San Luis Valley Aquatic Habitat Assessment

Compendium of Reports for Purchase Order POGG1-2020-3208

DUCKS UNLIMITED

COLORADO WATER CONSERVATION BOARD
STATE OF COLORADO
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San Luis Valley Aquatic Habitat Assessment: Compendium of Reports

This compendium of reports summarizes grant activities performed under the San Luis Valley Aquatic Habitat Assessment during the period of June 10th, 2020 through June 30th, 2022. It provides final reports as deliverables for Tasks 1, 2, and 3 as established in Purchase Order POGG1-2020-3208 given by the Colorado Water Conservation Board (CWCB) to Ducks Unlimited, Inc. (DU) on June 10th, 2020.

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Official records and documents pertaining this report and the work performed under POGG1-2020-3208 are held in Ducks Unlimited's Great Plains Region Office at 2525 River Road, Bismarck, North Dakota, 58503.

The accomplishments reported here are a result of the coordinated efforts of the following grant partners:

In Association With: Colorado Cattlemen's Association, Rio Grande Headwaters Land Trust, The Nature Conservancy, Bureau of Land Management, and private landowners

COVER PHOTO: WETLAND HABITATS LOCATED ON IRRIGATED LANDS ALONG SAGUACHE CREEK IN THE SAN LUIS VALLEY OF COLORADO.

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Executive Summary

Changes in irrigation practices over the past 40 years coupled with extreme drought conditions, mining of the aquifer, and promulgation of Groundwater Rules and Regulations have compelled natural resource partners to identify how cooperative efforts across boundaries could better provide resources to high priority wetland dependent wildlife species utilizing the SLV. The San Luis Valley Wetland and Wildlife Conservation Assessment (SLV WWCA) was completed in 2019 by Wetland Dynamics, LLC and natural resource agency/organization partners to help identify the location of existing limited water resources, areas that have been resilient through drought conditions, and opportunities for partnerships across property boundaries. An aquatic habitat hydrologic model was used to determine hydrologic extent during seasons and wetland type from 1984-2017. This preliminary analysis was used in the SLV WWCA to help determine when and where water resources are currently most limited throughout the SLV.

Based on this analysis, the north end of the SLV in Saguache County, specifically within the San Luis Creek, Saguache Creek, and La Garita creek areas, have lost the most water resources. The SLV WWCA recognized key priority areas or conservation corridors where cooperative efforts on public and conserved private lands might be most effective to improve aquatic resources through historic drainages and creeks such as the Saguache County areas mentioned above. The SLV WWCA was completed with limited habitat maps from a few public lands and without the opportunity to ground-truth the aquatic habitat outputs (i.e. extents and trends in wetland and riparian habitat quality, persistence and resilience).

The San Luis Valley Aquatic Habitat Assessment funded by the Colorado Water Conservation Board, the Colorado State Land Board, and Ducks Unlimited, Inc. has provided funding to implement the recommendations outlined in the SLV WWCA. Specifically, this project completed the following recommendations from the SLV WWCA:

1. Expanded and created new partnerships and cooperative efforts within priority areas.
2. Used the GIS model to identify sites with limited resources within the focal areas.
3. Ground-truthed the accuracy of existing SLV WWCA aquatic hydrology model and a new priority modeling effort provided by the Intermountain Joint Venture on 27 conserved lands.
4. Identified new restoration projects on both public and private conserved lands.

These recommendations were implemented under four Tasks funded under CWCB's POGG1-2020-3208:

Task 1 – San Luis Valley Aquatic Habitat Inventory (FY21), by which at least ten (10) tracts within or adjacent to state lands in the SLV will be visited between July 1, 2020 and June 30, 2021 to assess the quality and quantity of riparian, wetland and wet meadow habitats available to key aquatic species occupying the San Luis Valley during their life cycle.

Task 2 – San Luis Valley Aquatic Habitat Inventory (FY22), by which at least ten (10) tracts within or adjacent to state lands in the SLV will be visited between July 1, 2021 and June 30, 2022 to assess the quality and quantity of riparian, wetland and wet meadow habitats available to key aquatic species occupying the San Luis Valley during their life cycle.

Task 3 – San Luis Valley Aquatic Habitat Model Ground-truthing, by which the validity of the 'Wetland Dynamics' hydrologic model estimating aquatic habitat features in the San Luis Valley, especially in characterizing quality, extent and persistence of riparian and wetland types, will be assessed by comparing model outputs to on-the-ground conditions on select aquatic habitat sites in the San Luis Valley.

Task 4 – San Luis Valley Aquatic Habitat Restoration Projects Assessment, by which and as a result of the inventory and ground-truthing of the 'wetland dynamics' model, select tracts where aquatic habitat conditions are not sufficient to support targeted populations of wildlife species, restoration projects aimed at improving those conditions will be identified.

The following narrative, figures, tables, exhibits, and attachments represents a compendium of the required reports for each of the four tasks. The compiled work represents final reports for Tasks 1, 2, and 3 of the Scope of Work and the current status of our work under Task 4 (which will be completed by June 30th, 2023).

Results from this effort included a variety of new information, partnerships, potential projects, and the ability to reliably utilize the SLV WWCA to target resilient focal areas based on the hydrologic model. Overall, this effort indicates that the SLV WWCA accurately describes existing resilient areas that provide limited wetland resources and areas were identified that could be enhanced or restored by providing appropriate resources at the right time of the year and improving water control infrastructure. The following activities have been accomplished:

1. Under Tasks 1 and 2 of the Grant, site visits to 31 conserved lands in the San Luis, Saguache, and La Garita Creek watersheds.
2. Under Tasks 1 and 2 of the Grant, an assessment of the quality and health of historic and current drainages at 22 locations on conserved lands utilizing the Colorado Natural Heritage Programs (CNHP) Ecological Integrity Assessment (EIA).
3. Under Task 3 of the Grant, we determined that the SLV WWCA is an effective and accurate tool to identify resilient wetland resources for conservation and restoration.
4. Under Task 4 of the Grant, we developed new partnerships with private landowners, CCALT, and the SLB.
5. Under Task 4 of the Grant, we identified potential restoration projects to improve aquatic habitat conditions on private and public lands in the San Luis and lower Saguache and La Garita Creek watersheds.
6. Under Task 4 of the Grant, we identified planning grant opportunities with partners to move forward on those identified restoration projects.

Introduction and Background for Project

The SLV is a high elevation montane basin in the Southern Rocky Mountains containing the headwaters of the Rio Grande. Ownership of land in the SLV creates a mosaic of public lands adjacent to private lands. Federal and State natural resource agencies and non-governmental organizations (Figure 1) along with private land conservation easements have protected large contiguous areas in the SLV.

As part of the SLV WWCA recommendations, improving partnerships across boundaries and initiating

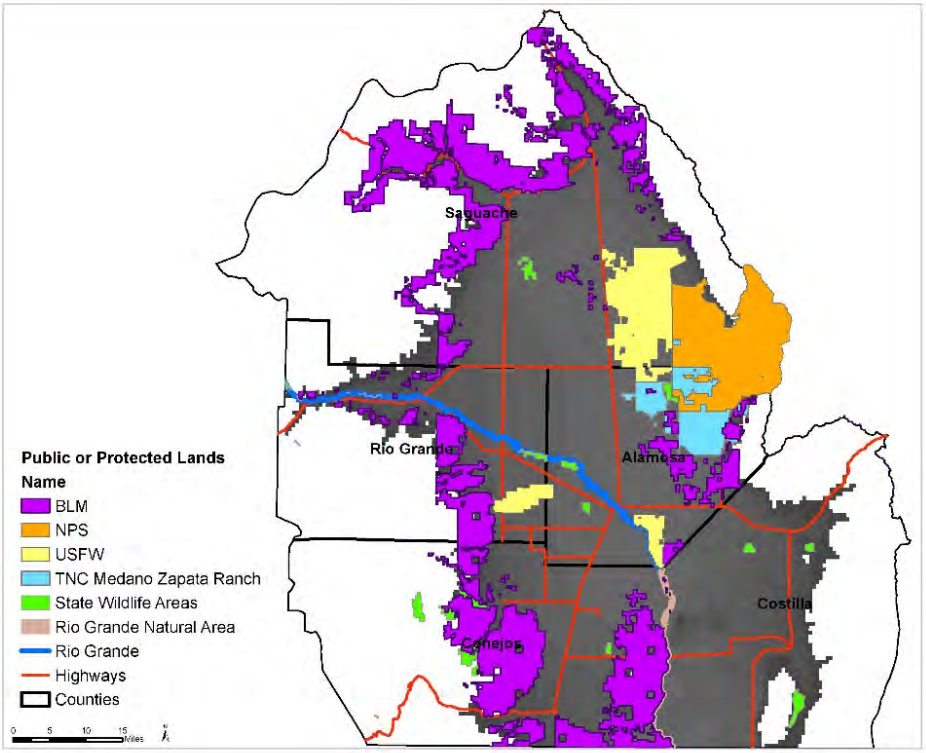

Figure 1. The 5 Counties comprising the floor of the San Luis Valley with public ownership

cooperative efforts with new partners was a key component to increasing conservation efforts throughout the SLV and sustaining limiting resources. Funding of the CWCB Water Plan Grant was a key factor in moving forward with several recommendations from that effort including working with new partners like the SLB, private landowners, and cooperative efforts across boundaries. The SLV WWCA identified priority areas where the historic hydrologic or aquatic extent has been lost. Many of the most significant declines in resources have occurred in Saguache County in the Closed Basin, which is an area north of the Rio Grande that is not surficially linked through hydrology to the Rio Grande or southern end of the SLV. Specifically, watersheds in Saguache County including San Luis Creek, Saguache Creek, and La Garita Creek and contributing tributaries have been most impacted by drought and ground water mining of the aquifer. These creeks meet at approximately the northwestern boundary of the Baca National Wildlife Refuge (Figure 2, Appendix II) which according to analysis in the SLV WWCA has lost nearly 75% of its aquatic resources (Figure 3, Appendix II; SLV WWCA 2019). A corridor of conservation exists along these creeks representing varied ownership including federal, state, and private lands

(Figure 2, Appendix II). The potential to work with a variety of agencies, organizations, and private landowners to promote water flow in historic drainages through restoration projects and cooperative agreements will help to restore not only instream flows but to reconnect the creeks to their floodplains, reduce declines in the water table, and improve resiliency throughout this area. Management of public lands such as Russell Lakes State Wildlife Area (RLSWA) within the Saguache and La Garita Creek corridor have promoted sheet flow across boundaries that has been beneficial to downstream users. A recent project by the Rio Grande Headwaters Restoration Project (RGHRP) to develop a Stream Management Plan (SMP) for Saguache Creek collected data in the Saguache Creek corridor upstream of the city of Saguache but did not include the downstream sites in this project area. This project used similar protocols as those employed in the SMP to determine aquatic health and identify landscape stressors and future locations for project work. These protocols were initially developed and utilized by CNHP and were used as a rapid assessment technique for sites included in this project. In order to promote consistency and comparability, general documentation of vegetation on each of the sites was accomplished by applying broad habitat types which complements mapping utilized in the SLV WWCA.

The hydrologic model developed by the Intermountain West Joint Venture (IWJV) and further developed through the SLV WWCA was ground-truthed during this project to test the accuracy of the model and its usefulness to help prioritize wetland areas for conservation efforts. The model was found to be accurate and effective in showing the extent of aquatic resources, especially those that are resilient during the driest drought years (period of 2000 to 2004 in the model). This effort confirms that the SLV WWCA GIS layer is a useful tool to help identify priority conservation areas and could be used by a wide variety of stakeholders for targeted conservation efforts.

Information gathered through this effort, including CNHP's EIA, inventory of habitats on SLB sites, habitat documentation, model ground-truthing, along with soils and topography, LiDAR information, and discussions with landowners were used to identify potential restoration projects on select sites. Based on results of the 2020 and 2021 field seasons, projects in the San Luis, La Garita, and Saguache Creek watersheds (Figure 4, Appendix II) were identified and discussed with associated landowners that expressed interest in future work to help promote more effective flood irrigation not only on their properties but across boundaries. These future cooperative restoration efforts, if funded and implemented, would contribute toward the reconnection of historic drainages that have been inconsistent in flow or seldom seen water in the last 20 years.

Location/Geographic Setting

The SLV is located in the Southern Rocky Mountains (SRM; Jodry and Stanford 1996) of the United States. Within the SRM are 34 intermountain basins, with the SLV representing one of the four major landforms that occur throughout the region. These basins are located at a variety of elevations within and between mountain ranges, characterized by a relatively flat rolling topography and an arid climate. Bailey (1994) describes the region as having one, large, general watershed. Adjacent watersheds include the Upper Colorado to the west and the Arkansas-White-Red to the east with boundaries defined by the San Juan Mountains and the Sangre de Cristo Mountains, respectively. However, within the SLV, topographic and geologic features have dictated surface water movement across the basin. A low alluvial terrace, formed by the Rio Grande as it flows east across the Valley floor, separates two large drainage basins: the open and closed basins (Figure 5; McCalpin 1996). The closed basin covers a drainage area of 7,644 sq km with water draining towards the 'sump' area near the Blanca Wetlands

Management Area. The San Luis, La Garita, and Saguache Creek watersheds (Figure 4, Appendix II) lie within the Closed Basin comprising a majority of the surficial water draining into the sump area. Water out-puts from the closed basin occur through groundwater infiltration, evaporation, transpiration, and the pumping of wells (Emery 1996). The open basin drains approximately 5,300 sq km and is drained by the Rio Grande and its tributaries south into New Mexico. The annual average water supply consists of spring snowmelt and precipitation, of which 1.5 million ac/ft is streamflow and 1 million ac/ft is precipitation on the valley floor. Approximately 445,000 ac/ft is delivered annually to the Stateline to meet Compact obligations to New Mexico and Texas (Emery 1971).

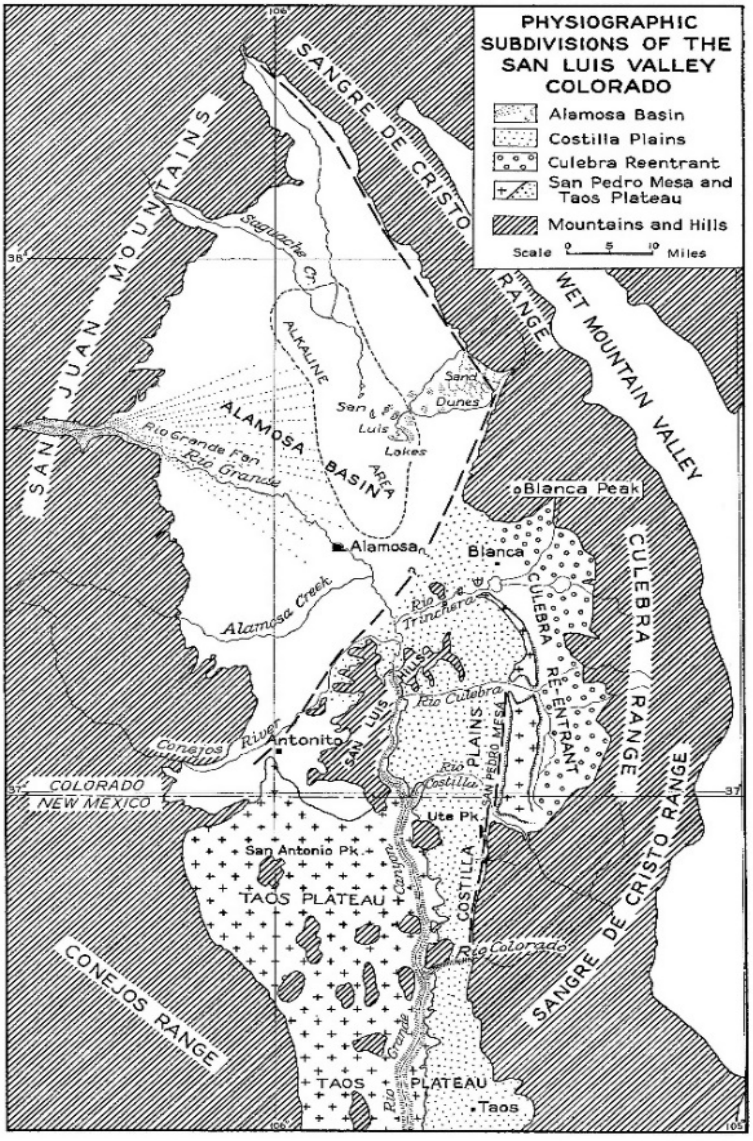

Figure 5. Physiographic subdivisions of the SLV, Colorado (Upson 1939).

Climate

The SLV is classified as a semi-arid cold desert with elevations ranging from 2286 to 2438 meters, with cold winters and moderate summers. The climate in the SLV is highly influenced by the surrounding

mountains which generates large variations in daily temperatures, low humidity, and precipitation patterns (Rogers et al, 1992). The Valley floor receives most of its precipitation during the monsoons in July and August with an annual accumulation of up to 20 cm, or 60% of the annual precipitation. Long-term precipitation data from Saguache, Del Norte, and Manassa, Colorado suggest that alternating low and high precipitation cycles recur at about 20- to 30-year intervals. Dry periods in the long-term precipitation pattern occurred in the 1890s, 1930s, early-1950s, early-1970s, late-1980s, and mid-2000s (Thomas 1963). The mountains receive most of its precipitation during the winter months as snow which provides the majority of surface water inputs to the SLV. The growing season is short and variable, ranging from 90 to 120 days from late May to mid-September (Emery 1979).

Hydrology

The thick basin-fill deposits of interbedded clay, silt, gravel, and volcanic rock form two main aquifers (confined and unconfined) in the SLV (Burroughs 1981, Wilkins 1998, Hanna and Harmon 1989). The two aquifers are separated by a confining layer of discontinuous clay beds and volcanic rocks (Emery et al. 1973). The unconfined alluvial aquifer sits just below the surface to a depth of about 40+ feet. Natural recharge to the unconfined aquifer occurs from infiltration of local precipitation along the margins of the SLV, infiltration of surface water from natural stream channels (i.e., Saguache Creek and San Luis Creek), inflow of groundwater from the San Juan and Sangre de Cristo Mountains, and upward leakage of groundwater through the confining bed (Powell 1958, McGowan and Plazak 1996, Stanzione 1996). The confined aquifer occurs below the unconfined alluvial aquifer and consists of an active and passive zone. Along the periphery of the SLV, the unconfined and active confined aquifers are directly connected hydraulically. The active confined aquifer is up to 4,000 feet below the land surface. Recharge to the confined aquifer occurs along the fault lines or margins of the SLV from infiltration of precipitation, infiltration of surface water, and inflow of ground water from the adjacent San Juan Mountains.

Riverine Systems

The Rio Grande enters the SLV near Del Norte, Colorado and flows to the south and east along the southern boundary of the Rio Grande alluvial fan (Figure 5). The river takes a more southerly direction at the town of Alamosa, Colorado where a low topographic and hydrologic divide (Powell 1958) historically stretched from the northern edge of the Rio Grande Alluvial fan to eight miles east of Alamosa and north to Blanca, which separated the Rio Grande floodplain from the Closed Basin to the north (Leonard and Watts 2008). Some current information indicates that the hydrologic divide that historically prevented hydrologic connectivity between the Rio Grande and areas to the north no longer exists due to ground water extraction, however, the divide may be reformed should the aquifer be restored to sustainable levels (Davis Engineering 2007). The entry of the Rio Grande into the SLV is bounded by a low elevation terrace on the south and west, which caused the channel to actively migrate, or “avulse” to the northeast of the town of Monte Vista, Colorado, and created a floodplain 200 to 300 times the width of the current average river channel width (Jones and Harper 1998). After turning south in Alamosa, Colorado, the Rio Grande floodplain is confined to the east by Hansen's Bluff (Jones and Harper 1998) and continues to the Stateline with New Mexico.

Historically, the Closed Basin of the SLV received surface water inputs from creeks originating in the Sangre de Cristo and San Juan Mountains and from limited onsite precipitation. The mountain creeks that drain into the Closed Basin are derived from a combined watershed drainage area of about 4,662

km^2 (Leonard and Watts 1989). Water from creeks originating in the Sangre de Cristo Mountains historically emptied into San Luis Creek and terminated in the Lower Sump area on the Blanca Wetlands Management Area. Saguache and La Garita Creeks originated in the Cochetopa Hills and La Garita Mountain areas, respectively, of the San Juan Mountains (Figures 2 and 4, Appendix II). South and east of Saguache, Colorado, Saguache Creek lacks a single distinct channel with surface water flowing across the land surface as winter sheetflow in large snowpack years. This water temporarily and shallowly flooded shrublands and grasslands as it flowed toward San Luis Creek (Hopper et al. 1975). La Garita Creek flowed from the west with tributaries, Russell Creek, and the Bell Arroyo, converging on Mishak Lakes to meet up with Saguache and San Luis Creeks on what is now the Baca National Wildlife Refuge (Figure 2, Appendix II). Flows from La Garita and Saguache Creeks have been measured near the San Juan Mountain foothills where some creek water infiltrates to recharge SLV aquifers (Anderholm 1996), consequently the historic amount of surface water in these creeks at the confluence with San Luis Creek is unknown. San Luis, La Garita, and Saguache Creeks historically were perennial drainages except during drought and low snowpack years (Anderholm 1996). Sediments carried by Saguache and La Garita Creeks, that originate in the San Juan Mountains, are different than those in creeks that originate in the Sangre de Cristo Mountains which carried large volumes of sediment during the relatively short, but high discharge, peak flows in late spring, commonly creating sediment deposition and scour areas (Madole et al. 2008). Sangre de Cristo creeks may have been perennial in portions of their course, such as Cottonwood Creek, but often did not have enough flow to reach San Luis Creek, in part because some creek water infiltrated and recharged local aquifers along the alluvial fan of the mountains. Monsoonal rains in July and August can produce flash floods in these creeks creating a secondary but lower than spring peak flow (USGS mean monthly streamflows).

Wildlife

The SLV is identified as one of the Intermountain West Joint Venture's (IWJV) priority landscapes and lies within Bird Conservation Region 16 (Southern Rockies/Colorado Plateau); is a geographic area of emphasis for spring and fall migration, breeding, and wintering waterfowl along with other species of concern such as the greater sandhill crane and threatened and endangered species in the Colorado Strategic Plan for the Wetland Wildlife Conservation Program (SSWRC 2011; CSWAP 2015); and an "emphasis area" in the Ducks Unlimited (DU) Colorado Conservation Plan (1997) and its International Conservation Plan (2005). Recent studies and further GIS modeling by the IWJV indicate that the SLV is a significant and highly important landscape both during spring and fall migration as it acts as a bottleneck for the entire Rocky Mountain Population (RMP) of greater sandhill cranes on their migrations to breeding and wintering grounds (Donnelly et al. 2021). The SLV is also an IWJV priority landscape for other priority bird species including neo-tropical migrants, secretive marshbirds, colonial nesting waterbirds, and other wetland dependent waterbirds. The SLV is the southernmost significant waterbird production area in the Central Flyway and the most important waterfowl production area in Colorado and is facing severe stress as identified in a Landscape Integrity Model for wetlands developed by the Colorado Natural Heritage Program (CNHP; Lemly et al 2011). The federally threatened Gunnison Sage-Grouse (*Centrocercus minimus*; GUSG) Poncha Pass population occurs within the upper San Luis Creek watershed with lekking and nesting areas occurring on sagebrush uplands to the east of San Luis Creek. The creek and tributaries provide important GUSG brood rearing habitat during the summer.

Rio Grande suckers (*Catostomus plebeius*) are a special species of concern and a Colorado endangered species and the Rio Grande Chub (*Gila pandora*) are a species of concern in Colorado that have been

found in areas of San Luis Creek. Backwater sloughs and permanently flooded wetlands that are adjacent to the creek provide important resources for fish that require brood rearing areas that are sometimes connected to the creek. Riparian habitat along the creek contains a variety of instream habitats including sandbars, banks, and forested/shrub species that shade the creek, creating a diverse suite of conditions for these species.

Anthropomorphic Changes

Alterations to hydrologic regimes throughout the Intermountain West, including the SLV, have been the greatest factor in the decline in health of wetland and riparian areas (Laubhan 2004). Changes in wetland and riparian hydroperiods resulted from the diversion of water from the Rio Grande and its tributaries along with Rio Grande Compact (Compact) requirements, and the installation of groundwater wells and other water-control infrastructure in the SLV that captured and diverted groundwater discharge and drainage. As center pivot sprinklers became the primary type of irrigation for crops, surface irrigation declined in practice. Currently, prolonged drought, changes in agricultural practices (sprinklers, fall tilling, etc.), groundwater pumping leading to mining of the aquifer, earlier peak runoff, and changes in ditch administration related to augmentation for groundwater sub-districts have negatively affected regional hydrology and ecology of wetlands (Cooper and Severn 1992). As a result, floodplain soils adapted to maintaining high water tables (Hubert 2004) have become dry and no longer act as a buffer to dry climatic conditions.

Groundwater Rules and Regulations (Rules) for Division 3 (the Rio Grande Basin or SLV) Water Resources were initiated in the mid-2000's coinciding with a large modeling effort (Rio Grande Decision Support System – RGDSS) and the development of 6 sub-districts within the region. The focus of this project lies in the San Luis Creek and Saguache Creek sub-districts. These Rules aim to maintain obligations of the Rio Grande Compact, protect senior surface water users, and recover and sustain regional aquifers. As part of the promulgation of these Rules, modeling and monitoring of the aquifer and stream levels would determine the impact from pumping on each river and the sustainability of the aquifer in the SLV for each sub-district. As water tables have continued to diminish, the ability to move water through the soil decreases and becomes slower due to a lack of capillary action (Miller and Turk 1943). Continued low flows in rivers and creeks along with declining groundwater resources inhibits water tables from responding quickly to capture spring snowmelt and precipitation events.

Other changes to riparian and wetland habitats have occurred resulting from changes in the landscape for urban development, construction of roads, and public land management. Climatic conditions, land-leveling, livestock stocking rates, seasons of use, and duration of grazing are a few factors that have impacted the natural function of wetland and riparian areas. These factors vary over time and by location. The establishment and placement of roads, levees, ditches, and water control structures have greatly affected the hydrologic flow within these areas (Zeedyk and Clothier 2009). Many roads and levees are placed parallel to rivers and creeks within the floodplain, intercepting natural hydrologic flow and altering wetland function along with providing large amounts of sediment through erosion (Zeedyk and Clothier 2009, Niemuth et al 2004). Over a century of alterations and use along the rivers and creeks have highly altered the system such that many areas no longer function naturally and may not function at all.

Exportation of water from the SLV has been an ongoing concern since the early 1990's. Water exportation proposals typically entail moving water from the SLV to supply water to fast growing urban

areas along the densely populated front range of Colorado. Thus far, efforts to export water have been thwarted by the SLV community. The demand for water resources increases as drought conditions persist across the state and front-range and as metropolitan populations increase. As the expense of augmentation and sustainability required by sub-district Rules to agricultural users increases, the prospect of selling water rights may become more attractive to landowners. Over the last 5 years renewed discussion about exporting water from the SLV to the front range has resurfaced. Renewable Water Resources (RWR) has purchased a ranch (2018) in the northern end of the SLV, adjacent to the Baca NWR, in the hopes that they will be able to utilize water rights on their ranch and acquire other water rights to export 22,000 ac/ft of water to the south-metro Denver area. RWR has proposed a plan to Douglas County (potential recipient of water) to export water from the SLV to meet their future needs.

Climate Change

Models in the Rio Grande Basin Implementation Plan indicate that future stream flows could decrease on average by 30%; perhaps exacerbated by the effects of dust on snow coupled with climate change that will lead to earlier spring runoff (two weeks earlier due to dust, 3 weeks earlier due to warmer temperatures; Deems et al. 2013 model). Studies indicate that spring runoff will be earlier, precipitation will decrease, and evaporation will increase which will result in reduced streamflow, increases in stream temperatures, increased evaporation that will lead to the need for an increase in agricultural water needs, along with reduced recharge of the aquifers and lower groundwater tables. The Upper Rio Grande Assessment study of climate change on the SLV (Dagmar and Vaddey 2013) indicates that by 2100 flows will decrease by about 30% from Del Norte to Ortiz and by 50% at the Rio Grande near the Lobatos gage southwest of the town of San Luis. Stream gage data from Del Norte (Figure 7, Appendix II) shows the declining trend in Rio Grande flows from 1891. Competing uses for water will be one of the biggest threats to wetland and riparian habitat for wildlife in the Intermountain west (North American waterbird Conservation Plan).

Methods

This project employed many methods that have and are currently being implemented across the SLV to allow for comparisons across sites. Some methods were developed to determine the accuracy of GIS models to prioritize limiting resources, specifically surface water extent during the spring and fall as well as resiliency. Biologists met or spoke with all private landowners and SLB lessees to gain a better understanding of the site, past management, infrastructure concerns, and gauge interest in future project or restoration work to promote water delivery efficiency and management.

Site Location

Site locations were initially identified based on several factors using ArcGIS including the SLV WWCA hydrologic extent model and COMAP layer of conserved private lands, among others. Factors for site location included:

- Properties with a private land conservation easement or State Land Board property located within the northern SLV.
- A historic and/or current drainage located within the property.
- On-the-ground confirmation of the hydrologic extent (2013 to 2017 period) identified in the SLV WWCA as a priority for providing limiting resources (e.g. early spring migration habitat).
- Lands were located within a corridor of conservation that would help link aquatic habitats from one priority area to another.
- And/or lands were managed by new partners that could be brought into the cooperative effort to restore and conserve priority habitats as recommended in the SLV WWCA.

