
General Information

Project Title

Heritage Farm Wetland Restoration

Project Short Description

This project will excavate a shallow floodplain bench and provide wetland restoration along a channelized section of Cougar Creek headwaters on Clark County's Heritage Farm property. This project implements a portion of the Heritage Farm master plan and addresses a priority of enhancing and restoring headwater wetlands within the Cougar Creek watershed. Primary benefits are wetland habitat creation, increased infiltration, and maintenance of cool summer baseflows to downstream Salmon Creek.

Project Long Description

The natural forested land cover throughout the Salmon Creek watershed, including the Cougar Creek subwatershed, has been greatly altered by many years of first agricultural, then urban land use changes. Historical wetlands have largely been drained by channelizing streams. The Cougar Creek subwatershed is 7% forested and 51% hard surface. The resulting impacts have led to Cougar Creek receiving a "poor" score in the 2010 Clark County Stream Health Report and a "very poor" condition in Clark County Long-Term Index Site Monitoring Summary 2002-2011. These reports highlight the need for protection and restoration of headwater and stream corridor wetlands. Suggested stream health strategies for Cougar Creek and Salmon Creek include increasing infiltration, retention and surface water storage throughout the watershed, as well as restoration of stream channels and floodplains.

Through Clark County's 2019-2024 Stormwater Capital Plan, recent research and management initiatives have targeted projects that will provide water quality treatment, hydrologic improvements, and habitat improvements. The Heritage Farm Headwater Wetland Restoration project will accomplish these initiatives in rehabilitating and restoring the natural hydrologic functions of a ditched and disturbed wetland in the headwaters of Cougar Creek, a major tributary to Salmon Creek. The project reverses existing ditching that has occurred and constructs a shallow floodplain bench. Additionally infiltration/retention areas and shallow wetlands are incorporated within the floodplain bench. The entire area will be planted with appropriate wetland and wetland fringe plantings. In so doing, the project restores as much as possible the surface and groundwater hydrologic regime that was present in the headwater wetland in its natural, native vegetation state.

There are unique opportunities associated with this project's location on Clark County's Heritage Farm. As stated in Clark County's 2010 78th Street/ Washington State University Property Master Plan,

General Information

Heritage Farm is a largely undeveloped site of approximately 79 acres. With gently sloping hills, fields and existing historic structures, the site retains its historic roots as the County’s “Poor Farm” and more recently, an agricultural research facility. The site is the only large, open, single-owner parcel in the heart of Hazel Dell. At the southeast end of the site is Hazel Dell Park. On the north end, along 78th Street, is the historic poor farm building or administration building. Between these two anchor areas lie agricultural lands, forest, wetlands and viewpoints. The 78th Street/WSU Property Master Plan is the first step in an effort to fulfill the County’s commitment to maintain the site as a place for agricultural use , historic preservation, community learning, sustainable practices and environmental stewardship. Heritage Farm is a site for community learning and gathering, administrative and program functions, naturalists, avid walkers, gardeners, farmers, demonstrations and research.

In 2016 as part of the Stormwater Capital Program, the Heritage Farm Parking Lot Low Impact Development (LID) Project was completed. This project utilized a variety of LID techniques to manage on-site stormwater runoff. All of the 0.7 acre parking lot storm water is managed on-site through the installation of concrete pavers, permeable asphalt and concrete, grass-pave, and bioretention units to increase infiltration and retention. Stormwater runoff to Cougar Creek is significantly reduced, increasing infiltration and ultimately reducing pollutants draining to Cougar Creek.

In this context, the proposed project offers an opportunity not only for headwater wetland restoration but also outreach to the surrounding community for watershed stewardship in urban and agricultural settings and LID techniques all in a single location.

Total Cost	\$1,478,467.46	Total Eligible Cost \$666,667.00
Effective Date	7/1/2020	Expiration Date 7/31/2023
Project Category	<ul style="list-style-type: none"> ✓ Nonpoint Source Pollution On-Site Sewage Systems Stormwater Activity0 Stormwater Facility Wastewater 	

General Information

Will Environmental Monitoring Data be collected? Yes

Ecology Program Water Quality

Overall Goal

The project goal is to restore the important natural headwater wetlands and riparian zone of Cougar Creek. Both the hydrologic regime and habitat restoration are important to the sensitive Cougar Creek headwaters where threatened native species such as the Northern Red-Legged Frog reside, and to Cougar Creek itself, which is an important contributor of cool, clean stream flows to Salmon Creek. Numerous watershed benefits will be realized including improved water quality, increased groundwater recharge, improved wetland hydroperiod, runoff volume reduction, reduced stream erosion, and sustained summer base-flows to Salmon Creek.

The project site will also enhance watershed educational outreach by providing a prominent example to the public of Low Impact Development techniques and riparian buffering alongside a restored headwater wetland, all helping to ameliorate environmental impacts from surrounding agricultural activities and rapidly urbanizing landscapes.

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Clark County - Public Works Department

WQC-2021-CICoPW-00032

Project Characterization

Project Themes

Select a primary and secondary theme that best describes the work to be achieved during this project.

Primary Theme:	Nonpoint Source Pollution
Secondary Theme(s):	Riparian/Wetland Restoration
	TMDL Support

Project Website

If your project has a website, please enter the web address below. After entering a website and saving, another blank row will appear. Up to three websites may be provided.

Website Title/Name	Web Address
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Recipient Contacts

Project Manager

Marlena Milosevich

Contact Information

Marlena Milosevich
Natural Resource Specialist III
1300 Franklin St
Vancouver, Washington 98660
(360) 397-6118
(360) 397-6051
marlena.milosevich@clark.wa.gov

Authorized Signatory

Ahmad Qayoumi

Contact Information

Ahmad Qayoumi
Director / County Engineer
1300 Franklin St
Vancouver, Washington 98660
(360) 397-6118
(360) 397-6051
ahmad.qayoumi@clark.wa.gov

Billing Contact

Andrea Logue

Contact Information

Andrea Logue
Program Assistant

Washington

Recipient Contacts

andrea.logue@clark.wa.gov

Other recipient signatures on printed agreement

Name

Title

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Clark County - Public Works Department

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Funding Request- Nonpoint Project

Total Eligible Cost: \$666,667

Grant Request: \$500,000

Match Required: \$166,667

IMPORTANT NOTICE. Grants for nonpoint projects require a 25% match. Projects with cash-only match are eligible for up to \$500,000 in grant. Projects with a mix of funds for match are eligible for up to \$250,000 in grant. Cash match includes any eligible project costs paid for directly by the recipient that are not reimbursed by the Ecology grant or another third party. Donations that become the long-term property of the recipient are considered cash match. Loan money provided through the CWSRF is also considered cash match. In-kind contributions are considered non-cash match. More information on match requirements can be found in the Water Quality Combined Financial Assistance Guidelines which are available for download on the Application Menu.

Will your match be cash-only? Yes No

Are you requesting or will you accept loan funds for part or all of the eligible project costs or to meet your match requirement? Yes No

Do you want your project to be considered for GPR subsidy under the CWSRF program? Yes No

NOTE: Projects are only eligible if they meet EPA's GPR criteria, and applicants accept a CWSRF loan.

Do you have any secured funds committed to this project? Yes No

If Yes, complete the Secured Funds Table, and include any secured matching funds if known.

