

Markham Ravine Mitigation Bank Full Prospectus



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- Exhibit A. Bank Sponsor Qualifications
- Exhibit B. Site Photos
- Exhibit C. Property Assessment and Warranty
- Exhibit D. Biological Resources Reports
- Exhibit E. Plant Survey and Report
- Exhibit F. Preliminary Jurisdictional Wetland Delineation
- Exhibit G. Density Analysis
- Exhibit H. Conservation Easement Template
- Exhibit I. BEI Template

Checklist for Draft Prospectus Mitigation Banks

Note: the requirements listed below are for a Prospectus. Additional requirements must be met in the Conservation Banking Instrument.

Please provide the following information and checklist with the submittal of a Final Prospectus:

Requirement	Location
<input checked="" type="checkbox"/> Proposed Bank Name – Use a short name based on a geographic feature, if possible, and include “Conservation Bank” in the name; note: name changes may be requested by an agency if the name has been used for another bank (including Mitigation Banks).	Section 1.1
<input checked="" type="checkbox"/> Bank Contacts – include the name, address, phone, fax, email, and role in project for: Bank Sponsor, Land Owner, Consultants, Prospective Land Manager, Real Estate Assurance, and Endowment Holder, etc. (if known).	Section 1.2
<input checked="" type="checkbox"/> The qualifications of the Bank Sponsor to successfully complete the type(s) of mitigation project(s) proposed, including information describing any past such activities by the Bank Sponsor.	Section 1.3 Exhibit A
<input checked="" type="checkbox"/> General location map and address of the proposed Bank Property; if no street address is available, then please include a written description of the location.	Section 2.1
<input checked="" type="checkbox"/> Accurate current map of the proposed Bank Property boundaries using a 7.5-minute USGS topographic quadrangle map as a base; if the map will be cropped, include the name of the quadrangle.	Section 2.1
<input checked="" type="checkbox"/> Aerial photo(s) of the proposed Bank Property and surrounding properties.	Section 2.2
<input checked="" type="checkbox"/> The objectives of the proposed Conservation Bank.	Section 4.1
<input checked="" type="checkbox"/> How the Conservation Bank will be established and operated.	Section 4.0
<input checked="" type="checkbox"/> The general need for and technical feasibility of the proposed Conservation Bank.	Section 4.2
<input checked="" type="checkbox"/> The proposed ownership arrangements and long-term management strategy for the Conservation Bank property.	Section 4.8
<input checked="" type="checkbox"/> Site conditions description. This must describe the ecological suitability of the site to achieve the objectives of the proposed Conservation Bank, including the physical, chemical, and biological characteristics of the bank site and how that site will support the target endangered species and their habitats, and should include: site conditions and habitats, photos of the site, description of wetlands and waters present (if applicable), what is proposed for re-establishment, enhancement, etc., site history including past land uses, surrounding land uses and zoning along with the anticipated future development in the area.	Section 2 & 3, Exhibit B
<input checked="" type="checkbox"/> Assurance of sufficient water rights to support the long-term sustainability of the conservation bank (if applicable).	Section 2.4
<input checked="" type="checkbox"/> Proposed number and kinds of Credits (and acres) on the property.	Section 4.6

Checklist for Draft Prospectus Mitigation Banks

Requirement	Location
<input checked="" type="checkbox"/> Biological resource survey report (an inventory of all biological resources onsite).	Exhibit E
<input checked="" type="checkbox"/> Corps-verified map of on-site jurisdictional wetlands and waters, if a Corps permit will be required because of impacts to wetlands or waters of the U.S. (if verification is scheduled but not completed, please note).	Exhibit F
<input checked="" type="checkbox"/> Preliminary Title Report indicating any easements or other encumbrances. Note, any liens and easements on the property that may affect a bank's viability will need to be resolved before a bank can be approved. Provide a written assessment of all easements and encumbrances describing the easement and how it may affect bank operation or habitat values.	Exhibit C
<input checked="" type="checkbox"/> Any other restrictions on the property.	Section 2.6
<input checked="" type="checkbox"/> An affirmative statement that a Conservation Easement covering the property, or fee title transfer of the property, will occur as part of Bank Establishment. Include number of acres of Bank Property area based on exclusion of any easement areas that allow uses incompatible with conservation. Note: pursuant to California Government Code Section 65965, only certain entities can be approved to hold an interest in mitigation lands. CDFW Regional offices can provide information related to this statutory requirement.	Section 4.9 Exhibit I

1. General Bank Information

1.1. Proposed Bank Name

The bank will be named after Markham Ravine which runs through the northern border of the property. Therefore, the proposed Bank name is Markham Ravine Mitigation Bank (“Bank”).

1.2. Bank Contacts

1.2.1 Bank Sponsor and Long-Term Land Manager

Westervelt Ecological Services, LLC (“WES”)

600 North Market Boulevard, Suite 3

Sacramento, California 95834

Contact: Tina Emmett

Office: (916) 646-3644

Mobile: (916) 213-7639

Email: temmett@westervelt.com

1.2.2 Land Owner

Anthony R. Giannoni (“Land Owner”)

Placer 290 Investors, LLC

5150 Fair Oaks Blvd, #101-364

Carmichael, California 95608

2. Bank Sponsor Qualifications

WES is a private firm that provides mitigation solutions. With local offices in Sacramento, California, the parent organization, The Westervelt Company (“TWC”), has been in operation for over 130 years and is committed to land stewardship and managing its land and water resources for future generations. TWC currently manages over one million acres of land nationwide through sustainable forestry, other forestry certifications, wildlife management programs, and mitigation banking.

In the past nine years, WES has successfully established conservation and mitigation banks in California and the Southeastern United States. Ten of these banks are located in California and include wetland mitigation banks as well as conservation banks for federally and state listed species such as California red-legged frog (*Rana draytonii*), California tiger salamander (*Ambystoma californiense*), giant garter snake (*Thamnophis gigas*), vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), Conservancy fairy shrimp (*Branchinecta conservatio*), San Joaquin kit fox (*Vulpes macrotis mutica*), western spadefoot (*Spea hammondi*), Western burrowing owl (*Athene cunicularia*), and Swainson’s hawk (*Buteo swainsoni*). WES also has five additional banks in various stages of entitlement in California and the Southeast and has recently opened a Rocky Mountain Region office based outside of Denver, Colorado. The California mitigation and conservation banks were established using the templates adopted and updated by the Interagency Review Team (“IRT”). Descriptions of the capabilities and qualifications of key personnel for this Bank are presented in **Exhibit A**.

3. Property Description

3.1. General Location and Address of Bank

The Bank is located northwest of the intersection of Brewer Road and North Avenue in western Placer County, west of the city of Lincoln, California. The western property boundary borders Sutter County, and Markham Ravine (“Ravine”) meanders along the north boundary of the property (**Figure 1**).

The Bank address is 402 South Brewer Road, Pleasant Grove, California (“Property”). There is an existing single family residence and two storage equipment structures located on the Property. Access to the Bank is located just off South Brewer Road.

The Bank is approximately 300 acres of the 305-acre Property. The Placer County Assessor’s Parcel Numbers (“APNs”) for the Property are 021-030-060-000 and 021-030-065-000. The Bank corresponds to the southwestern quarter of Section 18 of Township 12 North, Range 5 East, Mount Diablo Base and Meridian, as depicted on the “Sheridan, California” 7.5-minute quadrangle (**Figure 2**) (U.S. Geological Survey 1980). The Bank is located at latitude 38°53’11.22” N, longitude 121°27’37.87”W.

