FEASIBILITY STUDY | JUNE 2025

THOMES AND ELDER CREEK DIVERSIONS FOR DIRECT OR IN-LIEU GROUNDWATER RECHARGE RED BLUFF SUBBASIN

PREPARED FOR

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LIST OF ACRONYMS AND ABBREVIATIONS

Acronym	Meaning
Ag ASR	Agricultural Aquifer Storage and Recovery
AEM	Airborne Electromagnetic
CFS	Cubic Feet per Second
DWR	Department of Water Resources
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
SAGBI	Soil Agricultural Banking Index

1. INTRODUCTION

This feasibility study was conducted as part of the Tehama County Groundwater Sustainability Plan (GSP) Implementation Prop 68 Grant under the Thomes and Elder Creek Diversions Task. This study covers the investigation of opportunities for recharge in the Red Bluff Subbasin from Thomes and Elder Creeks. As Thomes Creek forms the southern boundary of the groundwater subbasin, this study specifically covers the sites identified on the north side of Thomes Creek. Sites identified on the south side of Thomes Creek are covered in a feasibility study covering the Corning Subbasin.

1.1. Location

The Red Bluff Subbasin is located in the Northern Sacramento Valley. The subbasin covers the valley portion of central Tehama County. Thomes Creek forms the southern boundary of the subbasin. Sites identified in this feasibility study are located in the central portion of the Subbasin along Elder Creek and along the southern boundary of the Subbasin along Thomes Creek.

1.2. Project Goals

This project aims to utilize flows from Thomes and Elder Creeks to recharge groundwater supplies within the Red Bluff Subbasin. This recharge may take one or more forms. First, direct recharge through diversions into recharge ponds or basins, or through Agricultural Aquifer Storage and Recovery (Ag ASR) wells may be utilized to increase stored groundwater. Alternatively, in-lieu recharge, which substitutes surface water supplies in situations where groundwater has historically been used, may also be implemented.

2. SITE IDENTIFICATION

2.1. Site Criteria

Sites were selected based on various criteria which indicated their potential for groundwater recharge.

2.1.1. Proximity

Proximity to Thomes or Elder Creeks was the first criteria assessed when searching for potential sites. Gravity surface water diversion and conveyance facilities on Elder and the north bank of Thomes Creek are limited to non-existent. Any recharge outside the small areas served by these facilities must currently be carried out via pumps and pipelines. Proximity to Thomes or Elder Creeks ensures that pumping and pipe costs are minimized. Additionally, sites were evaluated to ensure that temporary pumps could physically be installed and operated during times of high flow on Thomes Creek. As the time periods when diversions will be allowed will be short in duration, the ability to access pumps to start and stop pumps quickly is necessary.

2.1.2. Topography and Land Use

Sites were further evaluated based on their ability to receive and infiltrate applied surface water. Various public datasets and information collected during site visits were utilized to evaluate sites. Analysis of sites

prioritized those which were generally level, to encourage the spreading of applied water and encourage infiltration into the subsurface. Additionally, sites with land uses compatible with applications of large volumes of surface water during periods of high flow in Thomes or Elder Creeks were sought out. These included present uses such as fallow, grazing/rangeland, and some orchard/vineyard crops.

2.1.3. Geology

Sites were evaluated based on their ability to infiltrate applied surface water. Two publicly available datasets, the Soil Agricultural Banking Index (SAGBI) developed by the University of California Soil Resource Lab and the Airborne Electromagnetic (AEM) Survey data collected by the California Department of Water Resources (DWR) were both utilized when evaluating sites.

SAGBI values are calculated based on five factors which influence the success of groundwater recharge including: deep percolation, root zone residence time, topography, chemical limitations, and soil surface condition. These factors are combined to create a rating from 0 to 100. Ratings from 49-69 are considered moderately good, 69-85 are considered good, while ratings from 85-100 are considered excellent. Sites with moderately good to excellent ratings were preferred.

AEM Survey data was used to further evaluate sites. The AEM survey conducted by DWR utilized an induced electrical current to determine the resistivity of subsurface materials at various depths. Contracted helicopter pilots flew “lines” across the state to collect resistivity data. Areas with low resistivity (3 – 10 Ohm-m) are associated with fine grained materials and/or saline water and areas with high resistivity (70 – 300 Ohm-m) are associated with coarse grained materials with fresh water. Sites with high resistivity values from AEM survey lines were preferred.

2.1.4. Landowner Cooperation

Successful groundwater recharge requires extensive cooperation from landowners. Landowners must be willing to allow diverted surface water to be applied to their land and be willing to operate temporary pumps to divert water during periods of high flow. In some cases, landowners must also be willing to allow modifications to their property to enhance recharge such as creating berms or shallow basins or utilizing new or existing wells for Ag ASR purposes.

2.2. Sites Identified

Throughout 2024, various sites were identified by map reconnaissance and consultations with landowners in the Subbasin. Three specific sites, one on the north bank of Thomes Creek, hereafter known as the North Thomes Creek site, a site along Elder Creek downstream of the community of Rancho Tehama, hereafter known as the Rancho Tehama site, and Marenco Ranch, were identified. One additional site, near the community of Henleyville, was investigated, but not selected due to unfavorable site conditions.

3. SITE EVALUATION AND SELECTION

3.1. North Thomes Creek

3.1.1. Location and Land Use

The Simpson Road site is located on the north side of Thomes Creek and east of Paskenta Road, northwest of the city of Corning. The site is directly adjacent to Thomes Creek. The total size of the property held by the landowner is over 1800 acres, however the site identified for initial recharge feasibility consists of approximately 77 acres of fallow land bordered by two levees which run perpendicular to the flow of Thomes Creek (see **Figure 3-1**). The portion of the site identified for recharge is generally flat, with a gentle slope east. Photos of the site can be found in **Appendix A: North Thomes Creek Photos**.

As this site is directly adjacent to Thomes Creek, pump and piping requirements to divert water during high flow events will be minimized. A total of about 2,000 feet of pipe would be sufficient to divert water from the creek to the highest portion of the recharge area.

As the site is currently unplanted, recharge operations would have no impact on current land use. Additionally, the gentle slope of the site allows for maximum spreading of applied water with minimal modification in terms of leveling and berm construction.

