2026 On-the-Ground Project Application Form

General Information

Project Name: Cottonwood Creek Restoration Project Phase 1

Applicant Name: Big Blackfoot Chapter of Trout Unlimited

Is your organization registered with the Montana Secretary of State? Y

Explanation: Each applicant must be registered with the Montana Secretary of State to do business in the state of Montana. Registration with the Secretary of State may be completed via the following website: https://sosmt.gov/business/

Is your organization registered with the federal System for Award Management (SAM)? Y

Explanation: Each applicant is required to register with SAM. To register or check your organization's status, go to https://sam.gov/content/home. If you get an "Unsupported Browser" error, copy, and paste the link into a Google Chrome browser window.

Primary Contact: Jim Stutzman | Title: Board President

Address: PO Box 1 | City: Ovando | State: MT | Zip Code: 59854

Phone Number: 406-799-4393 | Email: stutz292@hotmail.com

Signature: James Stutzman — Digitally signed by James Stutzman Date: 2026.02.20 11:43:54 -07'00'

Explanation: This is the person who DEQ would routinely contact to discuss project progress, billing, etc.

Signatory: Ryen Neudecker | Title: Restoration Coordinator

Address: PO Box 1 | City: Ovando | State: MT | Zip Code: 59854

Phone Number: 406-240-4824 | Email: ryen@montanatu.org

Signature: Ryen Neudecker — Digitally signed by Ryen Neudecker Date: 2026.02.20 11:42:27 -07'00'

Explanation: This is the person who can legally sign contracts and other binding documents on behalf of the applicant (e.g., a board chair)
Note: The primary contact, signatory and landowner must sign the application. Signatures must be either signed electronically, or wet-signed, scanned and sent electronically.

Landowner Name: Mark Bretz (see attached pg)

Landowner Signature:

Landowner Name:

Landowner Signature:

Landowner Name:

Landowner Signature:

Explanation: Landowner signatures are required. **Signing the application does not obligate the landowner to implement a project.** Instead, it is an indication that the landowner has read the application and agrees, in principle, with the project concept and goals.

Your organization's Unique Entity Identifier number (UEI #) 52-1765527

Explanation: Each applicant is required to have a current UEI number. The UEI number replaces the old DUNS number. If your organization had a DUNS number, you should have received a notification from the federal government indicating that your DUNS number has been changed to a UEI number. If you did not receive this notification, or if you never had a DUNS number, you will need to go to the federal government's System for Award Management (SAM - https://sam.gov/content/home) to obtain your UEI number. DEQ recommends starting this process early as it is very time-consuming, requires providing documentation-sometimes with follow-up requests for additional information, and can take up to 2 months to complete. If you need assistance, you may contact the federal help desk at 866-606-8220 Monday-Friday 8:00 a.m. through 8:00 p.m. EST.

Does your organization have adequate liability insurance for the risks associated with your project? Y

Explanation: Each applicant must have or obtain liability insurance coverage meeting the requirements stated in the Draft Sample Contract and/or requirements negotiated based on the appropriate level of risk associated with the project.

Describe the technical and administrative skills your organization will use to effectively and efficiently complete your proposed project(s).

The mission of BBCTU is to restore and preserve the cold-water fishery of the Blackfoot River and its tributaries. Our organization works closely with the Blackfoot Challenge whose mission is to coordinate efforts that will enhance, conserve and protect the natural resources and rural lifestyle of the Blackfoot River Valley for present and future generations. Through our collaborative efforts, in partnership with several local, state, federal agencies, other non-profits, and private landowners (Blackfoot Restoration Partners) we work towards a shared vision of resource conservation and management. Ryen Neudecker is the Restoration Coordinator for BBCTU and has 25 years' experience coordinating and implementing habitat restoration projects in the Blackfoot River Watershed and has managed over 100 different grants and partnership agreements with state, private and federal partners.

BBCTU has been the applicant and administrator of several past 319 projects including five phases of Nevada Creek, two phases of Poorman Creek, Cottonwood Creek and other restoration projects throughout the watershed.

Budget Form

Please fill out the On-the-Ground Project Budget Template (Excel file). Cells highlighted in yellow may be edited to fit the needs of your particular project. DEQ uses a template to construct nonpoint source grant contracts. The Budget Template contains tasks and typical deliverables that match up with the grant contract template. Please see the Example Contract and Scope of Work Template for a more detailed look at typical task requirements and deliverables.

Project Form

A separate Project Form (including providing separate attachments) must be submitted for each project included in your application. Use the following examples to help determine when to lump and when to split projects.

Splitting Examples (fill out multiple Project Forms)

- Stream restoration work occurring on two separate streams..
- Two projects with significantly different sets of project partners.
- Two projects that address substantially different pollution sources (e.g., one project move a corral off of a streambank, and another removes mine tailings, with both projects being on the same property).

Lumping Examples

- Contiguous stream restoration work spanning multiple land parcels.
- Three projects that address similar sources of pollution on a single land parcel (e.g., moving a corral off a stream, implementing a grazing management plan, and relocating a manure storage facility out of the floodplain, all on the same ranch)

Project Form

A separate Project Form (including providing separate attachments) must be submitted for each project included in your application

Project Name: Cottonwood Creek Restoration Project Phase 1

Required Attachments in Addition to This Form

- [x] Letter of support from the organization that created or sponsored the creation of the DEQ-accepted Watershed Restoration Plan or the Tribe that created the EPA-approved Tribal Nonpoint Source Management Plan (*if applicable).*
- [x] Letter of support from EACH landowner associated with the proposed project area (*if applicable).*
- [x] Budget Table (see Microsoft Excel Template).
- [x] **Detailed Project site map(s)** Attach a map or set of maps showing the location and size of proposed activity if a site has been predetermined. The map scale must be between 1:1,000 and 1:12,500. The map(s) must have an aerial photo background (e.g., USDA NAIP photography, Google Earth imagery, etc.). The map(s) must show the latitude, longitude, site name, and landowner for the activity site. The map(s) should also identify waterbodies affected by the pollution that the activity is designed to address. (*This is in addition to adding points of the project location to the website on page 4*).

Optional Attachments

Attach additional items and information that could help reviewers better understand your project. Information could describe public health risks, opportunities to leverage other funding sources, etc. However, application reviewers may have limited time available, and excessively long, optional attachments might not get reviewed. Do not attach copies of TMDL documents, TMDL implementation evaluations, Watershed Restoration Plans, Tribal Nonpoint Source Plans, or large comprehensive studies. The following attachments may be included. Please no more than 20 pages.

- [x] Project Design Plans/Drawings
- [x] Preliminary Engineering Reports / Site Evaluations
- [ ] Landowner Agreements / Construction Permits / Floodplain Permits
- [x] Site photos
- [x] Additional Letters of Support
- [ ] Other:
- [ ] Other:
- [ ] Other:

Project Area

Please provide as detailed a description of the project area as possible.

List the counties in which the project will be located.

Powell County

List the 12-digit Hydrologic Unit Codes (HUCs), sometimes referred to as Sixth Code HUCS, in which the project will take place. Use the following link to help assist you in determining the HUCs: https://apps.nationalmap.gov/viewer/

170102030903

Project Location Map

In addition to providing your own project site map, please go to the following website and follow the instructions to add your project location to the map.

https://gis.mtdeq.us/portal/apps/storymaps/stories/42f4a668285c4ef6aa94b1623f10df57

Connection to a Previous or Ongoing Project

Is this project tied to a previous or ongoing project? If so, please describe the connection.

This project builds upon the collaborative effort to restore and delist several tributaries in the Nevada Creek watershed from the Impaired Waters list that began in 2010, with the latest stretch on Nevada Creek being completed in November of 2025. Beginning in 2022, the Blackfoot Restoration team began collecting data and working with the Bretz and Mannix Family on developing a master plan to design and implement a large-scale restoration project on Cottonwood Creek to address the full range of limiting factors impacting the fishery and instream, riparian and upland habitat. Restoring Cottonwood Creek and addressing the multiple limiting factors throughout the drainage is an important priority for the Blackfoot Restoration team and is part of the Blackfoot Watershed Restoration Plan. We envision several phases of work on Cottonwood Creek that will involve stream and riparian restoration, fish passage, grazing management, irrigation efficiency improvements, and water conservation.

BBCTU is also collaborating with Bureau of Land Management on habitat restoration work in the headwaters of the Cottonwood Creek drainage upstream of this proposed work on private land. Project elements include grazing managment and instream and riparian habitat improvement work.

Project Purpose

Select the watershed restoration plan or tribal nonpoint source plan that your project will help implement (please type in if missing from list) (*Not required for HAB reduction projects)*

Blackfoot River - Blackfoot Challenge

Y — Letter of support from author, or if the author was contracted, the author sponsor, attached? *(If no, explain why below.)*

IMPAIRMENT LISTINGS: Projects that address water quality impairments on Montana's 2020 List of Impaired Waters are preferred though not a requirement. Funding may be used for projects that protect waterbodies that are demonstrated to be healthy.

Waterbody name from the 2020 List of Impaired Waters	Cottonwood Creek
Probable causes of impairment to be addressed	Flow Regime Modification; Sedimentation/Siltation; Temperature
Waterbody name from the 2020 List of Impaired Waters	
Probable causes of impairment to be addressed	

HEALTHY WATERSHEDS: While project funding is prioritized to addressing known impairments, funding can be used to protect healthy waters from becoming impaired.

Name of healthy waterbody to be protected	
Description of identified threat	
Name of healthy waterbody to be protected	
Description of identified threat	

Project Partners

Identify each of the project partners and describe their contribution to the project. Include landowners, land managers, project designers, funders, and your own organization. Indicate whether each partner, other than your organization, has provided a letter of support. (*Note: each landowner must provide a letter of support if project site(s) have been predetermined.*)

Landowner	Contributions to Project	Letter of Support Attached?
Bretz Ranch	Input to and review of project master plan and project designs along with in-kind materials (sods, gravel, fill and willows). Financial contributions related to grazing management and irrigation efficiency projects.	☑
		☐
		☐
		☐

Project Partner	Contributions to Project	Letter of Support Attached?
Montana Fish, Wildlife & Parks	MTFWP has or will assist with developing project objectives, design review, establish permit conditions and lead the monitoring effort of the fisheries response. Future Fisheries is also a potential source of funding and we intend to apply in June of 2026.	☑
USFWS Partners for Fish & Wildlife Program	The USFWS will provide technical review and oversight assistance, permitting assistance and financial support, play a key role in the completion of the grazing management project and will provide grass seed and assist with project seeding.	☑
Trout Unlimited National	TU National has been instrumental in reviewing water rights throughout the Cottonwood Creek drainage and providing guidance on the proposed water lease and water conservation project that involves consolidating several irrigation diversions into a more efficient system.	☐
Blackfoot Challenge	The BC is helping develop the grazing management system in coordination with the landowner and lessee and will help conduct outreach and education with local communities and schools related to this and overall water quality in the Blackfoot. BC water steward also collected two years of instream flow data.	☑
Mannix Brothers Ranch	Mannix Brothers Ranch has helped develop the grazing management plan and provided input on the overall project master plan that involves water conservation, riparian and stream restoration and fish passage.	☐

Project Coordination and Planning Task

This task would include completion of all applicable planning tasks from the list below, as well as coordination and oversight of the efforts of all project partners.

Identify the status of the following project planning tasks, where applicable.

	Completed?	Copy Attached?	To Be Completed Pre-Contract (Oct 2026)?	To Be Completed as Contract Deliverable?
*Draft Project Designs	✔	✔	☐	☐
*Final Project Designs	☐	☐	✔	✔
Consultation With Potential Regulators	☐	☐	✔	☐
Necessary Permits	☐	☐	✔	☐
Cultural Resources Inventory *(if relevant)*	☐	☐	✔	☐
Other: USFWS NEPA	☐	☐	✔	☐
Other:	☐	☐	☐	☐
Other:	☐	☐	☐	☐

***See Call for Applications Section 5.1 for minimum design standards.*

Describe any additional project planning that *will have been completed prior* to execution of a contract (October 2026).

Project bid solicitation, review and potential awards. Material acquisition related to the grazing management system. The total project reach is 3,700 feet in length and the reach tied to 319 funding is proposed to start at station 15+00 on the plan set and extend down to 37+00. We are planning to implement the upper 1,500 feet of channel work to meet timelines for a USFWS grant. The grazing management system that will help protect, restore and conserve the steaam and riparian restoration project will also be in place likely before the initiation of the contract.

Describe any additional project planning and coordination that will need to be completed after the execution of a contract (October 2026).

Project planning beyond what is described above will include coordination on volunteer events, project tours, youth field days, material acquisition related to the overall project, final contracts for implementation and administrative tasks.

Landowner Agreement Task

DEQ includes the following language in every nonpoint source contract involving on-the-ground activities:

Contractor shall submit signed landowner agreement(s) verifying that Contractor and DEQ staff may access the project site, at reasonable times and with prior notification, for the purposes of project planning, implementation, and post-implementation monitoring. The agreement(s) must ensure appropriate operation and maintenance of all structures, vegetation, and management measures for the life of the project (typically 10 years). If grazing will be allowed within the project area, the agreement(s) must include a sustainable management plan for livestock grazing, designed to protect and enhance riparian function. If a signed landowner agreement does not meet the above-stated minimum requirements, Contractor shall negotiate an amended agreement with the landowner that ensures appropriate operation and maintenance of all structures, vegetation, management measures, and includes a sustainable management plan for any livestock grazing for the life of the project (typically 10 years).

Identify the status of the following landowner agreement tasks, where applicable.

	Completed?	Copy Attached?	To Be Completed Pre-Contract (Oct 2026)?	To Be Completed as Contract Deliverable?
Draft Landowner Agreement(s)	☐	☐	☑	☐
Final Landowner Agreement(s)	☐	☐	☑	☑
Grazing Management Plan	☐	☐	☑	☐
Other:	☐	☐	☐	☐
Other:	☐	☐	☐	☐

Project Effectiveness Monitoring Task

If you will be conducting any on-the-ground implementation work, you will be required to complete the monitoring activities described in the task language below, as applicable. Describe below how you plan to determine the effectiveness of your project. Project effectiveness success criteria should be time-bound and assess each project objective quantitatively. Success criteria should clearly define adaptive management thresholds. Examples may include: a minimum 25% decrease in sediment/nitrogen/phosphorus load within 2 years; a 70% survival rate of containerized plantings after one year.

If you are applying for nonpoint source grant funding for project design only, and not for project implementation, you may either skip this task, or describe below which parts of this task you intend to complete:

Proposed monitoring activities include:
1) Estimates of the nitrogen and phosphorus load reductions (lb/year)
2) Estimates of the sediment load reductions (tons/year) measured by pre-and post-Bank Erosion Hazard Index Measurements
3) Estimates of vegetation mortality rates (survival %)
4) Pre- and post-construction photo point monitoring, consistent with the "Oregon Watershed Enhancement Board Guide to Photo Monitoring" methodologies
5) As-built design surveys

Example Task Language

Contractor shall, in consultation with the DEQ Project Manager, develop a reasonable method or set of methods for evaluating and reporting on the effectiveness of the project in addressing water quality issues. Contractor shall complete a monitoring plan to guide monitoring activities. Contractor shall complete the following monitoring activities:

- *Estimate the sediment load reductions (tons/year) achieved through implementation of the proposed restoration activities and management practices.*
- *Estimate the nitrogen load reductions (pounds/year) achieved through implementation of the proposed restoration activities and management practices.*
- *Estimate the phosphorus load reductions (pounds/year) achieved through implementation of the proposed restoration activities and management practices.*
- *For projects designed to address pollution from pollutants other than nitrogen, phosphorus and sediment, evaluate and report on the effectiveness of the project in addressing water quality issues.*
- *Contractor shall collect data, as directed by the DEQ Project Manager, to be used in estimating sediment, nitrogen, and phosphorus load reductions (and for harmful algal bloom reduction projects, carbon sequestration/emissions reductions) achieved through implementation of restoration activities and management practices designed to address these pollutants.*
- *Use the following measures to evaluate the sustainability of restoration activities and management practices:*
    - *[Vegetation mortality rate.]*
    - *Pre- and post-construction photo point monitoring consistent with the "Oregon Watershed Enhancement Board Guide to Photo Monitoring" methodologies, or a similar published photo point monitoring method accepted by DEQ. The U.S. Forest Service provides additional photo point monitoring guidance in the "United Stated Forest Service Photo Point Monitoring Handbook".*
    - *[Riparian survey.]*
    - *[Other.]*

Please describe any additional monitoring you intend to do as part of the project.

Native trout response is an important biological indicator of success in meeting our instream and riparian habitat goals. To evaluate long-term project effectiveness, MTFWP will continue surveying trout populations in several reaches of Cottonwood Creek following project implementation.