3.2. Historical and Present Uses and Zoning of Bank Site

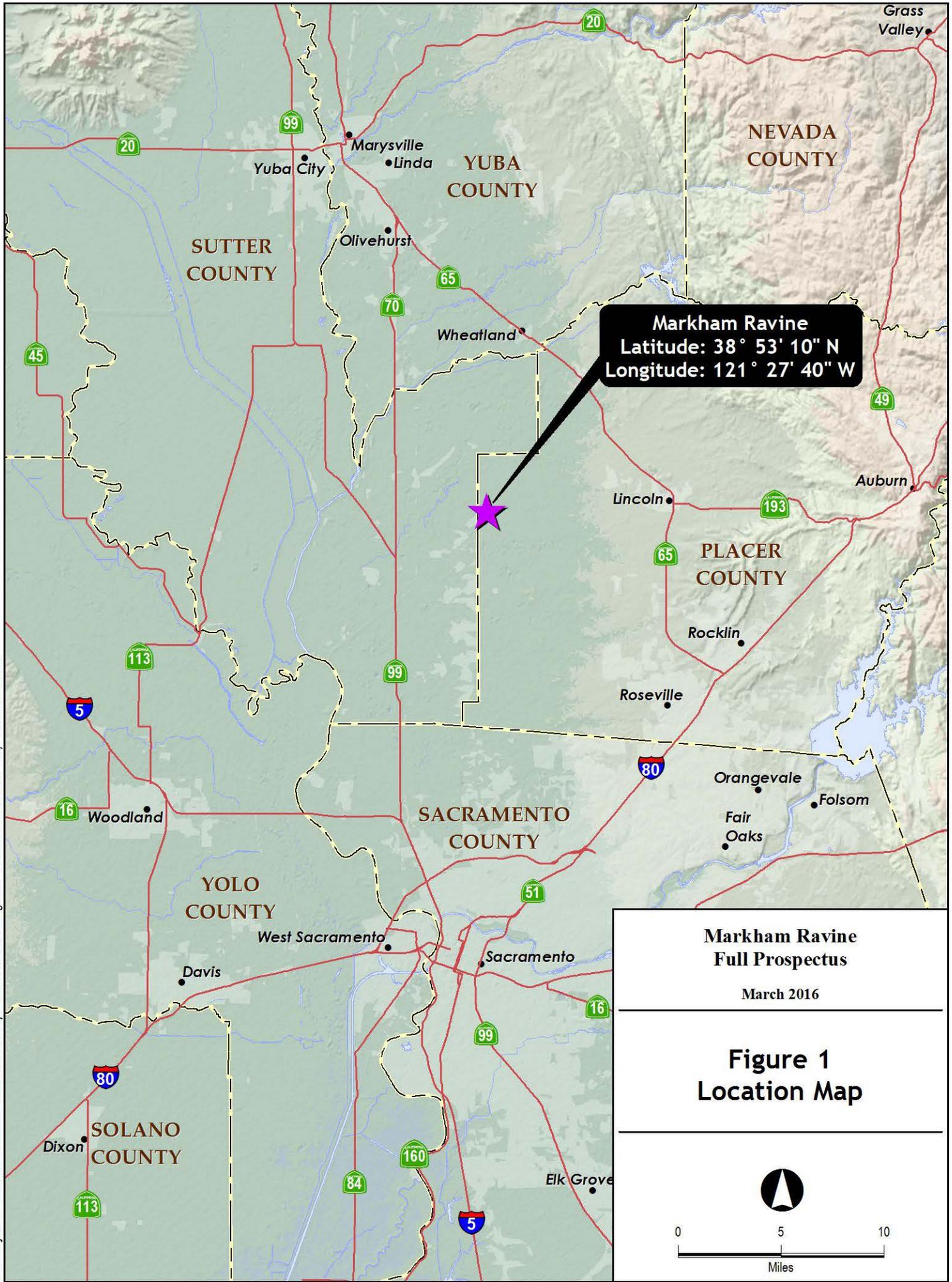
3.2.1. Historic Land Use of Bank Site

The Property has been used for cattle grazing since at least the 1930s. A 1910 historic topographical map of the area shows the Ravine with a full, natural meander across the site (USGS 1910). The 1910 topographical map also shows an additional blue-line feature running east-west through the Bank site, just south of the Ravine. Historic 1937 aerial photographs show signatures of the Ravine meandering into and off of the northern border of the Property, and the additional blue line feature indicated in the 1910 topographical map is no longer present. The 1937 aerial photos also show indications of horse and trailer tracks and storage locations that were used to harvest, move and store hay crops on the Property (**Figure 3**). Sometime in the mid-century, the Ravine meanders on the Property were filled, straightened, and bermed to allow for additional pastureland.

3.2.2. Present Land Use and Zoning of Bank Site

The property is currently zoned agricultural with a minimum lot size of 80 acres (F-B-X-80) (**Figure 4**). The Placer County General Plan (Placer County 2013) land use designation is Agriculture.). There are a number of policies and language in both General Plans that support the conservation of habitat and wildlife that support the use of the site as a Bank (Sutter County 2011 and Placer County 2013). WES has met with Placer County staff regarding the Bank’s consistency with the proposed Placer County Conservation Plan (“PCCP”). The Bank is included in the proposed PCCP’s Placer County Conservation Reserve Area.

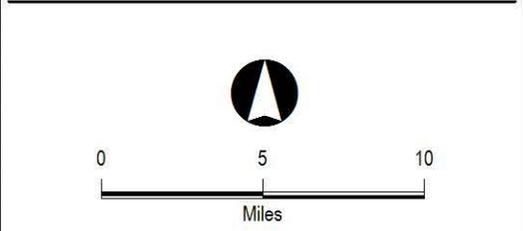
The current Land Owner acquired the Property in 2009. The Property visually can be divided into farmed and not-farmed areas. The approximately five-acre non-farmed area on the east side of the Property contains a single family residence, parking structure, and irrigation pond. The farmed portion of the Property is currently used as irrigated pastureland for cattle. The Property’s

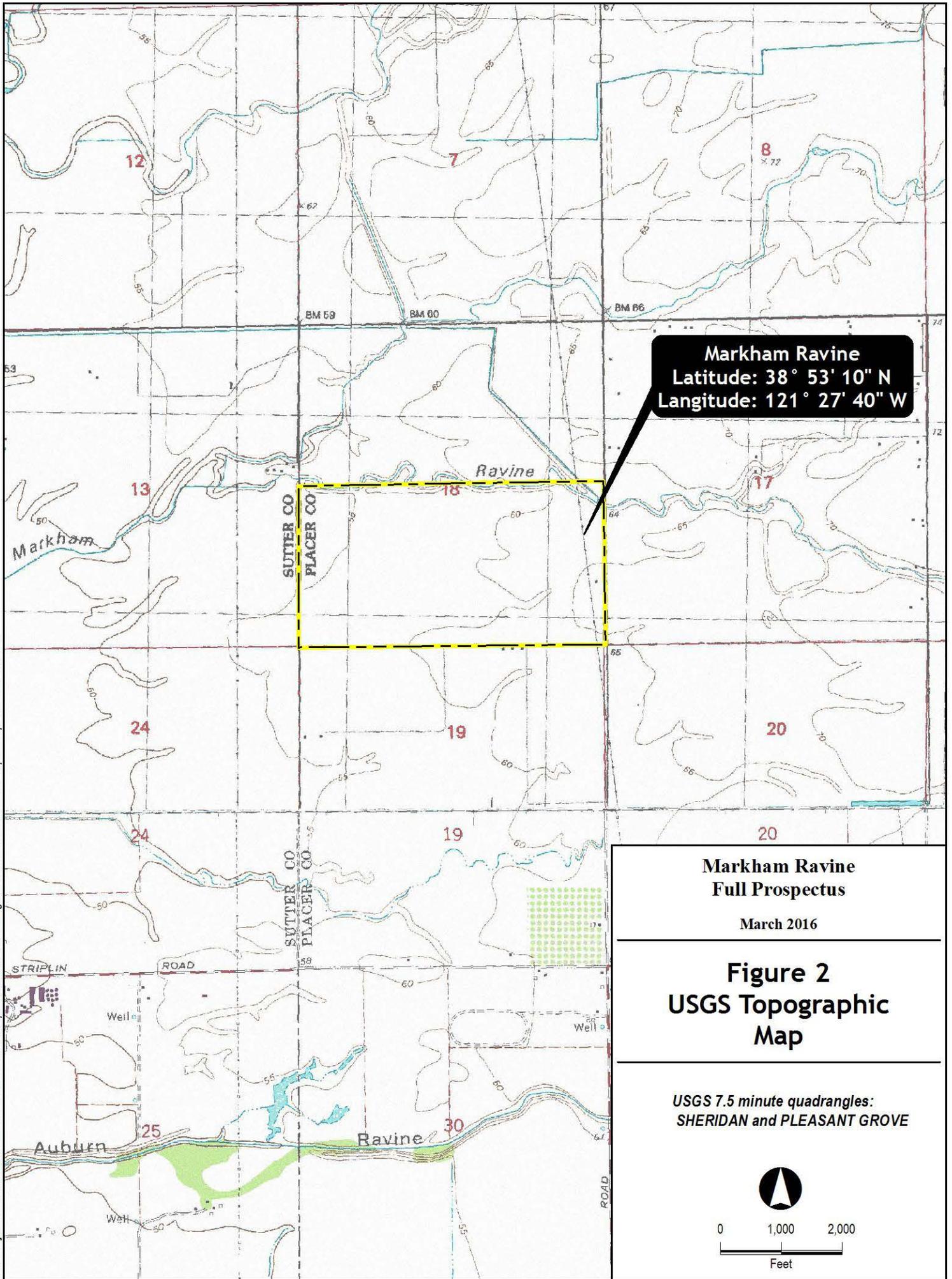


Markham Ravine
Latitude: 38° 53' 10" N
Longitude: 121° 27' 40" W

**Markham Ravine
Full Prospectus**
March 2016

**Figure 1
Location Map**





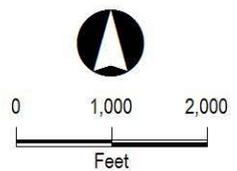
Markham Ravine
Latitude: 38° 53' 10" N
Longitude: 121° 27' 40" W

