

Riparian and Wet Meadow Restoration: Cottonwood Gulch

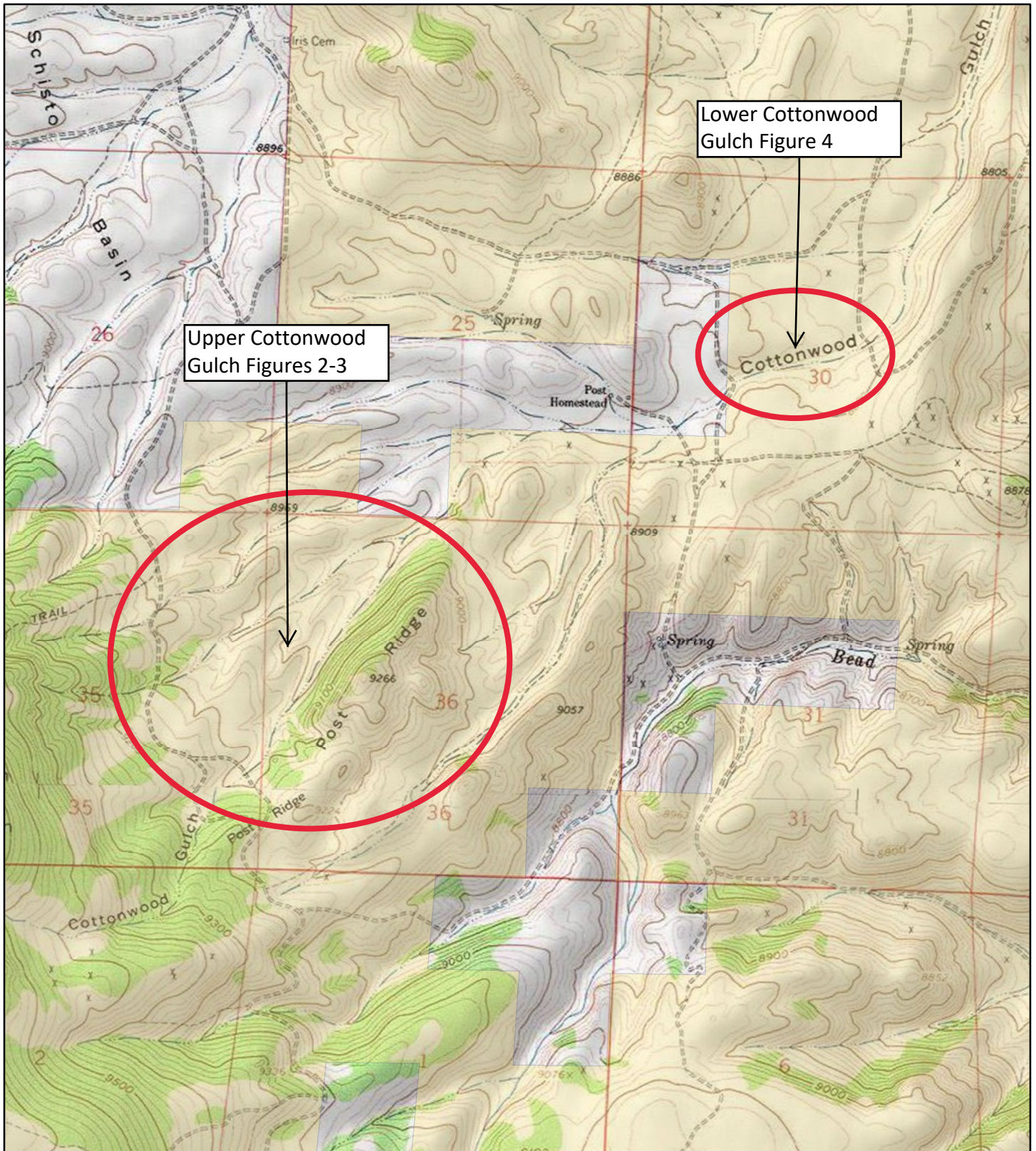
BLM Gunnison Field Office

On 22-23 September 2021, a final site analysis and field design trip was held at **Cottonwood Gulch** on the Gunnison field office. BLM hydrologist **Andrew Breibart** led the trip and was accompanied by project partners including **Paul Jones** (Wet Meadow Coordinator) and **Shawn Conner** (BIO-Logic Inc.).

