A Biological Evaluation Report for

Wasatch County School District Proposed High School Site

Heber, Wasatch County, Utah

Submitted to
Wasatch County School District
101 East 200 North
Heber City, Utah 84032

Submitted by
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August 12, 2019

CRS ENGINEERS

Abstract

The Wasatch County School District is evaluating potential high school sites in Wasatch County. In July 2019, the School District contracted with CRS Engineers (CRS) to provide environmental analyses of a potential site located in Heber City. CRS evaluated federally endangered, threatened, proposed or candidate species in addition to designated and proposed critical habitat. CRS also evaluated migratory birds of conservation concern (BCC), other migratory birds protected by the Migratory Bird Treaty Act (MBTA), and the Bald and Golden Eagle Protection Act.

No federally listed species, critical habitat, BCC, or eagles were identified during the survey. Additionally, CRS did not identify migratory birds or active nests on site.

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1.0 Introduction

The Wasatch County School District is evaluating potential high school sites in Wasatch County. In July 2019, the School District contracted with CRS Engineers (CRS) to provide environmental analyses of a potential site located in Heber City. CRS evaluated federally endangered, threatened, proposed or candidate species in addition to designated and proposed critical habitat. CRS has prepared the following biological evaluation (BE) as required by section 7(c) of the Endangered Species Act (ESA) for this project located in Wasatch County. CRS conducted site reviews of the study area on June 28, July 11, and August 7, 2019 during the Ute-Ladies'-Tresses (ULT) growing season (see Figure 1).

Figure 1: View of the survey area; view to the west.

1.1 Project Location and Habitat Description

The survey area measures approximately 63 acres and is located in Heber City, Utah on public and privately owned land located in Section 31, Township 3 South, Range 5 East. Land within the survey area is flat, sloping slightly from north to south with elevations ranging from 5,558–5,545 feet (1,690–1,694 meters) above sea level (see Figures 2–3). Soils within the survey area have been disturbed by residential development, transportation, grazing, and agricultural use. The survey area is located within the Moist Wasatch Front Footslopes (EPA, 2018). Vegetation was assessed during all three site surveys (see Table 1 and Appendix A: Site Photographs). Water levels were extremely high during the June 28 visit. Due to the need to control canal water levels within the Heber Valley, water was released into any available field with landowner permission.