When the above criteria were met, a small area was selected and evaluated using a rapid assessment of wetland values (see EIA-AAs below). A total of 13 properties were identified for the fiscal year 2021 field season (fall of 2020) and 18 properties for the fiscal year 2022 field season (fall of 2021). This report details results from all 31 properties visited during both field seasons; a total of 19 properties were evaluated and 12 were excluded as they did not meet the criteria outlined above. The 12 excluded properties were SLB lands, 3 in the La Garita Creek watershed, and 9 in the Saguache Creek watershed. The 19 sites evaluated were located on private lands, SLB, BLM, and a TNC property (Table 1; Figures 6a and 6b). A total of 22 sites were evaluated on the 19 properties; 3 properties had two sites evaluated.

Table 1. Total of 22 sites studied by ownership and watershed in the northern SLV

Ownership/ Easement Holder	Watershed	# of Sites
Bureau of Land Management	La Garita Creek Tributaries	1
Private Land	La Garita Creek Tributaries	3
	Saguache Creek	2
	San Luis Creek	5
State Land Board	La Garita Creek Tributaries	3
	Saguache Creek	5
	San Luis Creek	2
The Nature Conservancy	La Garita Creek Tributaries	1

There were 10 private land conservation easement sites, 10 SLB sites, 1 BLM site, and 1 TNC site studied. Sites were visited August-October 2020 and 2021.

Ground truthing of Assessment Model

Biologists created geo-referenced pdf maps that included the boundaries of the properties along with other pertinent information such as roads and creeks and the SLV WWCA hydrologic extent layer from the 2013 to 2017 period. During the site visits a mobile app, Avenza, was utilized to help determine the accuracy of the SLV WWCA model. The app allows the user to 'see' exactly where they are on the map/property so that as you pass in and out of hydrologic extent it is immediately evident if the model was accurate based on existing surface water and/or presence of vegetation that would indicate surface water extent during a different time of year. Since biologists visited properties in the fall, extent of spring flooding was extrapolated based on biologist's experience in these systems, vegetation, high water marks, and discussions with landowners.

A new model provided by the IWJV also was ground-truthed on the same properties to determine its ability to accurately show where sites are gaining, maintaining, or losing surface water over time.

EIA – AAs

The CNHP Colorado Wetland Ecological Integrity Assessment (EIA) was utilized on 19 of the 31 properties visited in 2020 and 2021 (Figure 6b, Appendix II). The EIA is a rapid assessment that includes landscape, vegetation community, hydrology, and aquatic indicators, along with a stressor checklist. Each EIA includes one specific AA at each site that looked more closely at specific conditions within a smaller area (approximately 1.2 acres). These AA locations were selected by biologists within the landscape at each site while meeting the following criteria:

- The area was within an historic or current drainage that may or may not be wet or have a distinct channel.
- The area was within the SLV WWCA layer providing surface water during spring and/or fall migration during the 2013 to 2017 period.
- The area contained some native vegetation consistent with wetland/riparian areas.

If there were no locations within the property that met the criteria, an AA or EIA were not completed. After the AA was chosen biologists setup a midpoint and recorded the location with GPS. A biologist then put a flag at four locations a consistent distance from the midpoint (40 meters) in the cardinal directions, making a circle with a 40-meter radius and GPS'd the points. Figure 8 is an example of one of the AAs completed. Photos were taken at each flag point toward the midpoint from each flag (cardinal direction). The EIA form was filled out for each AA. A minimum of one AA per property was completed. Biologists completed the stressor and landscape checklist at the computer with Google Earth and ArcGIS Pro in order to accurately measure distance to some structures e.g. roads, buildings, etc.

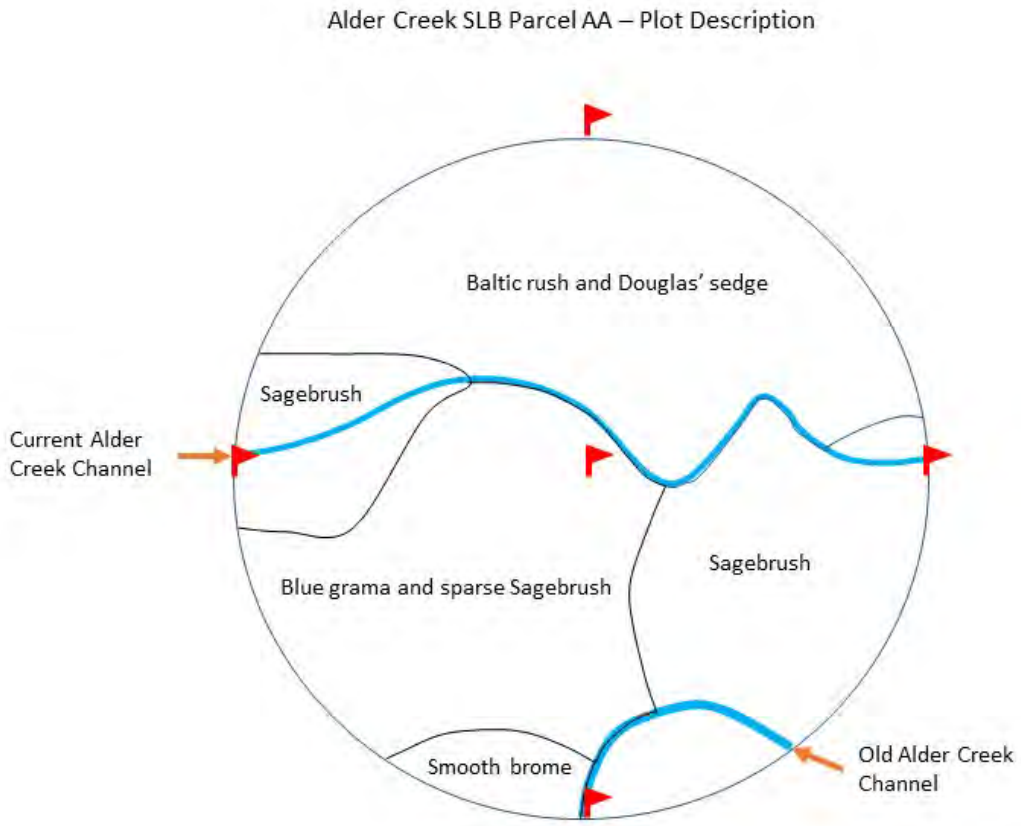

Figure 8. Example diagram of an AA and documentation of site characteristics.

Habitat and Wildlife

A general habitat description was completed for each of the properties. A plant species list and vegetation classification were documented for all AAs while completing the EIA. The plant list used National Vegetation Classification System (NVCS) codes and alliances so that vegetation at sampling locations may be comparable to public lands and some private lands that have been mapped in a similar way throughout the SLV. In addition, the canopy and vegetation structure of riparian areas were categorized using the Hink-Ohmart classification method. The Hink-Ohmart classification is a standard

vegetation method used during official surveys for the endangered southwestern willow flycatcher (SWFL) in the SLV. Finally, as many wildlife species are indicators of the quality and health of habitat, unique or interesting birds and wildlife observed during the survey were noted for each site.

Future Restoration Identification

During site visits, biologists took photos and GPS'd locations where water control infrastructure were in a poor or failed condition and noted on maps locations for potential work. Discussions with private landowners and SLB lessees helped to identify past work and areas where water delivery was difficult or impossible. After the field season biologists used GIS mapping and points to locate potential projects and prepare brief summaries for future work.

Tasks 1 & 2: San Luis Valley Aquatic Habitat Inventory (FY21&FY22)

Site Descriptions

The following site descriptions give a general overview of each of the 19 properties evaluated where 22 AAs were placed during fall of 2020 and 2021. Staff decided not to assess the aquatic resources on 12 of the SLB properties and in one location on the Meadow Ranch DU conservation easement after visiting the property and determining that it did not fully meet the parameters of the study. These properties either lacked a distinct channel and/or surface flow with water spreading across the landscape as sheet flow or changes in management had altered conditions that prevented assessment of aquatic resources. Table 2 (Appendix I) provides a complete list of all SLB properties visited with legal description, watershed location, and the name of evaluated EIA AA. Appendix III shows an example photo of each site assessed in the EIA AA by watershed.

San Luis Creek

A total of 5 properties were visited within the San Luis Creek corridor. These properties all contained either a tributary of San Luis Creek and/or the mainstem of San Luis Creek (Figure 6a, Appendix II).

Oxcart Ranch

The Oxcart Ranch is a CCALT conservation easement that contains the mainstem of San Luis Creek lying along a portion of the eastern boundary. Two creeks flow onto the Ranch and into San Luis Creek; Clover Creek from the west and Swindinski Creek from the east. Hwy 285 bisects the Ranch, northwest to southeast. The Ranch contains sagebrush and rabbitbrush uplands, riparian areas dominated by willow along the creek corridors, and wet meadows. An AA was conducted along San Luis Creek on this property (Figure 6a, Appendix II).

Alder Creek SLB

The Alder Creek SLB property lies immediately adjacent and south of the Oxcart Ranch and is also bisected by Hwy 285. Alder Creek flows in from the west across this property and connects with San Luis Creek on private land just beyond the SLB boundary. Habitat is similar to the Oxcart Ranch. An AA was conducted along Alder Creek just upstream from the confluence with San Luis Creek (Figure 6a, Appendix II). The Alder SLB property contains an inactive gravel pit and parking lot to the east of Hwy 285. This site is directly adjacent to and west of BLM land around Decker Creek near where the only known active lek site for the federally threatened Poncha Pass population of Gunnison Sage-Grouse (GUSG) exists.

Riparian areas throughout these properties provide important brood-rearing habitat for GUSG. The photo on the right of a GUSG brood was taken along San Luis Creek in 2019 near the Alder SLB property.

Gunnison Sage Grouse brood utilizing riparian area in the Northern San Luis Valley.

Slash LD Ranch

The Slash LD Ranch lies further to the south and almost entirely to the east of Hwy 285 in two different parcels, east and west of the Rock Creek SLB property and is currently being considered for a conservation easement (Figure 6a, Appendix II). The valley bottom begins to widen at the northwest corner of the ranch where San Luis Creek enters the property and continues along the western boundary of the western property while Rock Creek flows along the northeastern portion of the western property. Eaglebrook and Butterfly Creeks both flow from the east onto the northeast corner of the eastern property and then onto the Rock Creek SLB property, joining Rock Creek. The Slash LD and Rock Creek SLB properties contain large expanses of wet meadow habitat, sagebrush and rabbitbrush uplands, and some riparian. Riparian areas dominated by willow species exist along San Luis Creek but are not present along the other creeks. Creeks flowing in from the east are not typically confined to a single channel but sheet flow across the landscape towards San Luis Creek. Creek water is diverted through small ditches across the irrigated wet meadows. Two AAs were completed on the Slash LD Ranch to adequately assess the different drainages; one was located near San Luis Creek and the other near Neiland Creek (Figure 6a, Appendix II). One AA was conducted on the Rock Creek SLB property on Rock Creek.

Fullenwider Ranch

The Fullenwider Ranch is a CCALT conservation easement directly adjacent to and south of the Slash LD and Rock Creek SLB properties (Figure 6a, Appendix II). San Luis Creek is not defined by a distinct channel but sheet flows across the valley bottom on the west side of the property at the toe of the bench and Hwy 285. Rock Creek flows along the eastern boundary, also lacking a distinct channel. Several springs exist on the property along the toe of the eastern bench. A Partners for Fish and Wildlife project was completed in the 1990's which developed some ponds and created some levees downstream of the driveway and house. Habitat on this ranch consists of wet meadows and rabbitbrush uplands. Very little if any willow exists in this area, partly due to the lack of defined channels and a wider valley bottom. Two AAs were located on this Ranch; one in the valley bottom of San Luis Creek and one near Brook Creek.

La Garita Creek and Tributaries

Davey Ranch

The Davey Ranch DU conservation easement lies between Hwy 285 to the west and RLSWA to the east (Figure 6b, Appendix II). Russell Creek historically flowed through the property supported by a natural spring which has since dried up. Surface and groundwater wells now provide water through this drainage which lacks a confined channel, shallowly sheet flowing from west to east. The ranch contains seasonal wetlands, wet meadows, and greasewood uplands. One AA was completed near the historic drainage of Russell Creek (Figure 9, Appendix II).

Russell Creek SLB properties

There are four SLB properties directly to the east of Russell Lakes SWA that are dominated by greasewood uplands with some dune benches. The northern SLB property, we identified as RC1 for Russell Creek 1, contains a small portion of the Werner Arroyo flowing to the southeast towards other SLB properties (Figures 6b and 10, Appendix II). The middle two SLB properties lack any historic creek channel and are primarily greasewood uplands, dune benches, and some salt flats. These properties were visited but no AAs were completed as they did not meet the outlined criteria. The fourth SLB property, RC4, contains a portion of the historic Russell Creek drainage that flows within what appears

to be several distinct channels along the southern boundary. Winter sheet ice and sheet flow from Russell Lakes SWA moves through this area and significantly impact the water resources available through this area. Greasewood uplands exist throughout most of the property with wet meadows along distinct channels and wetland plants growing within the stream channels which are commonly dry throughout the late summer and fall.

Corzine Ranch

The Corzine Ranch DU conservation easement lies to the south of Russell Lakes SWA and to the east of Hwy 285 (Figure 6b, Appendix II). Historic flows from La Garita and/or Carnero Creek would have flowed in a sheet flow manner across the ranch, eventually flowing into the Russell Creek drainage. Some surface water and groundwater wells maintain the seasonal wetlands and wet meadows that currently exist across the ranch. Greasewood uplands dominate the eastern portion of the ranch. An AA was completed in the southwestern corner of the Ranch in a wet meadow that lacked a discrete channel but was within the historic drainage of the creeks (Figure 11, Appendix II). One SLB property lies adjacent to the southeast of the ranch. This property also lies within the area that would have received sheet flow from La Garita Creek. This SLB property was visited and contains some wet meadows and greasewood uplands, however, and AA was not completed on this property as it did not meet all of the criteria listed above in the EIA-AA section.

Meadow Ranch

The Meadow Ranch DU conservation easement also lies within the historic La Garita creek watershed (Figure 6b, Appendix II). The Ranch historically has maintained wet meadows, seasonal wetlands, and semi to permanent wetlands. These resources have been sustained by groundwater wells. Due to Groundwater Rules and Regulations being promulgated, wells that traditionally flowed around 500 cfs were turned down recently to less than 50 gpm in many areas. This is a large 5,200-acre ranch and 2 AAs were planned to be done on this easement. The reduction in groundwater well artesian flow has negatively impacted available water and the surrounding habitat. As a result, one of the potential sites of interest was not assessed. One AA was completed in the northwest corner containing a wet meadow and small permanent wetland sustained by a well flowing under 50 gpm (Figure 12, Appendix II). Although this AA site did not fit neatly into our general guidelines of determining sites to be assessed, it represents a type of wetland resource that may become limited and more important in the future given the establishment of and compliance with groundwater rules. Greasewood and rabbitbrush uplands dominate the majority of this ranch with some salt flats, and saltgrass and other salt tolerant grasslands.

Mishak Lakes

Mishak Lakes lies to the east of SLB the properties on Russell Creek and north of the Meadow Ranch. The site is comprised of many playa basins that exist at the historic confluence of La Garita Creek, Russell Creek, and the Werner Arroyo. Historically this area would have maintained some permanent water flow with periods of inconsistency or drought based on climatic conditions. This site contained a small lake and a few ponds and was included as part of a waterfowl breeding population survey in the 1960s and identified as a 'high concentration area' for waterfowl (Hopper et al, 1975). The SLV WWCA indicates that this area was very wet during this time and although some of the smaller basins appear to be resilient, a majority of the wetland habitat including the lake and ponds have been lost (Figure 13, Appendix II). The property is made up of several different ownerships; BLM, TNC, and a private land conservation easement. Little to no management occurs although there was some indication that grazing may intermittently occur in some areas. Two AA's were completed, one on the Russell Creek

drainage on BLM land in the northwest corner and one within the historic lake/playa system of La Garita Creek on TNC land. In general, this landscape system remains fairly intact with remnants of wetland plant species such as spike rush but is lacking historic surficial water flow due to drought, ground water mining, and lack of surface flow through the historic drainages. Greasewood and rabbitbrush uplands dominate the majority of the area outside of creek channels and playa basins.

Brown SLB

The Brown SLB property is the southernmost property of many contiguous SLB properties along Hwy 17 and Saguache Creek (Figures 6b and 9, Appendix II). This property encompasses the confluence of La Garita creek and Saguache Creek and lies on the western boundary of the Baca NWR within the Close Basin Project. Historically this area would have received surface flows from La Garita Creek and potentially Saguache Creek depending on the myriad sheet flow paths taken by the creek. The current lessee has been on the property since the 1960s and doesn't remember flows reaching this area since that time. There are about 20 horses that graze the property during the fall and winter. The Closed Basin Project built several roads, fences, and gates on this property that are maintained to allow access to wells associated with the project. The AA was located in one of several distinct channels with fairly steep banks in the central portion of the property (Figure 14, Appendix II). Greasewood and rabbitbrush uplands dominate the majority of the uplands with little to no herbaceous cover while the channels are characterized by weeds and non-wetland plant species.

Saguache Creek and Tributaries

Hill SLB

The Hill SLB property contains a portion of Saguache Creek and this property was the most upstream Saguache Creek property included in this study (Figure 6b, Appendix II). The creek, although no longer perennial at this location, still maintains a distinct channel with riparian vegetation. Saguache Creek sites visited downstream of the Hill SLB do not contain riparian vegetation. The property has been grazed with cattle at various AUMs annually. There are 5 main ditch diversions off of the creek on this property although there does not appear to be any water rights associated with the property itself (Figures 15 and 16, Appendix II). Greasewood and rabbitbrush dominate upland sites, meadows have been planted with a variety of grasses, and some willow exists along the creek banks.

The Saguache Creek Ranch CCALT conservation easement lies along Saguache Creek (Figure 6b, Appendix II). Historically Saguache Creek would have flowed across a majority of the Ranch in various channels and flooded wetland areas throughout its floodplain. Through changes in management over time, the creek has become more of a ditch through this property with little to no riparian habitat although flood irrigation has maintained a variety of wetlands in the historic floodplain of the creek. Groundwater wells add to the adjudicated Saguache Creek surface water rights that maintain the Ranch. The Ranch is grazed and hayed annually. In 2021 the north end of the ranch was fairly dry which has not happened in the past according to the owners. Two AAs were completed, one in an old drainage that now resembles a backwater slough in the central portion of the ranch and one in an irrigated meadow adjacent to what would be Saguache Creek (Figures 6b and 17, Appendix II). Although the AA site near the old creek channel did not fit neatly into our general guidelines of determining sites to be assessed, it is in a highly resilient area and it represents a type of wetland resource that may become limited and more important in the future given the establishment of and compliance with groundwater rules.

Cloud Crest SLB

The Cloud Crest SLB property lies south of the Saguache Creek Ranch on the Bell Arroyo. This property has at least one artesian well on it and contains a fairly distinct channel with no water rights. The lessee may put 20 pairs of cattle for a few months in the summer on the property but it depends on the condition of the property. No cattle were on the property for several years due to drought conditions. One AA site was located in the dry creek channel on the eastern portion of the property (Figure 18, Appendix II). The landscape and creek channel have had little to no modification, lack of surface flow and lowered groundwater tables appear to be the only change. A majority of the property is dominated by greasewood and rabbitbrush with some herbaceous plant species although noxious weeds are present in the dry creek beds.

Saguache Creek SLB properties

There were 12 SLB properties visited along Saguache Creek and Hwy 17. Three properties and sites were chosen to include in the study that met the criteria established for AAs (one other downstream property was placed in the La Garita watershed group; Figures 6b and 19, Appendix II). Historically Saguache creek would have flowed through many of the properties and flooded playa basins and wetlands most years (Figure 3, Appendix II). Flows from the creek now rarely if ever make it to this area. Several small artesian wells occur throughout the properties along with Closed Basin Project (CBP) wells. There are several well-maintained roads associated with the CBP. Progressive Financial Services leases the northwest properties in this group and subcontracts out their lease to Joey Quintana who owns the adjacent ranch. The property has been grazed annually since 2017 and big game hunters have been allowed access in the fall for elk hunting. The creek has been altered on this property with water control structures, levees, and other infrastructure. Several of the levees and structures have failed and don't appear to be in use. The AA was located in the northwest corner of the property within the creek channel and near some modifications (Figure 20, Appendix II). The following two downstream AAs were located on properties leased by Bob and Judy Bunker (Figures 19 and 21, Appendix II). Over the years due to drought conditions the lessees have reduced their herd to 12 pairs and have at times not grazed the properties in order to maintain the long term health of the land. This reduction in grazing pressure is apparent as these properties are in good condition. Hydrology of the creek has been altered in these properties due to the well maintained CBP road that crosses the creek several times. Vegetation is similar among properties with greasewood and rabbitbrush dominating uplands with some herbaceous grasses and dry creek beds containing some grasses, a few wetland plant species, and some noxious weeds.

EIA

A total of 22 AAs/EIAs on 19 distinct properties were completed. Not all properties visited had an AA or EIA completed due to not meeting all the criteria for the AA. Properties where an AA was not conducted were on SLB lands that did not contain a distinct channel or surface flowing water to provide aquatic resources. These SLB properties were all located along Saguache Creek or between the Werner Arroyo and Russell Creek in the La Garita Creek watershed (Figure 6b, Appendix II).

There were three different ecological systems that described the 22 different AAs within three watersheds; Inter-Mountain Basin Greasewood flat (IBGF), Irrigated Wet Meadow (IWM), and North American Arid West Emergent Marsh (EM; Table 3). The IBGF is described as a 'Shrubland with >10%

Table 3. Total of 22 sites studied by watershed and ecological system in the northern SLV

Watershed	Ecological System	# of Sites
San Luis Creek	Irrigated Wet Meadow	7
Saguache Creek	Irrigated Wet Meadow	1
	North American Arid West Emergent Marsh	1
	Inter-Mountain Basin Greasewood Flat	5
La Garita Creek	Irrigated Wet Meadow	3
	Inter-Mountain Basin Greasewood Flat	5

total vegetation cover, located on flats or in temporarily or intermittently flooded drainages. Vegetation dominated by black greasewood (*Sarcobatus vermiculatus)* and four-wing saltbush or other species (*Atriplex spp*.) with inclusions of Alkali sacaton (*Sporobolus airoides)*, western wheatgrass (*Pascopyrum smithii)*, inland saltgrass (*Distichlis spicata)*, Nuttall's alkali grass (*Puccinellia nuttaliana)*, and common spikerush (*Eleocharis palustris)* herbaceous vegetation (Gilligan and Lemly, 2015). There were a total of 10 sites that were designated as IBGF, all but one of the sites (BLM) were located on State Land Board sites in the Saguache and La Garita Creek Watersheds. The IWM, or 'large herbaceous wetlands associated with a high-water table that is controlled by artificial overland flow (irrigation)' characterized 11 of the sites. IWM AA Sites typically lacked prolonged standing water but may have standing water early in the season if water levels are very high. Vegetation is dominated by native or nonnative herbaceous species: graminoids have the highest canopy cover. Species composition may be dominated by nonnative hay grasses (Gilligan and Lemly, 2015). All of the San Luis Creek AA sites were in the IWM along with one site in Saguache Creek and 3 in La Garita Creek watershed. AA Sites located in both systems may or may not have included a defined creek channel, however, the larger landscape was indicative of a wet meadow system that is artificially irrigated with creek flows managed based on available water rights. The EM is described as herbaceous wetlands with persistent, deep standing water at or above the surface at some point in the growing season with managed or artificial hydrology that may be drawdown. These systems are located in floodplains within oxbows or sloughs. Vegetation is dominated by species of cattail (*Typha*), bulrush (*Schoenoplectus)*, baltic rush (*Juncus*), spikerush (*Eleocharis*), and sedge (*Carex)*. This ecological system only occurred in one location on the Saguache Creek Ranch in an area that maintains fairly stable water conditions within the historic floodplain of Saguache Creek.

EIA data collected during the field visits were used to calculate scores for landscape, condition, size and overall ecological integrity in the three watersheds (Tables 4, 5, 6, and 7, Appendix II). Landscape rankings were calculated from the Landscape and Buffer Metrics. The Condition ranking was calculated from the Vegetation, Hydrology, and Physiochemistry metrics. Overall Ecological Integrity is calculated by combining Landscape and Condition ranks and finally size is included for the Overall Ecological Integrity + Size Rank (see Appendix IV for score sheets). The CNHP EIA scorecard calculates metrics numerically and then converts them into letter grades on the 4.0 scale. Tables and graphs may reflect the 4.0 scale or actual letter grades as depicted.

Results indicate that the AAs had an overall ecological integrity range of C+ to B+, with most being in the B range. All ranks were positively improved by adding the size metric such that overall scores ranged B- to A+ (Table 4; Figure 22). In general, metrics that related to landscape and size had better scores than

did site specific categories such as vegetation, hydrology, and condition. Conservation easements and SLB lands incorporated into this project were for the most part properties that were a piece of a much larger, mostly intact landscape, that are generally managed to provide range for grazing and/or hay for livestock. The large size of the properties in a mostly intact landscape were an important factor in the high overall scores. Properties of this size are buffered well from outside impacts and scored high in relation to conservation value due to this buffering effect.

Table 4. EIA AA Category and Rank

EIA Category	A+	A	A-	B+	B	B-	C+	C	C-	D	Average Rank
Overall Ecological Integrity Rank	0	0	0	9	1	5	7	0	0	0	B
Overall Ecological Integrity + Size Rank	10	0	4	6	0	2	0	0	0	0	A-
LANDSCAPE CONTEXT	2	0	7	10	0	3	0	0	0	0	B+
LANDSCAPE METRICS	1	0	5	13	0	2	1	0	0	0	B+
BUFFER METRICS	6	0	5	10	0	1	0	0	0	0	A-
CONDITION	0	0	0	6	0	6	6	0	4	0	B-
VEGETATION METRICS	2	0	4	4	0	3	3	0	4	2	B-
HYDROLOGY METRICS	0	0	0	1	0	3	18	0	0	0	C+
PHYSIOCHEMISTRY METRICS	7	0	4	9	0	1	1	0	0	0	A-
SIZE	6	0	5	6	0	5	0	0	0	0	A-

Overall scores were higher for sites in the La Garita Creek watershed and lowest in the San Luis Creek Watershed (Tables 5, 6, and 7, Appendix I; Figures 2, 22, and 23, Appendix II). All scores were lowest in all watersheds in the condition factors category (Table 4). Ranking scores ranged from an A+ to a C- across all categories, except for in two SLB properties on Saguache Creek that each received one 'D' score (Table 5, 6, and 7, Appendix II). The size and buffer metrics varied the least and had the highest rankings, B+ or above. The Hydrology metrics had the largest number of low scores across sites with a majority of sites receiving a C+ (Table 4; Figures 24a-c). These ranks are indicative of the altered hydrology present on all of the sites. The altered hydrology is the result of a variety of factors such as the creation of ditches, roads, buildings, groundwater mining, Rules, and the timing and duration of flows governed by annual irrigation seasons (presumptively April 1 – November 1) for surface and groundwater. The vegetation metric had the lowest rank of D and ranged from D to A+.

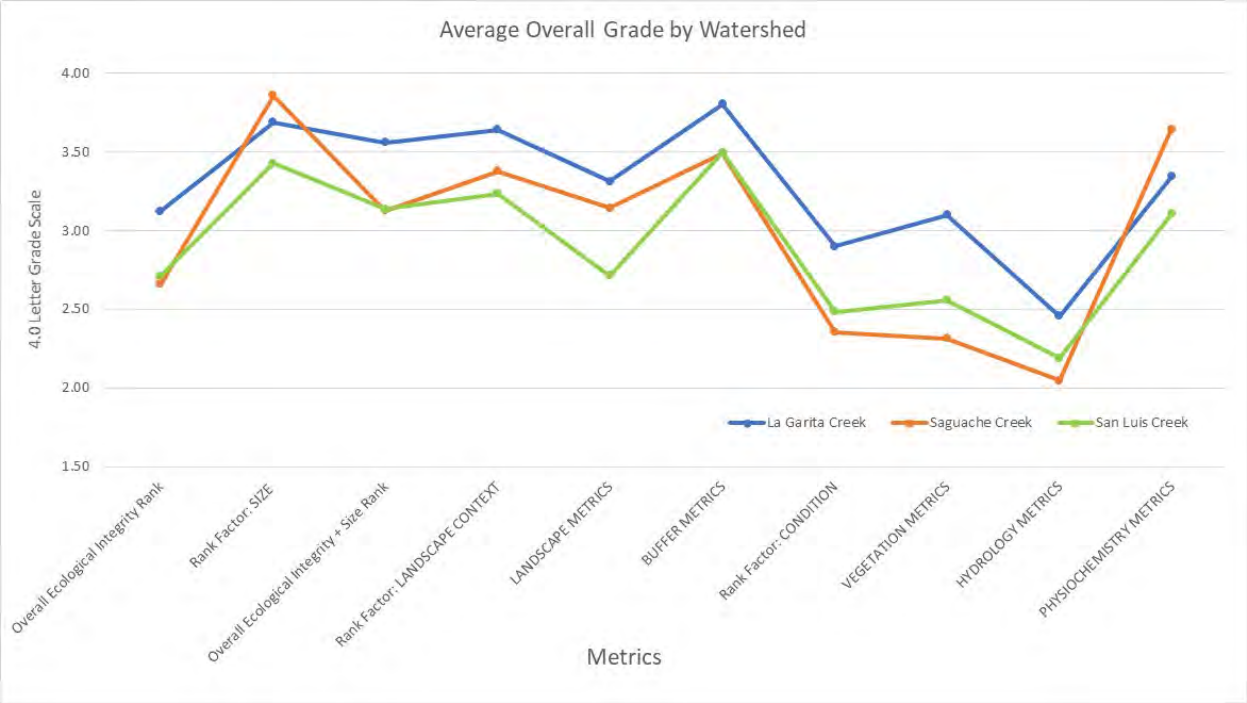

Figure 22. Average overall letter grade for each metric by watershed.