On 22 September 2021, the team inspected and walked the site reach at **upper Cottonwood Gulch** for restoration potential. Please see Figure 2 for a map of site analysis opportunities and constraints. The following day on 23 September the group returned and laid out two plug and spread structures. These equipment built structures were designed to reconnect the channel with abandoned former wet meadow on each side of a degraded and incised portion of the valley between two relatively intact wet meadow areas. Please see Figure 3 for this preliminary design and Photos 1-4.

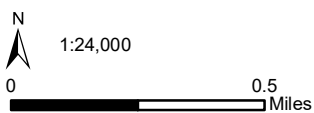
The team also walked the **lower reach of Cottonwood Gulch** and assessed site potential for hand-built restoration structures (Figure 4). After reviewing the area, the team agreed that the **lower end** was relatively stable with a meandering channel that had already eroded down to bedrock and that if any structures were used, they would be lower priority and designed to slow the flow on crossover areas between meander bends. The team agreed that not much could be done at the top of the reach where the channel goes thru a stock tank, but that the main meadow in the **middle of the reach** was suitable for restoration grade control structures and that the site would benefit from action. We discussed rock built One Rock Dams as grade control structures and perhaps a few headcut control structures. Additionally, if rock delivery to the site is not possible, that we could experiment with some vegetation-based wicker weir structures to try and accomplish the same objectives. There is Rocky Mountain juniper invasion going on in a nearby down valley meadow that could be a suitable source of material for these structures.

Lastly, due to the fact that the area is a grazed pasture for livestock and that trailing exists going up and down the valley bottom, several drift fences were envisioned to counteract these ongoing impacts.



Locations of boundaries and features are approximate.

