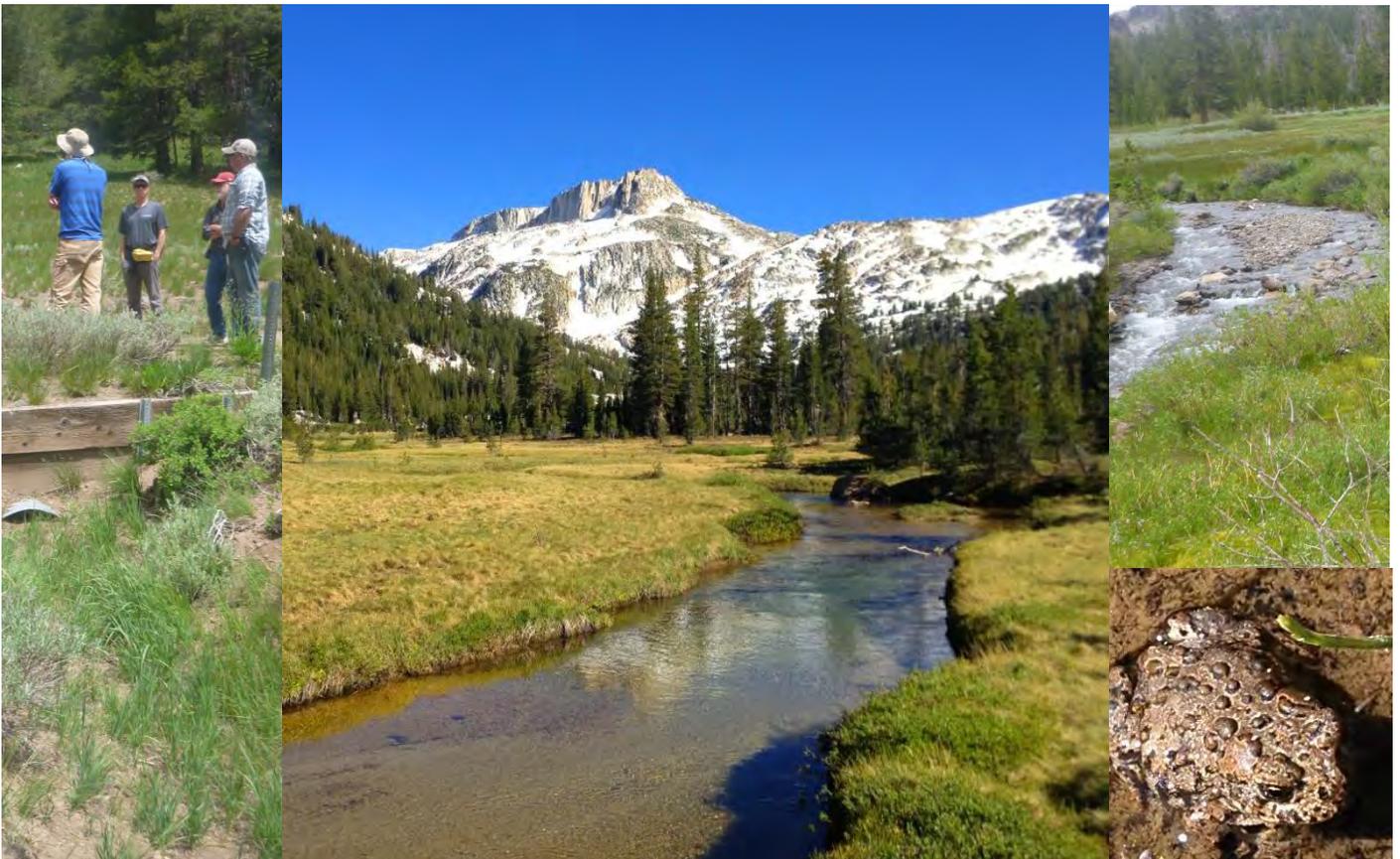


RESTORING WALKER MEADOWS: ASSESSMENT AND PRIORITIZATION



December 2015

A report supported by the National Fish and Wildlife Foundation and Trout Unlimited

Results of a broadly-collaborative effort to prioritize meadows in the Walker Basin for restoration.

Restoring Walker Meadows: Assessment and Prioritization



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INTRODUCTION

Meadows of the Walker River basin are an extremely valuable component of the landscape. Meadows provide diverse habitat, including habitat critical to endangered species. They reduce peak flows during storms and soak up spring runoff, recharging groundwater supplies. Meadows filter sediment, provide forage, and are important cultural and recreational sites. However, the National Fish and Wildlife Foundation (NFWF) estimates that half of all meadows in the Sierra Nevada are degraded and no longer provide these natural benefits (NFWF 2010). Fortunately, there are methods to restore the condition of unhealthy meadows, and investment in meadow restoration is expanding rapidly. Investors—including NFWF and other foundations, state and federal agencies, corporations, ranchers and land managers—seek to provide the largest return on their restoration investment. Therefore, an important question is which meadows, if restored, will provide the greatest value? To answer this question, American Rivers partnered with the Forest Service and NFWF to develop a scorecard to rapidly evaluate meadow condition and prioritize meadows for restoration (American Rivers 2012). The method has been applied in the Yuba, Mokelumne, Kern, and Tuolumne River watersheds, and assessment is underway in the Carson, Truckee, and American River basins. UC Davis has developed a database to store this “Meadow Scorecard” data (<http://meadows.ucdavis.edu/assessments/map>). This assessment method has been used to identify dozens of high priority meadows and thereby focused our efforts and accelerated restoration.

Between 2013 and 2015, American Rivers and Trout Unlimited were funded by NFWF to use the scorecard in the Walker basin to guide investment and accelerate the pace of restoration. We assessed every accessible meadow in the watershed that is larger than 15 acres, 30 in all. We identified five priority meadows and established the Walker Working Group to pursue restoration of these five sites as an initial objective.

Members of the Walker Working Group have identified 5 top-priority meadows and raised \$548,000 toward their restoration.