Source	Type	Amount Committed
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State/Federal agency:
 State/Federal agency:
 State/Federal agency:
 Interlocal contributions:

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Funding Request- Nonpoint Project

Interlocal contributions:

Interlocal contributions:

Local agency: Clark County Public Works Clean Water (match)	Cash	\$166,667.00
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Local agency: Clark County Public Works Clean Water (additional)	Cash	\$811,800.46
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Local agency:

In-kind contributions:

In-kind contributions:

In-kind contributions:

Other

Other

Other

Scope of Work - Task 1 Project Admin: 1

Task Number	1
Task Title	Project Administration/Management
Task Cost	\$9,750.00

IMPORTANT NOTICE. The cost of this task should not exceed 15% of the Total Eligible Costs you entered on the General Information form.

Task Description

A. The RECIPIENT shall carry out all work necessary to meet ECOLOGY grant or loan administration requirements. Responsibilities include, but are not limited to: Maintenance of project records; submittal of requests for reimbursement and corresponding backup documentation; progress reports; the EAGL (Ecology Administration of Grants and Loans) recipient closeout report; and a two-page outcome summary report (including photos, if applicable). In the event that the RECIPIENT elects to use a contractor to complete project elements, the RECIPIENT shall retain responsibility for the oversight and management of this funding agreement.

B. The RECIPIENT shall keep documentation that demonstrates the project is in compliance with applicable procurement, contracting, and interlocal agreement requirements; permitting requirements, including application for, receipt of, and compliance with all required permits, licenses, easements, or property rights necessary for the project; and submittal of required performance items. This documentation shall be available upon request.

C. The RECIPIENT shall maintain effective communication with ECOLOGY and maintain up-to-date staff contact information in the EAGL system. The RECIPIENT shall carry out this project in accordance with any completion dates outlined in this agreement.

Task Goal Statement

Properly managed and fully documented project that meets ECOLOGY’s grant or loan administrative requirements.

Task Expected Outcomes

- * Timely and complete submittal of requests for reimbursement, quarterly progress reports, Recipient Closeout Report, and two-page outcome summary report.
- * Properly maintained project documentation.

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Clark County - Public Works Department

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Scope of Work - Task 1 Project Admin: 1

Recipient Task Coordinator Marlena Milosevich

Deliverable #	Description	Due Date	Received? (ECY Use Only)	EIM Study ID	Latitude (expressed in decimals)	Longitude (expressed in decimals)	Location Address
1.1	Progress Reports that include descriptions of work accomplished, project challenges or changes in the project schedule. Submitted at least quarterly.	10/31/2020					
1.2	Recipient Closeout Report (EAGL Form)	7/1/2023					
1.3	Two-page Outcome Summary Report	7/1/2023					

Scope of Work - FOR APPLICATION

How many tasks do you want to appear?

Task #: 2

Task Title: Design and Permitting

Task Cost: \$327,397.99

Expected Start Date: 7/1/2020

Expected Finish Date: 3/1/2021

Describe the work that will be billed to this task. (char 3,500)

Clark County will complete the following tasks:

- A. Coordinate the preparation and submittal of State Environmental Policy Act (SEPA) documentation.
- B. Apply for and comply with all required local, state, tribal and federal permits, licenses, easements, or property rights necessary for the project.
- C. Comply with Executive Order (05-05) cultural resources review requirements. To initiate cultural resources review the following will be completed:
 - 1. Submit Ecology's ECY 05-05/106 form, or a cultural resources survey or assessment completed by a licensed archaeologist to ECOLOGY.
 - 2. Develop and submit an Inadvertent Discovery Plan (IDP) to ECOLOGY.
- D. Clark County owns the project site and will consult the Heritage Farm Advisory Board for approval of final designs . The Heritage Farm Master plan approved by the Advisory Board includes a wetland restoration actions .
- E. Develop a project design including a grading/BMP plan, planting plan and vegetation maintenance plan. Project will be reviewed and accepted in writing by ECOLOGY to be eligible for reimbursement.
- F. Submit one hard copy and one digital copy of the items listed below to ECOLOGY for acceptance . Design figures will be reduced to 11x17 inches in size and will be legible.
 - 1. Design Report. At a minimum, this package will include 90 percent plans, specifications, engineer's opinion of cost which includes a schedule of eligible costs, and project construction schedule.
- G. Respond to ECOLOGY comments.
 - 1. Receive an Ecology Design Report Acceptance Letter prior to proceeding to 90 Percent design.
 - 2. Receive an Ecology 90 Percent Design Acceptance Letter prior to proceeding to project advertisement for bid and construction .
- H. All materials submitted to ECOLOGY for acceptance will be approved by the county prior to submittal to ECOLOGY .
- I. Submit to ECOLOGY a digital copy of the Final Bid Package including: project plans, specifications, engineer's opinion of cost which includes a

Scope of Work - FOR APPLICATION

schedule of eligible costs, and project construction schedule.

Deliverables

To Add a Row

Enter a deliverable
 When done, click the **SAVE** button
 After SAVE a new row will appear
 Repeat these steps for each deliverable

To Delete a Row

In the row you want to delete, remove the information in all of the textboxes
 When done, click the **SAVE** button
 After SAVE the row will be deleted

Deliverables Table (Deliverables are documents that can be uploaded into EAGL to show that work was completed; deliverables should align with the detailed budget provided on the Task Costs and Budget Form and the project schedule uploaded on the Project Planning and Schedule Form.)

Deliverables Description	Deliverable Date	Deliverable Budget
2.1 SEPA determination, ECY 05-05/106 form, and IDP	1/1/2021	\$25,000.00
2.2 List of permits acquired, and environmental review documents	3/31/2022	\$40,000.00
2.3 Final Bid Package and preliminary deliverables (wetland delineation and monitoring, design report, 90% plans, response to comments, and Ecology acceptance letters)	3/31/2022	\$262,397.99
		Total Deliverable Budget: \$327,398
		Total Task Costs:

Task #: 3
Task Title: Construction Management
Task Cost: \$181,125.71

Scope of Work - FOR APPLICATION

Expected Start Date: 4/1/2022

Expected Finish Date: 4/1/2023

Describe the work that will be billed to this task. (char 3,500)

Clark County will complete the following tasks:

- A. Provide construction oversight and management of the project.
- B. Submit a detailed construction quality assurance plan to ECOLOGY before the start of construction . This plan will describe how adequate and competent construction oversight will be performed.
- C. Conduct a pre-construction conference meeting and invite ECOLOGY to attend.
- D. Submit an updated project schedule with projected cash flow to ECOLOGY within 30 days of the start of construction and as needed during construction.
- E. Prior to execution, submit any eligible change orders that are a significant deviation from ECOLOGY-accepted plans and specifications in writing for ECOLOGY review and acceptance for payment. Change orders will be signed by the contractor, the engineer (if appropriate), and Clark County prior to submittal to ECOLOGY for acceptance.
- F. Upon completion of construction, Provide to ECOLOGY:
 - 1. A Construction Completion Form signed by a professional engineer indicating that the project was completed in accordance with the plans and specifications.
 - 2. GIS compatible project area data in an ECOLOGY-approved format (.zip file).