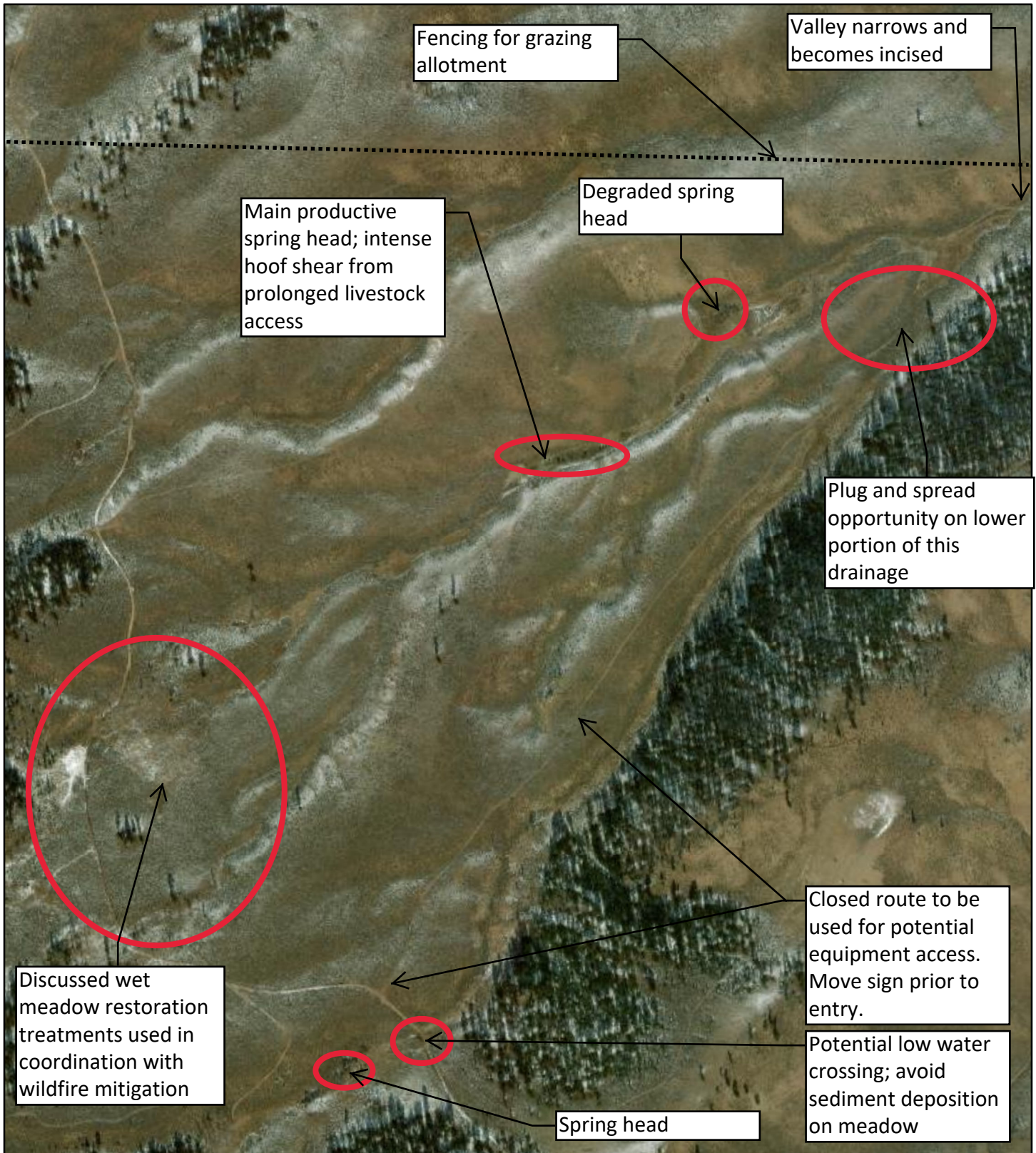
Base Map Source:
NGS 2D Topographic Map



**BLM Cottonwood Gulch
Wet Meadow Restoration
Site Analysis**

**Figure 1
Overview - Cottonwood Gulch - Topo**

BIO-Logic, Inc.