Meadow restoration is currently the unifying force of the Walker Working Group, but our vision is that the group’s focus will expand beyond these five meadows to improve the health of the watershed and aid in the recovery of the Lahontan Cutthroat Trout and Yosemite Toad. Group members include land managers (Humboldt-Toiyabe National Forest, California Department of Fish and Wildlife and US Marine Corps), non-profit organizations (Trout Unlimited, CalTrout and American Rivers), consultants (Todd Sloat Biological Consulting, Annie Overlin Botanical Consulting), and local agencies (the Mono County Resource Conservation District). The presence of the working group in the watershed has already helped to accelerate the pace of restoration. American Rivers and our partners completed prioritization in 2015, and members of the Walker Working Group have raised \$548,000 for restoration of high-priority sites (\$378,000 for design and permitting and \$170,000 for implementation activities).

The purpose of this Walker Basin Meadows Condition Report is twofold. First, it provides condition data and explains why the Walker Working Group chose the first set of meadows as the top priority for restoration. Second, the working group will use information presented here to plan subsequent restoration efforts once the first group of meadows is restored.

THE WALKER WATERSHED

The Walker River watershed covers 4,050 square miles of California and Nevada. The Walker River flows eastward from a 50-mile-long section of the Pacific Crest that stretches from Monitor Pass in the north to Virginia Lakes in the south. The West Fork of the Walker (West Walker) flows from the base of Tower Peak in the Hoover Wilderness eastward to Highway 395, where it turns north, paralleling the highway through the communities of Walker and Coleville into Topaz Lake Reservoir. From Topaz Lake, the river flows northeast through Nevada to Yerington and the confluence with the East Walker River. The East Walker originates south of Bridgeport Valley, where it flows out of numerous lakes east of Sawtooth Ridge and Matterhorn Peak. After leaving Bridgeport Reservoir, the East Walker River flows north through rural Nevada to its confluence with the West Walker, just south of Yerington. The mainstem of the Walker then curls east around Nevada's Wassuk Range and heads south to terminate in Walker Lake.

Historically, Lahontan cutthroat trout (LCT) moved throughout the Walker River drainage from the headwaters in California downstream to Walker Lake (Coffin and Cowan 1995). Unfortunately, LCT have been extirpated from 89% of their native range. Due to widespread diversions, reduced water quality, habitat fragmentation, and competition from non-native species LCT currently occupy only four small headwater streams in the Walker River watershed. They are also present in a few tributaries to the Carson and Truckee Rivers and have stronghold populations in Pyramid and Independence Lakes and northern Nevada. The U.S. Fish and Wildlife Service listed LCT as threatened under the Endangered Species Act in 1975.

METHODS

We assessed all accessible meadows larger than 15 acres in the Walker River watershed using the Meadow Condition Scorecard (American Rivers 2012). The scorecard is a rapid field assessment method that quickly scores channel and vegetation conditions to identify impacted meadows. The scorecard is based on the framework of the EPA Physical Habitat Assessment (Barbour et al. 1999) and uses metrics from the Bureau of Land Management Multiple Indicators Monitoring (MIM) Protocol and Proper Function Conditions (PFC) methods (US Department of the Interior (USDI), 2011 and USDI-BLM, USDA-Forest Service, and USDA-NRCS 1998), as well as a vegetation indicator developed by Dave Weixelman, Forest Service Range Ecologist for Region 5 (unpublished data). The scorecard is qualitative in nature; however, the scoring is based on quantitative measurements, such as bank height, percent bare ground, and length of gullies. These measurements and methods enable multiple observers to be field-calibrated and return consistent results throughout a watershed.

Meadow condition was scored using six qualitative measures that can receive a high score of 4 and a low score of 1:

1. Bank height
2. Bank stability (percent that is unstable)
3. Length of gullies and ditches (compared to the length of the channel)
4. Vegetation cover (graminoid/forb ratio)
5. Bare Ground (percent of meadow area)
6. Conifer or upland shrub encroachment (percent of meadow area)

In addition, the scorecard includes a checklist of anecdotal observations, such as past restoration efforts, roads in or adjacent to the meadow, grazing observations, and evidence of beaver.

To begin our assessment in the Walker, we used GIS layers provided by UC Davis and the California Department of Fish and Wildlife (CDFW) to identify all the meadows in the watershed larger than 15 acres. Initially, we identified 40 meadows. We did not survey 10 of the meadows. Eight were on private land, one required very remote mountain access, and one was the shallow perimeter of a lake.

RESULTS AND DISCUSSION OF CONDITION DATA

The results for the lowest-scoring meadows (the bottom 50%) are shown in Table 1. In addition to condition data, we include the number of actively eroding headcuts. The names of the meadows prioritized for restoration appear in bold text (see the section on Prioritization, below).

A score of 1 or 2 indicates either a substantial level of impact or an unusual environmental setting. For example, large areas of bare ground may be present where soils are well drained (coarse grained or steeper slopes) and where gopher activity is high. Meadows with scores in this range require a closer look to decide if there is a need for restoration, a change in management, or if the meadow condition is within the normal range for its particular site. Because information on a meadow's historical condition is rarely available for comparison there is no absolute method to identify and evaluate impacts (aerial photographs sometimes show the progression of encroachment by upland shrubs, but channel incision almost always predates aerial photography). It often takes field visits with an interdisciplinary team to decide whether a meadow is a candidate for restoration. The purpose of the data in Table 1 is to distinguish between meadows that need a closer look and those that are in good condition.