Deliverables

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Deliverables Description	Deliverable Date	Deliverable Budget
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Scope of Work - FOR APPLICATION

3.1 Bid documents, signed construction contract, Quality Assurance Plan, and Pre-con notes	5/1/2022	\$75,000.00
3.2 Updated project schedules and cash flow	9/1/2022	\$5,000.00
3.3 Construction project oversight, Construction Completion Form and project area shapefile	5/1/2023	\$101,125.71
		Total Deliverable Budget: \$181,125.71

Task #: 4

Task Title: Construction and Planting

Task Cost: \$136,152.30

Expected Start Date: 6/1/2022

Expected Finish Date: 5/1/2023

Describe the work that will be billed to this task. (char 3,500)

Clark County will complete the following tasks:

- A. Complete construction of the project in accordance with ECOLOGY- accepted plans and specifications.
 - B. Provide construction progress reports included in quarterly reports.
 - C. Establish temporary construction access and staging area (Mobilization), traffic controls, and construction erosion/water pollution control measures.
 - D. Establish a Spill Prevention, Control and Countermeasure (SPCC) Plan for ECOLOGY to review and approve.
 - E. Clear and grub the project site.
 - F. Remove structures and obstructions at the project site.
 - G. Oversee excavation of wetland ponds, flood plain bench, and channel restoration at the project site, which will infiltrate an estimated 23 acre-feet of water.
 - H. Oversee installation of 30 inch ductile iron storm sewer pipe at the project site.
- Oversee installation of project erosion and water pollution prevention at the project site.

Scope of Work - FOR APPLICATION

J. Oversee seeding and mulching of the project site.

K. Oversee installation of top soil A and B at the project site.

L. Oversee implementation of the planting plan. Approximately, 6.44 acres will be planted with native vegetation with approximately 5.97 acres wetland plantings and 0.47 transitional zone plantings. A 35-foot wide buffer between agricultural land and wetland will be installed along 1,500 linear feet of the project site. There will be approximately 274 native trees, 822 large native shrub, and 3,286 small native shrubs. Riparian planting survival will also be monitored.

M. Oversee construction of driveways to allow access to the southern part of Heritage Farm property through the project site.

Deliverables

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When done, click the **SAVE** button

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Repeat these steps for each deliverable

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Deliverables Description	Deliverable Date	Deliverable Budget
4.6 Install 30" ductile iron pipe	10/1/2022	\$5,217.50
4.7 Erosion control and water pollution prevention	7/1/2022	\$20,000.00
4.8 Seeding and mulching	11/1/2022	\$28,000.00
4.11 Planting	2/1/2023	\$82,934.80
		Total Deliverable Budget: \$136,152.30

Task #: 5

Task Title: Community Outreach and Signage

Task Cost: \$12,241.00

Scope of Work - FOR APPLICATION

Expected Start Date: 7/1/2020

Expected Finish Date: 7/1/2023

Describe the work that will be billed to this task. (char 3,500)

- A. WSU Extension will develop and proctor two (2) wetland and stream corridor educational events within the grant term.
- B. Design and install three (3) wetland interpretative outreach panels at the project site.

Deliverables

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Deliverables Description	Deliverable Date	Deliverable Budget
5.1 Develop and proctor 2 wetland and stream corridor educational events	1/1/2022	\$7,241.00
5.2 Design and install 3 interpretive sign panels	1/1/2022	\$5,000.00
		Total Deliverable Budget: \$12,241.00

Task #: 6

Task Title:

Task Cost:

Expected Start Date:

Scope of Work - FOR APPLICATION

Expected Finish Date:

Describe the work that will be billed to this task. (char 3,500)

Deliverables

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Deliverables Description

Deliverable Date

Deliverable Budget

Total Deliverable Budget: \$0

Task #: 7

Task Title:

Task Cost:

Expected Start Date:

Expected Finish Date:

Describe the work that will be billed to this task. (char 3,500)

Scope of Work - FOR APPLICATION

Deliverables

To Add a Row

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When done, click the **SAVE** button

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Deliverables Description

Deliverable Date

Deliverable Budget

Total Deliverable Budget: \$0

Task #: 8

Task Title:

Task Cost:

Expected Start Date:

Expected Finish Date:

Describe the work that will be billed to this task. (char 3,500)

Deliverables

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When done, click the **SAVE** button

To Delete a Row

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Scope of Work - FOR APPLICATION

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Deliverables Description

Deliverable Date

Deliverable Budget

Total Deliverable Budget: \$0

Task #: 9

Task Title:

Task Cost:

Expected Start Date:

Expected Finish Date:

Describe the work that will be billed to this task. (char 3,500)

Deliverables

To Add a Row

Enter a deliverable
When done, click the **SAVE** button
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WATER QUALITY COMBINED FINANCIAL ASSISTANCE

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Scope of Work - FOR APPLICATION

Project Planning and Schedule Form.)

Deliverables Description

Deliverable Date

Deliverable Budget

Total Task Costs: \$666,667

Total Deliverable Budget: \$0

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Clark County - Public Works Department

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Scope of Work Summary

Task Title	Task Cost
Project Administration/Management	\$9,750.00
Total	

Total Eligible Costs
(from the General Information Form)

Task Costs and Budget

Describe the process used to estimate the cost of the project. If your process included reviewing similar projects, describe how this review affected your estimate.

Construction cost estimates are prepared using the county's Engineering and Construction Program database for completed projects. Unit costs from this database are used to generate an engineer's estimate for each new project. Design, survey, permitting, and construction management cost estimates are developed using typical average percentages of construction cost from numerous completed projects. The database is updated regularly to reflect recent project costs.

A 15% level engineering design has been completed for this project. Funding is being requested to continue designing this project and for construction. The budget provided with this application reflects expected costs for administration, design, construction management, construction, outreach, and monitoring based on an assumed construction cost of \$928,849.80. The estimated construction cost (task 4) was developed through a 15% Engineers Estimate of Construction Costs scaled to the expected footprint of the 7 acre Heritage Farm project (Please see attached Engineer's Estimate of Construction Costs). The estimate for planting cost (task 4) was estimated by Clark County's wetland and riparian plant specialist (Please see attached planting plan). The continuation of the design portion (task 2) of the project is estimated based on 20% of the Engineer's Estimate of Construction Costs. The construction management portion of the project (task 3) is estimated based on 15% of the Engineer's Estimate of Construction Costs. This method of project task estimation is standardized for Clark County construction projects.

Clark County's wetland restoration and riparian plant specialist was consulted on the potential to use volunteers to plant the project site. However, much of the planting may not be conducive to volunteer work and thus, in a worst-case scenario, all planting has been budgeted as contracted work. In an effort to reduce funds on the project, volunteers may be used to plant a small portion of the project site depending on construction outcomes.

Similar projects have also been reviewed to help estimate the cost for both outreach and monitoring. The Washington State University Extension performs regular Best Management Practice (BMP) public outreach courses which are similar in effort to the proposed educational classes for this project. The Clark County Clean Water Wadeable Streams monitoring project was used to estimate monitoring time, instrumentation, and associated costs needed for effectiveness monitoring of this project. The Wadeable Streams project includes monitoring of TSS, temperature, turbidity, and continuous temperature.

Has the proposed project been demonstrated to be the lowest cost solution to the problem?

If the proposed project is not the lowest cost, describe the other benefits or considerations such as feasibility, community acceptance, or coordination with other projects that influenced the decision making process.

The proposed project site at Heritage Farm is one of the last undeveloped plots of land for headwater restoration to Cougar Creek. Other

Task Costs and Budget

headwater land in the Cougar Creek drainage, north of the project location, is currently being developed into housing or has already been developed.

The proposed project is located entirely on Clark County property which will allow for scalability if necessary. Many public visitors access the property for classes provided by the WSU Extension. This location was presented to the public for comment and approved in 2010 as part of the Heritage Farm master plan. The master plan will be presented for updated approval Clark County Council in the near future (see attached draft master plan).

An alternatives analysis has been started as part of the 15% engineering design. During the design phase of the grant, the alternatives analysis will continue to ensure the final design addresses project goals in the most cost-effective manner. The county's engineering team, wetland biologists, and vegetation specialists are well-versed in wetland issues and accustomed to designing projects that maximize the value of public investments.