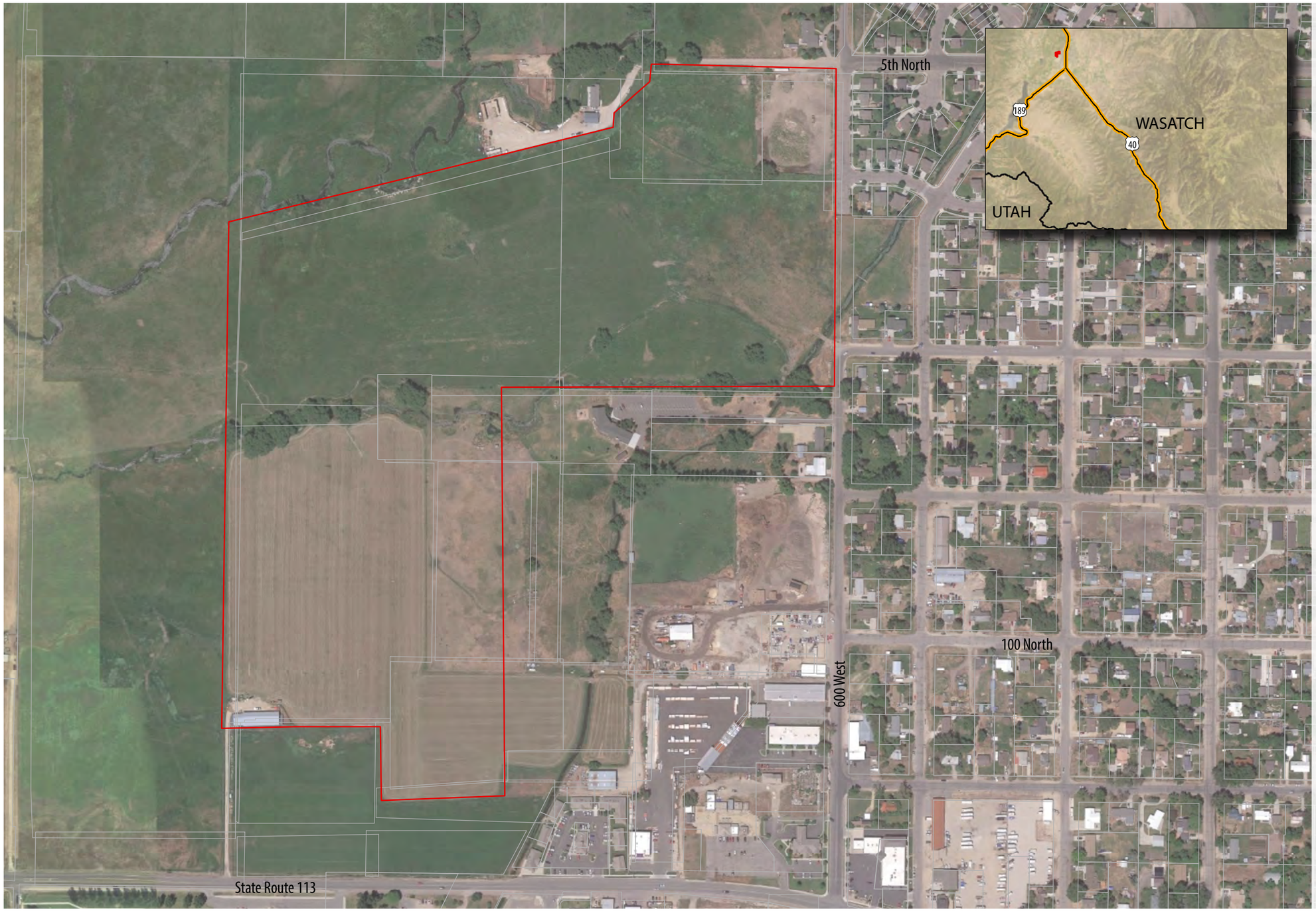

Figure 2. Proposed Project on Aerial Photography

Source: Google Earth, 2018

Doug Jacobson; July 31, 2019

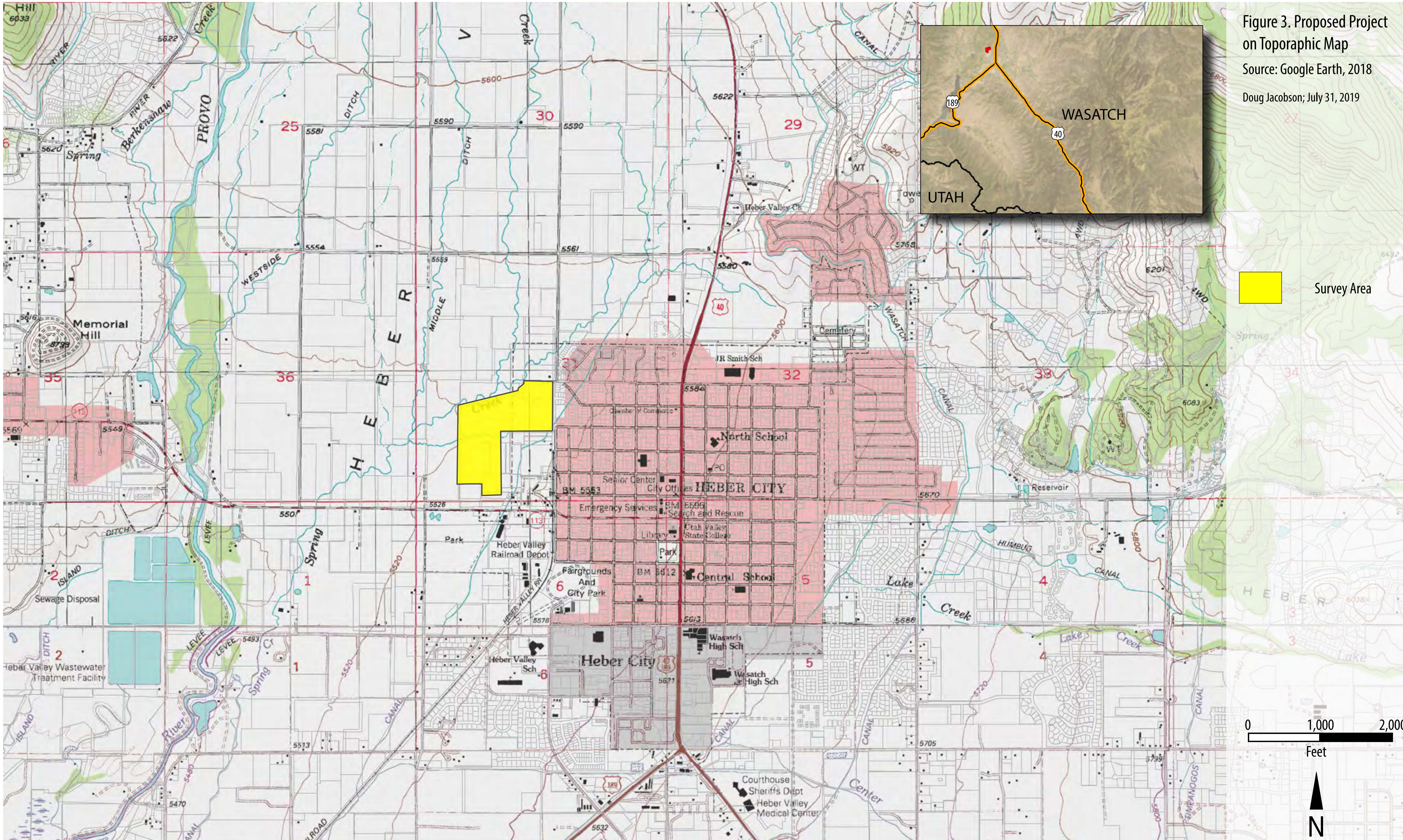
Figure 3. Proposed Project on Toporaphic Map
Source: Google Earth, 2018
Doug Jacobson; July 31, 2019
WASATCH
UTAH
Survey Area
0
1,000
2,000
Feet
N
HEBER CITY
Heber City
Memorial Hill
PROVO
Sewage Disposal
Heber Valley Wastewater Treatment Facility
North School
Central School
JR Smith Sch
Wasatch High Sch
Heber Valley Sch
Heber Valley Railroad Depot
Fairgrounds And City Park
Courthouse
Sheriffs Dept
Heber Valley Medical Center
Cemetery
Reservoir
Heber Valley Ch