Project Implementation Task

Provide a d**etailed description of the solution you are proposing** to implement to address a nonpoint source pollution problem.

- Describe the practices you intend to design and/or implement to solve the problem (what, where, when, how much or how many).
- Describe the anticipated maintenance needs (what, where, who, how long).
- Refer to the minimum design standards in the Call for Applications.
    - *Please fill out this section to the best of your ability, even if you are only seeking funding for project design.*

Cottonwood Creek is an important native trout tributary in the Douglas Creek, Nevada Creek and middle Blackfoot River watershed and flows 18 miles through BLM and private land. Supporting pure populations of resident westslope cutthroat trout in its upper reaches and listed by Montana DEQ as impaired for sedimentation/siltation, temperature and flow regime modification, the project has been identified as a priority project. Through initial assessment and monitoring work, the Blackfoot Restoration team has identified opportunities to improve instream, riparian and uplands conditions along with restoring fish passage and instream flows, all in collaboration and balance with ranch management and production goals. Within this initial phase of restoration work on Cottonwood Creek, we are proposing to implement a restoration project on 3,700 feet of channel--phase one of work tied in with the bigger picture goals and objectives designed to address limiting factors and restore resilience to Cottonwood Creek. Within phase one, 319 funds are proposed to be tied to 2,200 ft (station 1,500 and 3,700). Limiting factors identified within the proposed project reach include: channel dewatering and lack of channel maintenance flows, channel entrenchment and floodplain disconnection, habitat degradation and inhibited fish movement, irrigation ditch losses and fish losses, historic grazing pressure and vegetation conversion and marginal or unsuitable water temperatures.

The design approach aims to work with, rather than against the natural riverine processes and historical conditions were determined based on analysis of LiDAR data and historical aerial imagery. The design emulates these natural conditions by incorporating large wood structures and shaping the channel to encourage pool formation and overall aquatic habitat complexity, aligning the channel through historical meanders and integrates dense plantings of willows, while incorporating floodplain treatments that will set the stage for natural cottonwood regeneration. Specific objectives include: restoring channel maintenance and minimum instream low flows; reducing channel entrenchment and floodplain disconnection; addressing chronic bank erosion; increasing the distribution and availability of complex instream habitat; elimination of water withdrawals and fish entrainment; reducing grazing pressure; and expanding the width and functionality of riparian habitat conditions to improve bank stability, floodplain function and improve water temperatures.

The desired riparian condition is one dominated by wood riparian shrubs and a patchy mosaic of cottonwood galleries. The design includes willow brush trenches along the stream banks and throughout the floodplain and microsites will be created to encourage the colonization from upstream and surrounding seed sources from cottonwood, willow and other native species. Disturbing the root system of the existing cottonwood overstory will also propagate new seedlings. Recruitment and establishment of cottonwoods have been suppressed by past grazing practices in the floodplain and the proposed grazing management plan and exclosure will allow for existing cottonwood saplings to mature, which in turn, will result in the long-term recruitment of large wood to the stream channel. The entire project reach will be excluded from livestock grazing and the average buffer with will be at least 35 feet. The grazing management plan goal is to allow the riparian area to establish and stream banks to stabilize following restoration work and involves a two-stage approach involving 1) recovery and stabilization and 2) management and monitoring.

Community richness and population densities of fishes in the main stem Blackfoot River closely reflect the quality of nearby tributaries making the broad level, systematic restoration program across the entire watershed fundamental to the success in recovering native trout all while working in collaboration with private, state and federal partners. This project will continue our efforts and provide new opportunities to educate communities about water quality and encourage new projects and partnerships.

Education, Outreach and Training Task

To get good projects on the ground, trained staff and board members and educated, enthusiastic landowners are required. To promote the development of future projects, DEQ encourages project sponsors to use up to $5,000 per project of funding to support training and conduct education and outreach. Example training topics might include: project management, public procurement, technical writing, GIS, water quality monitoring, web design, public speaking, human resource management, photo journalism, UAV (drone) piloting, financial management, and restoration techniques. Education and outreach activities might include targeted landowner outreach, conducting project site tours for local landowners, tabling at community events, holding a watershed festival, providing stipends and travel reimbursements for speakers and participants to attend a nonpoint source pollution prevention workshop, or generating articles for social media. The primary requirement for training and outreach is clearly explaining how the activity generates behavior change to address nonpoint source pollution. Funding may not be used to pay for food and beverages, or for honorariums and gifts.

Describe the education and outreach activities or training you will complete to promote behaviors or facilitate future efforts to reduce nonpoint source pollution. Additionally, identify the goals of the training/education and outreach activities.

Big Blackfoot Chapter of Trout Unlimited will host at least two project tours to highlight project progress with conservation groups, agency partners and community members. BBCTU will also coordinate at least one service day for volunteers and students to collect and install willow cuttings. In addition, the partners will host at least one youth field day for local schools, working with students to measure stream flows, turbidity, and temperature, while also teaching them about native trout and macro-invertebrates and to assess riparian and in-stream habitat health. The benefit of this project and information about the Blackfoot Restoration program aimed at improving water quality and fisheries habitat needs will also be promoted through the BBCTU and Blackfoot Challenge's web site, social media and print and electronic newsletters. Activities will be documented by reporting on the number of attendees, submitting photos and providing links/screenshots to published articles. The goals will be to increase awareness of water quality improvement projects and provide hands on opportunities for students and community members to contribute to conservation projects in the Blackfoot watershed.

Identify the specific target audience and method of delivery. Additionally, describe how the proposed training and/or education and outreach will increase local capacity and interest for addressing/promoting behavior change to reduce nonpoint source pollution.

The specific target audience ranges from local landowners, agency partners, community members, interested conservation volunteers and students from local schools. On past projects, the service days, project tours and youth field days have generated positive momentum to implement projects on other properties, inspire future conservationists and raise awareness about the restoration program in the Blackfoot Watershed and lessons learned that are transferable to other watersheds.

Describe how you will evaluate the effectiveness of the proposed activities.

We will seek feedback from tour attendees, local teachers, and landowners through follow-up conversations conducted after each event to help evaluate impact and inform future efforts.

Project Administration Task

Please use the task description below as a guide when calculating your budget for project administration. DEQ typically includes these requirements in every nonpoint source grant contract, with only minor variation. Funding applied to the Project Administration Task on each project must not exceed 10% of the total amount of funding requested, or $12,000, whichever is lower.

Example Task Language

Contractor shall oversee and be accountable for the completion of all tasks. Contractor shall maintain regular contact with the DEQ project manager. Contractor shall prepare and submit Status Reports, Final Reports and Attachment B Billing Statements according to the format and schedule described below.

Report Format

- *Contractor shall submit each Attachment B Billing Statement, Status Report and Final Report using the most current reporting guidance and templates provided by the DEQ project manager.*
- *Contractor shall ensure each Status Report and Final Report contains adequate documentation to justify accompanying reimbursement requests and match reporting, to the satisfaction of the DEQ project manager.*
- *Contractor shall ensure that the Final Report is a standalone document describing all contract activities and containing copies of all contract deliverables (even if the deliverables were previously submitted).*

Reporting Schedule

- *Status Reports: Due June 15th and December 15th of each year the Contract is in effect, and each time an Attachment B Billing Statement is submitted.*
- *Draft Final Report: Contractor shall submit a complete draft Final Report for DEQ review and comment at least 15 days prior to the contract expiration date.*
- *Final Report: Contractor shall submit a Final Report, addressing DEQ comments on the draft Final Report, on or before the Contract expiration date.*
- *Attachment B Billing Statements: Contractor shall submit an Attachment B Billing Statement with each Status Report, or Final Report submitted to DEQ while the Contract is in effect. To maintain cash flow, Contractor may submit interim Attachment B Billing Statements as frequently as monthly during the term of the Contract. However, each interim Attachment B Billing Statement must be accompanied by an Interim Report.*

Project Timeline

	4Q 2026	1Q 2027	2Q 2027	3Q 2027	4Q 2027	1Q 2028	2Q 2028	3Q 2028	4Q 2028	1Q 2029	2Q 2029	3Q 2029
Project Coordination and Planning Task	✔											
Landowner Agreement Task	✔											
Project Effectiveness Monitoring Task	✔				✔							
Project Implementation Task	✔	✔			✔							
Education, Outreach and Training Task	✔	✔		✔	✔							
Project Administration Task	✔	✔		✔	✔							

Co-Benefit Considerations

DEQ is committed to carrying out nonpoint source pollution reduction projects within engaged communities where the impact stretches beyond improving water quality. DEQ will award additional points in the scoring form where co-benefits extend beyond the project. Below are a few examples of how projects might exemplify co-benefits.

- Project will reduce economic hardship such as from livestock mortalities, cost and energy needs to treat municipal drinking and wastewater treatment, or loss of income from recreation
- Project will benefit underserved markets
- Project will improve or create equitable access to a clean and healthy environment
- Project planning included consultation with Tribal Nations
- Project will improve flood and drought resilience of the landscape
- Project impacts will benefit a downstream community and other natural systems (e.g., drinking water sources, human health, wildlife habitat, etc)

Please use this section to highlight co-benefits your project may have.

Cottonwood Creek is a tributary to Nevada Creek, the largest tributary to the middle Blackfoot River and has the potential to provide important public fishing opportunities. The project is designed to increase wild trout habitat in the Blackfoot River watershed and will ultimately provide off-site recruitment to the Blackfoot River by improving spawning and rearing habitat and ultimately provide local kids, community members and visiting anglers with an increased opportunity to catch trout and ultimately support local businesses during their visit to the area. The project will create local jobs by using local contractors and supplies thereby fueling the local economy. Bank storage (water absorbed and stored in stream banks) through floodplain connection, water temperature decreases, and the rejuvenation of a healthy, self-sustaining, native riparian ecosystem will all contribute to climate resiliency. Floodplains play an integral role in the health of river systems and provide some of the most biologically productive habitat for a multitude of animals and plant species. The exchange of water, sediments and organisms that occurs during periodic inundation and through connectivity has far reaching benefits including attenuating flood stages, dispersing energy, improving water quality, and storing carbon. This project will benefit westslope cutthroat trout --a Montana species of special concern. Species dependent on healthy riparian areas will also see positive benefits including migratory song birds, sandhill cranes, waterfowl, grizzly bears and amphibians. Consultation with Tribal Nations will also be a part of the process.

BUDGET

2026 Nonpoint Source Pollution Reduction Application - On-the-Ground Project Budget Template

Project Title:

Instructions	Tasks and Potential Deliverables	Funding Request*	Non-Federal Match**	Other Funding***	Match Source	Match Secured? (Y/N)	Total Project Cost	Additional Information****
This task includes completion of all planning tasks and coordination and oversight of the efforts of all project partners. Provide a detailed budget and add a row if needed.	**Project Planning**							
	Preliminary site investigation data and site maps			$ 26,897.00			$ 26,897.00	USFWS
	Required Permits		$ 1,200.00	$ 3,300.00	BBCTU	Yes	$ 4,500.00	USFWS
	Draft Project Designs			$ 10,200.00			$ 10,200.00	USFWS
	Final Project Designs			$ 19,318.00			$ 19,318.00	USFWS
							$ -	
							$ -	
	Total	$ -	$ 1,200.00	$ 59,715.00			$ 60,915.00	
This task includes costs for developing and managing landowner agreements and developing grazing management plans as applicable. Provide a detailed budget and add a row if needed.	**Landowner Agreements**							
	Draft Landowner Agreement		$ 1,450.00		BBCTU	Yes	$ 1,450.00	
	Final Landowner Agreement		$962		BBCTU	Yes	$ 961.80	
	Grazing Management Plan		$ 1,217.65	$ 3,000.00	Landowner	Yes	$ 4,217.65	Bureau of Land Management
							$ -	
							$ -	
	Total	$ -	$ 3,629.45	$ 3,000.00			$ 6,629.45	
This task includes costs for developing and implementing a monitoring plan to evaluate effectiveness to reduce nonpoint source pollution. See example contract template or application instructions for required monitoring activities. Provide a detailed budget and add a row if needed.	**Effectiveness Monitoring**							
	Draft Monitoring Plan		$ 450.00		BBCTU	Yes	$ 450.00	
	Final Monitoring Plan	$ 1,100.00	$ 2,576.00	$ 4,000.00			$ 7,676.00	Bureau of Land Management
	Written Summary of all Monitoring Activities		$ 1,200.00		BBCTU	Yes	$ 1,200.00	
							$ -	
							$ -	
							$ -	
	Total	$ 1,100.00	$ 4,226.00	$ 4,000.00			$ 9,326.00	
This tasks includes all costs for implementation of the plans developed in the Project Planning task. If you are requesting funding for design only, leave this task blank. Provide a detailed budget and add a row if needed.	**Project Implementation**							
	Materials		$ 57,800.00	$ 9,000.00	Landowner, Future Fisheries	Yes (LO) No (FF)	$ 66,800.00	USFWS
	Labor	$ 3,000.00		$ 5,000.00			$ 8,000.00	USFWS
	Equipment costs	$ 83,000.00	$ 55,000.00	$ 55,000.00	Future Fisheries	No	$ 193,000.00	USFWS & Bureau of Land Management
	Construction oversight	$ 5,000.00		$ 30,000.00			$ 35,000.00	USFWS & Bureau of Land Management
	As-built surveys	$ 1,000.00		$ 2,000.00			$ 3,000.00	Bureau of Land Management
	Photo documentation		$ 755.00		BBCTU	Yes	$ 755.00	
	Landowner recommendation letter		$ 100.00		Landowner	Yes	$ 100.00	
							$ -	
							$ -	
							$ -	
	Total	$ 92,000.00	$ 113,655.00	$ 101,000.00			$ 306,655.00	
This task includes costs to develop and improve organizational capacity and to incorporate education and outreach into each on-the ground projects. Provide a detailed budget and add a row if needed.	**Education and Outreach**							
	Volunteer Coordination	$ 1,000.00	$ 1,061.00		BBCTU	Yes	$ 2,061.00	
	Event/Tour Planning	$ 400.00	$ 458.75		BBCTU	Yes	$ 858.75	
	Outreach/Publication materials		$ 687.00		BBCTU	Yes	$ 687.00	
							$ -	
							$ -	
	Total	$ 1,400.00	$ 2,206.75	$ -			$ 3,606.75	
Funding applied to Project Administration task must not exceed 10% of the total amount of funding requested per project, or $12,000, whichever is lower. Project admin includes normal business expenses and reporting requirements.	**Administration**							
	Mid/Annual/Interim Reports and Billing Statements	$ 1,545.75	$ 549.60		BBCTU	Yes	$ 2,095.35	
	Draft/Final Report and Billing Statement	$ 1,751.85	$ 1,030.50		BBCTU	Yes	$ 2,782.35	
	Communication with DEQ	$ 515.25	$ 343.50		BBCTU	Yes	$ 515.25	
							$ -	
							$ -	
	Total	$ 3,812.85	$ 1,923.60	$ -			$ 5,392.95	
		Funding Request*	**Non-Federal Match****	**Other Funding*****			**Total Project Cost**	
	Grand Totals	$ 98,312.85	$ 126,840.80	$ 167,715.00			**$ 392,525.15**	

*Funding Request - Must not exceed $300,000 and must be at least $125,000 for harmful algal bloom reduction projects

**Non-Federal Match - Can include in-kind materials.
***Other Funding - Include federal match here, or, for example, other funding that is supporting the project but cannot be reported as match on this grant because it is matching another funding source.

****Additional Information - Use to specify non-federal match and other funding sources, or use to justify cost if needed (e.g., hourly rates, rental costs, etc.)

LETTERS OF SUPPORT

Blackfoot CHALLENGE
Better Rural Communities through Collaborative Conservation

February 10, 2026

Nonpoint Source and Wetlands Section
Montana Department of Environmental Quality
1520 E. Sixth Avenue P.O. Box 200901
Helena, MT 59620-0901

RE: BBCTU 2026 319 Nonpoint Source Project Program Proposal

Dear DEQ and Agency Review Panel,

The Blackfoot Challenge would like to express our support for collaborative restoration and stewardship work that helps to improve riparian health, stream flows and water quality across the Blackfoot watershed. The project proposed by the Big Blackfoot Chapter of Trout Unlimited (BBCTU) was developed with the input and support of community members, partners, and affected landowners. The Blackfoot Challenge supports these types of community-based, landowner-driven processes that lead to proposals like this and help foster innovative public and private partnerships.