As part of the 15% design, three alternatives were considered as well as a no build option (See attached project planning documents):

Alternative One restores the maximum area possible keeping the existing ditch alignment and using the existing buildings and farmed areas as grading limits. A large floodplain bench is included in this alternative, providing extra runoff storage capacity during heavy rainfall events, so reducing downstream flow rates and erosion in Cougar Creek to the maximum extent practicable. The wide floodplain bench will also provide an abundance of area to plant wetland plants, and so will maximize the wetland creation and enhancement area. This alternative provided the most stormwater and wetland benefits but was not chosen due to the large amount of grading needed and high cost.

Alternative Two restores minimal wetland area by providing a meandering channel with a narrow floodplain bench. This alternative is the lowest cost alternative but provides the least amount of stormwater and wetland benefits.

Alternative Three restores the headwater wetland by creating a series of shallow wetland depressions along the existing channel to promote infiltration, increase the ground water elevation, and improve the wetland hydroperiod.

Ultimately Alternative Three was selected based on the wetland and watershed benefits provided. Although the cost is significantly higher than the maximum grant award, the county feels that the added benefits, replicating and restoring the original headwater wetland functions, have great value and make the most of the unique opportunities provided by this site. As such, Clark County is prepared to make up the difference using county funds. Design, construction management, and construction budgeting figures are based on this selection.

Upload a detailed budget for the project and any supporting documentation, including engineers estimates, cost analysis, etc.

Task Costs and Budget

Upload Documents

Click the Browse button

Select your file

Click Save, your file will appear in the List of uploaded documents

Repeat for each file

To Delete a file, select the Delete checkbox next to the file and click SAVE

https://ecyeag/IntelliGrants_BASE/_Upload/127066_914117_1-HeritageFarmHeadwaterWetlandRestorationBudget.pdf

Detailed Budget

https://ecyeag/IntelliGrants_BASE/_Upload/127066_914117_2-HeritageFarmWetlandRestoration-AlternativeAnalysisBudgetEngineer'sEstimateofConstructionCosts.pdf

Engineer's Estimates and Alternatives Cost Analysis

https://ecyeag/IntelliGrants_BASE/_Upload/127066_914117_3-draftestimateandplantlist.pdf

Planting Plan Estimate

https://ecyeag/IntelliGrants_BASE/_Upload/127066_914117_4-CCHMInterpretivePanelEstimate_2018_ClarkCounty.pdf

Interpretative Panel Estimate

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Project Team

Fill out the following table to describe your Project Team, including staff, contractors, and partner agencies:

Team Member Name/and or Title	Agency/ Company Name	Key Responsibilities	Qualifications/ Experience	Estimated Total Hours Devoted to the Project	Who will take over the person's responsibilities if they are unable to work on the project?
Marlee Milosevich, Grant Administrator	Clark County Public Works Clean Water	Marlee will be responsible for administering the grant and preparing all related reports and reimbursement requests. Marlee will serve as a liaison between the Project Manager and Department of Ecology.	Marlee has over 7 years of experience working in the field of environmental science and currently serves as a Natural Resource Specialist III in the Assessment and Monitoring section of Clean Water. Marlee holds a BS degree in Environmental Science: Fresh Water Ecology from Western Washington University.	144.0 0	Jeff Schnabel, Stormwater Infrastructure Manager
Jennifer Taylor/Environmental Permitting Specialis	Clark County/Public Works	Jennifer will complete all relevant environmental reviews and permitting.	Jennifer has over 20 years working in the environmental field including solid waste, spill response, and remediation, as well as her current focus on obtaining environmental approvals for transportation related projects. She is a certified Project Management Professional (PMP) with a Master's Certificate in GIS Analysis and B.S. in	20.00	Pam Schense, permitting specialist

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Project Team

		Project Team			
Julie Christian/Wetland specialist	Clark County/Public Works	Julie will complete the wetland analysis and planting design for the project. Julie will also support and oversee the planting work throughout construction and continuing into the post-construction monitoring phase.	Environmental Science & Regional Planning. Julie has 20-years of experience in design, construction, and management of native plant communities.	65.00	Kevin Tyler, Environmental Permitting Manager
Stephanie DeMars P.E./Design Engineer	Clark County/Public Works	Stephanie will complete the hydrologic and hydraulic design and engineering plans and documents for the project.	Stephanie has a Bachelor of Science degree in Civil Engineering and is a registered Professional Engineer in the state of Washington. Stephanie has over 5 years of experience in the design and construction of stormwater and transportation projects.	1700.00	John Milne, P.E. Design
Scott Fakler, P.E./Project Manager	Clark County/Public Works	Project Manager will oversee all work associated with this project. Scott will manage the design team, maintain all project records and deliverables, and oversee the schedule and budget.	Scott has over 25 years experience managing design and construction of numerous transportation and stormwater related projects in the public and private sectors. Scott holds a BS degree in Civil Engineering and is a registered professional engineer in the state of Washington.	300.00	Matt Hall, Project Management Manager

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Clark County - Public Works Department

WQC-2021-CICoPW-00032

Project Team

John Milne, P.E. Design	Clark County/Public Works	John will provide design support and QA/QC assistance and Quality Assurance/Quality Control for the project.	John has a MS in Water Resources Engineering and over 40 years experience in watershed planning, the development of stormwater regulations, flood plain management and the design and construction of civil, water resources, and environmental projects.	395.0 0	Paul Rudwick, P.E.
Doug Stienbarger, Small Acreage Program Manager	Washington State University Extension	Doug will develop and proctor educational outreach classes describing the benefits of headwater wetland areas to downstream corridors and habitats.	Doug has 23 years of experience as a WSU faculty educating the public on various issues, including natural resources and the environment. He also worked for over three years as a Conservation District Farm Planner. He serves as a member of Clark Conservation District Board and the Technical Advisory Committee for the Lower Columbia Fish Recovery Board. He has a MS in Land Resources, an interdisciplinary environmental science degree.	172.0 0	Teresa Koper, Small Acreage Program Coordinator

Describe similar projects that your project team or organization has completed. Note any deviations from the original proposal in

Project Team

scope, budget, or schedule and briefly describe project success and lessons learned. If the project was funded by Ecology, include the Ecology grant or loan number.

1. Curtin Creek Enhancement Area:

This 35 acre multi-benefit watershed project provided stormwater and wetland mitigation for two important road safety projects as well as additional flood plain, wetland, stream channel and riparian habitat improvements. The existing ditch was replaced with a meandering stream and a new flood plain bench was excavated to reconnect the stream to its flood plain. The project established a well-functioning stream and riparian environment in what had been a ditched and degraded agricultural reach of Curtin Creek.

The project was designated “2010 Environmental Project of the Year” by Washington APWA and has been used extensively to educate and promote the benefits of stream and watershed improvements to various groups within the Clark County community. The project was Clark County’s first attempt at constructing a large project with the potential to achieve significant regional watershed benefits . Although the riparian planting is successfully established, some lessons were learned in evaluating soil and hydrologic conditions to select the most suitable plant communities. That knowledge has been applied successfully to other county projects.

2. NE 119th Street Stormwater and Wetland Mitigation:

This 30 acre project completed the stormwater and wetland mitigation for three roadway projects along the NE 119th Street corridor. The project design was similar to that used on the Curtin Creek Enhancement Area project (above). The project is considered a success and has been well-received by the Clark County community as well as Ecology and the other permitting agencies. The project has since been renamed “Gaddis Wetlands” in honor of Clark County’s senior wetland ecologist who pioneered the county’s approach of identifying and restoring the natural watershed hydrology and functions when identifying, designing and constructing wetland mitigation projects.