Meadow Name	Water-shed	Elevation (ft)	Bank Height	Bank Stability	Gullies	Vegetation	Bare Ground	Encroachment	Number of Headcuts
Sardine Meadow	West	8748	1	1	2	3	3	1	4
Leavitt Meadow	West	7156	1	1	2	4	2	2	1
Little Wolf Creek	West	9230	2	3	3	3	1	3	3
Lower Piute Meadow	West	8074	2	2	4	3	3	1	0
Grizzly Meadow	West	9565	2	2	4	3	1	4	0
Little Antelope Valley	West	5523	1	3	1	4	4	4	4
Upper Piute Meadow	West	8271	2	2	4	3	3	3	0
Big Meadow	East	7477	2	2	3	4	3	3	0
Pickel Meadow	West	6733	2	2	2	4	4	3	0
Upper Wolf Creek	West	9395	3	4	3	3	2	3	3
Cloudburst Creek	West	9175	3	3	3	3	4	3	5
Lower Wolf Creek	West	8600	3	4	3	3	4	2	1
Middle Piute Meadow	West	8180	3	3	4	4	4	2	0
Kirman Lake Meadow	West	7156	4	3	3	4	4	3	0
Upper Little Wolf Creek Meadow	West	9175	4	3	4	4	2	4	0

TABLE 1. THE CONDITION AND NUMBER OF HEADCUTS FOR THE 15 LOWEST SCORING MEADOWS. NOTE THE COLOR AXIS FOR THE HEADCUT COLUMN DIFFERS FROM THE COLORS FOR THE CONDITION SCORES.

Two patterns are evident in Table 1. First, there are meadows with one attribute that scores below the rest. For example, a bare ground score of 2 stands out at Upper Little Wolf Creek Meadow. Likewise, encroachment is an outlier in a few meadows. Meadows of this first pattern do not have an impacted channel. The second pattern is that meadows with high banks often also have unstable banks, headcuts, and eroding gullies that are a result of channel incision. (The process of incision, headcutting and erosion has been descriptively called “unravelling.”) Meadows showing this second pattern of impact are the meadows that we identify for potential re-watering, using restoration designs that reverse incision. These impacts are more important from a watershed perspective than meadows of the first pattern.

In addition to patterns of past impacts, headcuts are an indication of *risk* from future erosion. Often headcuts are a symptom of incision because after the channel has incised the beds of tributaries and swales downcut to reach the elevation of the incised channel. These headcuts may be best treated by fixing the root cause, namely incision. In other cases, for example, Cloudburst and Lower Wolf Creek Meadows, the headcuts are extending from a more recent nickpoint such as a culvert or roadbed. For these meadows, treating a headcut may be the stitch in time that saves nine.

PRIORITIES

Members of the Walker Work Group met multiple times between 2013 and 2015, including field visits, to identify priorities and goals for restoration at individual meadows.

The prioritization process began by collecting range, habitat and occurrence data for important management species, including unpublished occurrences known by members of the work group. Using overlay maps of species' occurrence and meadow condition (see Figures 2-4, following pages), we identified meadows where restoration may benefit species. We also decided to focus on road-accessible meadows to minimize cost and logistics. Completing restoration on these initial sites will build momentum and strengthen working relationships among the work group members. We will build on this foundation to address other meadows we identified during the assessment. The meadows prioritized for restoration are shown in Table 2 and Figure 1.

Meadow Name	Management Species Present	Reasoning
Sardine Meadow	YT	Yosemite Toad breeding area. Headcuts and condition indicate restoration.
Leavitt Meadow	Historic LCT	Too complex for the first set of meadows to pursue. The group opted instead for Pickel Meadow, which is analogous, but the issues are not as extreme.
Little Wolf Creek	None	No species overlap
Lower Piute Meadow	SNYLF	Wilderness access only
Grizzly Meadow	YT, SNYLF	Wilderness access only
Little Antelope Valley	LCT	Irrigated land that is not a meadow; however high priority for species and headcuts in a non-meadow context.
Upper Piute Meadow	SNYLF	Wilderness access only
Big Meadow	Historic LCT, SG	Historic LCT, Sage grouse
Pickel Meadow	Historic LCT, SG	Historic LCT, Sage grouse
Upper Wolf Creek Meadow	LCT	Risk from headcut advancement appears low.
Cloudburst Creek	None	Risk from headcut advancement
Lower Wolf Creek	LCT	Risk from headcut, LCT
Middle Piute Meadow	SNYLF	Wilderness Access Only; Encroachment is the sole issue
Kirman Lake Meadow	SG	No issues.
Upper Little Wolf Creek Meadow	No	No issues.

TABLE 2. SPECIES PRESENT AND THE REASONING BEHIND PRIORITIZATION IS GIVE FOR EACH MEADOW. MEADOWS IDENTIFIED FOR RESTORATION ARE IN BOLD TEXT. MEADOWS ARE IN THE SAME ORDER AS IN TABLE 1: THEY ARE RANKED BY OVERALL CONDITION, WITH LOWEST SCORES FIRST. SPECIES CODES: SG=SAGE GROUSE, YT=YOSEMITE TOAD, SNYLF=SIERRA NEVADA YELLOW LEGGED FROG, LCT=LAHONTAN CUTTHROAT TROUT.