The proposed project, Cottonwood Creek Stream Restoration Phase I, builds on years of previous collaborative work in the Nevada Creek drainage to systematically address areas of degraded habitat and bank erosion. Much of the previous work on Nevada Creek has been supported by the DEQ nonpoint source project program, and this proposal builds on those efforts on a tributary stream of Nevada Creek. Restoration in this area is revitalizing native trout habitat and improving drought resilience, while eliminating water quality challenges that have existed for many years. The Challenge has partnered on this work by helping collect assessment data, designing grazing plans that support water quality goals, and engaging youth and adults in community education about revitalization efforts.

The BBCTU has been at the heart of many Blackfoot watershed restoration successes for nearly 40 years. The Blackfoot Challenge has enjoyed a strong working partnership on many of these shared projects. As BBCTU continues working towards the systematic restoration of native fisheries in the working landscapes of the Blackfoot, the Blackfoot Challenge will continue to support their work as a watershed partner and author of the Blackfoot Watershed Restoration Plan. Thank you for your consideration of this funding proposal and for all of the support DEQ has provided toward conserving and enhancing the Blackfoot watershed.

Sincerely,

Jim Stone

Jim Stone, Chairman

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Partners for Fish and Wildlife Program
Upsata Lake, 196 Lower Lake Side Lane
P.O. Box 66
Ovando, MT 59854

February 12, 2026

Nonpoint Source and Wetlands Section
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

RE: Support for the Big Blackfoot Chapter of Trout Unlimited Application to the 2026 Nonpoint Source Pollution Reduction funding for the Cottonwood Creek Phase 1 Restoration.

To Whom It May Concern:

The U.S. Fish and Wildlife Service (Service) strongly endorses projects that support our mission to conserve and manage federal trust and at-risk species, including westslope cutthroat trout (*Oncorhynchus clarkii lewisi*), such as the proposal submitted by the Big Blackfoot Chapter of Trout Unlimited (BBCTU) for the Cottonwood Creek Phase 1 Restoration project. Cottonwood Creek supports pure populations of resident westslope cutthroat trout and is an important native trout tributary to the Douglas Creek, Nevada Creek and middle Blackfoot River watershed. This project is part of a broader effort to improve habitat for westslope cutthroat trout along an eight-mile reach of Cottonwood Creek. This phase will focus on restoring instream and riparian habitats and on reducing bank erosion and sediment inputs into downstream reaches.

The Service's Partners for Fish and Wildlife Program has a long history of working with private landowners, BBCTU, and other partners collaborating to restore the native trout fisheries in the Blackfoot Watershed. The funding through this grant will advance BBCTU and the Service's efforts to address large-landscape conservation issues with a locally led collaborative and inclusive approach. We are excited to support the BBCTU proposal and to continue to work in this landscape.

We urge the Nonpoint Source Pollution Reduction Funding Panel to provide funding for this collaborative effort. If you have any questions regarding this letter of support, please contact me at (406) 351-3078 or by email at rebecca_reeves@fws.gov. Thank you for considering this request.

Sincerely,

Rebecca A Reeves

Rebecca Reeves
Partners for Fish and Wildlife

Mark Bretz

March 05, 2026

Montana Department of Environmental Quality
Nonpoint Source Program (Section 319)

RE: Letter of Support for Section 319 Stream Restoration Project on Cottonwood Creek

To Whom It May Concern:

I am writing in strong support of the proposed stream restoration project on my property along Cottonwood Creek in Powell County, Montana. I have been working with the Blackfoot Restoration Team the past several years to help develop a plan that will ultimately address ongoing concerns related to streambank erosion, sediment delivery, riparian health, and overall water quality, issues that were intensified under the former land owner. I understand that this project is being submitted for funding through the Montana DEQ Section 319 Nonpoint Source Program and is intended to improve water quality, enhance aquatic habitat, and promote long-term stream stability.

The proposed restoration actions, which may include stream restoration, riparian plantings, fencing, off-stream watering systems, and overall irrigation upgrades, align with my goals of maintaining productive agricultural operations while improving the health and resilience of the stream corridor. I recognize the importance of reducing sediment and nutrient inputs to support beneficial uses and downstream water quality.

I believe this project represents a collaborative and proactive approach to protecting Montana's water resources while sustaining working lands. I fully support the grant application and look forward to partnering with the project sponsors to ensure its success.

Please feel free to contact me if additional information is needed.

Sincerely,

Mark Bretz

Region 2 Headquarters
3201 Spurgin Road
Missoula, MT 59804
02-11-2026

Water Protection Bureau
c/o Mark Ockey
Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901
RE: Cottonwood Creek Restoration-Phase 1-Letter of Support

Dear DEQ Nonpoint Source Program Grant Committee:

Montana Fish, Wildlife & Parks would like to express our support for the Cottonwood Creek Restoration-Phase 1 application submitted by the Big Blackfoot Chapter of Trout Unlimited. This project represents one of the first major restoration actions in Cottonwood Creek, a significantly degraded stream with high biological value. Cottonwood Creek has Total Maximum Daily Loads (TMDL) for sediment, nutrients, and elevated water temperatures. This project will expand on the success of previous restoration projects in the Nevada Creek drainage by improving habitat conditions in the immediate stream reaches while reducing nonpoint source pollution in the Blackfoot River.

Cottonwood Creek supports an important population of westslope cutthroat trout with significant conservation value. This stream has been heavily impacted by past land uses that have contributed to limited riparian vegetation and excessive erosion, which have greatly reduced instream habitat quality and complexity. The project components will directly address these issues while creating conditions that are expected to facilitate expansion of cutthroat trout into newly restored habitats. Your continued investment in this part of the watershed will contribute to restoring the quality of aquatic resources in this tributary while improving conditions in the Blackfoot River. This work advances our fisheries management and conservation objectives in the watershed.

Please contact Patrick Uthe, *Blackfoot Fisheries Biologist*, at (406) 542-5532, or Patrick.Uthe@mt.gov for any questions on this project. Thank you very much for consideration of this funding application.

Sincerely,

Kendra McKlosky

Kendra McKlosky
Regional Supervisor

MAPS/ DESIGNS

COTTONWOOD CREEK STREAM RESTORATION PROJECT PHASE 1

Cottonwood Creek is a tributary to Douglas Creek, and ultimately Nevada Creek, all of which are 303(d) impaired.

Project End

Latitude: 46.8349891°N
Longitude: -112.9984564°W

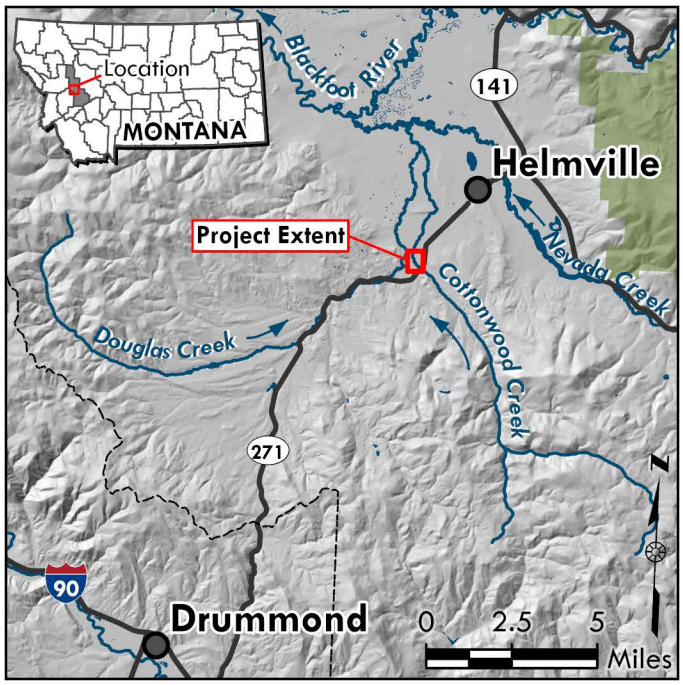
COTTONWOOD CREEK

Point of Diversion

UWC LLC

Project Start

271



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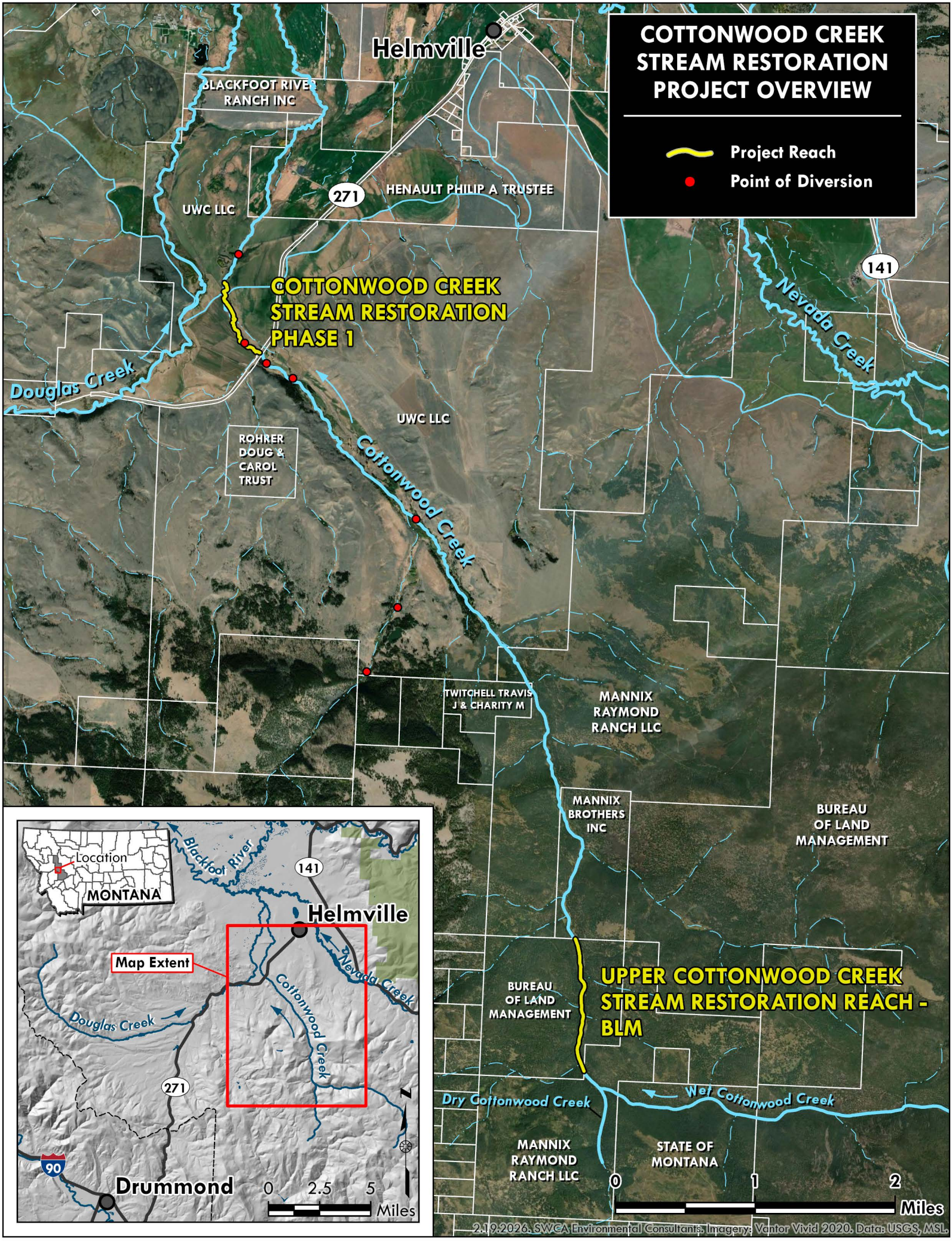
2.19.2026. SWCA Environmental Consultants. Imagery: Vantor Vivid 2020. Data: USGS, MSL.



2.19.2026. SWCA Environmental Consultants. Imagery: Vantor Vivid 2020. Data: USGS, MSL.

LOWER COTTONWOOD CREEK STREAM RESTORATION PROJECT
CONCEPTUAL DESIGN PLAN SET

PROJECT PARTNERS

Big Blackfoot Chapter of Montana Trout Unlimited

Blackfoot Challenge — Better Rural Communities through Collaborative Conservation

Montana Fish, Wildlife & Parks

U.S. Department of the Interior Bureau of Land Management

Trout Unlimited

U.S. Fish & Wildlife Service — Management of the National Wildlife Refuge System

US FISH AND WILDLIFE SERVICE
MONTANA PARTNERS FOR
FISH AND WILDLIFE PROGRAM

BRETZ RANCH

MANNIX BROTHERS RANCH

PROJECT DESCRIPTION

COTTONWOOD CREEK IS AN IMPORTANT NATIVE TROUT TRIBUTARY TO DOUGLAS CREEK, NEVADA CREEK, AND THE MIDDLE BLACKFOOT RIVER. IT FLOWS 18 MILES FROM ITS HEADWATERS THROUGH BUREAU OF LAND MANAGEMENT AND PRIVATE LAND. MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY HAS LISTED COTTONWOOD CREEK AS WATER-QUALITY IMPAIRED. A COMPREHENSIVE, WATERSHED-SCALE RESTORATION PLANNING EFFORT HAS BEEN INITIATED BY THE PROJECT PARTNERS (BLACKFOOT RESTORATION TEAM) TO ADDRESS LIMITING FACTORS AND IMPROVE SPAWNING, REARING, AND OVERWINTERING HABITAT FOR RESIDENT WESTSLOPE CUTTHROAT TROUT AND OTHER FOCAL FISH SPECIES. LOWER COTTONWOOD CREEK HAS BEEN IDENTIFIED AS A PRIORITY DEMONSTRATION PROJECT AND PROVIDES IMPORTANT WESTSLOPE CUTTHROAT TROUT MIGRATORY CORRIDOR HABITAT TO UPSTREAM SPAWNING AND REARING REACHES. THE BLACKFOOT RESTORATION TEAM HAS IDENTIFIED OPPORTUNITIES IN LOWER COTTONWOOD CREEK TO IMPROVE INSTREAM, RIPARIAN, AND UPLAND CONDITIONS ALONG WITH RESTORING FISH PASSAGE AND INSTREAM FLOWS, ALL IN COLLABORATION AND BALANCE WITH RANCH MANAGEMENT AND AGRICULTURAL PRODUCTION GOALS.

THIS CONCEPTUAL DESIGN PLAN SET INCORPORATES RESTORATION STRATEGIES AND TECHNIQUES THAT IMPLEMENT THE GOALS AND OBJECTIVES OF THE BLACKFOOT RESTORATION TEAM. CONCEPTS ARE INTENDED TO ADDRESS WATER QUALITY AND HABITAT IMPAIRMENTS AND LIMITING FACTORS IN ORDER TO RESTORE ECOSYSTEM RESILIENCY TO COTTONWOOD CREEK.

DRAWING INDEX

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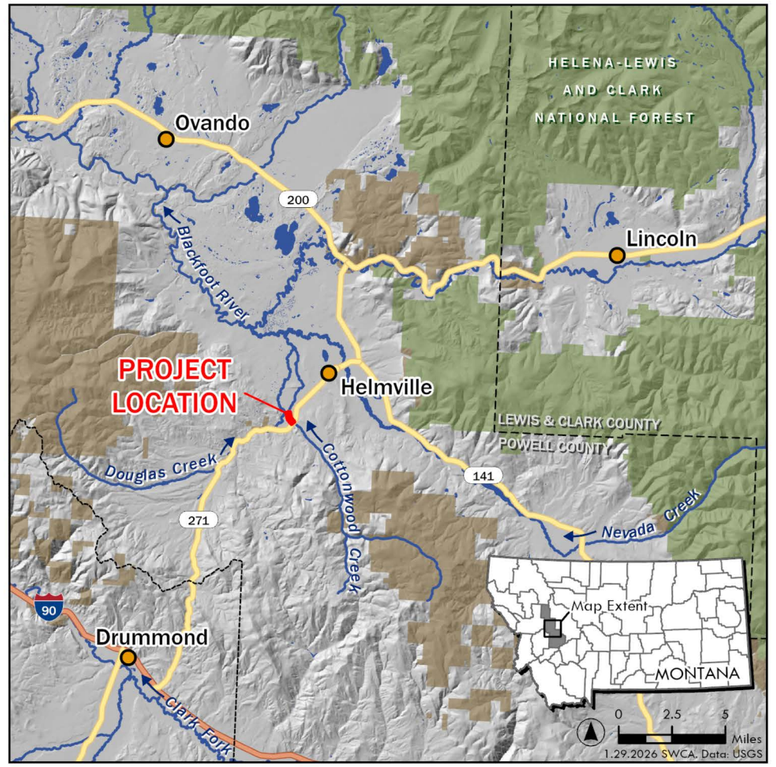
2.0 EXISTING CONDITIONS
2.1 EXISTING CONDITIONS - PHOTOS
3.0 EXISTING PLAN AND PROFILE REACH 1
3.1 EXISTING PLAN AND PROFILE REACH 2
4.0 RESTORATION PLAN REACH 1
4.1 RESTORATION PLAN REACH 2
5.0 CONSTRUCTED CHANNEL STREAMBED
5.1 VEGETATED WOOD MATRIX TYPE 1
5.2 VEGETATED WOOD MATRIX TYPE 2
5.3 LARGE WOOD STRUCTURES
5.4 FLOODPLAIN BRUSH TRENCHES
5.5 TYPICAL CONSTRUCTED WETLAND DETAIL

LOWER COTTONWOOD CREEK VICINITY MAP



S$^1/_2$ S33, T13N, R11W
POWELL COUNTY, MONTANA

STANDARD OF PRACTICE

SWCA ENVIRONMENTAL CONSULTANTS WORKS IN THE RIVER ENVIRONMENT AND UTILIZES THE MOST CURRENT AND ACCEPTED PRACTICES AVAILABLE FOR PLANNING AND DESIGN OF RIVER, FLOODPLAIN, AND AQUATIC HABITAT RESTORATION PROJECTS. CURRENT STANDARDS FOR THE DESIGN OF RESTORATION PROJECTS VARY DEPENDING ON PROJECT GOALS. STABILITY CRITERIA INCLUDE DESIGNING STREAMBED AND STREAMBANK STRUCTURES FOR THE AVERAGE ANNUAL PEAK FLOW DISCHARGE (APPROXIMATELY 80-100 CFS).