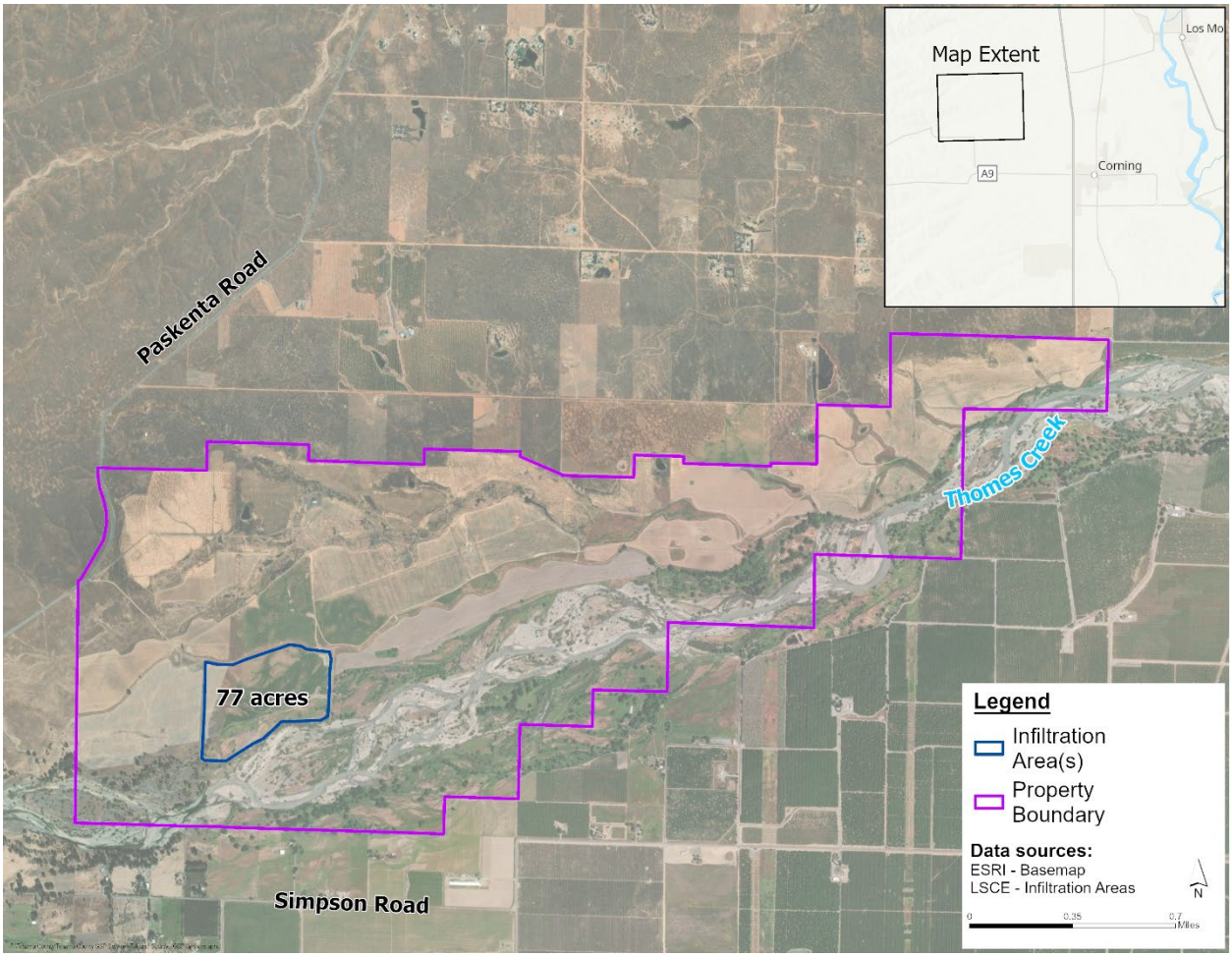

Figure 3-1. North Thomes Creek Site

3.1.2. Geology

The SAGBI rating across the site is excellent (see **Figure 3-2**). AEM data was collected covering the site, with moderate resistivity values recorded near the surface (0-15 ft) (see **Figure 3-3**). Both data sets indicated a high probability that the site will rapidly infiltrate applied surface water, though more investigation would be required to determine the eventual flow path of the infiltrated water.