Table 1. Vegetation identified within the survey area

Common Name	Scientific Name
Alfalfa	*Medicago sativa*
Cottonwood	*Populus* sp.
Dandelion	*Taraxacum officinale*
Flixweed	*Descurainia sophia*
Houndstongue	*Cynoglossum officinale*
Lambsquarters	*Chenopodium album*
Meadow foxtail	*Alopecurus pratensis*
Milkweed	*Asclepias syriaca*
Mountain rush	*Juncus arcticus* ssp. *littoralis*
Quack grass	*Elymus repens*
Red clover	*Trifolium pratense*
Redroot pigweed	*Amaranthus retroflexus*
Rescuegrass	*Bromus catharticus*
Russian olive	*Elaeagnus angustifolia*
Smooth horsetail	*Equisetum laevigatum*
Soft stem bulrush	*Schoenoplectus tabernaemontani*
Spike rush	*Eleocharis palustris*
Timothy grass	*Phleum pratense*
White clover	*Trifolium repens*
Whitetop	*Lepidium draba*

1.2 Qualifications

This report was prepared by Doug Jacobson. Doug received his master's degree in environmental science at Brigham Young University in Provo, Utah. He has four years experience studying and identifying Wasatch Range and Great Basin vegetation and wildlife. He has been involved with several special-status botany, raptor and other wildlife, and threatened and endangered species survey projects.

2.0 Literature Search

2.1 ESA Listed Species

An official species list was obtained from the United States Fish and Wildlife Service (USFWS) Information Planning and Conservation (IPaC) System database (see Appendix B: Official Species List). These species, listed in Table 2, are derived from habitat conditions and potential species occurrences within the survey area. No critical habitat was found within the survey area.

Table 2. Federally listed species potentially present within the survey area according to the IPaC database.

Common Name *Scientific Name*	Status	Suitable Habitat
Canada lynx *Lynx canadensis*	Threatened	Canada lynx occupy remote boreal or coniferous forests at high altitudes. Lynx prefer dense horizontal cover, persistent snow and an abundance of snowshoe hare. In Utah, lynx prefer forests comprised of Engelmann spruce, subalpine fir, and lodgepole pine forest cover types (Lynx Biology Team, 2013).
Ute ladies'-tresses *Spiranthes diluvialis*	Threatened	Ute ladies'-tresses are found in wetlands and riparian areas, including spring habitats, mesic meadows, river meanders, and floodplains (USFWS, 1992).