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(970) 240-4374



Locations of boundaries and features are approximate.

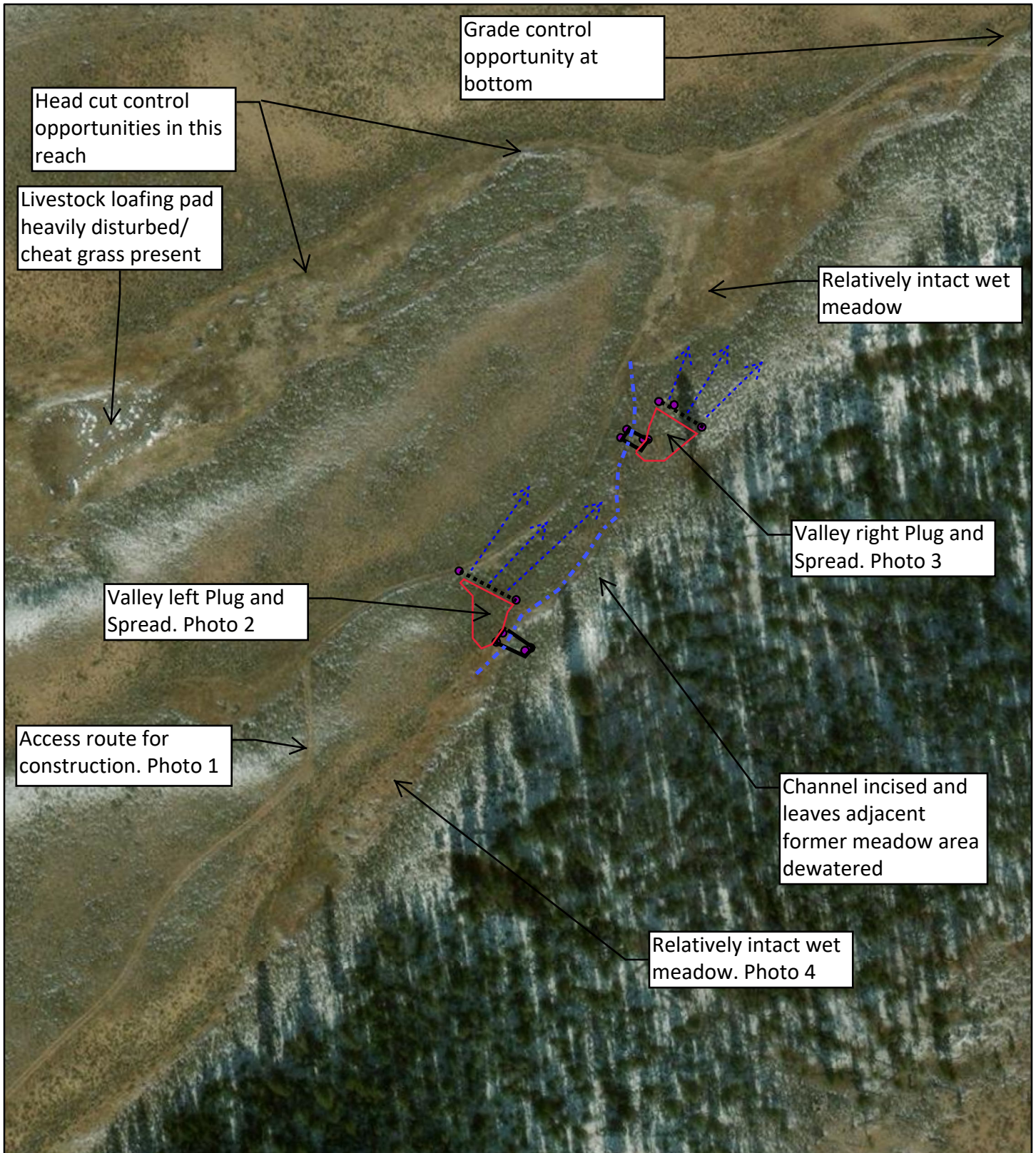
Basemap Source:
ESRI composite aerial image,
Aerial photos taken fall 2018



