King County

ENVIRONMENTAL CHECKLIST

Middle Boise Creek – Evans Habitat Restoration Project
2013

Purpose of the Checklist:

The State Environmental Policy Act (SEPA), Chapter 43.21 RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

Instructions for Applicants:

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "**do not know**" or "**does not apply**." Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be a significant adverse impact.

Use of Checklist for Nonproject Proposals:

Complete this checklist for nonproject proposals, even though questions may be answered "**does not apply**." In addition, complete the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (PART D).

For nonproject actions, the references in the checklist to the words "**project**," "**applicant**," and "**property or site**" should be read as "**proposal**," "**proposer**," and "**affected geographic area**," respectively.

A. BACKGROUND

1. *Name of the proposed project, if applicable:*

   Middle Boise Creek– Evans Habitat Restoration Project 2013

2. *Name of Applicant:*

   King County Department of Natural Resources and Parks
   Water and Land Resources Division

3. *Address and phone number of applicant and contact person:*

   Carolyn Butchart
   King County Water and Land Resources Division
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   Seattle, WA 98104-3855
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4. *Date checklist prepared:*

   April 2013

5. *Agency requesting checklist:*

   King County Department of Natural Resources and Parks
   Water and Land Resources Division

6. *Proposed timing or schedule (include phasing, if applicable):*

   The Middle Boise Creek - Evans Habitat Restoration Project (hereafter referred to as the "Project") is scheduled to be constructed during the summer of 2013. All work below the ordinary high water line (OHWL) shall occur between July 15th and August 15 and may extend longer if the fish window is extended. The planting of native vegetation and installation of elk proof fencing will take place between October 1 and December 31, 2013.

7. *Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.*

   No.

8. *List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.*

   King County, Boise Creek Rapid Rural Reconnaissance Report, April 2004. Herrera Environmental Consultants, Inc., Middle Boise Creek Habitat Restoration and Flood Reduction Feasibility Study, February 22, 2011.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

No

10. List any government approvals or permits that will be needed for your proposal, if known.

- Clean Water Act Section 404 Permit - U.S. Army Corps of Engineers
- Endangered Species Act (ESA) Section 7 Consultation - National Oceanic and Atmospheric Administration Fisheries and United States Fish and Wildlife Service
- National Historic Preservation Act Section 106 Review
- Coastal Zone Management Consistency Determination
- Section 401 Water Quality Certification -Washington State Department of Ecology
- Clearing & Grading Permit (includes Flood Hazard Certification) – King County Department of Permitting & Environmental Review
- Hydraulic Project Approval – Washington State Department of Fish & Wildlife
- Washington State Shoreline Exemption – King County DDES (administrator)
- National Pollution Discharge Elimination System (NPDES) – WA Department of Ecology
- King County Code 21A.24.381

11. Give a brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on the project description.)

The King County Water and Land Resources Division proposes to enhance fish habitat in Boise Creek in a predominantly agricultural area on the Enumclaw Plateau. The channel will be widened by re-contouring the south bank, placing large woody debris (LWD) and willow clusters within the channel banks and channel bed, creating a bench to support wetland vegetation on the south west side of the widened channel, and enhance wetland and upland vegetation outside of the channel with willows and other native riparian plants across the project site. The widened channel with LWD and willow stakes will allow for natural fluvial processes to occur including discrete sediment bar formations that create historical low flow channel(s), increase channel sinuosity, development of scour pools and other diverse aquatic habitats, and provide cover and biomass to create rearing and refuge habitat for Chinook salmon and steelhead trout, which are listed as threatened species under the Endangered Species Act. The widened channel will also reduce water velocities and erosional forces that may indirectly reduce bank erosion. Willows and other native riparian species will be planted across the site to provide shade, improve water quality and improve habitat within the wetland.

Specific project objectives include:

- Enhancing Chinook and steelhead spawning and rearing habitat under all flow regimes by providing in-stream margin habitat, in-stream cover, large woody debris, and improved channel sinuosity;
- enhancing riparian habitat quality by planting native plants in the riparian zone to increase shade and reduce water temperature; and
- protecting water quality by adding vegetation to improve biofiltration and eliminating livestock access to the stream by constructing a fence.