2.2 Migratory Birds of Conservation Concern

The search performed using the USFS IPaC system database indicated 11 migratory birds that may range within the survey area (see Appendix B: Official Species List). These species are listed in Table 3.

Table 3. Migratory Birds of Conservation Concern potentially present within the survey area according to the IPaC database.

Species Scientific Name	Level of Concern[a]	Season Occurrence	Breeding Season	Potential Habitat Use
Bald eagle *Haliaeetus leucocephalus*	Non-BCC Vulnerable	Breeding	Dec 1 to Aug 31	Foraging
Brewer's sparrow *Spizella breweri*	BCC-BCR	Breeding	May 15 to Aug 10	Nesting Foraging
Clark's grebe *Aechmophorus clarkii*	BCC Rangewide (CON)	Breeding	Jan 1 to Dec 31	Foraging
Golden eagle *Aquila chrysaetos*	BCC-BCR	Year-round	Dec 1 to Aug 31	Foraging
Lesser yellowlegs *Tringa flavipes*	BCC Rangewide (CON)	Migration	Breeds elsewhere	Foraging
Lewis's woodpecker *Melanerpes lewis*	BCC Rangewide (CON)	Migration	Apr 20 to Sep 30	Nesting Foraging
Olive-sided flycatcher *Contopus cooperi*	BCC Rangewide (CON)	Breeding	May 20 to Aug 31	Nesting Foraging
Rufous hummingbird *Selasphorus rufus*	BCC	Migration	Breeds elsewhere	Nesting Foraging
Virginia's warbler *Oreothlypis virginiae*	BCC Rangewide (CON)	Breeding	May 1 to Jul 31	Nesting Foraging
Willet *Tringa semipalmata*	BCC Rangewide (CON)	Migration	Apr 20 to Aug 5	Nesting Foraging
Willow flycatcher *Empidonax traillii*	BCC-BCR	Breeding	May 20 to Aug 31	Nesting Foraging

[a]BCC Rangewide = Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere in the USA; BCC-BCR = BCCs that are of concern only in particular Bird Conservation Regions (BCRs); Non-BCC = Not BCC in the area but appear on the list either due to the Eagle Act requirements, or potential susceptibilities in offshore areas

Bald and Golden Eagles

Due to their protection under the Bald and Golden Eagle Act, CRS examined the survey area for any signs of eagle nesting.

2.3 Migratory Birds Protected Under the MBTA

The survey was conducted during nesting season. No birds were identified within or flying over the survey area (see Table 2).

3.0 Evaluation Results

3.1 ESA Listed Species

Canada lynx

No suitable Canada lynx habitat exists within the survey area. The survey contains open agricultural fields, small areas of wet meadow, and sparse riparian habitat, and does not contain the coniferous habitat required by Canada lynx (see Appendix A: Site Photographs). CRS recommends that the proposed project would have no effect on Canada lynx.

Ute ladies'-tresses

While wetland habitat containing species such as Baltic rush (*Juncus balticus*), timothy-grass (*Phleum pratense*), and white clover (*Trifolium repens*) associated with wet meadow wetland habitat were identified within the study area (comprising 0.5% of the study area), suitable wetland habitat containing well-drained soils and Ute ladies'-tresses indicator species such as redtop (*Agrostis stolonifera*), lesser indian paintbrush (*Castilleja minor*), horsetail (*Equisetum* spp.), or goldenrod (*Solidago* spp.) were not identified within the study area. Stream banks within the study area are steep and do not provide the habitat required for ULT growth (some are armored with large concrete fragments or subject to grazing impacts). Additionally, water resources within the study area are controlled, and are significantly reduced or entirely shut down throughout the year, which reduces habitat conducive to ULT (see Appendix A: Site Photographs). Because ULT and associated indicator species were not observed during the survey and habitat is not conducive to ULT growth and establishment, CRS recommends that the proposed project would have no impact on ULT.

3.2 Migratory Birds of Conservation Concern

No birds listed in Table 3 were identified during any of the field visit dates. The proximity to residential and transportation areas indicate that the presence of BCC species is unlikely. CRS recommends that the proposed project would have no effect on birds of conservation concern.

Bald and Golden Eagles

CRS examined the survey area for sign of raptors protected by the Bald and Golden Eagle Protection Act. Bald eagles prefer to nest near large bodies of water with an abundance of fish (USFWS, 2017). Golden eagles are often found in open areas. They prefer to nest on cliffs or tall

trees that offer an unobstructed view of the surrounding landscape (USFWS, 2017). No signs of eagle nests in trees or on power poles were observed during the survey. CRS recommends that the proposed project would have no effect on eagles.