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**Figure 2
Upper Cottonwood Gulch - Aerial**

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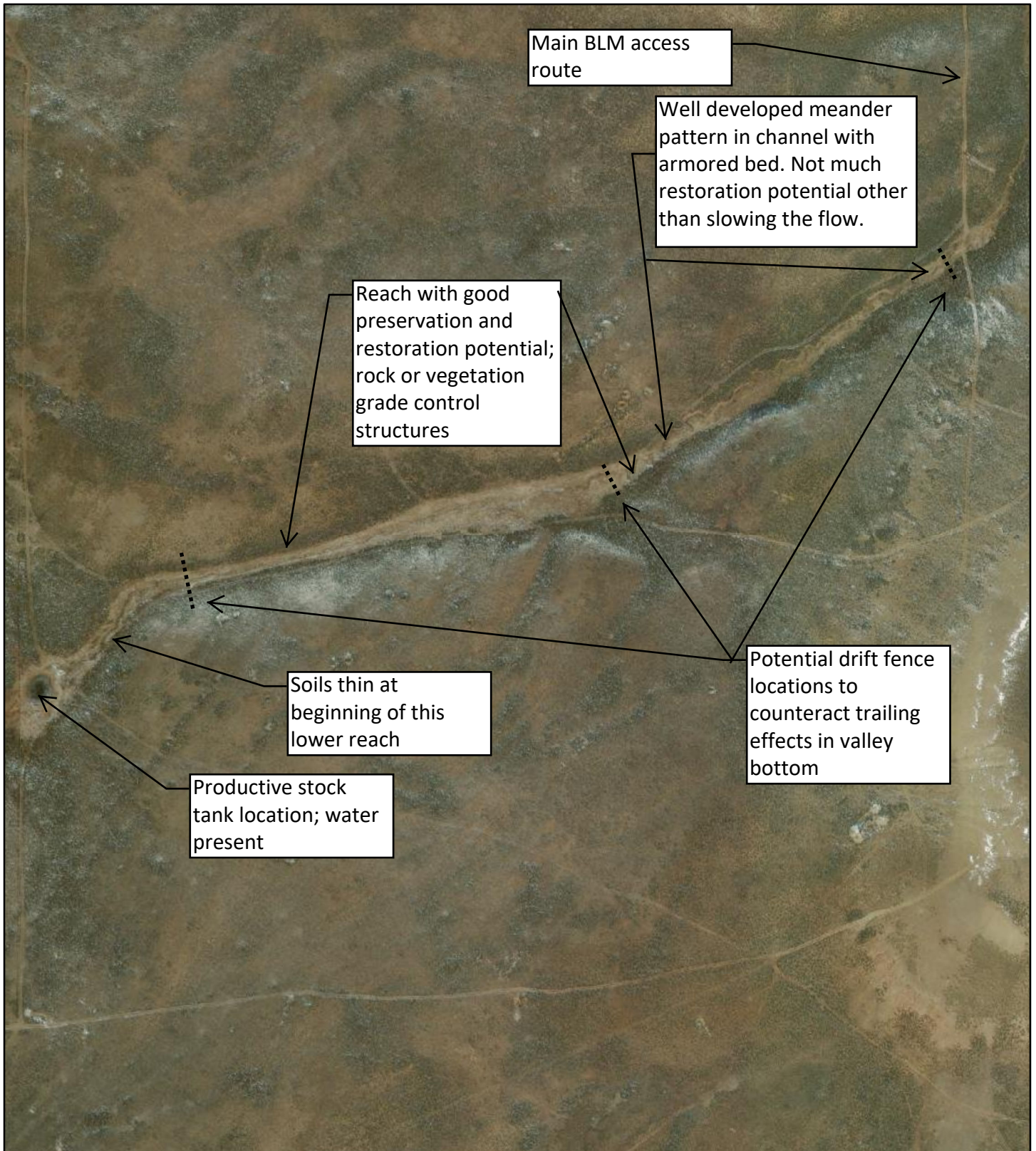
Basemap Source:
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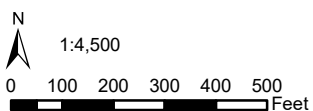
**Figure 3
 Upper Cottonwood Gulch - Potential Plug and Spread**