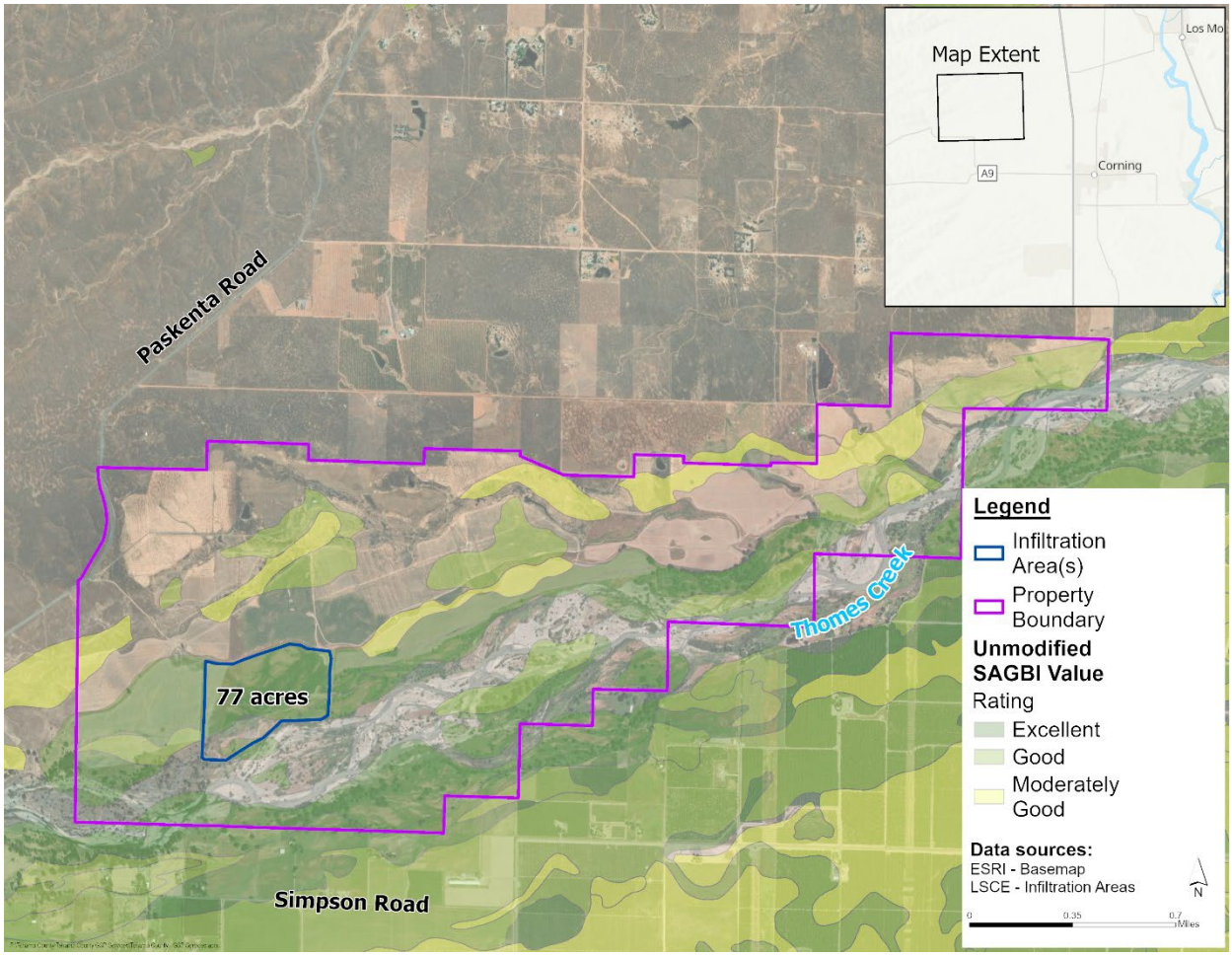

Figure 3-2. North Thomes Creek SAGBI

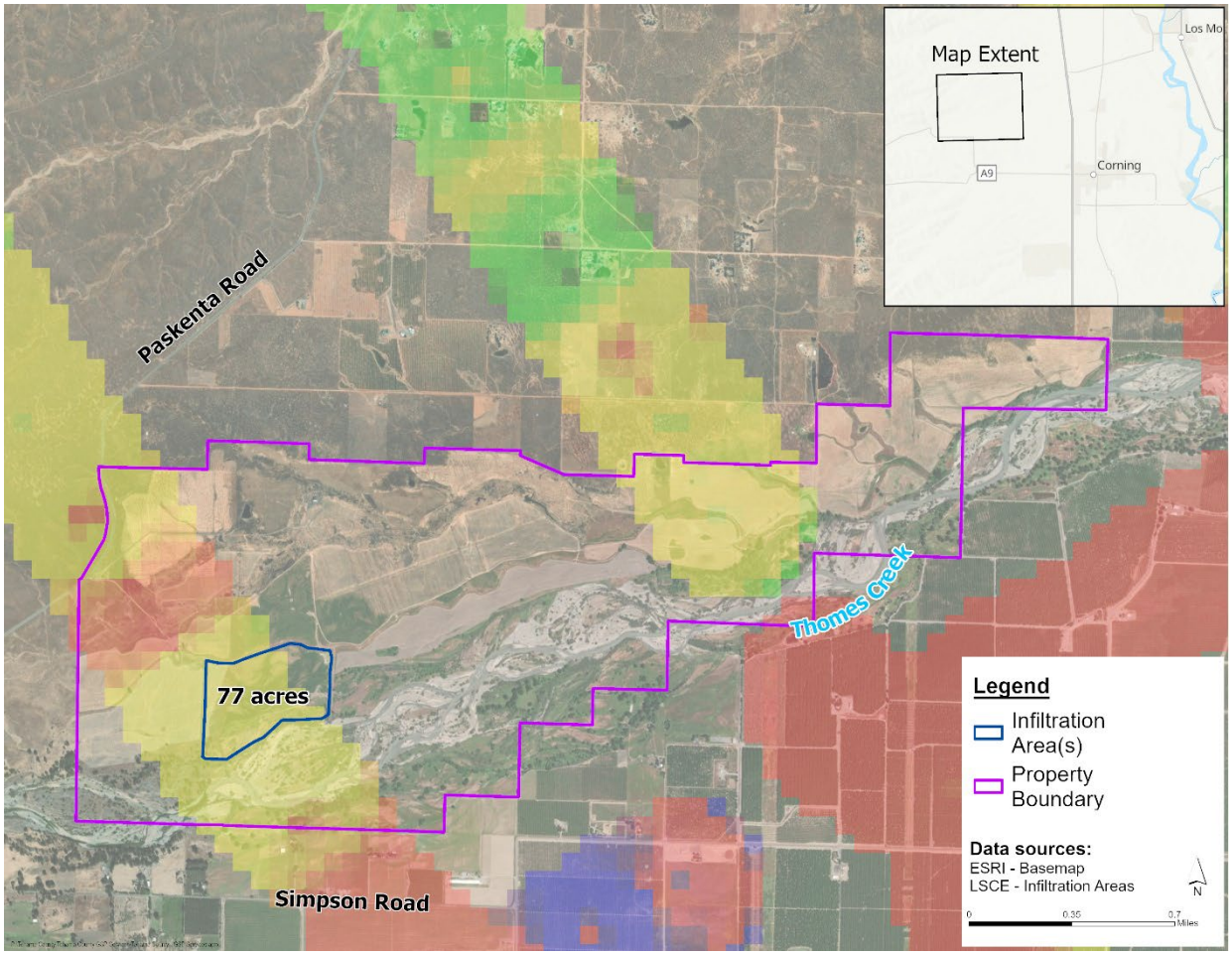

Figure 3-3. North Thomes Creek AEM 0-15 ft Depth

3.1.3. Landowner Cooperation

Throughout the process of site investigation, the landowners of the site have been cooperative and interested in implementing recharge on the site.

3.2. Rancho Tehama

3.2.1. Location and Land Use

The Rancho Tehama Site is located on the south side of Thomes Creek and north of Rancho Tehama Road. The total property consists of over 220 acres, mostly planted in almonds. In addition to the planted acreage, there are two areas of fallow land (one approximately 3 acres and the other approximately 6 acres) directly adjacent to Elder Creek that have the potential to receive diverted surface water (see **Figure 3-4**). The sites identified for recharge are generally flat and have easy access to Elder Creek. Photos of the proposed infiltration sites can be found in **Appendix B: Rancho Tehama Photos**.

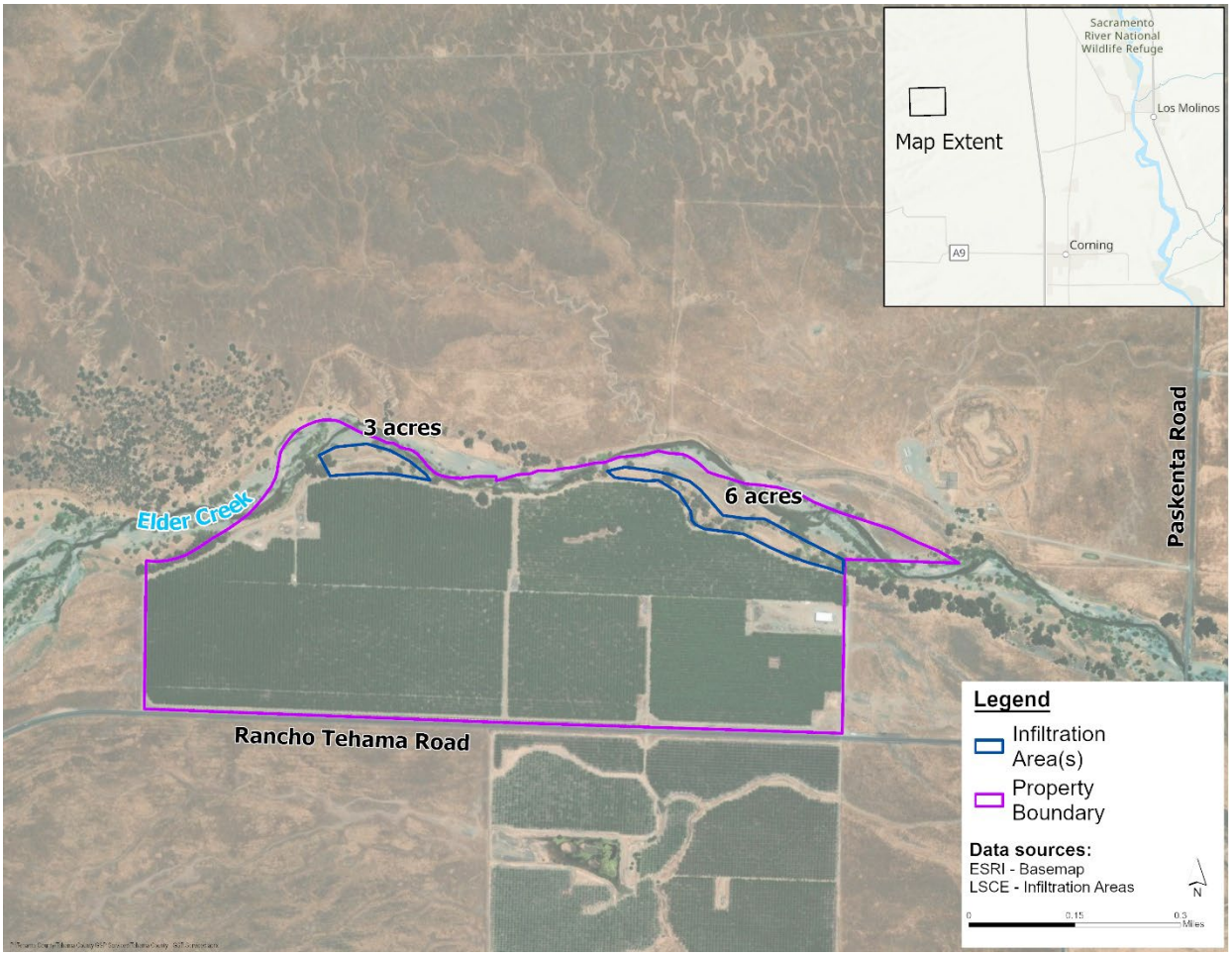

Figure 3-4. Rancho Tehama Site

The areas are directly south of Elder Creek, which will minimize pumping and piping requirements to divert from the creek.

The areas are currently fallow, so recharge operations would have minimal impact on current land use. The areas are both generally flat and should allow for spreading and infiltration of diverted surface water with minimal site modifications.