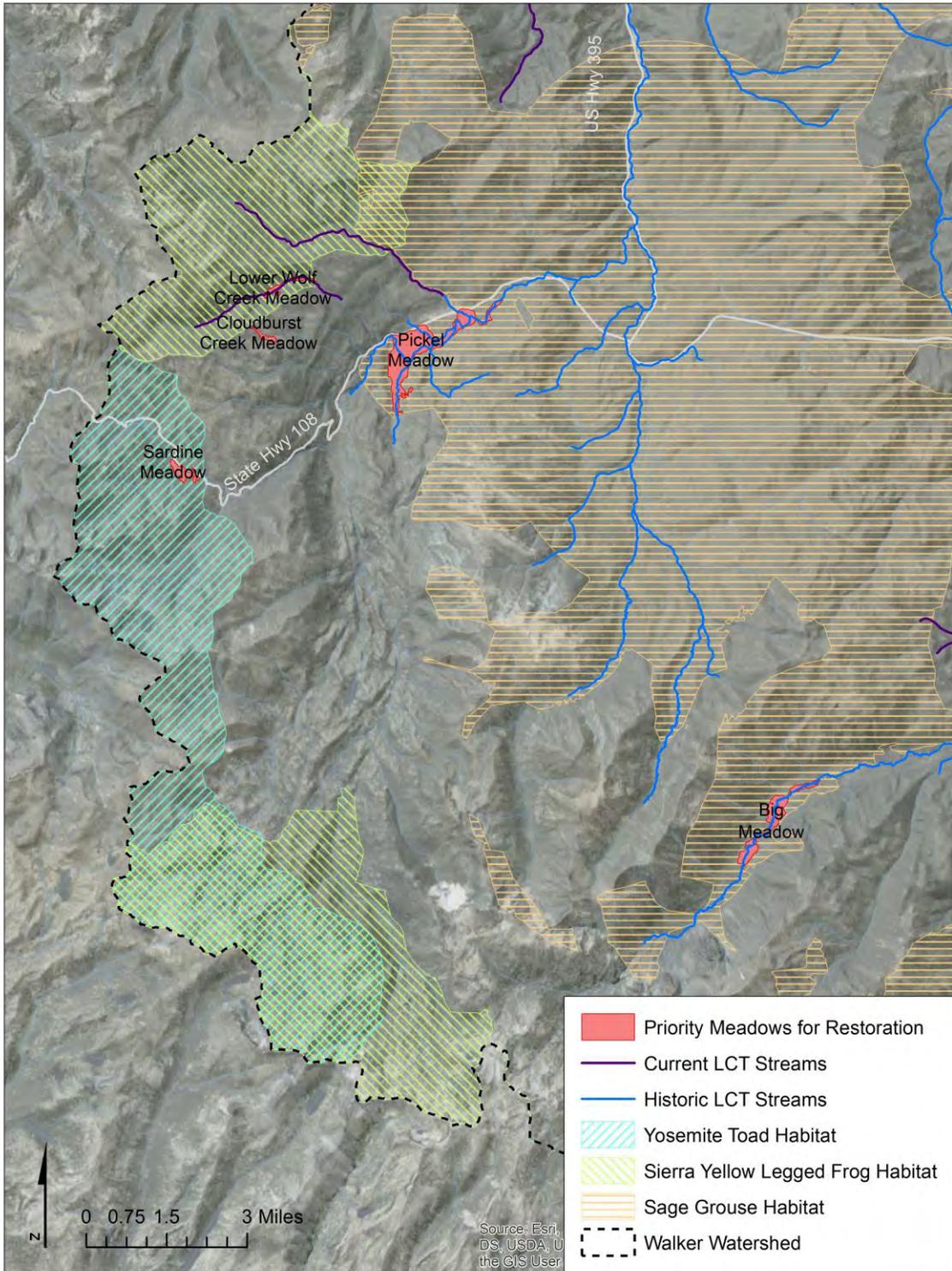


FIGURE 1. PRIORITY MEADOWS IDENTIFIED BY THE WALKER WORKGROUP ARE SHOWN IN RED. RANGES OF IMPORTANT MANAGEMENT SPECIES ARE ALSO SHOWN.