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Basemap Source:
 ESRI composite aerial image,
 Aerial photos taken summer 2018

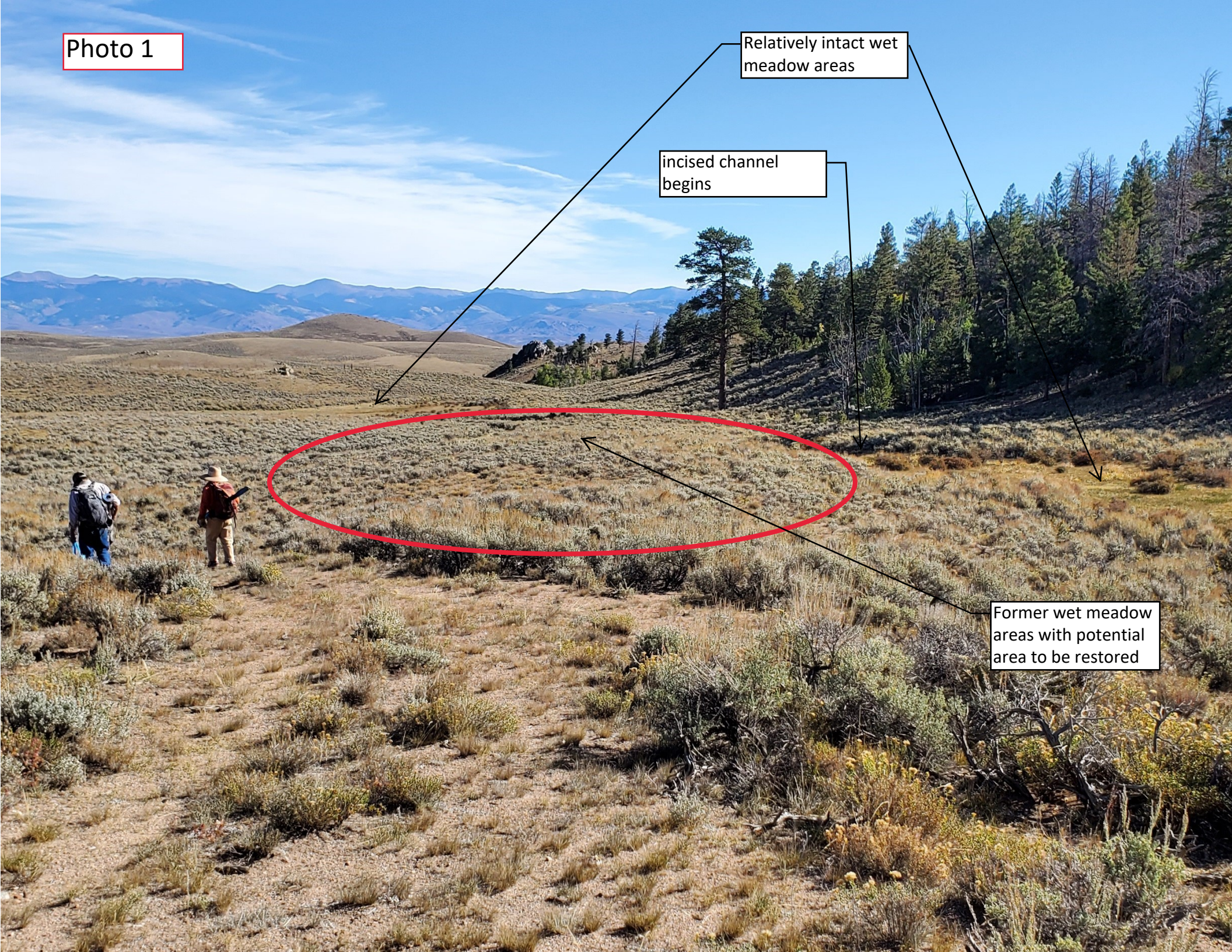


**BLM Cottonwood Gulch
 Wet Meadow Restoration
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**Figure 4
 Lower Cottonwood Gulch**