3.2.2. Geology

The SAGBI ratings across the site are good to excellent (see **Figure 3-5**). AEM data was collected in lines adjacent to the site, with moderate resistivity values near the surface and low resistivity values below about 50 ft in depth (see **Figure 3-6**). The SAGBI ratings for the site indicate the potential for rapid infiltration of applied surface water, though the AEM data are less indicative of good recharge potential. Further evaluation during pilot testing should offer more conclusive data on the site's recharge potential.

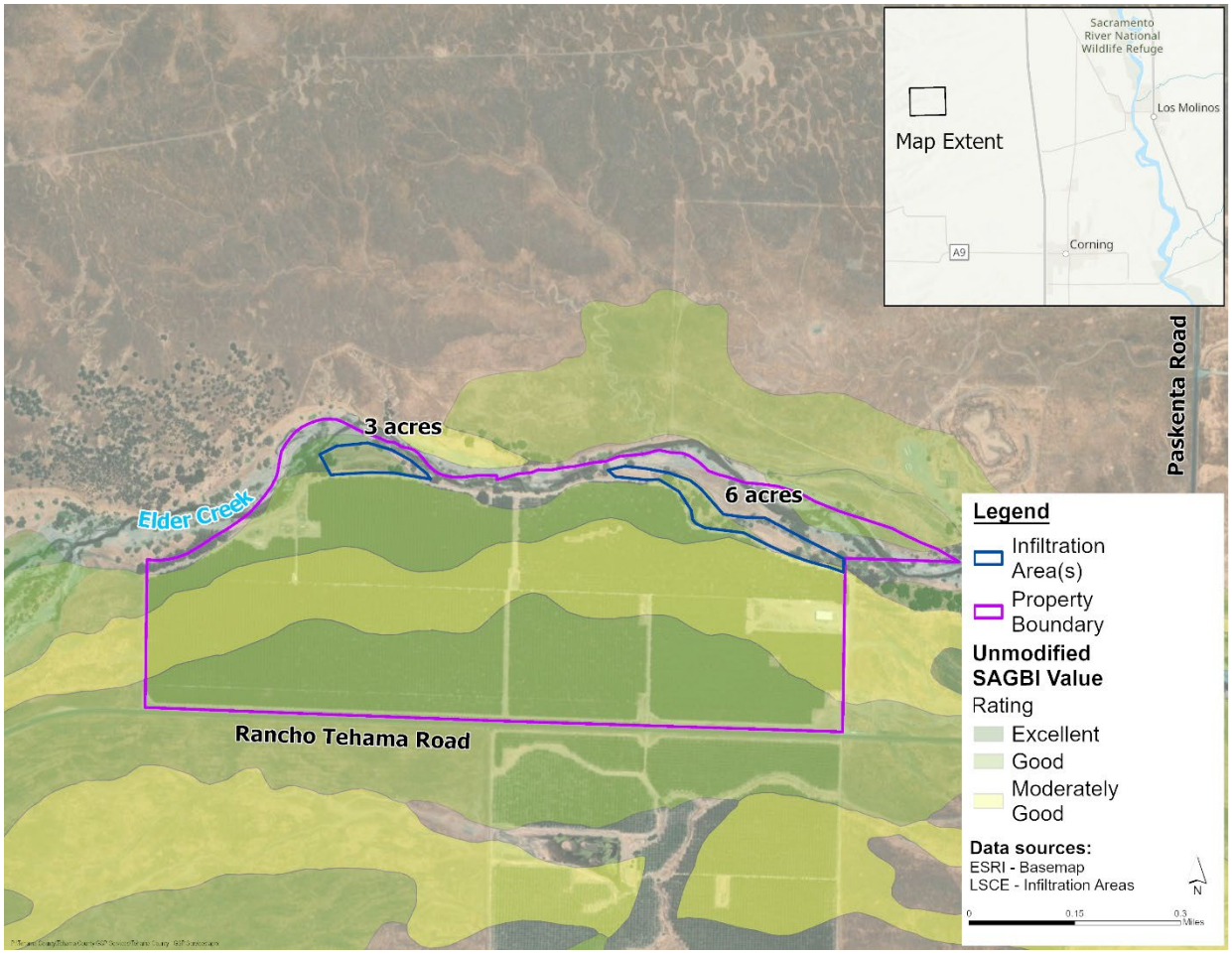

Figure 3-5. Rancho Tehama SAGBI

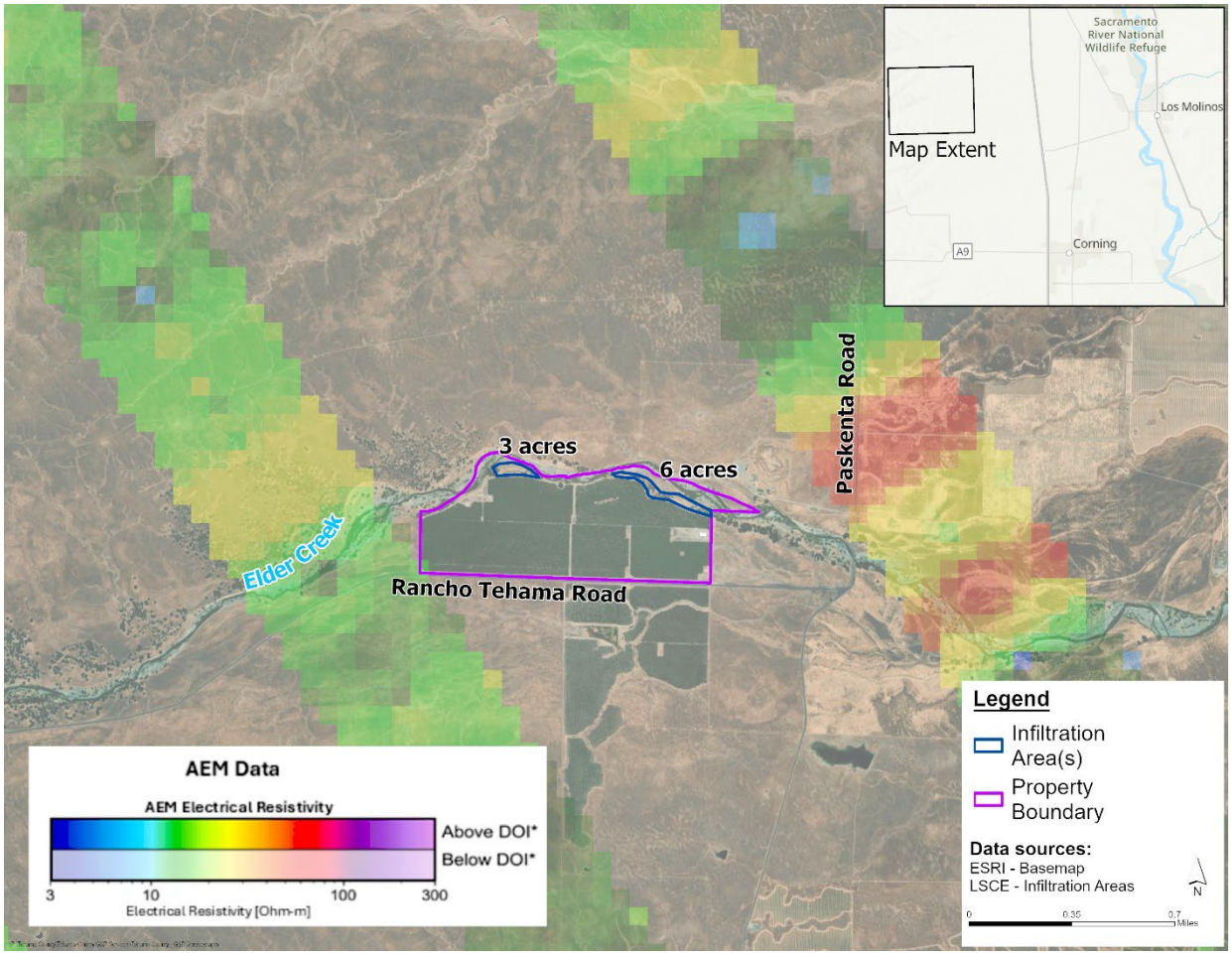

Figure 3-6. Rancho Tehama AEM 0-15ft Depth

3.2.3. Landowner Cooperation

Throughout the process of site investigation, the landowner has been cooperative and interested in implementing recharge on the site.

