Application Name: Sheep Creek Stewardship Project

Application Number: 220-8205-19387

By: Trout Unlimited Inc

Offering Type: Upper Grande Ronde Initiative

Application Type: Restoration

OWEB Region: Eastern Oregon
County: Union
Coordinates: 45.058912,-118.45571

Applicant:
Chrysten Lambert
1777 N Kent St Ste 100
Arlington VA 22209
(541) 273-2189
clambert@tu.org

Payee:
Dawn Elzy
1777 N Kent St Ste 100
Arlington VA 22209
(541) 450-4678
dawn.elzy@tu.org

Project Manager:
Levi Old
2210 18th St
Baker City OR 97814
5414083770
lold@tu.org

Budget Summary:
OWEB Amount Requested: $155,278
Total Project Amount: $444,589

Administrative Information

Abstract

Provide an abstract statement for the project. Include the following information: 1) Identify the project location; 2) Briefly state the project need; 3) Describe the proposed work; 4) Identify project partners.

The Sheep Creek Stewardship Project is located on Sheep Creek, a tributary to the Grande Ronde River. The project area includes 4.5 miles of the creek (RM 5.41-8.65). The US Forest Service & the US Bureau of Land Management in partnership with Trout Unlimited will implement the project.

Sheep Creek and its meadow habitats are not in proper functioning ecological condition due to historic anthropogenic influences.

The overall goal of this project is to achieve proper ecological form and function of Sheep Creek and its meadows, and thereby enhance habitat for Snake River Basin Spring/Summer Chinook, Snake River Basin steelhead, resident redband trout, bull trout and numerous other aquatic and terrestrial species. This includes habitat for beaver and other small mammal, floodplain ecosystem engineers.

The Sheep Creek Stream and Floodplain Project kickstarted in 2019 and into 2020 with the first phase of restoration treatments. Approximately 5 miles of tributaries were treated too. This funding request would support the project team in a long-term adaptive management and stewardship approach to healing the appropriate natural processes needed to set the system on a trajectory towards full ecological health. This next phase supports new actions that are complimentary and build-upon past actions.

Based on an in-depth analysis of best available science, expert opinion, close field observation, and technical tools, the project team has developed a suite of actions that will help this critical Blue Mountain meadow system return to a high-functioning system in the next 10 years.

The proposed additional actions include the placement of woody debris and post-assisted beaver mimicry structures, the addition of ungulate exclosure fence for vegetative recovery, material augmentation in stream to create wetland habitat and speed up aggradation, cattle fence replacement on BLM land, planting, riparian thinning, and the restoration of a compacted wetland.

Location Information

What is the ownership of the project site(s)?

✓*Public land (any lands owned by the Federal government, the State of Oregon, a city, county, district or municipal or public corporation in Oregon)*

What agency(ies) are involved?

US Forest Service, Wallowa-Whitman National Forest
US Bureau of Land Management, Vale District

❑*Private (land owned by non-governmental entities)*
❑*Not applicable to this project*

❑*This grant will take place in more than one county.*

Permits

Other than the land-use form, do you need a permit, license or other regulatory approval of any of the proposed project activities?

● Yes
❍ No

For Details Go to Permit Page

I acknowledge that I am responsible for verifying applicable permits, licenses, and General Authorizations required for the project, and can update information at grant agreement execution.

✓*Yes*

Racial and Ethnic Impact Statement

Racial and Ethnic Impact Statement

❍ The proposed grant project policies or programs could have a disproportionate or unique POSITIVE impact on the following minority persons. (indicate all that apply)

❍ The proposed grant project policies or programs could have a disproportionate or unique NEGATIVE impact on the following minority persons. (indicate all that apply)

● The proposed grant project policies or programs WILL HAVE NO disproportionate or unique impact on minority persons.

Insurance Information

If applicable, select all the activities that are part of your project - These require a risk assessment tool unless otherwise noted (check all that apply).

❑*Working with hazardous materials (not including materials used in the normal operation of equipment such as hydraulic fluid)*

❑*Earth moving work around the footprint of a drinking water well*

❑*Removal or alteration of structures that hold back water on land or instream including dams, levees, dikes, tidegates and other water control devices (this does not include temporary diversion dams used solely to divert water for irrigation)*

❑*Applicant's staff or volunteers are working with kids related to this project (DAS Risk assessment tool not required, additional insurance is required)*

❑*Applicant's staff are applying herbicides or pesticides (DAS Risk assessment tool not required, additional insurance is required)*

✓*Insurance not applicable to this project*

Additional Information

❑*This project affects Sage-Grouse.*

Problem Statement

Describe the watershed problem(s) that this restoration project seeks to address.

Overall Problem: Sheep Creek and its meadow habitats are not in proper functioning ecological condition (hydrologic, geomorphic, biological), due to historic management that included beaver trapping, overgrazing, logging, road building, and an altered fire regime. The recent Sheep Creek Stream and Floodplain Restoration Project treatments kick-started the road to recovery for this meadow system. Additional actions are needed to continue to set this system on a positive trajectory before the restoration project team assesses the ability to step away and allow the system to continue its positive state and transition towards ecological health.

Sub-problem 1 - Floodplain form and function:
The Sheep Creek floodplain has limited water capture and retention capacities due to past anthropogenic influences. These deficiencies have lowered ground water tables. This has resulted in lower riparian vegetation survival and vigor, a decreased ability for the floodplain to store water and buffer water temperature, less connection to the floodplain to moderate in-channel velocity, and lower quality fish and wildlife habitat. Lack of floodplain form and function has resulted in a:

* decrease in groundwater storage and meadow/wetland habitats, resulting in drier site and mesic-site species encroachment. Drier habitats are less conducive to riparian deciduous woody vegetation species (Salix spp.) that are important food and habitat for beaver populations

* potential increase of in-stream water temperatures from decrease in groundwater recharge, which can be problematic for salmonids - the project team is aiming for more overall temperature heterogeneity in the reach

* increase of in-channel velocity where the channel has down cut and doesn't spread water out onto the floodplain during high flows. The process of downcutting causes vertical erosion, which increases fine sediment levels and decreases habitat complexity

* decrease in the amount of zero velocity habitat (especially during high flows), which provide juvenile salmonids protection, temperature buffering, food sources and feeding areas, and resting areas

Note: The project team has started to address this problem via the first phase of treatments. Success is being demonstrated during high flows and at other parts of the hydrograph. The Stewardship project will seek to amplify this change with a target of increased floodplain connection during the low flow months of the hydrograph (3-4 months of year).

Sub-problem 2 - Ungulate herbivory and riparian shrub recovery problems are severe in the Sheep Creek meadows and many other parts of the Upper Grande Ronde Watershed. Shrub communities are critical for shade, cover, fish and wildlife habitat, sediment sorting, floodplain morphology response and more. Science from the Starkey Experimental Forest and numerous other publications (e.g., Wells et al., 2015, Case et al., 1997), and expert opinion point to the need to protect riparian plants from ungulate browse to recover robust shrub communities. It is suspected that at one point the riparian shrubs in places like Meadow Creek were all but eliminated due to past land use (Case et al., 1997). This is the case on Sheep Creek and clearly continues to be the case on certain reaches of Sheep Creek. Below are more details and findings that present and refine the components of this problem.

* In a 1997 study of UGR systems that included ungulate and cattle exclusion experiments they found: "Over browsing by herbivores can severely reduce seed production, shrub communities remain vulnerable when herbivores are present, "...wild herbivores had significant and negative influences on the rate of recovery on the height of black cottonwood. and height, crown area, crown volume, biomass and reproductive output of willows (Case et al., 1997)." In the case of Sheep Creek, we are more focused on willow recovery more than cottonwood.

*Vegetative heterogeneity is critical for long-term meadow health and the success of beaver populations. Healthy shrub communities are largely non-existent on this reach of Sheep Creek except for areas near the 5160 road where multiple roads surround the floodplain. This area is an example of a place where reduced browse has reaped large floodplain benefits. The only known beaver to live in the meadows of Sheep Creek in recent years subsisted for a short time in this area.

Note: The project team has started to address this problem by rebuilding the cattle fence on USFS ground, stacking plant pods, and creating three elk fences to date. The project team would like to create several more exclosure fences to build back enough shrub communities for beaver habitat and to decrease overall landscape effects of herbivory.

Sub-problem 3 - Lack of beaver habitat robust enough for these animals to colonize the system and make positive biomic (Johnson et. al., 2020) change to the system.

* "Biological influence is, obviously, exerted by animals as well as plants. Historically, beavers were endemic to most of North America (Castor canadensis) and Europe (Castor fibre), and their effects on hydrology, hydraulics, sediment dynamics, morphology, and floodplain connectivity are known to have been pervasive (Pollock, et. al., 2017). In areas characterized by beaver occupation and dam building, valley morphology is often described as a “beaver meadow,” indicating the intensity of geomorphic change resulting from beaver activity (Polvi & Wohl, 2012). When beavers were driven towards extinction during the late 19th century, their removal often resulted in channel degradation, disconnection from the floodplain, lowering of groundwater tables, and impoverished stream ecologies that are only now starting to recover in response to restoration projects that increasingly include beaver reintroduction or recolonization (Pollock et al., 2017; Figure 4c)." (Castro & Thorne, 2019)."

* The project team has spent many weeks on the ground over the past 3 years and have photo verification of the challenges likely present for beaver colonization on Sheep Creek. Please request more information as needed.

Sub-problem 3 - Fish and wildlife habitat complexity:

* Sheep Creek's fish habitat complexity (cover, pool quality/quantity, zero velocity habitat, and spawning gravel recruitment) is limited. Channel incision and lack of instream woody material has affected the quantity and quality

* A lack of functioning wet meadow characteristics across the floodplain valley bottom severely reduce the wildlife habitat in the Sheep Creek meadows. An example of this is there is little to no structural heterogeneity in the shrub communities. These communities should support the food and shelter needs of numerous animal species.

Note: The project team has started to address this problem by placing over 240 LWD structures in stream and hundreds of loose in-stream and floodplain wood. This next phase will increase this habitat complexity for fish and many other species of wildlife.

How have past or current land management practices contributed to the problem?

Historic trapping, overgrazing, logging, road building, and an altered fire regime have degraded the Sheep Creek watershed's ecological form and function. The loss of functional meadow and stream habitat adversely effects the survival and rearing of native salmonids, other fish, and wildlife species.

Beaver trapping pressure in the 19th Century almost caused extirpation of this species in the western United States. The decrease in beaver populations on Sheep Creek has contributed to channel incision, decreased habitat complexity, altered vegetative communities, and an altered flow/temperature regime. Beaver serve as ecological engineers by building dams that decrease the velocity of peak flows and spread flows out over longer periods of time. This increase of water retention time decreases erosive forces that cause stream incision. Higher levels of

surface and subsurface water retention expands riparian and wetland habitat along the stream. As beaver move in and out of systems, numerous side channels often form, and more woody vegetation ends up in the stream. This leads to increased habitat complexity for fish and wildlife.

Historic overgrazing of sheep and later cattle reduced deciduous vegetation communities around Sheep Creek. Overgrazing has also caused bank erosion, channel over widening, and soil compaction. This has caused vertical erosion and channel incision. Channel incision has altered the Sheep Creek system by lowering streambeds and groundwater tables causing a further decrease in riparian vegetation. Currently, the stream is excluded from domestic livestock grazing. However, wild ungulate (elk and deer) browsing pressure is very high in areas along Sheep Creek.

Historic logging practices caused a variety of problems in the Upper Grande Ronde watershed. The removal of wood from the system likely resulted in less in-stream large woody debris (LWD). Part of the Sheep Creek Basin is likely affected by this issue. It is important to note that the meadow reaches of the stream may not have had lots of large diameter wood historically, but abundant small diameter wood and beaver dams/lodges.

High densities of roads near Sheep Creek and its meadows have likely caused a variety of compounding problems. Impermeable road surfaces increase the rate of overland flow. This affects the timing and volume of flow in downstream areas of the watershed. Roads that are built on the sides of meadow systems (which is the case on sections of Sheep Creek) often result in long-term soil compaction. The soil compaction can lead to a reduction in water holding capacity and infiltration into nearby meadow systems.

Altered natural and human ignited fire (Native American and sheep herders) regimes due to 20th century fire suppression have likely affected the vegetative, hydrologic, and geomorphic processes of montane meadow systems like Sheep Creek. Less frequent intense wildfires are more likely to have negative effects on meadows (erosion in uplands) than more frequent low-intensity fires. Historically, naturally caused, and human ignited low intensity fires were likely more common.

Conifer encroachment due to lack of regular fire intervals has caused dense under and mid-story fir/pine species on the edges of meadows and in some cases all the way up to the Sheep Creek streambank. This early stage forest ecosystem dynamic increases competition for large tree regeneration, contributes to meadow water loss through evapotranspiration, and creates an ecological dynamic that suppresses native woody shrub growth.

The continued restoration and stewardship of Sheep Creek's form and function will address a combination of these interrelated problems through a geo-physical, hydrological, and biological approach to creek and meadow restoration.

Project History

Continuation - Are you requesting funds to continue work on a project previously funded by OWEB where that work did not result in a completed project?

● Yes
❍ No

Provide OWEB Grant #(s)

There was an initial grant submitted to the GRMW for this project that included BPA Funding and OWEB Funding. OWEB funded the cattle fence portion of the project which was a contract run by GRMW and USFS.

TU was passed maintenance and stewardship funding from the Bureau of Land Management for this project last calendar year. This grant number is 220-9004-19115.

What was completed with previous OWEB grants?

The previous USFS-GRMW OWEB grant included the completion of approximately 5.25 miles of cattle fence. The larger project which included BPA funding completed numerous other project actions.

Why is additional OWEB funding needed?

The project team would like to adaptively manage and steward this project over time until we feel like the system is on the right trajectory to recover itself. This will include additional actions that are new types of restoration treatments and repairs/additions to existing beaver mimicry and wood placement work.

As a project team we are working hard to develop a restoration framework that involves adaptive management and stewardship immediately following the initial phase of the project. This more fluid and timely approach to more actions is not the norm in restoration practice and is many times against funding timelines and norms. We feel the need is invaluable.

What we've learned is that there are often multiple entries into restoration project areas over decades. In the region around Sheep Creek this has occurred about one time per decade for the last 4 decades. We would like to try and raise funding to support our work on this effort on more of a continual basis until the system has the tools to recover on its own. Therefore, we aren't losing ground over that 10 years, but annually fostering it until it is on the right trajectory towards recovery. This takes persistence, focus, and lots of communication on many levels. The project team hopes that this work in Sheep Creek can be a pilot run for this methodology. One regional comparable effort is the Bridge Creek Restoration Project in the John Day Basin.

Resubmit - Have you submitted, but were not awarded an OWEB application for this project before?

❍ Yes
● No

Phased - Is proposed work in this application a phase of a comprehensive watershed restoration plan or project?

● Yes
❍ No

List the phases of the project.

Phase	Brief Description	Project Number
Phase 2	Additional treatment actions.	

Plans and Salmon

Is the proposed restoration activity(ies) identified in a local assessment or other plan?

● Yes
❍ No

Provide name of local plan, Watershed assessment or other locally relevant document.

The Upper Grande Ronde Atlas is a geo-spatial restoration prioritization plan developed in coordination with BPA by local fish biologists, researchers, engineers, hydrologists, practitioners, and stakeholders. The plan divides the subbasin into biologically significant reaches (BSR) and prioritizes those reaches for restoration based on fish use, fish life stages, limiting factors, and floodplain availability. The BSR are associated with restoration actions. Each reach is assigned a Tier with Tier 1 being the highest priority and Tier 3 being the lowest priority. The Sheep Creek project area is within a Tier 1 BSR.

Will this project benefit salmon or steelhead?

● Yes
❍ No

✓Snake River Basin - Steelhead
✓Snake River Spring/Summer-run - Chinook Salmon

How will the resulting restoration project benefit salmon or steelhead or their habitat?

The project will increase habitat complexity, increase off-channel low velocity habitats, create more stream temperature heterogeneity, increase riparian vegetation (shade, cover, morphology), and improve floodplain function.

Does the project address a restoration action identified in a regional assessment or recovery plan?

● Yes
❍ No

Regional Assessments or Recovery Plans
ESA Recovery Plan for Snake River Spring/Summer Chinook & Snake River Basin Steelhead
Northwest Power and Conservation Council Grande Ronde Subbasin Plan
Oregon's Native Fish Conservation Policy
Oregon Conservation Strategy

For each plan chosen above, describe how your project is consistent with specific recovery/restoration actions cited in that plan.

Proposed ESA Recovery Plan for Northeast Oregon Snake River Spring and Summer Chinook salmon and Snake River steelhead populations

The recovery plan identifies that "High priority habitat protection and restoration efforts should focus on improving habitat conditions in the upper Grande Ronde River above the City of La Grande including the habitat restoration of Sheep Creek. EDT results for the population ranked protection benefits for Sheep Creek the highest of 17 reaches (NPCC 2004a)."

Sheep Creek Restoration project is consistent with the following recovery strategies identified in the recovery plan for Upper Grande Ronde spring Chinook salmon and steelhead populations: "Habitat restoration actions (in the Upper Grande Ronde and tributaries) will address low summer flows, moderate summer temperatures, reconnect floodplains and wetlands, restore riparian conditions, and improve instream complexity."

Specific elements of the overall restoration strategies will:
*Protect and enhance spawning and rearing areas in Sheep Creek and the upper Grande Ronde River
*Improve the quantity and quality of summer/winter rearing habitats downstream of occupied areas, and improve conditions in currently used habitats

Northwest Power and Conservation Council Grande Ronde Subbasin Plan
This plan identifies sediment, temperature, key habitat quality, and flow as limiting factors in Sheep Creek and describes restoration opportunities "reduce sediment delivery, improve riparian function, decrease temperatures, and increase wood inputs." The restoration objectives in the Sheep Creek proposal align with these recovery actions.

Oregon's Native Fish Conservation Policy

The Policy identifies three goals:
1) Prevent the serious depletion of native fish.
2) Maintain & restore naturally produced fish in order to provide substantial ecological, economic and cultural benefits to the citizens of Oregon.
3) Foster & sustain opportunities for fisheries consistent with the conservation of naturally produced fish & responsible use of hatcheries.

By pushing Sheep Creek on a trajectory towards a positive ecological state, the project team can help improve native fish habitat.

The Oregon Conservation Strategy

This is a state strategy to conserve fish and wildlife. Columbia Spotted Frogs, Chinook, Steelhead, Bull trout and Redband trout and numerous Upper Grande Ronde wildlife species are highlighted in this plan. The Upper Grande Ronde River Area COA ID - 160 conservation strategy should focus on:

1) Maintain or enhance in-channel watershed function, connection to riparian habitat, flow and hydrology.
2) Maintain or restore riparian habitat and ecological function; provide habitat complexity for fish and wildlife.
3) Promote early detection and removal of invasive plants.
4) Maintain and restore wet meadows.

These strategies are very pertinent to the Sheep Creek Project. One of the noted points in the Upper Grande Ronde is the presence of springs. This project aims to address issues at several alluvial fan wetland and spring areas.

Does this project address one or both of the following:

✓ *Habitat needs for one or more Endangered Species Act-listed species and/or species of concern*
✓ *Concerns identified on 303(d) listed streams*
❑ *No*

Proposed Solution

Goal, Objectives, and Activities

State your project goal. A goal statement should articulate desired outcomes (the vision for desired future conditions) and the watershed benefit.

The overall goal of this project is to achieve proper ecological form and function of Sheep Creek and its meadows, and thereby enhance habitat for Snake River Basin Spring/Summer Chinook, Snake River Basin steelhead, resident redband trout, bull trout and numerous other aquatic and terrestrial species. This includes habitat for beaver and other small mammal floodplain ecosystem engineers.

List specific and measurable objectives. Objectives support and refine the goal by breaking it down into steps for achieving the goal. (NOTE: If you quantify your objectives, ensure all numbers match the metrics listed in your selected habitat types.) Provide up to 7 objectives.

Objective #1

Objective

The project team will continue to build upon and amplify the objectives and goals outlined in the initial project phase (2019-2020).

Describe the project activities. Activities explain how the objective will be implemented.

The team will work towards several new ('as-built') objectives for this portion of the project. These are outlined in the below objectives for the Sheep Creek Stewardship Project. Each of these objectives is meant to be complimentary and an addition to existing work to date.

Objective #2

Objective

Build 76 new BDA/PAL/LWD structures in the mainstem and floodplain.