King County will monitor and maintain the project for at least five years after construction.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity plan, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The project is located southeast of the City of Enumclaw within the Enumclaw Agricultural Production District (APD) in unincorporated King County. Boise Creek is a tributary to the White River, which is within Watershed Resource Inventory Area (WRIA) 10. Boise Creek forms the northern boundary of the project site; 268th Avenue SE forms the western boundary. The project is located in SE1/4 Section 25 of Township 20 N, Range 6 East. See Figure 1.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site (underline one): flat, rolling, hilly, steep slopes, mountainous, other.

The project site is located on the Enumclaw Plateau along the west flank of the Cascade Mountains. The relatively flat morphology of the Enumclaw Plateau is dominated by Holocene lahar deposits and forms the broad floodplain for Boise Creek.

b. What is the steepest slope on the site (approximate percent slope)?

The site is flat with a maximum slope of about 0.3%, with the exception of the stream banks themselves.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

Soils include Alderwood gravelly sandy loam, Buckley silt loam, Sultan silt loam.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No, except for those soils associated with streambank erosion.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate the source of fill.

The project will create a 0.63 acre widened channel with LWD, a benched area for wetland vegetation, and extensive plantings of native vegetation in order to create a mosaic of aquatic and wetland habitats. Total excavation for the widened channel and wetland bench is approximately 3,200 cubic yards of soil. Approximately 0.36 acres will be converted from upland habitat to riverine flow and 0.27 of existing wetland used for pasture for livestock will be enhanced to provide aquatic and wetland habitat.

Large wood will be placed in the widened channel bed and anchored using native material as ballast and native riparian species will be planted around and on top of the LWD to secure the wood from buoyancy and drag forces.

Approximately 1.9 acres of privately owned farmed wetland located south of the project site may be top-dressed with 2-inches of topsoil excavated from the restoration area and seeded with pasture grasses. This will improve pasture grass production but will not convert the wetland into upland habitat. No fill will be imported from off-site.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Erosion could occur during excavation; however, Best Management Practices (BMPs) will be used, as necessary, to prevent erosion or sedimentation during construction.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

No impervious surface area will be added to the project site.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

All known, available, and reasonable methods of prevention, control, and treatment (AKART), as well as Washington State Department of Ecology stormwater management manual Best Management Practices (BMPs), will be implemented.

2. Air

a. What types of emissions to the air would result from the proposal (for example, dust, automobile, odors, industrial wood smoke, greenhouse gases) during construction and when the project is completed? If any, generally describe and give approximate quantities, if known.

Construction activities may generate airborne dust in the work area. The proposed project, once construction is complete, will emit no gasses or other emissions with the potential to negatively affect health or climate.

Construction of the proposed project will use various vehicles and pieces of equipment that emit gasses with the potential to affect climate. These gasses include carbon dioxide (CO_2), methane and nitrous oxide, as well as others in much smaller amounts. The global warming potential (GWP) of these compounds is measured in "carbon dioxide equivalents", or CO_2e, which converts the GWP of various gasses into their equivalent in CO_2. The amount of CO_2e that may be emitted as a result of constructing the proposed project has been estimated by computing the amount of fuel to be consumed by equipment used to construct the project, both during construction assuming transit from Seattle, Washington. Fuel consumed is then converted into CO_2e emitted using formulae developed by the Energy Information Administration (EIA) of the U.S. Department of Energy. Using these formulae and estimates, construction of the proposed project would result in the discharge of approximately 7.59 tons of CO2e to the atmosphere.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No off-site emissions will affect this work.

c. Proposed measures to reduce or control emissions or other impacts to the air, if any:

Use of heavy and motorized equipment will be kept to a minimum to conserve fuel and minimize emissions.

3. Water

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe the type and provide names. If appropriate, state what stream or river it flows into.

Yes, the project site is directly adjacent to Boise Creek and adjoining wetlands used for pasture for livestock. Boise Creek is a tributary to the White River and is a Type S aquatic area that supports anadromous salmonids. The adjoining wetlands are depressional wetlands that are degraded as a result of livestock grazing.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Yes, the Project will require excavation and planting immediately adjacent to Boise Creek. Please see attached plans.