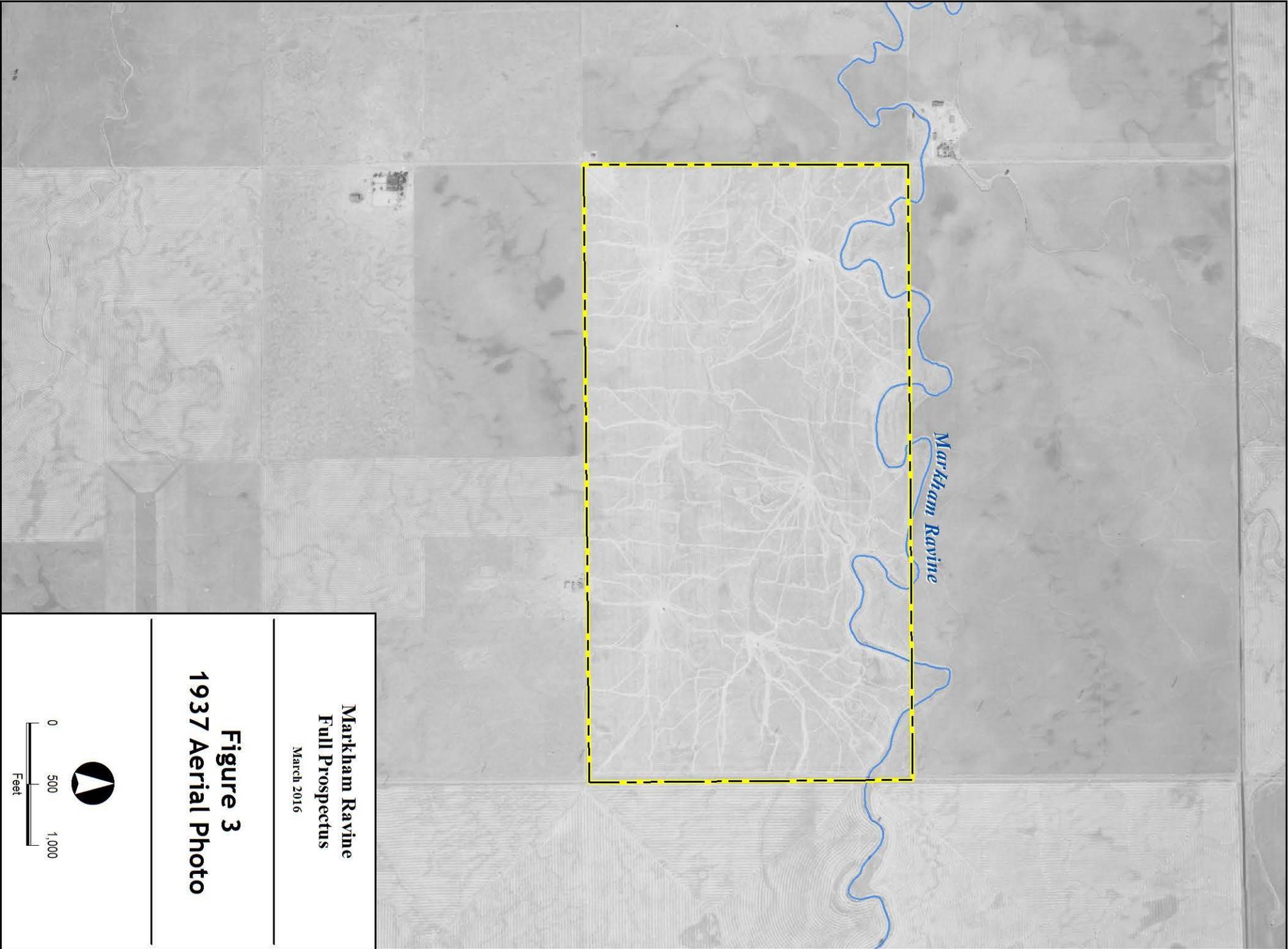
**Markham Ravine
Full Prospectus**

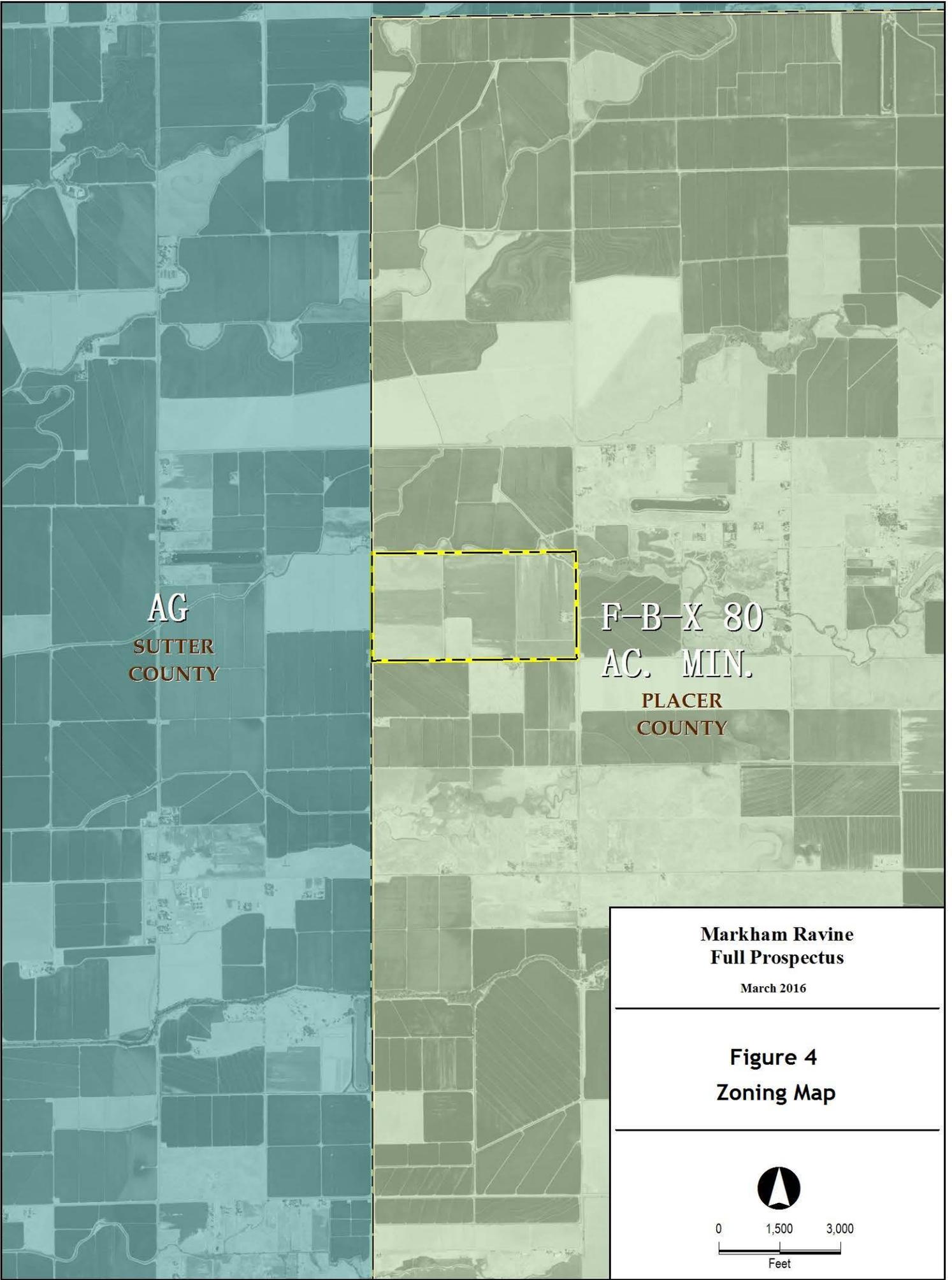
March 2016

**Figure 2
USGS Topographic
Map**

USGS 7.5 minute quadrangles:
SHERIDAN and PLEASANT GROVE







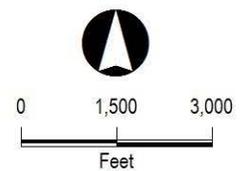
AG
SUTTER
COUNTY

F-B-X 80
AC. MIN.
PLACER
COUNTY

**Markham Ravine
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**Figure 4
Zoning Map**



seasonally irrigated pastureland is moderately valuable as foraging habitat for the SWHA (**Figure 5**). Cattle infrastructure, including troughs for watering, a windmill and well, fencing and gates occur on the Property. Open irrigation canals separate the sites ten irrigated fields. Photographs of the site can be found in **Exhibit B**.