Describe the project activities. Activities explain how the objective will be implemented.

Beaver Dam Analogues (BDA) and Post-Assisted Log Structures (PAL): The builders will drive 2-4in untreated wood posts into the channel and floodplain environments via hand and min-excavator mounted pneumatic post-pounders. The builders will pull soil and gravel material from the floodplain and in-stream to pack in the structures. The material will be pulled out of 5x5 foot pits that are adjacent to the structures being built. Plant material (lodgepole pine, grasses, and off/on-site hardwoods) will be used to build the wicker-weave designs. Lodgepole pine will be used to build PALs.

Large Woody Debris Structures: The builders will build wood jams which will have an average of 6 whole and partial trees and racking material. These structures will not be keyed into the banks. The structures will be equivalent to the hand-built wood structures that the roving Veteran's Hand Crew built in 2019-20. The project team will use lodgepole pine from the floodplain and immediate forested areas to build these structures. The structures will be constructed using grip hoists, log carriers, other handheld tools, and mini excavators. The project team would like to pull select wood from the floodplain banks and lots of wood from nearby thinning efforts for this work.

Objective #3

Objective

Repair and add to 85 BDA/LWD structures.

Describe the project activities. Activities explain how the objective will be implemented.

The project team will add to existing large wood structures with woody material found locally. The project team will add to/patch/repair existing BDA/LWD structures with local vegetative material, floodplain gravel and soil, and in-stream gravels.

Objective #4

Objective

Adjust and rearrange 15 very large woody debris structures built in 2013 by the US Forest Service on Sheep Creek.

Describe the project activities. Activities explain how the objective will be implemented.

The project team will unpin and/or pull apart 15 large diameter (avg. DBH - 50in.) LWD placed by the USFS in 2013. The team will move it into the bankfull channel. The objective is intended to create more in-channel roughness and hydraulic obstruction rather than leaving large portions of the logs on the floodplain.

Objective #5

Objective

Augment approximately 5708 feet of channel with gravel and floodplain fill material resulting in over 6 acres of new wetland habitat formation.

Describe the project activities. Activities explain how the objective will be implemented.

This work will reduce mainstem incision by speeding aggradation processes, create more wetlands habitat, and increase hydrologic connectivity – The project team is working with USFS Enterprise Team Paul Powers to implement plans to augment floodplain material (gravel, cobble, silt) to the stream to promote aggradation, and wetland habitat. The team selected specific high and dry areas of floodplain ground near down cut/disconnected areas of stream and areas where expanding off-channel flow and ponding is most likely to provide the highest benefit. This work includes notching historic side channels (as part of cut process) to improve inundation at various flows and to divert water while working in-stream during construction. The team also chose areas where adding on to existing wetland habitats will increase the overall footprint of these biologically diverse areas.

Action specifics - the project team will remove floodplain material from disconnected areas of floodplain and floodplain terraces. The process will grade these areas down, while aggrading the mainstem channel. This will reconnect hydrology during more parts of the hydrograph. The project team will fill in and around existing in-stream structures, and avoid good pool habitat when it is identified. The project team expects this 'quick aggradation' exercise to immediately inundate these disconnected areas throughout the bottom end of the hydrograph.

Here are some logistical details from a recent conversation with Paul Powers that help work through many common questions brought forth by this treatment type:
* We would fill the channel as much as we want. We could fill to the top/bankfull.
* You can fill in as much or as little around pools and wood jams as you would like.
* The cut areas that TU/USFS identified were analyzed by Paul and he said indeed they are pretty high surfaces so they would not be ‘divots’ per se when we leave the site. They would just be graded down to a lower elevation. They would heal very fast.
* Paul very much agrees with our take that the main goal of this is to speed up/mimic aggradation process.
* We’d feather in the material like a pool tail crest on the upstream end and then pretty quickly could fill a lot of the channel. We’d feather it out at the downstream end.

Objective #6

Objective

Decommission old BLM/ODFW cattle fence and rebuild 2900 feet of new 4-strand fence.

Describe the project activities. Activities explain how the objective will be implemented.

This portion of the project is aimed at keeping cattle out of the 80-acre BLM parcel. The weakest link in the perimeter fence is the west flanking fence. This project action will strengthen this fence for its lifespan and decrease issues with cattle trespass.

Objective #7

Objective

Build 5380 feet of valley flanking elk fence in three footprints along Sheep Creek to protect 11.8 more acres from ungulate browse.

Describe the project activities. Activities explain how the objective will be implemented.

This project action will increase the footprints of 1 BLM fence and 1 USFS existing (to be built in 2021), fences and add one additional fence footprint. This will increase the area of floodplain protected by 11.8 acres.

The project team expects this to lead to rapid riparian woody species recovery where plants are planted in the floodplain and where natural colonization is more likely to flourish on stream gravel bars.

This objective is being monitored in through 2-3 mechanisms. This includes photo point transects in completed in 2020 field season.

Objective #8

Objective

Thin and remove conifers from 96 acres of floodplain, valley flanking and perennial tributary wetland habitats.

Describe the project activities. Activities explain how the objective will be implemented.

This project action is proposed for several purposes. These include:

* Source wood for the project in-stream and floodplain work both in the main channel and in the side tributaries (similar to hand crew/small streams work to date)

* Reduce evapotranspiration issues and soil dynamic issues posed by encroached conifers. This will reduce/eliminate soil dynamic, competition etc. for recovering riparian hardwood communities

* Reduce chance of wildfire burning really hot, right through our floodplain/wetland communities. TU recently visited a river in SE Oregon that burnt to the ground. It burned the whole floodplain. This a real threat in a place like Sheep. The recovery time for these types of fires is very long.

** The project team is collaborating with the Sheep Creek Vegetation Management Project on this effort. TU is working with BLM and would like to thin their 80 acre parcel as well. The BLM piece is covered for thinning under existing NEPA from the 2019 project.

Objective #9

Objective

Plant 4,000 riparian shrubs and sedge/rush/grass plugs in areas protected from ungulate browse and in areas for rehab purposes (e.g., wetland alluvial fan, and cut/fill areas).

Describe the project activities. Activities explain how the objective will be implemented.

The plants will largely be planted inside of areas protected from ungulate browse. The project team has developed planting area maps using several key plant guides and the Upper Grande Ronde mapping and riparian guide (Wells, et al., 2015).

Objective #10

Objective

Reclaim alluvial fan wetland habitat near 5160 Bridge Area.

Describe the project activities. Activities explain how the objective will be implemented.

There is an alluvial fan wetland and perennial side tributary near the 5160 bridge that has a dispersed campsite on it. The project builders will decompact, regrade and plant the site with wet-loving and semi-wet loving vegetation. The action would downsize the dispersed campsite and return it into wetland and meadow habitat. The project team expects this to become more of a semi-wet/seasonally wetted alluvial fan habitat rather than a fully wetted perennial wetland.

Objective #11

Objective

Loose place approximately 70 trees per mile in the main channel and floodplain habitats throughout the project area.

Describe the project activities. Activities explain how the objective will be implemented.

Utilize hand crews as a low disturbance and effective approach to add racking material and small diameter trees to instream structures. Lead and mentor young adult stewardship crews and volunteers to:

- Use a low impact method for wood addition in sensitive areas
- Learn about watershed restoration
- Learn about natural resource careers
- Create a stewardship ethic

This objective is meant to add upon and enhance work to date. It is meant to increase stream complexity, reduce hydraulic efficiencies, encourage aggradation and off channel floodplain connection at high flows.

This work will largely be completed by the roving hand crew developed by TU/USFS in the first phase of this project.

List the major project activities and time schedule for each, including post project implementation.

Element	Description	Start Date	End Date
Build new BDA/PAL/LWD	Build structures in the mainstem and floodplain	7/2022	10/2023
Repair and add to 85 BDA/LWD structures	Repair and add to 85 BDA/LWD structures	7/2021	11/2023
Material Augmentation	Augment approximately 5708 feet of channel with gravel and floodplain fill material resulting in over 6 acres of new wetland habitat formation.	7/2022	10/2023
Decommission and rebuild old BLM/ODFW cattle fence	Decommission and rebuild 2850 feet of new 4-strand fence	7/2021	10/2023
Adjust and Rearrange 15 LWD Structures	Adjust and Rearrange 15 LWD Structures	7/2022	11/2023
Build 5380 feet of valley flanking elk fence	These three footprints along Sheep Creek will protect 11.8 more acres from ungulate browse	7/2021	10/2023
Conifer thinning for watershed health	Thin and remove conifers from 96 acres of floodplain, valley flanking and perennial tributary wetland habitats.	3/2022	10/2023
Planting	Plant 4,000 riparian shrubs and sedge/rush/grass plugs in areas protected from ungulate browse and in areas for rehab purposes (e.g., wetland alluvial fan, and cut/fill areas).	9/2021	10/2023
Reclaim alluvial fan wetland habitat near 5160 Bridge Area.	The project builders will decompact, regrade and plant the site with wet-loving and semi-wet loving vegetation.	6/2022	10/2023
Loose wood placement	Loose place approximately 70 trees per mile in the main channel and floodplain habitats throughout the project area.	7/2021	10/2023

Element	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023	Q3 2023	Q4 2023
Build new BDA/PAL/LWD										
Repair and add to 85 BDA/LWD structures										
Material Augmentation										
Decommission and rebuild old BLM/ODFW cattle fence										
Adjust and Rearrange 15 LWD Structures										
Build 5380 feet of valley flanking elk fence										
Conifer thinning for watershed health										
Planting										
Reclaim alluvial fan wetland habitat near 5160 Bridge Area.										
Loose wood placement										

Habitat Types

In which habitat type(s) are you proposing to work?

✓*Instream Habitat: below the ordinary high water mark (includes in-channel habitat restoration, bank stabilization, flow, fish screening, and fish passage) -- Details will follow.*

✓*Riparian Habitat: above the ordinary high-water mark of the stream and within the stream's floodplain. -- Details will follow.*

❑*Upland Habitat: above the floodplain and improves native habitat and watershed function.*

✓*Wetland Habitat: land or areas covered, often intermittently, with shallow water or have soil saturated with moisture. -- Details will follow.*

❑*Estuarine Habitat: tidally influenced areas.*

Instream Habitat

Select all applicable Instream categories.

❑**Bank stabilization**
❑**Fish passage improvement**
❑**Fish screening project**
❑**Instream Flow**

✓**Instream habitat restoration**

Select all the actions you propose to implement to address the problem.

✓*Placement of materials in channel*

Does the proposed project follow:

❑*ODFW Guidelines*
❑*NOAA Guidelines*
✓*Other*

Specify

The project team is using project learnings to date (including initial design set) and the Low-Tech Process Based Manuel (Wheaton, et al., 2019) for insight and technical information. The Sheep Creek stream and meadow are very low gradient and would likely have not have had very much LWD and rather coarse woody debris and beaver dams historically.

The project team is familiar with the NOAA and ODFW Guidelines and can reference them as needed.

What types of instream habitat materials are you proposing to install? (select all that apply)

✓*Large wood*

Number of structures.
53

Average number of logs per structure.
6

Average length of logs per structure (feet)
25

Average diameter of logs per structure (feet)
10

❑*Boulders*
❑*Combination log/boulder*
✓*Other materials: Materials that stabilize the streambed*

Specify structure type(s):

✓*Beaver dam alternative*
❑*Constructed riffle*
❑*Weirs installed*

Number of structures
38

✓*Channel reconfiguration and connectivity, including alcoves and side channel reconnection*

What type(s) of change are you proposing to the channel configuration and connectivity?

Augment approximately 5708 feet of channel with gravel and floodplain fill material resulting in over 6 acres of new wetland habitat formation.

This work will reduce mainstem incision by speeding aggradation processes, create more wetlands habitat, and increase hydrologic connectivity – The project team is working with USFS Enterprise Team Paul Powers to implement plans to augment floodplain material (gravel, cobble, silt) to the stream to promote aggradation, and wetland habitat. The team selected specific high and dry areas of floodplain ground near down cut/disconnected areas of stream and areas where expanding off-channel flow and ponding is most likely to provide the highest benefit. This work includes notching historic side channels (as part of cut process) to improve inundation at various flows and to divert water while working in-stream during construction. The team also chose areas where adding on to existing wetland habitats will increase the overall footprint of these biologically diverse areas.

Action specifics - the project team will remove floodplain material from disconnected areas of floodplain and floodplain terraces. The process will grade these areas down, while aggrading the mainstem channel. This will reconnect hydrology during more parts of the hydrograph. The project team will fill in and around existing in-stream structures, and avoid good pool habitat when it is identified. The project team expects this 'quick aggradation' exercise to immediately inundate these disconnected areas throughout the bottom end of the hydrograph.

Here are some logistical details from a recent conversation with Paul Powers that help work through many common questions brought forth by this treatment type:
* We would fill the channel as much as we want. We could fill to the top/bankfull.
* You can fill in as much or as little around pools and wood jams as you would like.
* The cut areas that TU/USFS identified were analyzed by Paul and he said indeed they are pretty high surfaces so they would not be ‘divots’ per se when we leave the site. They would just be graded down to a lower elevation. They would heal very fast.
* Paul very much agrees with our take that the main goal of this is to speed up/mimic aggradation process.
* We’d feather in the material like a pool tail crest on the upstream end and then pretty quickly could fill a lot of the channel. We’d feather it out at the downstream end.

Acres off-channel or floodplain habitat connected
63

Number of pools created/added
25

❑*Spawning gravel placement*
❑*Beaver reintroduction*
❑*Non-native plant control*
❑*Nutrient enrichment*
❑*Animal species removal*

Is the primary purpose of the instream habitat restoration treatment(s) to address water quality limiting factors?
❍ Yes
● No

Total miles of stream to be treated with all instream habitat restoration treatments
4

❑**Stockpiling logs**

Riparian Habitat

Select all applicable Riparian categories.

❑**Riparian road activities**

✓**Fencing and other materials for habitat protection**

Select all the actions you propose to implement to address the problem.

✓*Fencing*

Type of fence
4-Strand Bard Wire

Height (ft.)
4.5

Length (miles)
.5

Linear stream miles treated
.4

Will livestock graze inside the riparian area?
❍ Yes
● No

What assurances will be in place to demonstrate livestock exclusion will be maintained over the long-term, i.e. after 10 years, 15 years?

The Oregon Department of Fish and Wildlife has an existing agreement with the Bureau of Land Management to maintain the cattle exclusion fence around the whole perimeter of this 80-acre BLM parcel in the Upper Grande Ronde. Due to the long-term partnership between BLM and ODFW at this site, and it's importance to salmonid and wildlife habitat, the local restoration parties are interested in having this fence maintained over the long term. The Stewardship Project is stepping into rebuild a portion of this fence, which includes one flank along the valley bottom near the stream.

Will the fence design be wildlife friendly?
❍ Yes
● No

Will fencing activities install new fencing that did not exist previously?
❍ Yes
● No

✓*Exclusion other than fencing*
Specify materials

Build 5380 feet of valley flanking elk fence in three footprints along Sheep Creek to protect 11.8 more acres from ungulate browse. The project team plans to build 1 of three main types of wildlife fence. These include metal buck and pole (a new design by TU and Cargill Fencing), wooden buck-n-pole, or woven wire. This combined with the cattle fence acreage will equal the total of 91.8 acres protected.

Miles of fencing and other materials for habitat protection
1

Riparian acres protected by fencing and/or other exclusion
91.8

✓Vegetation establishment or management

Select all the actions you propose to implement to address the problem.
✓*Planting*
For Details Go to Plant Page

❑*Non-native plant control*
✓*Prescribed burnings, stand thinning, stand conversions, silviculture*
❑*Juniper treatment*

❑Livestock management
❑Debris and Structure Removal

Is an objective of the riparian treatment(s) to address water quality limiting factors?
❍ Yes
● No

Total linear stream miles to be treated.
4.0

Total riparian acres to be treated.
95

Left streambank miles to be treated.
3.4

Right streambank miles to be treated.
3.4

Wetland Habitat

Are you working in artificial or historic wetland habitat? (select one or both)

❑*Artificial wetland*
✓*Historic wetland*

Select all applicable Wetland categories.

✓**Wetland road activities**

For Details Go to Road Page

❑**Channel modification including creation**

✓**Vegetation establishment or management**

Select all the actions you propose to implement to address the problem.

✓*Planting*

For Details Go to Plant Page

❑*Non-native plant control*

❑**Fencing and other materials for habitat protection**
❑**Structure removal/modification/installation**
❑**Nonstructural removal and placement protection**

Total wetland acres to be treated:
1.18

Wrap-Up

Watershed Benefit

Describe the watershed or ecosystem function(s) that the project will address through the proposed restoration actions and the resulting benefits to water quality, native fish and wildlife habitat, and/or watershed health. Explain why the project is a priority for investment at this time.

The project team projects a very strong outcome to these actions combined with the actions completed on Sheep Creek to date. The combination of these actions should develop the site enough for it to move towards a more functioning ecological state.

Meadow systems within the Blue Mountains are hotspots for biological diversity and watershed function. There is no more valuable place on the landscape for fish, wildlife, and flora species than these low-gradient, mid-montane meadow systems. They bank cold-clean water and recharge it into the system later in the summer season. They support a high diversity of native grasses, shrubs, sedges rushes, and trees. They provide diverse and complex habitat for fish and wildlife. They buffer against the increasing threat of climate change.

Each of these important functional components of a meadow system cannot be realized without effective adaptive management and stewardship. This project is working towards a consistent and persistent approach to restoration actions and adaptive management.

It is noted in the recent paper (White, et. al., 2020), Progress Towards a Comprehensive Approach for Habitat Restoration in the Columbia Basin: Case Study in the Grande Ronde River, that:

"Regionally as well as locally, objectives and indicators are still heavily biased towards fish abundance. In the Grande Ronde, goals are weighted towards abundance of ESA-listed salmonids. Next steps include increased attention to functional diversity of habitats and drawing from traditional knowledge emphasizing ecological diversity and resilience (e.g., CTUIR’s First Foods concept)."

The project team has been developing this project for a functional diversity of habitats, and the Stewardship Project's proposed actions fall in line with this vision. The project team and some local partners see this approach as valid and that Sheep Creek should be a priority for this type of work. The USFS is working towards a large forest restoration and vegetation management project in this sub-watershed as well. Collaborating with this effort actively, could produce even more incredible benefits for this area. This also makes it rise on the priority list.

Public Awareness

Does this proposed project include public awareness activities?

● Yes
❍ No

Describe these activities, as well as any related products, and explain how the proposed activities relate to the project's objectives.

The project team expects several site visits over time with local partners and local community members. The project team expects to create some media products for the Trout Unlimited Blog, GRMW Ripples Newsletter, and similar outlets.

Design

Were design alternatives considered?

● Yes
❍ No

Describe the design alternatives that were considered and why the preferred alternative was selected.

The project team has spent many days and meetings developing this additional list of actions for Sheep Creek. This has included looking at a mix of potential approaches. Our final outcome is to move forward with a suite of diverse actions that target different components of the hydrologic, geomorphic and biological needs. This Biomic river restoration approach (Johnson, et. al., 2019).

The key areas where the project team has looked for professional opinions and synthesized existing science include:

* Extensive research and learning from beaver and wet meadow related science and technical information
* Extensive research on wet meadow restoration techniques
* Expert opinions from Paul Powers, USFS Fish Bio and Restoration Team Member, GRMW IT partners, TU science team and practitioners, USFS and consultant plant and riparian ecologists, LTPBR expertise, USFS range and silvicultural staff and more.
* Science and papers related to adaptive management, and climate change/adaptation/ecological state and transitions
* Drone monitoring and analysis
* REM/DEM/GGL exercises
* Extensive field ground truthing and learning

Select the appropriate level of design for your project.

❍ No design is required.
❍ 10-30%: Conceptual design (evaluation of alternatives, concept-level plans, design criteria for project elements, rough cost estimates).
❍ 30-85%: Preliminary design (selection of the preferred alternative, draft plans, draft design report, preliminary cost estimates).
● 85-100%: Final design (final design report, plans, and specifications, contracting and bidding documents, monitoring plan, final cost estimate).

If work remains on the project's design, describe the work that remains to be done and when you expect to have it completed. If no design is required put "N/A"

The project team plans to fine tune the remaining portions of the design in the coming months. This includes polishing up the cut/fill amounts. The design process has been in discussion for the past several years and is now fine-tuned to the suite of projected actions. The design is between 80-100%.

Describe the steps you will take to minimize adverse impacts to the site and adjacent lands during and after project implementation.