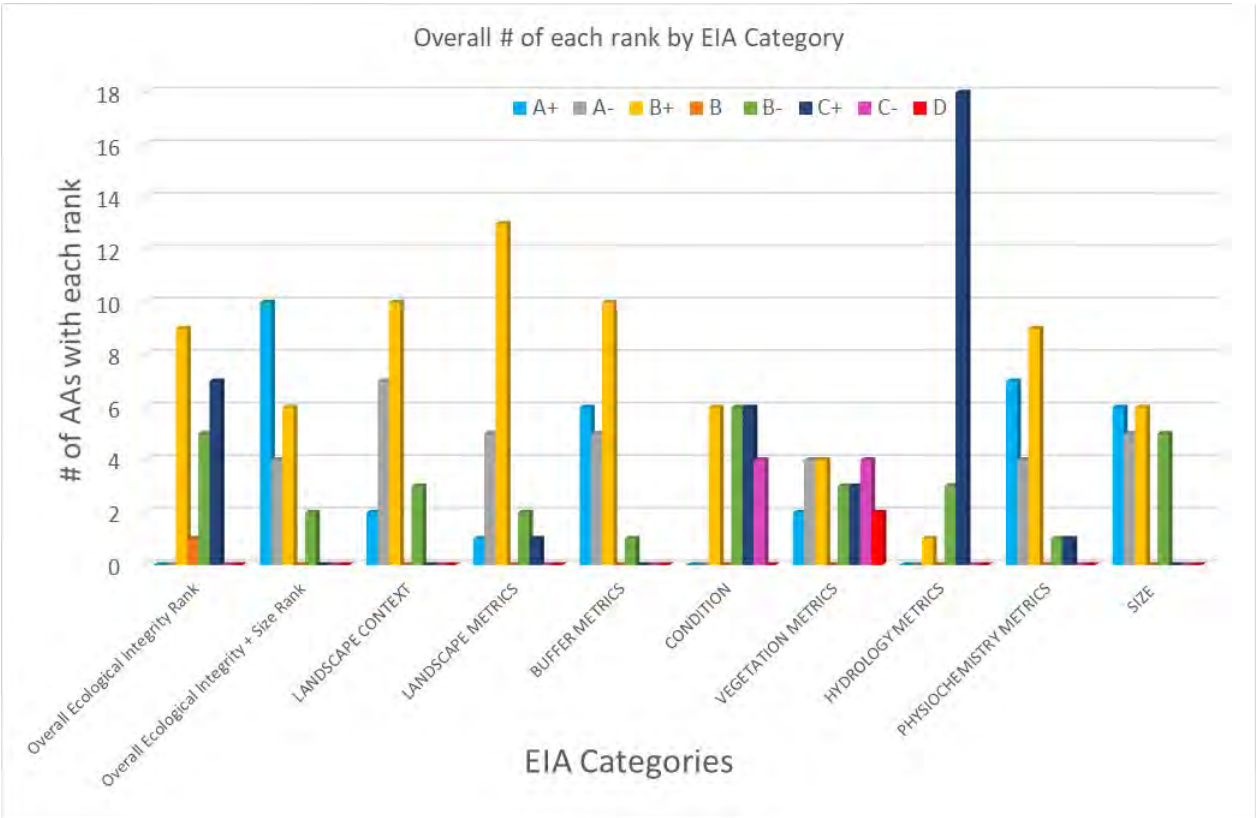

Figure 23. Overall # of AA's (22) with each rank by EIA category

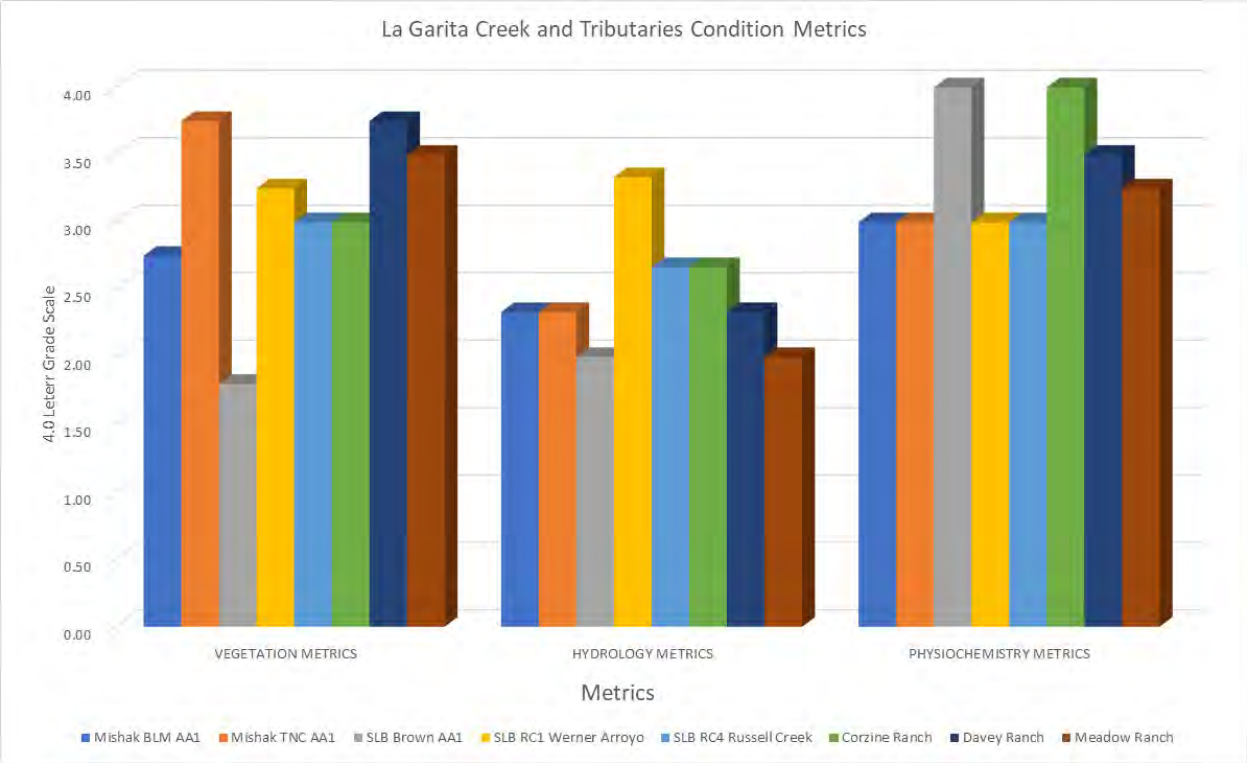

Figure 24a. Grades (1.0=D, 2.0=D, 3.0=B, 4.0=A) of AA's by site at San Luis Creek

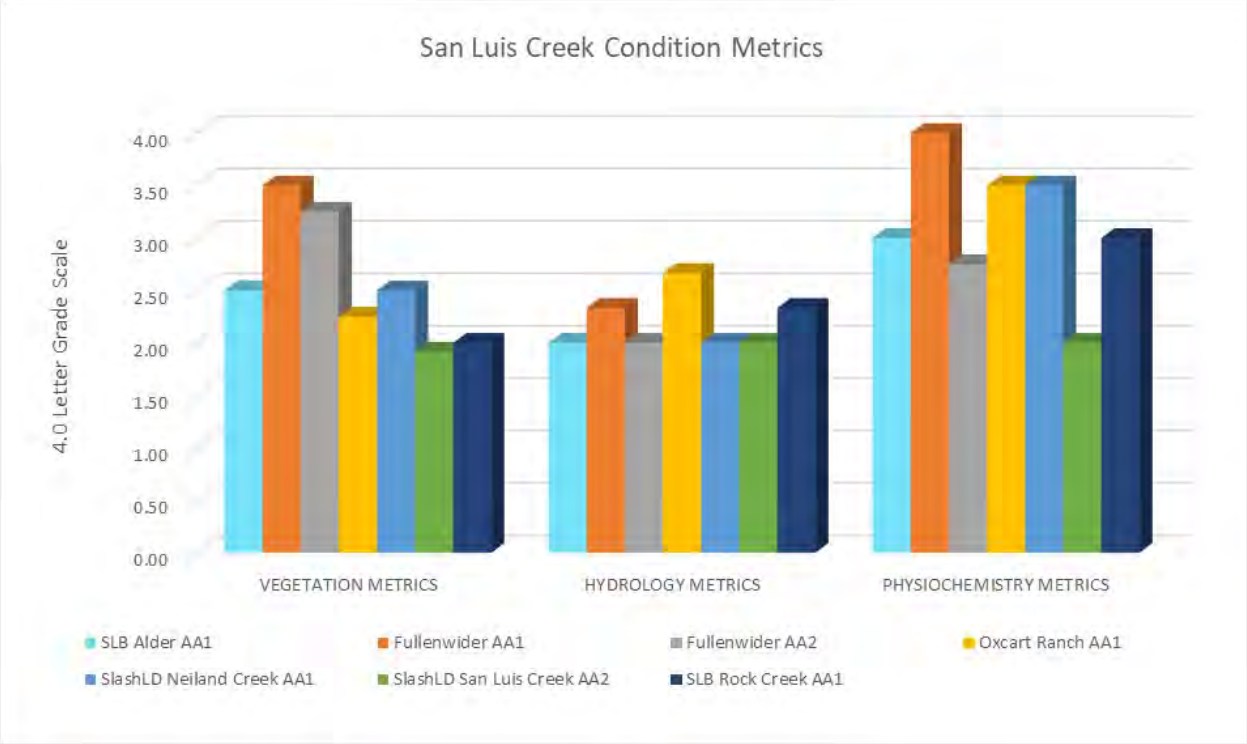

Figure 24b. Grades (1.0=D, 2.0=C, 3.0=B, 4.0=A) of AAs by site in the La Garita Creek Watershed

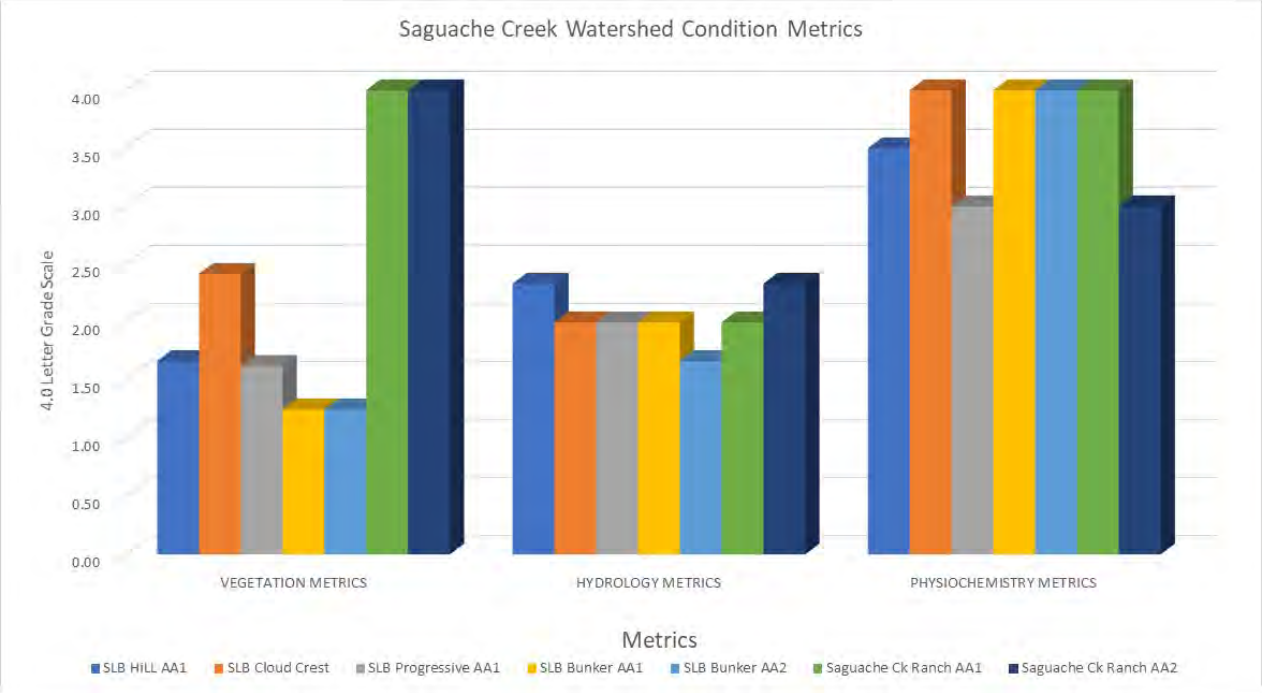

Figure 24c. Grades (1.0=D, 2.0=C, 3.0=B, 4.0=A) of AAs by site in the Saguache Creek Watershed

Sites that ranked the lowest in this category were observed to have had a greater negative impact from livestock grazing, lower vegetation cover or higher amount of bareground, higher weed cover, pugging, and/or a prevalence of non-native vegetation, and/or removal of surficial flow of water and declining water tables. Some lower vegetation ranks in the irrigated meadows may be indicative of planted and cultivated hay meadow species such as smooth brome, wheatgrasses, and alfalfa rather than native wetland species.

Scoring of the hydrology metrics proved to be the most difficult to determine for most sites. Due to drought conditions, groundwater mining, climate change, and changes to the irrigation season over the past decade many of the sites have reduced or no surficial flow through the drainages visited. However, most of the sites, as indicated by high scores for size and buffer metrics, are relatively intact, meaning that the wetland systems exist within natural corridors and although the extent and timing of water flow may have been altered these systems are fairly natural. The vegetation metrics tend to show these changes in hydrology most quickly. Should surface and groundwater be restored to these creeks and wetlands, function of these systems should return fairly quickly if not immediately in some cases. Therefore, EIA scores for hydrology are indicative of the loss of water in most cases rather than an anthropomorphic modification that would prevent restoration of the system.

These rankings indicate that from a landscape view these systems are still relatively healthy and intact. The metrics that scored lowest (vegetation and hydrology) are for the most part related to factors that can be addressed through changes in grazing management, infrastructure upgrades to improve irrigation, but most importantly through the restoration of surface water flow through historic drainages. These are valuable watersheds from a conservation perspective. All three of these watersheds have the potential for further restoration and conservation. Ownership of properties both

private and public along the San Luis Creek drainage provide an almost contiguous corridor of conserved lands and the only watershed visited that may maintain somewhat permanent surface flow through the mainstem of the creek. The La Garita Creek corridor from the RLSWA to SLB lands along Hwy 17, although not contiguous, are clearly providing a large swath of conserved and unfragmented land that retain landscape features and at least some hydrologic and vegetative characteristics that would promote successful restoration. The Saguache Creek watershed has a high potential for restoration as much of the area is protected with private land conservation easements that then terminates in a large block of SLB lands along Hwy 17 and the Baca NWR boundary. Despite the SLB lands having lost all surface flow, landscape features and some hydrologic and vegetative characteristics still exist. Should flows be restored to these lands, restoration efforts should be successful (Figures 2, 3, and 4; Appendix II).

Habitat and Management

Habitat on the lands assessed were fairly consistent depending on the elevation and characteristics of the drainage, e.g. perennial or ephemeral creeks. Uplands in the La Garita and Saguache Creek Watersheds were typically rabbitbrush and greasewood (Rubber Rabbitbrush Shrubland Alliance and Black Greasewood Shrubland Alliance), consistent with valley floor ecosystems. Uplands in the San Luis Creek drainage were typically rabbitbrush on the valley floor adjacent to the creeks with a combination of rabbitbrush transitioning to mountain big sagebrush (*Artemisia tridentata vaseyana*; Rubber Rabbitbrush Shrubland Alliance and the Mountain Big Sagebrush Mixed Steppe and Shrub Alliance) as elevation increased to the east towards the foothills. Habitat within the valley bottoms were fairly consistent between watersheds as many have been planted to include high quality forage grasses and forbs for livestock grazing and haying. Many meadows were classified as 'planted/cultivated' and included smooth brome (*Bromus inermis*), wheatgrasses, alfalfa (*Medicago sativa*), and/or clover species (Planted/Cultivated Alliance and Smooth Brome Semi-natural Herbaceous Alliance). Some native wet meadow species were dominated by Baltic rush (*Juncus balticus*) and a variety of sedge species including field sedge (*Carex praegracilis*), Douglas's sedge (*Carex douglasii*), and beaked sedge (*Carex utriculata*) along with several different forb species (Sedge spp. Alliance, Rush spp./Sedge spp. Herbaceous Alliance, Baltic Rush Seasonally Flooded Alliance, and Douglas' Sedge Temporarily Flooded Herbaceous Alliance). Riparian woody vegetation was documented on the San Luis Creek drainage and primarily along the mainstem of San Luis Creek and not on the tributaries. One other location, the most upstream Saguache Creek property (Hill SLB), also had sparse willow growth along the creek channel. Two species of willow were dominant, sandbar willow (*Salix exigua*) and Greenleaf willow (*Salix lucida*; Willow spp. Temporarily Flooded Shrubland Alliance) with little regeneration of willow observed. The Hink Ohmart classification for both sites along San Luis Creek (Oxcart Ranch and Slash LD) indicated a Type 4 description of the riparian structure which is characteristic of intermediate trees with little or no understory. Although an herbaceous layer was present, grazing and recent haying near these areas impacted the classification. The Hill SLB site on Saguache Creek had the same Hink Ohmart classification although there was less willow cover and no standing herbaceous layer as it had all been hayed and/or grazed.

Overall noxious weeds were present but were not dominant across all sites. The Saguache Creek watershed sites had the most noxious weeds present compared to the other sites/watersheds. All Saguache Creek sites had one or more of the following Colorado List B noxious weeds: Tamarisk (*Tamarix sp*), Tall whitetop (*Lepidium latifolium*), Canada thistle (*Cirsium arvense*), Russian knapweed (*Acroptilon repens*), and Black henbane (*Hyoscyamus niger*). SLB staff were notified about the black henbane and tamarisk that were observed on the SLB Hill property, locations were GPS'd in order to

help with treatment (Figure 15, Appendix II). One site along San Luis Creek had a high percent cover of Canada thistle (*Cirsium arvense*) and was located in a beaked sedge meadow adjacent to San Luis Creek where livestock were concentrated during certain times of the year.

Task 3: San Luis Valley Aquatic Habitat Model Ground-truthing

Validation of the 'Wetland Dynamics' Hydrologic Model

Prior to visiting the properties, each one was evaluated with GIS on the computer to determine locations where water resources were available (annually or during spring/fall) or were wet according to the 2013-2017 SLV WWCA GIS layer (Figures 3, 6a and 6b, Appendix II). Biologists visited all sites in the fall using the SLV WWCA GIS layer on the Avenza App to evaluate the accuracy of the model's hydrological extent. Locations that were identified as wet during some point in the year were visited and a determination was made whether or not the hydrologic extent was accurate based on presence of surface water, presence of wetland/riparian vegetation, and/or discussions with the landowner. A majority of the areas visited showed that the annual 2013-2017 hydrologic extent layer was accurate. Sites along drainages and in irrigated meadows were all identified by the GIS layer as having surface water at some time during the year. In addition, many of the AA sites determined to be resilient based on the Assessment layer in the La Garita and Saguache Creek watersheds coincided with NWI classifications of either ponds or lakes (Figures 13, 19, 20, 21, Appendix II).

During site visits, locations predicted to be wet by the Assessment were either wet or showed indications of being wet with the exception of two locations. One location was on the Meadow Ranch which had been wet in the past but was not at the time of the field visit due changes in grazing and water management the prior year (an AA was originally placed in this location but was not completed due to intensive grazing and lack of irrigation that had resulted in the removal of almost all vegetation from the site and completely altered the habitat). The second property that did not have indications of on-the-ground wetness was the drainage on the Cloud Crest SLB property which the model showed had wet conditions within greasewood immediately adjacent to the channel (Figure 18, Appendix II). Both exceptions could be explained due to changes in management or slight offsets perhaps due to reflectance of snow in the model.

Overall, the ground-truthing efforts indicated that the SLV WWCA layer is an accurate way to identify where surface water resources exist throughout the Saguache Creek, La Garita Creek and Tributaries, and San Luis Creek watershed area comprising the Closed Basin of the SLV. This tool can be used to help prioritize locations for future conservation and restoration efforts. Given the accuracy of the 2013-2017 layer we suspect that the 2000-2004 layer, which is the time period that captures the severe drought conditions in 2002, has good utility in identifying the most resilient areas in the Northern San Luis Valley. We believe that the combination of the 2013-2017 layer and 2000-2004 layer is a good tool for identifying areas for targeted conservation during these times of water scarcity.

Task 4: San Luis Valley Aquatic Habitat Restoration Projects Assessment

Throughout the course of the site visits and discussions with landowners, biologists took GPS locations of failed water control infrastructure and identified locations where future work could help restore wetland and riparian areas. The identified work is not a comprehensive view of all the work that could be done but represents and documents a preliminary look at some of the needs across the watersheds. All of the public and private San Luis Creek sites have potential for future work and several of the properties near the Russell Lakes SWA have some potential for work. All of the proposed locations for work fell within the SLV WWCA GIS hydrologic extent layer as sites that have continued to provide limited aquatic/water resources in an increasingly dry basin. Table 8 (Appendix I) outlines a very general description of some of the restoration activities that could be completed by watershed and property.

San Luis Creek

There are two CCALT conservation easements and one property in the process of becoming a conservation easement, and two SLB properties along San Luis Creek and tributaries of the creek that have the potential to restore drainages, sheet flow, and spring fed wetlands (Figure 6a, Appendix II). The photos to the right are examples of some poor to failing infrastructure along with some potential sites for restoration. Water control infrastructure upgrades including water control structure replacement, ditch maintenance, and levee work are apparent on all properties.

Dilapidated culvert.

Ditch in need of repair.

Some riparian and creek restoration work, notably along the mainstem of San Luis Creek, is a priority to improve the health of the system and to maintain consistent perennial flows. The creek has active beaver activity and has been a Colorado Parks and Wildlife stocking site for Rio Grande Sucker and Rio Grande Chub, state species of concern and candidates for Threatened and Endangered status. This area also provides brood rearing habitat for the threatened GUSG. A recent field trip in April 2021 with a wide range of partners evaluated a private property along San Luis Creek for public acquisition or conservation easement. This property lies between the SLB and CCALT easement properties evaluated in this project and if it is acquired by a public land management agency or placed in conservation easement then a contiguous 7.5 mile length of the San Luis Creek would be protected. This large corridor would be a great location for restoration work and possibly some changes to grazing management (intensity and timing) within the riparian area.

Historic drainages that may or may not have current surface flow could be restored depending on available water and associated water rights. Headwaters of these creeks occur on US Forest Service and BLM lands that are adjacent to these properties and have the potential for improved aquatic resources with future restoration projects. An evaluation of the creek and wet meadow restoration potential of

the Alder Creek SLB property was completed by Biologic, Inc in summer 2020. Restoration in this property would help improve conditions within the AA assessed in this project and throughout the SLB property as it connects with San Luis Creek (Figure 6a, Appendix II).

The Fullenwider Ranch CE was particularly noteworthy for the spring fed wetland system on the ranch near AA2 (Figure 6a, Appendix II). This property has past/expired Partners for Fish and Wildlife projects that have deteriorated overtime or are not consistent with projects that would be constructed under the current limited water resources. Existing wetlands downstream of the house and driveway/road have been damaged over time partially due to livestock grazing and disturbance. Restoration of the spring fed wetland along with enhanced sheet flow through the driveway/road, potential re-working of the levee system, and tweaks to grazing management would positively impact this area. The existing valley bottom along the historic San Luis Creek and spring fed system has been 'pugged' meaning that the plants are pedestaled with water running around the base of the roots. Restoration of this valley that allowed for greater sheetflow would help improve the quality of the forage, maintain the water table, and improve irrigation capabilities.

La Garita Creek and Tributaries

This area is within the boundaries of the Saguache Subdistrict for groundwater rules and regulations (Subdistrict 5). Two annual replacement plans (ARP) were submitted by Subdistrict 5 to the Division of Water Resources (DWR) in 2021 and both plans were denied which resulted in wells being turned off during part of summer 2021. A new ARP was submitted in late April 2022 to DWR and will be considered over a 35-day comment period. Wells will be turned down to base flow on May 1, 2022 until or if the ARP is approved. Landowners in this area that utilize groundwater resources must now provide their own augmentation plan to meet surface water depletions and aquifer sustainability. Without an approved augmentation plan only exempt wells and those flowing below 50 gpm are allowed to operate. To our knowledge, none of the large capacity wells on the properties evaluated for this project have an approved augmentation plan and will not be allowed to flow until augmentation is met. Due to these circumstances, project work in this area will probably be postponed until Rules are met by individual landowners or the Saguache Subdistrict (#5) develops an ARP that is approved by DWR.

The Davey Ranch DU conservation easement along Russell Creek on the west side of the Russell Lakes SWA has project potential (Figure 9, Appendix II). The photo (right) is an example of the needed water control infrastructure upgrades including water control structure replacement, ditch maintenance, and levee work to improve surface water delivery along the historic Russell Creek drainage and wet meadows.

Photograph of dilapidated water control facility.

The Corzine Ranch conservation easement south of the Russell Lakes SWA is dependent upon both surface and groundwater resources to maintain

the wet meadows that lie within the historic La Garita Creek drainage. Flows through this area appear to have been characteristic of a shallow sheet flow environment rather than confinement to a specific channel. Many of the ditches and water control structures are in a poor to failed condition. At this time, staff are unsure of the landowner's interest in project work given the current situation with the Subdistrict and Rules. When wells are turned down to 50 gpm the Ranch will be relying on surface water rights which will not sustain the current extent of wetlands on the Ranch. Before projects are pursued it will be important to gain a thorough understanding of the water that may be available to determine realistic objectives.

The SLB properties east of Russell Lakes SWA are leased by David and Verla Schmittel who, since the deep drought year of 2002, have incrementally reduced their cattle heard thus limiting grazing impacts on these properties due to the ongoing drought conditions. These properties are in very good condition, RC4 is of particular interest for future monitoring of surface and groundwater resources. Water flows off of Russell Lakes SWA onto RC4 during the winter and spring. A better understanding of how water flows to, across, and off the property including the extent of sheet ice and flooding in the spring would help all surrounding landowners or managers to better utilize water to promote improved wildlife and livestock habitat across boundaries. In addition to healthy range conditions due to well managed grazing these parcels have very few weeds and were one of only two properties of the 19 evaluated where a weed management plan was not recommended.

The landowner with the lease on the SLB property immediately south of the Corzine Ranch (Figure 6b, Appendix II) indicated that there were surface water rights associated with the property but that they had never been delivered to the property. An AA was not established on this site as there was not a clear creek drainage although wet meadows were present. The water rights for this property should be explored by the SLB. If water can be delivered to the property it would help improve resources for wildlife and livestock.

Mishak Lakes area contains 4,000 acres of upland, creek drainages, and playa basins (Figures 6b and 13, Appendix II). Ownership of the area is complex with BLM, TNC, and a RiGHT conservation easement comprising the area. Historically an important area for waterfowl and waterbirds, the area no longer receives consistent creek flows from Russell Creek, La Garita Creek, or the Werner Arroyo. Historically, these flows were augmented by springs that would have maintained flow to some extent throughout the winter months. There are a few water control structures at the northwest corner on the BLM

A remnant spike rush community at Mishak Lakes.

Vehicle disturbance of basins on Mishak Lakes.

property (Mishak BLM AA1; Figure 13, Appendix II) that could be repaired or replaced. Overall, returning surface flow to the area would restore most of the area as the playa basins are intact and still contain wetland plants such as spikerush (*Eleocharis palustris;* Photo previous page left). Currently many two track roads crisscross the basins and drainages (Photo previous page right). Should surface flow be returned, proper placement of two tracks and abandoning those that exist within basins and drainages would help maintain the quality and health of the system.

The Brown SLB property lies at the confluence of La Garita Creek and Saguache Creek. Flows have not been observed in this area for decades although there is some documentation that for a short time La Garita Creek flowed to this location in 2015 for the first time in many years. This 2015 water delivery was tied to a Baca NWR call for their water right on La Garita Creek. These flows were augmented by water flowing off of the RLSWA during the spring snowmelt. Monitoring of flows across boundaries to document the source, timing, and duration is important in order to move forward with potential restoration and agreements. A piezometer study across these watersheds would be valuable to inform potential cooperative efforts between public and private landowners that could restore flow through these drainages.

Saguache Creek and Tributaries

The Hill SLB property is the only property visited on Saguache Creek that has maintained some riparian vegetation, willow, and a distinctive creek channel. There are 5 main diversions for ditches that occur on the creek on this property (Figures 15 and 16, Appendix II). Diversions are in very poor condition and appear to be constructed of a variety of materials that require annual if not weekly maintenance when in priority (plastic tarps, concrete, soil, bags, wood debris, etc. Photo Right). Construction of new diversions that reduce annual disturbance would increase water delivery efficiency and be beneficial to the health of the creek.

Water diversion on the Hill SLB property on Saguache Creek.