The Ravine is now perennial and utilized by the Nevada Irrigation District (“NID”) and operated by South Sutter Irrigation District (“SSID”) for delivery of irrigation water to adjacent farms. The Property Owner has the ability to purchase water through NID to irrigate the Property. The perennial Ravine located on the Property is surrounded by informal farm berms that protect the site from flooding. The berms are primarily vegetated with native and non-native tree and herbaceous riparian vegetation as discussed in **Section 3.1.4.1**. The northeast corner of the Bank features a lift pump, which is currently used to supply purchased NID irrigation water from the Ravine into an underground, concrete, gravity fed pipeline running along Brewer Road which exits to the west into an irrigation ditch (**Exhibit B**, Photo 12). This pipeline provides the primary water source for the irrigated fields located on the Bank. An agricultural well located near the southeast corner of the Property supplies water to the remainder of the Property, and is accessed by a high volume, diesel powered lift pump (**Exhibit B**, Photo 5). A drinking water panel meeting the standards of the Safe Drinking Water Act is being performed on the wells ground water and is presented in the BEI. Two overflow irrigation ditches run down the center of the Property and drain toward the Ravine. A decommissioned well is located at the midpoint of the westerly ditch.

The Bank site was previously proposed as a wetlands and species mitigation project under the Markham Ravine Ranch Conceptual Habitat Development Plan (“CHDP”) in 2010. Entitlement of the CHDP was never completed and is no longer being pursued (Giannoni pers. comm.).

3.3. Real Estate Records and Assurances

A Preliminary Title Report dated September 9, 2015 contains three easements for electrical transmission lines and utility lines; these areas will be mapped and excluded from the Bank and the conservation easement. Currently two private loans are listed on title. These loans are lines of credit and will be released and reconveyed concurrent with the Bank approval process. All copies of title exceptions are provided and further explained in the Property Assessment and Warranty (**Exhibit C**).

3.4. Water Rights

The Property has no formal water rights but the Property Owner has the ability to purchase irrigation water from NID as needed. NID water is currently purchased and pumped onto the Property from the Ravine for agricultural irrigation. The same system of water delivery may be used for temporary irrigation of the any plant establishment as needed.

3.5. Mineral Rights

Mineral rights have not been severed from the Property and are retained with fee title.



**Markham Ravine
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**Figure 5
Current Aerial Photo**

Date of aerial: November 19, 2015
(Overlaid on NAIP 2014)



0 350 700
Feet

KEY

-  Agriculture Well and Pump
-  Lift Pump

3.6. Other Restrictions on the Property

The Land Owner has verified there is a grazing lease on the Property. This or similar lease will be renewed and maintained as needed to maintain the Bank in accordance with the Interim and Long-term Management Plans and the Conservation Easement.

3.7. Historical and Present Uses and Zoning of Adjacent Properties

Historically, the parcels surrounding the Bank were used for agricultural activities. The Bank's surrounding parcels (to the north, south and east) are currently zoned Agriculture, with a minimum lot size of 80 acres (F-B-X-80). The Placer County General Plan (Placer County 2013) land use designation is Agriculture for these parcels. The western parcels are zoned Agriculture-80 acre minimum in the Sutter County General Plan (Sutter County 2011) (**Figure 4**). The surrounding parcels are currently in agricultural uses, primarily rice cultivation.

3.8. Compatibility of Bank with Surrounding Properties

Development of a mitigation bank for Clean Water Act Section 404 credits on the site is compatible with the surrounding properties. It is expected that the adjoining land uses will remain as they currently exist, in either agricultural production or in open space uses (**Figure 6**). If agricultural lands are converted to other uses, their soils, remoteness from urban areas, and minimum acreage requirements would dictate that they would likely be converted to open space and wildlife habitat uses and not urban or other uses incompatible with the proposed Bank.

The Bank and its surrounding parcels are located in the vicinity of several regional conservation targets, parks, open space and wildlife areas, including those areas within the United States Fish and Wildlife Service's (USFWS) Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon ("Recovery Plan") (USFWS 2005), the Natomas Basin Habitat Conservation Plan (City of Sacramento et al. 2003) and the proposed PCCP Reserve Area (PCCDRA 2011) (**Figure 7**). Several others are further discussed in **Section 5.7.1**. Development of the Bank will increase the amount of local conserved landscape and further the long-term goals of the proposed PCCP and the Recovery Plan.

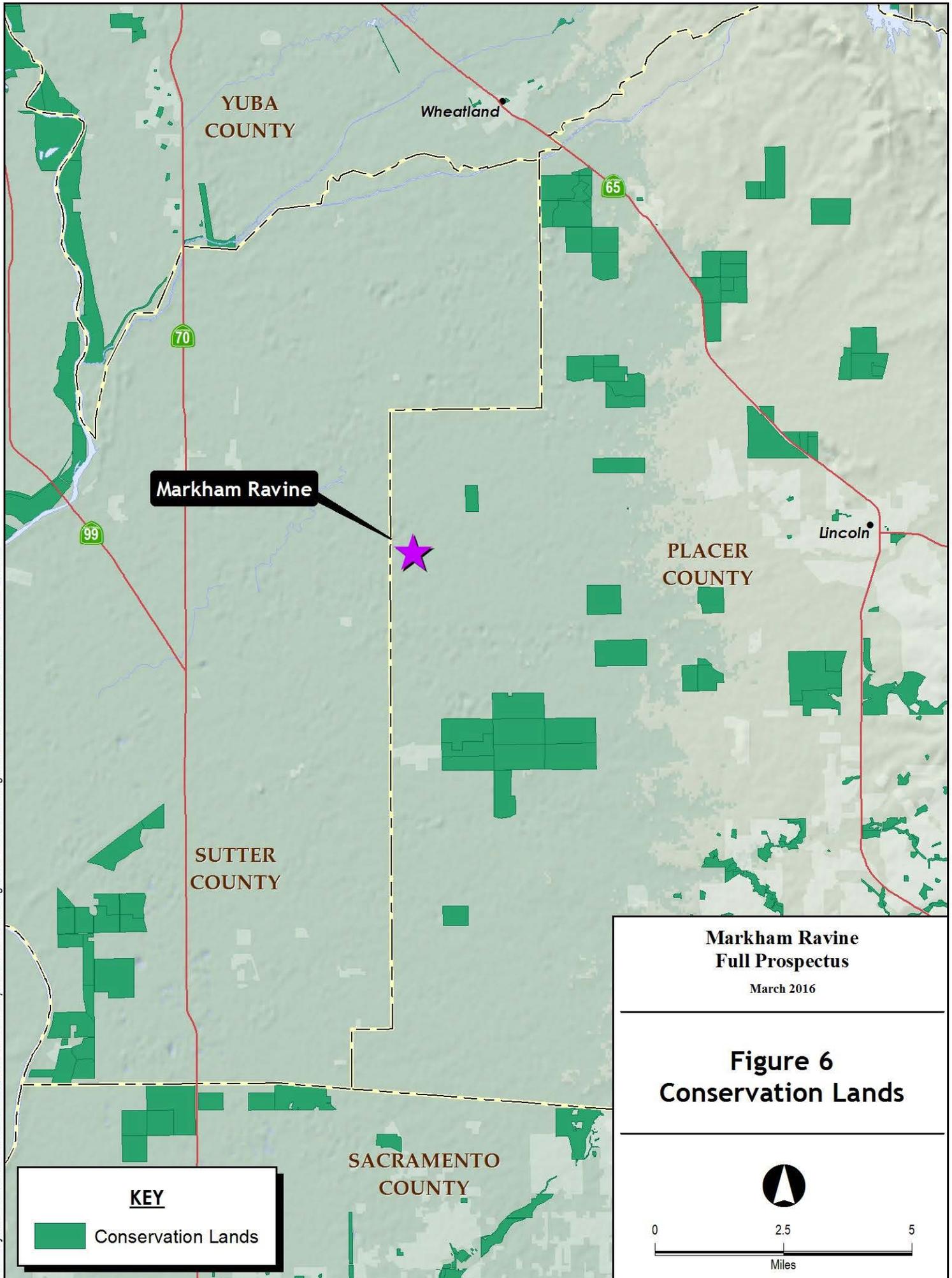
3.9. Qualifications of Bank Property for Conservation Bank Purposes

WES assures that the proposed Bank site has NOT been:

- Used as mitigation for a previous project(s);
- Already designated or dedicated for passive park or open space use, where that use is generally compatible with sustaining biological values;
- Designated for purposes which are inconsistent with habitat preservation (i.e., lands purchased for roads, landfills, etc.); or
- Acquired by a public entity (e.g., with State Bond Act funds) or provided to a jurisdiction for park or natural open space uses.