Project Planning and Schedule

Project Start Date 7/1/2020

The date the actual work will start, or if interim refinance, the date the work started.

List and describe the criteria you used to determine the value and feasibility of the project.

Examples: useful life, installation cost, site suitability, and environmental justice.

1) A team of county engineers, scientists, and managers selected the project for inclusion in the 2019-2024 Stormwater Capital Plan based on its location in the headwaters on county-owned land, the water quality and restoration needs of the basin, and recommendations in multiple planning documents.

The Heritage Farm Wetland Restoration project aligns with one of the stated priorities for the 2019-2024 plan -- improving water quality treatment in Cougar Creek. The location and project were identified in 2008 during a Stormwater Needs Assessment for Cougar Creek, and align with recommendations in the 2010 Clark County Stream Health Report. The Heritage Farm Master Plan specifically identifies a project of this type and has been vetted through community stakeholder input.

2) Alternatives analysis has begun, and will be continued and refined during the preliminary engineering design. The early analysis has been incorporated into the 15% engineering design and estimate. As part of the 15% design, three alternatives were considered as well as a no build option (See attached project documents):

Alternative One restores the maximum area possible keeping the existing ditch alignment and using the existing buildings and farmed areas as grading limits. A large floodplain bench is included in this alternative, providing extra runoff storage capacity during heavy rainfall events, so reducing downstream flow rates and erosion in Cougar Creek to the maximum extent practicable. The wide floodplain bench will also provide an abundance of area to plant wetland plants, and so will maximize the wetland creation and enhancement area. This alternative provided the most stormwater and wetland benefits but was not chosen due to the large amount of grading needed and high cost (greatly exceeding the maximum grant award).

Alternative Two restores minimal wetland area by providing a meandering channel with a narrow floodplain bench. This alternative is the lowest cost alternative but provides the least amount of stormwater and wetland benefits.

Alternative Three restores the headwater wetland by creating a series of shallow wetland depressions along the existing channel to promote infiltration, increase the ground water elevation, and improve the wetland hydroperiod.

Ultimately Alternative Three was chosen based on the wetland and watershed benefits provided. Although the cost is significantly higher than the maximum grant award, the county feels that the added benefits, replicating and restoring the original headwater wetland functions, have great

Project Planning and Schedule

value and make the most of the unique opportunities provided by this site. As such, we would be prepared to make up the difference using county funds. Design, construction management, and construction budgeting figures are based on this selection.

A no build option was compared to Alternative Three, the project selected, using a preliminary wetland functional assessment by Clark County's engineering design team (see attached Preliminary Watershed Improvement Summary and Preliminary Wetland Functional Assessment). Preliminary design results suggest that our project could score an 81 on a wetland functional assessment compared to not building on the existing site which currently scored a wetland functional assessment of 21. This project increases the potential for removing sediments, nutrients, and heavy metals and toxic organics. Peak Flows have potential to be greatly reduced, also reducing downstream erosion. The project also has potential to significantly increase groundwater recharge. General Habitat suitability will potentially be increase for invertebrates, amphibians, wetland associated birds and mammals. Native plant richness will increase as well as primary production and export.

3) Primary stakeholders are the Clark County Council, Washington State University Extension, Heritage Farm, the Clark County Clean Water Commission, the Lower Columbia Fish Recovery Board (LCFRB), and Ecology. The project addresses existing 303(d) listings, Endangered Species Act listed salmon and steelhead, threatened native species such as the Northern Red-Legged Frog, Salmon Creek TMDLs, LCFRB's Watershed Management Plan, and supports Clark County's Stormwater Management Plan. The six-year stormwater capital plan, which outlines the Cougar Creek Headwater Wetland Restoration project, is approved annually by the Clark County Council. The Clean Water Commission is an advisory group supporting implementation of the Stormwater Management Plan and providing public input on capital, monitoring, and other municipal stormwater permit-related activities. The LCFRB has developed Watershed Management Plans to set forth important strategies, measures and actions for the beneficial management of our watersheds, intended to meet the present and future needs of our communities, local economies, recreational experiences as well as our fish and wildlife.

4) The project is located on county-owned property and is expected to provide watershed benefits in perpetuity. Long-term evaluation of wetland and riparian plantings for viability and health will be conducted by county wetland specialists as the site matures.

5) This historic county site offers a unique opportunity to demonstrate to the Clark County community how to restore valuable wetlands that provide multiple local and regional watershed and stream benefits. It is particularly important to the Clean Water Division that we collaborate with, receive the support of, and partner with the Department of Ecology on what will be a flagship project for our community and a key opportunity for us to build support for watershed restoration work in the future.

Briefly describe all project alternatives (including the preferred alternative) considered, and explain how each alternative met or failed to meet the criteria listed above.

Use one line for each alternative and click "save" to enter additional alternatives.

Project Planning and Schedule

Description of Alternative

Criteria

Alternative 1: Alternative 1: Maximum Improvement

This alternative provided the most stormwater and wetland benefits but was not chosen due to the large amount of grading needed and high cost

Alternative 1: Alternative 2: Meandered Channel

Alternative two restores less wetland area by providing a meandering channel with a relatively narrow floodplain bench. This is the lowest cost alternative but provides the least amount of benefit.

Alternative 1: Preferred) Alternative 3: Stepped Flood Plain Bench

Restores the headwater wetland by creating a series of shallow wetland cells along a meandered alignment. This alternative has been chosen based on the wetland and watershed benefits provided

Alternative 1: No Build (project not selected for improvement)

Nothing will be done on the site. This alternative leaves little to no watershed benefits to meet the criteria above.

List project stakeholders and provide documentation showing key stakeholders have been identified and will support the project.

Clark County Council:

Clark County Council has demonstrated its support of the Heritage Farm Headwater Wetland Restoration by approving Clark County Clean Water to seek Washington State DOE grant monies to supplement Clark County Clean water budget for this project . Clark County's six-year stormwater capital plan, where the Cougar Creek Headwater Wetland project is outlined , is approved annually by the Clark County Council.

Heritage Farm managed by Clark County Public Works Parks & Land Division(See attached letter of support):

Clark County Public Works Parks & Land Division owns and manages Heritage Farm where the Cougar Creek Headwater Wetland Restoration project is proposed. Property will not need to be purchased and no land owner agreements are needed as the land ownership is already under Clark County Public Works. Patrick Lee, the Legacy Lands Program Coordinator, supports this project in its ability to restore more natural conditions with a more functional riparian buffer and improving stormwater infiltration to address temperature issues downstream in Cougar Creek and Salmon Creek.

Washington State University Extension (See attached letter of support):

WSU Extension provides many educational classes on the Heritage farm property. Through WSU Extension’s Small Acreage Program, water quality information is taught to the public as part of their Living on the Land class series, various BMP workshops, and septic system and well maintenance classes. WSU Extension will support this project directly by providing educational events centered around the stream corridor.

Project Planning and Schedule

Douglas Stienbarger, Director of the WSU Extension, believes this project is a great opportunity for demonstrating restoration techniques and use of riparian plants to the public.

Clark County Clean Water Commission (See attached letter of support):

The Clean Water Commission is an advisory group, made up of Clark County citizens, supporting the implementation of the Stormwater Management Plan and providing public input on capital, monitoring, and other municipal stormwater permit-related activities. Marie LaManna, Chair of the Clean Water Commission, believes that this project addresses the Commission's mission to achieve healthy watersheds by restoring the headwater wetlands of Cougar Creek and enhancing riparian vegetation to return the natural hydrologic function and native vegetation on the Heritage Farm property. The Clean Water Commission also supports that this project will also incorporate aspects of the Heritage Farm's Master Plan to educate the public regarding stormwater management through active demonstration of best practices to rural, suburban, and urban Clark County residents which creates a greater awareness of the benefits of wetlands, enhanced riparian areas and restored headwaters.