3.3. Marenco Ranch

3.3.1. Location and Land Use

The Marenco Ranch Site is located on both sides of Elder Creek, east of Pasktenta Road and west of Rawson Road. The total property consists of over 4,400 acres, planted in orchard crops and pasture. Areas nearest the creek are at a lower elevation and exclusively planted in pasture and were identified as the most advantageous. There are four separate sites with areas of 39, 28, 44, and 39 acres for a total area of over 150 acres (see **Figure 3-4**). The sites identified for recharge are generally flat and have easy access to Elder Creek. Photos of the proposed infiltration sites can be found in **Appendix C: Marenco Ranch Photos**.

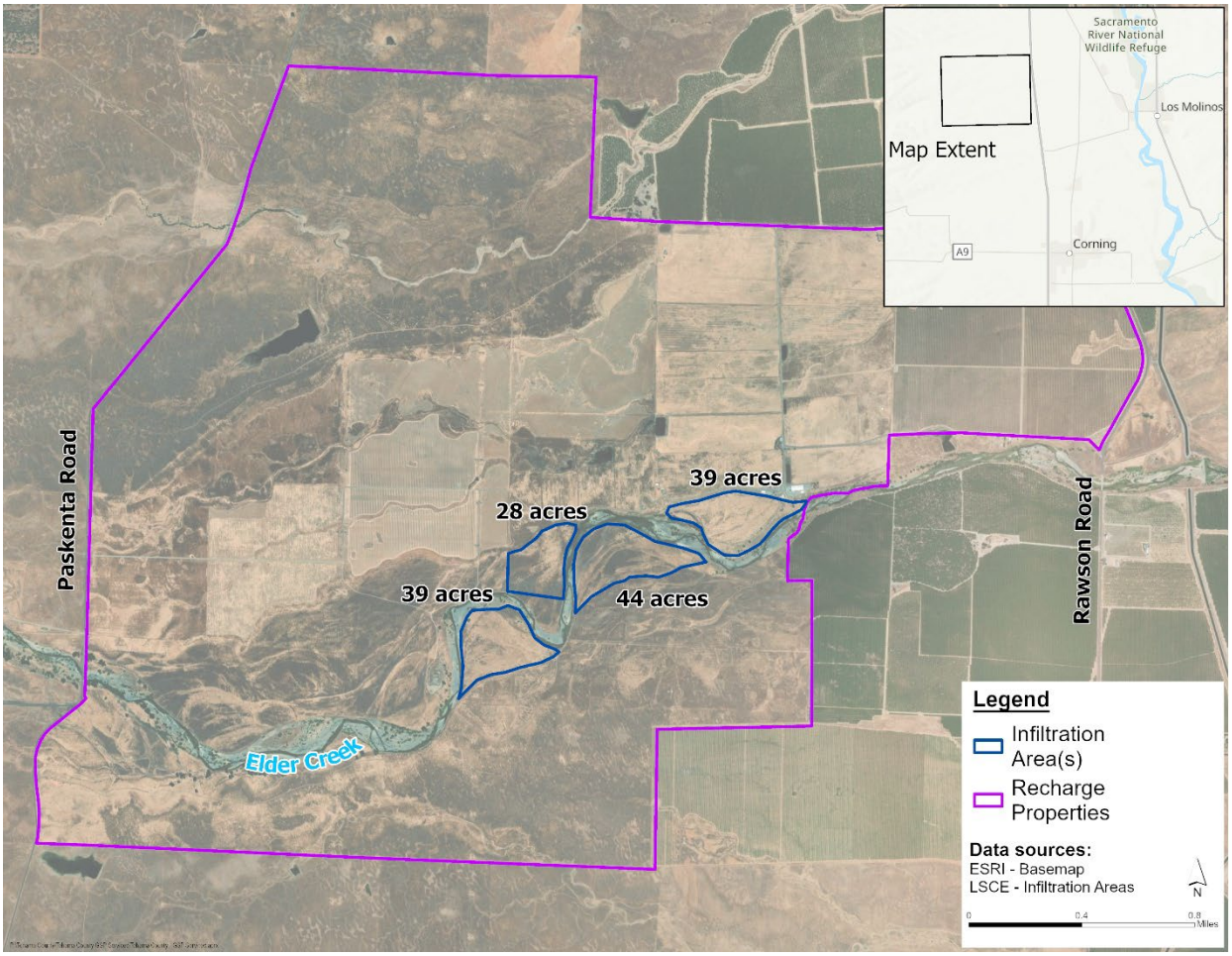

Figure 3-7. Marenco Ranch Site

3.3.2. Geology

SAGBI values vary across the area. However, the areas are generally classified as good or excellent (see **Figure 3-8**). There are two AEM lines which cover or are adjacent to the identified infiltration areas which show moderate resistivity values near the surface and low resistivity values below about 50 ft in depth (see **Figure 3-9**). The SAGBI ratings for the site indicate the potential for rapid infiltration of applied surface water, though the AEM data are less indicative of good recharge potential. A site-specific Towed Transient Electromagnetic (tTEM) survey of the site was conducted in April 2025. This testing operates on the same principle as the AEM survey, but utilizing equipment towed across the ground. This testing gives more precise results about the granularity of sediments in the subsurface. This survey was conducted to refine the understanding of the subsurface and determine subsurface flow paths that applied water would likely take. The results of the study are currently being evaluated by the tTEM contractor. Further evaluation during pilot testing should offer more conclusive data on the site's recharge potential.