There are several water control structures that are in poor condition that could be replaced as well as ditches that could be repaired. Cattle annually graze the area and although there are a few cross fences, they are in various stages of disrepair and have large portions missing. A more strategic grazing management plan that incorporated rest and exclusion fences around areas where willows still exist would be beneficial to helping maintain creek banks, reducing water temperatures, improving bank storage, and improving wildlife habitat. This property contained two species on the Colorado State noxious weed list that are high priority for treatment; black henbane and tamarisk (Figures 15 and 16, Appendix II). These species are difficult to get rid of and treatment can be expensive. These locations should be treated and monitored closely to prevent any further spread. While this property has a number of restoration challenges it also appears to have a great deal of potential for recovery as it in an upstream location on the creek, contains a distinct channel, may maintain water resources for a longer duration during the year, and contains remnant riparian vegetation.

The Saguache Creek Ranch CCALT conservation easement was in good health with limited noxious weeds. This property was one of only two properties of the 19 evaluated where a weed management plan was not recommended for potential projects. This Ranch depends on both surface and groundwater resources for flood irrigation. Given the lack of an approved ARP for the Saguache Subdistrict by DWR to meet groundwater rules and regulations, it is unknown if water from groundwater resources will be available to help meet irrigation needs in 2022 and beyond.

Water control structure with potential for rehabilitation and restoration.

Cooperative efforts among public and private conservation landowners may provide the key to developing a plan that will not only help ranchers maintain their operation but provide important waterfowl and wildlife habitat in the Saguache Creek area. Further discussions and partnerships are needed to fully understand the needs and costs of such a plan. Many of the water control structures are in poor to failed condition and could be replaced to help facilitate more efficient and effective flood irrigation. Some of these structures were documented during the site visit (Figure 17, Appendix II; Photo Left). Due to the wetland health of this property this Ranch would be a good candidate for creative, cooperative agreements to maintain water resources.

The Cloud Crest SLB property was extremely dry and lies outside of the main Saguache Creek channel and floodplain and within the Bell Arroyo which has had little to no flow in the past few decades (Figure 18, Appendix II). Although some cattle may be present for up to 4 months, there have been several years that the lessee has not had any cattle grazing on it due to poor conditions from drought and lack of water. This SLB property along with those along the lower end of Saguache Creek have minimal modifications to the system outside of a lack of water that is due in part to diversions but is mostly a result of climate change, drought, and groundwater mining. The drainage on this property is still apparent and still contains a few wetland plants although there are several noxious weeds that now cover some large areas, mainly tall whitetop and Russian knapweed. With the addition of water flow through the existing channel, this area would be restored and provide important water resources for livestock and wildlife.

The SLB properties at the downstream end of Saguache Creek along Highway 17 to the confluence of La Garita Creek are contiguous and in similar condition (Figures 6b, 14, 19, 20, and 21, Appendix II). In the last several decades little to no flow of surface water through Saguache Creek has occurred, most of the creek channel is intact, some wetland plants exist in the creek bed and basins, and noxious weeds and upland grasses are more prevalent in this drainage than in the others. All three AAs evaluated in this stretch were classified by NWI as either lakes or ponds and were areas showing resiliency based on the SLV WWCA layer. Given that some wetland plant species still exist through this corridor, restoration efforts have a high potential for success. Saguache Creek enters at the northwest corner of the group of SLB lands onto the Progressive Financial Services leased property. The AA on this leased property scored the lowest of the AAs in this SLB corridor due to the level of human modification and disturbance which included several levees, borrow ditches, and water control structures (Figures 19 and 20, Appendix II).

Most of the infrastructure was in a poor to failed condition with blowouts in levees and water control structures that were no longer connected to levees. Grazing has occurred on this property annually despite very dry conditions unlike the other properties where lessees have decreased cattle numbers and removed cattle from the land if conditions were not suitable. Restoration of free flow through the creek drainage with removal of levees and flattening of borrows to adjacent elevation would be appropriate should flows return to this area in the future. Water control structures within levees at the property line should be restored while those within unused levees meant to pond water should be removed.

The remaining SLB properties downstream of this property have little modification. A maintained county road crosses the creek several times but appears to provide several culverts of appropriate size through the road at each crossing to maintain flow through the entire creek bed. A two-track allows access to AA1 and crosses and parallels several basins and a small artesian well provides some stock water that flows across the two-track (Photo Right). Restored flows are the primary need for these downstream properties to be fully functional aquatic systems. Should these flows be restored, some changes in the location of the two-tracks may be warranted to help maintain the health of the basins.

Riparian area with two-track road on State Land Board property in the northern San Luis Valley.

In the last 2-3 years a gravel lease proposal was submitted to the SLB to develop gravel pit(s) in some of these parcels. Gravel pits in these areas would significantly alter the hydrology of the area and likely capture or pool water that is moving subsurface through these historic drainages. The SLB rejected proposed gravel pit applications. Similar future proposals if approved could undermine restoration efforts in these watersheds.

The results of this project clearly show that despite the dramatically reduced water resources in the San Luis Valley, corridors of intact and quality wetland habitat remain that still provide landscape-scale resources for migrating birds and other wildlife. The EIA results indicated that the factors that scored the lowest (hydrology and vegetation) are the factors that have the greatest potential to be addressed through enhanced water delivery infrastructure, cooperative agreements that restore surface flow, improvements to livestock grazing management, and weed management. By focusing partnerships and project funding towards landscape scale projects to improve water delivery efficiency, provide limited water resources, protecting, maintaining, enhancing, and improving these corridors is possible. WDLLC staff in partnership with DU will submit a Technical Assistance for Federal Cost Share grant through the CWCB in spring 2022 to help begin planning restoration projects in these watersheds. Partners with the BLM, TNC, CCALT, Rio Grande Headwaters Land Trust, and SLB will be brought in to help determine funding, project viability, and timelines for developing the next phase of project work for each watershed.

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Table 2. State Land Board Parcel Information for Northern San Luis Valley Watershed Project located in Saguache County.

Parcel Name or Lessee Name	Legal Description	Section	Township	Range	Acres	AA name if applicable
San Luis Creek Watershed						
Alder	E2NE, S2NW, S2	36	48N	9E	480	SLB Alder AA1
Rock Creek	All	16	47N	9E	640	SLB Rock Creek AA1
La Garita Creek Watershed						
Jerry Brown	W2, W2E2, FP E2E2 (LYING W OF RR ROW)	17	42N	10E	525	SLB Brown AA1
Shane Temple	All	16	42N	8E	640	No AA
David Schmittel	All	23	43N	8E	640	SLB RC1 Werner Arroyo
David Schmittel	All	25	43N	8E	640	No AA
David Schmittel	All	26	43N	8E	640	No AA
David Schmittel	All	36	43N	8E	640	SLB RC4 Russell Creek
Saguache Creek Watershed						
Kristi Hill	All	16	44N	8E	640	SLB Hill AA1
Cloud Crest	All	16	43N	9E	640	SLB Cloud Crest
Progressive Financial	N2	23	43N	9E	320	No AA
Progressive Financial	All	24	43N	9E	640	Progressive
Judy Bunker	All	25	43N	9E	640	SLB Bunker AA1
Judy Bunker	All	36	43N	9E	640	No AA
Judy Bunker	All	19	43N	10E	640	No AA
Judy Bunker	All	30	43N	10E	640	No AA
Judy Bunker	All	31	43N	10E	640	SLB Bunker AA2
Judy Bunker	All	32	43N	10E	640	No AA
Jerry Brown	S2NW, SW, LOTS 3-4, FP W2E2 (LYING WEST OF RR ROW)	5	42N	10E	435.4	No AA
Jerry Brown	All	6	42N	10E	640	No AA
Jerry Brown	All	7	42N	10E	640	No AA
Jerry Brown	W2, FP E2 (LYING WEST OF RR ROW)	8	42N	10E	472.8	No AA

Appendix I: Tables

Table 5. EIA AA ranks by category and site on San Luis Creek

Site Name	Overall Ecological Integrity Rank	Rank Factor: SIZE	**Overall Ecological Integrity + Size Rank**	**Rank Factor: LANDSCAPE CONTEXT**	LANDSCAPE METRICS	BUFFER METRICS	**Rank Factor: CONDITION**	VEGETATION METRICS	HYDROLOGY METRICS	PHYSIOCHEMISTRY METRICS	Ecological System
SLB Alder Creek AA1	C+	A-	**B-**	**B-**	C+	B+	**C+**	B-	C+	B+	Irrigated Wet Meadow
Oxcart Ranch AA1	B-	A-	**B+**	**B+**	B+	B+	**B-**	C+	B-	A-	Irrigated Wet Meadow
Fullenwider AA1	B+	A-	**A-**	**A-**	B+	A+	**B+**	A-	C+	A+	Irrigated Wet Meadow
Fullenwider AA2	B-	B+	**B+**	**B+**	B-	B+	**B-**	B+	C+	B-	Irrigated Wet Meadow
SlashLD Neiland Creek AA1	B-	A-	**B+**	**B+**	B+	A-	**C+**	B-	C+	A-	Irrigated Wet Meadow
SlashLD San Luis Creek AA2	C+	B+	**B-**	**B-**	B-	B+	**C-**	C-	C+	C+	Irrigated Wet Meadow
SLB Rock Creek AA1	B-	A+	**B+**	**B+**	B+	B+	**C+**	C+	C+	B+	Irrigated Wet Meadow

Table 6. EIA AA ranks by category and site on La Garita Creek and Tributaries

Site Name	Overall Ecological Integrity Rank	Rank Factor: SIZE	**Overall Ecological Integrity + Size Rank**	**Rank Factor: LANDSCAPE CONTEXT**	LANDSCAPE METRICS	BUFFER METRICS	**Rank Factor: CONDITION**	VEGETATION METRICS	HYDROLOGY METRICS	PHYSIOCHEMISTRY METRICS	Ecological System
Corzine Ranch AA1	B+	A+	**A-**	**A-**	B+	A+	**B-**	B+	B-	A+	Irrigated Wet Meadow
Davey Ranch AA1	B+	B+	**A-**	**B+**	B+	A-	**B+**	A-	C+	A-	Irrigated Wet Meadow
Meadow Ranch AA1	B+	A+	**A-**	**A-**	B+	A+	**B-**	A-	C+	B+	Irrigated Wet Meadow
SLB RC4 Russell Creek AA1	B+	B+	**B+**	**A+**	A-	A+	**B-**	B+	B-	B+	Inter-Mountain Basin Greasewood Flat
SLB RC1 Werner Arroyo AA1	B+	A-	**A+**	**A-**	A-	A-	**B+**	B+	B+	B+	Inter-Mountain Basin Greasewood Flat
Mishak BLM AA1	B-	A+	**B+**	**A-**	A-	A-	**B-**	B-	C+	B+	Inter-Mountain Basin Greasewood Flat
Mishak TNC AA1	B+	A+	**A+**	**A+**	A+	A-	**B+**	A-	C+	B+	Inter-Mountain Basin Greasewood Flat
SLB Brown AA1	C+	A+	**B-**	**B+**	B+	B+	**C+**	C-	C+	A+	Inter-Mountain Basin Greasewood Flat

Table 7. EIA AA ranks by category and site on Saguache Creek and Tributaries

Site Name	Overall Ecological Integrity Rank	Rank Factor: SIZE	**Overall Ecological Integrity + Size Rank**	**Rank Factor: LANDSCAPE CONTEXT**	LANDSCAPE METRICS	BUFFER METRICS	**Rank Factor: CONDITION**	VEGETATION METRICS	HYDROLOGY METRICS	PHYSIOCHEMISTRY METRICS	Ecological System
SLB Hill AA1	C+	B+	**B-**	**B-**	B+	B-	**C+**	C-	C+	A-	Inter-Mountain Basin Greasewood Flat
SLB Cloud Crest AA1	B-	A+	**B+**	**B+**	A-	B+	**C+**	C+	C+	A+	Inter-Mountain Basin Greasewood Flat
SLB Progressive AA1	C+	A+	**B-**	**B+**	B+	B+	**C-**	C-	C+	B+	Inter-Mountain Basin Greasewood Flat
SLB Bunker AA1	C+	A+	**B-**	**B+**	A-	B+	**C-**	D	C+	A+	Inter-Mountain Basin Greasewood Flat
SLB Bunker AA2	C+	A+	**B-**	**B+**	B+	B+	**C-**	D	C-	A+	Inter-Mountain Basin Greasewood Flat
Saguache Creek Ranch AA1	B+	A+	**A+**	**A-**	B+	A+	**B+**	A+	C+	A+	Irrigated Wet Meadow
Saguache Creek Ranch AA2	B+	A+	**A+**	**A-**	B+	A+	**B+**	A+	C+	B+	North American Arid West Emergent Marsh

Table 8. Potential restoration projects identified on each evaluated property.

Location	Water Control Infrastructure	Zeedyk Wet Meadow Restoration	Creek and Riparian Restoration	Wetland Restoration and Enhancement	Groundwater Monitoring (Piezometers)	Pugging Restoration	Fencing (temporary or permanent)	Alternative Water Agreements	Grazing Management Plan	Weed Management Plan	Travel Management
San Luis Creek Watershed											
Fullenwider Ranch	X	X		X	X	X			X	X	X
Oxcart (Meyer) Ranch	X	X	X		X					X	
Slash LD Ranch	X	X	X		X		X		X	X	X
SLB Alder Creek		X			X				X	X	
SLB Rock Creek	X	X			X				X	X	X
La Garita Creek Watershed											
Corzine Ranch	X				X	X		X	X	X	
Davey Ranch	X				X		X	X	X	X	
Meadow Ranch	X			X	X		X	X	X	X	
Mishak BLM	X	X			X			X	X	X	X
Mishak TNC		X			X			X	X	X	X
SLB Brown					X		X	X	X	X	
SLB RC1 Werner Arroyo		X			X		X	X	X	X	
SLB RC4 Russell Creek	X	X			X			X	X		
Saguache Creek Watershed											
Saguache Creek Ranch	X		X	X	X			X			
SLB Bunker 1	X				X			X		X	X
SLB Bunker 2					X			X		X	
SLB Cloud Crest					X			X		X	
SLB Hill	X	X	X		X		X	X	X	X	
SLB Progressive	X			X	X		X	X	X	X	

Appendix II: Figures

Figure 2. The northern end of the San Luis Valley drainages and conservation in watershed corridors.

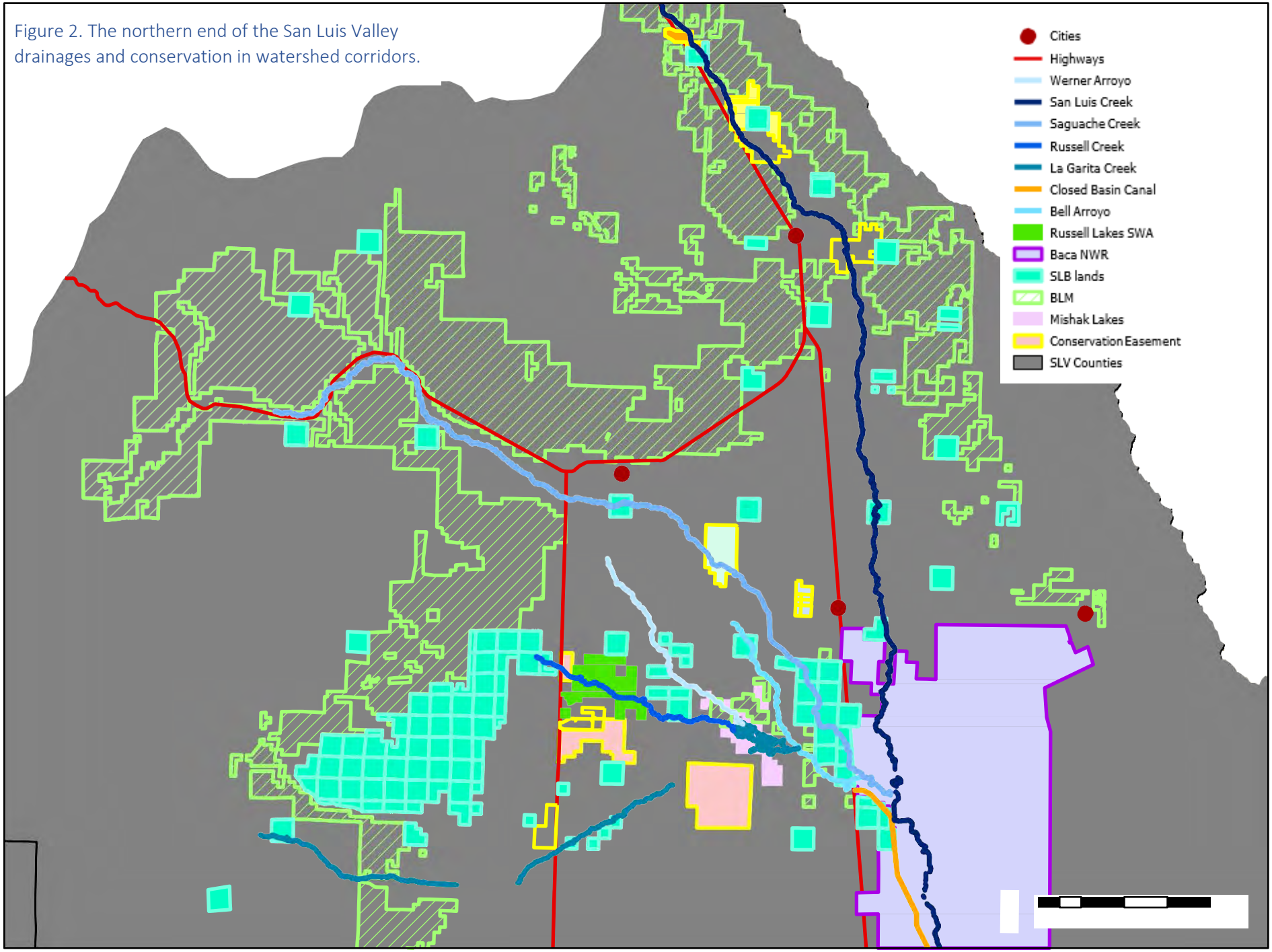


Figure 3. SLV WWCA assessment layers, 1984 to 1987 and 2013 to 2017 in the northern end of the SLV, showing decline in hydrologic extent.

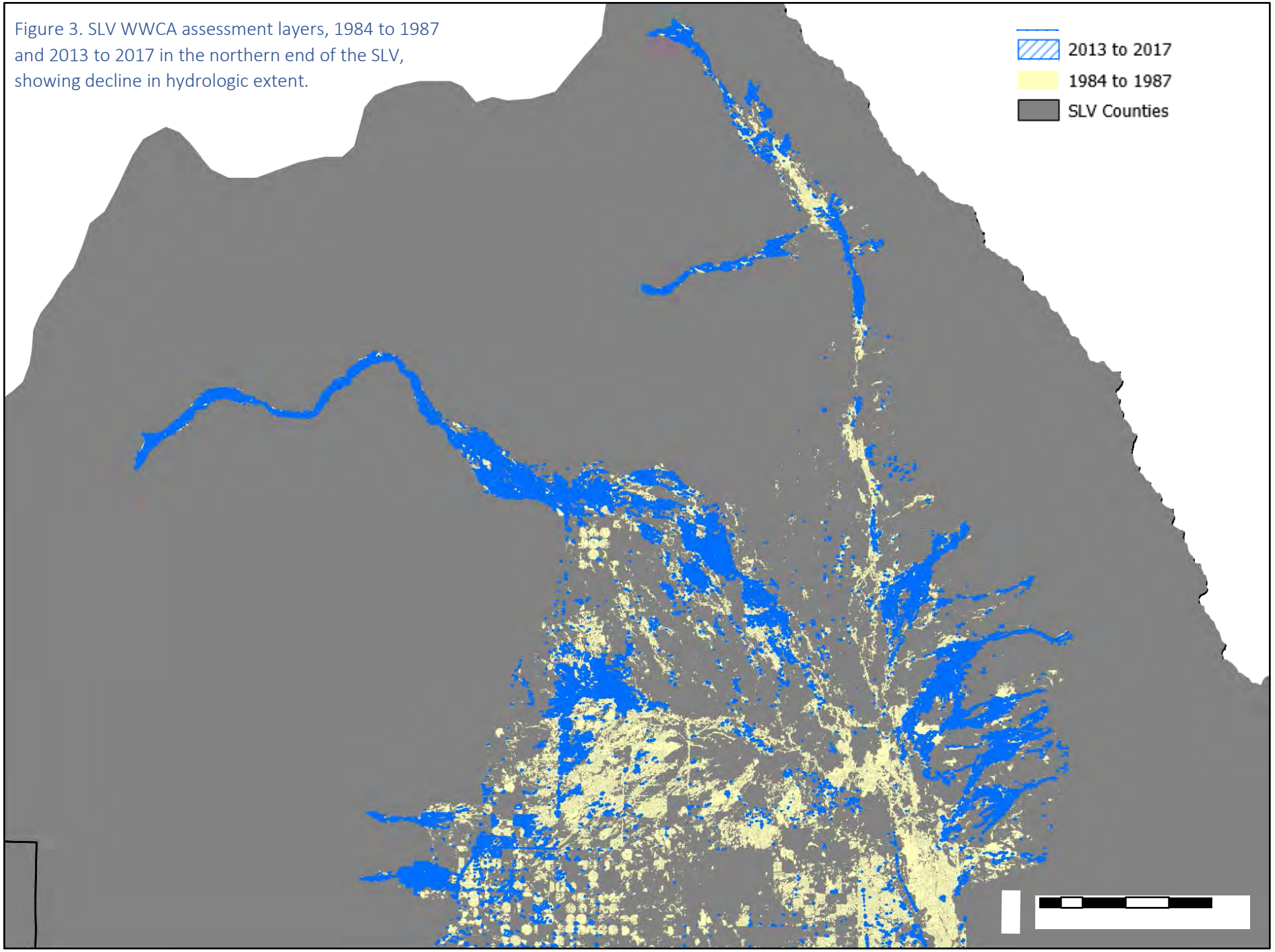
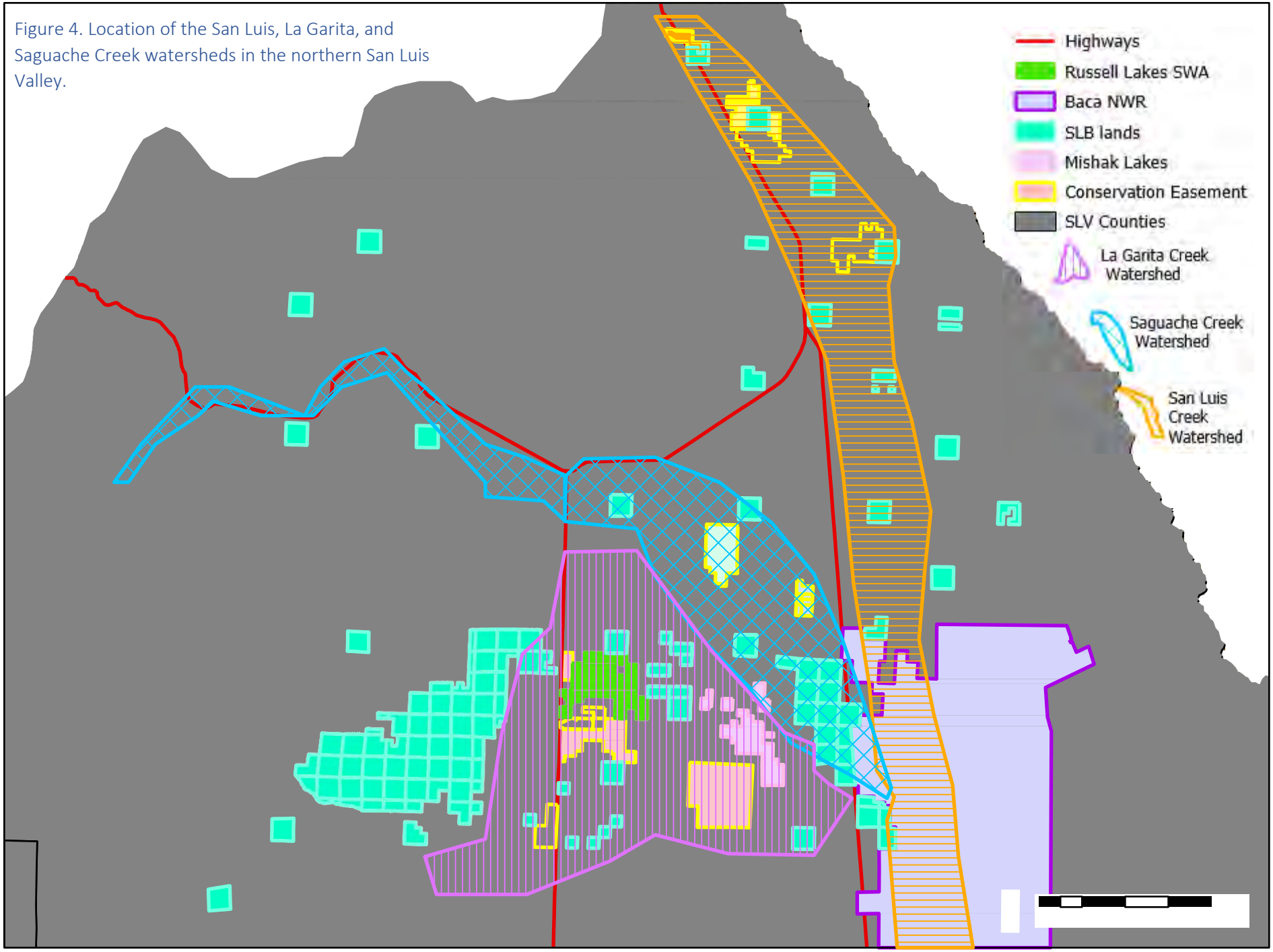


Figure 4. Location of the San Luis, La Garita, and Saguache Creek watersheds in the northern San Luis Valley.



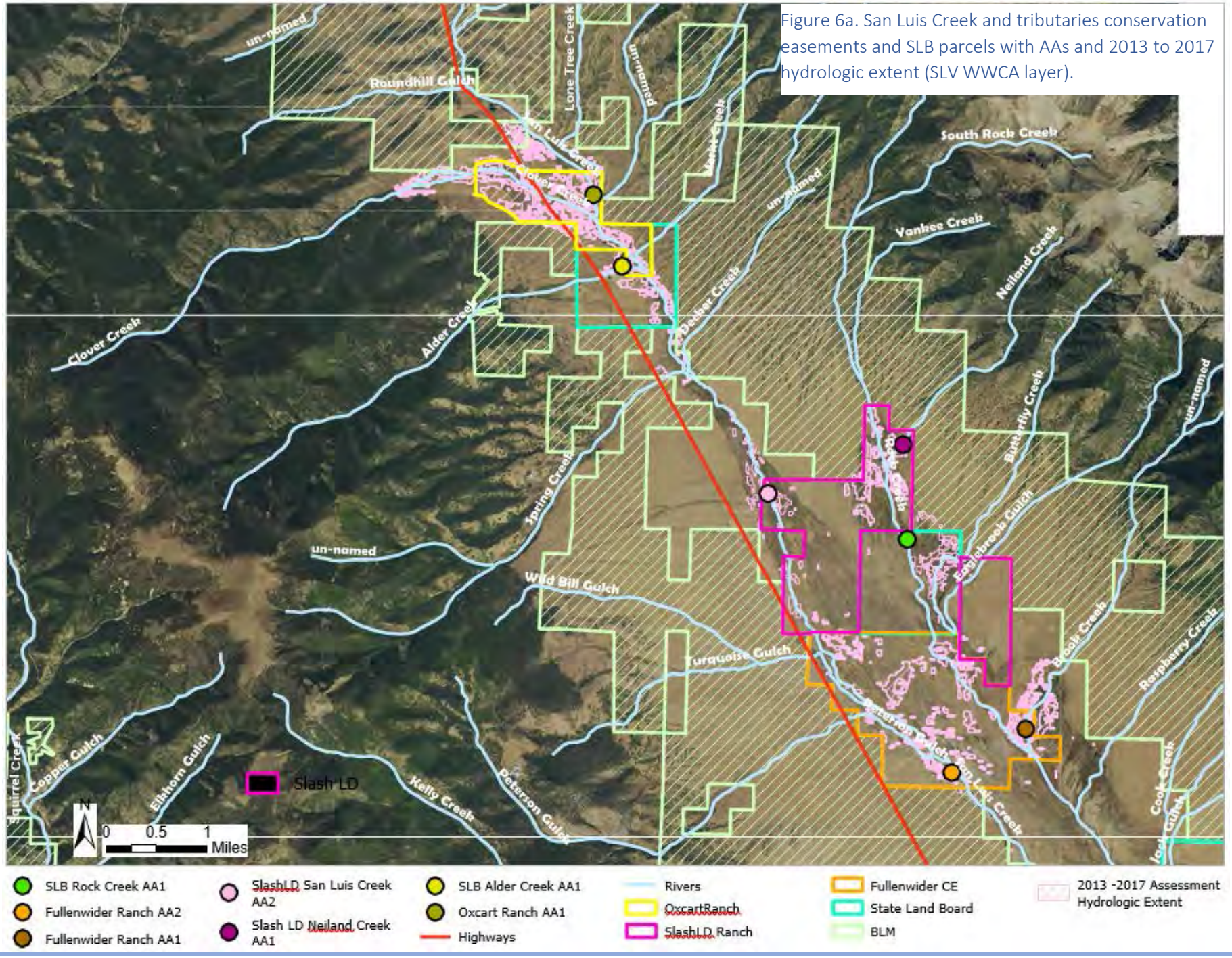


Figure 6a. San Luis Creek and tributaries conservation easements and SLB parcels with AAs and 2013 to 2017 hydrologic extent (SLV WWCA layer).

