

Big Cottonwood Creek Restoration Project Update and Overview



02/07/2023

Dear Landowners,

Discussions and planning over the last several months have developed into an initial plan for the Creek's restoration. The following information is a summary of the project goals, location of treatments, and the timeline for monitoring and maintenance. This is not a final plan, but the plan to date. Some landowners have not been successfully contacted and their properties have been excluded from the project at this time. This may change over the course of the project.

The overall goal of Big Cottonwood Restoration project is to help improve the post-fire and flooded, incised creek back to a healthier condition (using pre-fire and flood (year 2016) as the reference). This project we will investigate Process Based Restoration's (PBR) technique of Post Assisted Log Structures' (PALS) abilities to improve incised channels and increase floodplain connectivity while considering implications to water rights. The supporting objectives of this project are to:

- Install channel spanning PALS to:
 - slow flow velocity
 - encourage sediment deposition and channel aggradation
 - provide geomorphic diversity (i.e. pools, riffles, glides)

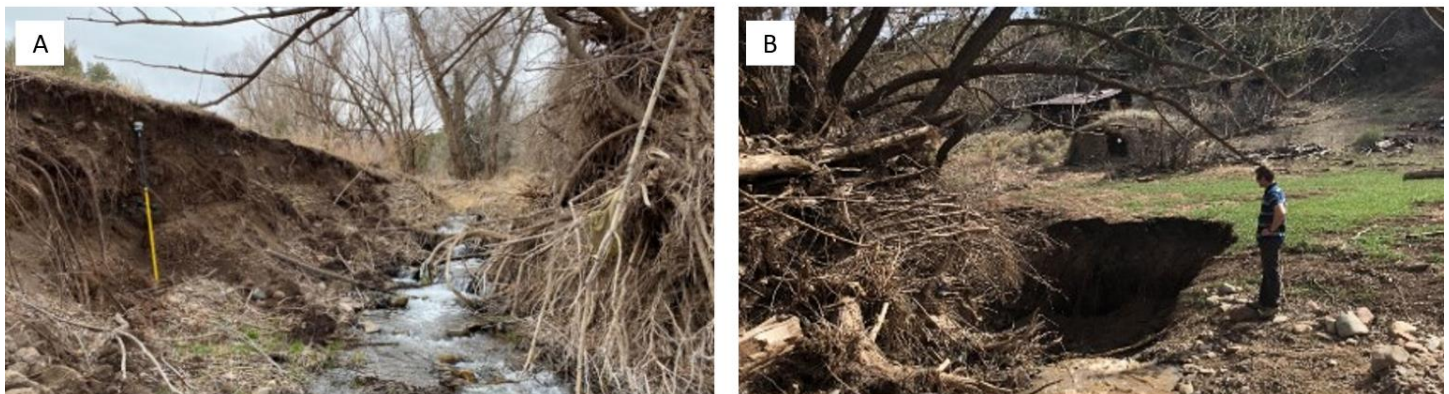


Figure 1: Existing conditions of Big Cottonwood Creek show: A) large head cuts that continue to cause incision, and B) numerous areas of incision that range from 8-12 feet.

Project Site and Location

The project site is a reach of approximately 11,000 linear feet and PALS treatments will be constructed on 20 different properties. For viewing convenience, the project area is broken down into five (5) reaches (Appendix A, Figure A1). Figures A2-A6 show the individual reaches with landowner properties and planned PALS locations.

The proposed activity is to use post assisted log structures, or PALS, to create channel spanning, temporary grade controls (sketches shown below of design typicals). These finished PALS are considered temporary as they will eventually be covered with sediment and the wood will deteriorate. During the sedimentation period, these PALS will be very leaky, and will not cause water pooling/ponding.

The posts used for the PALS will be driven in the channel with a handheld hydraulic post pounder. Posts will be untreated wood of 2-3 inch diameter and approximately 6 feet in length. Posts will be driven approximately 3-4

feet into the channel, leaving 2-3 feet of post above the channel. The posts will be spaced approximately 1.5 to 2 feet apart perpendicular to the channel. Big Cottonwood Creek channel widths range from 6 feet to 20 feet, which will require anywhere from 4-15 posts driven into the channel's cross section at a given location. In between the installed posts, willow and possibly juniper cuttings will be woven to create channel spanning grade controls to slow down the stream velocity and to encourage sediment deposition. Work in this creek channel does require a permit from the US Army Corps of Engineers. This has been submitted in early January, 2023 and we are currently waiting for their final ruling.