3.3 Migratory Birds Protected under the MBTA

No migratory birds were observed during any of the site surveys. While the survey area contains nesting and foraging habitat suitable for some migratory birds, agricultural, residential, and land disturbing (fill deposition) activities within and surrounding the study area decrease the likelihood of migratory bird nesting. The MBTA makes it illegal to take, possess, import, export, transport, sell, purchase, barter or offer for sale, purchase, or barter any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued by the Department of the Interior. More than 1,000 native bird species are protected by the MBTA.

A Presidential Memorandum issued on December 22, 2017 states that the MBTA, "prohibitions on pursuing, hunting, taking, capturing, killing, or attempting to do the same apply only to affirmative actions that have as their purpose the taking or killing of migratory birds, their nests, or their eggs" (Jorjani, 2017). This memorandum affirms that incidental death and/or destruction during development, construction, or operation of otherwise lawful activities are not in violation of the MBTA (Levin et al., 2018).

4.0 Conclusion

No federally listed species, critical habitat, BCC, or eagles were identified during the survey. Additionally, CRS did not identify migratory birds or active nests on site. CRS recommends that the project would have no effect on birds protected under the MBTA.

5.0 Sources Cited

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Biological Evaluation: Appendix A

Site Photographs

CRS ENGINEERS

Photo 1. View of Lake Creek, with concrete debris on bank, June 28, 2019.

Photo 2. View of the grazed and open land within of the survey area.

Photo 3. Sagebrush and Spring Creek Canal with high water levels.

Photo 4. Overview of grazing area with sparse cottonwood trees near Lake Creek in background.

Biological Evaluation: Appendix B

Official Species List

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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: July 31, 2019
Consultation Code: 06E23000-2019-SLI-0531
Event Code: 06E23000-2019-E-01396
Project Name: Weber County Proposed High School Environmental Analysis

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: 06E23000-2019-SLI-0531

Event Code: 06E23000-2019-E-01396

Project Name: Weber County Proposed High School Environmental Analysis

Project Type: DEVELOPMENT

Project Description: Environmental evaluation of proposed site for high school.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/40.51103665037263N111.42885961048287W

Counties: Wasatch, UT

Endangered Species Act Species

There is a total of 2 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 Fisheries[1], 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.

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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.

Mammals

NAME	STATUS
Canada Lynx *Lynx canadensis* Population: Wherever Found in Contiguous U.S. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened

Flowering Plants

NAME	STATUS
Ute Ladies'-tresses *Spiranthes diluvialis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2159	Threatened

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 Act[1] and the Bald and Golden Eagle Protection Act[2].

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.

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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 *Haliaeetus leucocephalus* 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 *Spizella breweri* 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
Clark's Grebe *Aechmophorus clarkii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Dec 31
Golden Eagle *Aquila chrysaetos* 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	Breeds Jan 1 to Aug 31
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Lewis's Woodpecker *Melanerpes lewis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9408	Breeds Apr 20 to Sep 30
Olive-sided Flycatcher *Contopus cooperi* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Rufous Hummingbird *selasphorus rufus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8002	Breeds elsewhere
Virginia's Warbler *Vermivora virginiae* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9441	Breeds May 1 to Jul 31
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Willow Flycatcher *Empidonax traillii* 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	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:

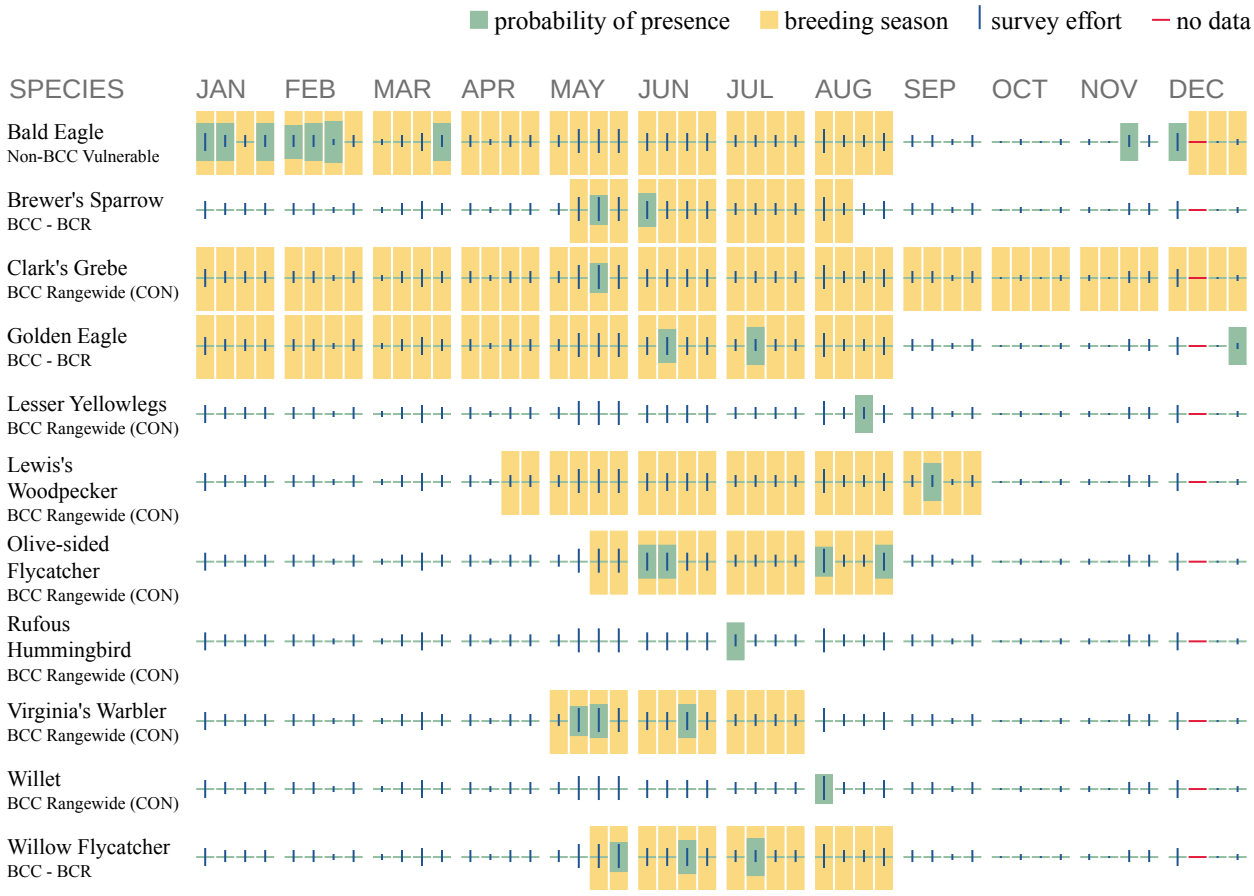
1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability 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.

Biological Evaluation: Appendix C

Custom Soils Report

CRS ENGINEERS

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Heber Valley Area, Utah - Parts of Wasatch and Utah Counties