3) Estimate the amount of fill and dredge material that could be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

Approximately 1,400 cubic yards of material will be excavated from the existing depressional wetland to enhance the aquatic habitat of Middle Boise Creek. Approximately 510 cubic yards of excavated topsoil will be spread on 1.9 acres of farmed wetland located south of the project site. Soil will be spread approximately 2-inches deep and seeded with pasture grasses. This will improve pasture grass production but will not convert these wetlands to upland.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities, if known.

No in-water work will be performed. A strip of streambank will be left intact during the majority of excavation of the adjacent floodplain and wetland habitat. The size of this remaining streambank will be further reduced to a small berm sufficient to maintain low flow in the existing channel until flows increase during the winter.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

The project lies within Zone A of the Special Flood Hazard Area identified on the Flood Insurance Rate Panel Map 53033C1505F. No Base Flood Elevations or flood depths are shown, but compliance with floodplain development standards is required. Appropriate flood modeling tools are being used to ensure the project will not increase flooding.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No waste material will be discharged.

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities, if known.

No.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: domestic sewage; industrial containing the following chemicals…; agricultural; etc.). Describe the general

size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No waste materials will be discharged to ground water.

c. Water Runoff (including storm water):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

All construction will occur during summer months in order to reduce stormwater management issues. Stormwater runoff within the construction area will either infiltrate on the site, or be treated with BMPs infiltration is not achievable.

2) Could waste materials enter ground or surface waters? If so, generally describe.

No

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

BMPs will be used to mitigate water runoff.

4. Plants

a. Check or underline types of vegetation found on the site:

- ☒ Deciduous trees: alder, maple, aspen, other
- ☒ Evergreen trees: fir, cedar, pine, other
- ☒ Shrubs
- ☒ Grass
- ☒ Pasture
- ☐ Crop or grain
- ☒ Wet soil plants: cattail, buttercup, bulrush, skunk cabbage, other
- ☐ Water plants: water lily, eelgrass, milfoil, other
- ☐ Other types of vegetation

The western one acre of the site is vegetated with mature non-native ornamental trees and shrubs, including pine trees (*Pinus spp.*), laurels (*Lauracea*) and roses (*Rosa spp.*) mixed with native plantings of black cottonwood (*Populous trichocarpa*) and willow (*Salix spp.*). The eastern portion of the site is predominantly pasture grass that is sparsely vegetated with a few clumps of native willows. A dredge-spoil berm extends along the top of the streambank, which is undercut and being eroded by Boise Creek. Upland conditions exist along the berm and in the western portion of the site due to slightly higher ground surface elevations resulting from fill soils associated with the historic house location.

b. What kind and amount of vegetation will be removed or altered

Primarily pasture grasses.

c. List threatened or endangered species known to be on or near the site.

None present as ascertained through a query of the GIS data provided by the Washington Natural Heritage Program of the Department of Natural Resources and the Washington Department of Fish and Wildlife Priority Habitat and Species database.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

The riparian zone associated with the project will be extensively planted with native plants, including Douglas fir, Sitka spruce, vine maple, oceanspray, snowberry, wild rose, willow species, black cottonwood, red alder, and Pacific ninebark.

5. Animals

a. Check or underline any birds or animals that have been observed on or near the site, or are known to be on or near the site:

☒ Birds: hawk, heron, eagle, songbirds, other
☒ Mammals: deer, bear, elk, beaver, other
☒ Fish: bass, salmon, trout, herring, shellfish, other

Anadromous fish species known to inhabit Boise Creek include Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), and steelhead (*O. mykiss*) (Kerwin 1999). The distribution of anadromous species in the watershed is limited by a natural falls at river mile 4.4, just upstream of the Enumclaw Golf Course. Resident rainbow (*O. mykiss*) and cutthroat trout (*O. clarki*) inhabit the reaches upstream of this barrier.

b. List any threatened or endangered species known to be on or near the site.

- Puget Sound Chinook salmon (threatened)
- Puget Sound steelhead (threatened)

c. Is the site part of a migration route? If so, explain.