3.10. Public Funding Received

No public funding has been received for this proposed Bank. Development of the Bank will be entirely funded by the Bank Sponsor.



Markham Ravine



KEY

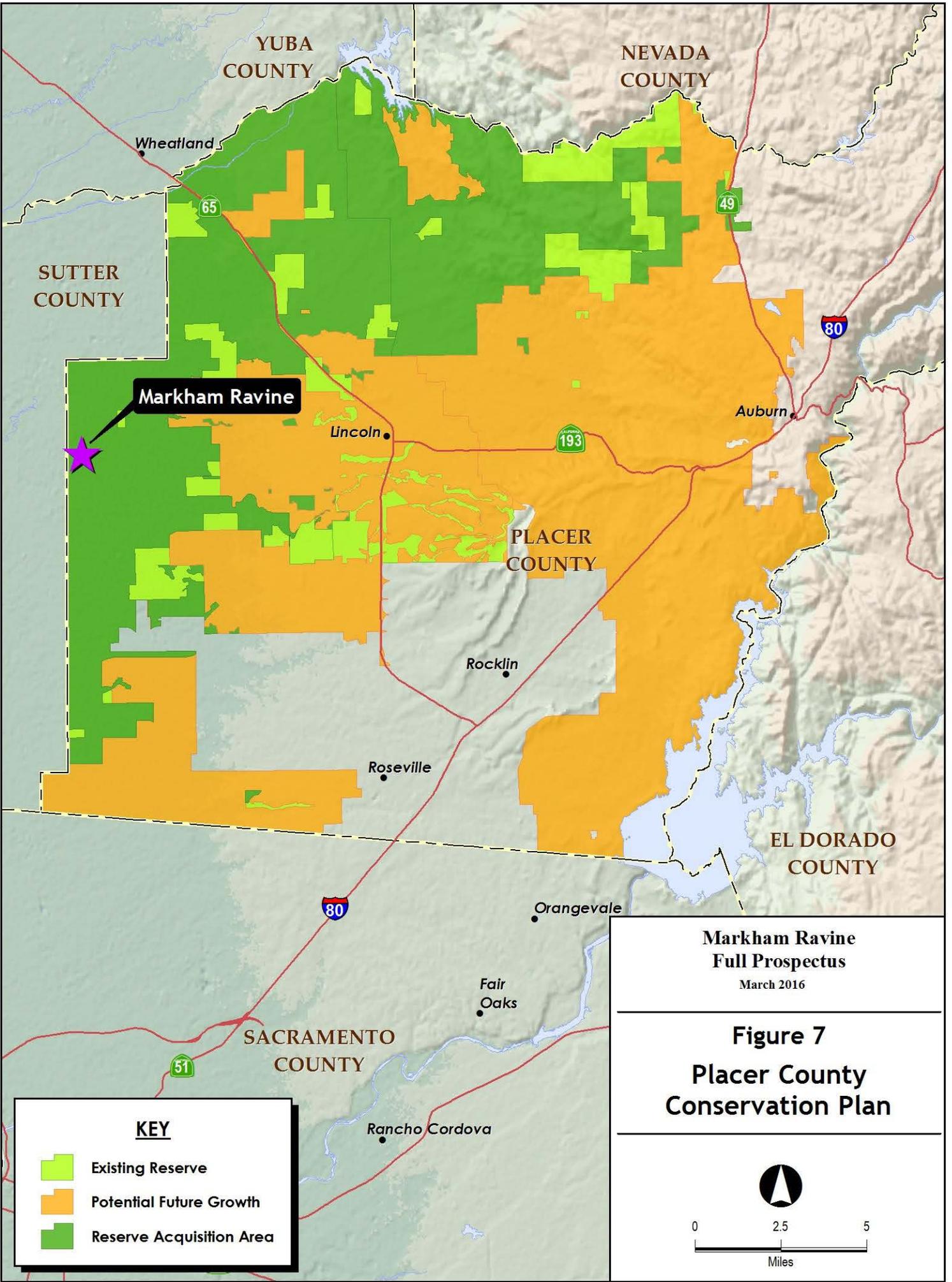
 Conservation Lands

**Markham Ravine
Full Prospectus**
March 2016

**Figure 6
Conservation Lands**


0 2.5 5
Miles

GISProject15\Markham Ravine\MXD\1602\Markham and PCCP from Placer County CBrown 160204 v1.mxd



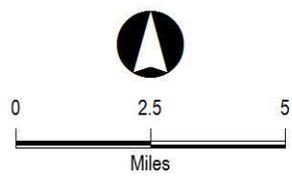
Markham Ravine

**Markham Ravine
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Figure 7
**Placer County
Conservation Plan**

KEY

- Existing Reserve
- Potential Future Growth
- Reserve Acquisition Area



4. Biological Resources

4.1. Biological Resources

Information on vegetation and wildlife, including information on special status species, is summarized from the Biological Resources Survey prepared by Restoration Resources (Restoration Resources 2010), and includes special status wildlife surveys conducted by Williams Wildland Consulting (Williams Wildland Consulting, Inc. 2007), raptor surveys conducted by the Wildlife Heritage Foundation (Wildlife Heritage Foundation 2010) and Restoration Resources (Restoration Resources 2010) and in the Evaluation of Westervelt's Markham Ravine Property for Tricolored Blackbird Use and Mitigation Suitability (NHC 2015). All Biological Resource Reports can be found under **Exhibit D**. A list of plant species observed during field surveys is included in **Exhibit E**. The biological resources report conducted by Restoration Resources in 2010 is in the process of being updated by WES and will be submitted with the Bank Enabling Instrument.

The Bank site is currently an agricultural field used for irrigated crop production for grazing. As observed during the field surveys conducted between 2007, 2010 (Wildlife Heritage Foundation, 2007), and by WES field ecologists in 2015. The irrigated pasture consists of livestock forage, such as perennial grasses and forbes.

4.1.1. Wildlife

Brewer's blackbird (*Euphagus cyanocephalus*) and tricolored blackbird (*Agelaius tricolor*) ("TCBB") have been observed foraging in the irrigated pastures and nesting in the stands of Himalayan blackberry (*Rubus armeniacus*) that congregates along several of the interior irrigation ditches and along the Ravine banks (**Exhibit B, Photos 6-7**). WES staff have observed raptors foraging within the irrigated pasture, including red-tail hawk (*Buteo jamaicensis*), white tailed kite (*Elanus leucurus*), Northern harrier (*Circus cyaneus*), bald eagle (*Haliaeetus leucocephalus*) and American kestrel (*Falco sparverius*). Great-horned owl (*Bubo virginianus*) has previously been observed utilizing some of the larger trees for roosting and possible nesting along the Ravine (Restoration Resources 2010). Other species observed utilizing the irrigation ditches are other species of blackbirds, various song birds, ducks and amphibians.