Heber High School

July 15, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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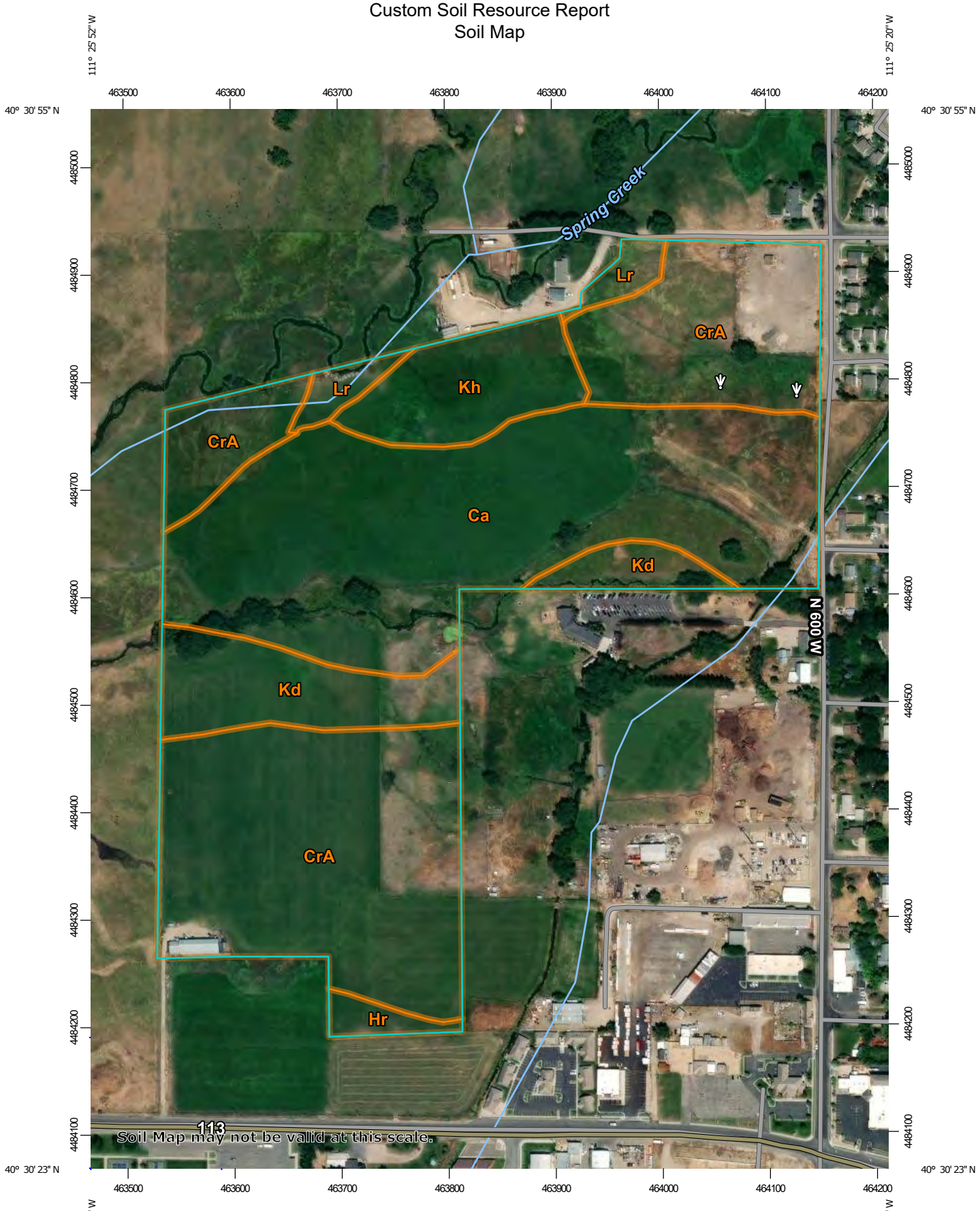
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:4,800 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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

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 1:24,000.

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: Heber Valley Area, Utah - Parts of Wasatch and Utah Counties
Survey Area Data: Version 9, Sep 11, 2018

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

Date(s) aerial images were photographed: Jun 14, 2016—Nov 8, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

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
Ca	Center Creek loam	24.7	38.5%
CrA	Crooked Creek clay loam, 1 to 3 percent slopes	26.6	41.3%
Hr	Holmes gravelly loam	0.7	1.2%
Kd	Kovich loam, channeled	6.3	9.8%
Kh	Kovich loam, moderately deep water table	4.4	6.9%
Lr	Logan silty clay, cold variant	1.5	2.4%
Totals for Area of Interest		**64.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Heber Valley Area, Utah - Parts of Wasatch and Utah Counties

Ca—Center Creek loam

Map Unit Setting

National map unit symbol: jxp1
Mean annual precipitation: 16 to 22 inches
Mean annual air temperature: 40 to 45 degrees F
Frost-free period: 70 to 90 days
Farmland classification: Prime farmland if irrigated and drained

Map Unit Composition

Center creek and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Center Creek

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave

Typical profile

A12 - 0 to 5 inches: loam
B1 - 5 to 12 inches: loam
B21t - 12 to 20 inches: loam
B22t - 20 to 33 inches: clay loam
B3 - 33 to 40 inches: very gravelly coarse sandy loam
C1 - 40 to 50 inches: very gravelly sandy loam
C2 - 50 to 60 inches: extremely gravelly coarse sandy loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Available water storage in profile: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C
Ecological site: Semiwet Fresh Streambank (Narrowleaf Cottonwood) (R047XA006UT)
Hydric soil rating: No

Minor Components

Poorly drained soils

Percent of map unit: 5 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Other soils

Percent of map unit: 5 percent

CrA—Crooked Creek clay loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: jxp8
Mean annual precipitation: 16 to 22 inches
Mean annual air temperature: 40 to 45 degrees F
Frost-free period: 70 to 90 days
Farmland classification: Prime farmland if irrigated and drained

Map Unit Composition

Crooked creek and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Crooked Creek