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236 Wisconsin Avenue
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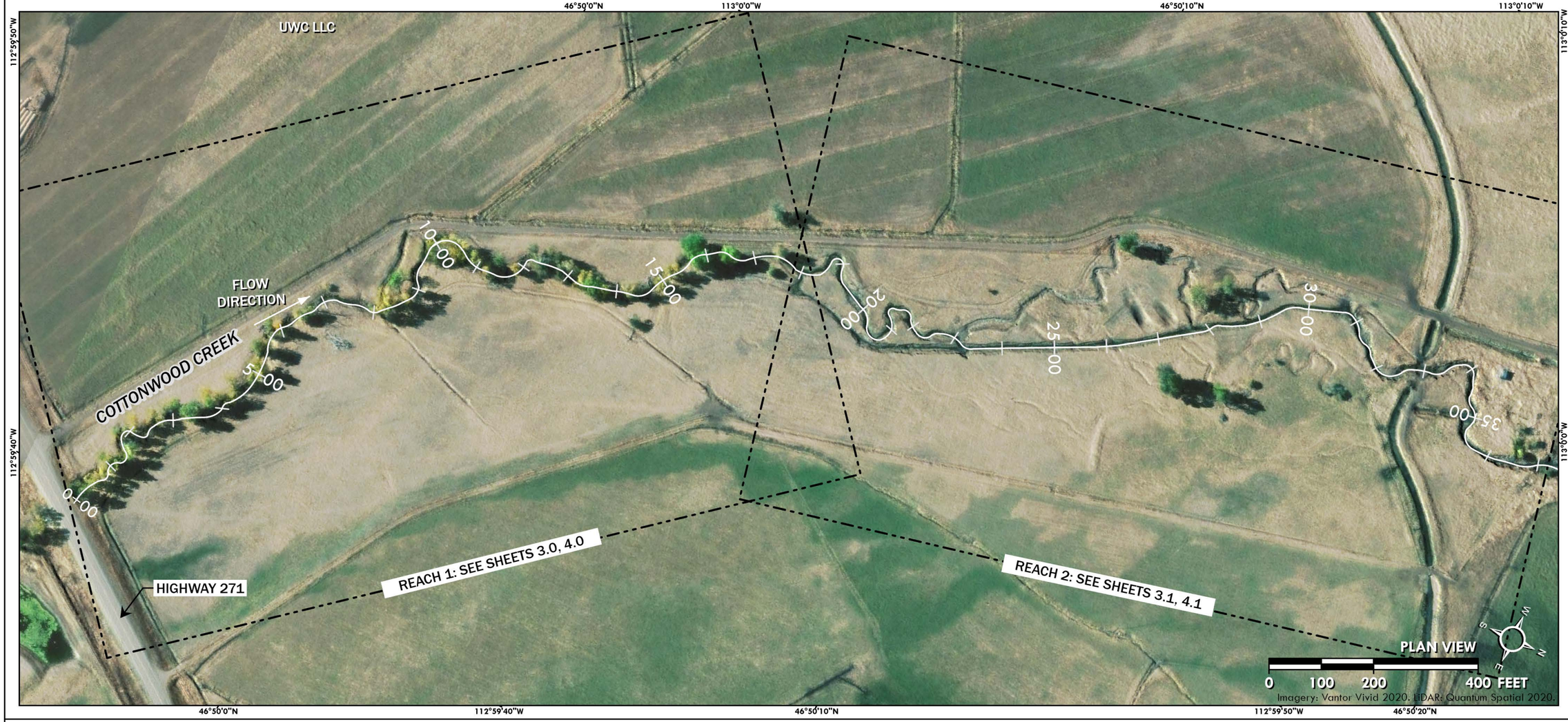
LOWER COTTONWOOD CREEK RESTORATION PROJECT

COVER PAGE

NO.	DATE	BY	DESCRIPTION	CHK
1	2.10.26	SH	DESIGN	JM
2	2.13.26	SH	DESIGN	JM

PROJECT NUMBER
102354

SHEET NUMBER
1.0



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EXISTING CONDITIONS

LOWER COTTONWOOD CREEK RESTORATION PROJECT

PROJECT OVERVIEW AND EXISTING CONDITIONS

- THE PROJECT AREA ENCOMPASSES APPROXIMATELY 3,700 FEET OF LOWER COTTONWOOD CREEK FROM HIGHWAY 271 TO 200 FEET DOWNSTREAM OF THE NEVADA CREEK WATER USERS ASSOCIATION NEVADA CREEK DOUGLAS CANAL. LAND OWNERSHIP IS ENTIRELY PRIVATE.
- **REACH 1** IS CHARACTERIZED AS A MODERATELY ENTRENCHED B4C STREAM TYPE, AND TRANSITIONS TO AN ENTRENCHED, F4 STREAM TYPE IN SEGMENTS OF THE REACH MARKED BY HIGH BANK HEIGHT RATIOS. BED MORPHOLOGY IS CHARACTERIZED AS PLANE-BED WITH LIMITED POOL DEVELOPMENT DUE TO THE LACK OF INSTREAM LARGE WOOD AND PLANFORM VARIABILITY. A NARROW RIPARIAN CORRIDOR, DOMINATED BY A SPARSE, DECADENT COTTONWOOD GALLERY, BRACKETS THE CHANNEL AND PROVIDES SOME SHADE AND COVER TO REACH 1. PAST LAND MANAGEMENT PRACTICES PARTIALLY STRAIGHTENED AND CHANNELIZED REACH 1 TO ACCOMMODATE AGRICULTURAL LAND USE PRACTICES IN THE HISTORICAL FLOODPLAIN. DESPITE THE ENTRENCHED CONDITIONS, STREAMBANK STABILITY IS GENERALLY HIGH DUE TO THE DENSE ROOTING STRUCTURE PROVIDED BY MATURE COTTONWOODS. AN EXISTING UNSCREENED IRRIGATION DIVERSION IS PRESENT IN REACH 1 AND DELIVERS IRRIGATION WATER TO IRRIGATED PASTURE LOCATED TO THE SOUTHWEST OF COTTONWOOD CREEK.
- LOWER COTTONWOOD CREEK TRANSITIONS TO AN ENTRENCHED, G4 STREAM TYPE IN **REACH 2.** THE CHANNEL WAS MECHANICALLY STRAIGHTENED AND DITCHED, AND RELIC MEANDER SCROLLS ARE PRESENT ON THE LANDSCAPE TO THE WEST OF THE CURRENT ALIGNMENT. INTENSIVE GRAZING HAS DISPLACED WOODY SHRUBS AND CONVERTED VEGETATION WITHIN THE FLOODPLAIN CORRIDOR TO GRASS/FORB UPLAND COMMUNITIES. THE REACH LACKS INSTREAM HABITAT AND FLOODPLAIN DISCONNECTION LIKELY DEPLETES INSTREAM FLOWS DURING LATE SUMMER AND FALL. THE REACH IS HIGHLY DEVOID OF COMPLEX HABITAT FEATURES INCLUDING RUNS, POOLS, AND GLIDES. IN SEVERAL LOCATIONS, THE STRAIGHTENED CHANNEL HAS BREACHED ITS BERM, AND FLOWS ACCESS RELIC MEANDER SCROLLS, FURTHER COMPOUNDING FLOW DEWATERING AND HABITAT AVAILABILITY. AT THE BOTTOM OF REACH 2, DOUGLAS CANAL CROSSES COTTONWOOD CREEK IN A BURIED SIPHON. THIS INFRASTRUCTURE CONSTRAINT INHIBITS FISH MOVEMENT DURING LOW FLOW PERIODS AND IS A PHYSICAL CONSTRAINT IN REACH 1.
- DOWNSTREAM OF THE SIPHON, BANK HEIGHT RATIOS INCREASE, AND DESPITE A REMNANT RIPARIAN ZONE CONSISTING OF WOODY RIPARIAN SHRUBS, THE REACH EXPERIENCES HIGH RATES OF BANK EROSION AND ENTRENCHMENT, IMPACTING WATER QUALITY AND THE AVAILABILITY OF COMPLEX AQUATIC HABITAT.

NO.	DATE	BY	DESCRIPTION	CHK
1	2-10-26	SH	DESIGN	JM
2	2-13-26	SH	DESIGN	JM

PROJECT NUMBER
102354

DRAWING NUMBER

2.0

REACH 1 IS CHARACTERIZED AS A MODERATELY TO HIGHLY ENTRENCHED F4 STREAM TYPE. HISTORICAL STRAIGHTENING OF THE CHANNEL RESULTED IN DOWNCUTTING AND LOSS OF FLOODPLAIN CONNECTION. A SPARSE, DECADENT MATURE COTTONWOOD GALLERY BRACKETS THE CHANNEL AND PROVIDES MINIMAL SHADE AND COVER TO LOWER COTTONWOOD CREEK.

AT **REACH 1**, AN EXISTING IRRIGATION DIVERSION INTAKE STRUCTURE (PHOTO RIGHT) IS UNSCREENED AND DEPLETES LATE SEASON INSTREAM FLOWS. THE RESTORATION PLAN WILL REMOVE AND DECOMMISSION THE DIVERSION TO ELIMINATE FISH ENTRAINMENT AND INCREASE LATE SUMMER FLOWS TO LOWER COTTONWOOD CREEK.

HIGH BANK HEIGHT RATIOS AND CHANNEL ENTRENCHMENT DRIVES EROSION IN **REACH 2.** VEGETATION COMMUNITIES HAVE CONVERTED FROM A LIKELY WOODY RIPARIAN COMMUNITY TO A GRASS/FORB AGRICULTURAL ASSEMBLAGE.

HIGH BANK HEIGHT RATIOS AND CHANNEL ENTRENCHMENT DRIVES EROSION IN **REACH 2.** VEGETATION COMMUNITIES HAVE CONVERTED FROM A LIKELY WOODY RIPARIAN COMMUNITY TO A GRASS/FORB AGRICULTURAL ASSEMBLAGE.

A MAJORITY OF **REACH 2** WAS HISTORICALLY STRAIGHTENED AND CHANNELIZED TO ACCOMMODATE AGRICULTURAL LAND USES. THIS RESULTED IN CHANNEL INCISION AND LOSS OF FLOODPLAIN CONNECTION. HABITAT IS EXTREMELY SIMPLIFIED AND DOMINATED BY RIFFLE HABITAT UNITS WITH LIMITED POOL DEVELOPMENT.

VIEW OF EXISTING STRAIGHTENED CHANNEL (PHOTO LEFT) AND HISTORICAL CHANNEL ALIGNMENT (PHOTO RIGHT) IN **REACH 2.** THE EXISTING BERM HAS BREACHED RESULTING IN A BIFURCATED CHANNEL AND SEASONAL DEWATERING.

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tel.406.862.4927
fax.406.862.4963

EXISTING CONDITIONS - PHOTOS

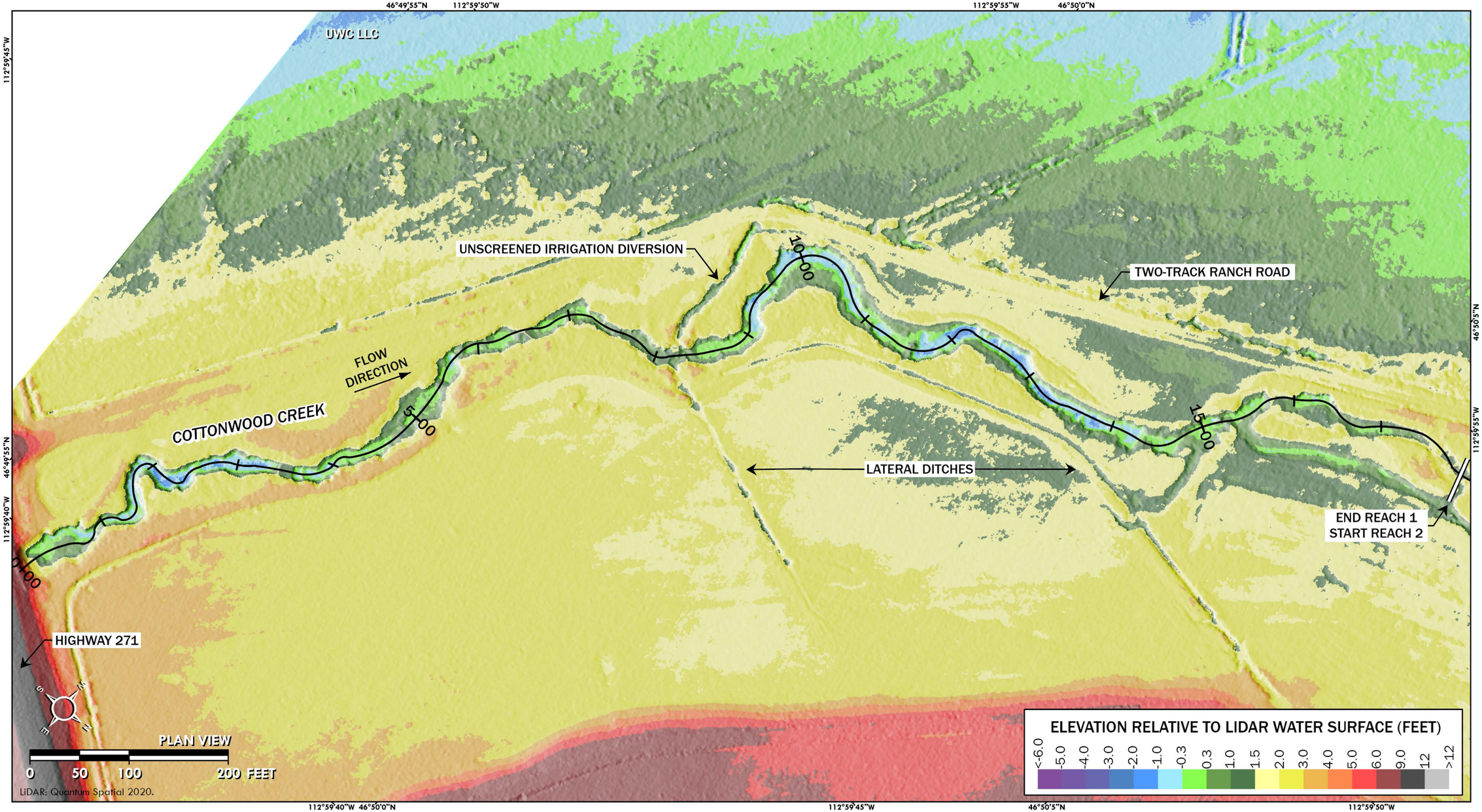
LOWER COTTONWOOD CREEK RESTORATION PROJECT

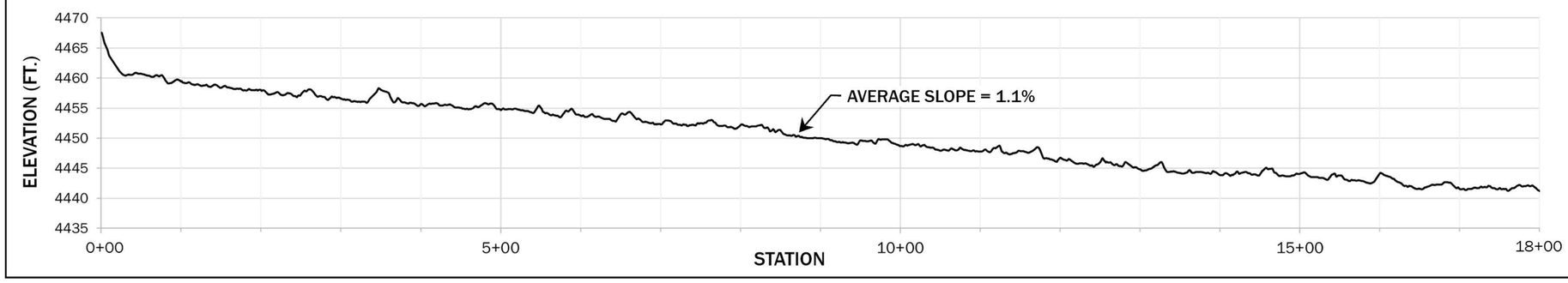
NO.	DATE	BY	DESCRIPTION	CHK
1	2-10-26	SH	DESIGN	JM
2	2-13-26	SH	DESIGN	JM

PROJECT NUMBER
102354

DRAWING NUMBER

2.1





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EXISTING PLAN AND PROFILE REACH 1