The project team is taking several approaches to minimize impacts to the landscape:

* The project will use existing access roads from the initial project for all of the floodplain based work.

* The cut areas are on high and dry ground. They are largely made of floodplain alluvium and have invasive annual grasses on them during the summer season. The project team expects these to turn into more wetland habitat post project.

* The project team will make sure the site is rehab includes seeding, plantings, and floodplain wood.

Project Management

List the key individuals, their roles, and qualifications relevant to project and post project implementation. At a minimum include the following: project management, project design, project implementation, and project inspection.

Role	Name	Affiliation	Qualifications	Email	Phone
Project Management	Levi Old	Trout Unlimited	MS Field Natural History and Ecology 15+ Years in Conservation/Restoration/ Education	lold@tu.org	(541) 408-3770 Ext._____
Project Management	Sarah Brandy	USFS	Fisheries Biologist and Manager Restoration Practitioner	sbrandy@fs.fed.us	(541) 962-8590
Design Support and Cartography	Alex Towne	Grande Ronde Model Watershed	Expert Cartographer	alex@grmw.org	(541) 663-0570
Technical Support	Aric Johnson	USFS	Range Ecologist	aric.johnson@usda.gov	(541) 962-8517
Technical Support and Planting Support	Joe Platz	USFS	Fisheries Biologist and Restoration Practitioner	joe.platz@usda.gov	(541) 962-8571
Technical Support and Funding	Jesse Steele	Grande Ronde Model Watershed	Executive Director and Fisheries Biologist	jesse@grmw.org	(541) 663-0570

Optional Monitoring

OPTIONAL: Restoration Project Monitoring

- ❑ *Salmonid Monitoring*
- ❑ *Non-salmonid biological monitoring*
- ❑ *Water (quantity) flow monitoring*
- ❑ *Water quality monitoring*
- ❑ *Rangeland monitoring*
- ❑ *Onsite*
- ❑ *Downstream*
- ❑ *Upstream*
- ❑ *Upslope*

Will effectiveness monitoring be conducted for this project?

● Yes
❍ No

Please describe the monitoring activities and any additional sources of funding (amount and source) to support this effort.

There are numerous ongoing monitoring activities on this project.

Monitoring: There are several in-depth (and rapid) monitoring exercises set up for this project. There is a draft adaptive management and monitoring plan set up to guide the project team. These monitoring components include:

Vegetation Trend Monitoring -
Analysis of 30+Years of Satellite Data,
Plant Species Transects across numerous valley wide plots
Photo Monitoring transects
Drone - Yearly timed high and low water flights
Inundation Mapping
Temperature trend monitoring
Geomorphic change detection (GCP) and LIDAR Change Detection (may occur if funding allows)

There is also several agency driven data collection efforts including:
ODFW AQI Survey
USFS Stream Habitat Level II Survey
CHAMP Sites

TU, the TU Science Team and the USFS Ecology Team are working on the vegetation trend monitoring components. TU and USFS plan to fund this into out years. The agency efforts are being conducted and funded by the respective agencies.

Budget

Item	Unit Type	Unit Number	Unit Cost	OWEB Funds	External Cash	External In-Kind	Total Costs
Salaries, Wages and Benefits							
TU Project Manager	Hours	540	$42.00	$0	$13,680	$9,000	$22,680
2- Weeks/Field Season (2 Interns) - $15/H	Match Lump Sum	1	$2,400.00	$0	$0	$2,400	$2,400
			Category Sub-total	$0	$13,680	$11,400	$25,080
Contracted Services							
BDA/PAL/LWD Construction	Each	76	$900.00	$0	$68,400	$0	$68,400
BDA/LWD Additions and Repair	Each	85	$250.00	$5,000	$16,250	$0	$21,250
Loose Wood Placement (70 trees/mile)	Miles	3	$4,100.00	$0	$12,300	$0	$12,300
Adjust 15 Pinned USFS LWD Structures	Each	15	$740.00	$0	$11,100	$0	$11,100
Plants (1 gal - Salix spp., other woodies) (sedge/rush/grass plugs)	Each	4000	$5.00	$0	$20,000	$0	$20,000
Planting Contract	Each	4000	$5.00	$0	$20,000	$0	$20,000
Additional Construction Funding (Contingency)	Each	1	$23,735.00	$0	$23,735	$0	$23,735
Mobilization (10% Construction)	Each	1	$18,691.00	$0	$18,691	$0	$18,691
Indirect for BPA Portion (13.74%) All staff time, contracted services and travel.	Each	1	$28,281.00	$0	$28,281	$0	$28,281
Elk Fence Time and Materials	Feet	5380	$12.00	$64,560	$0	$0	$64,560
BLM - Remove & Replace Cattle Fence on West Flank (4-strand barbed wire)	Feet	2900	$4.00	$11,600	$0	$0	$11,600
Construction: Channel Material Augmentation/Floodplain Wood/ Wetland Enhancement	Days	17	$1,480.00	$25,160	$0	$0	$25,160
Alluvial Fan Wetland Restoration (Time & Materials)	Days	1	$2,300.00	$2,300	$0	$0	$2,300
Riparian Thinning & Wood Acquisition	Acres	96	$275.00	$26,400	$0	$0	$26,400
			Category Sub-total	$135,020	$218,757	$0	$353,777
Travel and Training							
Travel	Miles	2910	$0.58	$0 *	$1,674	$0	$1,674
			Category Sub-total	$0	$1,674	$0	$1,674
Materials and Supplies							
Reforestation Grant - Planting	Each	1	$40,000.00	$0 *	$0	$40,000	$40,000
Untreated Wooden Posts	Each	760	$5.00	$0	$0	$3,800	$3,800
			Category Sub-total	$0	$0	$43,800	$43,800
Equipment							
			$0	$0	$0	$0	$0
			Category Sub-total	$0	$0	$0	$0

Other							
			$0	$0	$0	$0	$0
			Category Sub-total	$0	$0	$0	$0
			Modified Total Direct Cost Amounts	$135,020	$234,111	$55,200	$424,331
Indirect Costs							
Federally Negotiated Indirect Cost Rate	Override Amount			$18,758	$0		$18,758
Post Grant							
Status Reporting Amount	Status Reporting	1	$1,500.00	$1,500	$0	$0	$1,500
Effectiveness Monitoring Amount	Effectiveness Monitoring	1	$0.00	$0	$0	$0	$0
			Total	$155,278	$234,111	$55,200	$444,589

* = OWEB funds excluded from indirect.

Provide context and justification for how your budget was developed. Explain how project costs and/or rates were determined.

BDA/PAL/LWD Hand Placed Structures and Repair/Additions Rate/s: These rates were developed based on conducting this work across several regional project areas in the last several years. This included construction by the roving hand crew and by consulting other regional experts. Many expert will say that it take approximately 1000$ to build a BDA in the field. We work with a variety of crews that have a range of prices. This cost estimate is a solid average based on our crews.

Loose Wood Placement: This work is similar to the above and depends heavily on how far the wood needs to be pulled/hoisted to the floodplain and/or in-stream final resting location.

Adjust and rearrange 15 LWD structures: This price is based on 185$/H Excavator/Operator for 4 hours per structure. These pieces of wood are very large and pinned in many places.

Channel Material Augmentation/Floodplain Wood/Wetland Enhancement and Alluvial Fan/Wetland Decompaction - Restoration: This time and materials-type estimate is calculated off of USFS Enterprise Fisheries Biologist - Paul Powers (per acre estimates) who is an expert in taking similar cut/fill approaches to stream and wetland restoration. This is also informed by the project team's experience working with heavy equipment and on other regional projects. Water Control/Dewatering are factored into this cost.

Elk Fence - This estimate is based on extensive elk fence research TU conducted in the winter of 2019. This includes estimates from regional projects and cost estimates from contractors.

Riparian Thinning/Wood Acquisition: This estimate is based on information provided by USFS Silviculturalist.

Cattle Fence: This is based on costs from recent cattle fencing projects conducted by the USFS. This also factors in the remote area for which the fence will be built and the overall small amount of fencing compared to many fencing jobs/contracts.

Mobilization: The project team used other project mobilization estimates (Sheep Creek, Indian Creek, Percentage Based Mobilization Examples) for construction projects to come to this this cost.

Contingency (additional construction funding): This is on the lower end of project contingencies, which I've seen up to 15% on engineer's estimates at times. The project team is using 8% contingency on construction line items.

Indirect: TU is applying its full NICRA rate to all of the OWEB and all of the BPA costs respectively.

Does the budget identify a contingency amount for specific line item(s) within the Contracted Services and/or Material and Supplies budget category?

●Yes

❍No

Explain the specific reasons a contingency is needed for each line item.

Generally we have found construction and engineering costs to be all over the map in this region. We have done our best to build in contingency to make sure we can secure the appropriate contractors and accomplish the work in the projected timeframe.

BDA/PAL/LWD Hand Placed Structures and Repair/Additions Rate/s: Contingency will help make sure the project team gets this work all to the ground.

Loose Wood Placement: This work is based on a per mile estimate. Similar to the above statement, this will depend on the crew capabilities and past experience. Contingency is important to buffer against potential challenges.

Channel Material Augmentation/Floodplain Wood/Wetland Enhancement and Alluvial Fan/Wetland Decompaction - Restoration: This estimate is based on other regional projects. Sheep Creek is a remote area, restoration contracts are competitive and this project is likely going to have a lot of water management during construction. This provides a buffer for issues in these categories.

Elk Fence - Elk fence bids can come come in high, especially depending on the price of steel which is fluctuating rapidly these days.

Riparian Thinning/Wood Acquisition: Depending on the densities of conifer to thin and the readiness of a competitive contracting pool, this cost could fluctuate.

Cattle Fence: This project is small in nature for cattle fencing contracts. Many fencing contractors like to take larger jobs. Contingency will help ensure the project team can secure a contractor if bids come in high.

Mobilization: The contingency is not taken for mobilization.

Funding and Match

No Fund Source Contribution Amounts have been identified for this application.

Fund Sources and Amounts

Organization Type	Name	Source Note	Contribution Type	Amount	Description	Status
Non-Governmental Organization	Trout Unlimited	TU will pursue funds	In-Kind - Labor	$9,000	Labor for Project Planning	Secured
Federal	BOR	Intern Support	In-Kind - Labor	$2,400	1-2 Weeks/Field Season (2 Interns) - 15$/H	Pending
Federal	Reforestation Grant	Secured by Levi and Sarah in 2020 for Planting	In-Kind - Labor	$40,000	Labor and Materials	Pending
Federal	BOR	Untreated Wooden Posts	In-Kind - Materials	$3,800	Untreated wooden posts for BDA/PAL	Pending
Federal	BPA	Fish and Wildlife Funding	Cash	$234,111	Staff Time, Contracted Services, Travel	Pending
Fund Source Cash Total		**$234,111**	**Fund Source In-Kind Total**		**$55,200**	

Match

Contribution Source-Type: Description	Amount
Trout Unlimited-In-Kind - Labor: Labor for Project Planning	$0
BOR-In-Kind - Labor: 1-2 Weeks/Field Season (2 Interns) - 15$/H	$0
Reforestation Grant-In-Kind - Labor: Labor and Materials	$20,000
BOR-In-Kind - Materials: Untreated wooden posts for BDA/PAL	$0
BPA-Cash: Staff Time, Contracted Services, Travel	$0
Match Total	**$20,000**

Do match funding sources have any restrictions on how funds are used, timelines or other limitations that would impact the portion of the project proposed for OWEB funding?

❍ Yes
● No

Do you need state OWEB dollars (not Federal) to match the requirements of any other federal funding you will be using to complete this project?

● Yes
❍ No

If yes, please provide the amount of state dollars needed out of your total request.

155277

Does the non-OWEB cash funding include Pacific Coast Salmon Recovery Funds?

❍ Yes
● No

Uploads

Map: Sheep Creek Overview & Planning Maps TU.pdf **- Overview and Tool Output Maps**

Project Design: SheepCreekStewardshipDesign03012021_Reduced.pdf **- Sheep Creek Stewardship Project Design**

Project Design: SheepCreekStewardshipThinning.pdf **- Sheep Creek Stewardship Thinning Project Design**

Planting Details: PlantingMaps_PhotosSheepCreekStewardship.pdf **- Planting Maps Specs and Examples**

Photos: ProspectusPresentation.pdf **- Prospectus Presentation**

Federally Negotiated Indirect Cost Rate Plan: FY21-22 TU Indirect Cost Rate Agreement.pdf **- TU Indirect Agreement**

Secured Match Forms: Match-Form Sheep Stewardship.pdf **- Match Form**

Road Page

Road Questions

Select all the Road Activities you will be doing.

✓Road closures/decommissioning for the purpose of restoration

Type of closure/ decomissioning

- ❑*Block entrance (could be seasonal)*
- ✓*Revegetation*
- ❑*Waterbarring*
- ❑*Remove culvert(s) and associated fill*
- ✓*Establish drainageways and remove unstable road shoulders*

Current road surface

The current road surface is a large dispersed campsite sitting on top of a historic alluvial fan wetland.

Miles of road closed or decommissioned

.1

Average width of road (Ft.)

100

❑Road Obliteration
❑Road Relocation
❑Road drainage system improvement
❑Road Surface Improvement

Total miles of road treated

.1

Plant Page

Planting Questions

Relationship to other conservation programs

❑*This project will use OWEB funds to increase the planting density on CREP acres.*

Planting Activities

Describe the current condition of the site(s) to be planted.

The site current site conditions include:

* sedges and rushes near the stream
* a quick jump to upland non-native and native dry-loving grasses and forbs
* limited to no riparian willow spp and other hardwood spp.
* heavy herbivory
* in areas nearby there is a spruce-fir-alder community that is in relatively in-tact shape. This is a WWNF plant community that exists naturally on the upper reaches of Sheep Creek. On most of the restoration reach there should be a mix of sedges, rushes, grasses (mesic and wet-tolerant) and woody shrubs (primarily salix spp.)

Describe how you will prepare the site(s) prior to planting and how those activities are appropriate considering the site conditions described in the previous question.

The project team has done extensive research and observation on the plant communities in this project reach. This included several WWNF plant community documents (please see example planting maps in the uploads section).

The project team has been working diligently to repair the hydro-geomorphic setting in the stream and floodplain as well. This along with browse protection continue to be ongoing practices that set the stage for a higher chance of planting success.

Fill out the table below. Identify the vegetation communities you plan on planting in, the acres each vegetation community encompasses, and the density of your planting.

Vegetation Community	Acres	Density
Tall Willows Wet Meadow Shrubland	11.8 acres	296 stems/acre
Wet meadow moist complex herbland	1 Acre	500

Fill out the table below for each vegetation community listed in the table above, provide the common and scientific names of up to five plants that will be planted, the form(tree, shrub, grass), type of plant (bare root, cutting, etc) and the planting timing.

Vegetation Community	Plants: Common Name	Plants: Scientific Name	Form	Type	Year	Month
Tall Willows Wet Meadow Shrubland	Salix spp.	Salix spp.	Shrub	Rooted	2022-23	October

Wet Meadow Moist Complex Herbland	Fescue and Sedge	Festuca & Carex	Grass	Plugs	2022-23	October

Plant Stewardship

After the plantings are installed, will you conduct plant stewardship ("free to grow")?

- ● Yes
- ❍ No

Are you requesting OWEB funds for plant stewardship activities?

- ❍ Yes
- ● No

Explain how you plan to carry out activities to help the plantings survive and grow over time.

The project team is working on a variety of plant stewardship activities. This includes bucket watering in the late summer season, tending to plant pods and elk exclusion fencing, weeding and tending to cattle exclusion fencing. These are all ongoing activities that the greater project team is working on at the moment.

Measures of Planting Success

Use the table below to explain how you will document and determine success for the plantings.

Vegetation Community	Parameter	Percentages
Tall Willows	Percent Survival	65%
Wet Meadow	Percent Survival	65%

If, in the course of the 3-5 years following planting, the success rate falls below your standard, what is your plan?

If this is the case and the plants have browse protection then this will be very puzzling. Future plantings in Sheep Creek may need a more aggressive approach with extensive weed matting and irrigation to get plants established.

Permit Page

Project Activity Requiring a Permit or License	Name of Permit or License	Entity Issuing Permit or License	Status
Instream Wood and Gravel Placement	Regional General Permit	Army Corps of Engineers & OR. Dept. of State Lands	Will be a programmatic permit.
All parts of project not covered in previous NEPA.	NEPA - Signed Decision Memo	USFS	In development in 2020.
Entire Project	ESA Concurrence (ARBO II)	USFWS and NOAA	Will be a programmatic (ARBO II)
Post-Assisted Structures	Fish Passage Check-Off	Oregon Department of Fish and Wildlife	Pursuing in 2020