Lower Columbia Fish Recovery Board (LCFRB) (See attached letter of support):

The LCFRB was established by the Washington State legislature to oversee and coordinate salmon and steelhead recovery in southwest Washington. In addition to its salmon recovery responsibilities, the LCFRB is the Lead Agency under the Washington Watershed Management Act for the southwest Washington Watershed Planning Units (WRIAs 25/26, 27/28 and 29A). In this capacity, the LCFRB developed Watershed Management Plans that set forth important strategies, measures and actions for the beneficial management of our watersheds, intended to meet the present and future needs of our communities, local economies, recreational experiences as well as our fish and wildlife. Steve Manlow, Executive Director of the LCFRB, strongly supports this project in its ability to provide downstream benefits to Endangered Species Act listed salmon and steelhead in Salmon Creek by restoring wetlands, promoting infiltration of stormwater, increasing ground water elevations, and improving creek and wetland hydrology. "This proposal aligns well with the WRIA 27/28 Watershed Management Plan priorities".

Washington State Department of Ecology (Ecology):

Clark County Clean Water would like to create a partnership with Ecology and believes that Ecology is a very important stakeholder in the Heritage Farm Headwater Wetland Restoration project due to the projects watershed beneficial impacts on the Salmon Creek TMDLs for temperature, turbidity and bacteria. If this project is selected for grant awarding, Ecology will be providing support in the form of funding.

Describe the steps you have taken to be ready to start the project by May 1, 2021. Provide detailed information and documentation on project elements such as status of designs, permits, interlocal agreements, landowner agreements, easements, other secured funding, staff, or agency approvals.

The Heritage Farm Wetland and Channel Restoration project has been prioritized and vetted by Clark County engineering, scientific, and management staff. The project is included in the 2019-2024 Stormwater Capital Plan approved by the Clark County Council. The project will be

Project Planning and Schedule

administered by the Public Works Clean Water Division, utilizing project staff from other Public Works divisions. Staff are available to begin this project immediately upon execution of a grant agreement, to include survey, design, permitting, construction management, project management, and administration.

Environmental permitting may be challenging due to the site's location in the headwaters area of Cougar Creek. We anticipate initiating the permit process as soon as a permit-ready set of plans has been developed (approximately 60% design). Obtaining the necessary approvals is not expected to delay the project's design or construction.

All proposed improvements are within existing county-owned property, eliminating the need to develop access or easement agreements. The county's Clean Water Fund will provide the match for this grant. The Clean Water Division has sufficient revenue and budget authority to provide the required match and to provide up-front project funding prior to reimbursement.

Upload a project schedule that includes all tasks necessary to complete the project, including tasks that are not part of the funding request.

Upload any other supporting documentation.

Upload Documents

https://ecyeag/IntelliGrants_BASE/_Upload/127095_914135-HeritageFarmHeadwaterWetlandRestorationSchedule.xlsx
https://ecyeag/IntelliGrants_BASE/_Upload/127095_914135_2-LegacyLandsHeritageAug2019.pdf
https://ecyeag/IntelliGrants_BASE/_Upload/127095_914135_3-WSU-HF-grant-sppt-ltr-DOE.PDF
https://ecyeag/IntelliGrants_BASE/_Upload/127095_914135_4-CWCLetter.pdf
https://ecyeag/IntelliGrants_BASE/_Upload/127095_914135_5-HeritageFarm-Alternatives-PlanandProfile.pdf
https://ecyeag/IntelliGrants_BASE/_Upload/127095_914135_6-LCFRBsupport_ClarkCoHeritageFarmDOEgrant.pdf
https://ecyeag/IntelliGrants_BASE/_Upload/127095_914135_7_2-HERITAGEFARMWETLANDRESTORATIONWATERSHEDIMPROVEMENTSUMM

(Schedule) Heritage Farm Headwater Wetland Restoration Schedule
 Heritage Farm Public Works Parks & Land Division Letter of Support
 Washington State University Extension Letter of Support
 Clean Water Commission Letter of Support
 Alternative Plans and Profiles
 LCFRB Letter of Support
 Preliminary Wetland Restoration Watershed Improvement Summary

Project Planning and Schedule

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https://ecyeagl/IntelliGrants_BASE/_Upload/127095_914135_8-HeritageFarmHeadwaterWetlandPreliminaryWetlandFunctionalAssessment.docx

Preliminary Wetland Functional Assessment

https://ecyeagl/IntelliGrants_BASE/_Upload/127095_914135_9-HeritageFarmHeadwaterWetlandRestorationSelectedPlanandProfile.pdf

Selected Heritage Farm Headwater Wetland Plan and Profile

Water Quality and Public Health Improvements

To go to the Water Quality Atlas, follow this link: <https://fortress.wa.gov/ecy/waterqualityatlas/StartPage.aspx>.

Name the specific water body(ies) this project will improve or protect.

The project improves and protects Cougar Creek and Salmon Creek, both of which are subject to existing TMDLs and 303(d) listings. Clark County addresses TMDLs through implementation of the Stormwater Management Plan, including capital projects, and is an engaged stakeholder on local TMDL implementation teams.

There are TMDLs for temperature, turbidity, and bacteria on Salmon Creek which is a receiving water of Cougar Creek. This headwater wetland and channel restoration project located in the Cougar Creek watershed will decrease the temperature and turbidity to the receiving waters of Cougar Creek which will then feed cool less turbid waters to Salmon Creek. A brief overview of the existing and proposed drainage characteristics on the site and the physical processes involved is provided below:

Stormwater runoff from the north and south currently drains toward the existing channel through the property, collecting stormwater runoff from a network of storm sewer systems east of the property and conveying it from east to west through the project site. This project will infiltrate as much as possible of that stormwater runoff, that currently drains directly to the creek. Infiltration will occur below the base of the expanded wetland and on the flood plain bench (for larger storms).

The soil filtration process will remove particulates from the infiltrated stormwater runoff before it re-emerges as base flow in the stream, and so will reduce turbidity in the stream. For larger, less frequent stormflow events, additional sedimentation will take place by allowing large particles to drop out in the shallow wetlands before entering the stream.

The warm stormwater runoff passing through the soil mass will cool to soil temperature before entering the stream, where that cool base flow can then mix with the warmer stream flows typically found in summer streams, acting to lower temperatures in the stream. Providing tree canopy and shade in the replanted wetland area will reduce the temperatures of surface flows through the site, also helping to lower stream temperatures.

Local planning efforts concerning Salmon Creek and Cougar Creek have spanned two decades and included the Salmon Creek Watershed Plan, the Stormwater Needs Assessment Program, capital planning exercises, the 2010 78th Street/ WSU Property Master Plan (AKA Heritage Farm), and numerous monitoring efforts reflected in the 2010 Stream Health Report and other analytical products. Ecology and Clark County have cooperated on a number of monitoring efforts and evaluations intended to identify opportunities for watershed improvement.

The Heritage Farm Headwater Wetland Restoration Project directly supports recommendations found in several of these plans and reports. Much of the remaining land in the headwaters of Cougar Creek has already been developed or is currently being developed into housing.

Water Quality and Public Health Improvements

Is the project planning, implementation, or a combination?

Planning

✓ Implementation

Planning/Implementation

If implementation or planning/implementation, complete the Action Table.