4.1.2. Special Status Species

The majority of the Bank site is currently managed as irrigated pasture for cattle grazing. The habitat values of the irrigated pasture are primarily limited to raptor and TCBB foraging. TCBB nesting habitat exists within the Himalayan blackberry thickets along the Ravine and portions of the irrigation canals. The trees within the limited riparian habitat on the banks of the Ravine provides limited nesting habitat values for a variety of raptors and songbirds, as well as amphibians such as Western pond turtle (*Actinemys marmorata*). Wildlife assessments conducted by Williams Wildland Consulting, Inc. in 2007 observed no special-status wildlife species in the study area; however, marginal habitat for giant garter snake and western spadefoot is present in the Ravine, poor foraging habitat is present for SWHA, suitable burrows but not suitable foraging habitat for Western burrowing owl, poor to very poor habitat is present for three protected species of fairy shrimp (i.e., *Branchinecta lynchi*, *B. conservatio*, and *Lepidurus packardii*), suitable nesting sites in the Himalayan blackberry for TCBB, and marginal foraging habitat for three species of relatively common bats. Brian Williams concluded in his report that

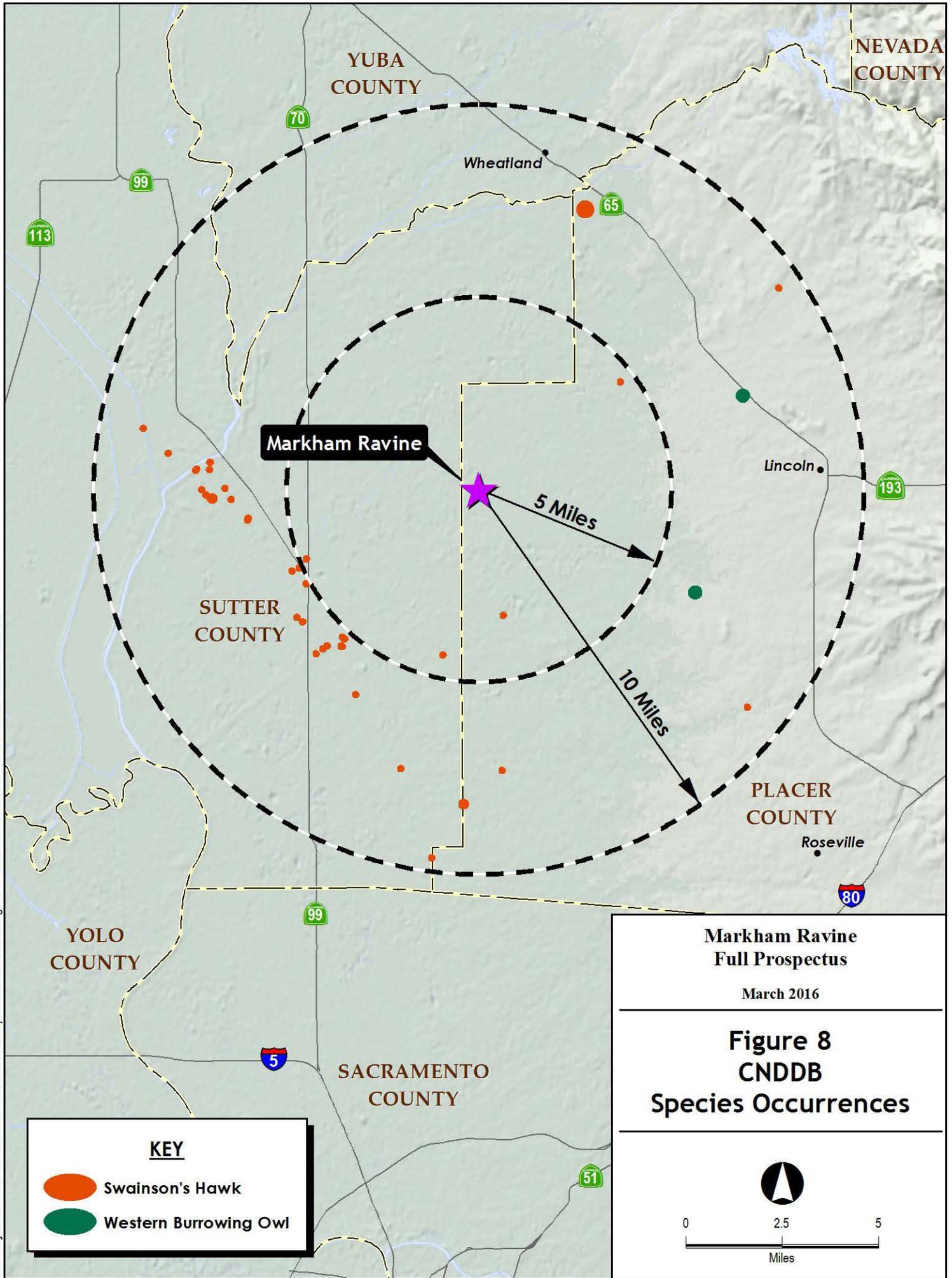
the Property's greatest ecological values are its location within an undeveloped setting and the potential for restoration of the Ravine.

Several special-status species occurrences have been documented within an approximately five-mile radius of the site; however, no special status plant species have been observed onsite, and only TRBB have been documented as nesting in blackberry habitat present onsite.

4.1.2.1. *Swainson's Hawk*

The SWHA is listed as Threatened by the California Department of Fish and Wildlife (CDFW). SWHA have adapted to foraging mainly in agricultural croplands within California's Central Valley (Estep 2010). Adults nest primarily in tall trees along riparian corridors, small groves, roadsides and tree rows. This species migrates through the southern and central interior of California September through October, and returns north March through May. They forage mainly in agricultural fields. Their diet consists of mainly small mammals, reptiles, birds and insects (Estep 2010). Twenty-two SWHA nesting sites have been documented within a 10 mile radius of the Property (**Figure 8**) within the last 10 years (CDFW 2015). Nesting occurrences are listed in **Table 1**.

Table 1. Swainson's Hawk and Western Burrowing Owl Nesting Occurrences				
Swainson's Hawk Occurrences within a 10 mile Radius of Markham Ravine (2005-2015)				
	CNDDDB Occurrence #	Last Year Observed	Nest Y/N (# of nests)	# of Fledglings
1	547	2010	Y	2
2	596	2010	Y(2)	4
3	1494	2010	Y	2
4	1496	2010	Y(2)	4
5	1502	2010	Y(2)	4
6	1504	2010	Y	2
7	1570	2010	Y(2)	4
8	1572	2010	Y	2
9	1908	2010	Y	2
10	2106	2010	Y	2
11	2110	2010	Y	2
12	2112	2012	Y	Unknown
13	2113	2009	Y	2
14	2114	2009	Y	Unknown
15	2115	2009	Y	Unknown
16	2116	2012	Y	2
17	2117	2009	Y	Unknown
18	2119	2010	Y	2
19	2120	2013	Y	Unknown
20	2121	2010	Y	Unknown
21	2122	2010	Y	2
22	2200	2010	Y	Unknown
Western Burrowing Owl Occurrences within a 10 mile Radius of Markham Ravine (2005-2015)				
1	1177	2008	Unknown	Unknown
2	1181	2008	Unknown	Unknown



4.1.2.2. *Western Burrowing Owl*

Western burrowing owl (“BUOW”) is designated as a species of special concern by the CDFW. BUOW are typically found in open habitats with shorter vegetation, such as grazed pasture and grasslands, as well as some agricultural fields that are rarely tilled or irrigated. BUOW nest in ground burrows typically created by ground squirrels and other ground burrowing mammals. They have also been known to use culverts or rock piles and other artificial burrows. BUOW have been documented nesting and foraging within a 10 mile radius around the Bank within the past 10 years (**Figure 8**), individual occurrences are listed in **Table 1** (CDFW 2015). Currently BUOW foraging at the Bank is limited. However, once Bank construction is completed, upland habitat for BUOW nesting and foraging will be more suitable for this species.

4.1.2.3. *Tricolored Blackbird*

TCBB is designated as a species of special concern by the CDFW. In December of 2014 the TCBB was listed as endangered on a 6-month emergency basis by CDFW. This listing was extended for a year in December of 2015 while a final decision on listing is reached (Center for Biological Diversity 2015). This colonial bird nests in dense shrubs, bushes and thorny vegetation that shield nests from predators. Preferred habitats are typically open and near water (Restoration Resources 2010). TCBB were observed nesting and foraging on site in 2015 (NHC 2015).

4.1.2.4. *Vernal Pool Branchiopods*

The potential for listed large branchiopods (defined as vernal pool shrimp (*Branchinecta lynchi*) and vernal pool tadpole shrimp (*Lepidurus packardii*)) to occur on or in the vicinity of the Bank is reasonable given the landscape and historic nature of the Property; WES intends to obtain vernal pool inoculum from local development projects that have unavoidable impacts to vernal pool habitat permitted by United States Army Corps of Engineers (USACE) and USFWS to be used in the Project’s re-established vernal pool habitats. Surveys conducted on 2010 by Restoration Resources did not detect any evidence of occurrence by these species.

4.1.2.5. *Non-Native Species*

Non-native plant species observed on the Bank include crab grasses (*Digitaria* spp.) and dallisgrass (*Paspalum dilatatum*). The Development Plan that will be developed as part of the Bank Enabling Instrument (“BEI”) for the Bank may include conditions for spraying and disking prior to construction to reduce non-native species. Any additional necessary treatments will be included in the Interim and Long-Term Management Plans included in the BEI.