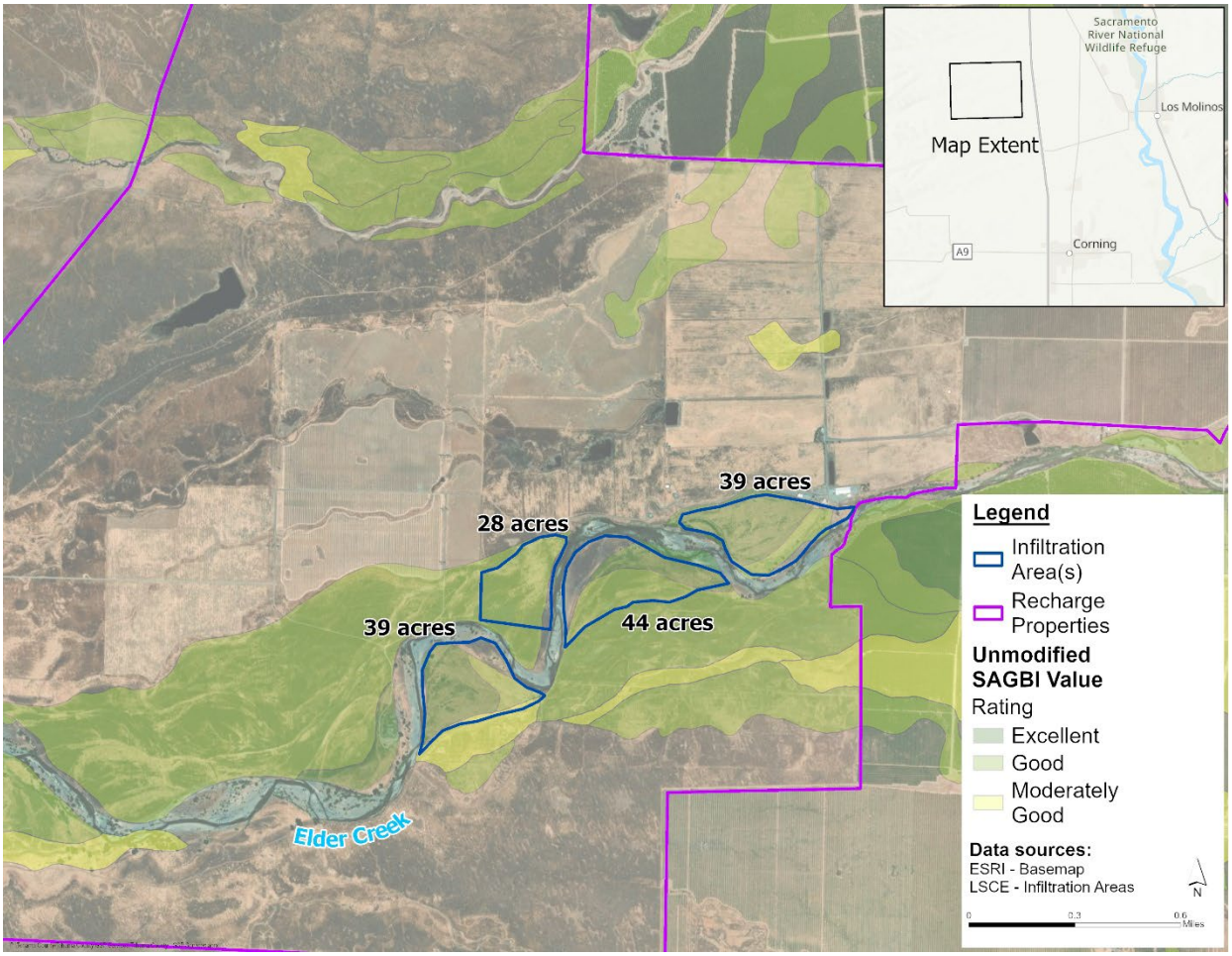

Figure 3-8. Marenco Ranch SAGBI

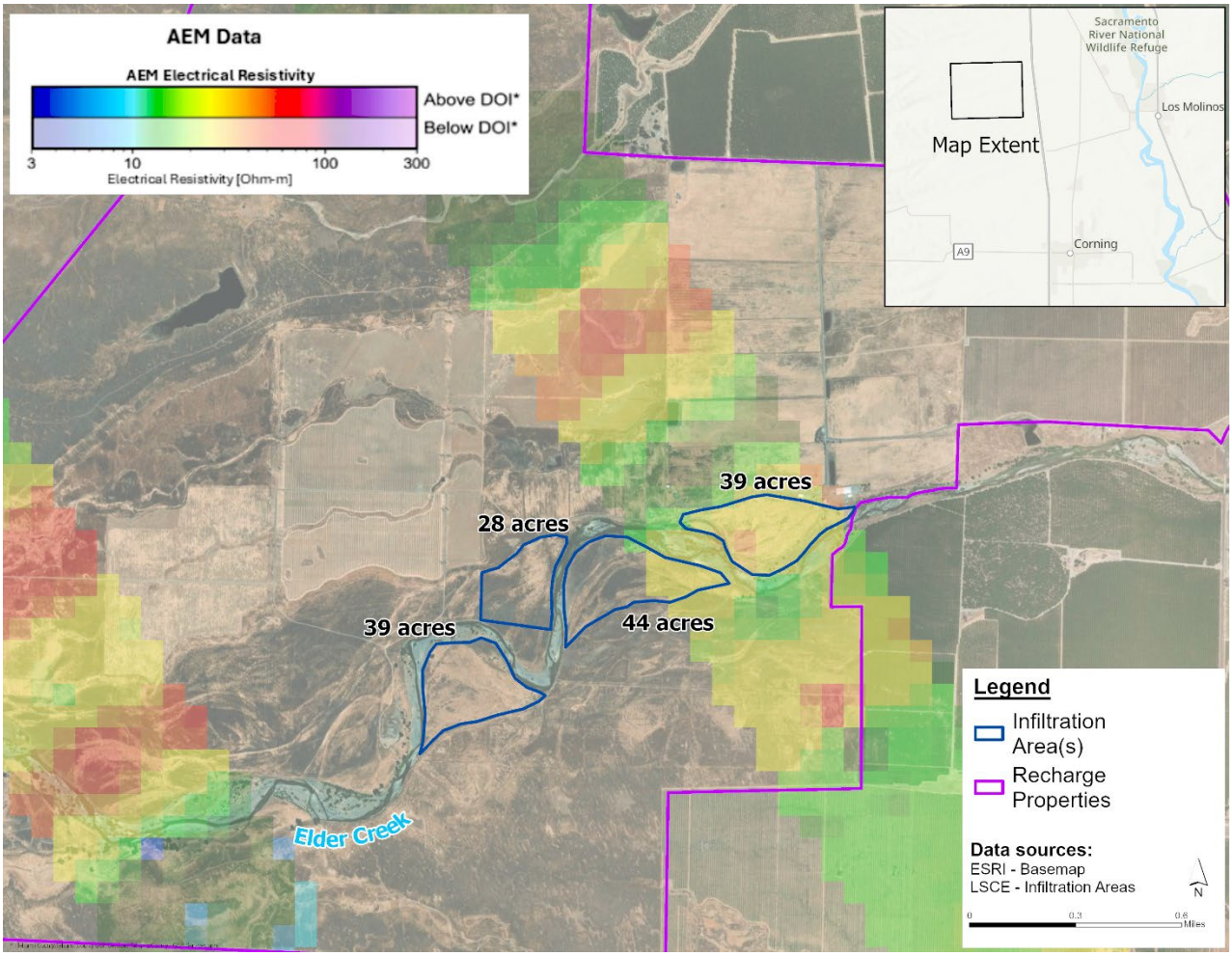

Figure 3-9. Marenco Ranch AEM 0-15 ft Depth

3.3.3. Landowner Cooperation

Throughout the process of site investigation, the landowner of the site has been very cooperative and very motivated to implement recharge on the site.

4. PERMITTING PROCESS

4.1. 5-Year Temporary Permits

As far as can be determined, the sites identified along Thomes and Elder Creeks do not have existing appropriative water rights. Appropriative rights allow water to be diverted for underground storage, and so are a necessary step in implementing recharge on these sites. The California State Water Resources Control Board (SWRCB) issues temporary (180-day or 5-year) permits, as well as permanent water rights. Temporary permits, as the name suggests, are temporary in nature, but are significantly lower in cost and can be approved in a shorter time frame than permanent rights.

Additionally, temporary rights are generally granted under the streamlined recharge permitting criteria. These criteria generally follow the "90th Percentile, 20 Percent Method" wherein diversions are allowed when the waterway is at or above its 90th percentile of flow and the flow diverted is less than or equal to 20 percent of the total flow. These streamlined criteria allow for an expedited evaluation of the permit application. A Water availability analysis (WAA) was conducted on both Thomes and Elder Creeks based on flows observed at the Thomes Creek at Paskenta and the Elder Creek near Paskenta stream gauges. The 90th Percentile Flow for each day during the diversion season (December through March) was calculated based on 28 years of data collected at the station for Thomes Creek and based on 75 years of data collected at the station for Elder Creek. These values are shown in **Tables 4-1 and 4-2**. Additionally, total potential monthly diversion volumes were calculated based on water year type for each creek and are shown in **Tables 4-3 and 4-4**.