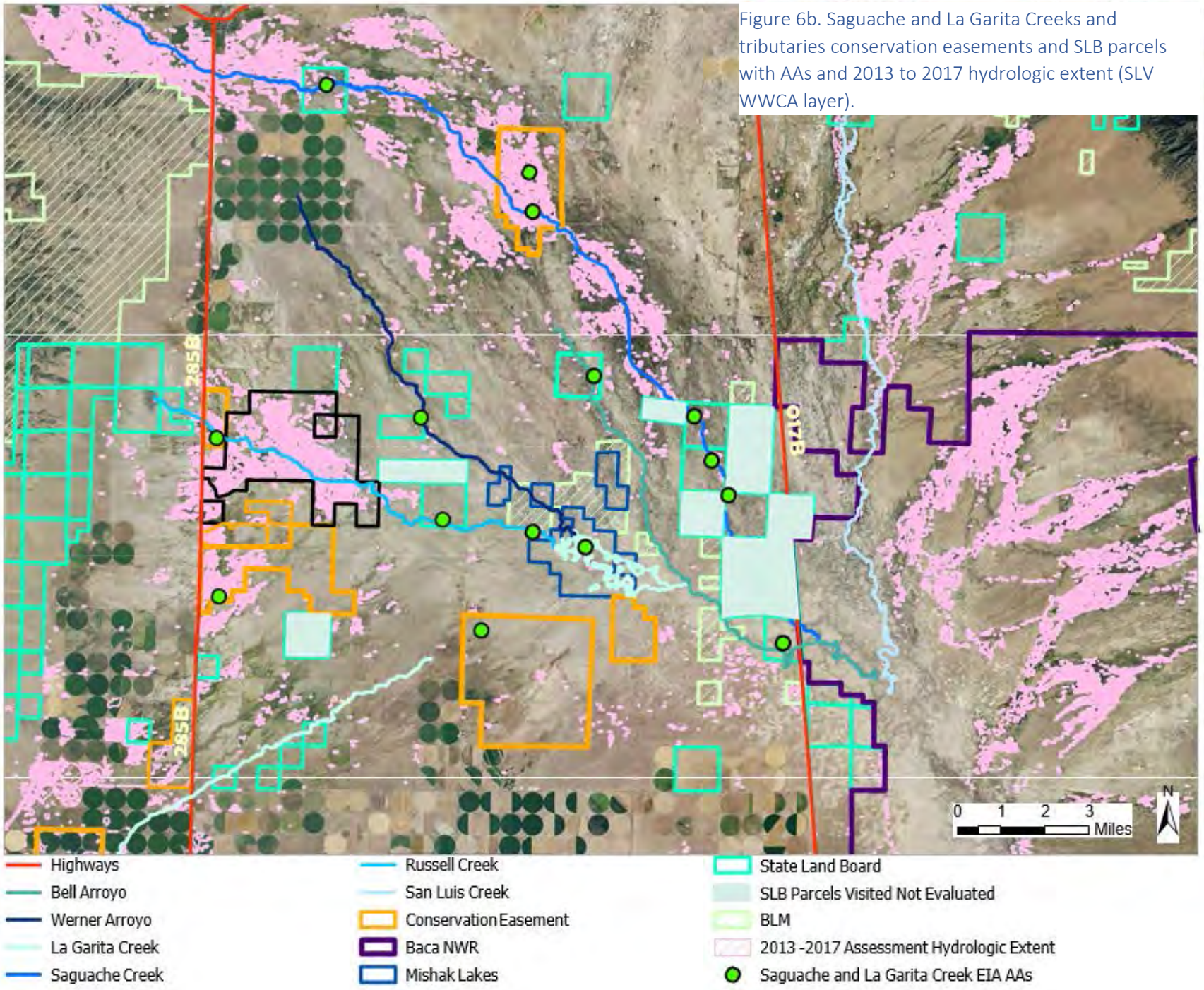


Figure 6b. Saguache and La Garita Creeks and tributaries conservation easements and SLB parcels with AAs and 2013 to 2017 hydrologic extent (SLV WWCA layer).

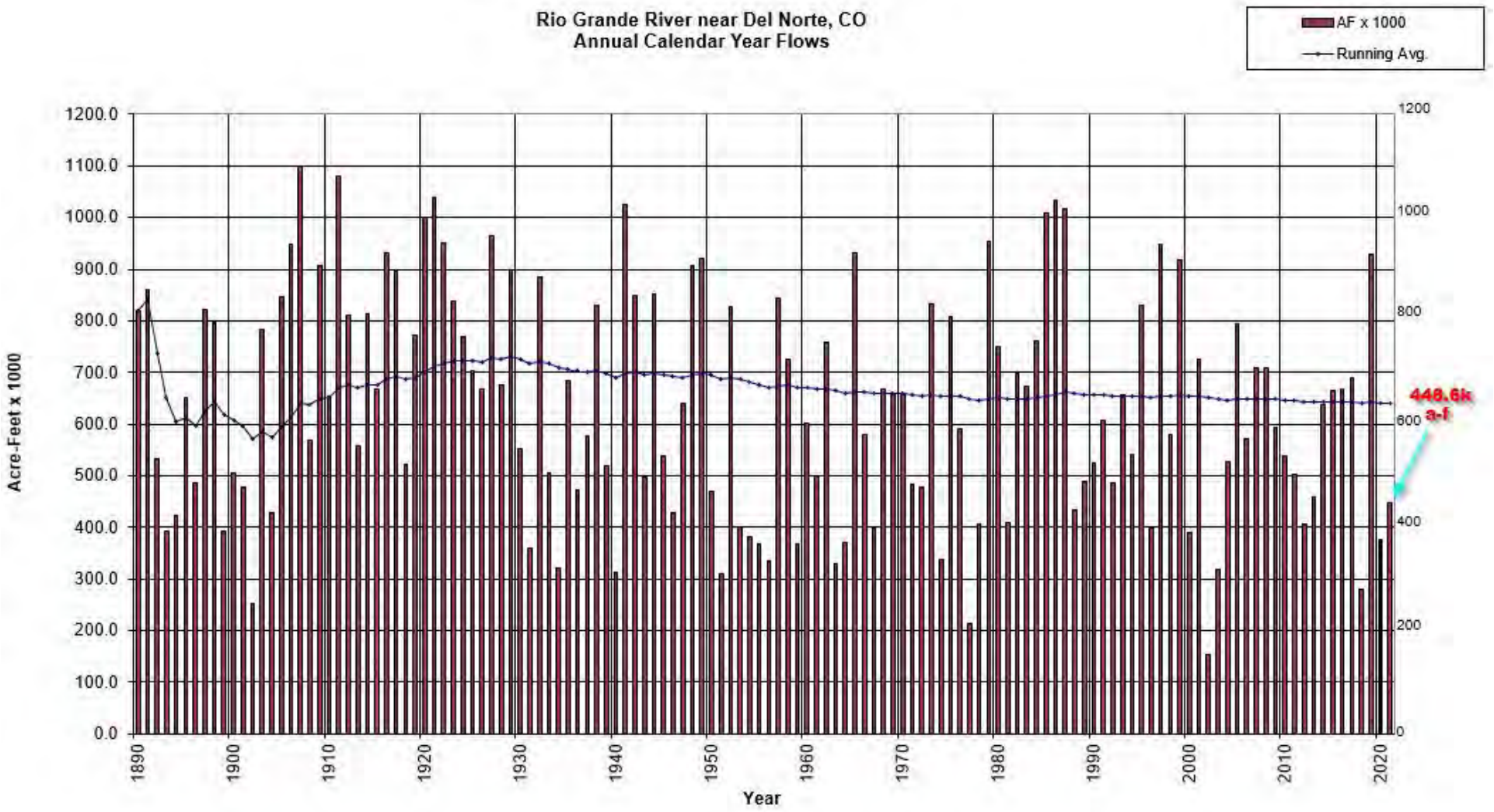


Figure 7. Rio Grande Flows (AFX1000) at the Del Norte, CO gage from 1891 to present (graph provided by Division of Water Resources #3).

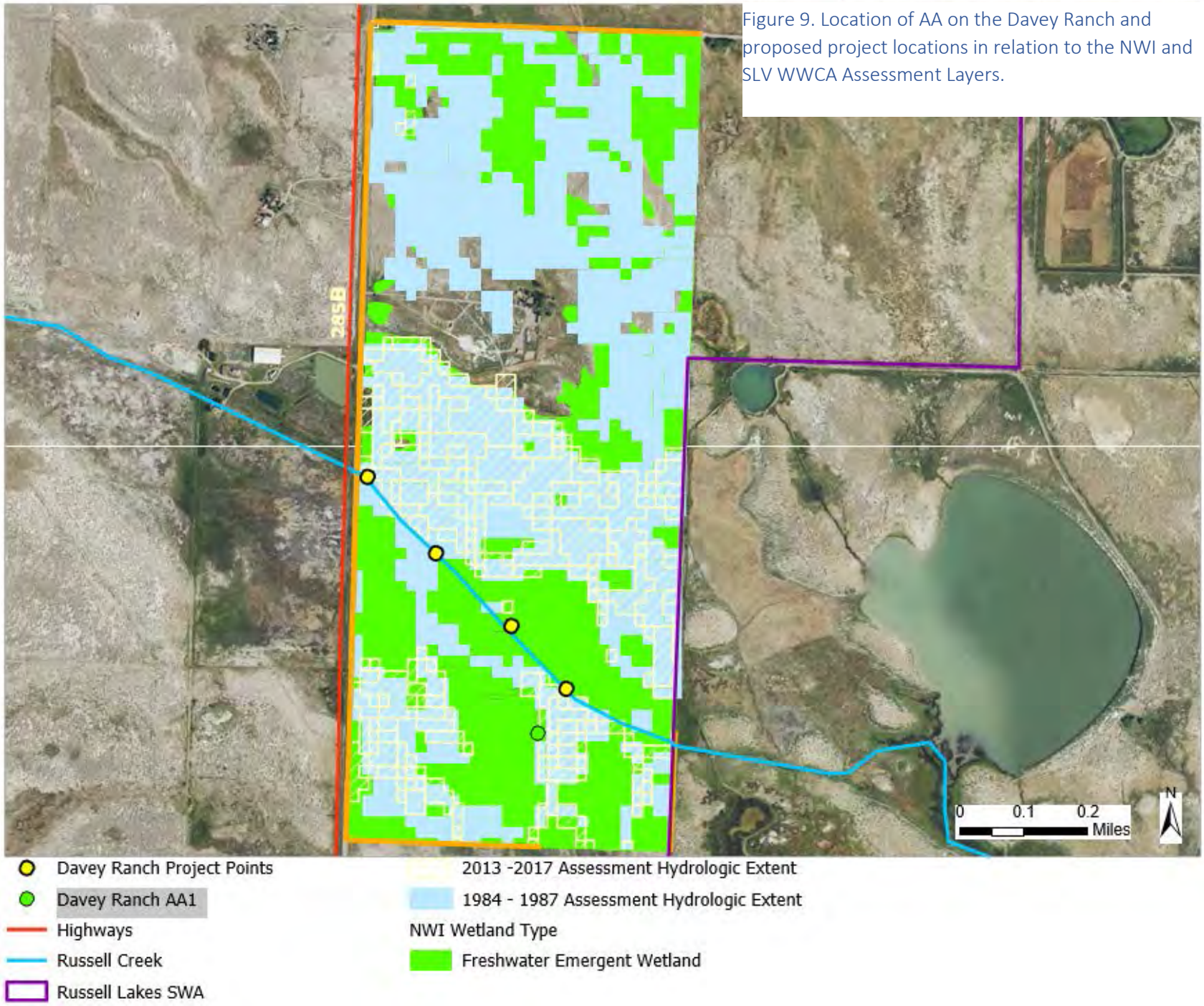


Figure 9. Location of AA on the Davey Ranch and proposed project locations in relation to the NWI and SLV WWCA Assessment Layers.

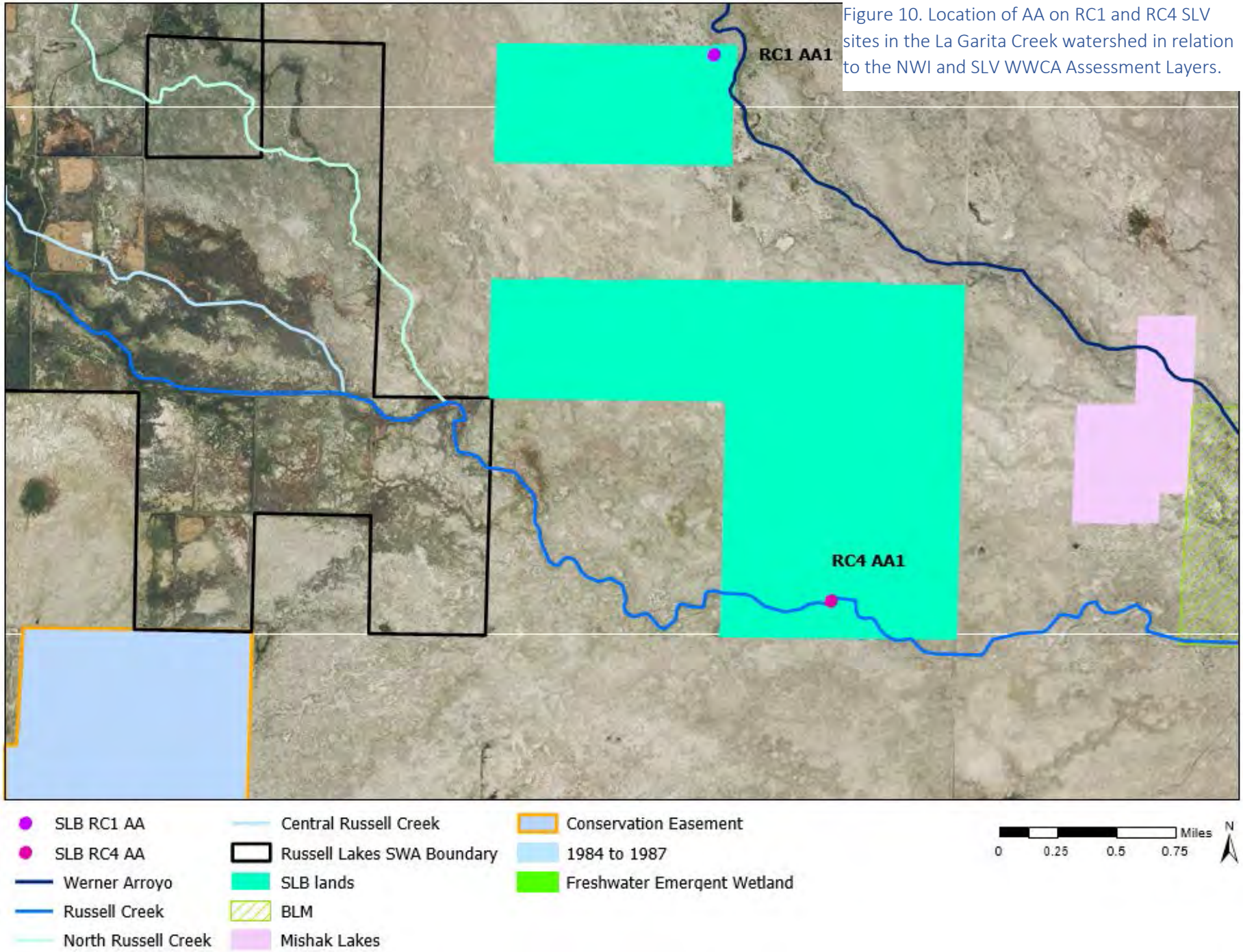


Figure 10. Location of AA on RC1 and RC4 SLV sites in the La Garita Creek watershed in relation to the NWI and SLV WWCA Assessment Layers.

Figure 11. Location of the AA on the Corzine Ranch in the La Garita Creek watershed in relation to the NWI and SLV WWCA Assessment Layers.

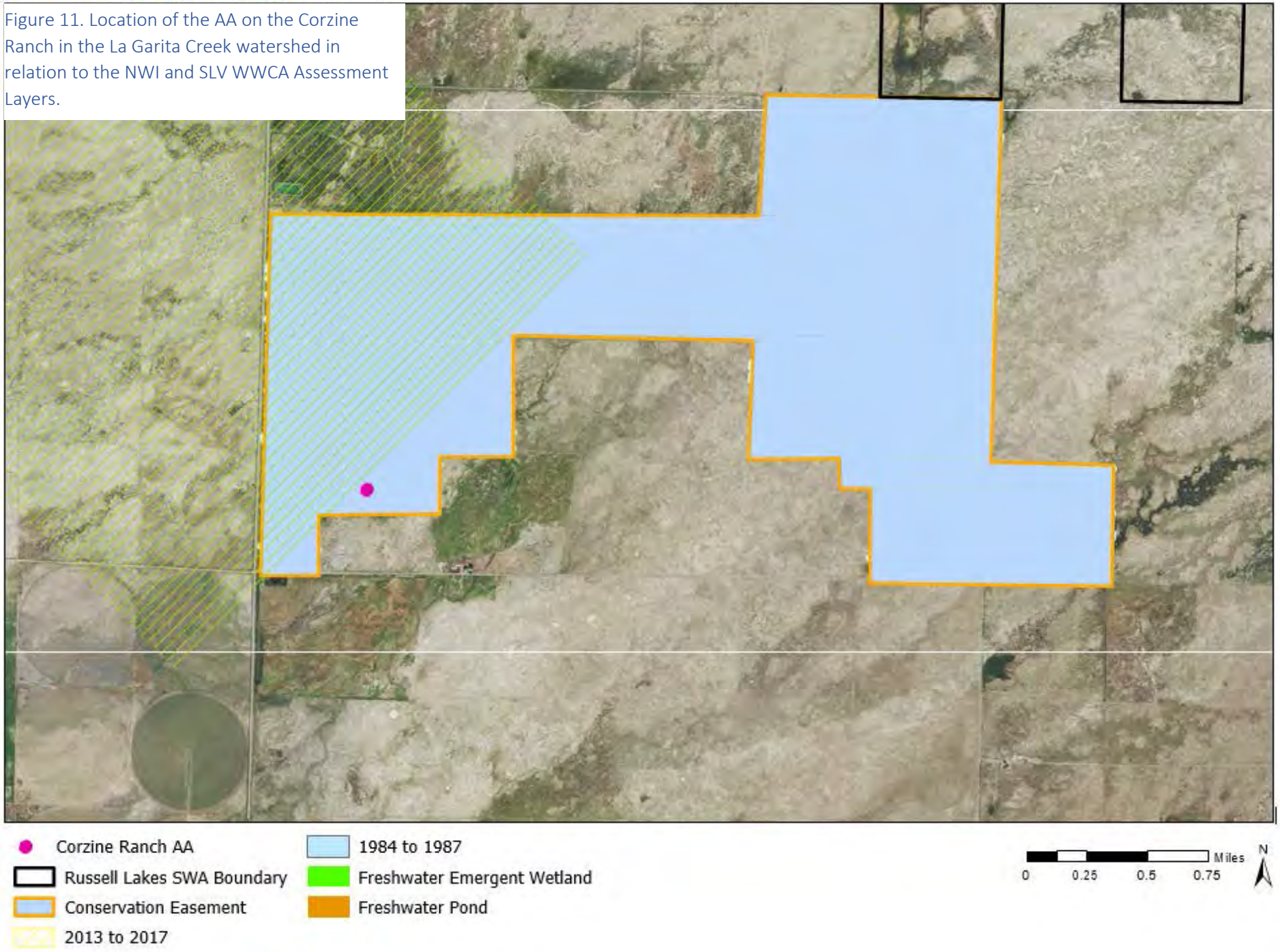


Figure 12. Location of AA on the Meadow Ranch in the La Garita Creek watershed in relation to the NWI and SLV WWCA Assessment Layers.

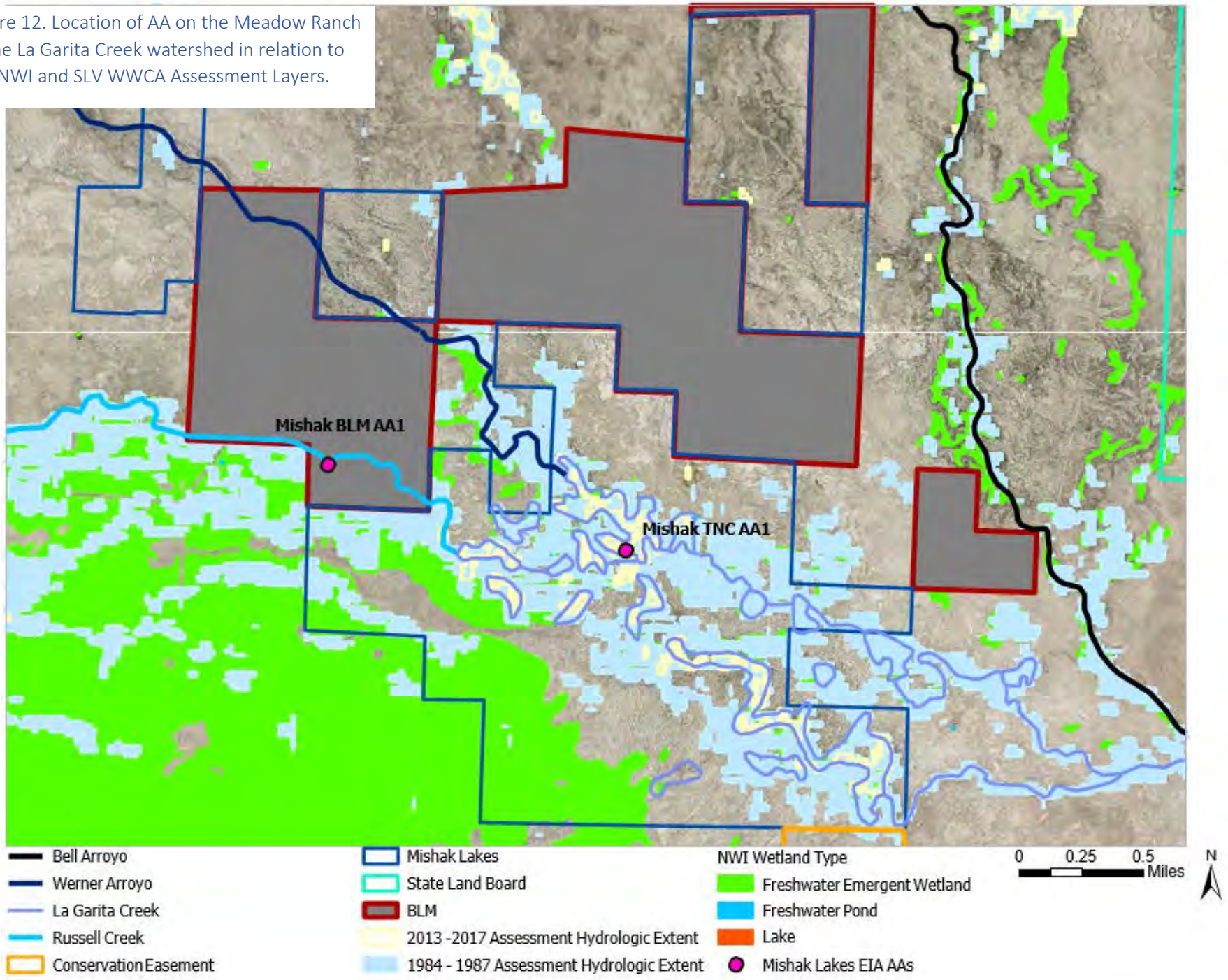


Figure 14. Location of AA on the Mishak Lakes area in the La Garita Creek watershed in relation to the NWI and SLV WWCA Assessment Layers.

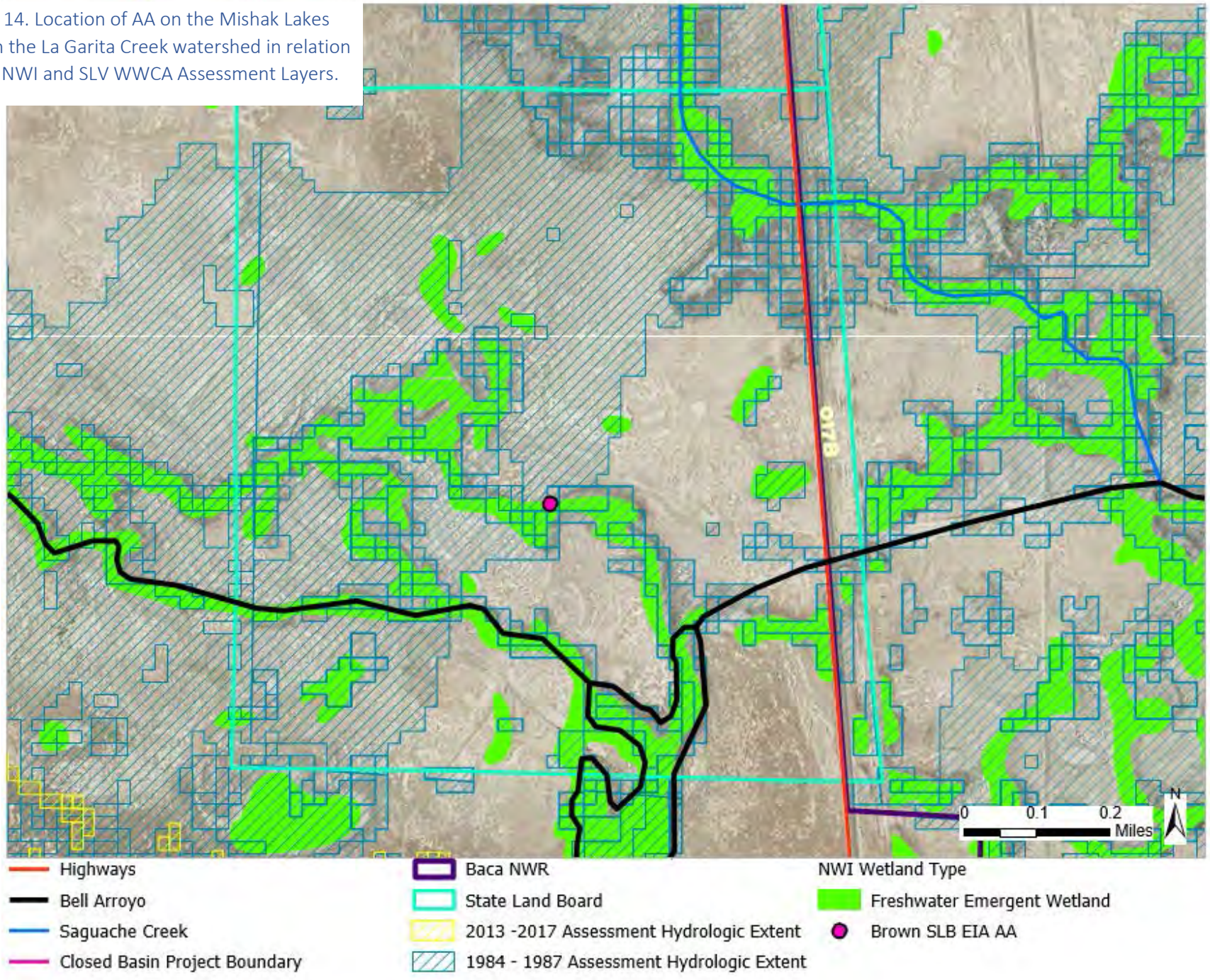


Figure 15. Location of AA on the Brown SLB property in the La Garita Creek watershed in relation to the NWI and SLV WWCA Assessment Layers.