Sheep Creek Stream and Floodplain Restoration Project

Landowner

- Bureau of Land Management
- Forest Service
- Private

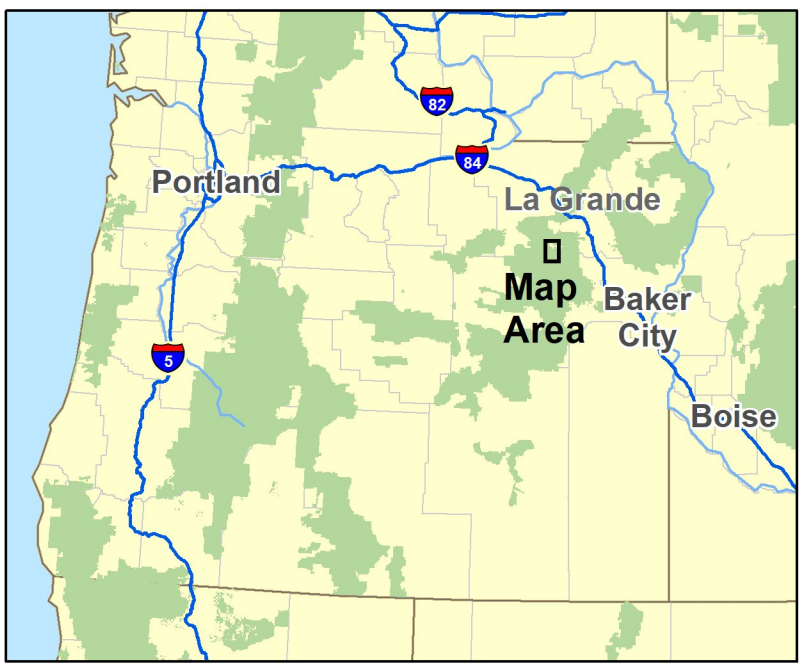
Sheep Creek

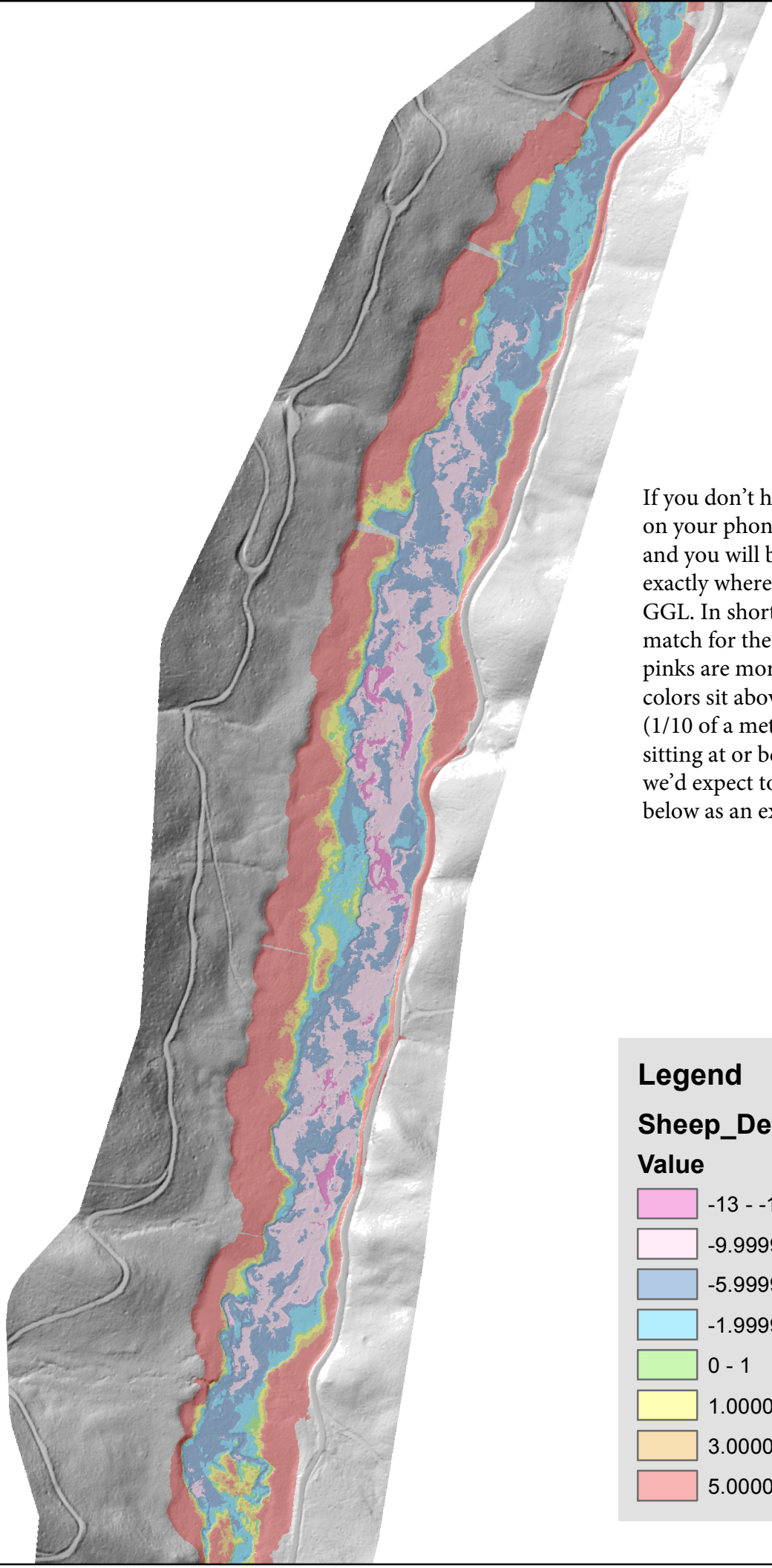
Restoration Reach

East Sheep Creek

N
W E
S

0 0.5 1 1.5 2
Miles





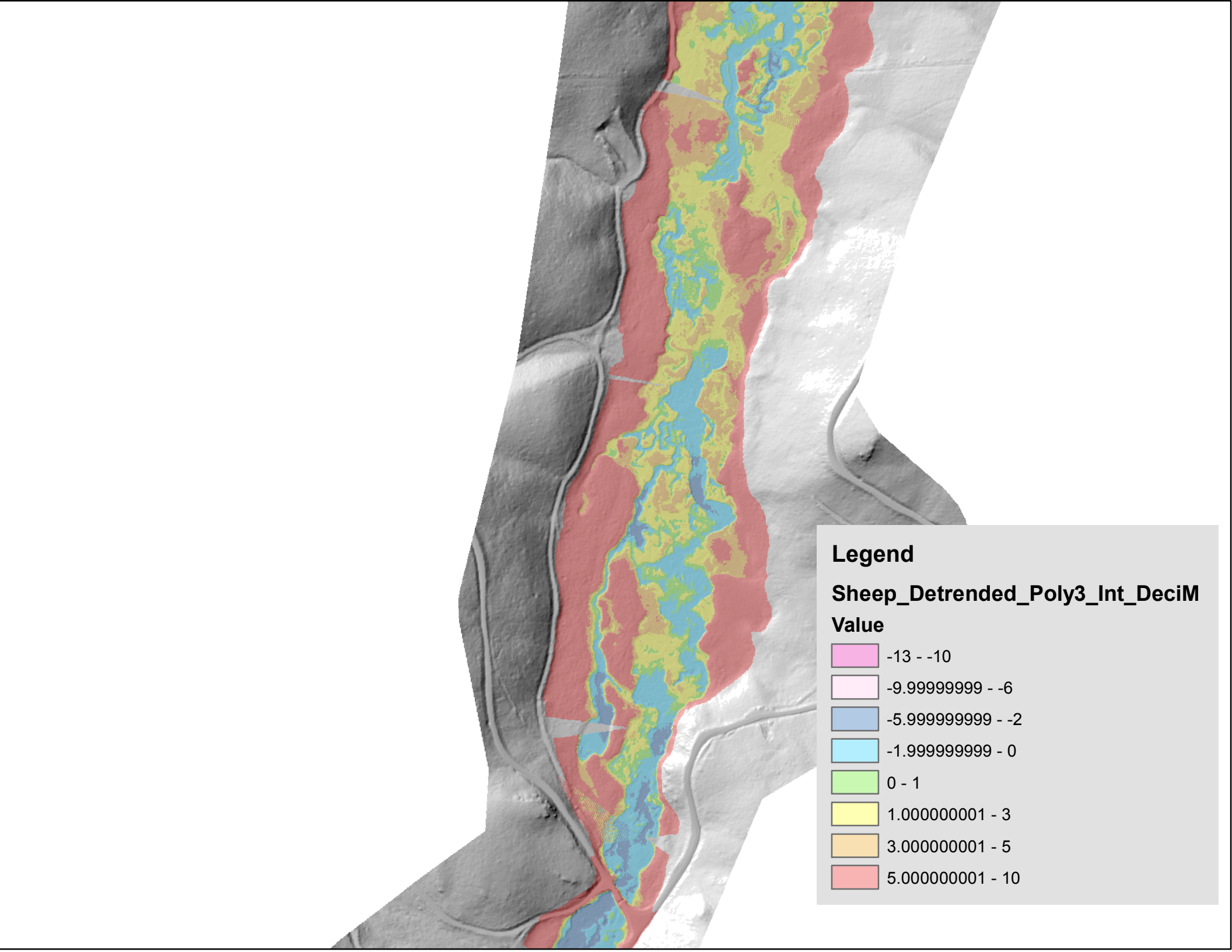
If you don't have it already, install Avenza Maps on your phone or tablet. Load these two maps and you will be able to walk the site and see exactly where all the surfaces sit relative to the GGL. In short, the baby blue color is an exact match for the GGL, dark blue sits just below, pinks are more than 0.5 meters below. Warm colors sit above. All values are in decimeters (1/10 of a meter or about 3.9 inches). Anything sitting at or below the zero (baby blue) is what we'd expect to be wetted at base flow (see image below as an example).

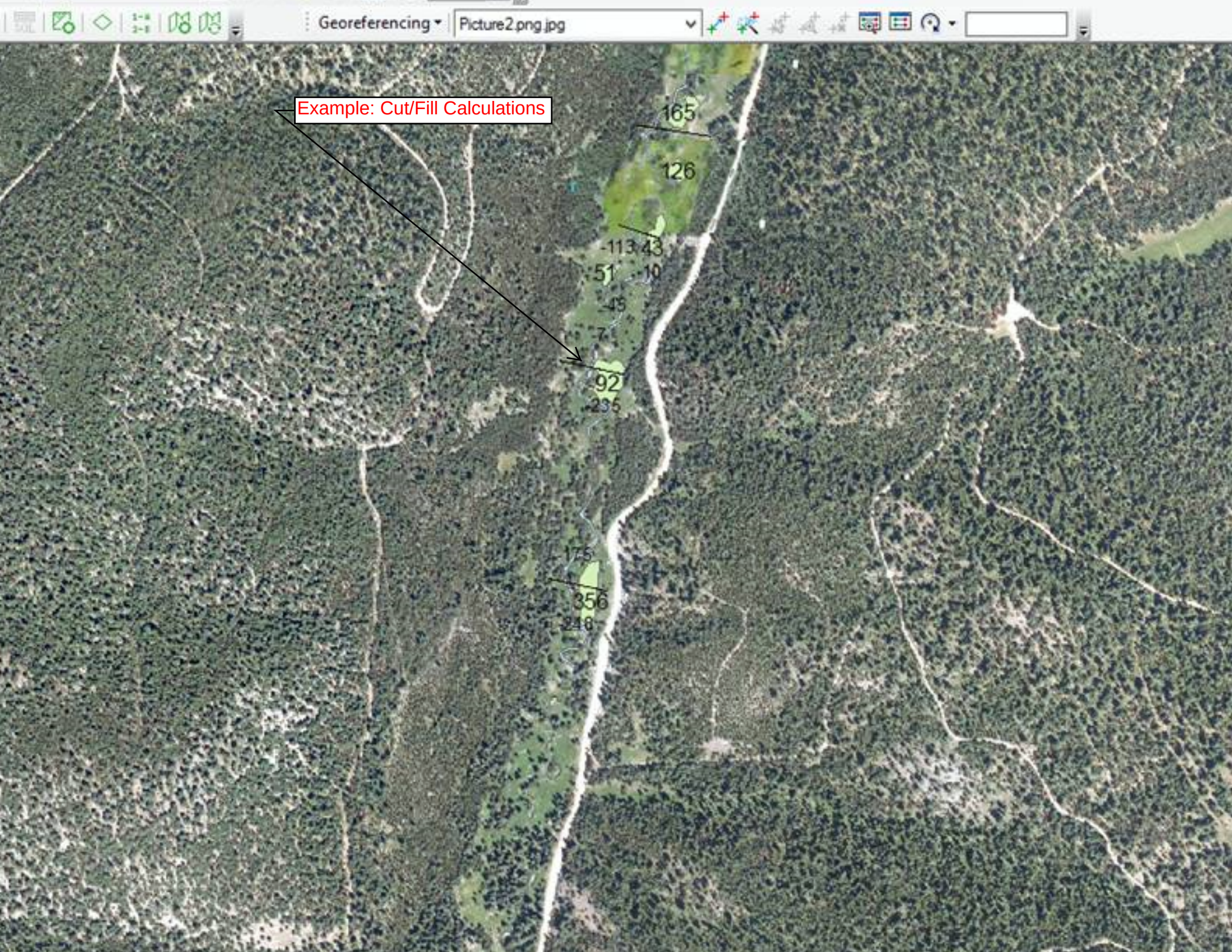
Legend

Sheep_Detrended_Poly3_Int_DeciM

Value

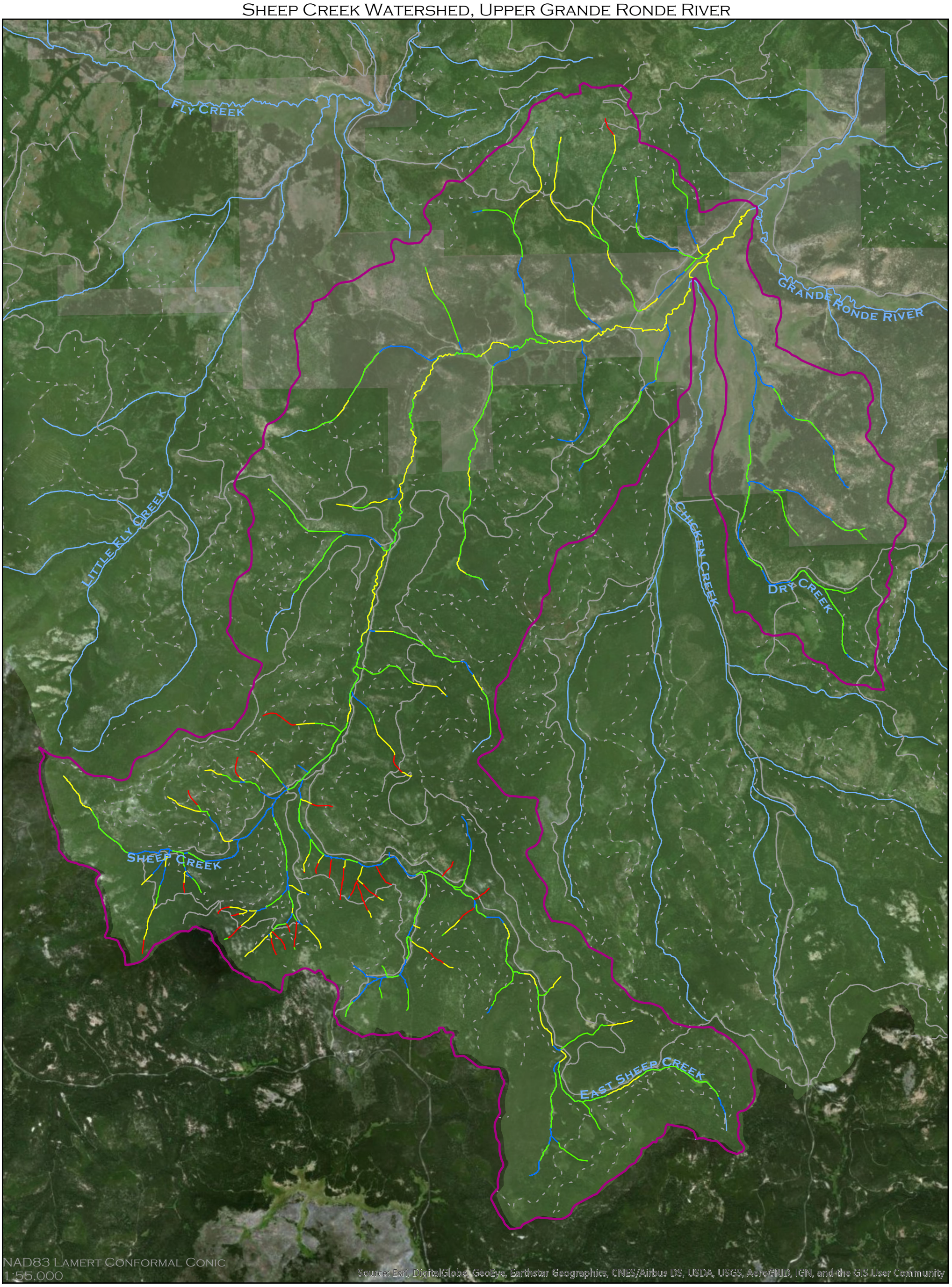
- -13 - -10
- -9.99999999 - -6
- -5.999999999 - -2
- -1.999999999 - 0
- 0 - 1
- 1.000000001 - 3
- 3.000000001 - 5
- 5.000000001 - 10


Legend
Sheep_Detrended_Poly3_Int_DeciM
Value
-13 - -10
-9.99999999 - -6
-5.999999999 - -2
-1.999999999 - 0
0 - 1
1.000000001 - 3
3.000000001 - 5
5.000000001 - 10


Georeferencing
Picture2.png.jpg
Example: Cut/Fill Calculations
165
126
-113
43
51
-10
-45
-7
92
-235
175
356
-218

Beaver Restoration Assessment Tool

Sheep Creek Watershed, Upper Grande Ronde River



NAD83 Lamert Conformal Conic
1:55,000

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Maximum Dam Density
dams/km
- 0 - None
- 0 - 1 Rare
- 1 - 4 Occasional
- 5 - 15 Frequent
- 16 - 40 Pervasive

- Closed Roads
- Open Roads
- Streams
- Sheep Creek Watershed Boundary
- Private
- Public

N
W E
S

0 0.5 1 2 Miles

GRMW 2018

SHEEP CREEK STEWARDSHIP PROJECT OVERVIEW

SHEEP CREEK STEWARDSHIP PROJECT

Upper Right:
118°27'39"W
45°2'42"N

Lower Left:
118°27'56"W
45°2'28"N

Point Features
- Proposed BDA/PAL/LWD
- USFS Exisiting
- BLM Existing
- Alluvial Fan

Polygon Features
- Elk Fence
- Cut Area
- Alluvial Fan Impact Area
- Aspen Regeneration Area

Line Features
- BLM Cattle Fence Rebuild
- Fill Reach
- Loose Tree Placement (70trees/mile)

FLOW

N E S W

50 Meters

1:1,200

PROJECT PARTNERS

TROUT UNLIMITED

FOREST SERVICE US DEPARTMENT OF AGRICULTURE

SHEEP CREEK STEWARDSHIP PROJECT

Upper Right:
118°27'34"W
45°2'52"N

Lower Left:
118°27'50"W
45°2'38"N

Point Features
- Proposed BDA/PAL/LWD
- USFS Exisiting
- BLM Existing
- Alluvial Fan

Polygon Features
- Elk Fence
- Cut Area
- Alluvial Fan Impact Area
- Aspen Regeneration Area

Line Features
- BLM Cattle Fence Rebuild
- Fill Reach
- Loose Tree Placement (70trees/mile)

FLOW

N
W
E
S

50
Meters
1:1,200

PROJECT PARTNERS

TROUT UNLIMITED

FOREST SERVICE US DEPARTMENT OF AGRICULTURE

SHEEP CREEK STEWARDSHIP PROJECT

Upper Right:
118°27'31"W
45°3'3"N

Lower Left:
118°27'46"W
45°2'49"N

Point Features
- Proposed BDA/PAL/LWD
- USFS Exisiting
- BLM Existing
- Alluvial Fan

Polygon Features
- Elk Fence
- Cut Area
- Alluvial Fan Impact Area
- Aspen Regeneration Area

Line Features
- BLM Cattle Fence Rebuild
- Fill Reach
- Loose Tree Placement (70trees/mile)

FLOW

N
W
E
S

50
Meters
1:1,200

PROJECT PARTNERS

TROUT UNLIMITED

FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE

SHEEP CREEK STEWARDSHIP PROJECT

Upper Right:
118°27'28"W
45°3'14"N

Lower Left:
118°27'45"W
45°3'N

Point Features
- Proposed BDA/PAL/LWD
- USFS Exisiting
- BLM Existing
- Alluvial Fan

Polygon Features
- Elk Fence
- Cut Area
- Alluvial Fan Impact Area
- Aspen Regeneration Area

Line Features
- BLM Cattle Fence Rebuild
- Fill Reach
- Loose Tree Placement (70trees/mile)

FLOW

N E S W

50 Meters

1:1,200

PROJECT PARTNERS

TROUT UNLIMITED

FOREST SERVICE US DEPARTMENT OF AGRICULTURE

SHEEP CREEK STEWARDSHIP PROJECT

Upper Right:
118°27'24"W
45°3'25"N

Lower Left:
118°27'40"W
45°3'11"N

Point Features
- Proposed BDA/PAL/LWD
- USFS Exisiting
- BLM Existing
- Alluvial Fan

Polygon Features
- Elk Fence
- Cut Area
- Alluvial Fan Impact Area
- Aspen Regeneration Area

Line Features
- BLM Cattle Fence Rebuild
- Fill Reach
- Loose Tree Placement (70trees/mile)

FLOW

N E S W

50 Meters

1:1,200

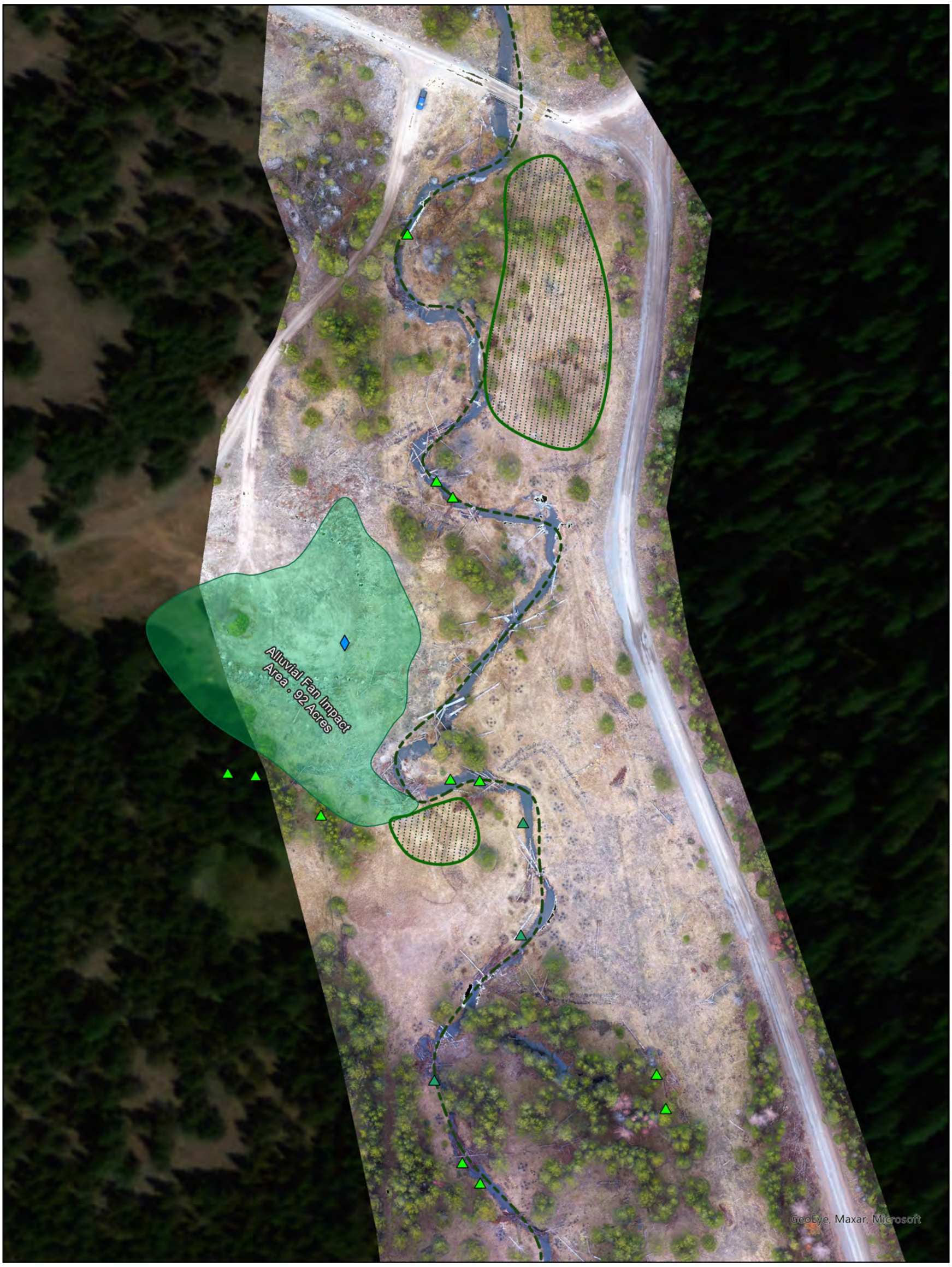
PROJECT PARTNERS

TROUT UNLIMITED

FOREST SERVICE US DEPARTMENT OF AGRICULTURE

SHEEP CREEK STEWARDSHIP PROJECT

Upper Right:
118°27'15"W
45°3'36"N



Lower Left:
118°27'35"W
45°3'21"N

Point Features
- Proposed BDA/PAL/LWD
- USFS Exisiting
- BLM Existing
- Alluvial Fan