LOWER COTTONWOOD CREEK RESTORATION PROJECT

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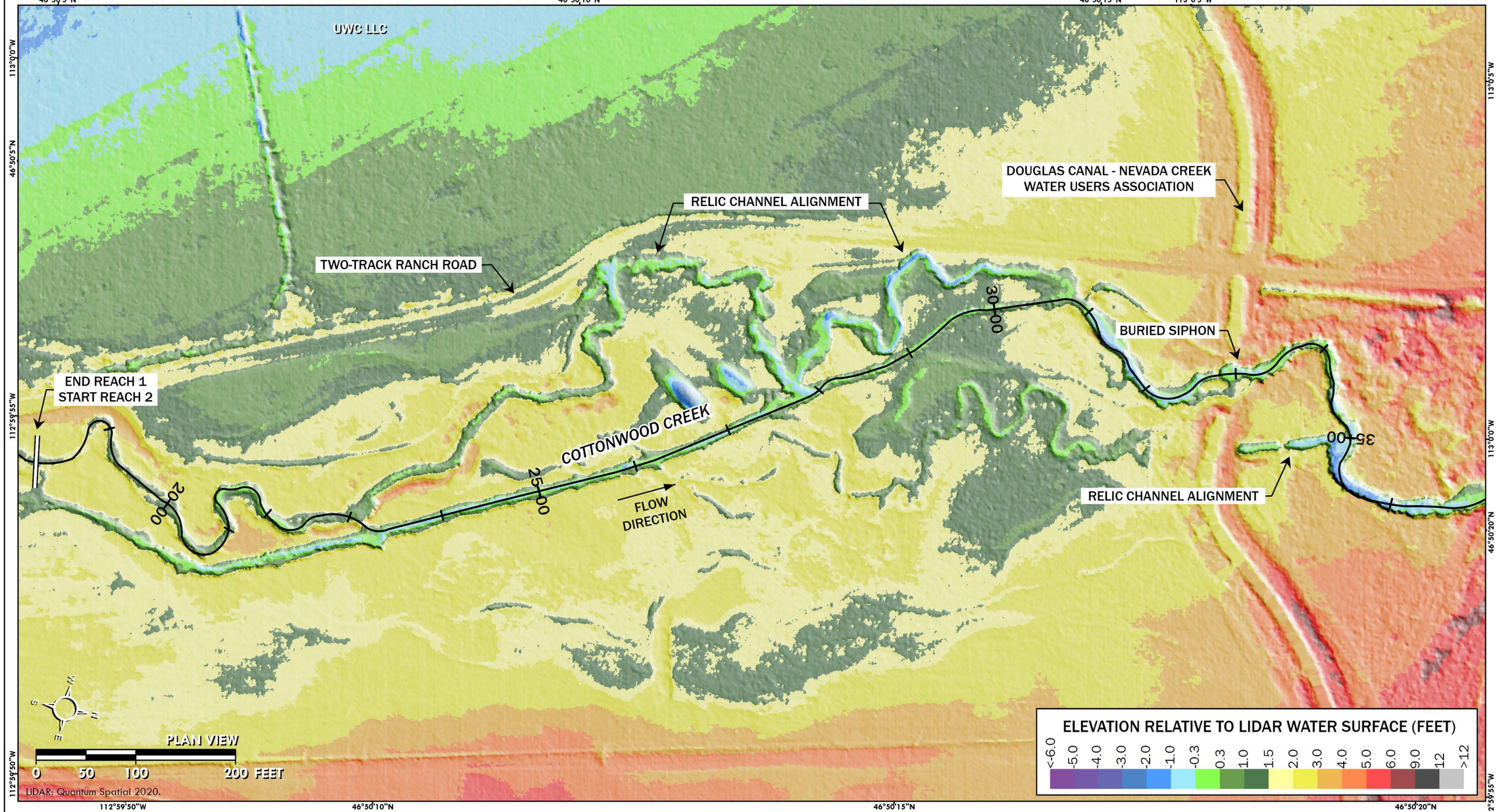
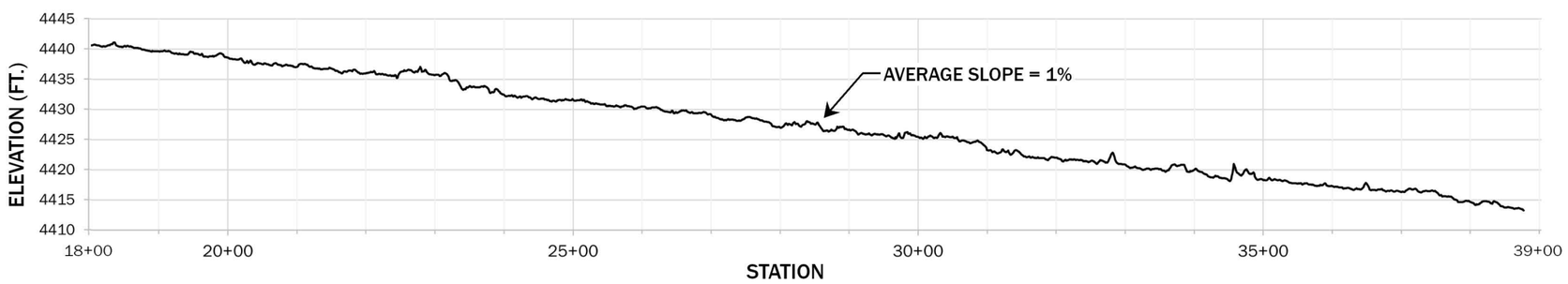
1	2.10.26	SH	DESIGN	JM
2	2.13.26	SH	DESIGN	JM

PROJECT NUMBER
102354

DRAWING NUMBER
3.0





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EXISTING PLAN AND PROFILE REACH 2

LOWER COTTONWOOD CREEK RESTORATION PROJECT

NO.	DATE	BY	DESCRIPTION	CHK
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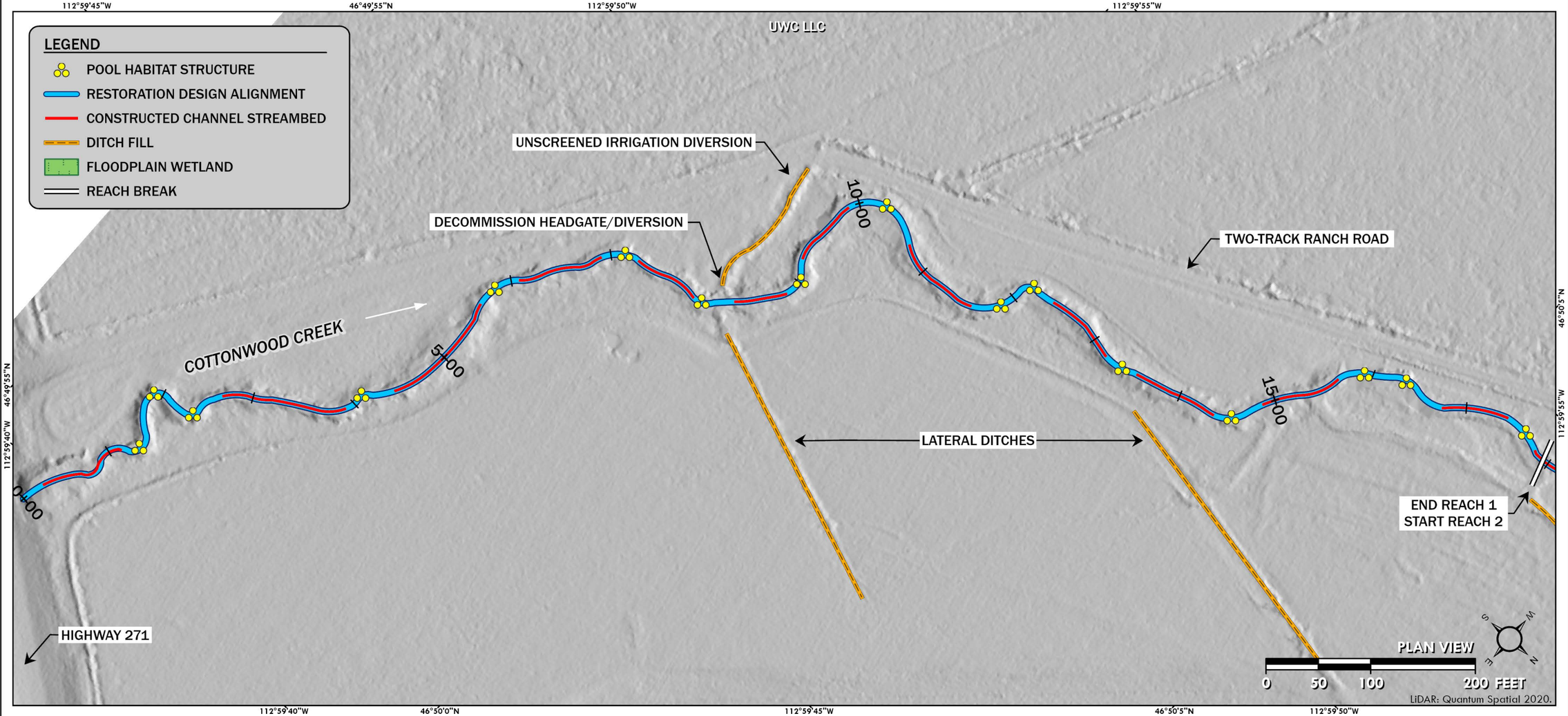
2	2-13-26	SH	DESIGN	JM

PROJECT NUMBER
102354

DRAWING NUMBER

3.1



LIMITING FACTORS

- CHANNEL DEWATERING AND LACK OF CHANNEL MAINTENANCE FLOWS
- CHANNEL ENTRENCHMENT AND FLOODPLAIN DISCONNECTION
- HABITAT DEGRADATION AND INHIBITED FISH MOVEMENT
- IRRIGATION DITCH ENTRAINMENT AND FISH LOSSES
- HISTORIC GRAZING PRESSURE AND VEGETATION CONVERSION
- MARGINAL OR UNSUITABLE WATER TEMPERATURES

RESTORATION OBJECTIVES

- RESTORE CHANNEL MAINTENANCE FLOWS AND MINIMUM INSTREAM LOW FLOWS
- REDUCE CHANNEL ENTRENCHMENT AND FLOODPLAIN DISCONNECTION
- INCREASE THE DISTRIBUTION AND AVAILABILITY OF COMPLEX INSTREAM HABITAT
- ELIMINATE WATER WITHDRAWALS AND FISH ENTRAINMENT
- REDUCE GRAZING PRESSURE AND EXPAND WIDTH OF VEGETATED FLOODPLAIN

RESTORATION TREATMENTS

- DECOMMISSION EXISTING IRRIGATION DIVERSION AND LATERAL DITCHES
- ELEVATE CHANNEL BED PROFILE WITH CONSTRUCTED RIFFLES TO INCREASE FLOODPLAIN CONNECTION
- ADD COARSE WOOD TO ENCOURAGE POOL DEVELOPMENT AND DIVERSIFY RIFFLE HABITAT
- IMPLEMENT GRAZING MANAGEMENT SYSTEM AND EXPAND WIDTH OF
- VEGETATED FLOODPLAIN

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RESTORATION PLAN REACH 1

LOWER COTTONWOOD CREEK RESTORATION PROJECT

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2	2.13.26	SH	DESIGN	JM

PROJECT NUMBER
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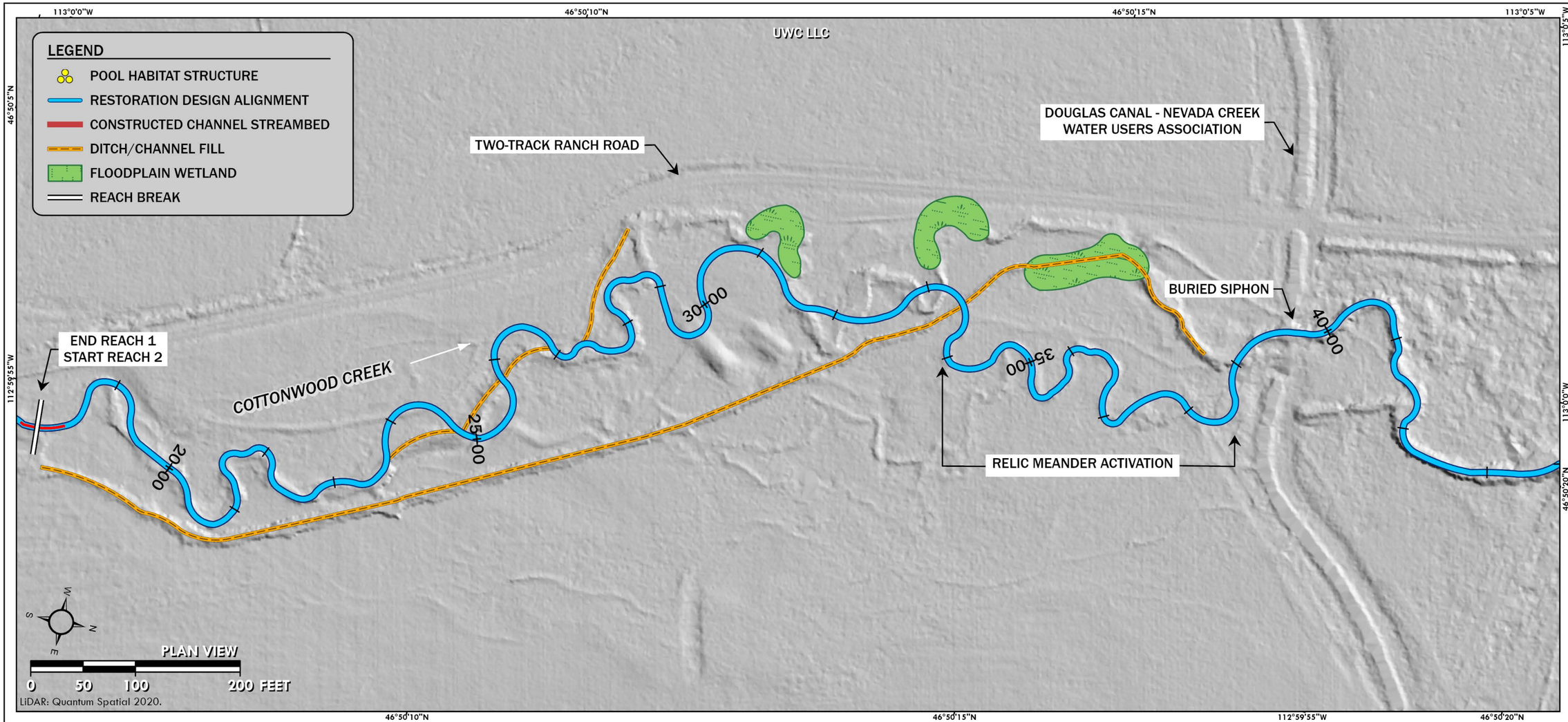
DRAWING NUMBER

4.0



LIMITING FACTORS

- CHANNEL DEWATERING AND LACK OF CHANNEL MAINTENANCE FLOWS
- CHANNEL ENTRENCHMENT AND FLOODPLAIN DISCONNECTION
- HABITAT DEGRADATION AND INHIBITED FISH MOVEMENT
- BREACHED FLOODPLAIN BERMS AND FLOW BIFURCATION
- HISTORIC GRAZING PRESSURE AND LACK OF WOOD RIPARIAN VEGETATION
- HIGH BANK EROSION AND SEDIMENT DELIVERY
- MARGINAL OR UNSUITABLE WATER TEMPERATURES