To add multiple implementation actions:

Enter the implementation action and plan reference.

When done, click the **SAVE** button.

After SAVE a new row will appear.

Repeat these steps for each implementation action.

Action

Increase ground water inflows to streams to decrease maximum temperatures.

Restore hyporheic zone by creating headwater wetlands to reduce maximum daily instream temperatures, reduce channel erosion, and avoid sedimentation of fine materials in the stream reducing turbidity.

Riparian Planting to reduce solar radiation which will reduce instream temperatures.

Reference the document that describe the action, including page numbers and where a copy can be obtained

Salmon Creek Temperature Total Maximum Daily Load: Water Quality Improvement Report and Implementation Plan. Pg. xi and Pg. 44 Washington State Department of Ecology

Salmon Creek Temperature Total Maximum Daily Load: Water Quality Improvement Report and Implementation Plan. 2011 p. Xi, Xii, 44 Washington State Department of Ecology

Salmon Creek Watershed Bacteria and Turbidity Total Maximum Daily Load 2001 p.13,15 Washington State Department of Ecology

Salmon Creek Temperature Total Maximum Daily Load: Water Quality Improvement Report and Implementation Plan. Pg. 44 Washington State Department of Ecology

What type of plan or regulatory requirement does this project address?

✓ TMDL/TMDL Alternative (approved or in development)/Straight to Implementation

Wastewater Engineering Report/Sewer Plan

✓ Permit

✓ Salmon Recovery Plan

✓ Watershed Plan

Shoreline Master Plan

Water Quality and Public Health Improvements

Administrative Order or Other Legal Action

✓ Capital Improvement Plan

Puget Sound Action Plan

Mitigation

Other

Not Applicable

If your project is addressing a TMDL, select at least one from the dropdown list.

To select multiple TMDLs, hold down the control key as you select

TMDL Name

Salmon Creek Bacteria and Turbidity TMDL (Approved)

Salmon Creek Watershed Temperature TMDL (Approved)

Did you discuss this project with Ecology staff? If yes, provide the name of the staff and the last date of contact.

Yes, Leanne Whitesell and Devin Rostorfer (September 30, 2019)

Describe how the project drainage area connects to the water body.

Examples: surface flow, ditch, pipe, groundwater, infiltration, and path/distance to outfall/discharge.

The headwaters of Cougar Creek run directly through the Heritage Farm project area. The location of the project is currently a ditched and disturbed wetland in the in the headwaters of Cougar Creek, a major tributary to Salmon Creek. The project reverses existing ditching that historically occurred and constructs a shallow floodplain bench with incorporated shallow wetlands for infiltration/retention and ground water recharge. The restored headwater wetland will act as a supply of cool ground water to Cougar Creek and then on to its confluence with Salmon Creek which is located approximately 3.1 miles downstream of the project.

The project will excavate a shallow floodplain bench, reconnecting the stream to its floodplain, reducing stream erosion and restoring the natural hydroperiod of this headwater wetland area. The wetlands will be restored and enhanced along the existing channel alignment. The grading plan will create shallow wetland cells in the floodplain restoring the natural retention and treatment provided by the historic wetlands, restoring the natural groundwater recharge, reducing stormwater runoff volumes passing to the stream and reducing ongoing stream erosion. Overland runoff currently flowing directly to the stream will be collected in those shallow retention areas, also serving to improve the water quality and reduce peak flows of runoff entering the stream.

The enhanced groundwater recharge will deliver cooler groundwater flows to the stream, supplementing low summer base flows in Cougar Creek, delivering cool water to the stream, increasing flow depths and improving fish passage conditions for resident fish. Cougar Creek being

Water Quality and Public Health Improvements

an important feeder tributary to Salmon Creek, summer conditions for Endangered Species Act listed salmon and steelhead in the main Salmon Creek channel will also be improved.

The native wetland vegetation on the site will be re-established, providing shading to reduce stream temperatures in Cougar Creek, while helping restore the natural water balance within the project area.

The aggregated watershed benefits provided by the project will also improve conditions in Salmon Creek downstream of the project. Cougar Creek is one of only a few critical sources of cool water to the Salmon Creek main stem, a salmon-bearing system where cool-water refugia is limited during summer.

The next three questions will assist Ecology Evaluators in assessing the project value.

Describe the measure and method that will be used to determine the water quality benefit and overall success of the project.

If you need help determining a water quality metric, please refer to the Funding Guidelines for suggested metrics by project type.

The project offers opportunities to directly measure impacts to water quality and hydrology over an extended period. A pre-construction monitoring program will be implemented to establish current water quality and other water quality characteristics that will be used to inform project design and act as a base line to assess improvements attributable to completion of the project.

Monthly random date grab samples will be collected for water quality parameters such as total suspended solids (TSS) and turbidity pre and post construction to provide a base line and then to measure success of the project. These monthly grab samples will be collected at both the inlet and outlet of the project area to measure differences in water entering the site and water leaving the site both before and after the project. HOBO temperature continuous temperature loggers will also be deployed at both the inlet and outlet of the project area pre and post construction. Continuous temperature data will give a more precise view of temperature fluctuations in measuring the success of this project. Continuous temperature data is used in the Ecology 303D listing process.

In addition to water quality, monitoring will also include plant establishment, groundwater elevations, and water flow. Piezometers will be deployed to measure ground water level and flow in the designing phase of this project and after construction to measure water quality benefit and overall success of the project. Visual water flow measurements will be taken of water flowing off site.

After the completion of the grant period, Clark County will continue to monitor the project site for an extended period to evaluate development of mature forested vegetation. Vegetation survival will be measured by transect with a goal of 8 inch plant density.

Using the method described above, estimate the water quality and public health benefits that will be achieved by the project.

This project will use a watershed-based design to improve water quality and flow control and reduce stream erosion and degradation within the project area itself, while also addressing regional watershed concerns and needs within Cougar Creek and the Salmon Creek main stream channel. As such, multiple water quality, flow control and watershed benefits will be achieved. As noted above, pre- and post- construction

Water Quality and Public Health Improvements

monitoring will be completed to characterize and quantify the actual water quality, stream flow, and other environmental benefits provided by the project.

The enhancement of headwater wetlands will create floodplain retention areas, providing bioretention treatment of stormwater runoff, restoring the natural groundwater recharge, reducing stormwater runoff volumes passing to the stream and reducing ongoing stream erosion. Overland runoff currently flowing directly to the stream will be collected in shallow retention areas, also serving to improve the water quality and reduce peak flows of runoff entering the stream. Restoration of the natural groundwater recharge will provide cooler less turbid water to both Cougar Creek and Salmon Creek. Reducing stream erosion, peak flows of runoff entering stream, temperature and turbidity by creating infiltration and groundwater recharge all create long term benefits of improved water quality for fish and other biological life downstream.

Conceptual-level modeling of the selected grading alternative shows around 23 acre-feet of additional infiltration (and groundwater recharge) with peak flood flows passing downstream being reduced by upwards of 50%. Groundwater recharge entering a creek as base flow may be a relatively constant 11 degrees Celsius, so helping lower summer stream temperatures which can be as high as 20 degrees Celsius in mid-summer.

Approximately, 0.8 acres of wetlands could be designed for creation with 5.2 acres of wetland enhancement at Heritage Farm. This increase in wetland habitat increases habitat suitability for invertebrates, Amphibians such as the threatened native species Northern Red-Legged Frog, wetland associated birds and mammals. There is also the opportunity to increase native plant richness and primary production and export through project planned native revegetation efforts.