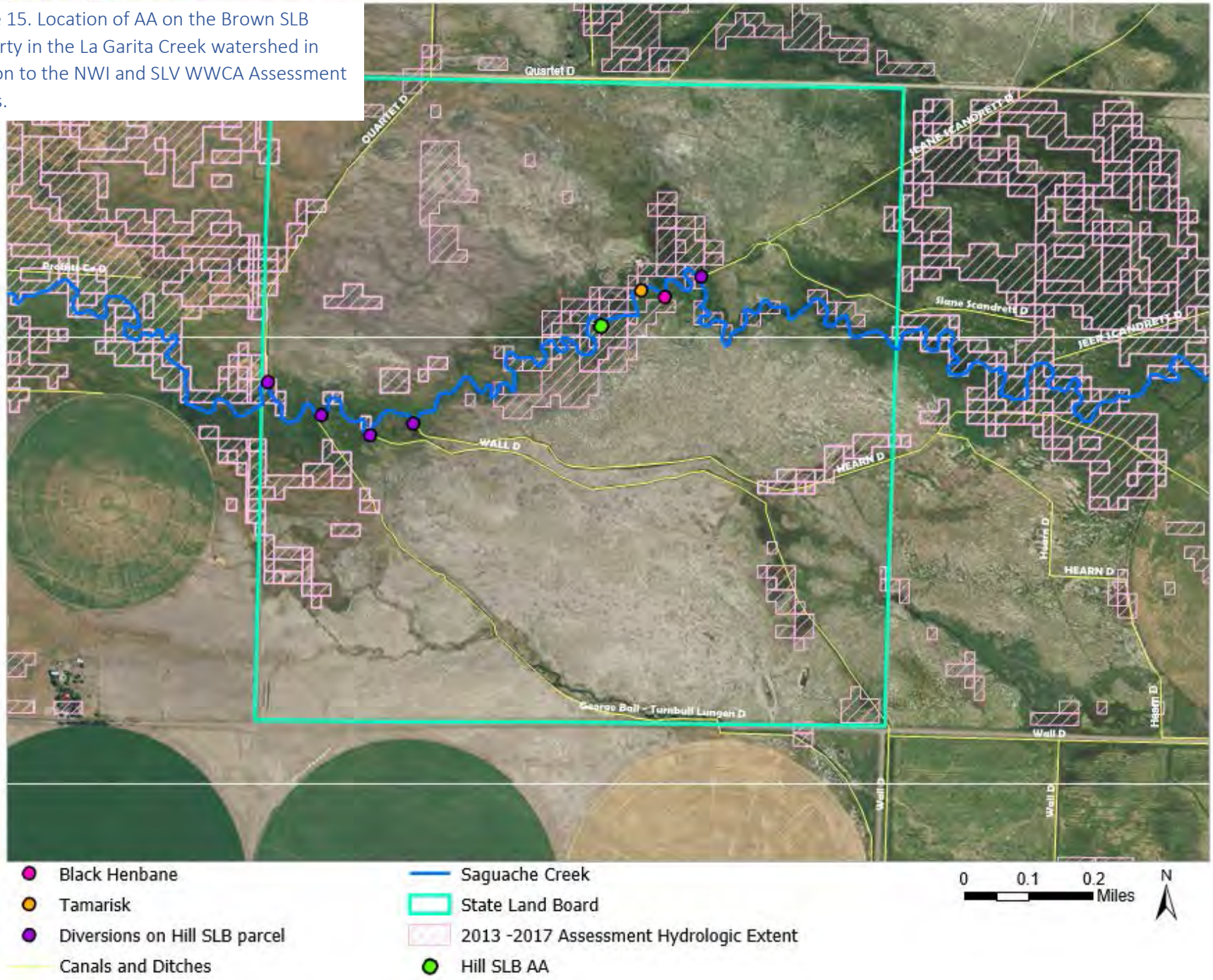


Figure 16. Location of AAs on the SLB Hill property in the Saguache Creek watershed in relation to the NWI and SLV WWCA Assessment Layers.

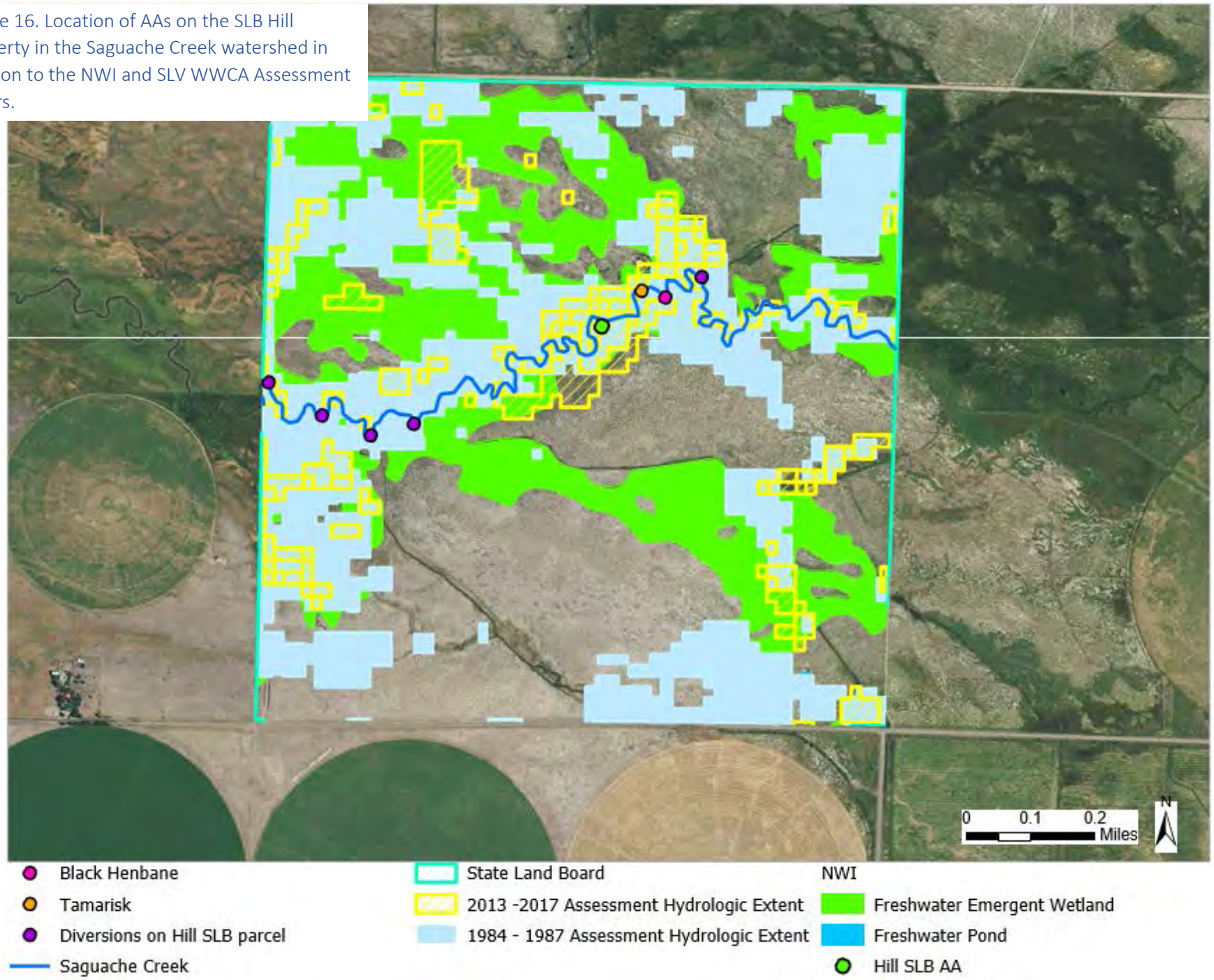


Figure 17. Location of AAs on the Saguache Creek Ranch property in the Saguache Creek watershed and proposed project locations in relation to the NWI and SLV WWCA Assessment Layers.

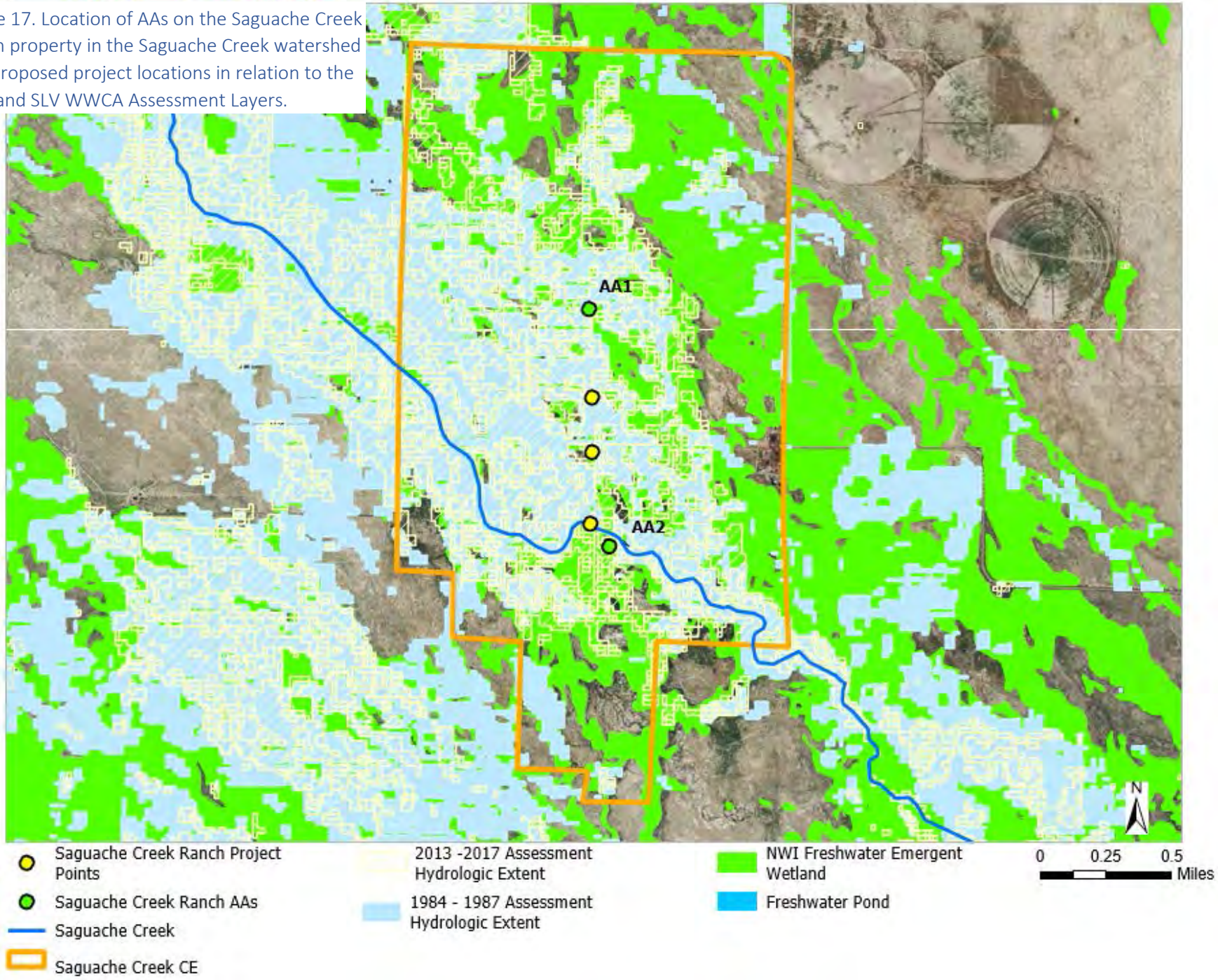


Figure 18. Location of AAs on the Cloud Creek SLB property in the Saguache Creek watershed and proposed project locations in relation to the NWI and SLV WWCA Assessment Layers.

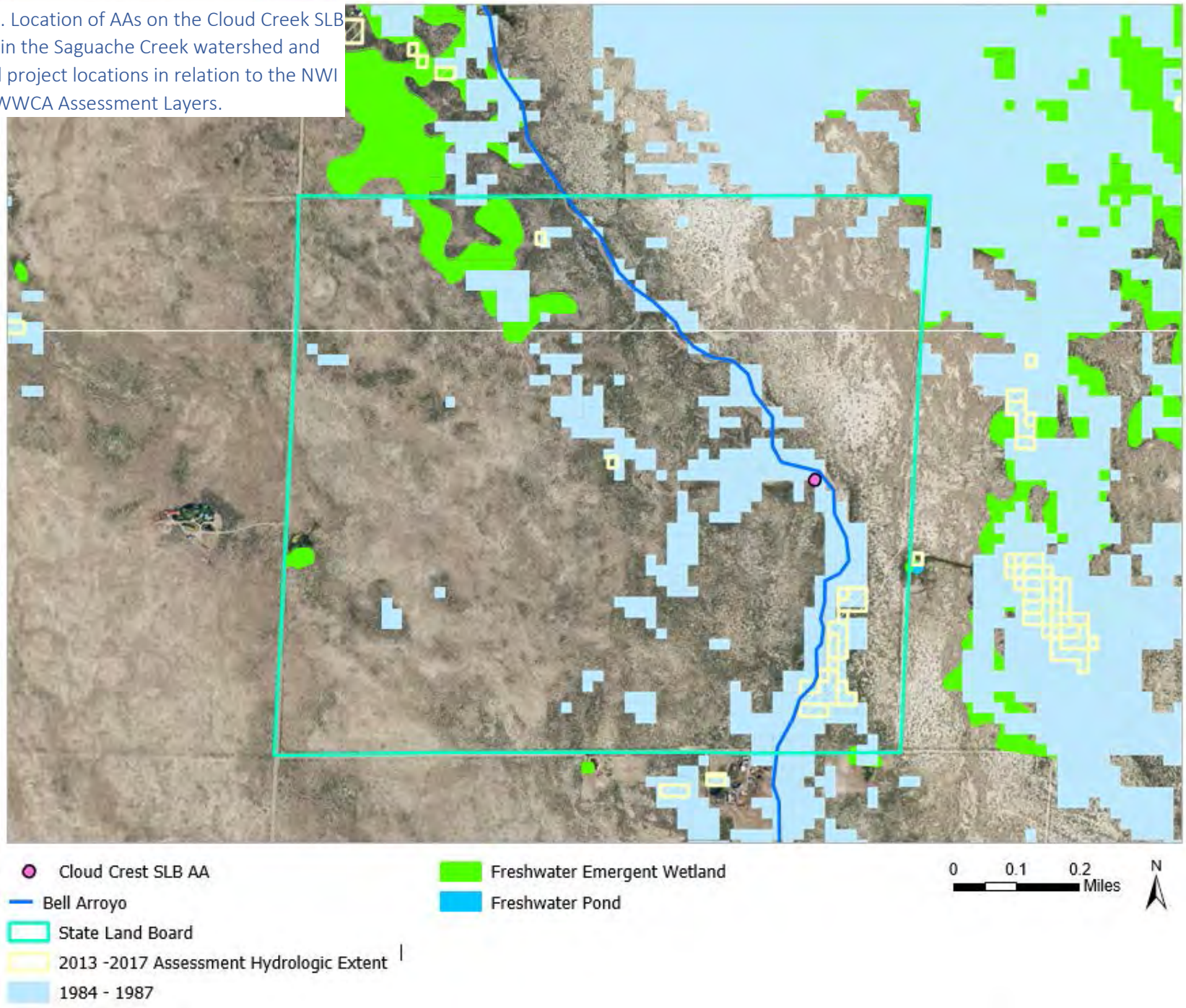
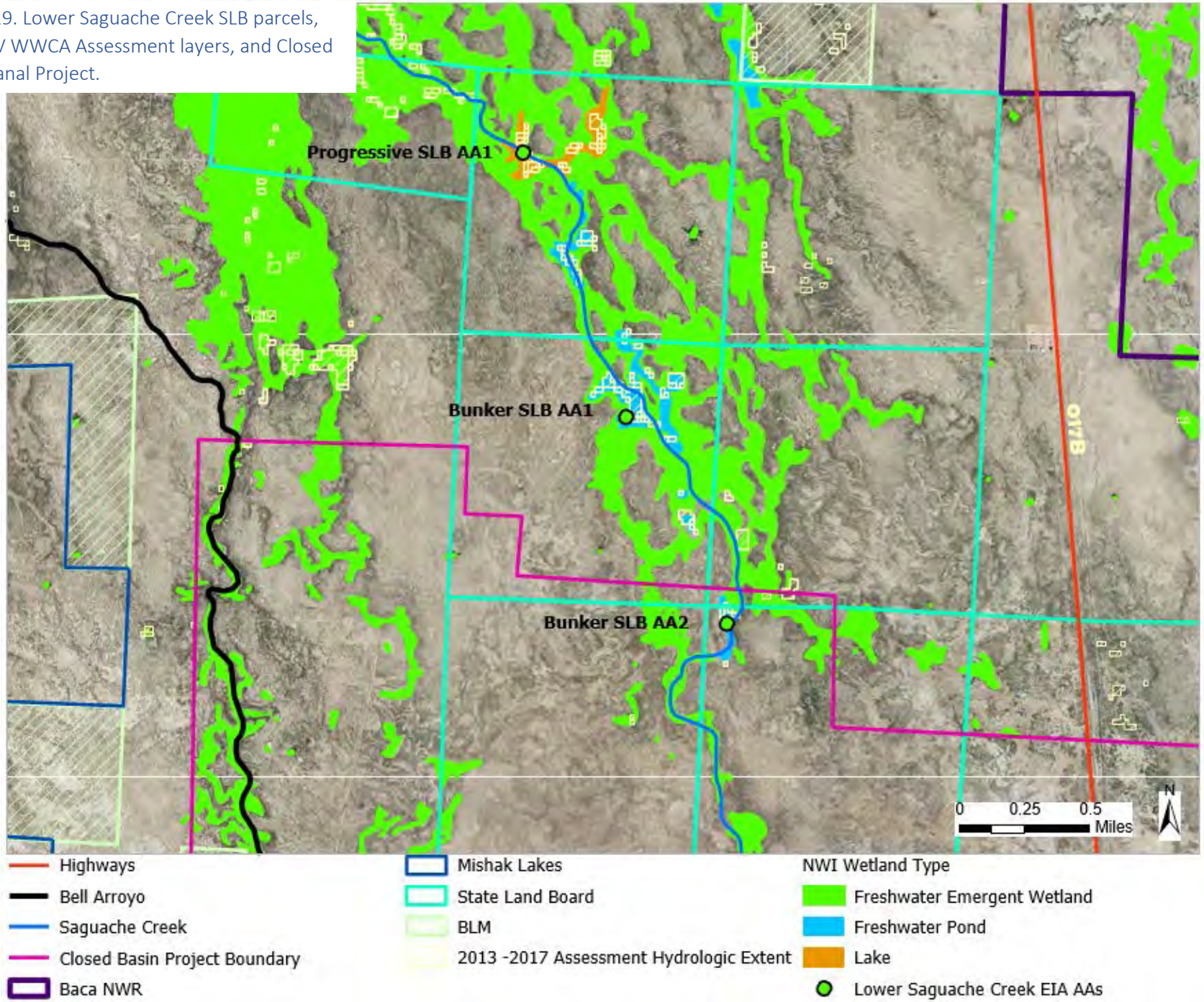


Figure 19. Lower Saguache Creek SLB parcels, AAs, SLV WWCA Assessment layers, and Closed Basin Canal Project.



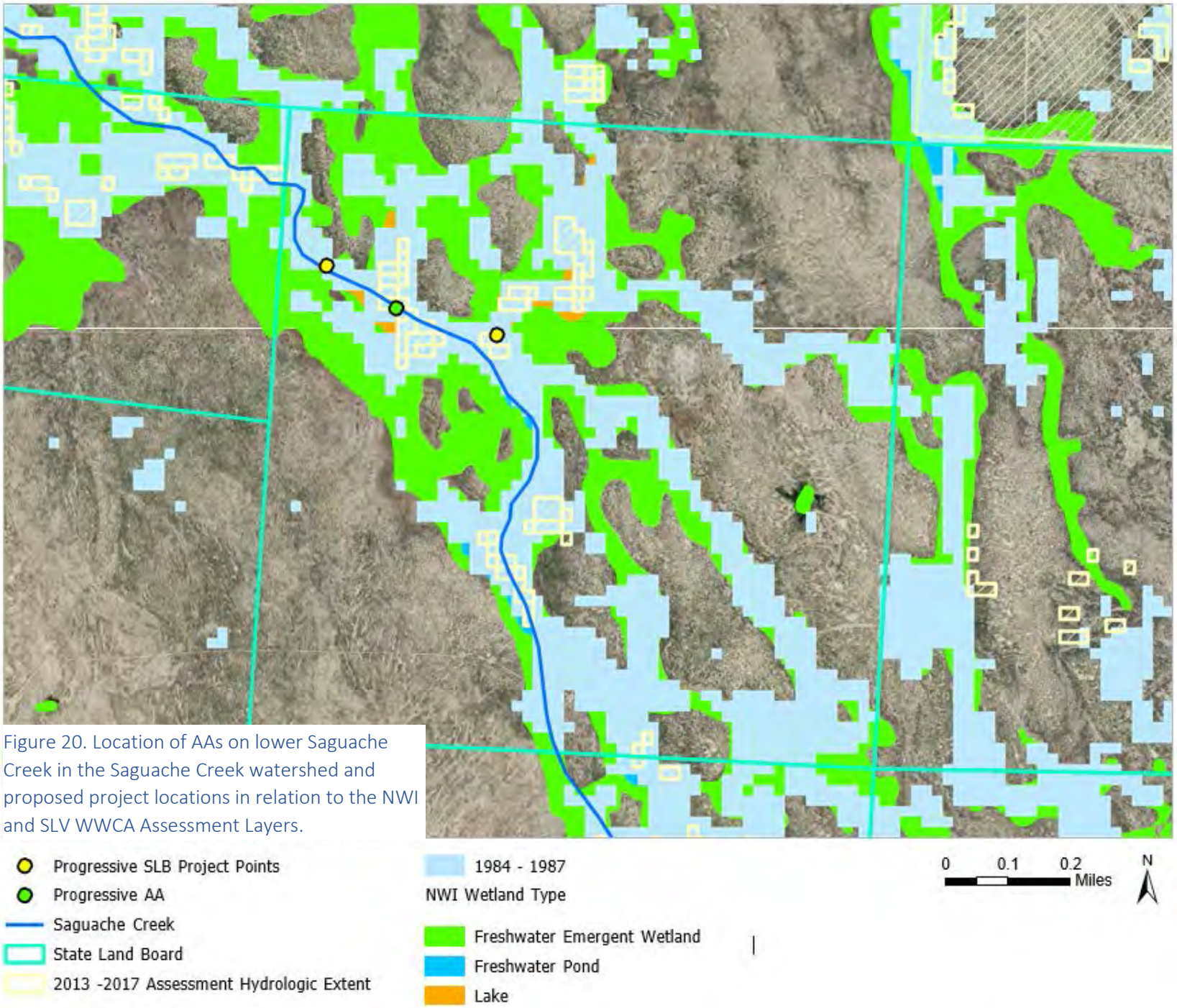
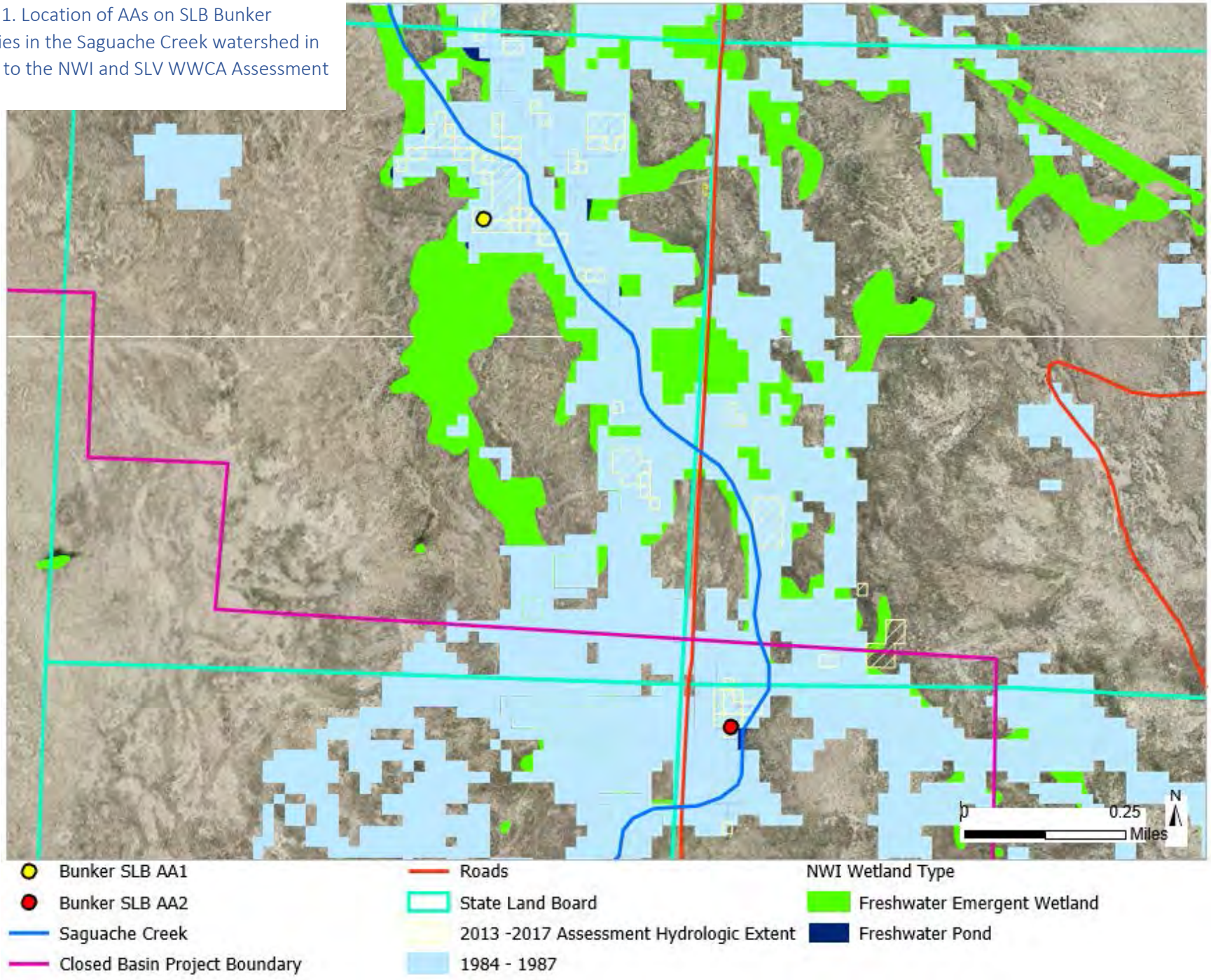


Figure 20. Location of AAs on lower Saguache Creek in the Saguache Creek watershed and proposed project locations in relation to the NWI and SLV WWCA Assessment Layers.

Figure 21. Location of AAs on SLB Bunker properties in the Saguache Creek watershed in relation to the NWI and SLV WWCA Assessment Layers.