Attachment for Post Assisted Log Structures (PALS)

Note: PALS in V_N Ranch project will be channel spanning. Profile view, cross section view, and planform view of spanning PALS are shown below. PALS will be field fitted and close to these drawings.

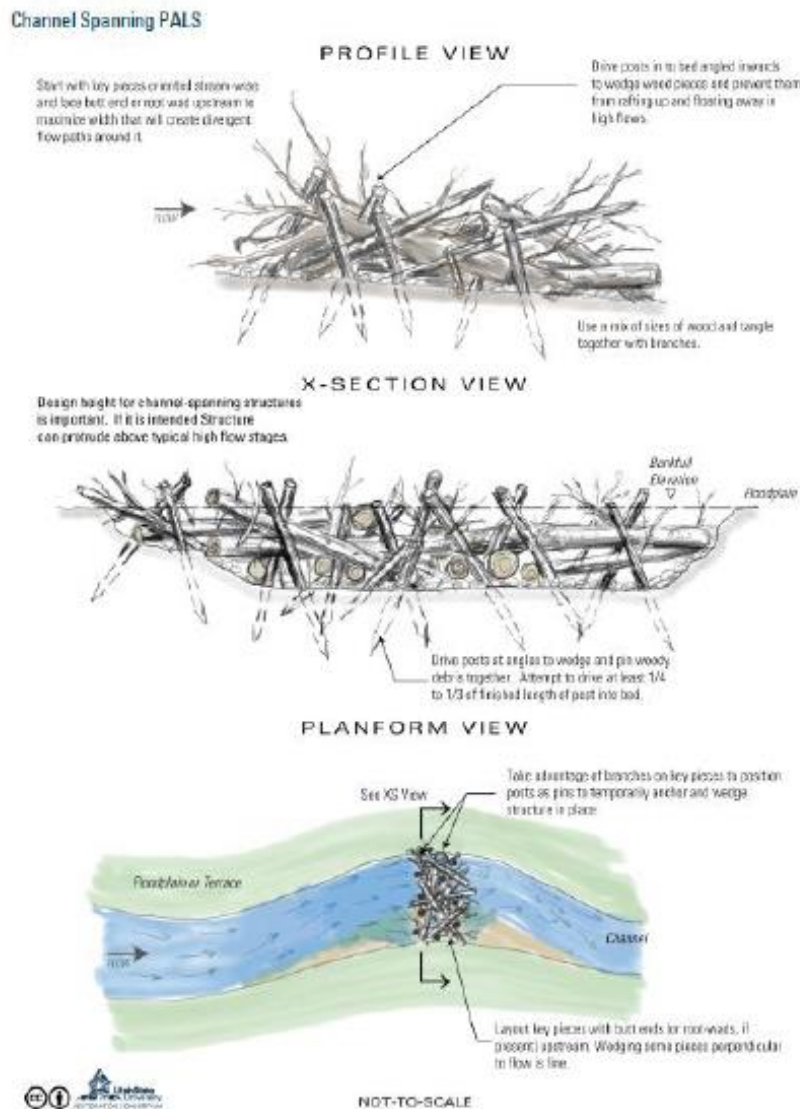


Figure 26 - Typical schematic of a channel-spanning PALS.



Monitoring Plan

Monitoring is a large component of this project and will be conducted for 10 years and we are required to provide maintenance to PALS treatments for 3 years and rebuild them overtime to ensure they are aggrading the channel to a desired elevation. As we do not want to exceed any of the pre-condition channel elevations as well need to balance this with landowner desires, monitoring will be required both for antidotal evidence of treatment performance as well as quantified evidence of sediment accumulation and channel bed elevations.

It is noted here that all water rights holders in this area are stakeholders in this project. Monitoring has already started to collect baseline elevation data. Future data collection for monitoring will continue and include:

- Years 1-2: Monthly monitoring* and maintenance**
- Years 3-5: Seasonal monitoring* and maintenance** (limited maintenance, reduces every year)
- Years 5-10: Seasonal monitoring*

*Monitoring may include surveys (drone & land), cross-section flow, depth and width, water quality parameters (pH, temp, turbidity, etc.), riparian and habitat health indicator assessments.