Anadromous fish species, including salmon and steelhead trout, migrate up Boise Creek to the project site to spawn. Salmon and steelhead fry then out-migrate past the site on their way to salt water. The project site is also located along the Pacific Flyway and may be visited by migrating birds. The North Rainier Elk Herd (White River Unit) traverses this area.

d. Proposed measures to preserve or enhance wildlife, if any:

This restoration project is designed to provide cover, holding and rearing habitat for juvenile salmonids. Riparian vegetation will provide food and cover for aquatic, avian and terrestrial wildlife species.

6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

The finished project will require no energy.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

N/A

7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste that could occur as a result of this proposal? If so, describe.

1) Describe special emergency services that might be required.

N/A

2) Proposed measures to reduce or control environmental health hazards, if any:

N/A

b. Noise:

1) What types of noise exist in the area that may affect your project (for example, traffic, equipment, operation, other)?

Normal urban and rural noises are expected. These will have no impact on the activities covered by this document.

2) What types and levels of noise would be created by or associated with the project on a short-term or long-term basis (for example, traffic construction, equipment operation, other)? Indicate what hours noise would come from the site.

There will be short-term construction noise from heavy equipment and dump trucks during daylight working hours (7 a.m. to 7 p.m., Monday through Friday) while the project is being constructed. Construction should last less than three weeks. Noise levels in the immediate vicinity of heavy equipment operation may be as high as 90 decibels, but should dissipate rapidly with distance from the equipment. No additional noise will be generated by the finished project.

3) Proposed measures to reduce or control noise impacts, if any:

Construction noise will comply with the provisions of applicable noise ordinances. Equipment operation will be limited to the hours from 7 a.m. to 7 p.m., Monday through Friday. Work on Saturdays, though unlikely, will be limited to the hours from 9 a.m. to 5 p.m.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties?

Adjacent properties include residential farms.

b. Has the site been used for agriculture? If so, describe.

Yes. The site is located within the Enumclaw Agricultural Production District and has been farmed since the early 1900's. Recent uses are primarily restricted to livestock grazing.

c. Describe any structures on the site.

None

d. Will any structures be demolished? If so, what?

No structures will be demolished.

e. What is the current zoning classification of the site?

Zone A35.

f. What is the current comprehensive plan designation of the site?

Agricultural (Agricultural Production District).

g. If applicable, what is the current shoreline master program designation of the site?

Resource.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

Yes. Boise Creek is classified as a King County Type S Aquatic Area. A Category IV wetland is located on site as well.

i. Approximately how many people would reside or work in the completed project?

None.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any:

None.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

None.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high-, middle-, or low-income housing.

None

b. Approximately how many units, if any, would be eliminated? Indicate whether high-, middle-, or low-income housing.

None

c. Proposed measures to reduce or control housing impacts, if any:

None.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas? What is the principal exterior building material(s) proposed?

No part of the proposed work will extend above existing grade.

b. What views in the immediate vicinity would be altered or obstructed?

None.

c. Proposed measures to reduce or control aesthetic impacts, if any:

Native vegetation will be planted on the site to improve both ecological and aesthetic functions.

11. Light and Glare

a. What type of light or glare will the proposal produce? During what time of day would it mainly occur?

None.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

c. What existing off-site sources of light or glare may affect your proposal?

None.

d. Describe proposed measures to reduce or control light and glare impacts, if any.

None.

12. Recreation

a. *What designated and informal recreational opportunities are in the immediate vicinity?*

There is no recreational use of Boise Creek in the project area or immediate vicinity. The closest public recreational area is Pinnacle Peak Park, which is located approximately one mile south of the project area.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

No recreational impacts are expected to occur as a result of this project.

13. Historical and Cultural Preservation

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

A professional archeologist with expertise in historic and cultural resource identification and preservation reviewed local, state and federal records and data bases for information about t he project site.. No inventoried or documented cultural or historical resources were found to be present on or adjacent to the project site.

b. Generally describe any landmarks or evidence of historical, archaeological, scientific, or cultural importance known to be on or next to the site.