Appendix III: Photos of each EIA AA by Watershed

San Luis Creek Watershed EIA Photos

Fullenwider Ranch AA1

Fullenwider Ranch AA2

Oxcart (Meyer) Ranch AA1

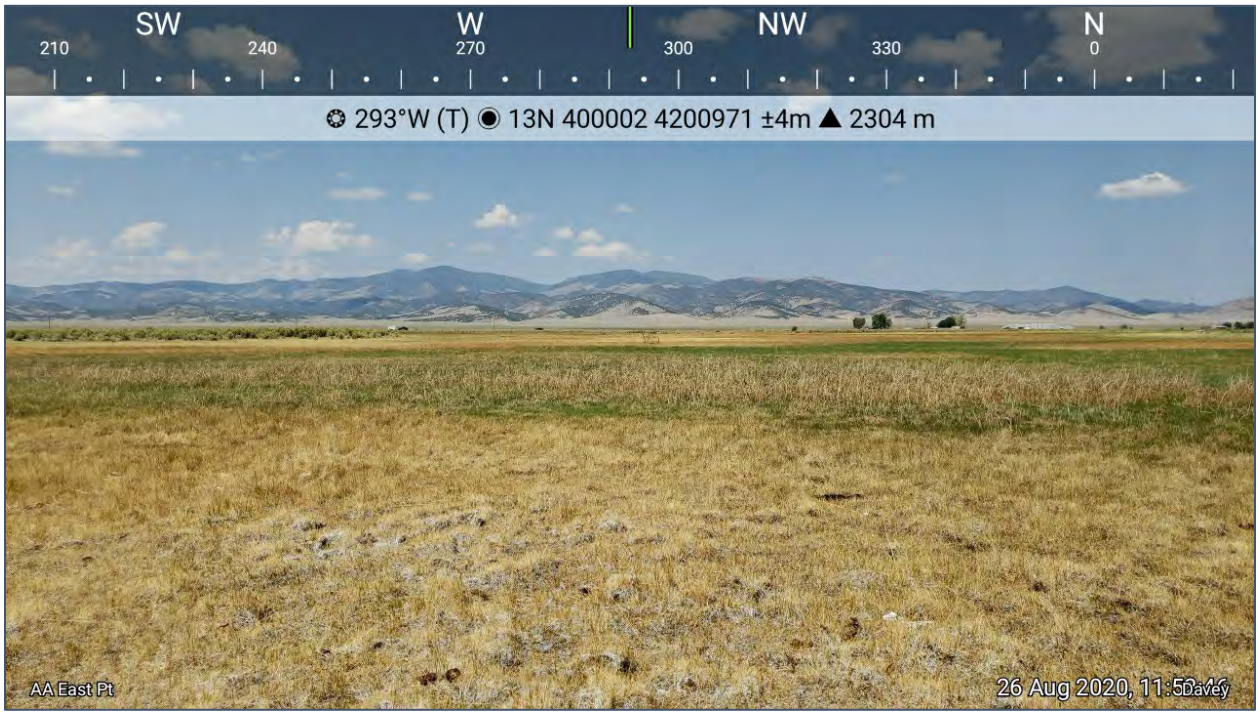
Slash LD Neiland Creek AA1

Slash LD San Luis Creek AA2

SLB Alder AA1

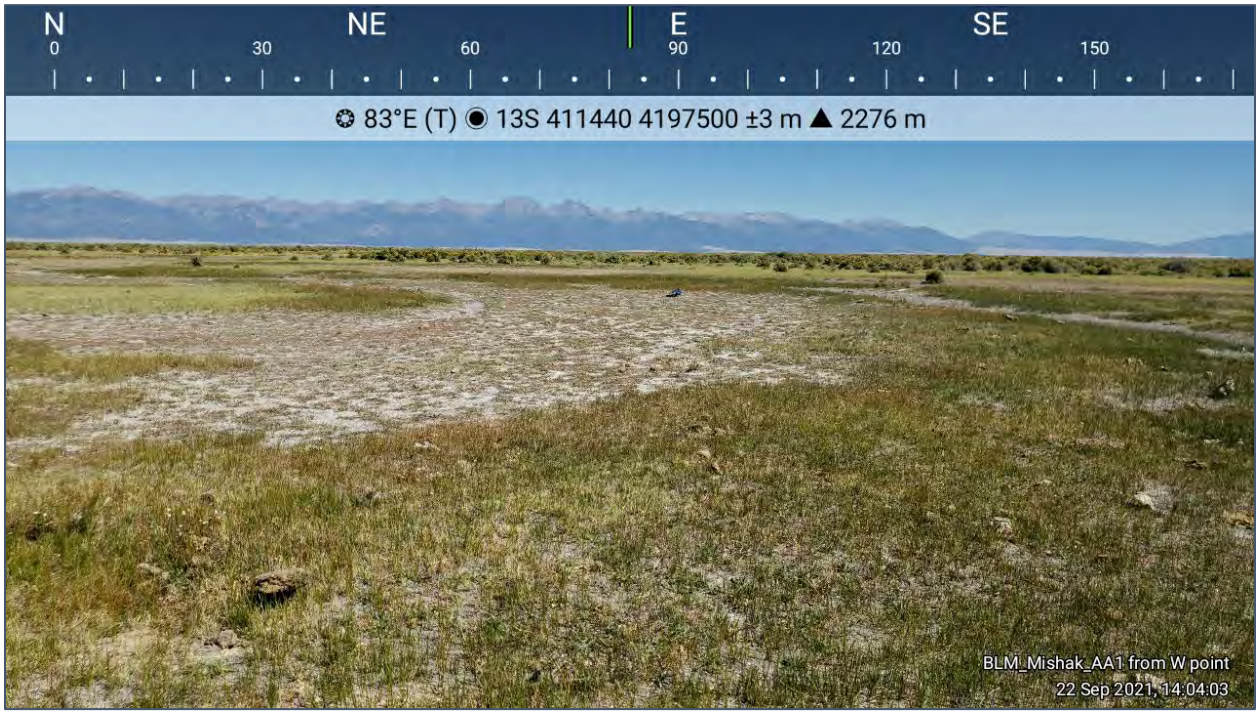
SLB Rock Creek AA1

La Garita Creek Watershed EIA Photos



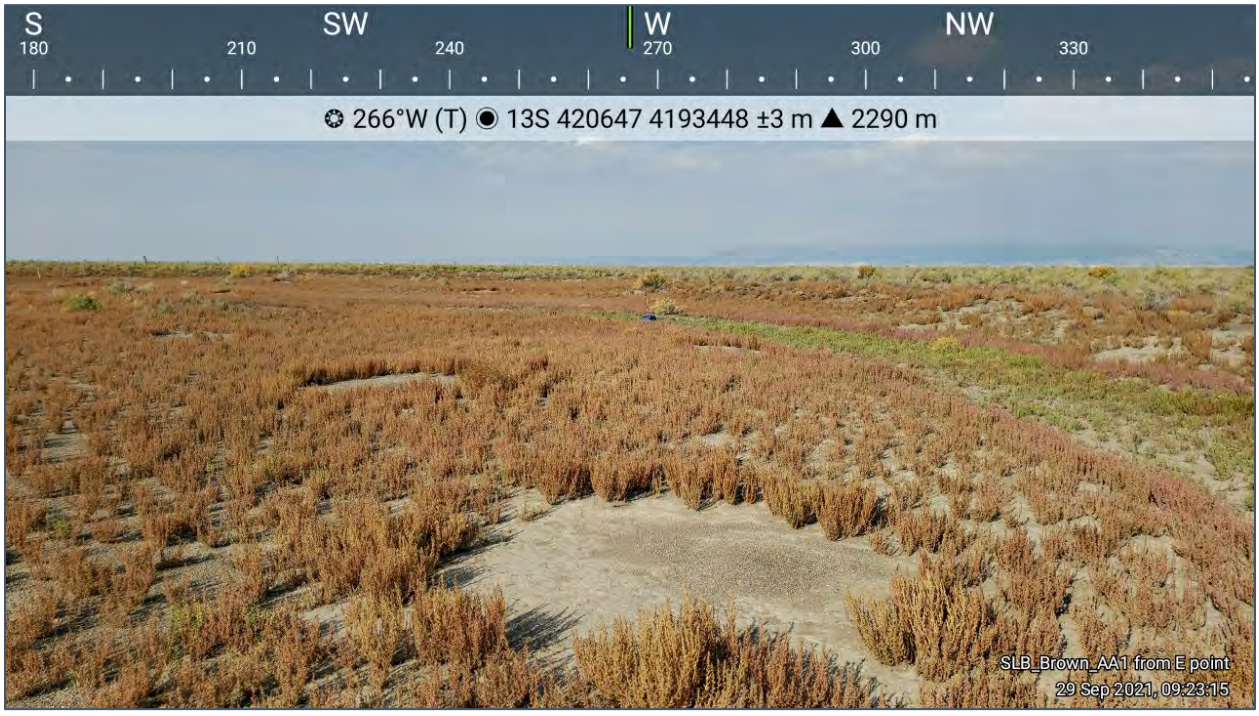
Davey Ranch

Meadow Ranch



Mishak BLM AA1

Mishak TNC AA1



SLB Brown AA1

SLB RC1 Werner Arroyo

SLB RC4 Russell Creek

Saguache Creek Watershed EIA Photos

Saguache Creek Ranch AA1

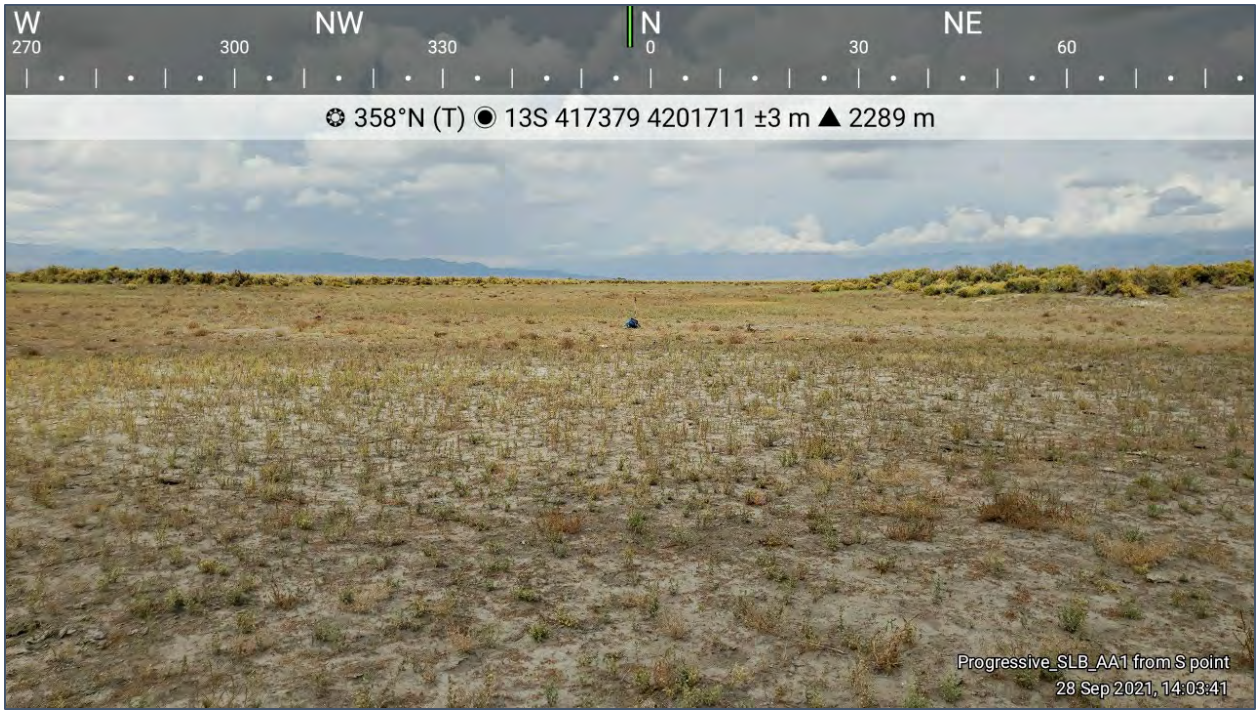
Saguache Creek Ranch AA2

SLB Bunker AA1

SLB Bunker AA2

SLB Cloud Crest

SLB Hill AA1



SLB Progressive AA1

Appendix IV: Scorecards for Each EIA by Watershed

San Luis Creek Watershed

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD						
Made by: Colorado Natural Heritage Program, Version: August 31, 2015						
Site ID:	Fullenwider AA1					
Site Name:	Fullenwider AA1					
Project:	CWCB grant			**Date**	10/19/2020	
Ecol System:	Irrigated Wet Meadow 7B					
HGM:	Novel					
Cowardin:	PEMc					
		Wt	**Field Rating**	**Field Points**	**Calc Points**	**Calc Rating**
Overall Ecological Integrity Score and Rank					**3.30**	**B+**
Overall Ecological Integrity + Size Score and Rank					**3.80**	**A-**
Rank Factor: LANDSCAPE CONTEXT		0.30			**3.67**	**A-**
	LANDSCAPE METRICS	0.33			**3.00**	**B+**
	L1. Contiguous Natural Land Cover	1	A	4		
	L2. Land Use Index	1	C	2		
	BUFFER METRICS	0.67			**4.00**	**A+**
	B1. Perimeter with Natural Buffer	n/a	A	4		
	B2. Width of Natural Buffer	n/a	A	4		
	B3.1. Condition of Natural Buffer - Veg	n/a	A	4		
	B3.2. Condition of Natural Buffer - Soils	n/a	A	4		
Rank Factor: CONDITION		0.70			**3.14**	**B+**
	VEGETATION METRICS	0.55			**3.50**	**A-**
	V1. Native Plant Species Cover	1	A	4		
	V2. Invasive Nonnative Plant Species Cover	1	A	4		
	V3. Native Plant Species Composition	1	C	2		
	V4. Vegetation Structure	1	A	4		
	V5. Regen. of Native Woody Species **(opt.)**	1	NA	NULL		
	V65. Coarse and Fine Woody Debris **(opt.)**	1	NA	NULL		
	HYDROLOGY METRICS	0.35			**2.33**	**C+**
	H1. Water Source	1	C	2		
	H2. Hydroperiod	1	B	3		
	H3. Hydrologic Connectivity	1	C	2		
	PHYSIOCHEMISTRY METRICS	0.10			**4.00**	**A+**
	S1. Soil Condition	1	A	4		
	S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	NA	NULL		
	S3. Algal Growth **(opt.)**	0.5	NA	NULL		
Rank Factor: SIZE		n/a			**3.50**	**A-**
	SIZE METRICS	1			**3.50**	**A-**
	Z1. Comparative Size **(opt.)**	1	A	4		
	Z2. Change in Size **(opt.)**	1	B	3		

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD

Made by: Colorado Natural Heritage Program, Version: August 31, 2015

Site ID:	Fullenwider AA2					
Site Name:	Fullenwider AA2					
Project:	CWCB Grant			**Date**	10/19/2020	
Ecol System:	Irrigated Wet Meadow 7b					
HGM:	Novel					
Cowardin:	PEMf					

		Wt	Field Rating	Field Points	Calc Points	Calc Rating
Overall Ecological Integrity Score and Rank					**2.88**	**B-**
Overall Ecological Integrity + Size Score and Rank					**3.13**	**B+**
Rank Factor: LANDSCAPE CONTEXT		0.30			**3.14**	**B+**
	LANDSCAPE METRICS	0.33			**2.50**	**B-**
	L1. Contiguous Natural Land Cover	1	B	3		
	L2. Land Use Index	1	C	2		
	BUFFER METRICS	0.67			**3.46**	**B+**
	B1. Perimeter with Natural Buffer	n/a	A	4		
	B2. Width of Natural Buffer	n/a	A	4		
	B3.1. Condition of Natural Buffer - Veg	n/a	A	4		
	B3.2. Condition of Natural Buffer - Soils	n/a	C	2		
Rank Factor: CONDITION		0.70			**2.76**	**B-**
	VEGETATION METRICS	0.55			**3.25**	**B+**
	V1. Native Plant Species Cover	1	A	4		
	V2. Invasive Nonnative Plant Species Cover	1	A	4		
	V3. Native Plant Species Composition	1	B	3		
	V4. Vegetation Structure	1	C	2		
	V5. Regen. of Native Woody Species **(opt.)**	1	NA	NULL		
	V65. Coarse and Fine Woody Debris **(opt.)**	1	NA	NULL		
	HYDROLOGY METRICS	0.35			**2.00**	**C+**
	H1. Water Source	1	C	2		
	H2. Hydroperiod	1	C	2		
	H3. Hydrologic Connectivity	1	C	2		
	PHYSIOCHEMISTRY METRICS	0.10			**2.75**	**B-**
	S1. Soil Condition	1	C	2		
	S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	B	3		
	S3. Algal Growth **(opt.)**	0.5	A	4		
Rank Factor: SIZE		n/a			**3.00**	**B+**
	SIZE METRICS	1			**3.00**	**B+**
	Z1. Comparative Size **(opt.)**	1	A	4		
	Z2. Change in Size **(opt.)**	1	C	2		

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD							
Made by: Colorado Natural Heritage Program, Version: August 31, 2015							
Site ID:		Oxcart Ranch AA1					
Site Name:		Oxcart Rancy, Melanie Meyer San Luis Creek					
Project:		CWCB grant			**Date**	9/23/2020	
Ecol System:		Irrigated Medow 7B					
HGM:		Novel					
Cowardin:		PEMhf					
			Wt	**Field Rating**	**Field Points**	**Calc Points**	**Calc Rating**
Overall Ecological Integrity Score and Rank						**2.76**	**B-**
Overall Ecological Integrity + Size Score and Rank						**3.26**	**B+**
Rank Factor: LANDSCAPE CONTEXT			0.30			**3.31**	**B+**
	LANDSCAPE METRICS		0.33			**3.00**	**B+**
		L1. Contiguous Natural Land Cover	1	a	4		
		L2. Land Use Index	1	c	2		
	BUFFER METRICS		0.67			**3.46**	**B+**
		B1. Perimeter with Natural Buffer	n/a	a	4		
		B2. Width of Natural Buffer	n/a	a	4		
		B3.1. Condition of Natural Buffer - Veg	n/a	c	2		
		B3.2. Condition of Natural Buffer - Soils	n/a	a	4		
Rank Factor: CONDITION			0.70			**2.52**	**B-**
	VEGETATION METRICS		0.55			**2.25**	**C+**
		V1. Native Plant Species Cover	1	d	1		
		V2. Invasive Nonnative Plant Species Cover	1	c-	1.5		
		V3. Native Plant Species Composition	1	c	2		
		V4. Vegetation Structure	1	c	2		
		V5. Regen. of Native Woody Species **(opt.)**	1	b	3		
		V65. Coarse and Fine Woody Debris **(opt.)**	1	a	4		
	HYDROLOGY METRICS		0.35			**2.67**	**B-**
		H1. Water Source	1	c	2		
		H2. Hydroperiod	1	b	3		
		H3. Hydrologic Connectivity	1	b	3		
	PHYSIOCHEMISTRY METRICS		0.10			**3.50**	**A-**
		S1. Soil Condition	1	b	3		
		S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	a	4		
		S3. Algal Growth **(opt.)**	0.5	a	4		
Rank Factor: SIZE			n/a			**3.50**	**A-**
	SIZE METRICS		1			**3.50**	**A-**
		Z1. Comparative Size **(opt.)**	1	a	4		
		Z2. Change in Size **(opt.)**	1	b	3		

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD								
Made by: Colorado Natural Heritage Program, Version: August 31, 2015								
Site ID:		SlashLD Neiland Creek AA1						
Site Name:		SlashLD Neiland Creek AA1						
Project:		CWCB Grant				**Date**	10/14/2020	
Ecol System:		Irrigated Wet Meadow 7B						
HGM:		Novel						
Cowardin:		PEMC						
			Wt	**Field Rating**	**Field Points**		**Calc Points**	**Calc Rating**
Overall Ecological Integrity Score and Rank							**2.75**	**B-**
Overall Ecological Integrity + Size Score and Rank							**3.25**	**B+**
Rank Factor: LANDSCAPE CONTEXT			0.30				**3.49**	**B+**
	LANDSCAPE METRICS		0.33				**3.00**	**B+**
		L1. Contiguous Natural Land Cover	1	A	4			
		L2. Land Use Index	1	C	2			
	BUFFER METRICS		0.67				**3.74**	**A-**
		B1. Perimeter with Natural Buffer	n/a	A	4			
		B2. Width of Natural Buffer	n/a	A	4			
		B3.1. Condition of Natural Buffer - Veg	n/a	A	4			
		B3.2. Condition of Natural Buffer - Soils	n/a	B	3			
Rank Factor: CONDITION			0.70				**2.43**	**C+**
	VEGETATION METRICS		0.55				**2.50**	**B-**
		V1. Native Plant Species Cover	1	B	3			
		V2. Invasive Nonnative Plant Species Cover	1	B	3			
		V3. Native Plant Species Composition	1	C	2			
		V4. Vegetation Structure	1	C	2			
		V5. Regen. of Native Woody Species **(opt.)**	1	B	3			
		V65. Coarse and Fine Woody Debris **(opt.)**	1	C	2			
	HYDROLOGY METRICS		0.35				**2.00**	**C+**
		H1. Water Source	1	C	2			
		H2. Hydroperiod	1	C	2			
		H3. Hydrologic Connectivity	1	C	2			
	PHYSIOCHEMISTRY METRICS		0.10				**3.50**	**A-**
		S1. Soil Condition	1	B	3			
		S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	A	4			
		S3. Algal Growth **(opt.)**	0.5	A	4			
Rank Factor: SIZE			n/a				**3.50**	**A-**
	SIZE METRICS		1				**3.50**	**A-**
		Z1. Comparative Size **(opt.)**	1	A	4			
		Z2. Change in Size **(opt.)**	1	B	3			

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD							
Made by: Colorado Natural Heritage Program, Version: August 31, 2015							
Site ID:		SlashLD San Luis Creek AA2					
Site Name:		SlashLD San Luis Creek AA2					
Project:		CWCB grant			**Date**	10/14/2020	
Ecol System:		Irrigated Wet Meadow 7B					
HGM:		Riverine					
Cowardin:		PEMC					
			Wt	**Field Rating**	**Field Points**	**Calc Points**	**Calc Rating**
Overall Ecological Integrity Score and Rank						**2.25**	**C+**
Overall Ecological Integrity + Size Score and Rank						**2.50**	**B-**
Rank Factor: LANDSCAPE CONTEXT			0.30			**2.94**	**B-**
	LANDSCAPE METRICS		0.33			**2.50**	**B-**
		L1. Contiguous Natural Land Cover	1	B	3		
		L2. Land Use Index	1	C	2		
	BUFFER METRICS		0.67			**3.16**	**B+**
		B1. Perimeter with Natural Buffer	n/a	A	4		
		B2. Width of Natural Buffer	n/a	A	4		
		B3.1. Condition of Natural Buffer - Veg	n/a	C	2		
		B3.2. Condition of Natural Buffer - Soils	n/a	B	3		
Rank Factor: CONDITION			0.70			**1.95**	**C-**
	VEGETATION METRICS		0.55			**1.92**	**C-**
		V1. Native Plant Species Cover	1	D	1		
		V2. Invasive Nonnative Plant Species Cover	1	C-	1.5		
		V3. Native Plant Species Composition	1	B	3		
		V4. Vegetation Structure	1	C	2		
		V5. Regen. of Native Woody Species **(opt.)**	1	C	2		
		V65. Coarse and Fine Woody Debris **(opt.)**	1	C	2		
	HYDROLOGY METRICS		0.35			**2.00**	**C+**
		H1. Water Source	1	C	2		
		H2. Hydroperiod	1	C	2		
		H3. Hydrologic Connectivity	1	C	2		
	PHYSIOCHEMISTRY METRICS		0.10			**2.00**	**C+**
		S1. Soil Condition	1	C	2		
		S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	NA	NULL		
		S3. Algal Growth **(opt.)**	0.5	NA	NULL		
Rank Factor: SIZE			n/a			**3.00**	**B+**
	SIZE METRICS		1			**3.00**	**B+**
		Z1. Comparative Size **(opt.)**	1	A	4		
		Z2. Change in Size **(opt.)**	1	C	2		

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD								
Made by: Colorado Natural Heritage Program, Version: August 31, 2015								
Site ID:		SLB Alder AA1						
Site Name:		SLB Alder AA1						
Project:		CWCB grant				**Date**	9/23/2020	
Ecol System:		Rocky Mnt Alpine Wet Meadow 7A						
HGM:		Riverine Slope						
Cowardin:		PEMFd						
			Wt	**Field Rating**	**Field Points**		**Calc Points**	**Calc Rating**
Overall Ecological Integrity Score and Rank							**2.49**	**C+**
Overall Ecological Integrity + Size Score and Rank							**2.99**	**B-**
Rank Factor: LANDSCAPE CONTEXT			0.30				**2.77**	**B-**
	LANDSCAPE METRICS		0.33				**2.00**	**C+**
		L1. Contiguous Natural Land Cover	1	c	2			
		L2. Land Use Index	1		NULL			
	BUFFER METRICS		0.67				**3.16**	**B+**
		B1. Perimeter with Natural Buffer	n/a	a	4			
		B2. Width of Natural Buffer	n/a	a	4			
		B3.1. Condition of Natural Buffer - Veg	n/a	b	3			
		B3.2. Condition of Natural Buffer - Soils	n/a	c	2			
Rank Factor: CONDITION			0.70				**2.38**	**C+**
	VEGETATION METRICS		0.55				**2.50**	**B-**
		V1. Native Plant Species Cover	1	c	2			
		V2. Invasive Nonnative Plant Species Cover	1	a	4			
		V3. Native Plant Species Composition	1	c	2			
		V4. Vegetation Structure	1	c	2			
		V5. Regen. of Native Woody Species **(opt.)**	1	NA	NULL			
		V65. Coarse and Fine Woody Debris **(opt.)**	1	NA	NULL			
	HYDROLOGY METRICS		0.35				**2.00**	**C+**
		H1. Water Source	1	c	2			
		H2. Hydroperiod	1	c	2			
		H3. Hydrologic Connectivity	1	c	2			
	PHYSIOCHEMISTRY METRICS		0.10				**3.00**	**B+**
		S1. Soil Condition	1	b	3			
		S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	NA	NULL			
		S3. Algal Growth **(opt.)**	0.5	NA	NULL			
Rank Factor: SIZE			n/a				**3.50**	**A-**
	SIZE METRICS		1				**3.50**	**A-**
		Z1. Comparative Size **(opt.)**	1	b	3			
		Z2. Change in Size **(opt.)**	1	a	4			

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD						
Made by: Colorado Natural Heritage Program, Version: August 31, 2015						
Site ID:	Corzine					
Site Name:	Corzine					
Project:	CWCB grant			**Date**	9/14/2020	
Ecol System:	Irrigated Wet Meadow 7B					
HGM:	Novel					
Cowardin:	PEM					
		Wt	**Field Rating**	**Field Points**	**Calc Points**	**Calc Rating**
Overall Ecological Integrity Score and Rank					**3.19**	**B+**
Overall Ecological Integrity + Size Score and Rank					**3.69**	**A-**
Rank Factor: LANDSCAPE CONTEXT		0.30			**3.67**	**A-**
	LANDSCAPE METRICS	0.33			**3.00**	**B+**
	L1. Contiguous Natural Land Cover	1	A	4		
	L2. Land Use Index	1	C	2		
	BUFFER METRICS	0.67			**4.00**	**A+**
	B1. Perimeter with Natural Buffer	n/a	A	4		
	B2. Width of Natural Buffer	n/a	A	4		
	B3.1. Condition of Natural Buffer - Veg	n/a	A	4		
	B3.2. Condition of Natural Buffer - Soils	n/a	A	4		
Rank Factor: CONDITION		0.70			**2.98**	**B-**
	VEGETATION METRICS	0.55			**3.00**	**B+**
	V1. Native Plant Species Cover	1	A	4		
	V2. Invasive Nonnative Plant Species Cover	1	B	3		
	V3. Native Plant Species Composition	1	B	3		
	V4. Vegetation Structure	1	C	2		
	V5. Regen. of Native Woody Species **(opt.)**	1	NA	NULL		
	V65. Coarse and Fine Woody Debris **(opt.)**	1	NA	NULL		
	HYDROLOGY METRICS	0.35			**2.67**	**B-**
	H1. Water Source	1	c	2		
	H2. Hydroperiod	1	b	3		
	H3. Hydrologic Connectivity	1	b	3		
	PHYSIOCHEMISTRY METRICS	0.10			**4.00**	**A+**
	S1. Soil Condition	1	a	4		
	S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	NA	NULL		
	S3. Algal Growth **(opt.)**	0.5	NA	NULL		
Rank Factor: SIZE		n/a			**4.00**	**A+**
	SIZE METRICS	1			**4.00**	**A+**
	Z1. Comparative Size **(opt.)**	1	A	4		
	Z2. Change in Size **(opt.)**	1	A	4		

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD

Made by: Colorado Natural Heritage Program, Version: August 31, 2015

Site ID:	Davey
Site Name:	Davey
Project:	CWCB grant
Date	8/26/2020
Ecol System:	Irrigated Wet Meadow 7B
HGM:	Novel
Cowardin:	PEM

	Wt	Field Rating	Field Points	Calc Points	Calc Rating
Overall Ecological Integrity Score and Rank				**3.31**	**B+**
Overall Ecological Integrity + Size Score and Rank				**3.56**	**A-**
Rank Factor: LANDSCAPE CONTEXT	0.30			**3.49**	**B+**
LANDSCAPE METRICS	0.33			**3.00**	**B+**
L1. Contiguous Natural Land Cover	1	A	4		
L2. Land Use Index	1	C	2		
BUFFER METRICS	0.67			**3.74**	**A-**
B1. Perimeter with Natural Buffer	n/a	A	4		
B2. Width of Natural Buffer	n/a	A	4		
B3.1. Condition of Natural Buffer - Veg	n/a	A	4		
B3.2. Condition of Natural Buffer - Soils	n/a	b	3		
Rank Factor: CONDITION	0.70			**3.23**	**B+**
VEGETATION METRICS	0.55			**3.75**	**A-**
V1. Native Plant Species Cover	1	a	4		
V2. Invasive Nonnative Plant Species Cover	1	a	4		
V3. Native Plant Species Composition	1	a	4		
V4. Vegetation Structure	1	b	3		
V5. Regen. of Native Woody Species **(opt.)**	1	NA	NULL		
V65. Coarse and Fine Woody Debris **(opt.)**	1	NA	NULL		
HYDROLOGY METRICS	0.35			**2.33**	**C+**
H1. Water Source	1	c	2		
H2. Hydroperiod	1	c	2		
H3. Hydrologic Connectivity	1	b	3		
PHYSIOCHEMISTRY METRICS	0.10			**3.50**	**A-**
S1. Soil Condition	1	b	3		
S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	a	4		
S3. Algal Growth **(opt.)**	0.5	a	4		
Rank Factor: SIZE	n/a			**3.00**	**B+**
SIZE METRICS	1			**3.00**	**B+**
Z1. Comparative Size **(opt.)**	1	a	4		
Z2. Change in Size **(opt.)**	1	c	2		

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD

Made by: Colorado Natural Heritage Program, Version: August 31, 2015

Site ID:	Meadow Ranch
Site Name:	Meadow Ranch
Project:	CWCB grant
Date	9/2/2020
Ecol System:	Irrigated Wet Meadow 7b Low Fidelity
HGM:	Depressional
Cowardin:	PEM

	Wt	Field Rating	Field Points	Calc Points	Calc Rating
Overall Ecological Integrity Score and Rank				**3.17**	**B+**
Overall Ecological Integrity + Size Score and Rank				**3.67**	**A-**
Rank Factor: LANDSCAPE CONTEXT	0.30			**3.67**	**A-**
LANDSCAPE METRICS	0.33			**3.00**	**B+**
L1. Contiguous Natural Land Cover	1	a	4		
L2. Land Use Index	1	C	2		
BUFFER METRICS	0.67			**4.00**	**A+**
B1. Perimeter with Natural Buffer	n/a	a	4		
B2. Width of Natural Buffer	n/a	a	4		
B3.1. Condition of Natural Buffer - Veg	n/a	a	4		
B3.2. Condition of Natural Buffer - Soils	n/a	a	4		
Rank Factor: CONDITION	0.70			**2.95**	**B-**
VEGETATION METRICS	0.55			**3.50**	**A-**
V1. Native Plant Species Cover	1	a	4		
V2. Invasive Nonnative Plant Species Cover	1	a	4		
V3. Native Plant Species Composition	1	a	4		
V4. Vegetation Structure	1	c	2		
V5. Regen. of Native Woody Species **(opt.)**	1	na	NULL		
V65. Coarse and Fine Woody Debris **(opt.)**	1	na	NULL		
HYDROLOGY METRICS	0.35			**2.00**	**C+**
H1. Water Source	1	c	2		
H2. Hydroperiod	1	c	2		
H3. Hydrologic Connectivity	1	NA	NULL		
PHYSIOCHEMISTRY METRICS	0.10			**3.25**	**B+**
S1. Soil Condition	1	B	3		
S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	b	3		
S3. Algal Growth **(opt.)**	0.5	a	4		
Rank Factor: SIZE	n/a			**4.00**	**A+**
SIZE METRICS	1			**4.00**	**A+**
Z1. Comparative Size **(opt.)**	1	A	4		
Z2. Change in Size **(opt.)**	1	a	4		