Polygon Features
- Elk Fence
- Cut Area
- Alluvial Fan Impact Area
- Aspen Regeneration Area

Line Features
- BLM Cattle Fence Rebuild
- Fill Reach
- Loose Tree Placement (70trees/mile)

FLOW

N E S W

50 Meters

1:1,200

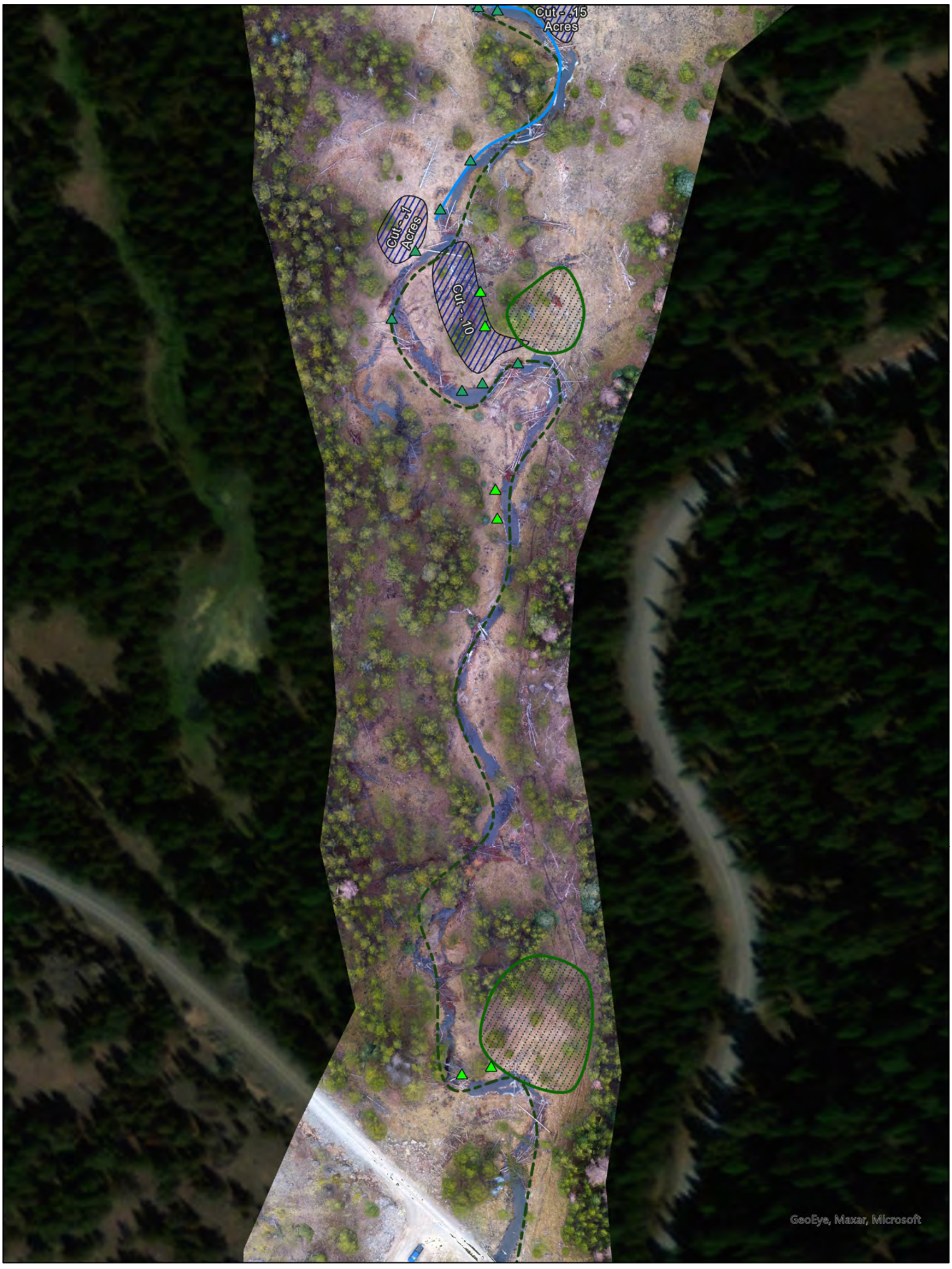
PROJECT PARTNERS

TROUT UNLIMITED

FOREST SERVICE US DEPARTMENT OF AGRICULTURE

SHEEP CREEK STEWARDSHIP PROJECT

Upper Right:
118°27'10"W
45°3'45"N



Lower Left:
118°27'27"W
45°3'31"N

Point Features
- Proposed BDA/PAL/LWD
- USFS Exisiting
- BLM Existing
- Alluvial Fan

Polygon Features
- Elk Fence
- Cut Area
- Alluvial Fan Impact Area
- Aspen Regeneration Area

Line Features
- BLM Cattle Fence Rebuild
- Fill Reach
- Loose Tree Placement (70trees/mile)

FLOW

N E S W

50 Meters

1:1,200

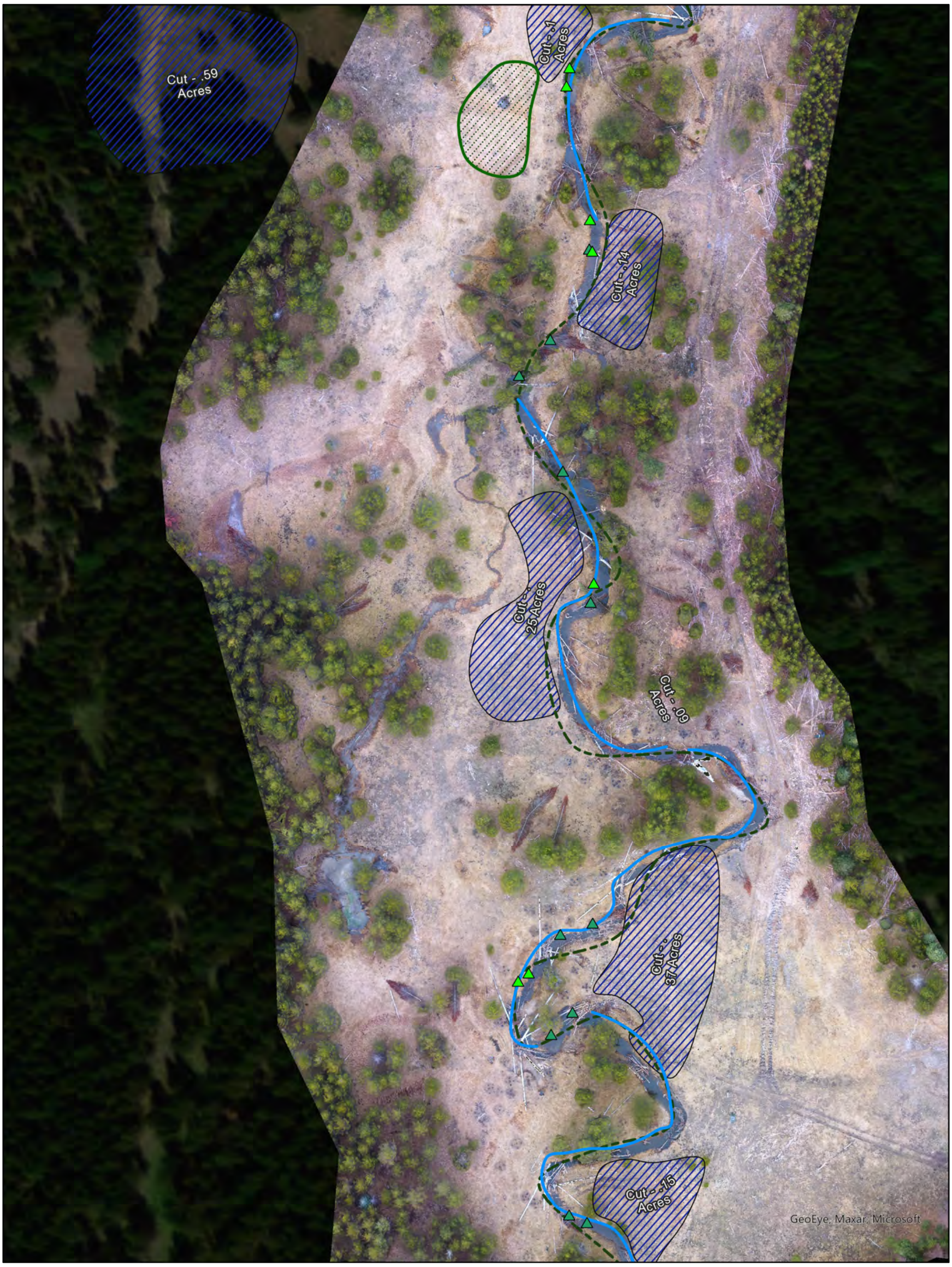
PROJECT PARTNERS

TROUT UNLIMITED

FOREST SERVICE US DEPARTMENT OF AGRICULTURE

SHEEP CREEK STEWARDSHIP PROJECT

Upper Right:
118°27'11"W
45°3'56"N



Lower Left:
118°27'24"W
45°3'43"N

Point Features
- Proposed BDA/PAL/LWD
- USFS Exisiting
- BLM Existing
- Alluvial Fan

Polygon Features
- Elk Fence
- Cut Area
- Alluvial Fan Impact Area
- Aspen Regeneration Area

Line Features
- BLM Cattle Fence Rebuild
- Fill Reach
- Loose Tree Placement (70trees/mile)

FLOW

N
W E
S

50 Meters

1:1,200

PROJECT PARTNERS

TROUT UNLIMITED

FOREST SERVICE US DEPARTMENT OF AGRICULTURE

SHEEP CREEK STEWARDSHIP PROJECT

Upper Right:
118°27'8"W
45°4'7"N

Lower Left:
118°27'23"W
45°3'53"N

Point Features
- Proposed BDA/PAL/LWD
- USFS Exisiting
- BLM Existing
- Alluvial Fan

Polygon Features
- Elk Fence
- Cut Area
- Alluvial Fan Impact Area
- Aspen Regeneration Area

Line Features
- BLM Cattle Fence Rebuild
- Fill Reach
- Loose Tree Placement (70trees/mile)

FLOW

N
W E
S

50
Meters
1:1,200

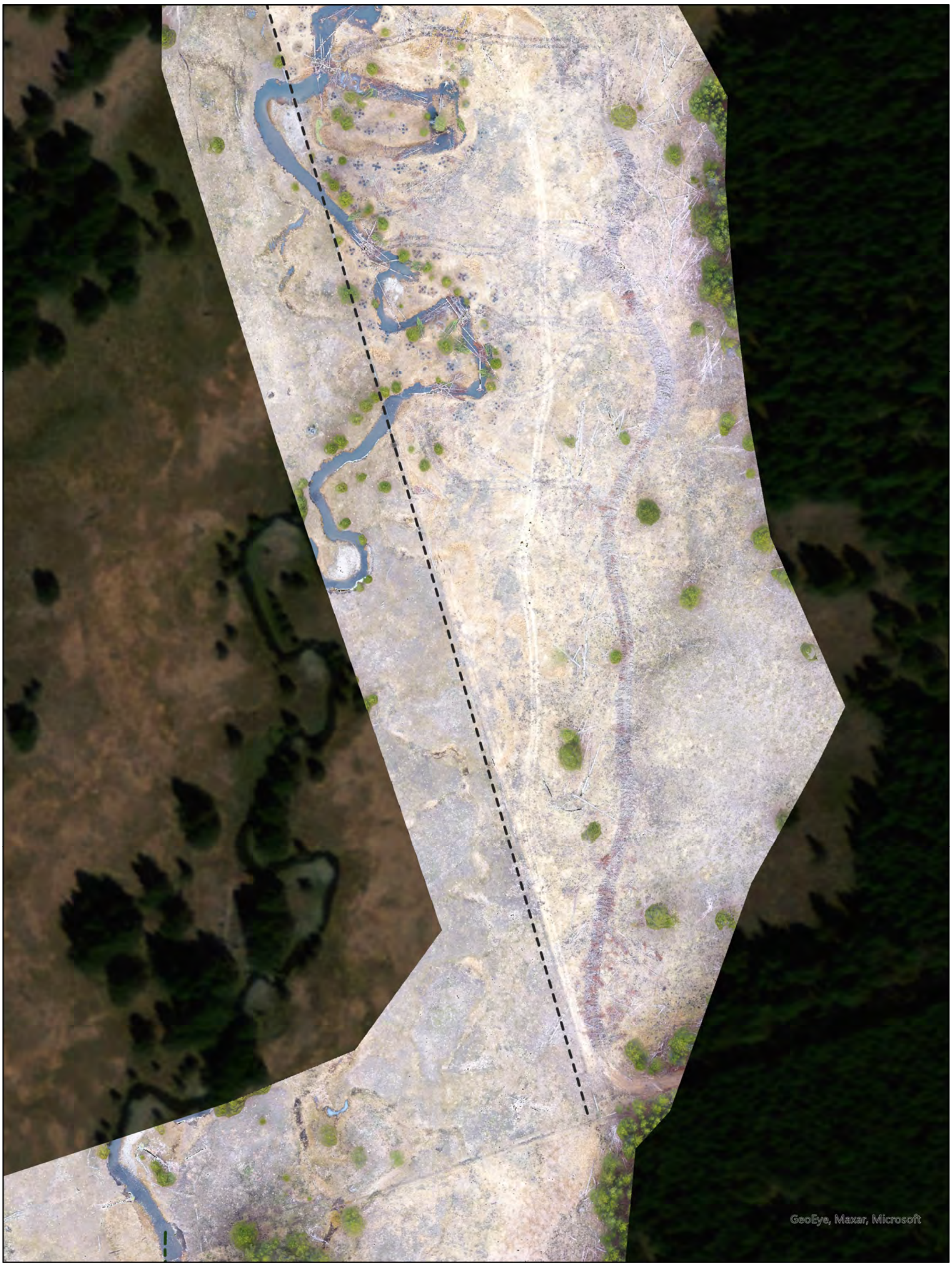
PROJECT PARTNERS

TROUT UNLIMITED

FOREST SERVICE US DEPARTMENT OF AGRICULTURE

SHEEP CREEK STEWARDSHIP PROJECT

Upper Right:
118°26'59"W
45°4'17"N



Lower Left:
118°27'15"W
45°4'3"N

Point Features
- Proposed BDA/PAL/LWD
- USFS Exisiting
- BLM Existing
- Alluvial Fan

Polygon Features
- Elk Fence
- Cut Area
- Alluvial Fan Impact Area
- Aspen Regeneration Area

Line Features
- BLM Cattle Fence Rebuild
- Fill Reach
- Loose Tree Placement (70trees/mile)

FLOW

N
W
E
S

50
Meters
1:1,200

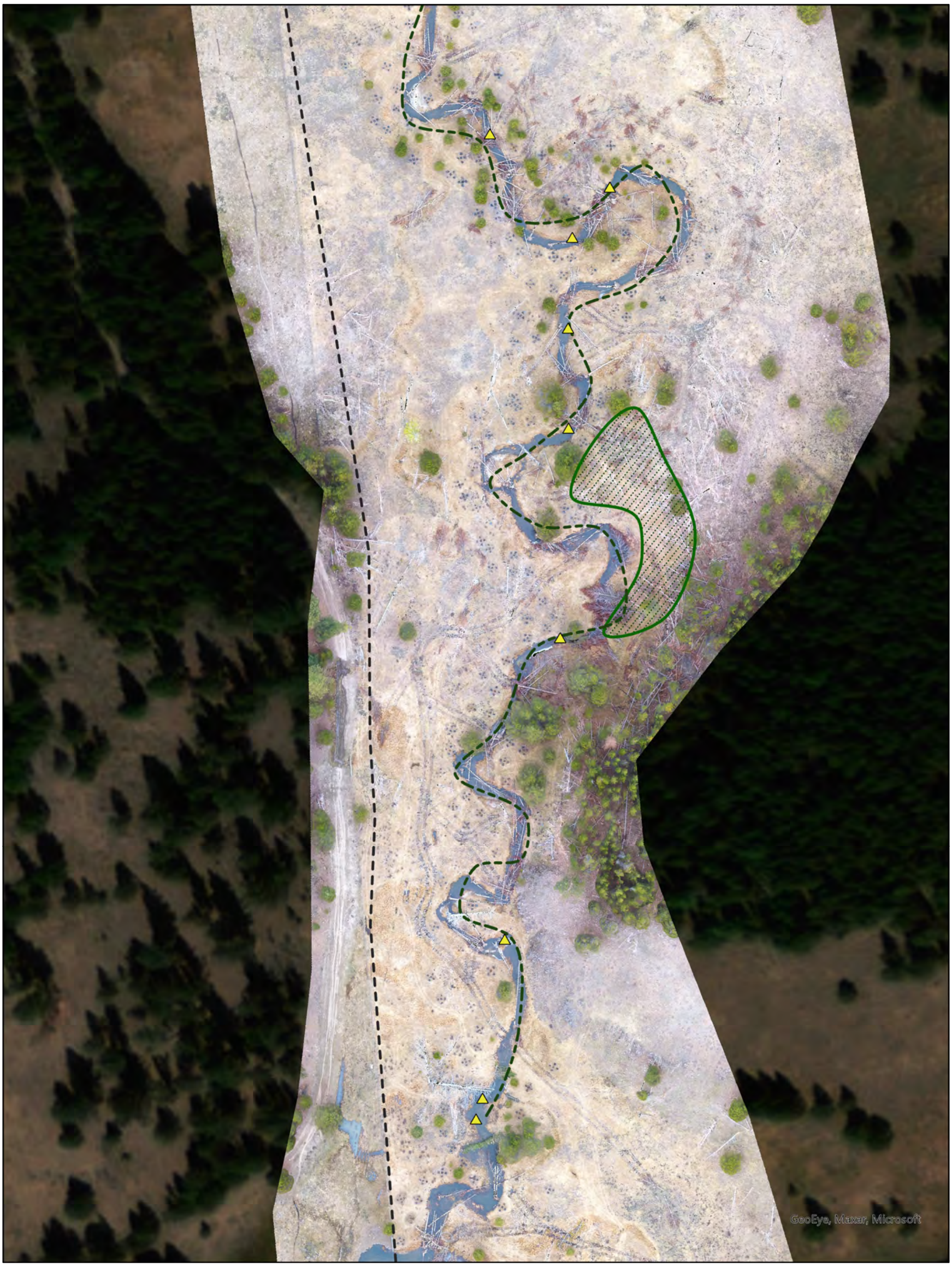
PROJECT PARTNERS

TROUT UNLIMITED

FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE

SHEEP CREEK STEWARDSHIP PROJECT

Upper Right:
118°26'58"W
45°4'28"N



Lower Left:
118°27'12"W
45°4'15"N

Point Features
- Proposed BDA/PAL/LWD
- USFS Exisiting
- BLM Existing
- Alluvial Fan