The Groundwater Sustainability Agencies (GSA) are in the process of applying for 5-year temporary water rights permits to implement further pilot recharge projects on the identified sites. The GSAs have determined that 5-year temporary rights are most advantageous in this instance due to the variability of flows on Thomes Creek from one year to the next. During the 5-year permit period, the GSA expects to conduct diversions on Thomes and Elder Creeks and apply the diverted water to the sites. The viability of each of the sites will then be fully evaluated based on the performance of the sites. The ability of the sites to receive and infiltrate surface water, and the subsequent positive impacts on water levels in the Subbasin will be evaluated during these pilot projects. Information packets for each site were generated to assist in the permit application process, which provide details on each site as well as locations identified to monitor positive impacts groundwater levels in the Subbasin. These information packets can be found in **Appendix D**.

Table 4-1. Thomes Creek 90th Percentile Flow (CFS)				
Day	December	January	February	March
1	829	2802	1201	988
2	718	544	1509	1007
3	726	628	1280	1085
4	459	1642	1383	1156
5	620	1397	1446	1139
6	636	1059	2233	1345
7	432	1219	2678	1034
8	667	2011	1617	863
9	559	1979	1555	911
10	1119	1456	1410	1435
11	1154	1896	1141	1039
12	619	2101	951	1069
13	722	1507	1035	1565
14	1007	1737	1448	1610
15	840	1987	987	1747
16	795	2058	1190	1420
17	855	2132	1468	1256
18	493	1892	1306	981
19	957	1361	1296	1062
20	969	1340	1649	1253
21	1040	994	1744	1333
22	1009	856	1143	1441
23	651	1141	1163	1170
24	417	844	908	1180
25	316	1097	667	1052
26	738	1377	869	878
27	2697	1223	1138	1014
28	2132	1301	1325	985
29	1563	1546		1056
30	2613	1188		937
31	5497	942		1022

Table 4-2. Elder Creek 90th Percentile Flow (CFS)				
Day	December	January	February	March
1	216	404	560	569
2	266	256	711	473
3	356	290	473	390
4	200	601	644	427
5	223	397	588	625
6	275	329	682	517
7	253	509	1046	414
8	220	429	757	478
9	210	417	786	690
10	337	377	711	645
11	214	484	673	551
12	165	953	745	483
13	185	836	722	394
14	201	1088	723	350
15	295	759	649	548
16	245	1278	904	537
17	270	927	641	479
18	232	866	642	385
19	296	766	863	371
20	439	661	1004	476
21	502	563	858	569
22	536	764	638	469
23	452	558	595	456
24	304	456	526	705
25	268	623	529	512
26	301	1040	598	515
27	465	727	537	546
28	399	761	595	505
29	501	680		427
30	534	555		358
31	446	482		411

Table 4-3. Thomes Creek Potential Diversion Volumes (acre-feet)					
Water Year Type	December	January	February	March	Total
Wet	891	736	1,026	861	3,513
Above Normal	66	529	496	536	1,627
Below Normal	0	250	40	309	598
Dry	264	132	0	66	463
Critically Dry	197	0	74	99	370
All Years	373	366	392	417	1,548

Table 4-4. Elder Creek Potential Diversion Volumes (acre-feet)					
Water Year Type	December	January	February	March	Total
Wet	812	854	846	951	3,463
Above Normal	433	683	821	340	2,278
Below Normal	71	220	219	180	690
Dry	195	169	111	232	706
Critically Dry	205	72	81	125	483
All Years	410	486	461	469	1,825

4.2. Permanent Water Rights

Pending the success of the planned pilot projects on each site, the GSAs may opt to convert the temporary water rights permits to permanent rights. The process of applying for and receiving a permanent water right is significantly longer, more complex and costly. A permanent water right requires an in-depth analysis of water availability, and potential impacts to other water rights holders and wildlife at various diversion times and volumes. The advantages of a permanent water right, though, are significant. As the name implies, rights are permanent and do not require periodic re-application. Additionally, in-depth analysis of required in-stream flows may indicate that diversions can be made at lower than 90th percentile flows. This would allow diversions to happen more often, and potentially outside the normal diversion time period of December through March. It is expected that permanent water rights will only be pursued in cases where pilot projects indicate that diversions will have a significant positive impact on the subbasin.

5. NEXT STEPS

5.1. Permitting

5-year temporary permits for diversions from Thomes and Elder Creeks are currently in progress. The GSA will be the permittee, as the diversions for recharge are to benefit the subbasin as a whole. The provisions of the permit will include the North Thomes Creek Site as a point of diversion, along with two additional

sites on the south side of Thomes Creek in the Corning Subbasin. A separate permit, with the Rancho Tehama and Marenco Ranch sites listed as points of diversion, will be applied for as well. The GSA anticipates that a permit will be issued in time for potential diversions as early as December 2025. This temporary permit will be in place for 5 years. Pending successful pilot testing, any necessary permanent construction will take place before December 31, 2026, which is the end of the amended grant funding period.

5.2. Pilot Testing

Following the issuance of the permit, diversions can be made as soon as diversion criteria are met. These diversions will be made via temporary pumps. Pilot testing will consist of various data collection efforts. Measurements of total diversions will be made throughout the diversion season via flow meters on the temporary pumps. Additionally, water depth transducers may be utilized to determine infiltration rates at various points across the sites, depending on specific site conditions. Finally, water levels in nearby wells will be recorded, either by manual measurements or via continuous monitoring equipment. These water levels will be compared with values from more distant wells to determine if recharge operations are having a measurable positive impact on water levels in the subbasin.

In addition to diversions for surface application, a portion of the diversions at the Marenco Ranch site may be directed into an Agricultural Aquifer Storage and Recovery (Ag ASR) pilot project. This project aims to directly inject surface water diverted from Elder Creek into the deeper portion of the aquifer via existing wells on the site. The pilot project will be undertaken under the supervision of the California Regional Water Quality Control Board, Central Valley Region. As of the preparation of this report, a workplan detailing the pilot project is in development for review and comment by the board.

5.3. Construction

5.3.1. North Thomes Creek

As stated in the previous section, temporary pumps and piping will be used for pilot testing on the site. However, based on information gathered during site visits, some minimal construction on this site prior to pilot testing would also be beneficial. Minor leveling and construction of berms on the site would maximize the ability to apply and spread water on the site and prevent surface flow back towards Thomes Creek. If pilot testing is successful on the site, more permanent structures for diverting and directing flow from Thomes Creek will be investigated.

5.3.2. Rancho Tehama

Temporary pumps and piping will be used on the Rancho Tehama site to direct water to the recharge area. Based information gathered during site visits, some minor leveling and construction of berms may be beneficial. During the pilot testing phase, the site will be observed to determine if any further modifications to the site are necessary to encourage spreading and infiltration of applied water. If pilot testing is successful on the site, more permanent structures for diverting and directing flow from Elder Creek will be investigated.

5.3.3. Marenco Ranch

Temporary pumps and piping will be used on the Marenco Ranch site to direct water to the identified recharge areas. During the pilot testing phase, the site will be observed to determine if any further modifications to the site are necessary to encourage spreading and infiltration of applied water. If pilot testing is successful on the site, more permanent structures for diverting and directing flow from Elder Creek will be investigated.

Appendix A: North Thomes Creek Photos

North Thomes Creek- Potential Diversion Point

North Thomes Creek- Potential Diversion Point

Appendix B: Rancho Tehama Photos

Rancho Tehama- Recharge Area

Rancho Tehama- Recharge Area

Rancho Tehama- Recharge Area

Appendix C: Marenco Ranch Photos

Marenco Ranch- Recharge Area (winter)

Marenco Ranch- Typical Vegetation (summer)

Marenco Ranch- Diversion Point

Marenco Ranch- Diversion Point

Appendix D: 5-Year Permit Information Sheets

Marenco Ranch

Information Package

This information package is intended to support the preparation of a 5-year temporary diversion permit to conduct groundwater recharge on the Marenco Ranch Property. The information contained herein was gathered through site visits, analysis of the subject property through publicly available datasets, and input from the landowner. This package contains a table of site information gathered from visits to the location and communication with the landowner, calculations of potential recharge, information about wells, maps, and photos of the site.