4.1.2.5. *Vegetation Communities*

Based on vegetation communities and conditions present on-site, species’ known distributive data for the region, and a literature review, a list of potentially occurring special-status plant species and wildlife species was developed for the site (**Exhibit D**).

4.1.3. Riparian

Some riparian vegetation is present along the Ravine at the northern border (**Exhibit B**, Photos 6-8). The canopy of this community consists of Fremont cottonwood (*Populus fremontii*), Gooddings black willow (*Salix gooddingii*), arroyo willow (*Salix lasiolepis*), Brazillian vervain

(*Verbena litoralis*), tule (*Schoenoplectus* sp.), and Himalayan blackberry. A full list of the species found on site is included in **Exhibit E**. Many of these larger trees provide potential nesting habitat for a variety of bird species.

4.1.4. Seasonal Wetland Depressions

Several seasonal wetland depression areas have been delineated close to the berms that divide the irrigated pasture cells. These areas are vegetated by waxy mangrass (*Glyceria declinata*), hairy-flower bent grass (*Agrostis avenacea*), smartweed (*Polygonum* spp.), clustered field sedge (*Carex praegracilis*), barnyard grass (*Echinochloa crus-galli*), annual beard grass (*Polypogon monspeliensis*), creeping spikerush (*Eleocharis macrostachya*) and tall flatsedge (*Cyperus eragrostis*). Few vernal pool species occur within the depressional areas including popcorn flower (*Plagiobothrys* sp.), dense-flower spike primrose (*Epilobium densiflora*) and vernal pool buttercup (*Ranunculus bonariensis* var. *trisepalus*) (Restoration Resources 2010).

4.1.5. Ruderal/Disturbed

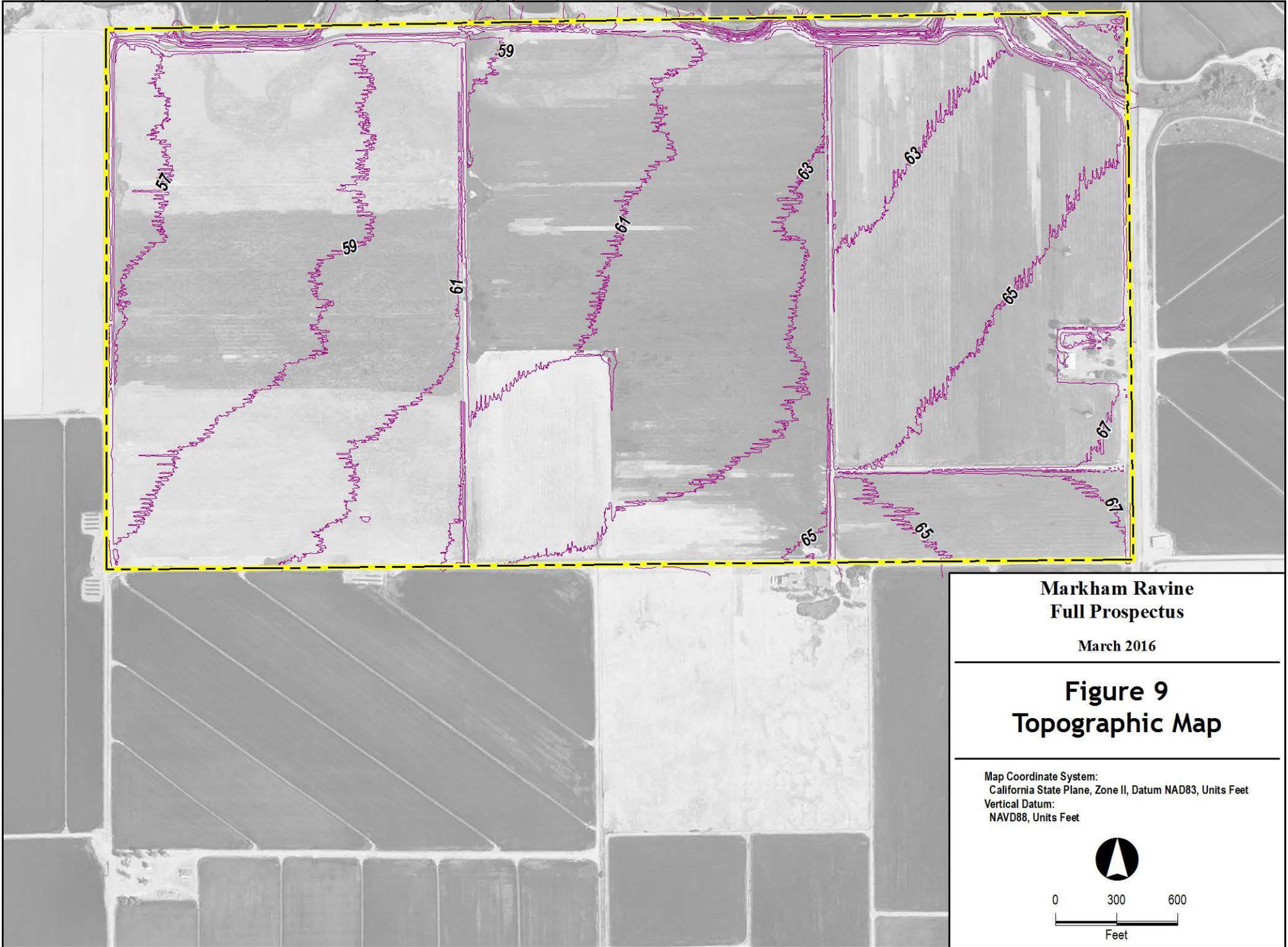
Field borders, roadsides, and upland portions of the levees are considered ruderal areas. Plant species observed within the ruderal community on-site include ryegrass (*Festuca perennis*), hyssop loosestrife (*Lythrum hyssopifolia*), smooth brome (*Bromus inermis* subsp. *inermis*), Mediterranean barley (*Hordeum marinum* subsp. *gussoneanum*), birdfoot trefoil (*Lotus corniculatus*), and dallisgrass (Restoration Resources 2010).

4.2. Hydrology and Topography

The site's natural hydrology has been altered by some straightening and berming of the Ravine's natural meander, and by active farming and grazing practices. The roughly 1.25 mile section of the Ravine on the north side of the Property is part of ± 59.7 stream miles that make up the length of the Ravine. Of these ± 59.7 stream miles, ± 13.2 miles consist of aqueduct with the remainder as intermittent stream (Restoration Resources 2012). The Ravine drains a ± 33 square mile area of western Placer and eastern Sutter Counties. The Ravine is included in the greater Upper Coon-Upper Auburn watersheds. The Ravine is currently used as a channel for distribution of irrigation water by SSID through the NID. The site is currently protected from flooding by berms built up along the Ravine bank, but receives irrigation water from NID via a lift pump located on site as well as supplemental water from the ground water well located on site. The man-made pond located just adjacent to the residence of the Property is a largely ornamental feature that may have previously been used to water cattle or to hold irrigation water. This non-jurisdictional pond is located outside the Bank and may be drained and filled.

The primary sources of hydrology for the site are precipitation, ground water and irrigation from the Ravine. The average annual precipitation in Pleasant Grove, California is 31.04 inches (USA.com 2015), with most of the rain falling in November through March.

The topography of the Bank is nearly level across the site (approximately 0.2%), as it is cultivated and used for cattle grazing, with the site sloping from east to west having roughly a 10-12 foot fall. The elevation is approximately 60 feet above mean sea level (**Figure 9**). Irrigation ditches separate the Property into 10 separate fields (**Figure 4**). The fields drain from east to west.