Polygon Features
- Elk Fence
- Cut Area
- Alluvial Fan Impact Area
- Aspen Regeneration Area

Line Features
- BLM Cattle Fence Rebuild
- Fill Reach
- Loose Tree Placement (70trees/mile)

FLOW

N
W E
S

50
Meters
1:1,200

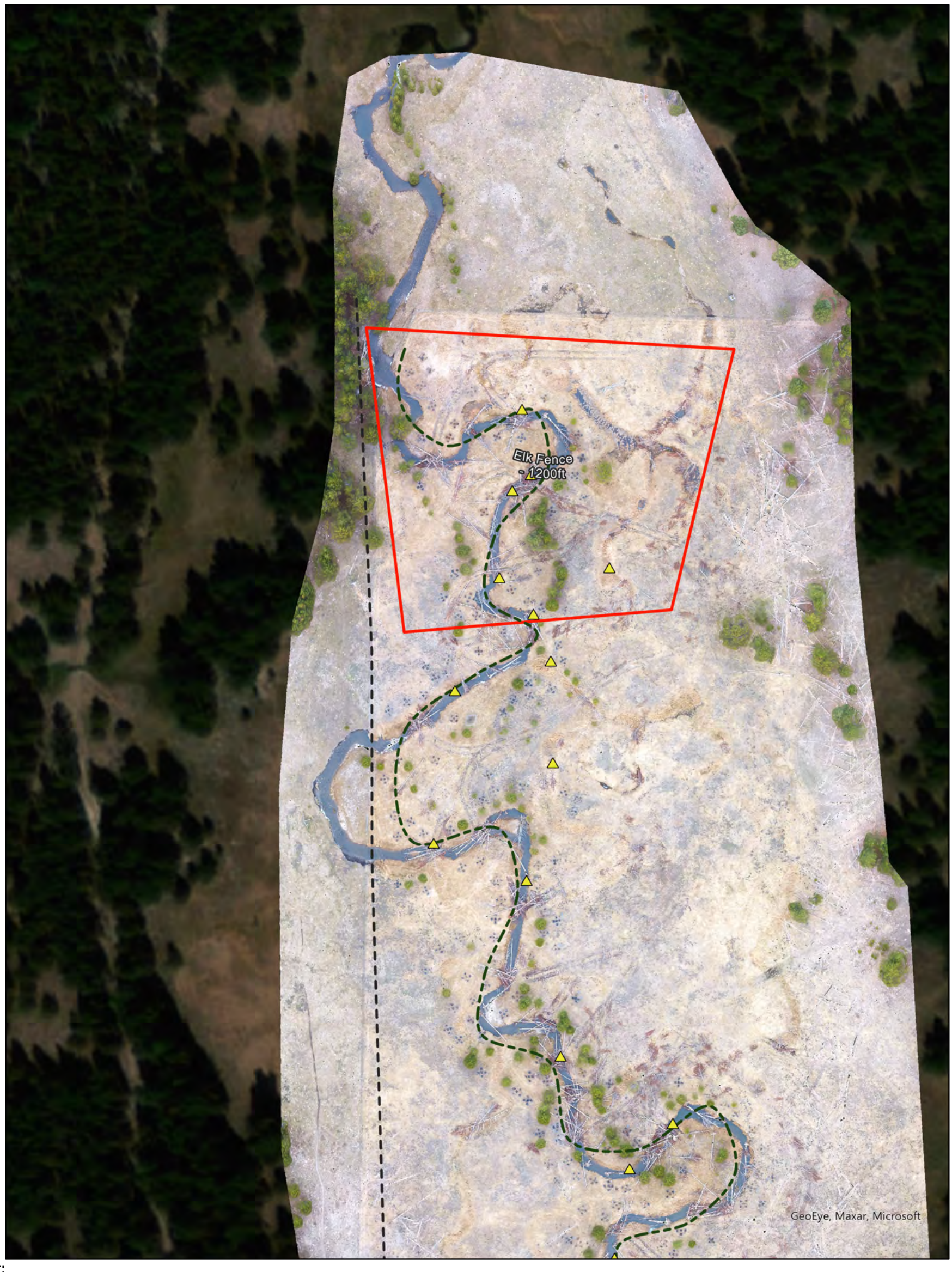
PROJECT PARTNERS

TROUT UNLIMITED

FOREST SERVICE US DEPARTMENT OF AGRICULTURE

SHEEP CREEK STEWARDSHIP PROJECT

Upper Right:
118°27'W
45°4'36"N



Lower Left:
118°27'12"W
45°4'24"N

Point Features
- Proposed BDA/PAL/LWD
- USFS Exisiting
- BLM Existing
- Alluvial Fan

Polygon Features
- Elk Fence
- Cut Area
- Alluvial Fan Impact Area
- Aspen Regeneration Area

Line Features
- BLM Cattle Fence Rebuild
- Fill Reach
- Loose Tree Placement (70trees/mile)

FLOW

N
W E
S

50
Meters
1:1,200

PROJECT PARTNERS

TROUT UNLIMITED

FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE

SHEEP CREEK STEWARDSHIP THINNING PROJECT

45.068,
-118.4584

45.0666,
-118.4535

45.065,
-118.4541

45.0647,
-118.4577

45.0643,
-118.4542

45.062,
-118.4546

45.0616,
-118.4555

45.0606,
-118.464

45.06,
-118.4551

45.058320199000036,
-118.4565

45.0565,
-118.4577

45.0556,
-118.4583

45.0547,
-118.459

45.054,
-118.4584

45.0508,
-118.4639

45.0509,
-118.4597

45.0502,
-118.461

45.0465,
-118.4583

45.0451,
-118.4618

45.0413,
-118.463

Bureau of Land Management, State of Oregon, State of Oregon DOT, State of Oregon GEO, Esri Canada, Esri, HERE, Garmin, INCREMENT P, USGS, EPA, USDA

Thinning Areas
Centroid

500
Meters
1:13,000

N
W
E
S

PROJECT PARTNERS

TROUT UNLIMITED

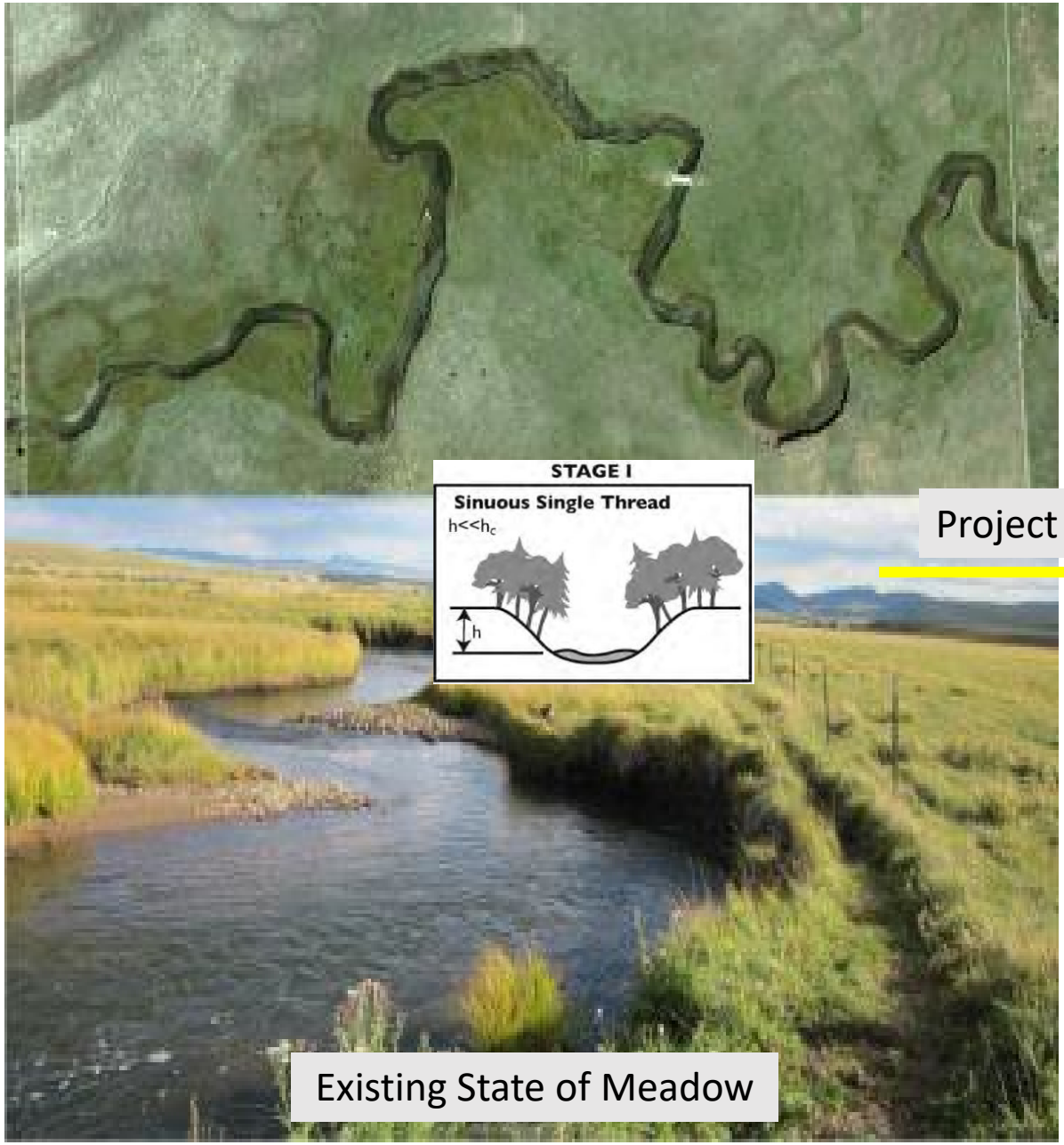
FOREST SERVICE US DEPARTMENT OF AGRICULTURE

Blue Mountain Rapid Riparian Planting Project -

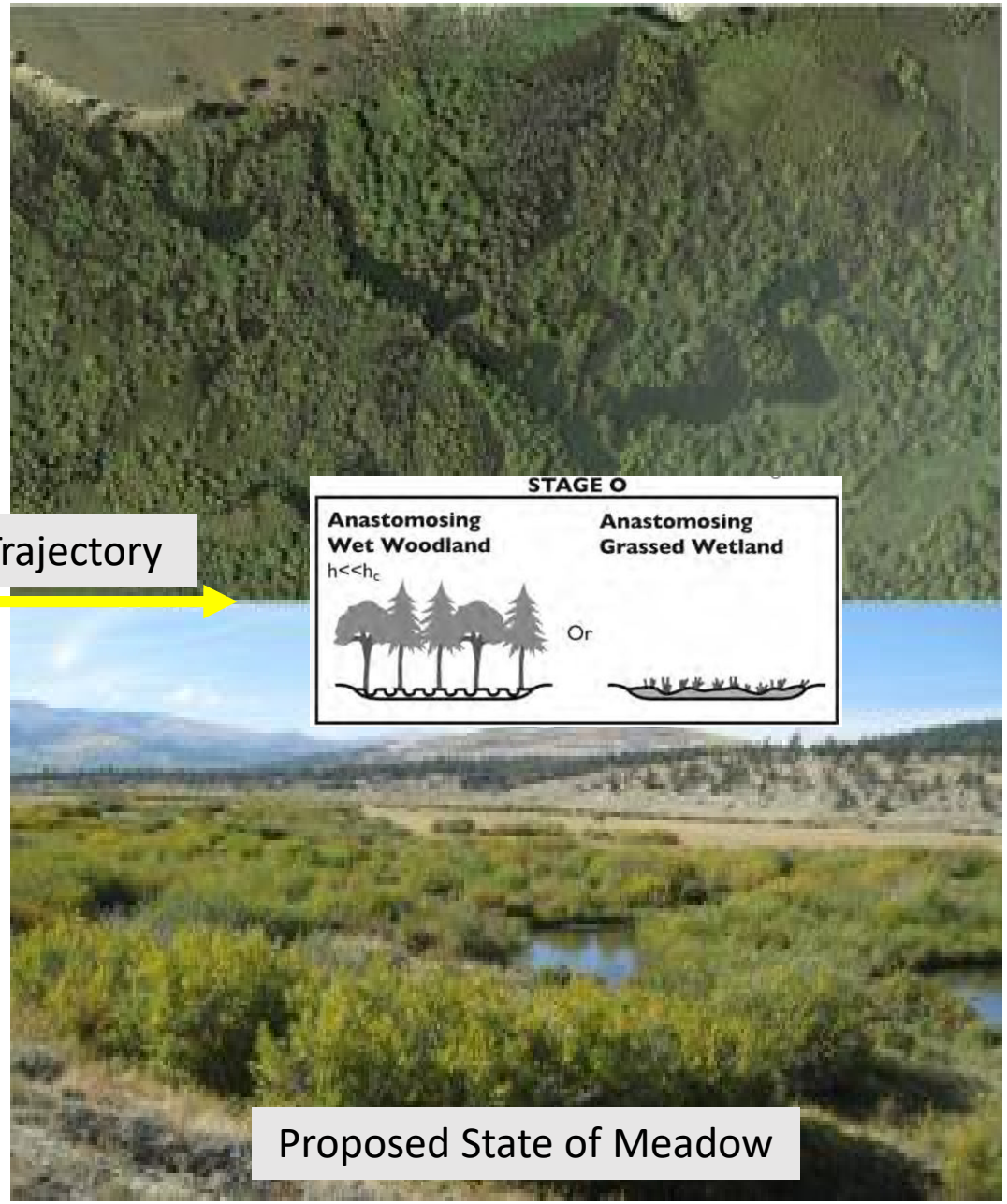
Part of the Sheep Creek Stream and Floodplain Project and Sheep Creek Stewardship Project

Proposal Materials

- Page 2-3: Diagrams and photos of project trajectory
- Page 4-8: Maps: Overview and Planting Areas, and Plant Community Types with Planting Areas



Project Trajectory



Existing State of Meadow

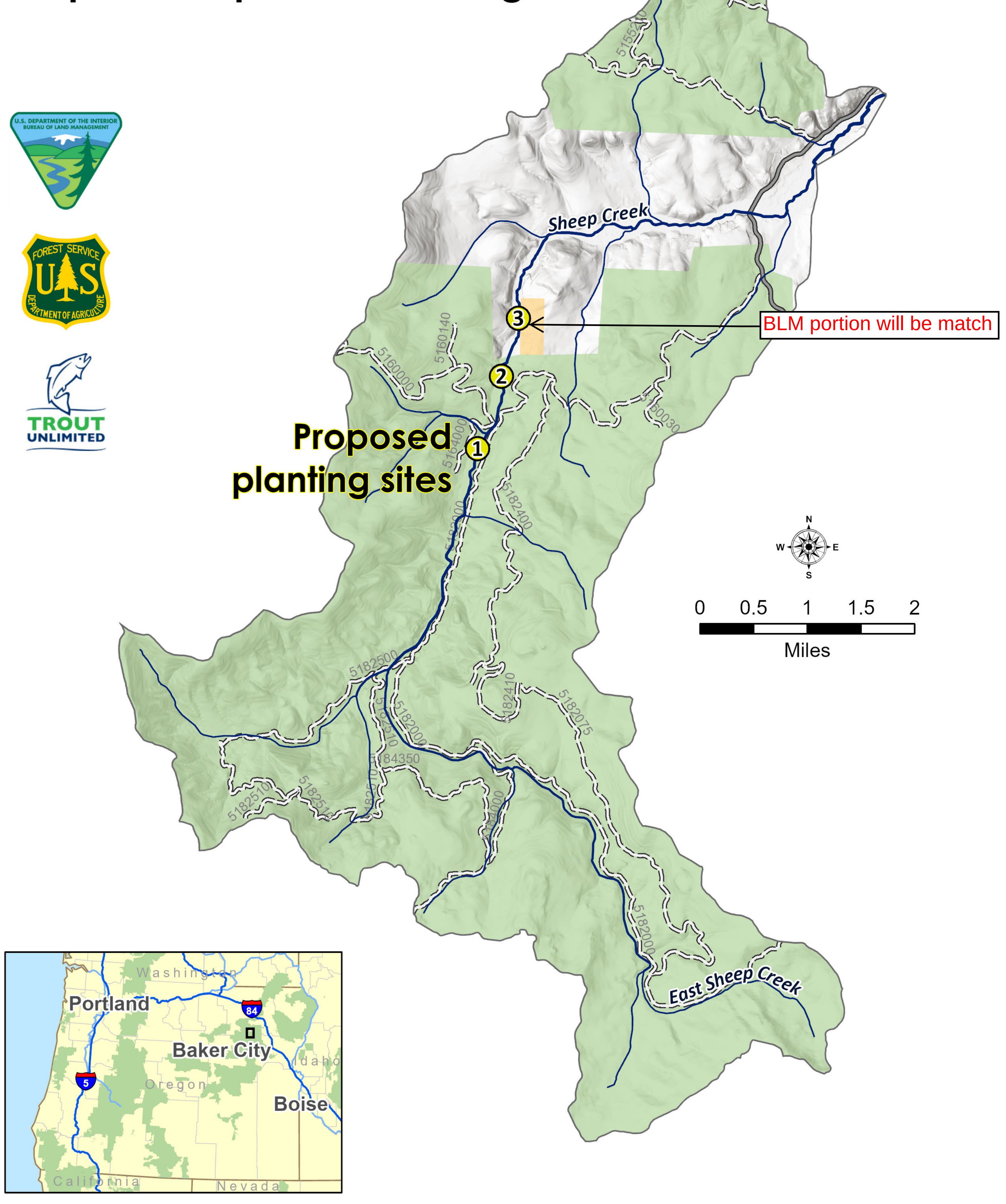
Proposed State of Meadow

Photos - Beardsley (2018); Diagrams - Cluer and Thorne (2014)

Existing photos from Sheep Creek (2018) Pre-Implementation – Note lack of shrubs in meadow valley bottom and simplified habitat.

Reference Reach – Proposed future condition of Sheep Creek Meadow – Notice robust shrub communities, beaver dam, and diverse mosaic of habitats.