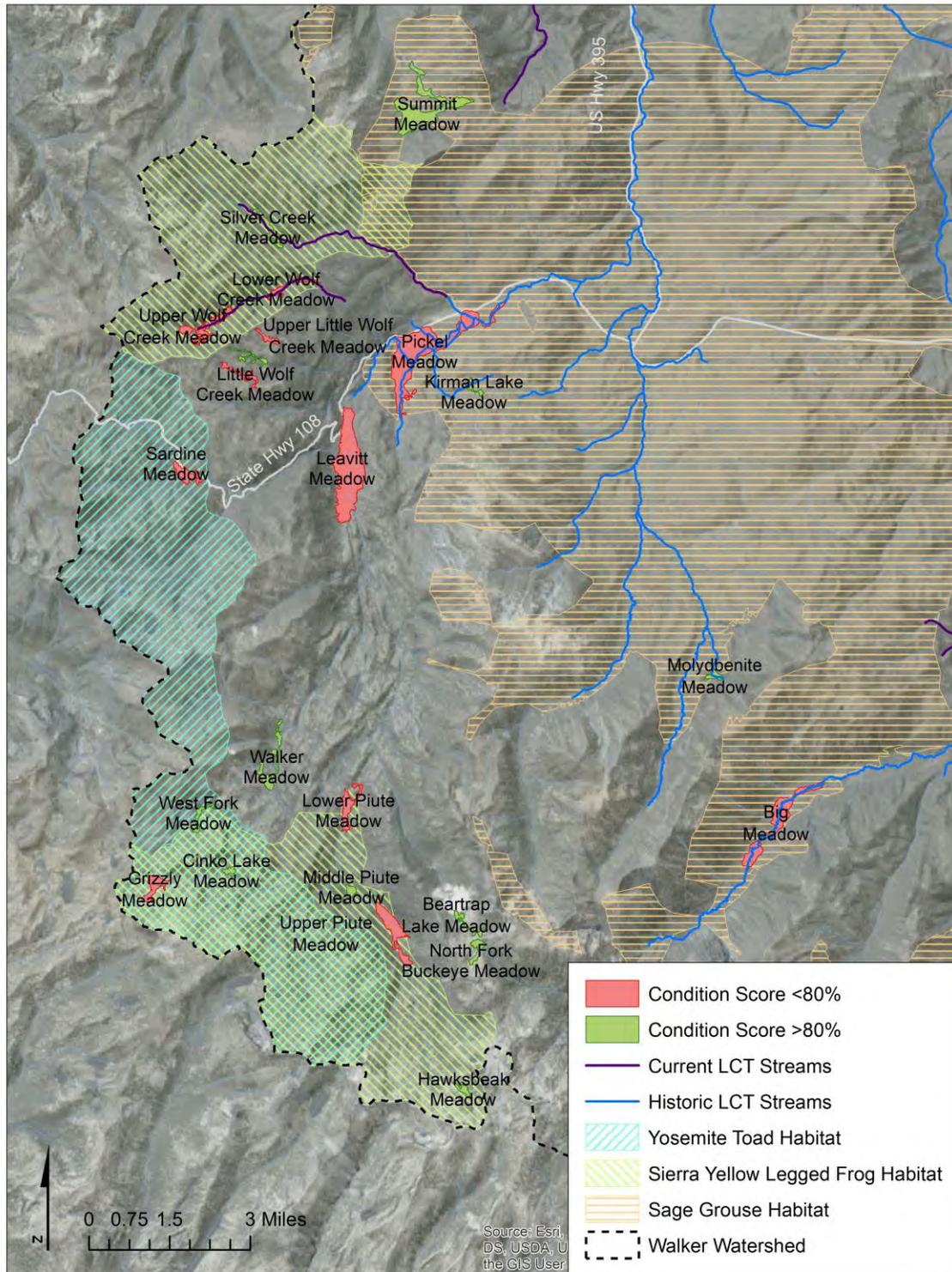


FIGURE 2. MEADOWS OF THE WEST WALKER. THE 12 POTENTIAL CANDIDATES FOR RESTORATION ARE SHOWN IN RED. THESE ARE THE LOWEST-SCORING MEADOWS IN TABLES 1 AND TWO. RANGES OF IMPORTANT MANAGEMENT SPECIES ARE ALSO SHOWN.

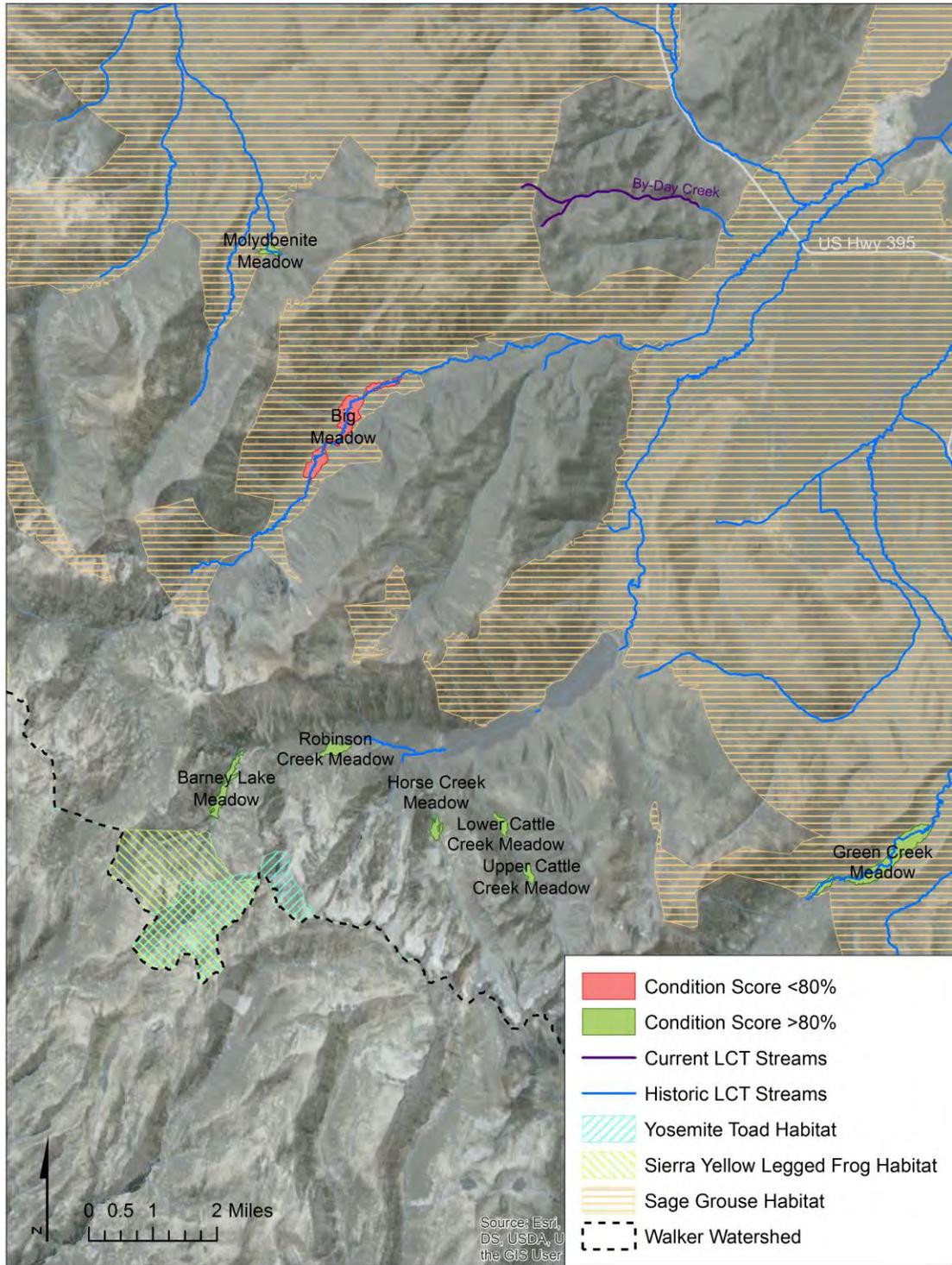


FIGURE 3. MEADOWS OF THE EAST WALKER WITH POTENTIAL CANDIDATE FOR RESTORATION SHOWN IN RED. RANGES OF IMPORTANT MANAGEMENT SPECIES ARE ALSO SHOWN.