**Maintenance may include reconstruction of damaged structures, development of new structures, removal of structures.

These datasets will continue to be collected on a similar basis to provide information to water rights holders, project funders, and to report post-restoration goals and efficacy. Post project reporting requirements of the Corps will be complied with.

Appendix A: Site Location and Treatment Locations.

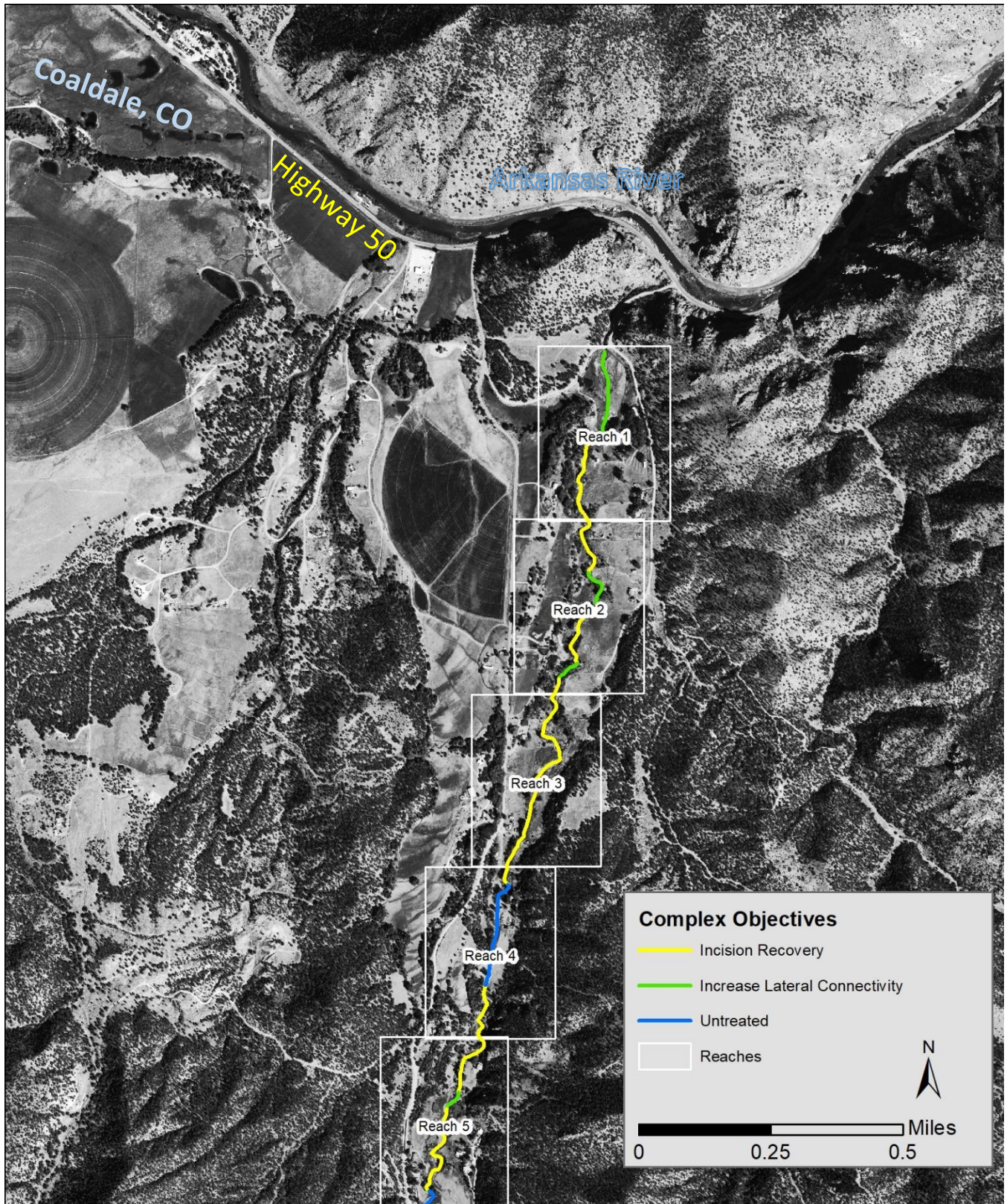
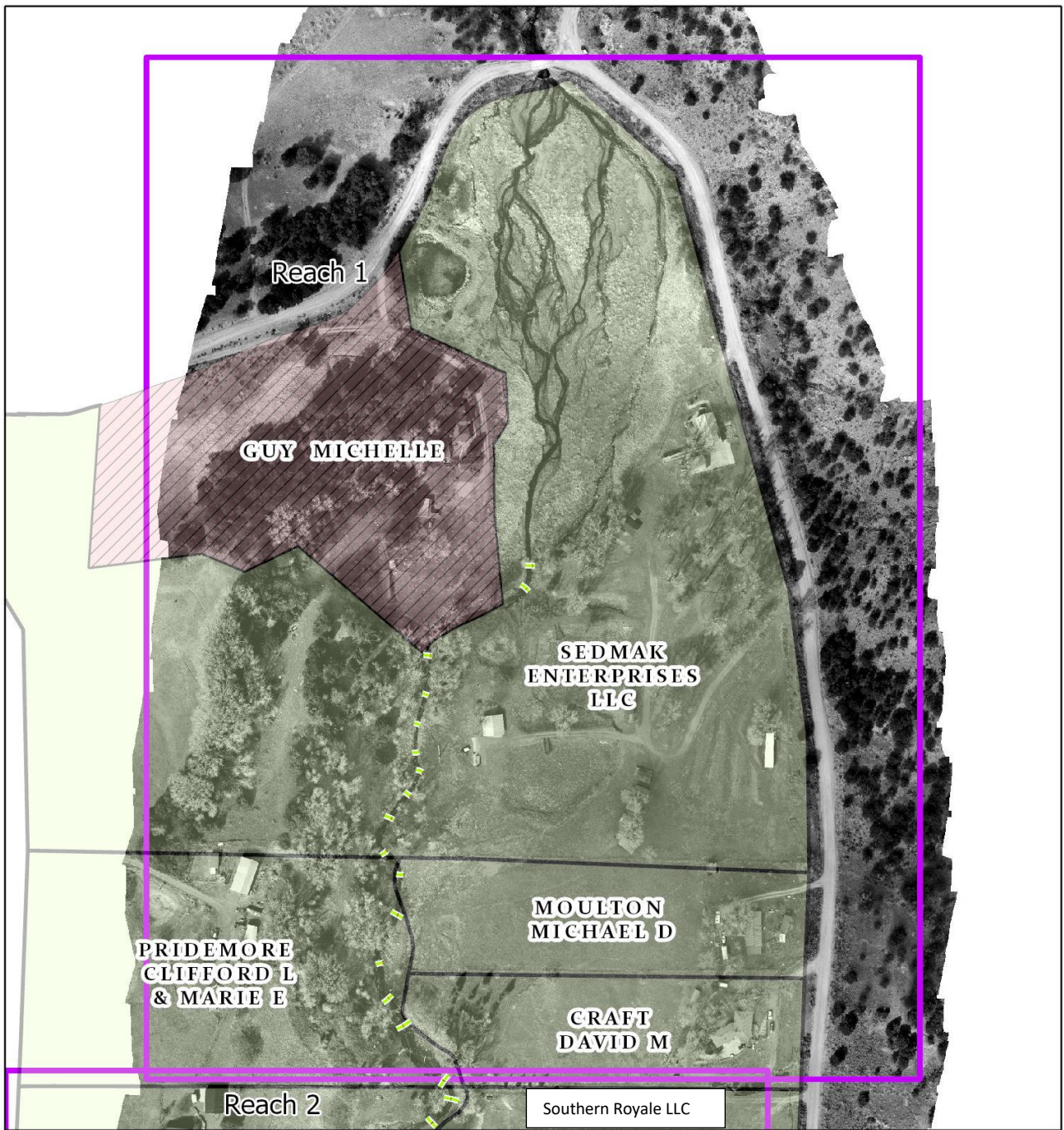


Figure A1: Site location (blue polygon)