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD								
Made by: Colorado Natural Heritage Program, Version: August 31, 2015								
Site ID:		Mishak_BLM_AA1						
Site Name:		Mishak_BLM_AA1						
Project:		CWCB grant			**Date**	9/22/2021		
				Fidelity				
Ecol System:		4A. Inter-Mountain Basin Greasewood Flat		Med				
HGM:		Riverine		Low				
Cowardin:		PEMA		High				
			Wt	**Field Rating**	**Field Points**	**Calc Points**	**Calc Rating**	
Overall Ecological Integrity Score and Rank						**2.94**	**B-**	
Overall Ecological Integrity + Size Score and Rank						**3.44**	**B+**	
Rank Factor: LANDSCAPE CONTEXT			0.30			**3.66**	**A-**	
	LANDSCAPE METRICS		0.33			**3.50**	**A-**	
		L1. Contiguous Natural Land Cover	1	A	4			
		L2. Land Use Index	1	B	3			
	BUFFER METRICS		0.67			**3.74**	**A-**	
		B1. Perimeter with Natural Buffer	n/a	A	4			
		B2. Width of Natural Buffer	n/a	A	4			
		B3.1. Condition of Natural Buffer - Veg	n/a	A	4			
		B3.2. Condition of Natural Buffer - Soils	n/a	B	3			
Rank Factor: CONDITION			0.70			**2.63**	**B-**	
	VEGETATION METRICS		0.55			**2.75**	**B-**	
		V1. Native Plant Species Cover	1	b	3			
		V2. Invasive Nonnative Plant Species Cover	1	c	2			
		V3. Native Plant Species Composition	1	b	3			
		V4. Vegetation Structure	1	b	3			
		V5. Regen. of Native Woody Species **(opt.)**	1	NA	NULL			
		V65. Coarse and Fine Woody Debris **(opt.)**	1	NA	NULL			
	HYDROLOGY METRICS		0.35			**2.33**	**C+**	
		H1. Water Source	1	D	1			
		H2. Hydroperiod	1	b	3			
		H3. Hydrologic Connectivity	1	b	3			
	PHYSIOCHEMISTRY METRICS		0.10			**3.00**	**B+**	
		S1. Soil Condition	1	b	3			
		S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	NA	NULL			
		S3. Algal Growth **(opt.)**	0.5	NA	NULL			
Rank Factor: SIZE			n/a			**4.00**	**A+**	
	SIZE METRICS		1			**4.00**	**A+**	
		Z1. Comparative Size **(opt.)**	1	a	4			
		Z2. Change in Size **(opt.)**	1	a	4			

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD								
Made by: Colorado Natural Heritage Program, Version: August 31, 2015								
Site ID:		Mishak_TNC_AA1						
Site Name:		Mishak TNC						
Project:		CWCB grant			**Date**	9/22/2020		
				Fidelity				
Ecol System:		4A. Inter-Mountain Basin Greasewood Flat		Med				
HGM:		Riverine		Low				
Cowardin:		PEMC		Med				
			Wt	**Field Rating**	**Field Points**	**Calc Points**	**Calc Rating**	
Overall Ecological Integrity Score and Rank						**3.37**	**B+**	
Overall Ecological Integrity + Size Score and Rank						**3.87**	**A+**	
Rank Factor: LANDSCAPE CONTEXT			0.30			**3.83**	**A+**	
	LANDSCAPE METRICS		0.33			**4.00**	**A+**	
		L1. Contiguous Natural Land Cover	1	a	4			
		L2. Land Use Index	1	a	4			
	BUFFER METRICS		0.67			**3.74**	**A-**	
		B1. Perimeter with Natural Buffer	n/a	a	4			
		B2. Width of Natural Buffer	n/a	a	4			
		B3.1. Condition of Natural Buffer - Veg	n/a	a	4			
		B3.2. Condition of Natural Buffer - Soils	n/a	b	3			
Rank Factor: CONDITION			0.70			**3.18**	**B+**	
	VEGETATION METRICS		0.55			**3.75**	**A-**	
		V1. Native Plant Species Cover	1	a	4			
		V2. Invasive Nonnative Plant Species Cover	1	a	4			
		V3. Native Plant Species Composition	1	b	3			
		V4. Vegetation Structure	1	a	4			
		V5. Regen. of Native Woody Species **(opt.)**	1	NA	NULL			
		V65. Coarse and Fine Woody Debris **(opt.)**	1	NA	NULL			
	HYDROLOGY METRICS		0.35			**2.33**	**C+**	
		H1. Water Source	1	**D**	1			
		H2. Hydroperiod	1	c	2			
		H3. Hydrologic Connectivity	1	a	4			
	PHYSIOCHEMISTRY METRICS		0.10			**3.00**	**B+**	
		S1. Soil Condition	1	b	3			
		S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	NA	NULL			
		S3. Algal Growth **(opt.)**	0.5	NA	NULL			
Rank Factor: SIZE			n/a			**4.00**	**A+**	
	SIZE METRICS		1			**4.00**	**A+**	
		Z1. Comparative Size **(opt.)**	1	a	4			
		Z2. Change in Size **(opt.)**	1	a	4			

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD								
Made by: Colorado Natural Heritage Program, Version: August 31, 2015								
Site ID:		SLB_Brown AA1						
Site Name:		SLB_Brown AA1						
Project:		CWCB grant				**Date**	9/29/2021	
					Fidelity			
Ecol System:		4A. Inter-Mountain Basin Greasewood Flat			Med			
HGM:		Riverine			Low			
Cowardin:		PEMA			Low			
				Wt	**Field Rating**	**Field Points**	**Calc Points**	**Calc Rating**
Overall Ecological Integrity Score and Rank							**2.46**	**C+**
Overall Ecological Integrity + Size Score and Rank							**2.96**	**B-**
Rank Factor: LANDSCAPE CONTEXT				0.30			**3.31**	**B+**
	LANDSCAPE METRICS			0.33			**3.00**	**B+**
		L1. Contiguous Natural Land Cover		1	**A**	4		
		L2. Land Use Index		1	**C**	2		
	BUFFER METRICS			0.67			**3.46**	**B+**
		B1. Perimeter with Natural Buffer		n/a	A	4		
		B2. Width of Natural Buffer		n/a	A	4		
		B3.1. Condition of Natural Buffer - Veg		n/a	C	2		
		B3.2. Condition of Natural Buffer - Soils		n/a	A	4		
Rank Factor: CONDITION				0.70			**2.09**	**C+**
	VEGETATION METRICS			0.55			**1.80**	**C-**
		V1. Native Plant Species Cover		1	D	1		
		V2. Invasive Nonnative Plant Species Cover		1	D	1		
		V3. Native Plant Species Composition		1	D	1		
		V4. Vegetation Structure		1	C	2		
		V5. Regen. of Native Woody Species **(opt.)**		1	A	4		
		V65. Coarse and Fine Woody Debris **(opt.)**		1	NA	NULL		
	HYDROLOGY METRICS			0.35			**2.00**	**C+**
		H1. Water Source		1	**D**	1		
		H2. Hydroperiod		1	D	1		
		H3. Hydrologic Connectivity		1	A	4		
	PHYSIOCHEMISTRY METRICS			0.10			**4.00**	**A+**
		S1. Soil Condition		1	A	4		
		S2. Surface Water Turbidity / Pollutants **(opt.)**		0.5	NA	NULL		
		S3. Algal Growth **(opt.)**		0.5	NA	NULL		
Rank Factor: SIZE				n/a			**4.00**	**A+**
	SIZE METRICS			1			**4.00**	**A+**
		Z1. Comparative Size **(opt.)**		1	A	4		
		Z2. Change in Size **(opt.)**		1	**A**	4		

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD

Made by: Colorado Natural Heritage Program, Version: August 31, 2015

Site ID:	SLB RC1 Werner Arroyo
Site Name:	SLB RC1 Werner Arroyo
Project:	CWCB grant
Date	9/16/2020
Ecol System:	Inter-Mnt Basin Greasewood Flat High Fidelity
HGM:	Depressional, Low fidelity
Cowardin:	PEMAf Medium

	Wt	Field Rating	Field Points	Calc Points	Calc Rating
Overall Ecological Integrity Score and Rank				**3.38**	**B+**
Overall Ecological Integrity + Size Score and Rank				**3.88**	**A+**
Rank Factor: LANDSCAPE CONTEXT	0.30			**3.66**	**A-**
LANDSCAPE METRICS	0.33			**3.50**	**A-**
L1. Contiguous Natural Land Cover	1	A	4		
L2. Land Use Index	1	B	3		
BUFFER METRICS	0.67			**3.74**	**A-**
B1. Perimeter with Natural Buffer	n/a	A	4		
B2. Width of Natural Buffer	n/a	A	4		
B3.1. Condition of Natural Buffer - Veg	n/a	A	4		
B3.2. Condition of Natural Buffer - Soils	n/a	B	3		
Rank Factor: CONDITION	0.70			**3.25**	**B+**
VEGETATION METRICS	0.55			**3.25**	**B+**
V1. Native Plant Species Cover	1	A	4		
V2. Invasive Nonnative Plant Species Cover	1	A	4		
V3. Native Plant Species Composition	1	B	3		
V4. Vegetation Structure	1	C	2		
V5. Regen. of Native Woody Species **(opt.)**	1	NA	NULL		
V65. Coarse and Fine Woody Debris **(opt.)**	1	NA	NULL		
HYDROLOGY METRICS	0.35			**3.33**	**B+**
H1. Water Source	1	B	3		
H2. Hydroperiod	1	B	3		
H3. Hydrologic Connectivity	1	A	4		
PHYSIOCHEMISTRY METRICS	0.10			**3.00**	**B+**
S1. Soil Condition	1	B	3		
S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	NA	NULL		
S3. Algal Growth **(opt.)**	0.5	NA	NULL		
Rank Factor: SIZE	n/a			**3.50**	**A-**
SIZE METRICS	1			**3.50**	**A-**
Z1. Comparative Size **(opt.)**	1	A	4		
Z2. Change in Size **(opt.)**	1	B	3		

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD

Made by: Colorado Natural Heritage Program, Version: August 31, 2015

Site ID:	SLB RC4 Russell Creek
Site Name:	SLB RC4 Russell Creek
Project:	CWCB grant
Date	9/16/2020
Ecol System:	Inter-Mountain Basin Greasewood Flat
HGM:	PEM/Riverine
Cowardin:	Riverine/Depressional

	Wt	Field Rating	Field Points	Calc Points	Calc Rating
Overall Ecological Integrity Score and Rank				**3.17**	**B+**
Overall Ecological Integrity + Size Score and Rank				**3.42**	**B+**
Rank Factor: LANDSCAPE CONTEXT	0.30			**3.83**	**A+**
LANDSCAPE METRICS	0.33			**3.50**	**A-**
L1. Contiguous Natural Land Cover	1	A	4		
L2. Land Use Index	1	B	3		
BUFFER METRICS	0.67			**4.00**	**A+**
B1. Perimeter with Natural Buffer	n/a	A	4		
B2. Width of Natural Buffer	n/a	A	4		
B3.1. Condition of Natural Buffer - Veg	n/a	A	4		
B3.2. Condition of Natural Buffer - Soils	n/a	A	4		
Rank Factor: CONDITION	0.70			**2.88**	**B-**
VEGETATION METRICS	0.55			**3.00**	**B+**
V1. Native Plant Species Cover	1	A	4		
V2. Invasive Nonnative Plant Species Cover	1	B	3		
V3. Native Plant Species Composition	1	B	3		
V4. Vegetation Structure	1	C	2		
V5. Regen. of Native Woody Species **(opt.)**	1	NA	NULL		
V65. Coarse and Fine Woody Debris **(opt.)**	1	NA	NULL		
HYDROLOGY METRICS	0.35			**2.67**	**B-**
H1. Water Source	1	C	2		
H2. Hydroperiod	1	B	3		
H3. Hydrologic Connectivity	1	B	3		
PHYSIOCHEMISTRY METRICS	0.10			**3.00**	**B+**
S1. Soil Condition	1	B	3		
S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	NA	NULL		
S3. Algal Growth **(opt.)**	0.5	NA	NULL		
Rank Factor: SIZE	n/a			**3.00**	**B+**
SIZE METRICS	1			**3.00**	**B+**
Z1. Comparative Size **(opt.)**	1	A	4		
Z2. Change in Size **(opt.)**	1	C	2		

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD						
Made by: Colorado Natural Heritage Program, Version: August 31, 2015						
Site ID:	SCR_AA1					
Site Name:	Saguache Creek Ranch AA1					
Project:	CWCB grant			**Date**	10/4/2021	
			Fidelity			
Ecol System:	7B Irrigated Wet Meadow		High			
HGM:	Novel/Riverine		High			
Cowardin:	PEMCf		High			
		Wt	**Field Rating**	**Field Points**	**Calc Points**	**Calc Rating**
Overall Ecological Integrity Score and Rank					**3.41**	**B+**
Overall Ecological Integrity + Size Score and Rank					**3.91**	**A+**
Rank Factor: LANDSCAPE CONTEXT		0.30			**3.67**	**A-**
	LANDSCAPE METRICS	0.33			**3.00**	**B+**
	L1. Contiguous Natural Land Cover	1	A	4		
	L2. Land Use Index	1	c	2		
	BUFFER METRICS	0.67			**4.00**	**A+**
	B1. Perimeter with Natural Buffer	n/a	A	4		
	B2. Width of Natural Buffer	n/a	A	4		
	B3.1. Condition of Natural Buffer - Veg	n/a	A	4		
	B3.2. Condition of Natural Buffer - Soils	n/a	A	4		
Rank Factor: CONDITION		0.70			**3.30**	**B+**
	VEGETATION METRICS	0.55			**4.00**	**A+**
	V1. Native Plant Species Cover	1	A	4		
	V2. Invasive Nonnative Plant Species Cover	1	A	4		
	V3. Native Plant Species Composition	1	A	4		
	V4. Vegetation Structure	1	A	4		
	V5. Regen. of Native Woody Species **(opt.)**	1	NA	NULL		
	V65. Coarse and Fine Woody Debris (**opt.**)	1	NA	NULL		
	HYDROLOGY METRICS	0.35			**2.00**	**C+**
	H1. Water Source	1	D	1		
	H2. Hydroperiod	1	B	3		
	H3. Hydrologic Connectivity	1	C	2		
	PHYSIOCHEMISTRY METRICS	0.10			**4.00**	**A+**
	S1. Soil Condition	1	A	4		
	S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	NA	NULL		
	S3. Algal Growth **(opt.)**	0.5	NA	NULL		
Rank Factor: SIZE		n/a			**4.00**	**A+**
	SIZE METRICS	1			**4.00**	**A+**
	Z1. Comparative Size **(opt.)**	1	A	4		
	Z2. Change in Size **(opt.)**	1	A	4		

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD

Made by: Colorado Natural Heritage Program, Version: August 31, 2015

Site ID:	SCR_AA2						
Site Name:	Saguache Creek Ranch AA2						
Project:	CWCB Grant			**Date**	10/4/2021		
			Fidelity				
Ecol System:	6A. North American Arid West Emergent Marsh		High				
HGM:	Novel/Riverine		Low				
Cowardin:	PEMCf		High				
		Wt	**Field Rating**	**Field Points**	**Calc Points**	**Calc Rating**	
Overall Ecological Integrity Score and Rank					**3.42**	**B+**	
Overall Ecological Integrity + Size Score and Rank					**3.92**	**A+**	
Rank Factor: LANDSCAPE CONTEXT		0.30			**3.67**	**A-**	
	LANDSCAPE METRICS	0.33			**3.00**	**B+**	
	L1. Contiguous Natural Land Cover	1	A	4			
	L2. Land Use Index	1	C	2			
	BUFFER METRICS	0.67			**4.00**	**A+**	
	B1. Perimeter with Natural Buffer	n/a	A	4			
	B2. Width of Natural Buffer	n/a	A	4			
	B3.1. Condition of Natural Buffer - Veg	n/a	A	4			
	B3.2. Condition of Natural Buffer - Soils	n/a	A	4			
Rank Factor: CONDITION		0.70			**3.32**	**B+**	
	VEGETATION METRICS	0.55			**4.00**	**A+**	
	V1. Native Plant Species Cover	1	A	4			
	V2. Invasive Nonnative Plant Species Cover	1	A	4			
	V3. Native Plant Species Composition	1	A	4			
	V4. Vegetation Structure	1	A	4			
	V5. Regen. of Native Woody Species **(opt.)**	1	NA	NULL			
	V65. Coarse and Fine Woody Debris **(opt.)**	1	NA	NULL			
	HYDROLOGY METRICS	0.35			**2.33**	**C+**	
	H1. Water Source	1	C	2			
	H2. Hydroperiod	1	C	2			
	H3. Hydrologic Connectivity	1	B	3			
	PHYSIOCHEMISTRY METRICS	0.10			**3.00**	**B+**	
	S1. Soil Condition	1	B	3			
	S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	NA	NULL			
	S3. Algal Growth **(opt.)**	0.5	NA	NULL			
Rank Factor: SIZE		n/a			**4.00**	**A+**	
	SIZE METRICS	1			**4.00**	**A+**	
	Z1. Comparative Size **(opt.)**	1	A	4			
	Z2. Change in Size **(opt.)**	1	A	4			

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD								
Made by: Colorado Natural Heritage Program, Version: August 31, 2015								
Site ID:		SLB_Bunker AA1						
Site Name:		SLB_Bunker AA1						
Project:		CWCB Grant			**Date**	9/28/2021		
				Fidelity				
Ecol System:		4A. Inter-Mountain Basin Greasewood Flat		Med				
HGM:		Riverine		Med				
Cowardin:		PEMA		Med				
			Wt	**Field Rating**	**Field Points**	**Calc Points**	**Calc Rating**	
Overall Ecological Integrity Score and Rank						**2.29**	**C+**	
Overall Ecological Integrity + Size Score and Rank						**2.79**	**B-**	
Rank Factor: LANDSCAPE CONTEXT			0.30			**3.48**	**B+**	
	LANDSCAPE METRICS		0.33			**3.50**	**A-**	
		L1. Contiguous Natural Land Cover	1	a	4			
		L2. Land Use Index	1	B	3			
	BUFFER METRICS		0.67			**3.46**	**B+**	
		B1. Perimeter with Natural Buffer	n/a	A	4			
		B2. Width of Natural Buffer	n/a	A	4			
		B3.1. Condition of Natural Buffer - Veg	n/a	C	2			
		B3.2. Condition of Natural Buffer - Soils	n/a	A	4			
Rank Factor: CONDITION			0.70			**1.79**	**C-**	
	VEGETATION METRICS		0.55			**1.25**	**D**	
		V1. Native Plant Species Cover	1	D	1			
		V2. Invasive Nonnative Plant Species Cover	1	D	1			
		V3. Native Plant Species Composition	1	D	1			
		V4. Vegetation Structure	1	C	2			
		V5. Regen. of Native Woody Species **(opt.)**	1	NA	NULL			
		V65. Coarse and Fine Woody Debris **(opt.)**	1	NA	NULL			
	HYDROLOGY METRICS		0.35			**2.00**	**C+**	
		H1. Water Source	1	**D**	1			
		H2. Hydroperiod	1	D	1			
		H3. Hydrologic Connectivity	1	A	4			
	PHYSIOCHEMISTRY METRICS		0.10			**4.00**	**A+**	
		S1. Soil Condition	1	A	4			
		S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	NA	NULL			
		S3. Algal Growth **(opt.)**	0.5	NA	NULL			
Rank Factor: SIZE			n/a			**4.00**	**A+**	
	SIZE METRICS		1			**4.00**	**A+**	
		Z1. Comparative Size **(opt.)**	1	A	4			
		Z2. Change in Size **(opt.)**	1	**A**	4			

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD								
Made by: Colorado Natural Heritage Program, Version: August 31, 2015								
Site ID:		SLB_Bunker AA2						
Site Name:		SLB_Bunker AA2						
Project:		CWCB Grant			**Date**	9/29/2021		
				Fidelity				
Ecol System:		4A. Inter-Mountain Basin Greasewood Flat		Low				
HGM:		Riverine		Low				
Cowardin:		PEMA		Med				
			Wt	**Field Rating**	**Field Points**	**Calc Points**	**Calc Rating**	
Overall Ecological Integrity Score and Rank						**2.11**	**C+**	
Overall Ecological Integrity + Size Score and Rank						**2.61**	**B-**	
Rank Factor: LANDSCAPE CONTEXT			0.30			**3.15**	**B+**	
	LANDSCAPE METRICS		0.33			**3.00**	**B+**	
		L1. Contiguous Natural Land Cover	1	B	3			
		L2. Land Use Index	1	**B**	3			
	BUFFER METRICS		0.67			**3.22**	**B+**	
		B1. Perimeter with Natural Buffer	n/a	A	4			
		B2. Width of Natural Buffer	n/a	B	3			
		B3.1. Condition of Natural Buffer - Veg	n/a	C	2			
		B3.2. Condition of Natural Buffer - Soils	n/a	A	4			
Rank Factor: CONDITION			0.70			**1.67**	**C-**	
	VEGETATION METRICS		0.55			**1.25**	**D**	
		V1. Native Plant Species Cover	1	D	1			
		V2. Invasive Nonnative Plant Species Cover	1	D	1			
		V3. Native Plant Species Composition	1	D	1			
		V4. Vegetation Structure	1	C	2			
		V5. Regen. of Native Woody Species **(opt.)**	1	NA	NULL			
		V65. Coarse and Fine Woody Debris **(opt.)**	1	NA	NULL			
	HYDROLOGY METRICS		0.35			**1.67**	**C-**	
		H1. Water Source	1	**D**	1			
		H2. Hydroperiod	1	D	1			
		H3. Hydrologic Connectivity	1	B	3			
	PHYSIOCHEMISTRY METRICS		0.10			**4.00**	**A+**	
		S1. Soil Condition	1	A	4			
		S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	NA	NULL			
		S3. Algal Growth **(opt.)**	0.5	NA	NULL			
Rank Factor: SIZE			n/a			**4.00**	**A+**	
	SIZE METRICS		1			**4.00**	**A+**	
		Z1. Comparative Size **(opt.)**	1	A	4			
		Z2. Change in Size **(opt.)**	1	**A**	4			

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD								
Made by: Colorado Natural Heritage Program, Version: August 31, 2015								
Site ID:		SLB_Cloud Crest						
Site Name:		SLB_Cloud Crest						
Project:		CWCB grant				**Date**	9/22/2021	
				Fidelity				
Ecol System:		4A. Inter-Mountain Basin Greasewood Flat		High				
HGM:		Riverine		Low				
Cowardin:		PEMA		High				
			Wt	**Field Rating**	**Field Points**		**Calc Points**	**Calc Rating**
Overall Ecological Integrity Score and Rank							**2.74**	**B-**
Overall Ecological Integrity + Size Score and Rank							**3.24**	**B+**
Rank Factor: LANDSCAPE CONTEXT			0.30				**3.48**	**B+**
	LANDSCAPE METRICS		0.33				**3.50**	**A-**
		L1. Contiguous Natural Land Cover	1	A	4			
		L2. Land Use Index	1	B	3			
	BUFFER METRICS		0.67				**3.46**	**B+**
		B1. Perimeter with Natural Buffer	n/a	a	4			
		B2. Width of Natural Buffer	n/a	a	4			
		B3.1. Condition of Natural Buffer - Veg	n/a	c	2			
		B3.2. Condition of Natural Buffer - Soils	n/a	a	4			
Rank Factor: CONDITION			0.70				**2.43**	**C+**
	VEGETATION METRICS		0.55				**2.42**	**C+**
		V1. Native Plant Species Cover	1	d	1			
		V2. Invasive Nonnative Plant Species Cover	1	d	1			
		V3. Native Plant Species Composition	1	b	3			
		V4. Vegetation Structure	1	c	2			
		V5. Regen. of Native Woody Species **(opt.)**	1	a	4			
		V65. Coarse and Fine Woody Debris **(opt.)**	1	A/B	3.5			
	HYDROLOGY METRICS		0.35				**2.00**	**C+**
		H1. Water Source	1	d	1			
		H2. Hydroperiod	1	d	1			
		H3. Hydrologic Connectivity	1	a	4			
	PHYSIOCHEMISTRY METRICS		0.10				**4.00**	**A+**
		S1. Soil Condition	1	a	4			
		S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	n/a	NULL			
		S3. Algal Growth **(opt.)**	0.5	n/a	NULL			
Rank Factor: SIZE			n/a				**4.00**	**A+**
	SIZE METRICS		1				**4.00**	**A+**
		Z1. Comparative Size **(opt.)**	1	a	4			
		Z2. Change in Size **(opt.)**	1	a	4			

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD								
Made by: Colorado Natural Heritage Program, Version: August 31, 2015								
Site ID:		SLB_HILL_AA1						
Site Name:		Kristi Hill-Standt						
Project:		CWCB grant				**Date**	9/20/2021	
				Fidelity				
Ecol System:		4A. Inter-Mountain Basin Greasewood Flat		Low				
HGM:		Riverine		Med				
Cowardin:		PEMCd		Med				
			Wt	**Field Rating**	**Field Points**		**Calc Points**	**Calc Rating**
Overall Ecological Integrity Score and Rank							**2.32**	**C+**
Overall Ecological Integrity + Size Score and Rank							**2.32**	**C+**
Rank Factor: LANDSCAPE CONTEXT			0.30				**2.89**	**B-**
	LANDSCAPE METRICS		0.33				**3.00**	**B+**
		L1. Contiguous Natural Land Cover	1	a	4			
		L2. Land Use Index	1	c	2			
	BUFFER METRICS		0.67				**2.83**	**B-**
		B1. Perimeter with Natural Buffer	n/a	a	4			
		B2. Width of Natural Buffer	n/a	a	4			
		B3.1. Condition of Natural Buffer - Veg	n/a	c	2			
		B3.2. Condition of Natural Buffer - Soils	n/a	c	2			
Rank Factor: CONDITION			0.70				**2.08**	**C+**
	VEGETATION METRICS		0.55				**1.67**	**C-**
		V1. Native Plant Species Cover	1	d	1			
		V2. Invasive Nonnative Plant Species Cover	1	c	2			
		V3. Native Plant Species Composition	1	b	3			
		V4. Vegetation Structure	1	d	1			
		V5. Regen. of Native Woody Species **(opt.)**	1	d	1			
		V65. Coarse and Fine Woody Debris **(opt.)**	1	c	2			
	HYDROLOGY METRICS		0.35				**2.33**	**C+**
		H1. Water Source	1	c	2			
		H2. Hydroperiod	1	c	2			
		H3. Hydrologic Connectivity	1	b	3			
	PHYSIOCHEMISTRY METRICS		0.10				**3.50**	**A-**
		S1. Soil Condition	1	b	3			
		S2. Surface Water Turbidity / Pollutants **(opt.)**	0.5	a	4			
		S3. Algal Growth **(opt.)**	0.5	a	4			
Rank Factor: SIZE			n/a				**3.00**	**B+**
	SIZE METRICS		1				**3.00**	**B+**
		Z1. Comparative Size **(opt.)**	1	a	4			
		Z2. Change in Size **(opt.)**	1	c	2			

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.

COLORADO ECOLOICAL INTEGRITY ASSESSMENT (EIA) SCORECARD								
Made by: Colorado Natural Heritage Program, Version: August 31, 2015								
Site ID:		SLB_Progressive AA1						
Site Name:		SLB_Progressive						
Project:		CWCB grant				**Date**	9/28/2021	
					Fidelity			
Ecol System:		4A. Inter-Mountain Basin Greasewood Flat			Med			
HGM:		Riverine			Low			
Cowardin:		PEMA			Low			
				Wt	**Field Rating**	**Field Points**	**Calc Points**	**Calc Rating**
Overall Ecological Integrity Score and Rank							**2.32**	**C+**
Overall Ecological Integrity + Size Score and Rank							**2.82**	**B-**
Rank Factor: LANDSCAPE CONTEXT				0.30			**3.31**	**B+**
	LANDSCAPE METRICS			0.33			**3.00**	**B+**
		L1. Contiguous Natural Land Cover		1	A	4		
		L2. Land Use Index		1	c	2		
	BUFFER METRICS			0.67			**3.46**	**B+**
		B1. Perimeter with Natural Buffer		n/a	A	4		
		B2. Width of Natural Buffer		n/a	A	4		
		B3.1. Condition of Natural Buffer - Veg		n/a	C	2		
		B3.2. Condition of Natural Buffer - Soils		n/a	A	4		
Rank Factor: CONDITION				0.70			**1.89**	**C-**
	VEGETATION METRICS			0.55			**1.63**	**C-**
		V1. Native Plant Species Cover		1	D	1		
		V2. Invasive Nonnative Plant Species Cover		1	C-	1.5		
		V3. Native Plant Species Composition		1	C	2		
		V4. Vegetation Structure		1	C	2		
		V5. Regen. of Native Woody Species **(opt.)**		1	NA	NULL		
		V65. Coarse and Fine Woody Debris **(opt.)**		1	NA	NULL		
	HYDROLOGY METRICS			0.35			**2.00**	**C+**
		H1. Water Source		1	**D**	1		
		H2. Hydroperiod		1	C	2		
		H3. Hydrologic Connectivity		1	B	3		
	PHYSIOCHEMISTRY METRICS			0.10			**3.00**	**B+**
		S1. Soil Condition		1	B	3		
		S2. Surface Water Turbidity / Pollutants **(opt.)**		0.5	NA	NULL		
		S3. Algal Growth **(opt.)**		0.5	NA	NULL		
Rank Factor: SIZE				n/a			**4.00**	**A+**
	SIZE METRICS			1			**4.00**	**A+**
		Z1. Comparative Size **(opt.)**		1	A	4		
		Z2. Change in Size **(opt.)**		1	**A**	4		

Input field metric ratings into empty boxes to calculate Rank Factor and Final EIA Scores. Fill in all metrics that are not marked as optional. Optional metrics depend on method used and wetland type.


DUCKS
UNLIMITED