While no cultural resources are known to be on the site and no evidence of their presence was found during literature and database searches, the site's location along a stream corridor increases the likelihood that such resources may be present; however, this stream has been relocated and no longer occupies its historic alignment.

c. Proposed measures to reduce or control impacts, if any:

An archaeological survey will be performed prior to construction to determine if any buried cultural resources are likely to on the site. The results of the survey will be summarized in a technical report. If deemed necessary, an archaeologist will monitor excavation during project construction.

If cultural or archaeological resources are uncovered or encountered during project construction, work will cease immediately and appropriate steps necessary to protect those resources will be taken prior to resuming construction. If resources are discovered, the Washington State Department of Archaeology and Historic Preservation, the King County Historic Preservation Program, and any affected tribal groups will be notified immediately, and an on-site inspection will be conducted by a state-certified archaeologist and other qualified resource professionals. A mitigation plan will be prepared prior to construction resuming at the site.

14. Transportation

a. Identify public streets and highways serving the site and describe proposed access to the existing street system. Show on-site plans, if any.

268th Avenue SE, a public road, forms the western boundary of the project site.

b. Is the site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

No. The nearest transit stop is in the City of Enumclaw, approximately one mile to the north of the project site.

c. How many parking spaces would the completed project have? How many would the project eliminate?

None.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

No.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

The finished project will not generate any extra vehicle trips.

g. Proposed measures to reduce or control transportation impacts, if any:

None.

15. Public Services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

No.

b. Proposed measures to reduce or control direct impacts on public services, if any:

None.

16. Utilities

a. Underline utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.

Overhead power lines are located along 268th Ave SE.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity that might be needed.

No utilities are proposed for the project.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Charles Burton

Title: Engineer III

Date Submitted: April 8, 2013

Greenhouse Gas (GHG) Emissions Worksheet

Middle Boise - Evans Restoration

Note: The finished project will emit no GHGs aside from those occurring in the environment by natural processes. All emissions are therefore related to construction of the proposed project.

This project will be constructed by a private contractor so all calculations are estimates.