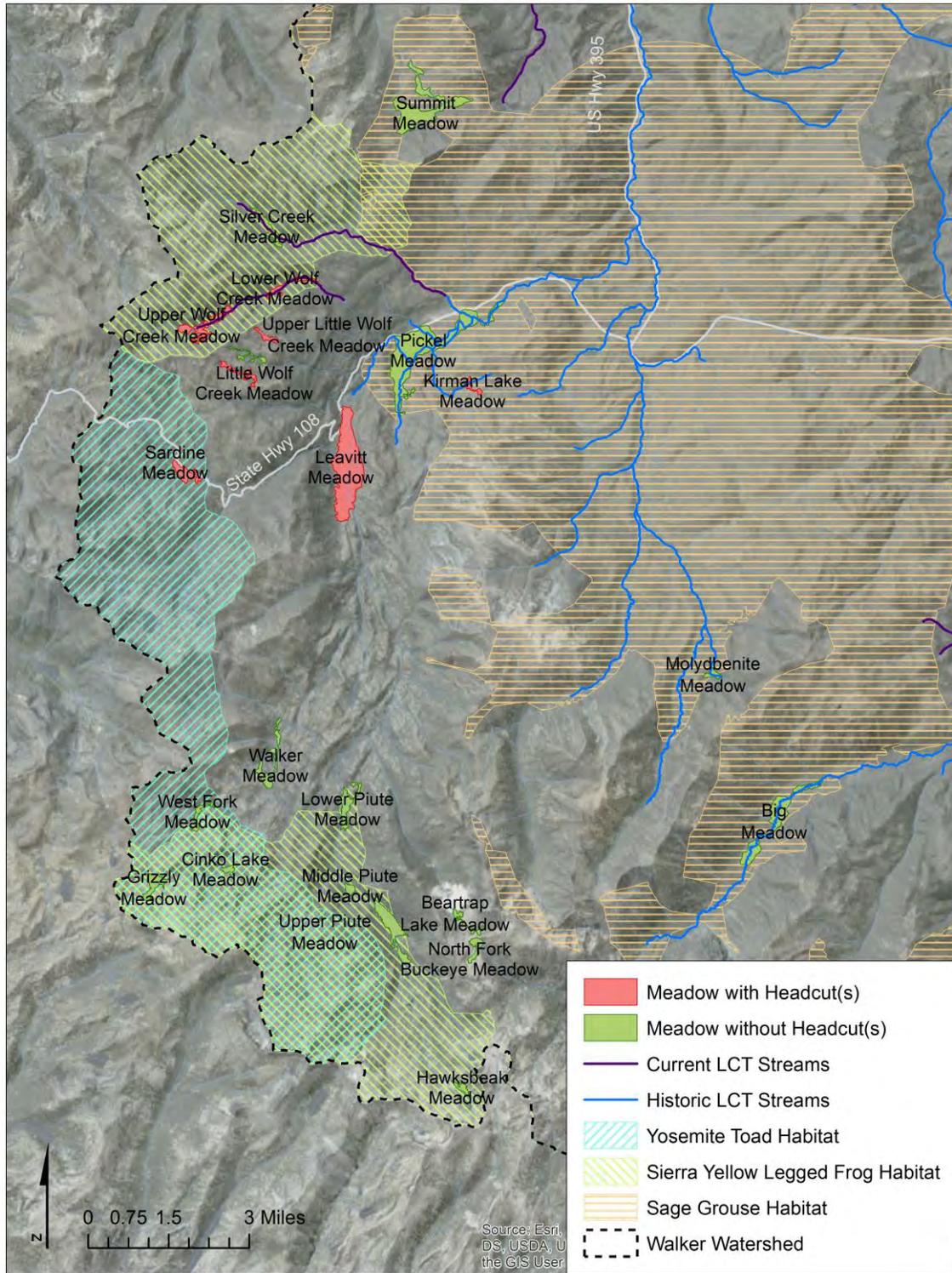


FIGURE 4 MEADOWS IN THE WALKER BASIN WITH HEADCUTS ARE SHOWN IN RED. RANGES OF IMPORTANT MANAGEMENT SPECIES ARE ALSO SHOWN.

INFLUENCE OF BEAVER

We observed eight meadows in the Walker watershed with active beaver populations. Three are located in the West Walker: Pickel, Leavitt and Molybdenite Meadows. Five are in the East Walker: Big, Horse Creek, Barney Lake, Robinson Creek and Green Creek Meadows.

In the four highest scoring meadows in the Walker basin—Green Creek, Robinson Creek, Barney Lake, and Horse Creek—dead lodgepole pine snags are present in areas of the meadow that are now wet into September, suggesting that these meadows were once drier.

The beaver influence on Pickel and Leavitt Meadow is minimal because the main meadow channel is the West Walker River, which is too large for beavers to dam with the forage available. In Big Meadow, beaver are not present outside the grazing enclosure. In the fenced areas of Big Meadow, a beaver dam has raised the water table and stabilized the banks for 600 feet above the dam.



FIGURE 5. BARNEY LAKE MEADOW WITH DEAD CONIFERS (LEFT). BEAVER DAM IN GREEN CREEK MEADOW (RIGHT)

CONCLUSION

Five meadows were identified as top priority by members of the Walker Work Group: Sardine Meadow (including upper and lower Sardine), Lower Wolf Creek Meadow, Cloudburst Meadow, Pickel Meadow and Big Meadow. Of the meadows not prioritized for restoration in this first effort, Leavitt Meadow is similar to Pickel Meadow and we expect restoration at Leavitt Meadow to build upon experience gained in Pickel. Wilderness meadows were not prioritized for restoration in this first effort because of the challenges and expense associated with these difficult-to-reach sites. We anticipate that restoration of the second flight of more complex meadow restoration efforts will be fueled by success with the first group of sites.

WALKER RIVER MEADOWS ASSESSMENT DATA

Sardine Meadow

A high-gradient meadow located on the south side of Highway 108, near the top of Sonora Pass at the confluence of Sardine and McKay Creeks. An incised channel and unstable banks characterize the upper third of the meadow, above a closed dirt road and former ford. The upper sage terrace on the west side of Sardine Creek between Sardine and McKay Creeks may have formerly been meadow floodplain that was connected to the creeks. A fenced spring emerges in the middle of the upper sage terrace. There are four headcuts spread throughout the meadow.