RESTORATION OBJECTIVES

- RESTORE CHANNEL MAINTENANCE FLOWS AND MINIMUM INSTREAM LOW FLOWS
- REDUCE CHANNEL ENTRENCHMENT AND FLOODPLAIN DISCONNECTION
- INCREASE PLANFORM VARIABILITY AND RESTORE FLOODPLAIN WETLANDS CONSOLIDATE FLOWS TO PRIMARY CHANNEL
- INCREASE THE DISTRIBUTION AND AVAILABILITY OF COMPLEX INSTREAM HABITAT
- ELIMINATE WATER WITHDRAWALS AND FISH ENTRAINMENT
- REDUCE GRAZING PRESSURE AND EXPAND WIDTH OF VEGETATED FLOODPLAIN

RESTORATION TREATMENTS

- DECOMMISSION EXISTING “DITCH” AND FILL TO FLOODPLAIN ELEVATION
- RECONSTRUCT A LOW GRADIENT, RIFFLE POOL STREAM TYPE (C4 AND E4 STREAM TYPES), MAXIMIZING USE OF RELIC MEANDER SCROLLS WHERE FEASIBLE AND COST-EFFECTIVE
- CONVERT SEGMENTS OF RELIC MEANDER SCROLLS TO OFF-CHANNEL EMERGENT AND SHALLOW WATER, DISCONNECTED FLOODPLAIN WETLANDS
- INCORPORATE VEGETATED WOOD MATRIX BANK STRUCTURES TO RESTORE WOODY RIPARIAN VEGETATION AND INCREASE HABITAT COMPLEXITY
- IMPLEMENT GRAZING MANAGEMENT SYSTEM AND EXPAND WIDTH OF VEGETATED FLOODPLAIN
- MITIGATE DOUGLAS CANAL INFRASTRUCTURE CONSTRAINTS AND RESTORE FISH PASSAGE

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RESTORATION PLAN
REACH 2

LOWER COTTONWOOD CREEK RESTORATION PROJECT

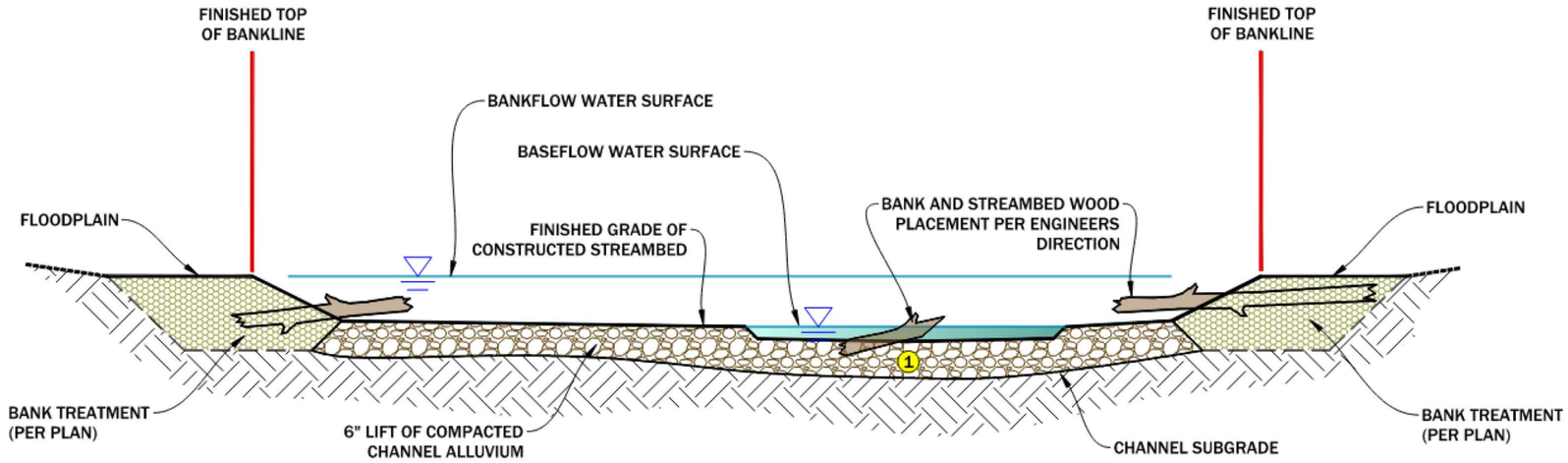
NO.	DATE	BY	DESCRIPTION	CHK
1	2-10-26	SH	DESIGN	JM
2	2-13-26	SH	DESIGN	JM

PROJECT NUMBER
102354

DRAWING NUMBER
4.1

NOTES ON CONSTRUCTED CHANNEL STREAMBED INSTALLATION

1. CONSTRUCTION OF THE CHANNEL STREAMBED WILL OCCUR AFTER THE CHANNEL SUBGRADE IS PREPARED.
2. ANY CHANGES TO THE CONSTRUCTION SEQUENCE MUST BE APPROVED THE CONSTRUCTION MANAGER.
3. CONTRACTOR SHALL MARK THE UPSTREAM AND DOWNSTREAM EXTENTS OF THE LOCATIONS OF THE CONSTRUCTED CHANNEL STREAMBED STRUCTURES.
4. PRIOR TO CONSTRUCTION OF THE CHANNEL STREAMBED, CONSTRUCTION MANAGER SHALL VERIFY CHANNEL SUBGRADE ELEVATIONS. CHANNEL SUBGRADE SERVES AS THE FOUNDATION FOR THE CONSTRUCTED CHANNEL STREAMBED.
5. CONTRACTOR SHALL STOCKPILE CHANNEL ALLUVIUM PER SPECIFICATIONS NOTED ON THE DRAWING.



CONSTRUCTED CHANNEL STREAMBED ALLUVIUM INSTALLATION SECTION VIEW
1 — 1" = 4'

STREAMBED FILL GRADATION	
SIZE (IN)	PERCENT PASSING
6	95
5	90-95
4	85-90
3	65-85
2	50-65
1	30-50
0.5	20-30
0.08	20
NOTE: MIX SALVAGED MATERIAL AND IMPORTED MATERIAL TO ACHIEVE SPECIFIED GRADATION	

MATERIAL SCHEDULE (PER FOOT)			
	ITEM	DIA. (IN)	QUANTITY (CY)
1	ALLUVIUM	SEE GRADATION TABLE	4 CY/LF

TYPICAL CONSTRUCTED STREAMBED THROUGH A RIFFLE FEATURE

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CONSTRUCTED CHANNEL STREAMBED TYPICAL DETAIL

LOWER COTTONWOOD CREEK RESTORATION PROJECT

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1	2-10-26	SH	DESIGN	JM
2	2-13-26	SH	DESIGN	JM

PROJECT NUMBER
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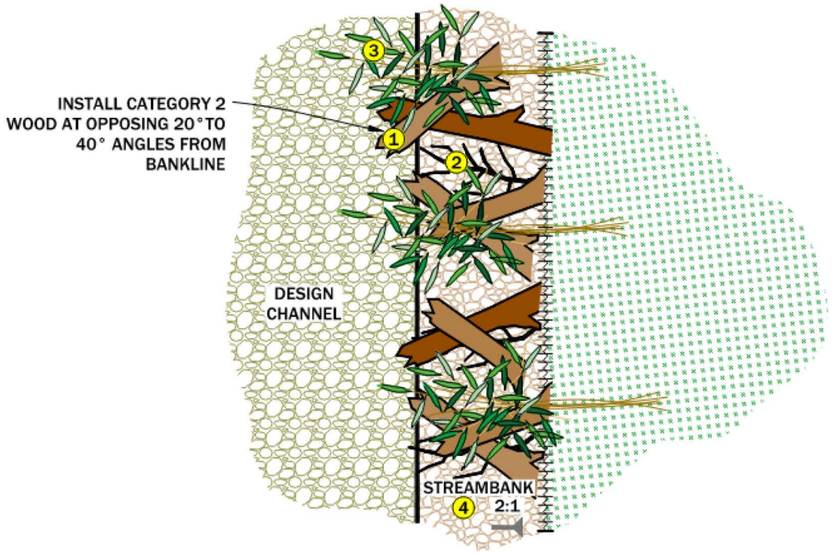
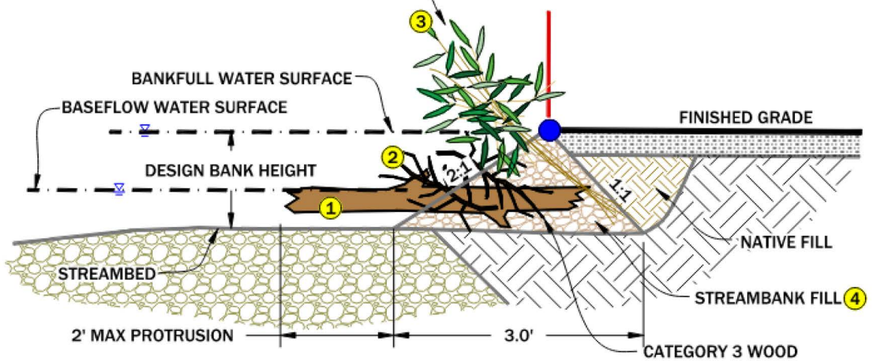
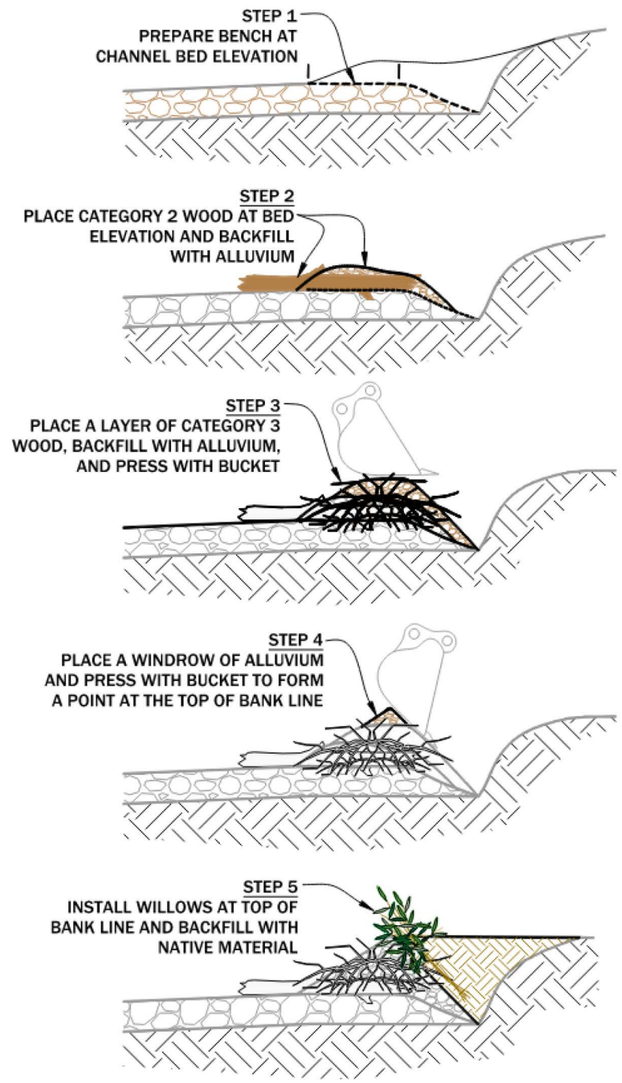
DRAWING NUMBER
5.0



1 VEGETATED WOOD MATRIX - TYPE 1
PLAN VIEW
1" = 3'



2 VEGETATED WOOD MATRIX - TYPE 1
SECTION VIEW
1" = 3'



3 RECOMMENDED VEGETATED WOOD MATRIX INSTALLATION SEQUENCE
SECTION VIEW
1" = 5'

GENERAL NOTES

1. CONSTRUCTION OF THE VEGETATED WOOD MATRIX WILL OCCUR AFTER THE CHANNEL AND FLOODPLAIN BACKFILL IS PLACED AND THE CHANNEL STREAMBED IS CONSTRUCTED. INSTALLATION OF FLOODPLAIN TREATMENT SHALL BE COMPLETED AFTER VEGETATED WOOD MATRIXES ARE INSTALLED.
2. IF VEGETATED WOOD MATRIX STRUCTURES ARE INSTALLED PRIOR TO OCTOBER 1, LEAVE BACK TRENCH UNFILLED AND COMPLETE STRUCTURE WHEN DORMANT WILLOWS ARE AVAILABLE.
3. IT IS CONTRACTOR'S RESPONSIBILITY TO CUT WOOD INTO APPROPRIATE SIZE LENGTHS TO FIT STRUCTURE DIMENSIONS.
4. ANY CHANGES TO THE CONSTRUCTION SEQUENCE MUST BE APPROVED BY CONSTRUCTION MANAGER.
5. CONTRACTOR SHALL MARK AND CONSTRUCTION ENGINEER SHALL APPROVE THE GENERAL LOCATION FOR EACH VEGETATED WOOD MATRIX STRUCTURE PRIOR TO CONSTRUCTION.

NOTES ON VEGETATED WOOD MATRIX INSTALLATION

1. EXCAVATE TO THE EXCAVATION LIMITS AS SHOWN. EXCAVATED MATERIAL SHALL BE STOCKPILED ON THE FLOODPLAIN OUTSIDE OF THE IMMEDIATE WORK AREA.
2. PREPARE THE BENCH OF THE STRUCTURE BY PLACING CHANNEL STREAMBED ALLUVIUM FROM THE BASE OF THE EXCAVATION DEPTH/BOTTOM OF EXCAVATION TO WITHIN 1.0-FT. OF FINISHED GRADE.
3. CATEGORY 2 AND CATEGORY 3 WOOD, AND CHANNEL STREAMBED ALLUVIUM SHALL BE PLACED IN ALTERNATING LAYERS AND BUCKET COMPACTED UP TO THE TOP OF BANK ELEVATION AS SHOWN BELOW IN THE INSTALLATION SEQUENCE. PLACE SIX (6) FT TO EIGHT (8) FT. DORMANT WILLOW CUTTINGS AT A DENSITY OF 5 PER LINEAR FT ALONG THE TOP OF BANK LINE ELEVATION. WILLOW CUTTINGS SHALL SLOPE AT AN APPROXIMATE 1:1 SLOPE AS SHOWN IN SECTION VIEW. STEMS MAY OVERLAP. THE CUT ENDS SHALL BE PLACED AT THE BASE OF THE SLOPES WITH THE UN-CUT ENDS EXTENDING BEYOND THE EDGE OF THE TRENCH SO NO GREATER THAN ONE-THIRD OF THE TOTAL CUTTING LENGTH IS EXPOSED BEYOND THE TOP OF BANK EDGE. WILLOW CUTTINGS SHOULD INTERCEPT THE DESIGN TOP OF BANK LINE AS SHOWN IN STEP 5 OF THE INSTALLATION SEQUENCE.
4. THE UPSTREAM AND DOWNSTREAM ENDS OF THE STRUCTURE SHALL TRANSITION SMOOTHLY INTO ADJACENT STREAMBANK STRUCTURES TO MINIMIZE EROSION, FLANKING, AND BANK FAILURE. STRUCTURE ENDS MAY BE STABILIZED WITH ADDITIONAL CATEGORY 1 ROCK AS APPROVED BY ENGINEER.
5. AFTER INSTALLATION OF THE VEGETATED WOOD MATRIX, BACKFILL THE STRUCTURE WITH STOCKPILED MATERIAL TO FINISHED GRADE, AND BUCKET COMPACT. INSTALL WILLOW TRENCHES AT A RATE OF 2 PER LINEAR FOOT (OR 20 PER TRENCH) AS SHOWN. NO AREAS BEHIND THE FINISHED BANKLINE ARE TO BE LEFT BELOW FINISHED GRADE.