Estimated distance between contractor and the project site

65 miles

Estimated days of construction activity: 15

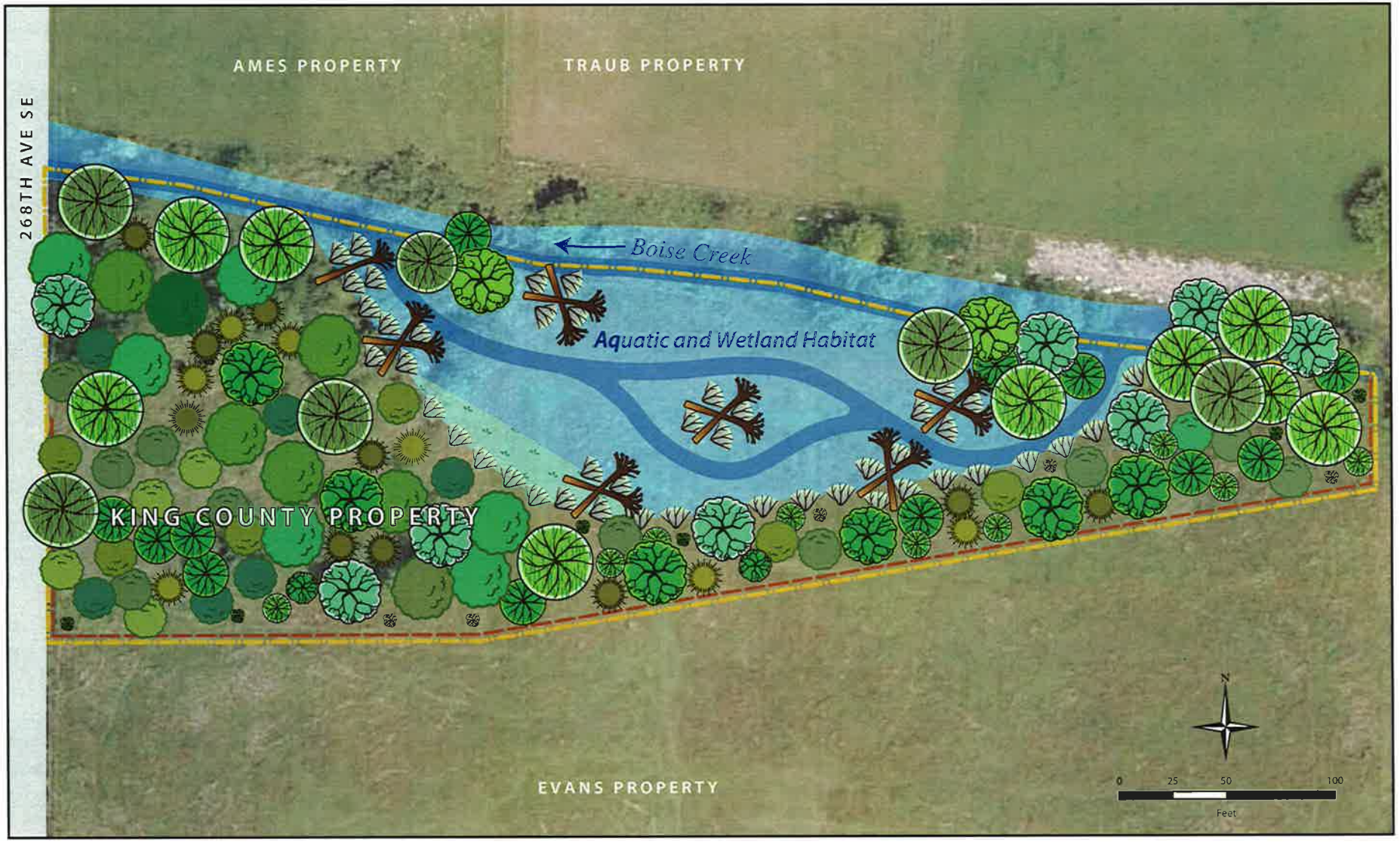
Vehicle/Equipment	Miles/ hours	Rate (mpg or gal/hr*)	fuel used	Fuel Type	Em. Coef. (lbs CO2e/ gal)	Emissions (lbs CO_2e)	Tons CO_2e
Pickup	969.3	20.7	46.83	Gasoline	19.564	916.11	0.46
Pickup	969.3	20.7	46.83	Gasoline	19.564	916.11	0.46
Pickup	969.3	20.7	46.83	Gasoline	19.564	916.11	0.46
dumptruck	1101.3	6.15	179.07	B20 Biodiesel	4.924	881.76	0.44
dumptruck	1101.3	6.15	179.07	B20 Biodiesel	4.924	881.76	0.44
Case 850 Bulldozer	52	6.3	327.6	B20 Biodiesel	4.924	1613.10	0.81
CAT 330 Excavator	52	6.3	327.6	B20 Biodiesel	4.924	1613.10	0.81
Log Truck	575	1.9	302.6	Diesel	22.384	6774.11	3.39
Heavy Equip Transport	256.8	1.9	135.2	B20 Biodiesel	4.924	665.52	0.33
TOTAL:						**15177.66**	**7.59**

Carbon Sequestration

Approximately 4492 shrubs and trees will be planted as part of this project. Of these, 34 are categorized as slow-growing conifers, 17 as moderate-growing hardwoods and 4441 fast-growing hardwood shrubs . The carbon sequestration rates of these trees was calculated using data tables from the U.S. Department of Energy, Energy Information Administration.

Using these data tables, the proposed plantings (assuming an 80% survival rate) will sequester **2.28 tons of carbon within one year after planting** .

Figure 1 - Vicinity Map
Middle Boise Creek - Evans Habitat Restoration Project



Widened Channel Grading Plan

Middle Boise-Evans Enhancement

- Aquatic and Wetland Habitat
- Benched Wetland
- Low Flow Channel
- Placed Log with Root Wad
- Willow Shrub
- Elk Fence
- Project Boundary

King County
Department of Natural Resources and Parks
Water and Land Resources Division

Produced by: GIS and WLRD Visual Communication and Web Unit (KCIT-DNRP)
File: 1303_3186m_BoiseCrkMap-rev1.ai mdev

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