultural material came in the form of a single isolated find (IF1). Since no significant cultural resources were located in the project area, Commonwealth recommends that there will be **No Historic Properties Affected** by this project.

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PROJECT DESCRIPTION

In the summer of 2018, BIO-WEST of Logan, Utah requested that Commonwealth Heritage Group, Inc. (Commonwealth) complete a cultural resources inventory of three detention basins in Evan and Mathias Canyons, just east of Perry in Box Elder County, Utah. The project is located in T9N., R1W., Section 31 and T9N., R2W., Section 36 on USGS Quadrangle Willard, Utah (1998). The purpose of the cultural resources survey is to identify, record, and evaluate any cultural resources for eligibility to the National Register of Historic Places (NRHP). The project consists of three small parcels totaling less than 4 acres. This survey was conducted under the authority of Public Lands Policy Coordination Office Permit No. 308.

RECORDS SEARCH

Deb Miller, with the Antiquities Division at the Utah State Historic Preservation Office in Salt Lake City, conducted a Geographical Information Systems file search for the project area on June 15, 2018. Two cultural resource projects and a single cultural resources site were identified within one-half mile of the current project area (Table 1 and 2).

Table 1. Sites Recorded within One-half Mile of the Current Study Area.					
Site No.	Associated Project No.	Site Type	Site Description	Distance to APE	Eligibility
42BO1720	U09SH0158	Canal	Historic Perry Canal	0.2 mi	Eligible

Table 2. Projects Conducted within One-half Mile of the Current Study Area.			
Report #	Company	Project	Author/Date
U09SH0158	NRCS	Irrigation System North of Perry	Williamson 2009
U08EO1157	EPG	Populus To Ben Loman	Weymouth 2008

No other cultural resource sites have been recorded in the vicinity of the current project area. The NRHP and the General Land Office Plat Maps were examined for historic resources in the current project. There were no NRHP listed sites noted within one mile of the current project area.

ENVIRONMENT

The project area is located in the foothills of the Wasatch Mountain Range, just east of Perry, Utah. Vegetation in the area generally consists of typical sagebrush community species, except in the canyon areas where cottonwoods and riparian species are common. The three project area parcels are located along the slopes between Evan and Mathias Canyons, at an elevation ranging between 4,700 to 4,900 feet above mean sea level. Sediments range from coarse sands with a high content of Pleistocene gravels, to fine silty sands with small, angular gravels. Vegetation in the area covers approximately 30-percent of the ground surface and consists mainly of sagebrush and high meadow community species including sagebrush, scrub oak, rabbit brush, and a large variety of assorted grasses. Cottonwoods and riparian species are also present within Evans and Mathias Canyons. Natural disturbance in the area consists primarily of wind and water erosion.

METHODOLOGY

The entire project area was surveyed at an intensive level. The project consists of less than 4 acres of lands managed by the Utah Division of Wildlife Resources. The project was surveyed on June 19, 2018 by John Rasmussen. The entire area was walked in parallel transects spaced no more than 15 meters (50 feet) apart. A Trimble GPS unit with sub-meter accuracy was used to verify the project location.

RESULTS

Commonwealth conducted an intensive level cultural resource inventory for the three detention basins near Perry, Utah. During this survey, no cultural resources sites and only a single isolated find was observed (IF1) (Table 3).

Isolated Find

A single isolated find (scatters of fewer than 15 artifacts) was recorded during this project. The isolate (IF1) consists of an isolated fragment of historic ceramic piping in a drainage. The following table describes this occurrence (Table 3).

IF #	Description	UTMs (Easting)	UTMs (Northing)
1	Ceramic pipe fragment with a 1 inch thick diameter and a red slip. Based on the curve of the fragment, it appears to have been from an approximately 6 inch diameter pipe.	415813	4592052

RECOMMENDATION OF EFFECT

Since the only cultural resource encountered during the project was an insignificant isolated find, Commonwealth recommends that **No Historic Properties will be Affected** by construction of this project.



GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

State of Utah

DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER
Executive Director

Utah Geological Survey

R. William Keach II
State Geologist/Division Director

August 22, 2019

Sean Keenan
BIO-WEST, Inc.
1063 West 1400 North
Logan UT 84321-2291

RE: Paleontological file search and recommendations for the Perry City Flood Control District, Evans and Mathias Debris Basins, Box Elder County, Utah
U.C.A. 79-3-508 (Paleontological) Compliance; Request for Confirmation of Literature Search

Dear Sean:

I have conducted a paleontological file search for the Perry City Flood Control Debris Basins Project in response to your request of August 21, 2019. There are no paleontological localities recorded in our files in this project area. Quaternary and Recent alluvial and lacustrine deposits that are exposed here have a low potential for yielding significant fossil localities (PFYC 2). Unless fossils are discovered as a result of construction activities, this project should have no impact on paleontological resources.

If you have any questions, please call me at (801) 537-3311.

Sincerely,

Martha Hayden
Paleontological Assistant