SARDINE - CLOCKWISE - HEADCUT, INCISION AND THIN RIPARIAN STRIP, CREEK WITH SAGE TERRACE, ROAD CLOSURE

Big Meadow

The lowest scoring meadow in the East Walker Watershed was Big Meadow. This meadow is located on Buckeye Creek, one of the major tributaries to the East Walker River. Big Meadow is within the historic range of LCT. There are two sections of this meadow. The lower fifth of the meadow is fenced from grazing and has fairly stable banks and a large amount of willow. Within the fenced area there is a beaver dam; the creek banks are particularly stable for about 300 feet behind the dam. The unfenced section appears heavily grazed and the banks unstable and substantially higher than in the upper meadow. Big Meadow is of mixed ownership made up of federal and private land.



BIG MEADOW - CLOCKWISE - BEAVER DAM, CATTLE CROSSING, OVERGRAZED AREA, BANK INSTABILITY, FENCED AREA

Pickel Meadow

At 538 acres, Pickel is the largest of the Walker Meadows. Pickel is located along Highway 108 across from the Marine Mountain Warfare Training Center. The meadow contains a CDFW Wildlife Area and a popular fishing reach. All of Pickel Meadow and its tributaries are historic LCT habitat. The West Walker River transects the meadow and divides it into distinct upper and lower sections.

The upper section of Pickel Meadow is in good condition, with stable overhanging banks. Poore Creek flows from Poore Lake and through the center of the meadow. Currently this section is fenced and appeared ungrazed at the time of our visit.

In the lower section, the West Walker River flows along the southern edge of the meadow at the base of a steep slope. The bank height score of Pickel Meadow may be especially low because of the way the channel is cutting into the slope. There is much less riparian vegetation, such as willow, in Pickel Meadow compared to nearby Leavitt Meadow. The majority of willow is in the center of the lower meadow where we noticed beaver activity.

The west half of the lower section of Pickel Meadow is actively grazed within a fenced enclosure. This area is irrigated with a series of ditches. The enclosure restricts cattle access to the West Walker River.



PICKEL - CLOCKWISE - BANK INSTABILITY, IRRIGATED AREA, IRRIGATION CHANNEL, TERRACE BANK, BEAVER DAM, LACK OF WILLOW GROWTH

Cloudburst Creek Meadow

One of three narrow meadows along Forest Service Road 062 on the slope north of Highway 108. This Forest Service road is heavily used by the Marine Mountain Warfare Center located where 062 intersects Highway 108. There are 5 small but active headcuts in the meadow and a large headcut repair at the base.



PHOTO 14 - CLOCKWISE - REPAIRED HEADCUT, MEADOW LOOKING AT THE ROAD, ACTIVE HEADCUT, SAGE ENCROACHMENT

Lower Wolf Creek Meadow

Forest Service Road 042 runs parallel to the north side of the meadow and dead-ends at the top of the meadow. On the western half of the meadow the road drops down to the edge of the meadow and there are three culverts that are concentrating flow from the hillslope and causing gullies to form. Midway through the meadow there is a pull-out used for camping.



LOWER WOLF CREEK- CLOCKWISE - INCISION PAST CULVERT, MEADOW OVERVIEW, SECOND CULVERT, WOLF CREEK

Leavitt Meadow

Leavitt is a large, 471 acre meadow on the mainstem of the West Walker River. The meadow's eastern half has a wide meander belt consisting of reworked gravel and bar material with scattered willows. In this portion, meadow vegetation is restricted to low points between the raised coarse material. On the western half on the meadow, herbaceous vegetation is irrigated from spring-fed ditches atop a terrace that is apparently seldom flooded by the Walker River. The Walker River continues to meander and cut into this upper meadow terrace. Unstable banks are present along much of the channel. A gated road with private residences runs along the western edge of the meadow. The road also accesses a pack station with fencing that extends into the lower part of the meadow.



LEAVITT - CLOCKWISE - BANK EROSION, THICKLY VEGETATED OXBOW, IRRIGATION STRUCTURES, UNVEGETATED BARS

Little Wolf Creek Meadow

This meadow is located in the group of meadows near Cloudburst meadow, along Forest Service Road 062. The meadow is long and narrow and lies perpendicular to the road, which is located at the base of the meadow. Once the meadow intersects the road, Little Wolf Creek passes through culverts and the gradient increases significantly. The main channel is incised and there are three major headcuts outside of the main channel in this reach. There are also large areas of bare ground; however, this may have been a result of the meadow being surveyed soon after snow melt.



LITTLE WOLF CREEK - CLOCKWISE - VALLEY BOTTOM CULVERT, UPPER HEADCUT, LOWER HEADCUTS, OVERALL MEADOW

Lower Piute Meadow

The lowest elevation meadow of the three Piute Meadows, it is located on the West Walker River above many of the Walker's major tributaries. The meadow is along a well-used trail 7.5 miles into the Hoover Wilderness. There is bank instability along portions of the channel; however other sections of the channel have sluffed and stabilized. The channel appeared unusually wide. Conifer encroachment is the lowest scoring attribute in Lower Paiute Meadow.

Four other meadows in the area had substantial conifer encroachment – Middle Piute, Upper Piute, Cinko Lake, and Walker Meadow, which could provide an economy of scale, if all were treated for conifer removal together.



LOWER PIUTE - CLOCKWISE - WOOD IN CHANNEL, WET MEADOW, BANK INSTABILITY, YOUNG CONIFERS

Grizzly Peak Meadow

Grizzly Peak Meadow is located near the top of the West Walker Watershed in the Hoover Wilderness. The meadow is 12 miles from the trailhead along the historic Walker Immigrant Route. The meadow is at the confluence of a number of headwater tributaries, of which the south channel is largest. The main channel on the south edge of the meadow is incised, and an inset floodplain and wet meadow has developed here. The northern portion of the meadow appears wetter and is watered by a series of channels and springs. Small pothole ponds were full at the time of our visit, but aerial photos indicate these pools dry seasonally. Large areas of rodent tunnels result in a low score for bare ground and indicate areas that are dry by late season.