LandOwners

Potential PALS

0 250 500 Feet

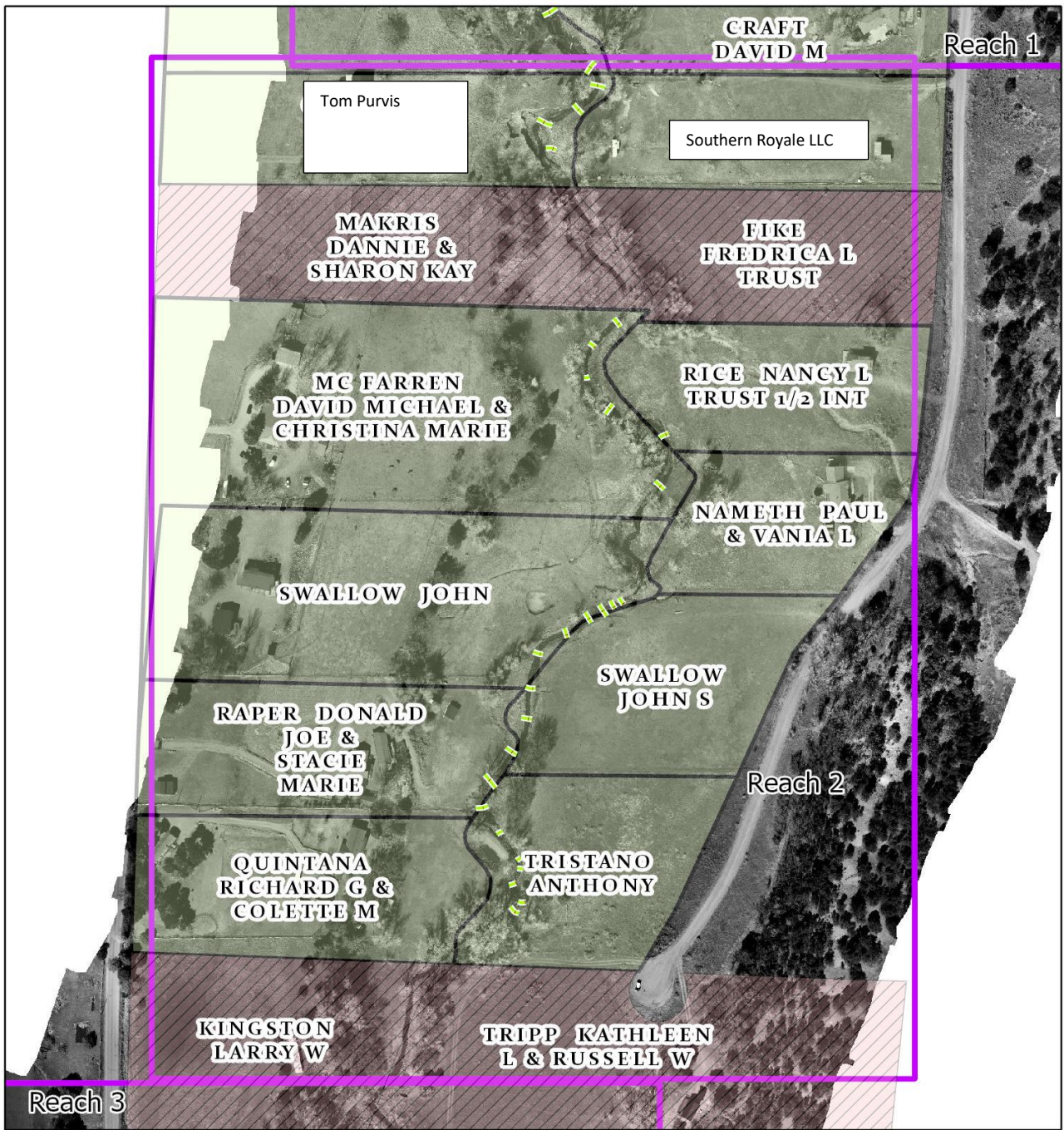


Involved

Reaches

- Yes
- No
- No, but desired

Figure A2: Big Cottonwood Creek Project Area, Reach 1, with shown landowners involved, and planned Post-Assisted Log Structures (PALS).