STREAMBANK FILL GRADATION	
SIZE (IN)	PERCENT PASSING
6	100
4	90-100
3	50-80
1	30-50
0.05	10-30
FINES	10

NOTE: MIX SALVAGED MATERIAL AND IMPORTED MATERIAL TO ACHIEVE SPECIFIED GRADATION

TYPE 1 - VEGETATED WOOD MATRIX MATERIAL SCHEDULE (PER LINEAR FOOT)			
	ITEM	DIA. (IN)	QTY.
1	CATEGORY 2 WOOD	2"-4"	0.2500
2	CATEGORY 3 WOOD	< 2"	2
3	WILLOW CUTTINGS	0.25"-1.0"	3
4	STREAMBANK ALLUVIUM	6" MINUS	0.1 CY

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VEGETATED WOOD MATRIX (TYPE 1) DETAIL

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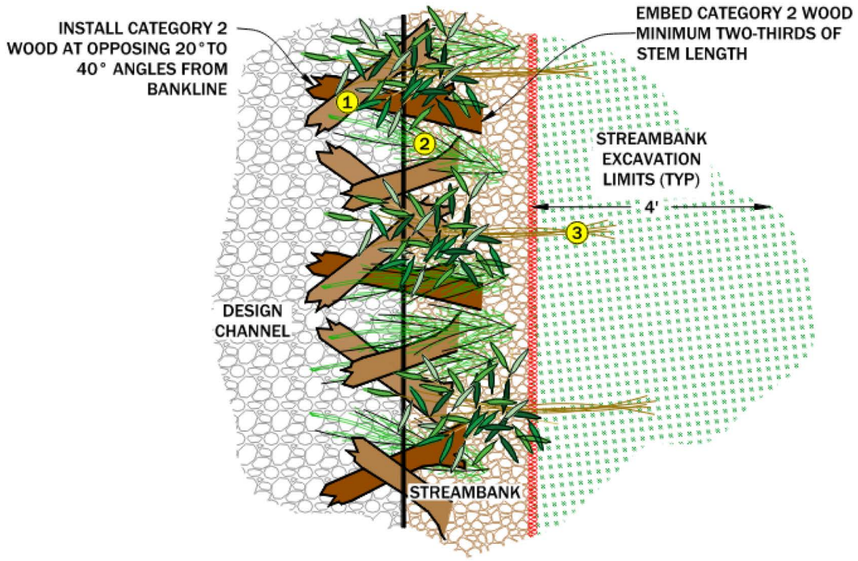
1	2-10-26	SH	DESIGN	JM
2	2-13-26	SH	DESIGN	JM

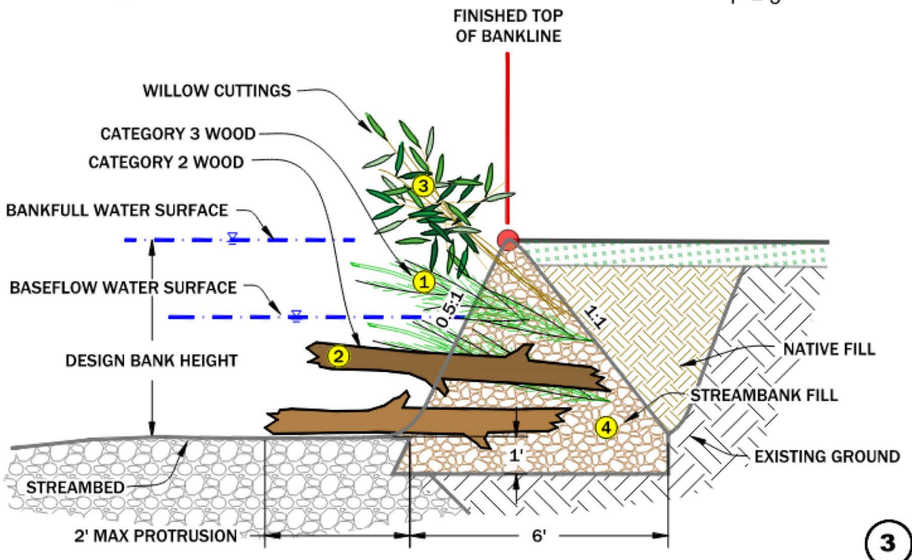
PROJECT NUMBER
102354

DRAWING NUMBER
5.1



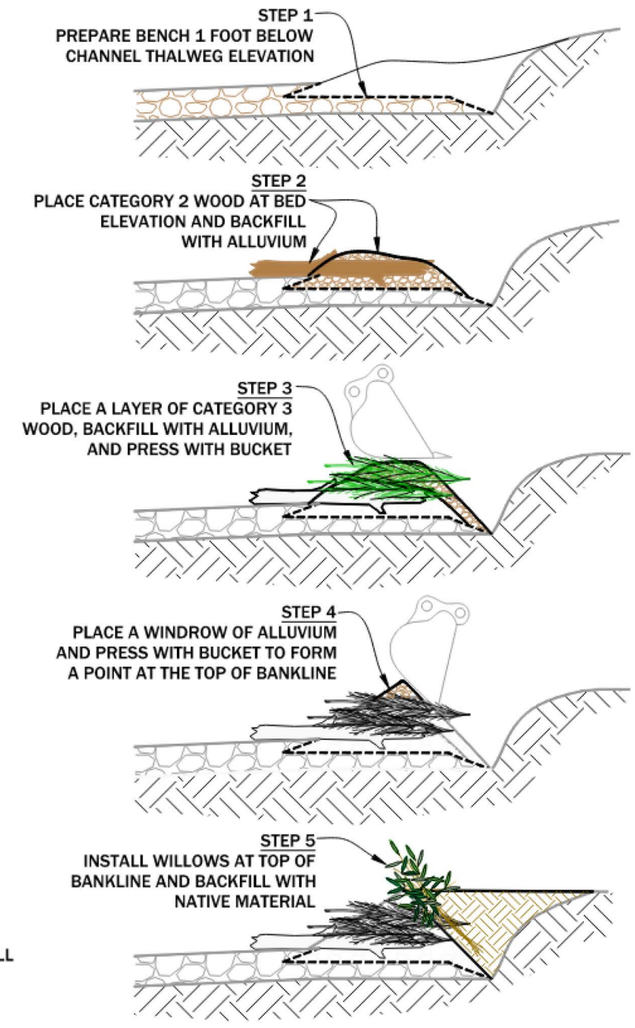
1 VEGETATED WOOD MATRIX - TYPE 2
PLAN VIEW

1" = 3'



2 VEGETATED WOOD MATRIX - TYPE 2
SECTION VIEW

1" = 3'



3 RECOMMENDED VEGETATED WOOD MATRIX INSTALLATION SEQUENCE
SECTION VIEW

1" = 5'

GENERAL NOTES

1. IF VEGETATED WOOD MATRIX STRUCTURES ARE INSTALLED PRIOR TO OCTOBER 1, LEAVE BACK TRENCH UNFILLED AND COMPLETE STRUCTURE WHEN DORMANT WILLOWS ARE AVAILABLE.
2. IT IS CONTRACTOR'S RESPONSIBILITY TO CUT WOOD INTO APPROPRIATE SIZE LENGTHS TO FIT STRUCTURE DIMENSIONS.
3. ANY CHANGES TO THE CONSTRUCTION SEQUENCE MUST BE APPROVED BY CONSTRUCTION MANAGER.
4. CONTRACTOR SHALL MARK AND CONSTRUCTION ENGINEER SHALL APPROVE THE GENERAL LOCATION FOR EACH VEGETATED WOOD MATRIX STRUCTURE PRIOR TO CONSTRUCTION.

INSTALLATION NOTES

1. EXCAVATE TO THE EXCAVATION LIMITS AS SHOWN. EXCAVATED MATERIAL SHALL BE STOCKPILED ON THE FLOODPLAIN OUTSIDE OF THE IMMEDIATE WORK AREA.
2. PREPARE THE BENCH OF THE STRUCTURE BY PLACING STREAMBED ALLUVIUM MINIMUM 1 FOOT BELOW CHANNEL THALWEG ELEVATION.
3. CATEGORY 2 AND CATEGORY 3 WOOD, AND STREAMBED ALLUVIUM SHALL BE PLACED IN ALTERNATING LIFTS AND BUCKET COMPACTED UP TO THE TOP OF BANK ELEVATION AS SHOWN IN THE INSTALLATION SEQUENCE. PLACE 6 FT TO 8 FT. DORMANT WILLOW CUTTINGS AT A DENSITY OF 5 PER LINEAR FT ALONG THE TOP OF BANK LINE ELEVATION. WILLOW CUTTINGS SHALL SLOPE AT AN APPROXIMATE 1:1 SLOPE AS SHOWN IN SECTION VIEW. STEMS MAY OVERLAP. THE CUT ENDS SHALL BE PLACED AT THE BASE OF THE SLOPES WITH THE UN-CUT ENDS EXTENDING BEYOND THE EDGE OF THE TRENCH SO NO GREATER THAN ONE-THIRD OF THE TOTAL CUTTING LENGTH IS EXPOSED BEYOND THE TOP OF BANKLINE. WILLOW CUTTINGS SHOULD INTERCEPT THE DESIGN TOP OF BANKLINE AS SHOWN IN STEP 5 OF THE INSTALLATION SEQUENCE.
4. THE UPSTREAM AND DOWNSTREAM ENDS OF THE STRUCTURE SHALL TRANSITION SMOOTHLY INTO ADJACENT STREAMBANK STRUCTURES TO MINIMIZE EROSION, FLANKING, AND BANK FAILURE.

AFTER INSTALLATION OF THE VEGETATED WOOD MATRIX, BACKFILL THE STRUCTURE WITH STOCKPILED MATERIAL TO FINISHED GRADE, AND BUCKET COMPACT. NO AREAS BEHIND THE FINISHED BANKLINE ARE TO BE LEFT BELOW FINISHED GRADE.

TYPE 2 - VEGETATED WOOD MATRIX MATERIAL SCHEDULE (PER LINEAR FOOT)

	ITEM	DIA. (IN)	QTY.
1	CATEGORY 2 WOOD	2"-4"	0.25
2	CATEGORY 3 WOOD	< 2"	2
3	BANK WILLOW CUTTINGS	0.25"-1.0"	5
4	STREAMBANK ALLUVIUM	6" MINUS	0.3 CY

STREAMBANK FILL GRADATION

SIZE (IN)	PERCENT PASSING
6	100
4	90-100
3	50-80
1	30-50
0.05	10-30
FINES	10

NOTE: MIX SALVAGED MATERIAL AND IMPORTED MATERIAL TO ACHIEVE SPECIFIED GRADATION

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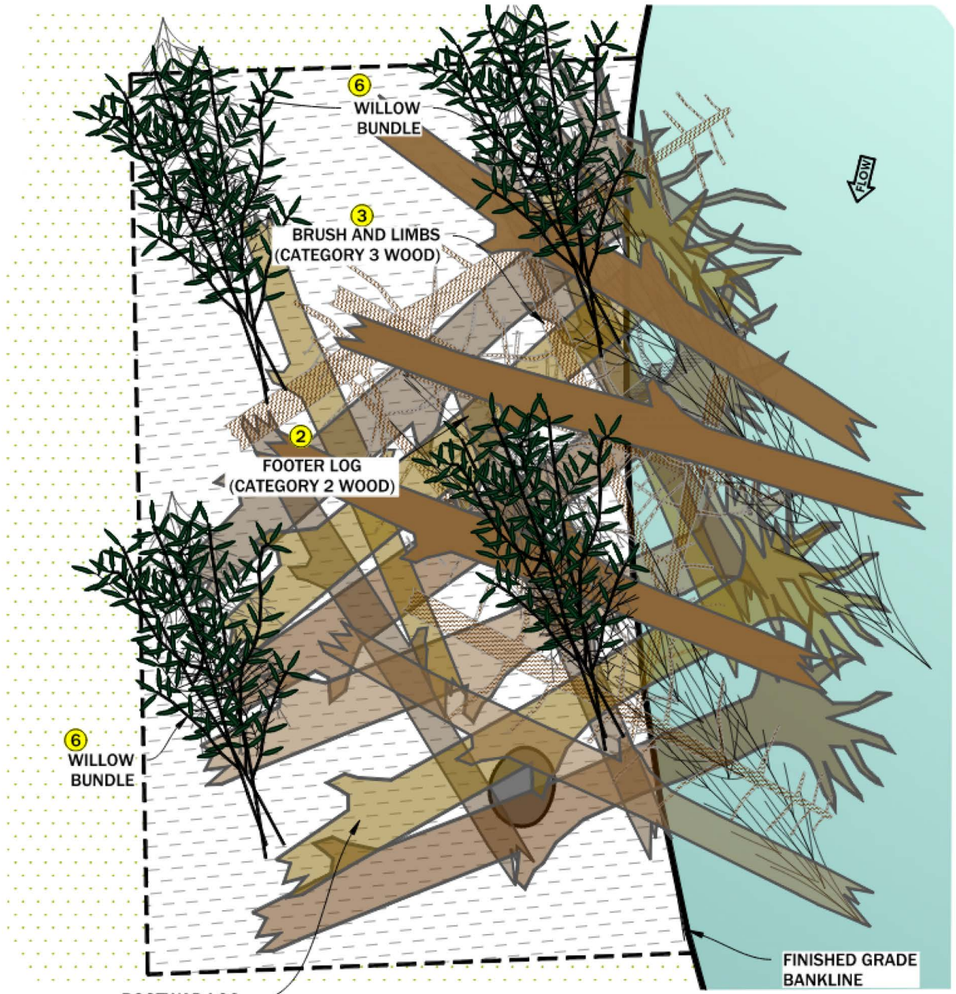
VEGETATED WOOD MATRIX (TYPE 2) DETAIL

LOWER COTTONWOOD CREEK RESTORATION PROJECT

NO.	DATE	BY	CHK	DESCRIPTION
1	2.10.26	SH	JM	DESIGN
2	2.13.26	SH	JM	DESIGN

PROJECT NUMBER
102354

DRAWING NUMBER
5.2



LARGE WOOD STRUCTURE
PLAN VIEW
0' 2.5' 5'

GENERAL NOTES

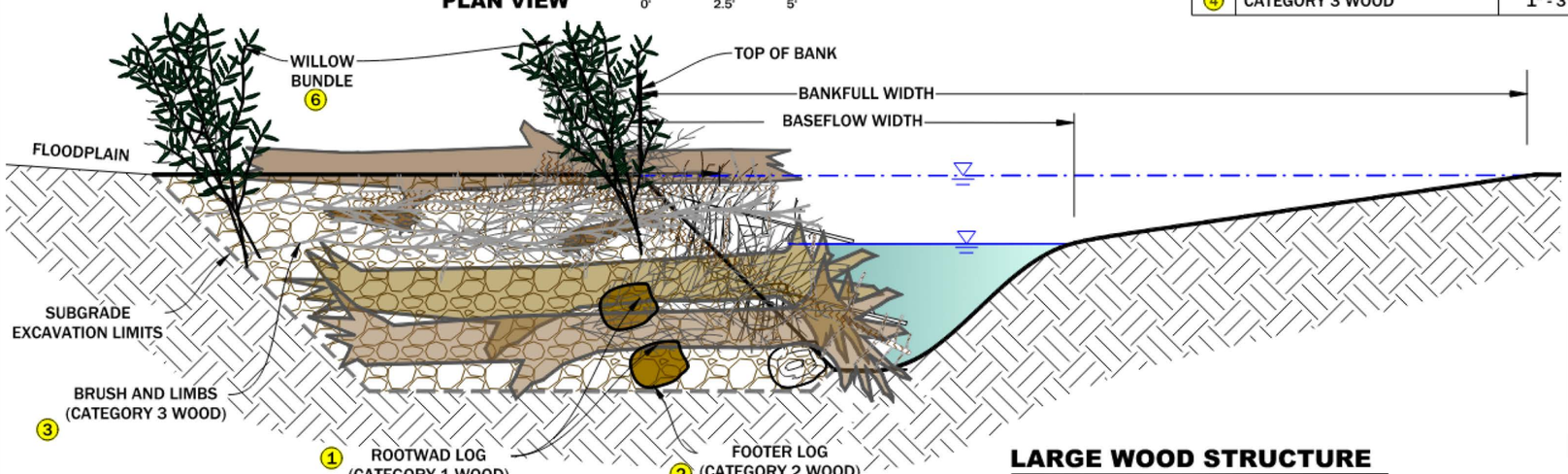
1. CONSTRUCTION OF THE LARGE WOOD STRUCTURE WILL OCCUR BEFORE THE CONSTRUCTED CHANNEL STREAMBED AND VEGETATED WOOD MATRIX BANK TREATMENTS ARE INSTALLED.
2. ANY CHANGES TO THE CONSTRUCTION SEQUENCE MUST BE APPROVED THE ENGINEER.
3. FIELD ENGINEER SHALL MARK THE GENERAL CONSTRUCTION LOCATION FOR EACH LARGE WOOD STRUCTURE PRIOR TO CONSTRUCTION.