The bank instability and incision in Grizzly Peak Meadow is not present in Hawksbeak Peak and Beartrap Lake Meadow, even though all three meadows are in the same watershed with comparable elevations and catchment areas.



GRIZZLY PEAK - CLOCKWISE - OVERALL MEADOW CONDITION, WILLOW GROWTH, HIGH BANKS, BANK EROSION

Little Antelope Valley

Although Little Antelope Valley is listed as a meadow by California Department of Fish and Wildlife and UC Davis it is actually an irrigated pasture with a series of small water diversion channels that spread runoff out over the valley. Little Antelope Valley is a CDFW Wildlife Area.

At the base of the valley there is 1500 feet of incised channel and several active headcuts.



LITTLE ANTELOPE VALLEY - CLOCKWISE - GRAMINOID COVER, IRRIGATION STRUCTURES, OVERALL VIEW OF LOWER CHANNEL, HEADCUT IN LOWER CHANNEL

Upper Piute Meadow

This is a large meadow high in the West Walker Watershed. The meadow is the first low gradient area after the West Walker River leaves its headwaters in Tower Canyon. There is substantial bank instability in Upper Piute Meadow where the high gradient West Walker River enters the meadow. Old meanders visible in aerial imagery also show how active the channel is in this reach.



UPPER PIUTE - CLOCKWISE - PIUTE MEADOW OVERVIEW, BANK INSTABILITY, HISTORIC MEANDER CHANNEL, MORE BANK INSTABILITY

Upper Wolf Creek Meadow

This is a high gradient meadow near the headwaters of Wolf Creek, which currently has a population of LCT. Upper Wolf Creek Meadow scored low because of areas of incision and a high percentage of bare ground. The incision is likely due to the high gradient and v-shaped channel, and the presence of stable banks suggest this may be the natural condition.



UPPER WOLF CREEK - CLOCKWISE - STEEP CHANNEL, MEADOW OVERVIEW, CONIFER ENCROACHMENT, WOLF CREEK, INCISED CHANNEL

Middle Piute Meadow

This is the middle of the three Piute Meadows. An unnamed tributary joins the West Walker River in Middle Piute Meadow and we observed numerous brook trout here. There are small conifers present in the meadow.



Middle Piute - Clockwise - Channel, Meadow Vegetation, Meadow Overview, Conifer Encroachment

Kirman Lake Meadow

Kirman Lake is a dry meadow south of Pickel Meadow. The channel flows out of Kirman Lake and into the West Walker River at Pickel Meadow. There are several pools in the meadow that may or may not be cutting headward at their upper borders. Areas of sagebrush near the channel could be monitored. We observed brook trout in the lake and the meadow is grazed.



KIRMAN LAKE MEADOW - CLOCKWISE - PLUNGE POOL, DRY VEGETATION, KIRMAN LAKE, CHANNEL OVERVIEW

Upper Little Wolf Creek Meadow

This is a wet meadow in the complex of meadows around Wolf Creek and Cloudburst Creek Meadows.



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APPENDIX 1: ALL MEADOW SCORES

MeadowName	Watershed	Elevation	Bank Height	Bank Stability	Gullies	Vegetation	Bare Ground	Encroachment	Number of Headcuts
Sardine Meadow	West	8748	1	1	2	3	3	1	4
Leavitt Meadow	West	7156	1	1	2	4	2	2	1
Little Wolf Creek Meadow	West	9230	2	3	3	3	1	3	3
Lower Piute Meadow	West	8074	2	2	4	3	3	1	0
Grizzly Meadow	West	9565	2	2	4	3	1	4	0
Little Antelope Valley	West	5523	1	3	1	4	4	4	4
Upper Piute Meadow	West	8271	2	2	4	3	3	3	0
Big Meadow	East	7477	2	2	3	4	3	3	0
Pickel Meadow	West	6733	2	2	2	4	4	3	0
Upper Wolf Creek Meadow	West	9395	3	4	3	3	2	3	3
Cloudburst Creek	West	9175	3	3	3	3	4	3	5
Lower Wolf Creek Meadow	West	8600	3	4	3	3	4	2	1
Middle Piute Meadow	West	8180	3	3	4	4	4	2	0
Kirman Lake Meadow	West	7156	4	3	3	4	4	3	0
Upper Little Wolf Creek Meadow	West	9175	4	3	4	4	2	4	0
Walker Meadow	West	8494	3	3	4	4	4	3	0
Cinko Lake Meadow	West	9129	4	4	4	4	4	2	0
Lower Cattle Creek Meadow	East	8510	4	4	4	4	4	2	0
Molybdenite Meadow	West	8950	4	3	4	4	4	3	0
Silver Creek Meadow	West	8800	4	4	4	3	4	3	0
Green Creek Meadow	East	7883	4	4	4	4	4	3	0
Summit Meadow	West	8775	4	4	4	4	4	3	0
Barney Lake Meadow	East	8300	4	4	4	4	4	3	0
Beartrap Lake Meadow	East	9873	4	4	4	4	4	3	0
Hawksbeak Meadow	West	9633	4	4	4	4	3	4	0
Horse Creek Meadow	East	8190	4	4	4	4	4	3	0
North Fork Buckeye Meadow	East	10068	4	4	4	4	4	3	0
Robinson Creek Meadow	East	7532	4	4	4	4	4	3	0
Upper Cattle Creek Meadow	East	8781	4	4	4	4	4	3	0
West Fork Meadow	West	9073	4	4	4	4	4	3	0

CONDITION DATA FOR ALL MEADOWS. FOR ADDITIONAL OBSERVATIONS AT EACH MEADOW (E.G., PRESENCE OF BEAVER, WILLOW COVER, ASPEN, ETC.) SEE [HTTP://MEADOWS.UCDAVIS.EDU/](http://meadows.ucdavis.edu/)