Also, because of the project's location at Heritage Farm, many visitors from the public can be educated on watershed stewardship as well as provided with natural beauty to increase public health. This project could act as a flagship project in Clark County to demonstrate the importance of headwater wetlands to a watershed as a whole and convey the important cascading relationship between headwaters and endangered salmon and steelhead downstream. At least 2 classes will be developed and proctored by the WSU Extension to educate the public on the Cougar Creek stream corridor and the importance of headwater wetlands in providing cool less turbid water to downstream fish bearing creeks such as Salmon Creek.

How long will the project provide benefits after the funding assistance ends? Who will be responsible for maintaining the benefits during its useful life?

The project area is entirely owned by Clark County. Water quality, flow control, wetland and other watershed benefits will be provided in perpetuity. This project will continue to provide cool less turbid water to Cougar Creek and Salmon Creek through non- point water runoff retention, reduction in peak flows entering the stream, groundwater recharge, and infiltration will continue similarly to how natural headwater wetlands fed streams originally before human impact.

Clark County will be responsible for maintaining this project's important water quality and watershed benefits for a minimum of 10 years and in perpetuity.

Water Quality and Public Health Improvements

How will greenhouse gas emissions be reduced or mitigated under this project? And what policies or measures has your organization put in place to reduce greenhouse gas emissions apart from this project?

The entire project area will be revegetated with native plants following completion of the grading and other site improvements.

Heritage Farm has developed a sustainability framework plan for the entire property detailed in the draft Master Plan (see attached). They property already supports underserved members of the community through 10 acres of crops harvested for low-income families through the Clark County Food Bank. Agricultural workshops for best management practices take place as well as demonstrated at the property of the project site. There are 84 community garden plots as well.

In addition to the historic features and community gathering venues the 78th Street/WSU property will provide, this site also offers an exciting opportunity to educate visitors about sustainable design and environmental stewardship. One major project component includes incorporating environmentally sustainable materials, techniques, methods and practices wherever possible in the site development.

The following list of recommendations will be explored to help establish the project framework in its subsequent design phases :

Gardening/Farm and Landscape Systems

1. Enhance wildlife habitat where indicated on the site
2. Eradicate invasive species and restore natural habitat
3. Use low impact or pesticide free gardening techniques where feasible
4. Design educational signage to interpret key sustainable features of the site
5. Provide observation areas at key points for educational purposes

Water Management

1. Treat all stormwater runoff on site in a functional, educational and artistic way
2. Minimize impervious surfaces for roads and parking
3. Incorporate low consumption strategies in the new irrigation system.
4. Educate gardeners on efficient watering techniques
5. Harvest rain water where appropriate

Energy

1. Minimize night light pollution
2. Incorporate low-level lighting with no direct beam illumination leaving the site
3. Research alternate power sources as appropriate

Water Quality and Public Health Improvements

Materials

1. Use low-maintenance, long-life materials
2. Reuse organic debris from clearing operations on site, or use County/City compost
3. Use local building materials when available
4. Use wood certified by the Forest Stewardship Council as appropriate
5. Use local stone as appropriate
6. Use natural materials
7. Incorporate a recycling program to limit construction and building waste
8. Adaptively reuse existing, historic buildings as appropriate

The Clark County Transportation Division is active in completing signalization improvement and synchronization projects to reduce traffic congestion. The Clark County car fleet is primarily made up of hybrid gas/electric cars.

Clark County provides free bus passes, bicycle lockers and other incentives to encourage trip reduction.

The Clark County Office building is LEED-certified.

Clark County has developed an early concept for a default “sustainable roadway grid” (roundabout corridor/green street) that will reduce energy usage and greenhouse gas emissions in addition to helping provide more sustainable watershed management. Recent roadway projects have included elements of this strategy, and the county is considering further applications of this strategy in our ongoing roadway designs.

Upload a map that shows an aerial view of the project area, an estimated direction of flow for the project area, potential locations for the proposed facility or activity, and how the project connects to the water body named above.

The map does not need to be precise, but it should help reviewers with a general understanding of the area. If access to GIS software is not available, screen shots or snips from Google Maps with arrows and text added using a paint program may be used.

Upload Documents

Click the Browse button

Select your file

Click Save, your file will appear in the List of uploaded documents

Repeat for each file

To Delete a file, select the Delete checkbox next to the file and click SAVE

https://ecyeagl/IntelliGrants_BASE/_Upload/127367_9 Heritage Farm Wetland Restoration Engineer Plan and Profile Map
14131-HeritageFarmHeadwaterWetlandRestorationS

Water Quality and Public Health Improvements

electedPlanandProfile.pdf

https://ecyeagl/IntelliGrants_BASE/_Upload/127367_914131_2-Cougar_Creek_Restoration_Overview.pdf

Heritage Farm Wetland Restoration Location within County

https://ecyeagl/IntelliGrants_BASE/_Upload/127367_914131_3-Cougar_Creek_Restoration_CougarCreekWatershed.pdf

Heritage Farm Wetland Restoration location in Cougar Creek sub watershed

https://ecyeagl/IntelliGrants_BASE/_Upload/127367_914131_4-HeritageFarmCougarCreekHeadwaterWetlandRestorationProjectLocation.pdf

Heritage Farm Headwater and Wetland connection to Cougar Creek

Environmental and Cultural Review

If you have a wastewater or stormwater facility project, and you are applying for or have received a loan from the CWSRF, when applicable upload the following documents.

- SEPA Checklist
- SEPA Threshold Determination
- Affidavit of Publication of SEPA Threshold Determination
- Public Meeting Documents
- SERP Coversheet
- SERP Checklist
- SERP Determination
- Other SERP/SEPA Documentation
- Cultural Review Final Determination
- DAHP Letter of Concurrence
- Completed activity/location specific Inadvertent Discovery Plan (IDP). An IDP is not associated with consultation and is required in the event of a discovery during ground disturbance.

In addition to the above documents, if you are required to prepare a federal cross cutter report, when applicable upload the following documents.

- Cross Cutter Report
- Cross Cutter Checklist
- Cross Cutter Final Determination

If you have a stormwater facility project, and you are applying for or have received funding via SFAP but not CWSRF, when applicable upload the following documents.

- SEPA Checklist
- SEPA Threshold Determination
- Affidavit of Publication of SEPA Threshold Determination
- Cultural Review Final Determination (No sensitive information allowed)
- DAHP Letter of Concurrence
- Completed activity/location specific Inadvertent Discovery Plan (IDP). An IDP is not associated with consultation and is required in the event of a discovery during ground disturbance.

Environmental and Cultural Review

If you have a nonpoint activity, an onsite sewage system, or a stormwater activity project, regardless of the funding source, when applicable upload the following documents.

- ✓ Cultural Review Final Determination (No sensitive information allowed)
- ✓ DAHP Letter of Concurrence
- ✓ Completed activity/location specific Inadvertent Discovery Plan (IDP). An IDP is not associated with consultation and is required in the event of a discovery during ground disturbance.

Upload Documents

Click the Browse button

Select your file

Click Save, your file will appear in the List of uploaded documents

Repeat for each file

To Delete a file, select the Delete checkbox next to the file and click SAVE

Description

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Clark County - Public Works Department

WQC-2021-CICoPW-00032

Uploads

Description

Heritage Farm Draft Master Plan Update

Heritage Farm Master Plan 2010

Attachments

https://ecyeagl/IntelliGrants_BASE/_Upload/127566_884773-MasterPlanUpdateDraftRpt_v46-19-2019.docx

https://ecyeagl/IntelliGrants_BASE/_Upload/127566_884825-FinalMasterPlanApril2010.pdf