CONSTRUCTION NOTES

1. EXCAVATE TO THE EXCAVATION LIMITS. EXCAVATED MATERIAL SHALL BE STOCKPILED ON THE FLOODPLAIN OUTSIDE OF THE IMMEDIATE WORK AREA.
2. INSTALL TWO FOOTER LOGS (CATEGORY 2 WOOD) AT THE BASE OF THE EXCAVATED TRENCH AT THE ORIENTATIONS NOTED IN PLAN VIEW. FOOTER LOGS SHALL PROJECT NO GREATER THAN 1 FT. BEYOND THE FINISH GRADE BANK LINE. EXPOSED ENDS OF FOOTER LOGS SHALL BE BROKEN/ROUGHENED SO AS TO APPEAR NATURAL. SAWED ENDS OF FOOTER LOGS SHALL NOT BE EXPOSED.
3. INSTALL TWO ROOTWAD LOGS (CATEGORY 1 WOOD) INTERSECTING BOTH FOOTER LOGS AT THE ORIENTATION NOTED IN PLAN VIEW. THE UPSTREAM ROOTWAD SHALL NOT PROJECT INTO THE CHANNEL AND SHALL BE FLUSH WITH THE FINISHED BANK LINE. THE DOWNSTREAM ROOTWAD SHALL PROJECT NO GREATER THAN 3 FT. BEYOND THE FINISHED BANK LINE
4. BACKFILL TRENCH WITH STOCKPILED MATERIAL UP TO THE TOP OF THE FOOTER LOGS (CATEGORY 2 WOOD). BACKFILL SHALL BE BUCKET COMPACTED.
5. INSTALL A SECOND TIER OF TWO FOOTER LOG (CATEGORY 2 WOOD) FOOTER LOGS SHALL PROJECT NO GREATER THAN 1 FT. BEYOND THE FINISH GRADE BANK LINE. EXPOSED ENDS OF FOOTER LOGS SHALL BE BROKEN/ROUGHENED SO AS TO APPEAR NATURAL. SAWED ENDS OF FOOTER LOGS SHALL NOT BE EXPOSED.
6. INSTALL SMALL WOOD AND BRUSH (CATEGORY 3 WOOD) AT APPROXIMATE 45° ANGLE TO ROOTWAD STEMS. BRUSH AND LIMBS SHALL PROJECT NO GREATER THAN 3 FT. BEYOND THE FINISHED BANK LINE.
7. INSTALL ONE TO TWO ROOTWAD LOGS (CATEGORY 1 WOOD) INTERSECTING THE LOWER TIER OF ROOTWADS AT THE ORIENTATION NOTED IN PLAN VIEW. THE ROOTWADS SHALL PROJECT NO GREATER THAN 2 FT. BEYOND THE FINISHED BANK LINE.
8. INSTALL SMALL WOOD AND BRUSH (CATEGORY 3 WOOD) AND WILLOW CUTTINGS INTERWOMEN INTO WOOD MATRIX UP TO FINISHED GRADE. BRUSH, LIMBS, AND WILLOW CUTTINGS SHALL PROJECT NO GREATER THAN 4 FT. BEYOND THE FINISHED BANK LINE.
9. BACKFILL WOOD MATRIX WITH STREAMBED FILL UP TO FINISHED GRADE WITH STOCKPILED NATIVE MATERIAL. NO AREAS BEHIND THE FINISHED BANKLINE ARE TO BE LEFT BELOW FINISHED GRADE.
10. INSTALL DEFLECTOR LOGS (CATEGORY 2 WOOD)) AT APPROXIMATE 45° ANGLE TO ROOTWAD STEMS. DEFLECTOR LOGS SHALL BE HALF EMBEDDED IN THE FLOODPLAIN AND PROJECT NO GREATER THAN 4 FT. BEYOND THE FINISHED BANK LINE. EXPOSED ENDS OF FOOTER LOGS SHALL BE BROKEN/ROUGHENED SO AS TO APPEAR NATURAL. SAWED ENDS OF FOOTER LOGS SHALL NOT BE EXPOSED.

LARGE WOOD STRUCTURE
MATERIAL SCHEDULE (PER LINEAR STRUCTURE)

	ITEM	DIA. (IN)	LENGTH (FT)	ROOTWAD (Y/N)	QTY.
1	SUBGRADE EXCAVATION				5 CY
2	CATEGORY 1 WOOD	10"-12"	12-15	YES - 18IN DIA. MIN	2 EA
3	CATEGORY 2 WOOD	3"-10"	10-15	NO	4 EA
4	CATEGORY 3 WOOD	1" - 3"	10-12	OPTIONAL 1-2 FT	10 EA



LARGE WOOD STRUCTURE
SECTION VIEW NTS

EXAMPLE OF A LARGE WOOD STRUCTURE

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LARGE WOOD STRUCTURE DETAIL

LOWER COTTONWOOD CREEK RESTORATION PROJECT

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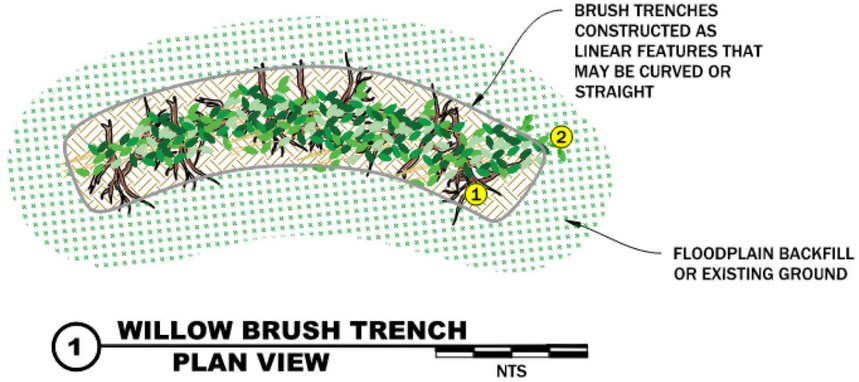
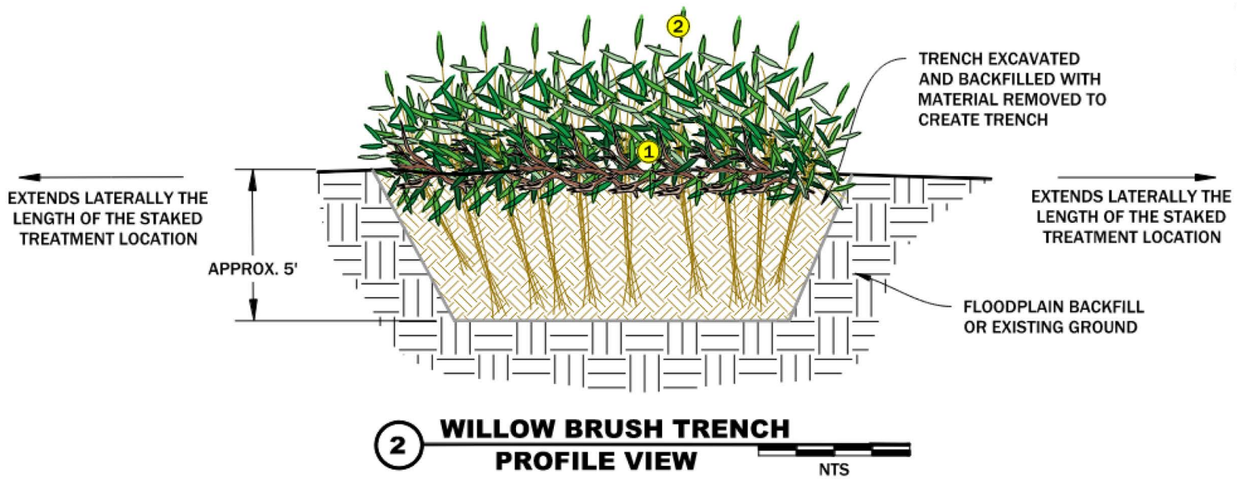
2	2-13-26	SH	DESIGN	JM

PROJECT NUMBER
102354

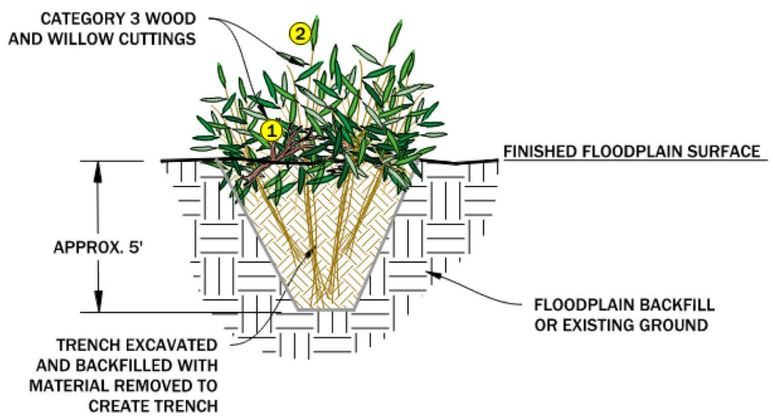
DRAWING NUMBER
5.3



1 WILLOW BRUSH TRENCH PLAN VIEW NTS



2 WILLOW BRUSH TRENCH PROFILE VIEW NTS



3 WILLOW BRUSH TRENCH SECTION VIEW NTS

NOTES ON WILLOW BRUSH TRENCH INSTALLATION

1. VEGETATED BRUSH TRENCHES WILL BE CONSTRUCTED TO INCREASE FLOODPLAIN CONNECTIVITY, DISPERSE SURFACE FLOWS AND PROMOTE REVEGETATION. CONSTRUCTION OF VEGETATED BRUSH TRENCHES WILL OCCUR AFTER SEPTEMBER 15TH AND BEFORE THE END OF THE CONSTRUCTION SEASON.
2. CONTRACTOR SHALL MARK AND ENGINEER SHALL APPROVE THE GENERAL CONSTRUCTION LOCATION FOR EACH VEGETATED BRUSH TRENCH PRIOR TO CONSTRUCTION.
3. VEGETATED BRUSH TRENCHES WILL BE CONSTRUCTED WITHIN THE FLOODPLAIN AT THE DIRECTION OF THE CONSTRUCTION MANAGER.
4. A TRENCH WILL BE CONSTRUCTED APPROXIMATELY 5' DEEP AND EXTEND THE LENGTH OF THE STAKED TREATMENT LOCATION. LIVE WILLOW CUTTINGS AND CATEGORY 3 WOOD WILL BE PLACED IN THE TRENCH SUCH THAT THEY ARE INTERMIXED AND ORIENTED AT A NEAR VERTICAL ANGLE.
5. THE TRENCH WILL THEN BE BACKFILLED WITH THE SAME MATERIAL REMOVED TO CREATE THE TRENCH AND SHOULD MATCH THE ELEVATION OF THE SURROUNDING FLOODPLAIN GRADE.

MATERIAL SCHEDULE (PER LINEAL FOOT)			
	ITEM	DIA.	QUANTITY (EA)
1	CATEGORY 3 WOOD	< 3"	3
2	WILLOW CUTTINGS	0.25" - 1"	5

EXAMPLE OF A VEGETATED BRUSH TRENCH INSTALLATION

EXAMPLE OF A CONSTRUCTED VEGETATED BRUSH TRENCH

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FLOODPLAIN BRUSH TRENCHES

LOWER COTTONWOOD CREEK RESTORATION PROJECT

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2	2-13-26	SH	DESIGN	JM

PROJECT NUMBER
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DRAWING NUMBER

5.4

TYPICAL CONSTRUCTED WETLAND DETAIL

LOWER COTTONWOOD CREEK RESTORATION PROJECT

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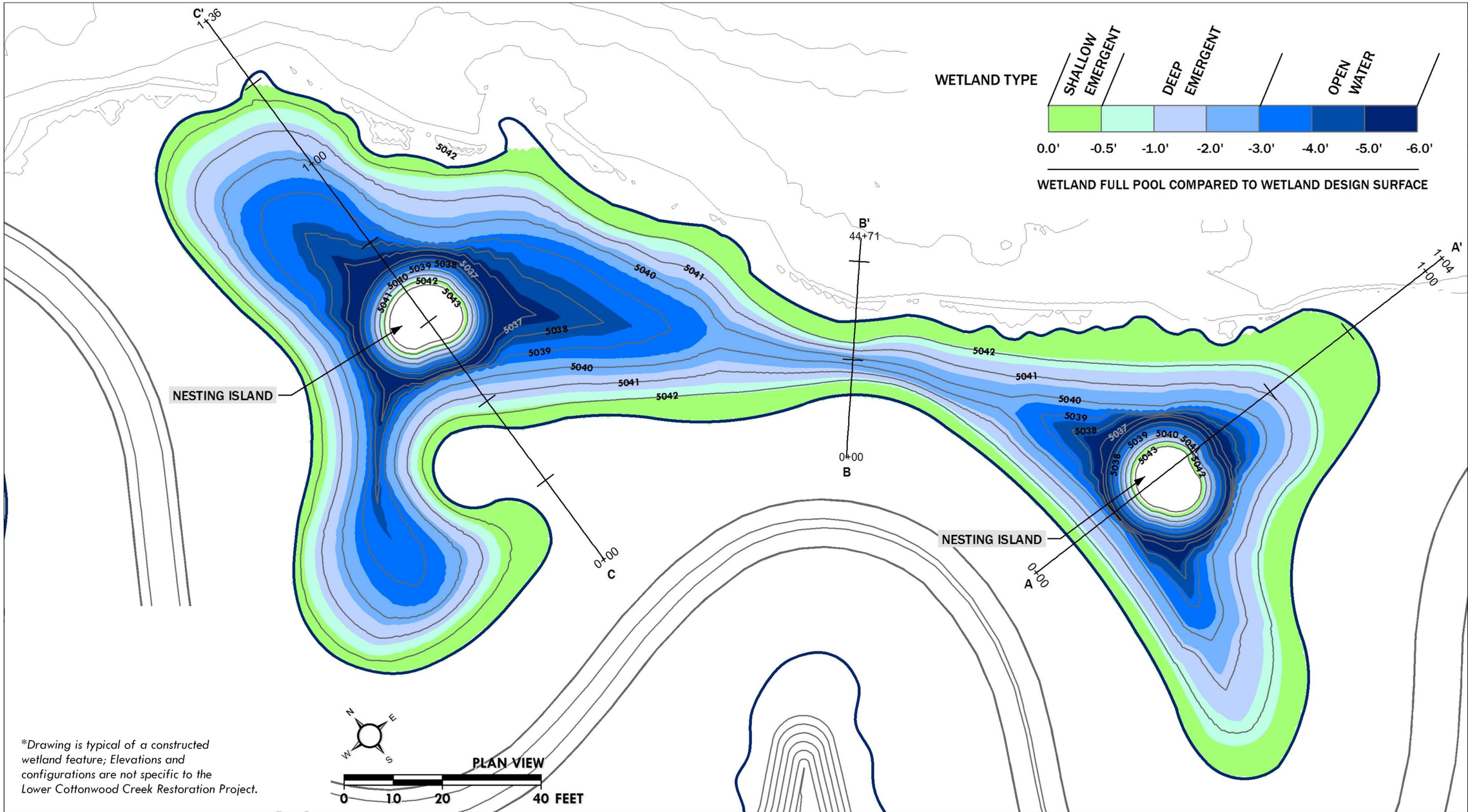
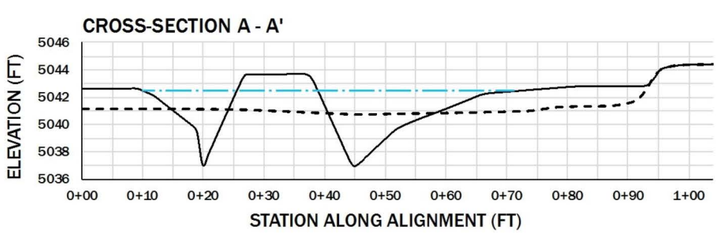
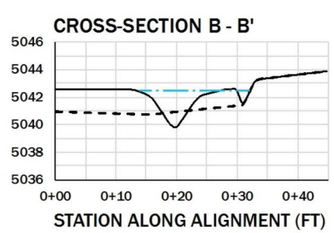
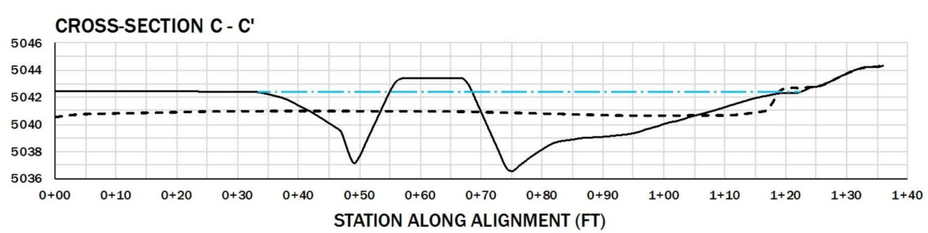


**Drawing is typical of a constructed wetland feature; Elevations and configurations are not specific to the Lower Cottonwood Creek Restoration Project.*

EXISTING GROUND — DESIGN SURFACE — FULL POOL WATER SURFACE ELEVATION







NO.	DATE	BY	DESCRIPTION	CHK
1	2-10-26	SH	DESIGN	JM
2	2-13-26	SH	DESIGN	JM

PROJECT NUMBER
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DRAWING NUMBER

5.5

OTHER ATTACHMENTS