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Photo 1

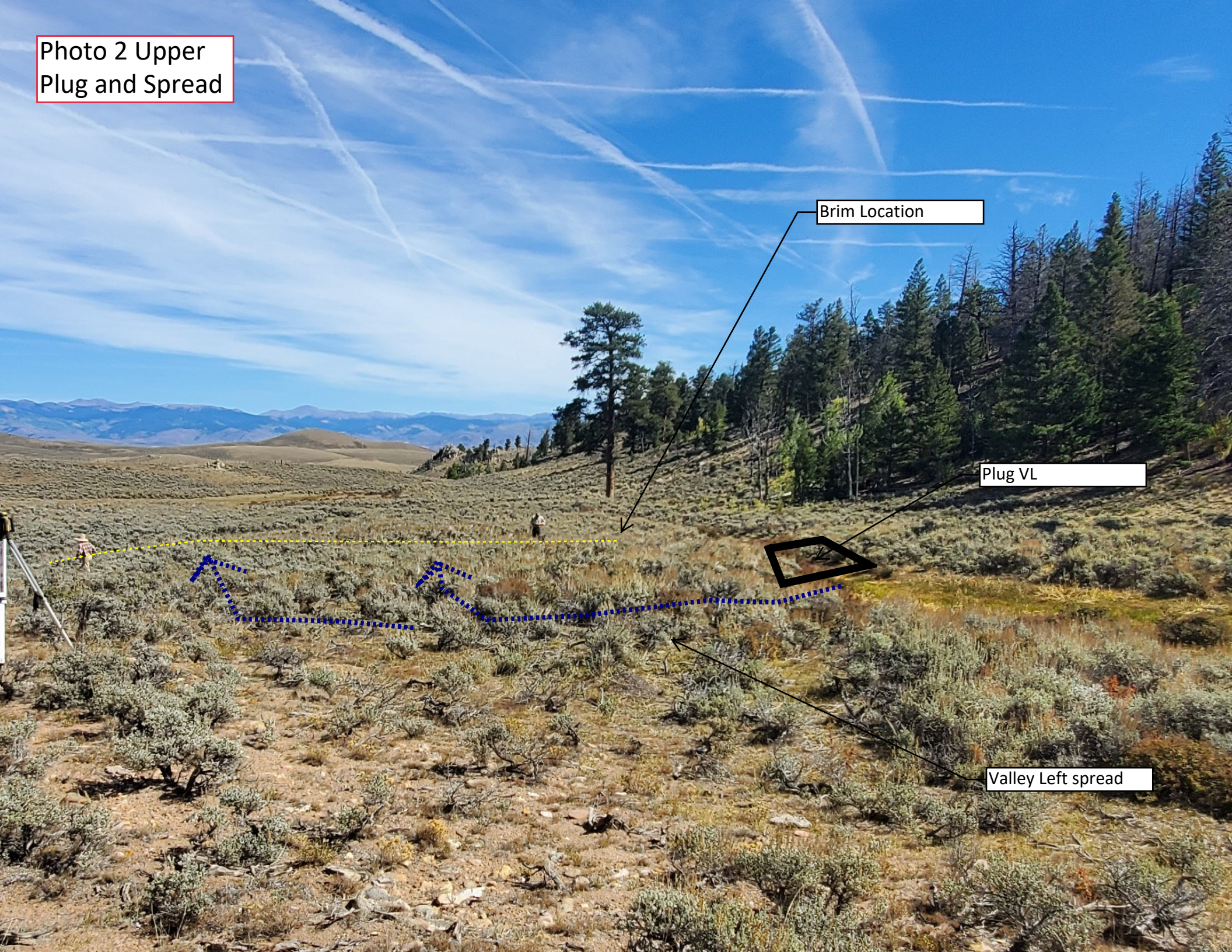


Relatively intact wet meadow areas

incised channel begins

Former wet meadow areas with potential area to be restored

Photo 2 Upper
Plug and Spread

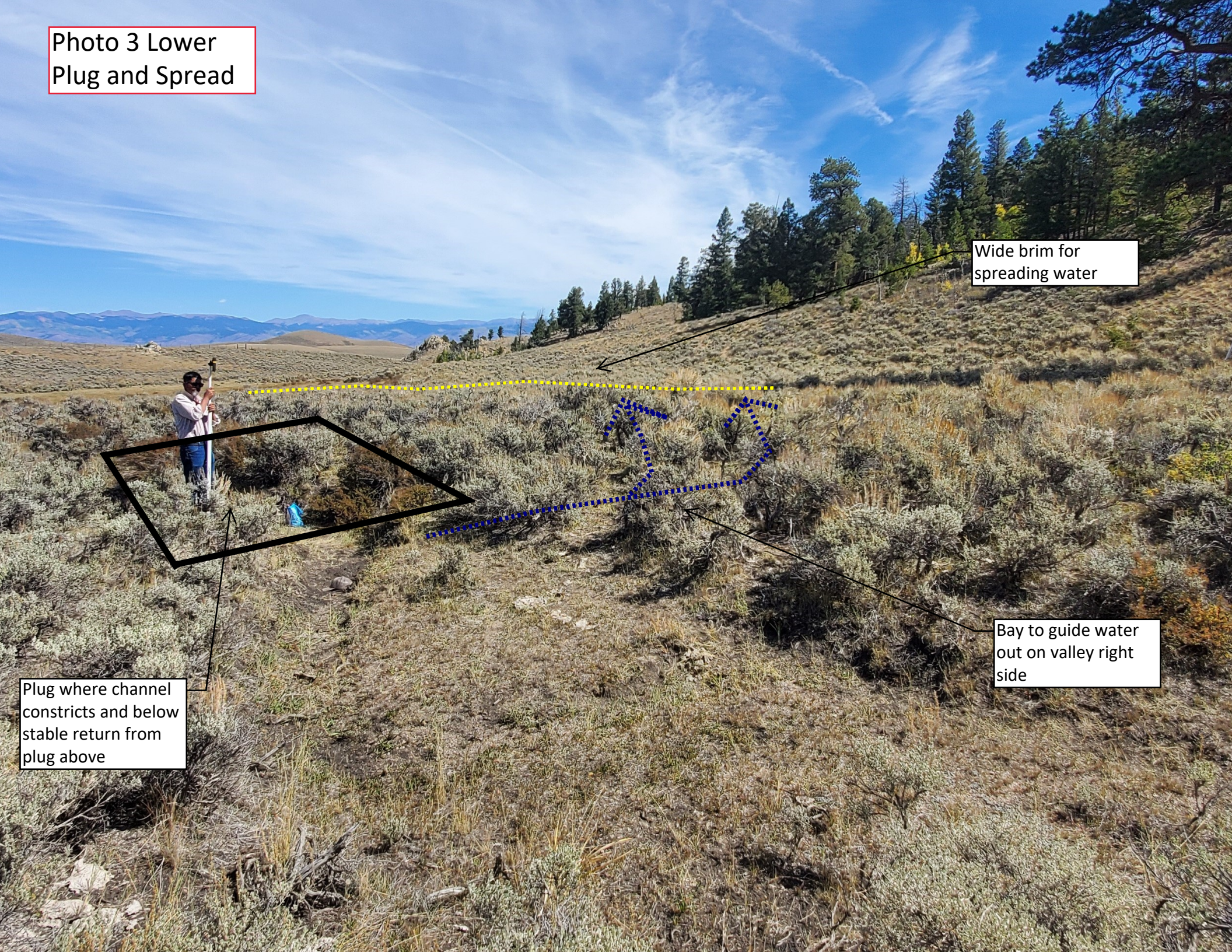


Brim Location

Plug VL

Valley Left spread

Photo 3 Lower
Plug and Spread



Wide brim for spreading water

Bay to guide water out on valley right side

Plug where channel constricts and below stable return from plug above

Photo 4
Cottonwood
Gulch

Looking upstream,
intact wet meadow
above

Channel formation
begins to develop,
and is incised below
this point leaving
adjacent former wet
meadow on each
side dried out.