Sheep Creek: Proposed Riparian Planting Areas

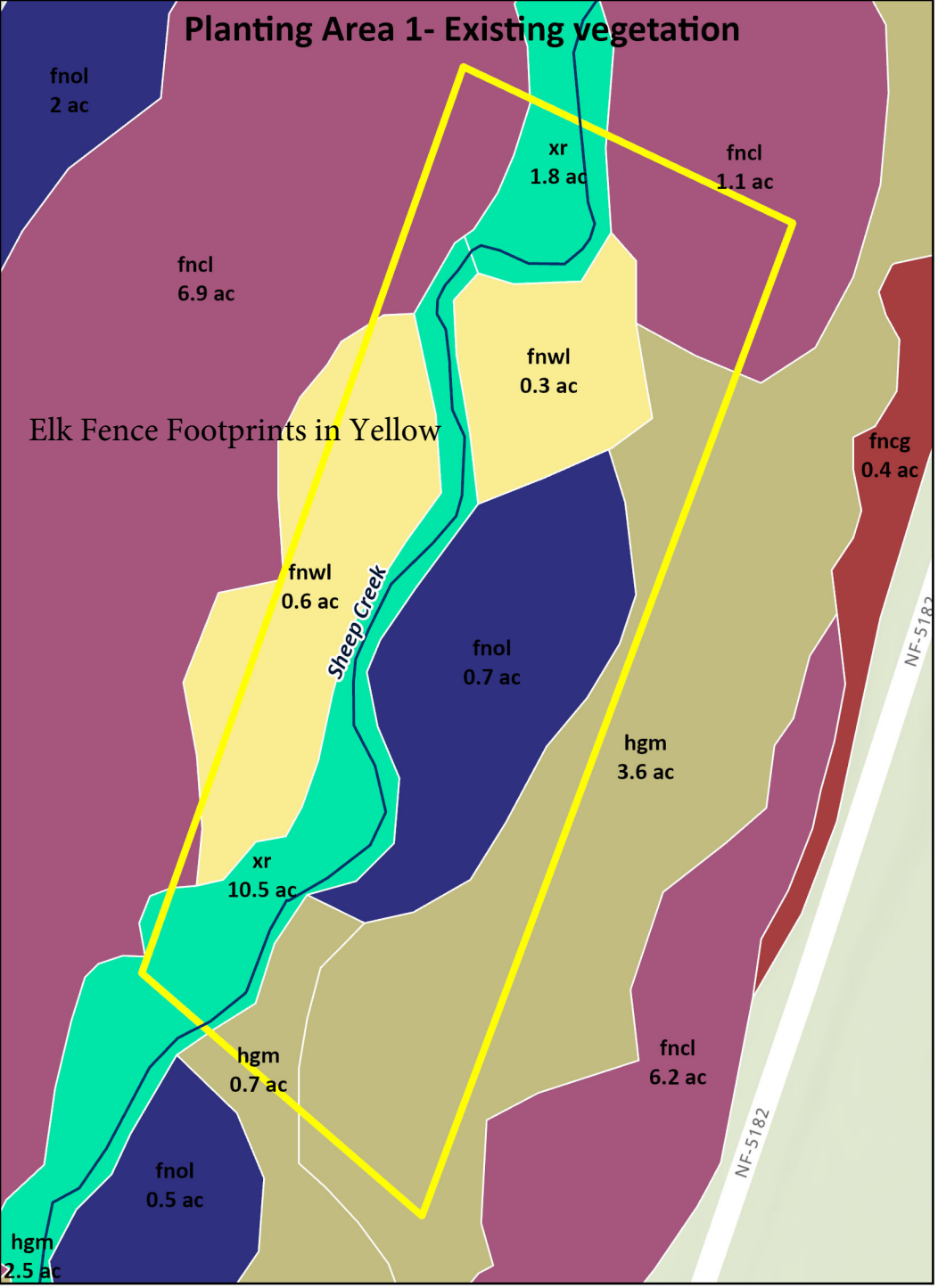


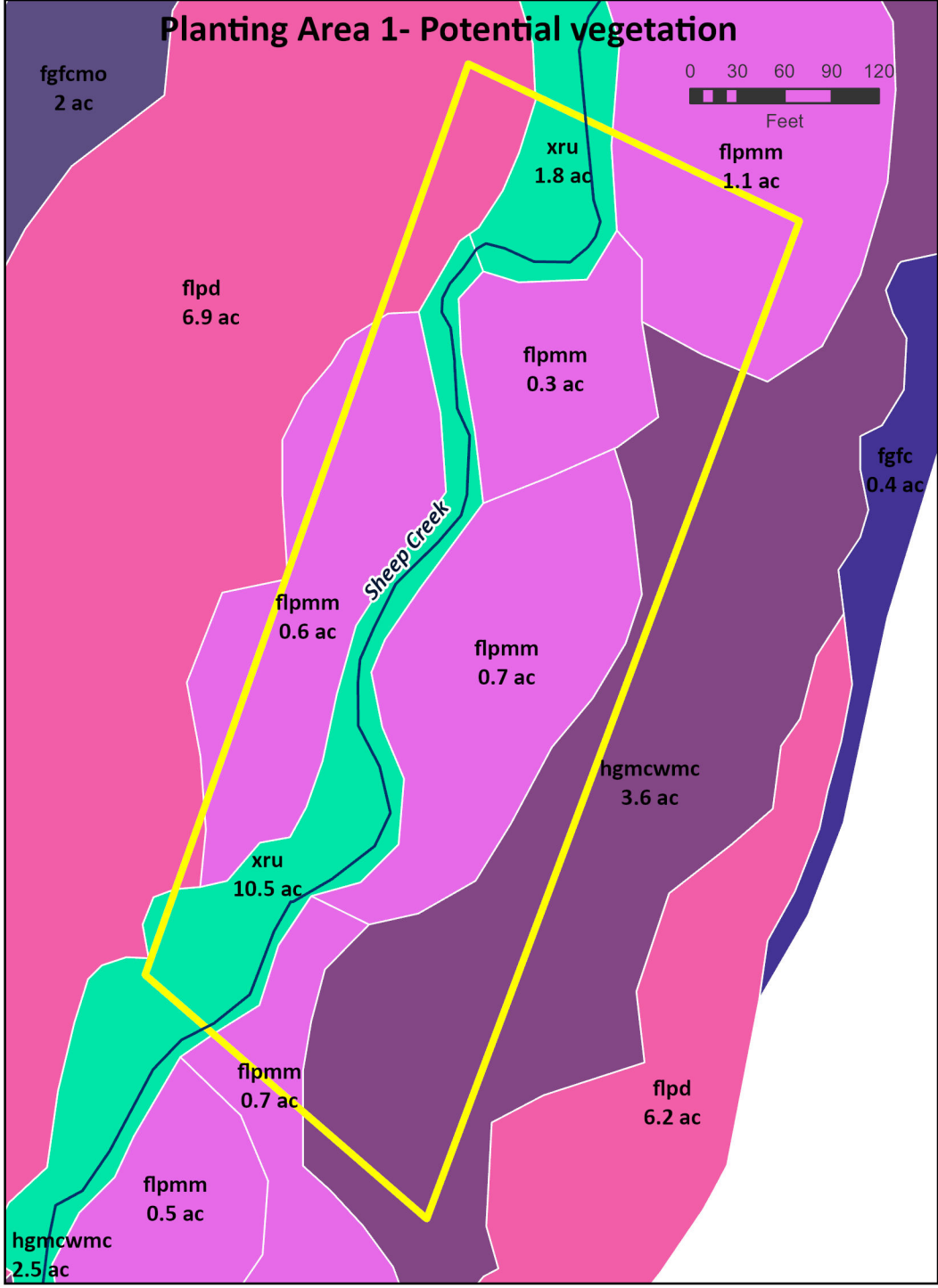
Our Approach: Rapid Riparian Revegetation promotes rapid cover of woody plants in a composition designed to mimic reference site conditions.

Guillozet, Peter, Kendra Smith, and Kathleen Guillozet. "The rapid riparian revegetation approach." Ecological Restoration 32.2 (2014): 113-124.

Community Maps: The following vegetation community maps are produced to demonstrate the existing vegetation and the potential vegetation given meadow recovery. The Sheep Creek meadow is highly departed from its potential due to past land degradation and persistent browse. The meadow supports very limited riparin shrub and tree communities. This geospatial analysis is derived from an extensive exercise modeling and ground-truthing vegetation communities in the Upper Grande Ronde River Basin, home to Sheep Creek. The Rapid Riparian Planting Effort will plant inside the elk footprint polygons shown on the map and outside of them to a more limited extent.

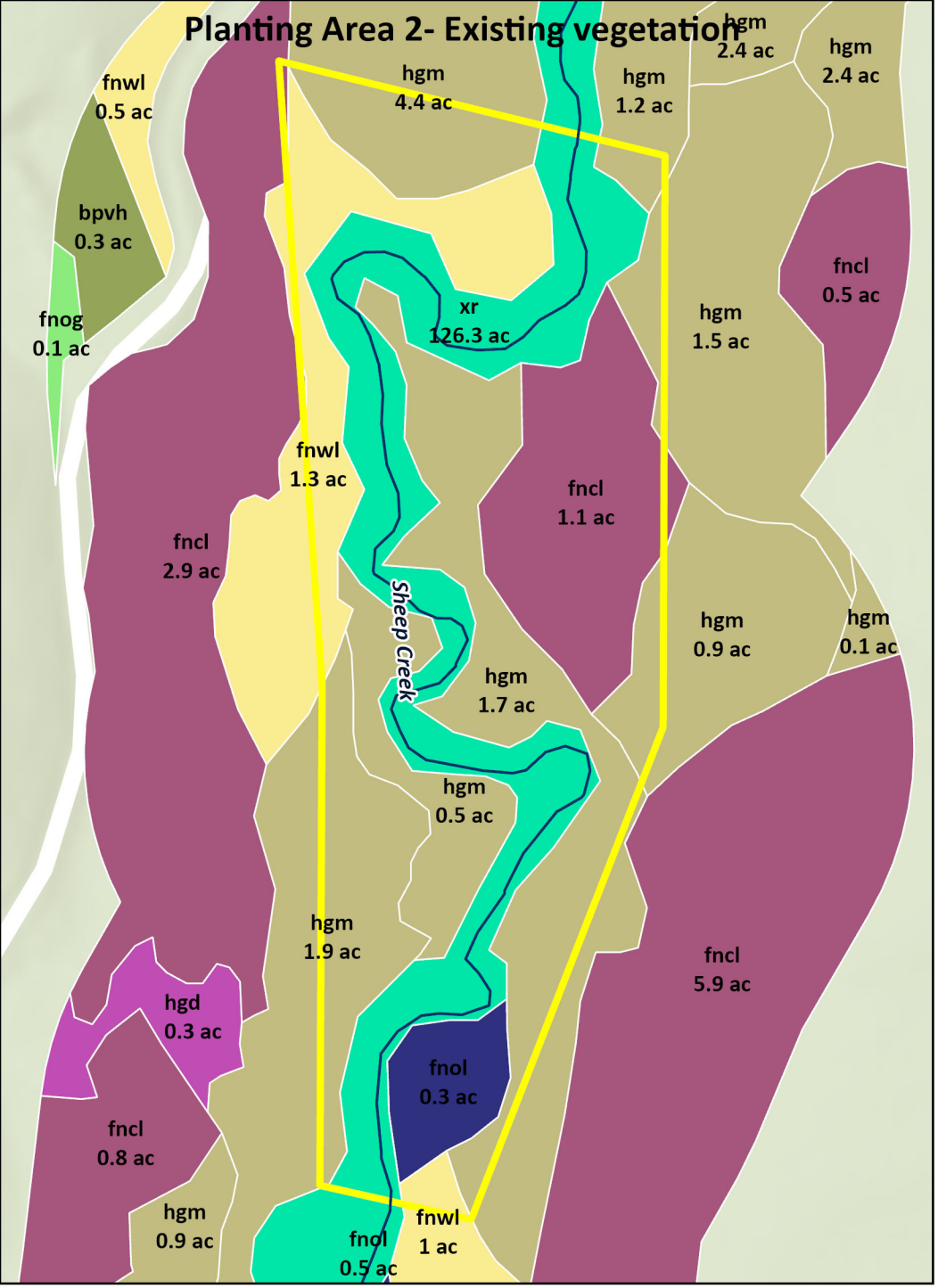
Wells, A.F., E. Crowe, and R. Blaha. 2015. Riparian vegetation mapping in the Grande Ronde watershed, Oregon: monitoring and validation of spring Chinook habitat recovery and population viability. ABR, Inc.-Environmental Research & Services, Anchorage, AK. 183 pp.

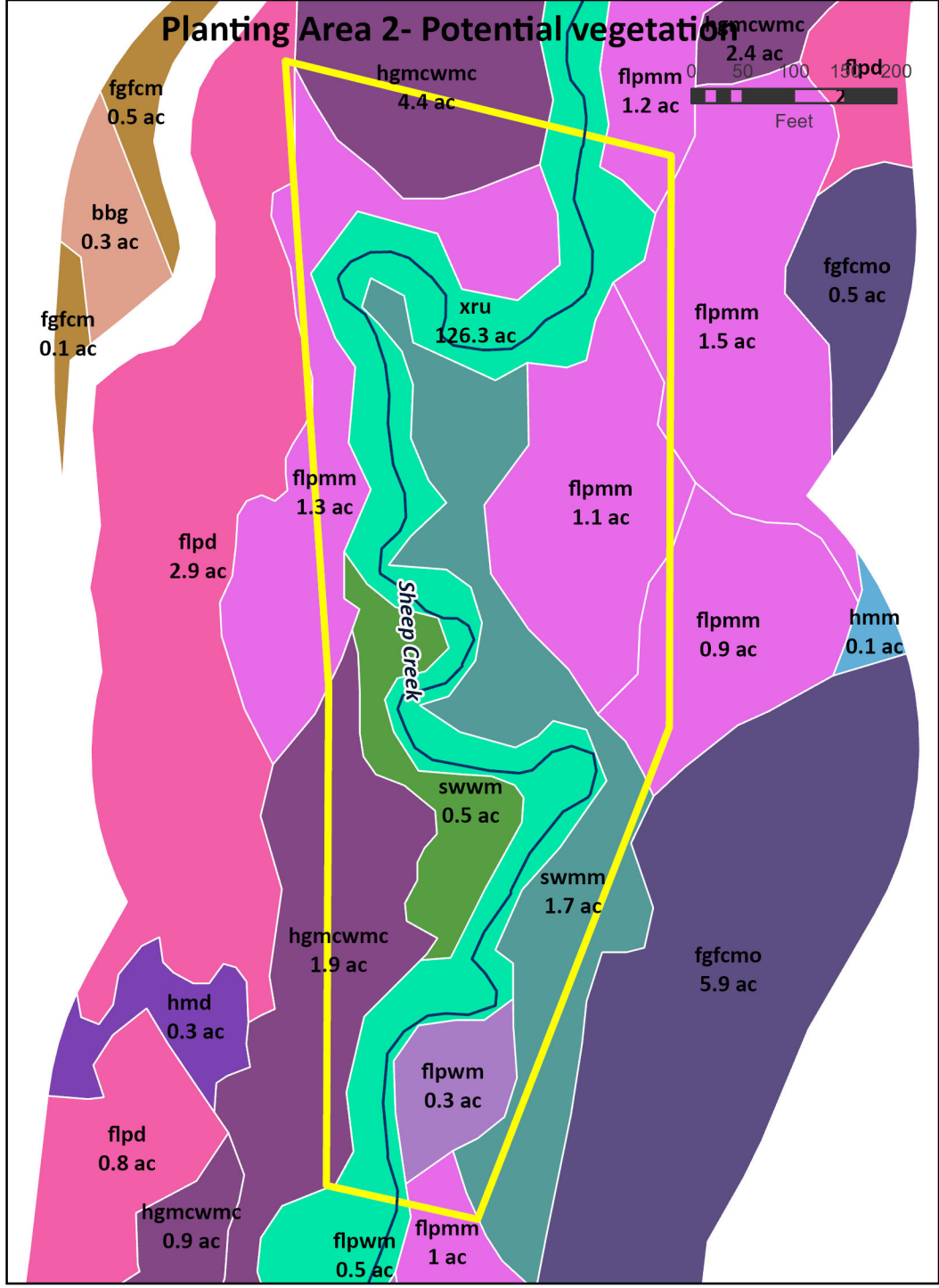




fncg : Closed Grand Fir Forest
fncl : Closed Lodgepole Pine Forest
fnol : Open Lodgepole Pine Forest
fnwl : Lodgepole Pine Woodland
hgm : Moist Graminoid Meadow
xr : Riverine Complex

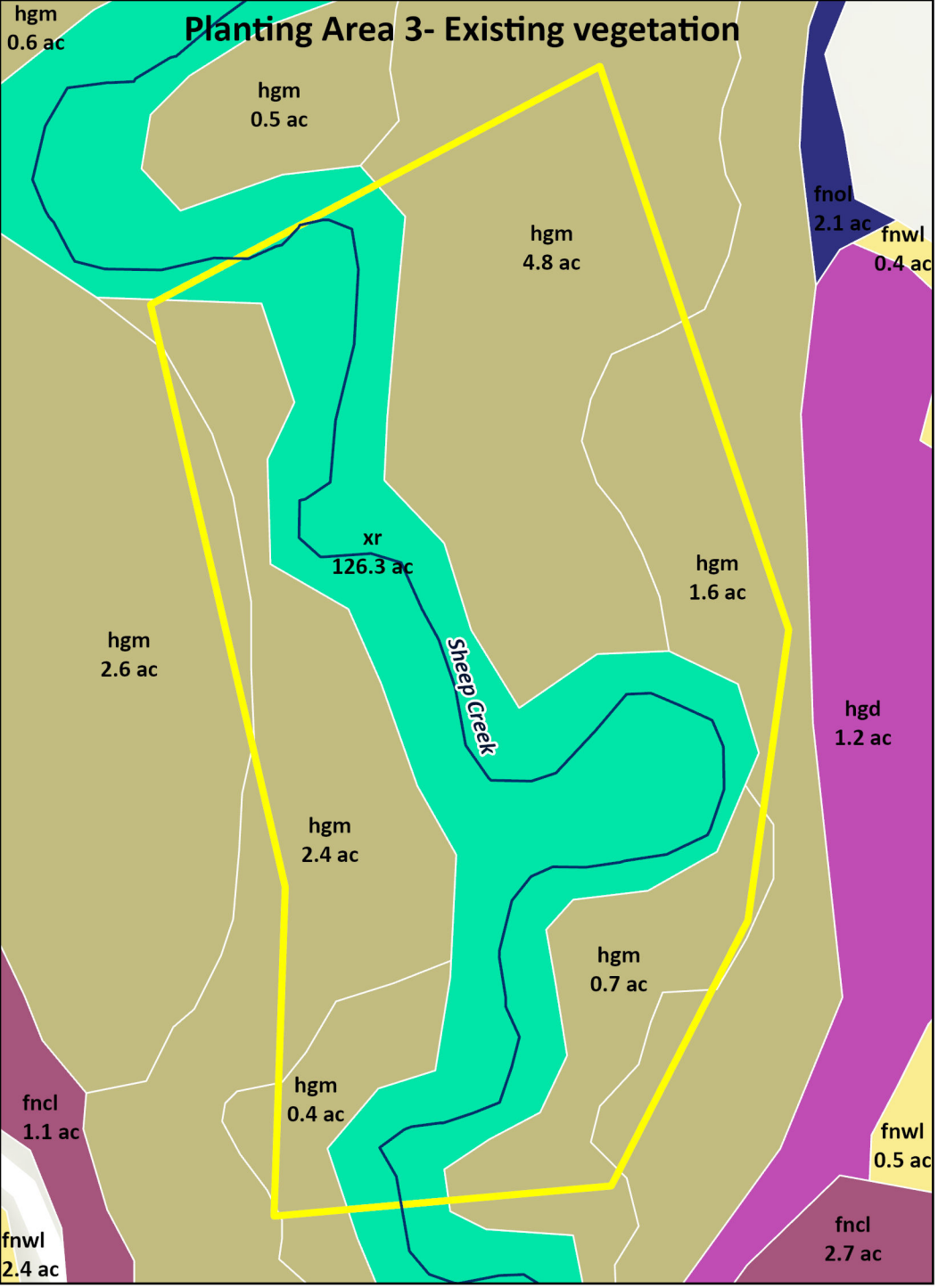
fgfc : Cold Grand Fir Forest
fgfcmo : Open Cool-moist Grand Fir Forest
flpd : Dry Lodgepole Pine Forest
flpmm : Lodgepole Pine Moist Meadow
hgmcwmc:Wet-Moist Meadow Complex Herbland
xru : Upper-elevation Riverine Complex