LandOwners

Potential PALS

0 250 500 Feet

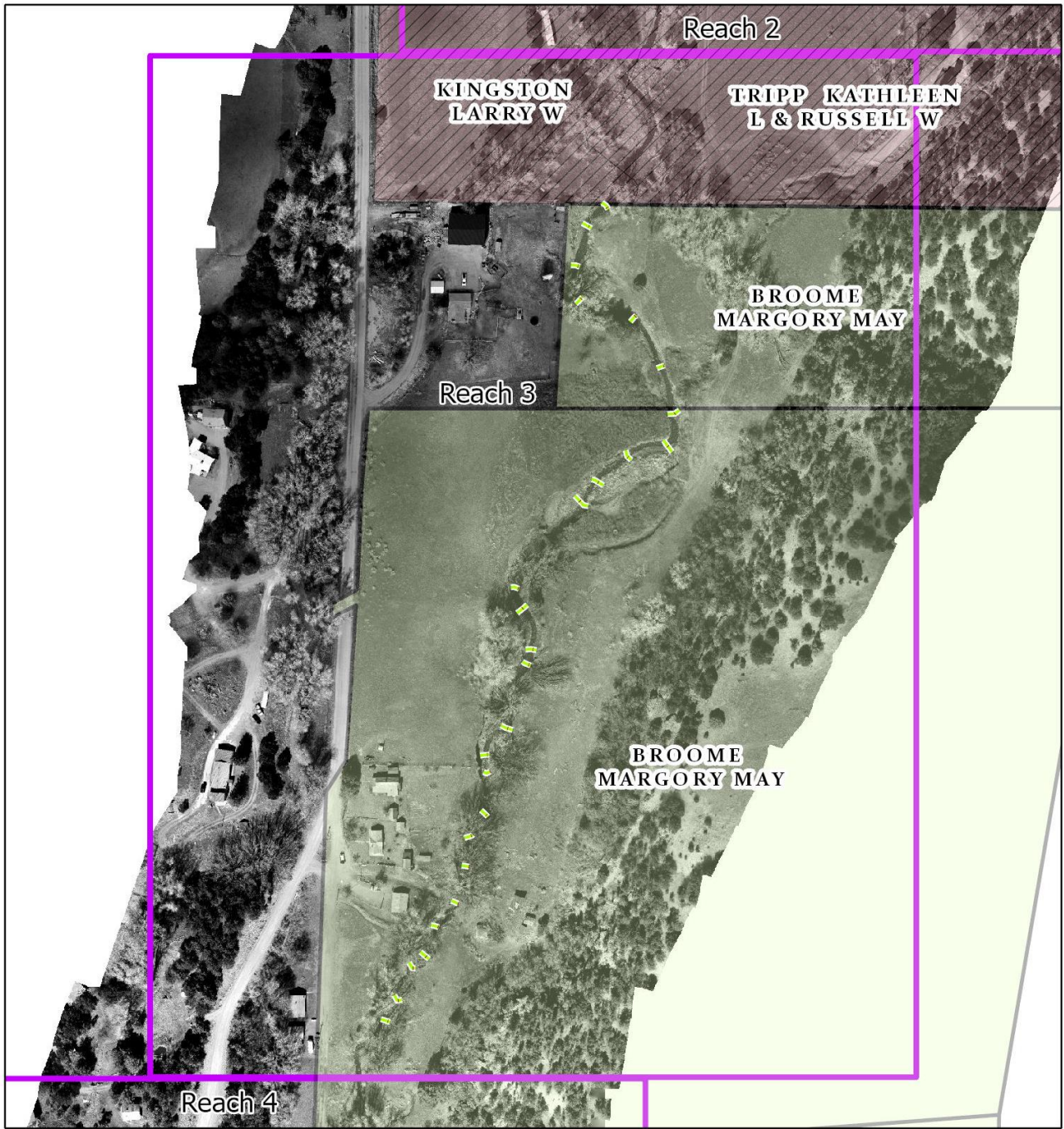


Involved

Reaches

- Yes
- No
- No, but desired

Figure A3: Big Cottonwood Creek Project Area, Reach 2, with shown landowners involved, and planned Post-Assisted Log Structures (PALS).