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave

Typical profile

A11, A12 - 0 to 12 inches: clay loam
C1 - 12 to 23 inches: clay loam
C2 - 23 to 33 inches: silty clay
C3 - 33 to 42 inches: clay loam
C4 - 42 to 50 inches: clay
C5 - 50 to 70 inches: clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches

Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): 4w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: Interzonal Wet Fresh Meadow (Sedge) (R047XA008UT)
Hydric soil rating: Yes

Minor Components

Peaty surface soils

Percent of map unit: 5 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Interzonal Wet Fresh Meadow (Sedge) (R047XA008UT)
Hydric soil rating: Yes

Hr—Holmes gravelly loam

Map Unit Setting

National map unit symbol: jxqn
Mean annual precipitation: 16 to 22 inches
Mean annual air temperature: 40 to 45 degrees F
Farmland classification: Farmland of statewide importance

Map Unit Composition

Holmes and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Holmes

Setting

Landform: Stream terraces, alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear, concave
Across-slope shape: Concave, convex

Typical profile

Ap, A12 - 0 to 11 inches: gravelly loam
B2t - 11 to 21 inches: very gravelly loam
B3 - 21 to 28 inches: extremely gravelly coarse sandy loam
C - 28 to 60 inches: extremely gravelly loamy coarse sand

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: Mountain Stony Loam (Mountain Big Sagebrush) (R047XA461UT)
Hydric soil rating: No

Minor Components

Steed cold variant

Percent of map unit: 5 percent

Rasband

Percent of map unit: 5 percent

Center creek

Percent of map unit: 5 percent

Kd—Kovich loam, channeled

Map Unit Setting

National map unit symbol: jxqq
Mean annual precipitation: 16 to 22 inches
Mean annual air temperature: 40 to 45 degrees F
Farmland classification: Farmland of statewide importance

Map Unit Composition

Kovich and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kovich

Setting

Landform: Flood plains
Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear
Across-slope shape: Concave

Typical profile

A11, A12 - 0 to 11 inches: loam
A13, A14 - 11 to 29 inches: loam
2C1 - 29 to 41 inches: extremely cobbly sandy clay loam
2C2 - 41 to 60 inches: extremely gravelly sand

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water storage in profile: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: B/D
Ecological site: Interzonal Wet Fresh Meadow (Sedge) (R047XA008UT)
Hydric soil rating: Yes

Minor Components

Poorly drained soils

Percent of map unit: 5 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Cobbly surface soils

Percent of map unit: 5 percent

Kh—Kovich loam, moderately deep water table

Map Unit Setting

National map unit symbol: jxqr
Mean annual precipitation: 16 to 22 inches
Mean annual air temperature: 40 to 45 degrees F
Farmland classification: Farmland of statewide importance

Map Unit Composition

Kovich and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kovich

Setting

Landform: Flood plains, stream terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Concave

Typical profile

A11, A12 - 0 to 11 inches: loam
A13, A14 - 11 to 29 inches: loam
2C1 - 29 to 41 inches: extremely cobbly sandy clay loam
2C2 - 41 to 60 inches: extremely gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 20 to 40 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water storage in profile: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C
Ecological site: Interzonal Wet Fresh Meadow (Sedge) (R047XA008UT)
Hydric soil rating: No

Minor Components

Poorly drained soils

Percent of map unit: 5 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Lr—Logan silty clay, cold variant

Map Unit Setting

National map unit symbol: jxr0
Mean annual precipitation: 16 to 22 inches
Mean annual air temperature: 40 to 45 degrees F
Frost-free period: 70 to 90 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Logan and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Logan

Setting

Landform: Flood plains, stream terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Concave

Typical profile

A11, A12 - 0 to 10 inches: silty clay
C1k - 10 to 16 inches: silty clay
C2k - 16 to 23 inches: loam
C3 - 23 to 29 inches: loam
C4 - 29 to 35 inches: gravelly loam
C5 - 35 to 44 inches: sandy loam
2C6 - 44 to 66 inches: very gravelly loamy sand

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum in profile: 50 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C/D
Ecological site: Interzonal Wet Fresh Meadow (Sedge) (R047XA008UT)
Hydric soil rating: Yes

Minor Components

Peaty surface soils

Percent of map unit: 5 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Interzonal Wet Fresh Meadow (Sedge) (R047XA008UT)
Hydric soil rating: Yes

Gravelly soils

Percent of map unit: 5 percent