The proposed project is located within the Red Bluff Subbasin. The project consists of diversion of flood waters from Elder Creek during periods of high flow. The land identified for infiltration is currently rangeland used for cattle grazing (**Table 1**). The infiltration area on the property is approximately 39 acres and is estimated to be able to infiltrate water at a rate of up to 2 feet of water per day, or a total of 78 acre-feet per day (**Table 2**). A water availability analysis of Elder Creek indicates that between the months of October and March (when diversions are expected to occur), diversions could occur from between 21 days in Wet years and 4 days in Dry or Critically Dry Years. Potential recharge is estimated to be between 1638 acre-feet in Wet years and 312 acre-feet in Dry or Critically Dry years (**Table 3**). Groundwater monitoring during recharge operations will be carried out on five (5) wells on the property to capture both the influence of recharge operations and background conditions. Details for the wells are depicted in **Table 4**.

Table 1: Site Information

Historic Land Use	rangeland / grazing
Current Land Use of Recharge Area	100% rangeland / grazing
Recharge Area	39 acres
Last Fertilization Date	Not fertilized
Landowner Contact Information	Hal Crain

Table 2: Potential Recharge Calculations

Project Name	Infiltration Site	Water Source	Infiltration Area (acres)	Infiltration Rate (estimated ft/day)	Potential Total Amount Infiltrated (AF/Day)

Marenco Ranch	East	Elder Creek	39	2	78

Table 3: Annual Recharge Estimates

Water Year Type	Total Expected Diversion Days	Potential Total Amount Recharged (AF/Year)
Wet	21	1638
Above Normal	14	1092
Below Normal	5	390
Dry	4	312
Critically Dey	4	312

Table 4: Wells

Well Identifier	Latitude	Longitude	Total Depth (ft)	Shallowest Screened Interval (ft bgs)	Purpose
Marenco Well #4	40.0412320°N	122.2547627°W	261	310-340	ASR/Direct Monitoring
Marenco Well #3	40.0437575°N	122.2548656°W	500	260-280	ASR/Direct Monitoring
Marenco Well #2	40.0482007°N	122.2549108°W	578	310-340	Background
Marenco Well #7	40.0421089°N	122.2679102°W	1090	400-460	Background
Marenco Well #4 (New)	40.0486909°N	122.2389396°W	1290	610-650	Background

North Thomes Creek Ranch

Information Package

This information package is intended to support the preparation of a 5-year temporary diversion permit to conduct groundwater recharge on the North Thomes Creek Ranch Property. The information contained herein was gathered through site visits, analysis of the subject property through publicly available datasets, and input from the landowner. This package contains a table of site information gathered from visits to the location and communication with the landowner, calculations of potential recharge, information about wells, maps, and photos of the site.

The proposed project is located within the Red Bluff Subbasin. The project consists of diversion of flood waters from Thomes Creek during periods of high flow. The land identified for infiltration is currently fallow farmland that has historically been planted in grains and pulses (**Table 1**). The infiltration area on the property is approximately 76.5 acres and is estimated to be able to infiltrate water at a rate of up to 2 feet of water per day, or a total of 153 acre-feet per day (**Table 2**). A water availability analysis of Thomes Creek indicates that between the months of October and March (when diversions are expected to occur), diversions could occur from between 19 days in Wet years and 2 days in Dry Years. Potential recharge is estimated to be between 2907 acre-feet in Wet years and 306 acre-feet in Dry years (**Table 3**). Groundwater monitoring during recharge operations will be carried out on four (4) wells on the property to capture both the influence of recharge operations and background conditions. Details for the wells are depicted in **Table 4**.

Table 1: Site Information

Historic Land Use	Rangeland, hay, wheat, peas
Current Land Use of Recharge Area	100% fallow
Recharge Area	76.5 acres
Last Fertilization Date	Spring 2024
Landowner Contact Information	

Table 2: Potential Recharge Calculations

Project Name	Infiltration Site	Water Source	Infiltration Area (acres)	Infiltration Rate (estimated ft/day)	Potential Total Amount Infiltrated (AF/Day)
North Thomes Creek Ranch	Middle	Thomes Creek	76.5	2	153

Table 3: Annual Recharge Estimates

Water Year Type	Total Expected Diversion Days	Potential Total Amount Recharged (AF/Year)
Wet	19	2907
Above Normal	11	1683
Below Normal	4	612
Dry	2	306
Critically Dey	3	459

Table 4: Wells

Well Identifier	Latitude	Longitude	Total Depth (ft)	Shallowest Screened Interval (ft bgs)	Purpose
Red Bluff South #1	39.9670912°N	122.3132873°W	980	660-960	Direct Monitoring
Red Bluff South #4	39.9722268°N	122.2948390°W	1560	635-675	Direct Monitoring
Red Bluff South #6	39.9729855°N	122.2804889°W	1860	820-900	Background
Red Bluff South #9	39.9819413°N	122.2563919°W	1300	500-540	Background

Rancho Tehama

Information Package

This information package is intended to support the preparation of a 5-year temporary diversion permit to conduct groundwater recharge on the Rancho Tehama Orchard Property. The information contained herein was gathered through site visits, analysis of the subject property through publicly available datasets, and input from the landowner. This package contains a table of site information gathered from visits to the location and communication with the landowner, calculations of potential recharge, information about wells, maps, and photos of the site.

The proposed project is located within the Red Bluff Subbasin. The project consists of diversion of flood waters from Elder Creek during periods of high flow. The land identified for infiltration is currently fallow headlands of orchards adjacent to Elder Creek (**Table 1**). The infiltration areas on the property are approximately 8.6 acres in total and are estimated to be able to infiltrate water at a rate of up to 2 feet of water per day, or a total of 17.2 acre-feet per day (**Table 2**). A water availability analysis of Elder Creek indicates that between the months of October and March (when diversions are expected to occur), diversions could occur from between 21 days in Wet years and 3 days in Critically Dry years. Potential recharge is estimated to be between 361 acre-feet in Wet years and 52 acre-feet in Dry years (**Table 3**). Groundwater monitoring during recharge operations will be carried out on four (4) wells on the property and adjacent property to capture both the influence of recharge operations and background conditions. Details for the wells are depicted in **Table 4**.

Table 1: Site Information

Historic Land Use	Fallow
Current Land Use of Recharge Area	100% fallow
Recharge Area	8.6 acres
Last Fertilization Date	Not fertilized
Landowner Contact Information	JJB Farms

Table 2: Potential Recharge Calculations

Project Name	Infiltration Sites	Water Source	Infiltration Area (acres)	Infiltration Rate (estimated ft/day)	Potential Total Amount Infiltrated (AF/Day)
Rancho Tehama	East and West	Elder Creek	8.6	2	17.2

Table 3: Annual Recharge Estimates

Water Year Type	Total Expected Diversion Days	Potential Total Amount Recharged (AF/Year)
Wet	21	361
Above Normal	13	224
Below Normal	4	69
Dry	4	69
Critically Dey	3	52

Table 4: Wells

Well Identifier	Latitude	Longitude	Total Depth (ft)	Shallowest Screened Interval (ft bgs)	Purpose
25N04W10_WCR 2017-005938	40.032991°N	122.302171°W	300	240-300	Direct Monitoring
25N04W15_WCR 2018-003728	40.027035°N	122.305034°W	1160	460-500	Background
25N04W09_E016 2483	40.033376°N	122.316652°W	350	200-240	Direct Monitoring
25N04W09_0958 249	40.032596°N	122.30207°W	390	180-210	Direct Monitoring