LandOwners

Potential PALS

0 250 500 Feet



Involved

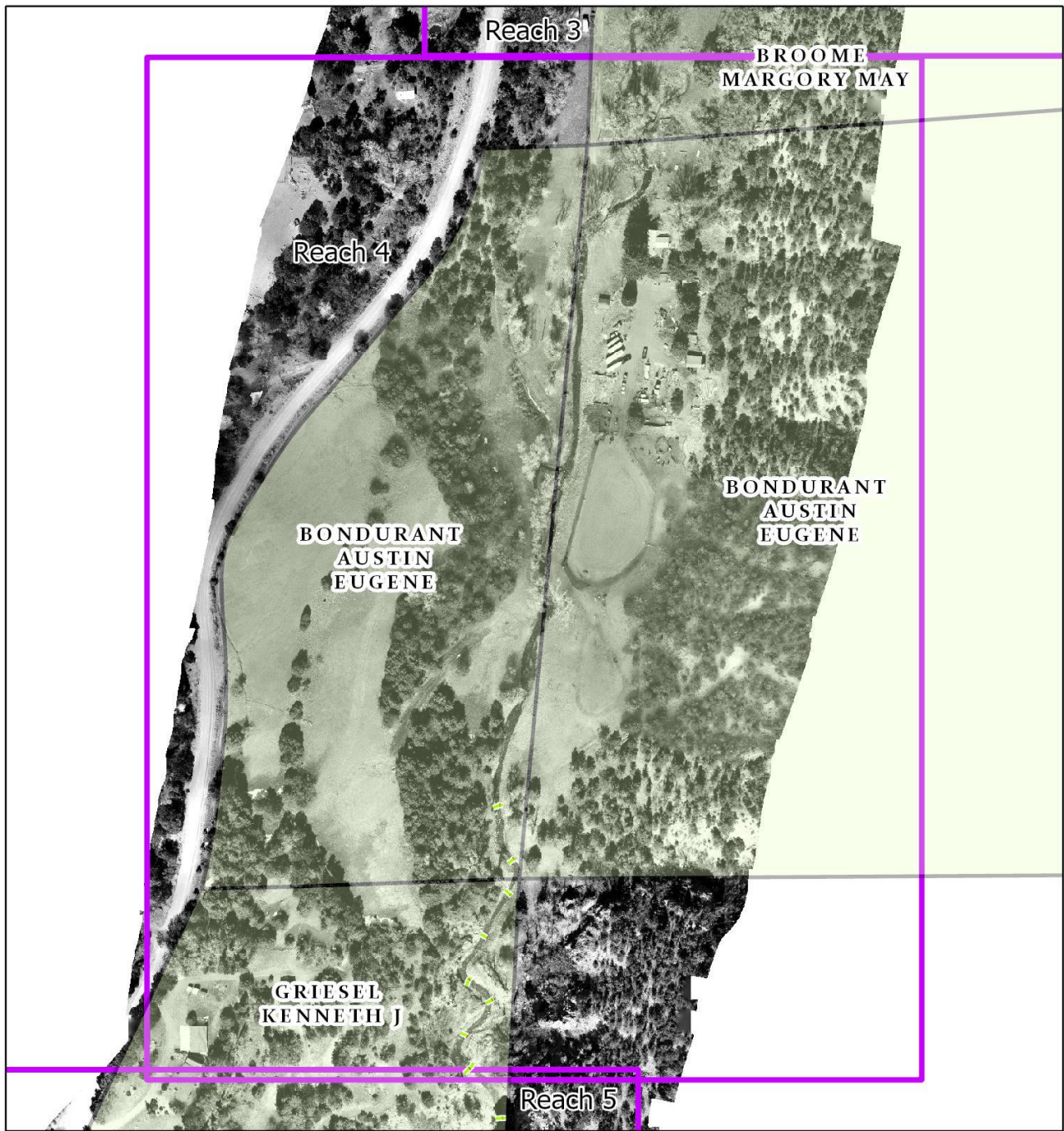
Reaches

Yes

No

No, but desired

Figure A4: Big Cottonwood Creek Project Area, Reach 3, with shown landowners involved, and planned Post-Assisted Log Structures (PALS).