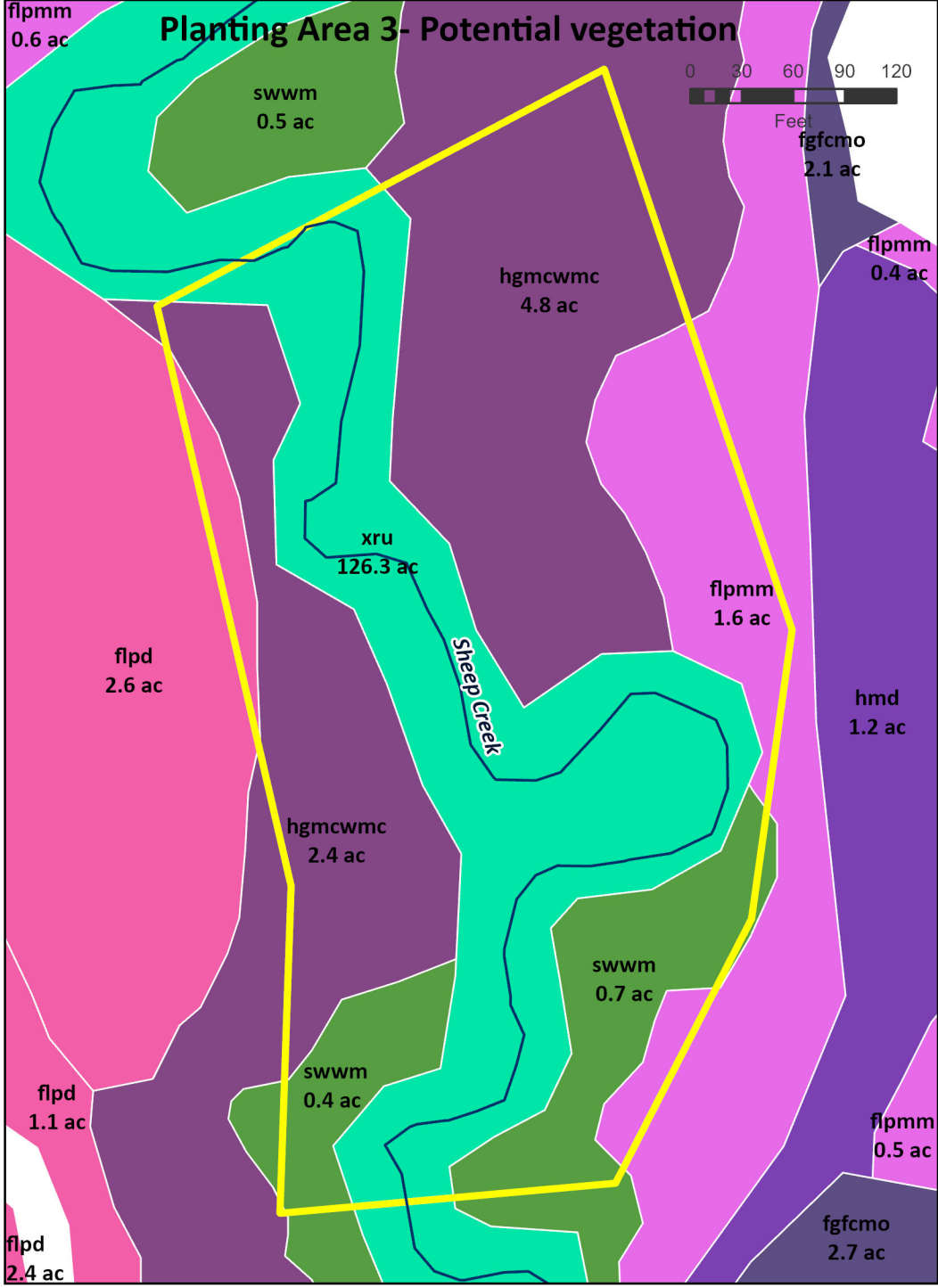




- bpvh : Barren partially vegetated herbaceous
- fncl : Closed Lodgepole Pine Forest
- fnog : Open Grand Fir Forest
- fnol : Open Lodgepole Pine Forest
- fnwl : Lodgepole Pine Woodland
- hgd : Dry Graminoid Meadow
- hgm : Moist Graminoid Meadow
- xr : Riverine Complex

- bbg : Barren
- fgfcm : Cool-moist Grand Fir Forest
- fgfcmo : Open Cool-moist Grand Fir Forest
- flpd : Dry Lodgepole Pine Forest
- flpmm : Lodgepole Pine Moist Meadow
- flpwm : Lodgepole Pine Wet Meadow
- hgmcwmc:Wet-Moist Meadow Complex Herbland
- hmd : Dry Meadow Herbland
- hmm : Moist Meadow Herbland
- swmm : Tall Willows Moist Meadow Shrubland
- swwm : Tall Willows Wet Meadow Shrubland
- xru : Upper-elevation Riverine Complex

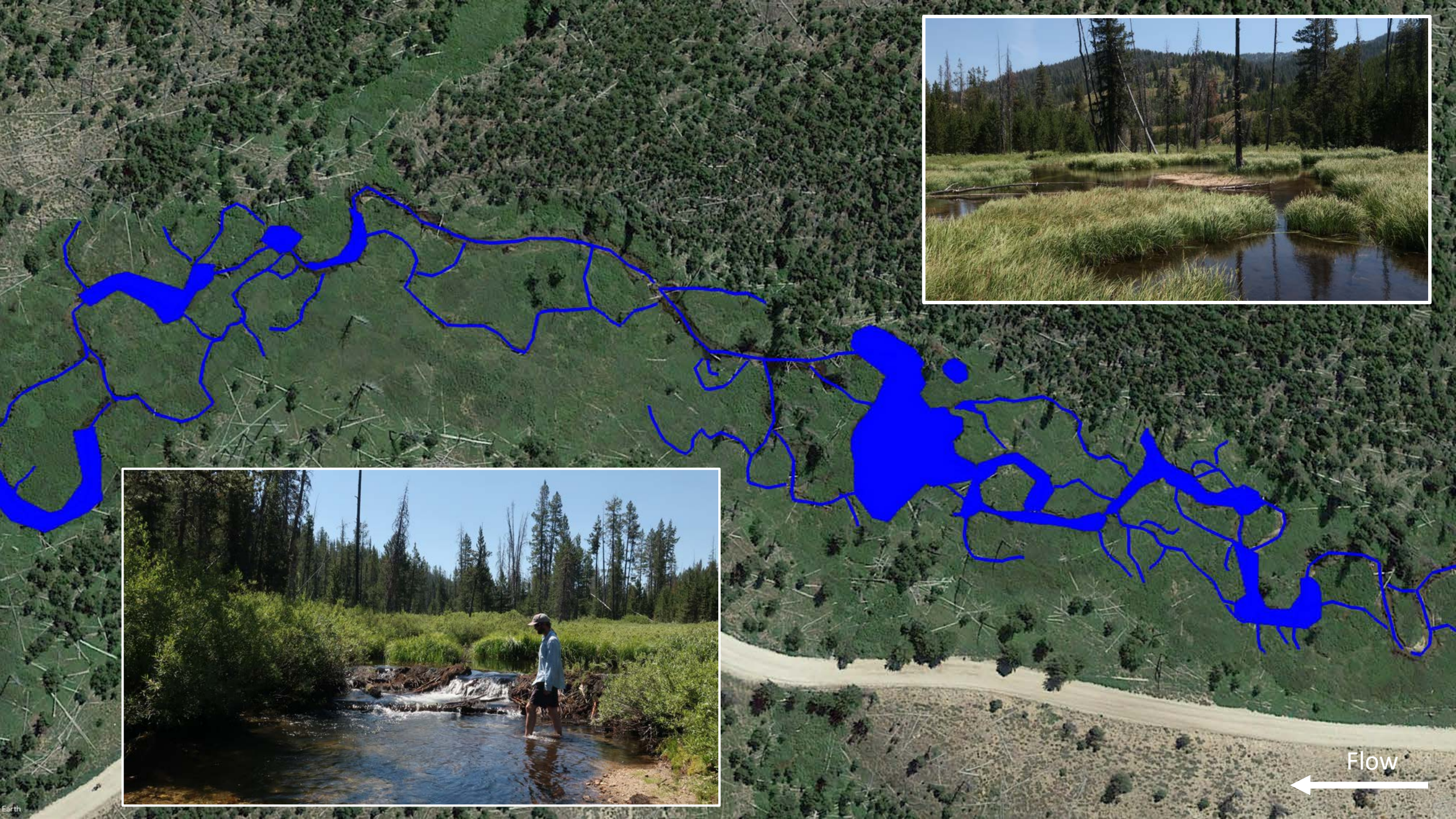




- fncl : Closed Lodgepole Pine Forest
- fnol : Open Lodgepole Pine Forest
- fnwl : Lodgepole Pine Woodland
- hgd : Dry Graminoid Meadow
- hgm : Moist Graminoid Meadow
- xr : Riverine Complex

- fgfcmo : Open Cool-moist Grand Fir Forest
- flpd : Dry Lodgepole Pine Forest
- flpmm : Lodgepole Pine Moist Meadow
- hgmcwmc:Wet-Moist Meadow Complex Herbland
- hmd : Dry Meadow Herbland
- swwm : Tall Willows Wet Meadow Shrubland
- xru : Upper-elevation Riverine Complex

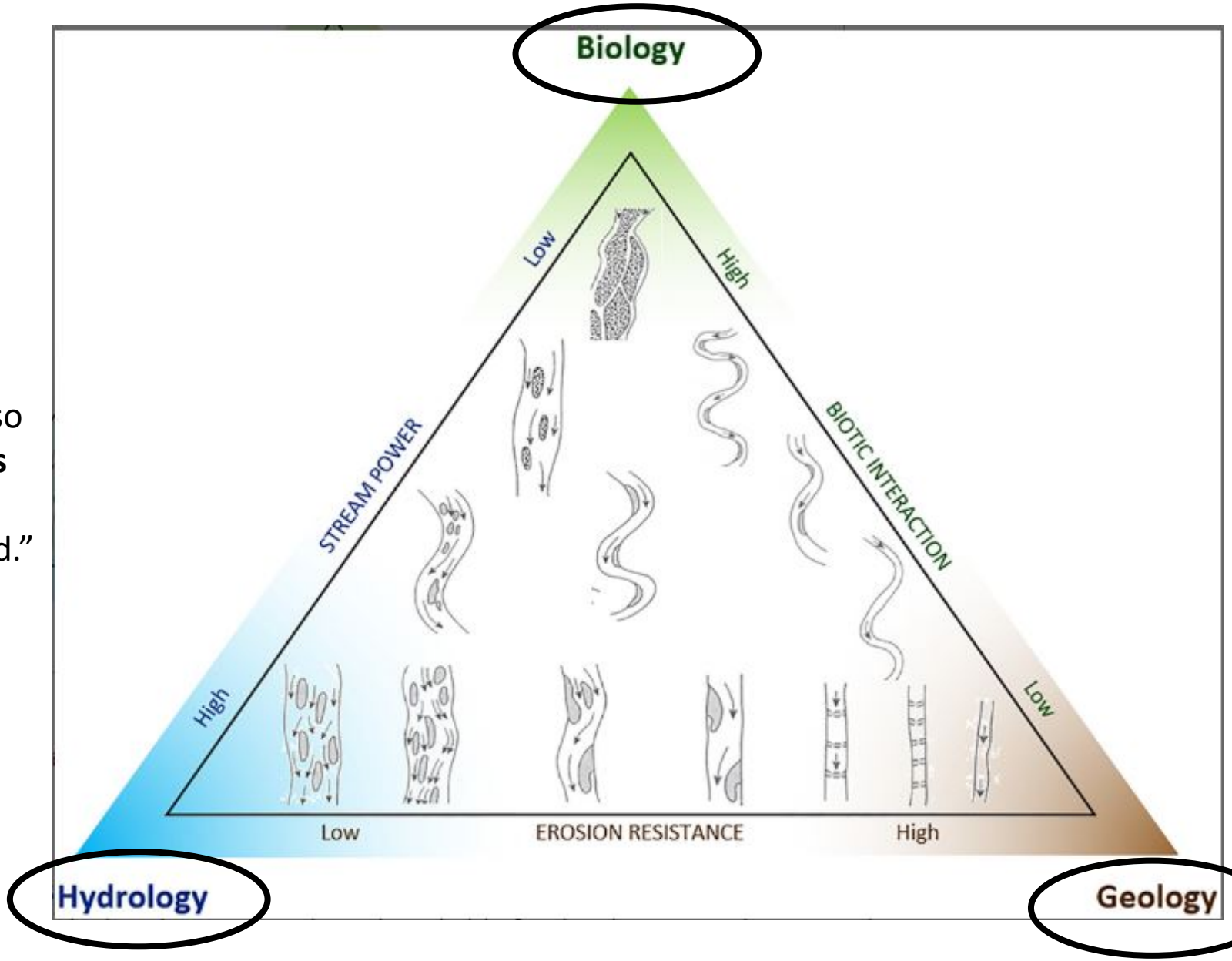

Project Reference Reach
Flow
Google Earth


Flow


Flow


Flow

"From an evolutionary perspective, plants and animals work to improve their own life chances and those of their species and, in so doing, **they drive biogeomorphic processes and influence fluvial processes** more strongly than has generally been recognized."



Johnson, MF, Thorne, CR, Castro, JM, et al. Biomic river restoration: A new focus for river management. *River Res Applic*. 2020; 36: 3– 12.

Set Clear Goals & Objectives Tied to Hypotheses & Restoration Strategies

Highlighted in new publication by our GR Team!

White, S.M., Brandy, S., Justice, C., Morinaga, K.A., Naylor, L., Ruzycki, J., Sedell, E.R., Steele, J., Towne, A., Webster, J.G. and Wilson, I. (2020), Progress Towards a Comprehensive Approach for Habitat Restoration in the Columbia Basin: Case Study in the Grande Ronde River. Fisheries. Accepted Author Manuscript.

QUANTITATIVE OBJECTIVES OF SHEEP CREEK RESTORATION

The Sheep Creek Restoration Project encompasses 4.5 miles of the upper Grande Ronde River. Sheep Creek and its meadow habitats were not in proper functioning ecological condition (hydrologic, geomorphic, vegetative composition) due to historical practices such as beaver trapping, overgrazing, logging, road building, and an altered fire regime. The Sheep Creek Restoration project was implemented in 2019 by Trout Unlimited and the U.S. Forest Service.

Quantitative objectives for habitat function included:

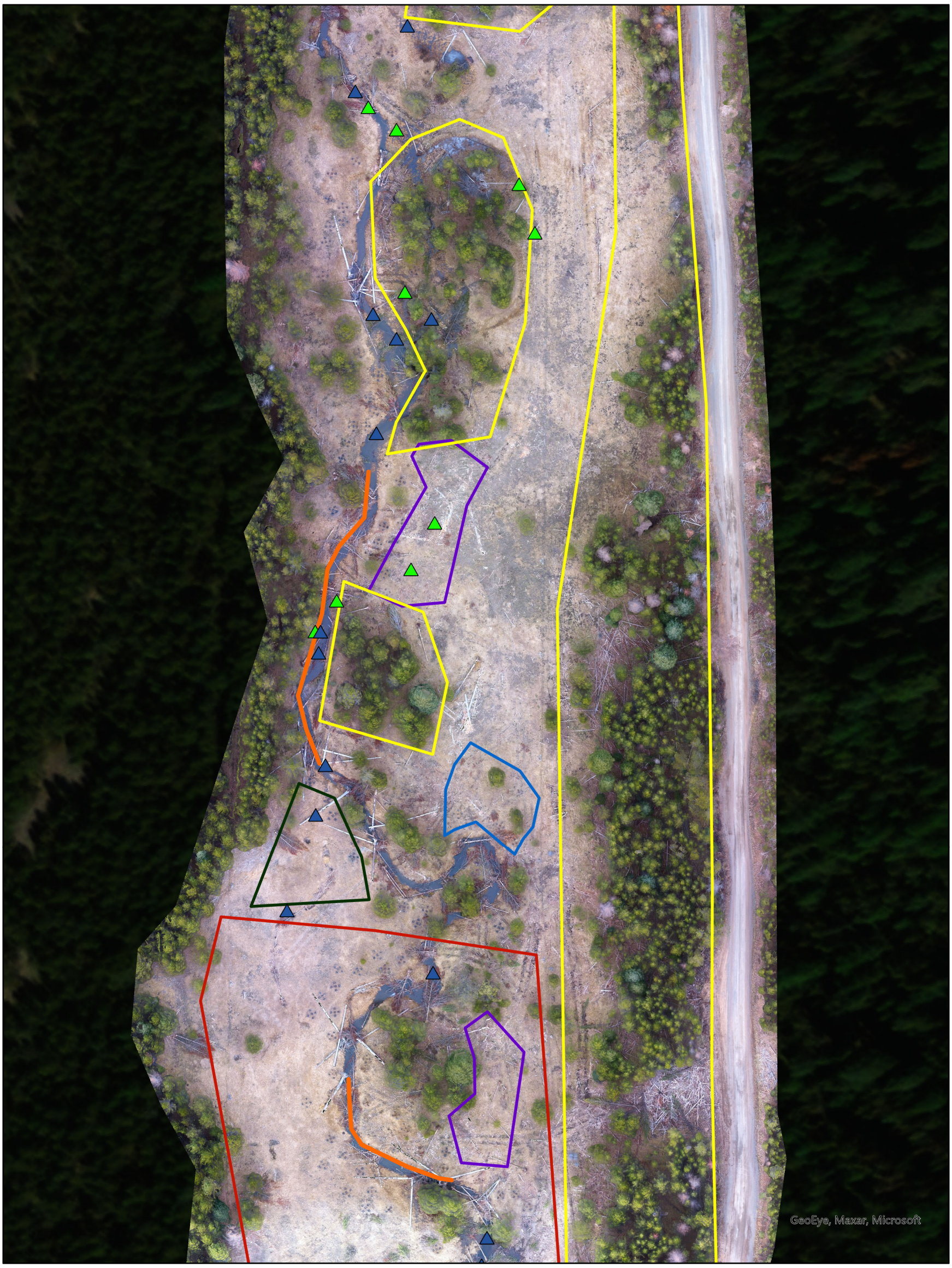
- Exclude cattle grazing from 145 acres of riparian habitat with 5.25 miles of fence to promote native riparian community
- Increase late-summer floodplain area by 30% after 2 years post-restoration
- Buffer seasonal high and low stream temperatures via increased groundwater inputs after 5 years of improved floodplain connection
- Add 1,500 pieces of large wood to the stream and floodplain
  - 72 channel spanning wood structures to backwater pools and activate side channels
  - 90 wood structures to provide velocity refuge and cover

Quantitative objectives are monitored via:

- Riparian transects to track vegetation species composition and density
- Aerial photography and GIS analysis to monitor floodplain inundation at high and low streamflows
- Stream temperature data loggers to evaluate changes in temporal thermal regime
- Habitat surveys to evaluate retention of large wood and subsequent adjustments to cover and stream channel morphology

SHEEP CREEK STEWARDSHIP PROJECT

Upper Right:
118°27'23"W
45°3'24"N



Lower Left:
118°27'40"W
45°3'10"N

- Alluvial Fan/Wetland Restoration
- Proposed BDA/PAL/LWD
- USFS Existing BDA/PAL
- BLM Existing BDA/PAL
- Loose Tree Placement (30/Mile) - 0.1mi
- Loose Tree Placement (Approx 30/Mile) - 0.66mi
- Fill Reach
- Elk Fence
- Channel Notch
- Cut Areas
- Thinning
- Aspen Regeneration Area

FLOW

N
W
E
S

50
Meters
1:1,200

PROJECT PARTNERS

TROUT UNLIMITED

FOREST SERVICE US DEPARTMENT OF AGRICULTURE

BONNEVILLE POWER ADMINISTRATION

The following file has been corrupted: FY21-22 TU Indirect Cost Rate Agreement.pdf
Upload Type: Federally Negotiated Indirect Cost Rate Plan
Upload Description: TU Indirect Agreement
Upload Exception: System.ArgumentException: PdfReader not opened with owner password
  at iTextSharp.text.pdf.PdfReaderInstance.GetImportedPage(Int32 pageNumber)
  at GrantApplication.outputPDF.CombineUploadPDFs(MemoryStream applicationPDF) in C:\SVN\asp\OOGA\GrantApplication\outputPDF.aspx.cs:line 106

Match Funding Form

Document the match funding shown on the budget page of your grant application.

OWEB accepts all non-OWEB funds as match. An applicant may NOT use another OWEB grant to match an OWEB grant; this includes ODA Weed Board projects because they are funded through OWEB grants. However, an applicant who benefits from a pass-through OWEB agreement with another state agency, by receiving either staff expertise or a grant from that state agency, may use those benefits as match for an OWEB grant. (Example: A grantee **MAY** use as match the effort provided by ODFW restoration biologists because OWEB funding for those positions is the result of a pass-through agreement).

At the time of application, match funding for OWEB funds requested does not have to be secured, but you must show that **at least 25% of match funding has been sought**. On this form, you do not necessarily need to show authorized signatures ("secured match"), but the more match that is secured, the stronger the application. Identify the type of match (cash or in-kind), the status of the match (secured or pending), and either a dollar amount or a dollar value (based on local market rates) of the in-kind contribution.

If you have questions about whether your proposed match is eligible or not, see Allowable Match document in OGMS https://apps.wrd.state.or.us/apps/oweb/fiscal/nologin.aspx under Technical Assistance application or contact your local OWEB regional program representative (contact information available in the instructions to this application).

Project Name: Sheep Creek Stewardship Project

Applicant: Levi Old, Trout Unlimited

Match Funding Source	Type	Status*	Dollar Value	Match Funding Source Signature/Date*
In-Kind Staff Time (BOR and other)	in-kind	secured	9,000	
	(select)	(select)		
	(select)	(select)		
	(select)	(select)		
	(select)	(select)		
	(select)	(select)		
	(select)	(select)		

*** IMPORTANT:** If you selected "secured" in the Status column for any match funding source, you must provide either the signature of an authorized representative of the match source in the Match Funding Source Signature/Date column, or attach a letter of support from the match funding source that specifically mentions the dollar amount you show in the Dollar Value column.