LandOwners

Potential PALS



Involved

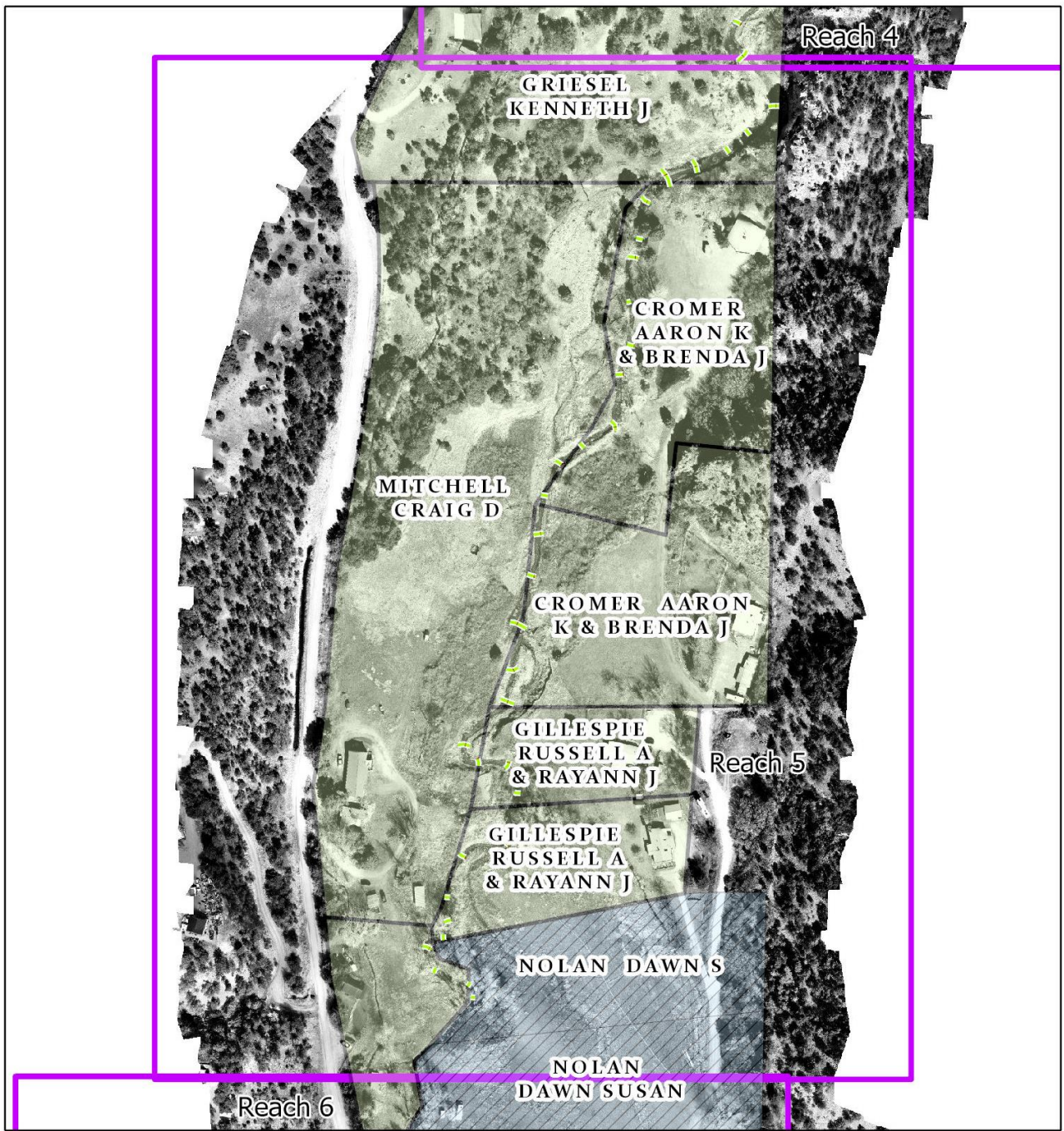
Reaches

Yes

No

No, but desired

Figure A5: Big Cottonwood Creek Project Area, Reach 4, with shown landowners involved, and planned Post-Assisted Log Structures (PALS).



LandOwners

Potential PALS

0 250 500 Feet



Involved

Reaches

Yes

No

No, but desired

Figure A6: Big Cottonwood Creek Project Area, Reach 5, with shown landowners involved, and planned Post-Assisted Log Structures (PALS).