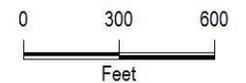


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**Figure 9
Topographic Map**

Map Coordinate System:
California State Plane, Zone II, Datum NAD83, Units Feet
Vertical Datum:
NAVD88, Units Feet



4.3. Soils

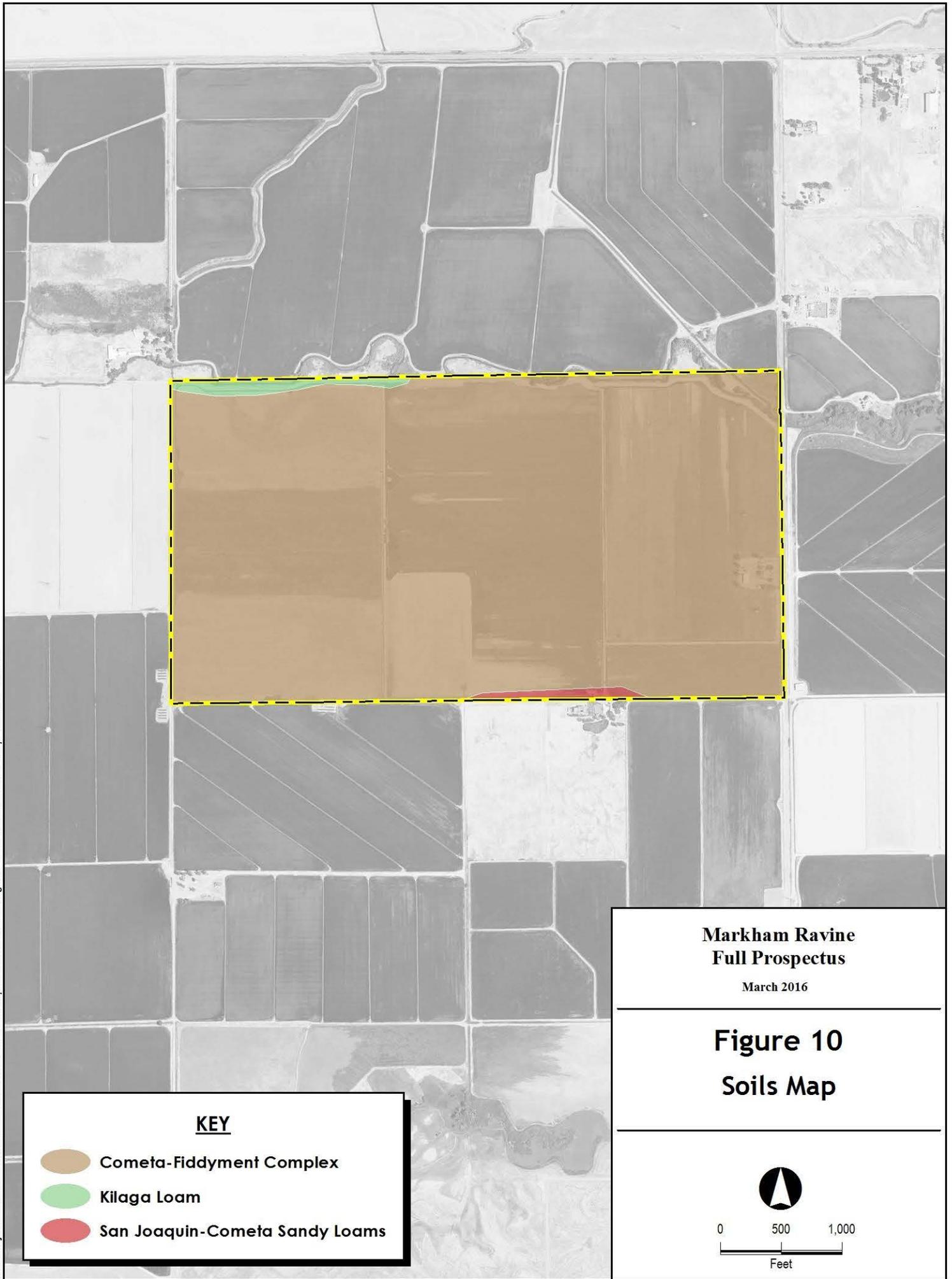
Soil information on the Bank was downloaded from the United States Natural Resources Conservation Service Web Soil Survey (NRCS 2006). Soils on the site are mapped as 94.3% Cometa-Fiddymment complex, 1 to 5 percent slopes (**Figure 10**). Cometa is typically found on terraces and is formed from alluvium derived from granitic sources. The typical profile is sandy loam from 0 to 18 inches, clay from 18 to 29 inches, and sandy loam from 29 to 60 inches. Fiddymment is typically found on ridges and is formed from alluvium derived from mixed rock sources. The typical profile is loam from 0 to 12 inches, clay loam from 12 to 28 inches, indurated hardpan from 28 to 35 inches and weathered siltstone from 35 to 39 inches. These soils are well drained and have a low runoff class. Other soil complexes include 3.0% Kilaga Loam, 2.6% San Joaquin-Cometa sandy loams, 1 to 5 percent slopes and 0.1% Cometa loam, 0 to 2 percent slopes (**Figure 10**).

Supplemental onsite soils investigations have occurred at the Bank to support the proposal to conduct wetland restoration. In 2010 Kelley and Associates Environmental Services, Inc. examined over 170 soil locations throughout the Bank site. Additionally, in 2016 WES conducted supplemental soils investigations at approximately 180 sites at the Bank.

The data from the roughly 350 soil pits excavated at the site paint a more complex soil picture than provided by existing NRCS data. The contemporary NRCS (2006) data is the result of mapping efforts that occurred nearly four decades following significant land alteration of the Bank site. Soil pit data thus far suggests that the site consisted of a remnant terrace bisected by a system of anastomosing ephemeral drainages. This remnant terrace has soil profiles more characteristic of the San Joaquin series than the Fiddymment series in that paralithic contact with siltstone at depth was not present in any soil pit investigated thus far. Some areas of what appears to be a Cometa series soils (i.e., soils similar to San Joaquin but lacking a duripan) have also been identified on the site. Additionally, some discrete areas of what appears to be Alamo series soils have been located at various locations on the site and these locations correspond well with darker signatures on the 1937 aerial photograph which were presumably wetlands on this heavy clay soil series. Alamo series soils formed in basins on the old terraces and are most often associated with larger vernal pools and “clay flat” (i.e., mineral soil flat wetlands) common on undisturbed vernal pool terrain elsewhere in Placer County.

Thus far the soil pit investigations did not show any evidence of deep ripping (i.e., 6-foot depth ripping intended to remove duripan); however, evidence of shallower ripping (i.e., 2-foot depth) characteristic of rice cultivation or soil preparation prior to land levelling was observed in some pits. Overall integrity of sub-surface aquatards (i.e., claypan and to a lesser extent duripan) is good within the remnant terraces on the Bank site. Heavy clay or sandy clay horizons are present and intact across much of the site while areas of deeper better drained soils corresponding with the filled historic ephemeral drainage channels. Soils with heavy clay soil horizons are suitable for vernal pool and seasonal wetland restoration. Deeper soils may also be suitable for seasonal wetland restoration given sufficient depth of excavation and adequate watershed contribution.

As mentioned above, soil pits suggest that the most extensive soils on the site are San Joaquin and Cometa series soils with minor inclusions of Alamo series clay soils. These soils are most frequently associated with alluvial deposits of Riverbank geologic formation and “low terrace”



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**Figure 10
Soils Map**

KEY

-  Cometa-Fiddymment Complex
-  Kilaga Loam
-  San Joaquin-Cometa Sandy Loams



0 500 1,000
Feet

vernal pools (Smith and Verrill 1994). The presence of these soil series are indicative of potential vernal pool landscapes and indicate that the proposal to establish vernal pools and seasonal wetlands at the Bank site is appropriate.

These examinations indicate that landscape of the Bank site could support ponding during the rainy season, primarily because of the high clay content of some soil horizons and duripan that underlay the site, historically making it able to support vernal pools and seasonal wetlands.

4.4. Ecological Suitability of the Bank Property

The Bank site is located in the vicinity of other protected lands that are managed for wetland and wildlife purposes and is within the designated area of the proposed PCCP Reserve Area referenced in **Section 6.8.3**. The site has soils ideal for the re-establishment of vernal pool and seasonal wetland habitats (see **Section 5.2**).

4.5. Wetland Delineation

A Preliminary Wetland Delineation (“PWD”) was prepared for the Property in 2011 by North Fork Associates. The PWD was verified by the USACE in 2011 (USACE Regulatory Branch Number SPK-2011-00684). The delineation was also updated in 2011 to expand the previously delineated area (**Exhibit F**). The jurisdictional wetland features are an existing 2.85 acres of seasonal wetland, wetland swale and wetted ditches that may be filled during the construction of the Bank. The Bank will permanently impact these features. When possible, these features will be incorporated into the design.

5. Bank Establishment and Operation

The Bank is being proposed as a combination Conservation and Mitigation Bank and will utilize BEI templates developed for California by the signatory agencies. An endowment will be established with the objective of providing the financial resources to manage the restored habitat in perpetuity. Additionally, the Bank will be made available for public outreach and scientific research to further understanding of wetland processes and special-status species habitat needs and biology. WES will become the fee title owner of the Bank Property and will be the Bank Sponsor and long-term Bank Manager. Upon signature of the BEI, WES will place a conservation easement on the Bank Property and will proceed with the proposed habitat restoration. WES will manage and monitor the habitats until all performance standards are met. The endowment will be funded by WES to provide for the costs of long-term management.

5.1. Restoration Goals and Objectives

The Bank is being proposed to re-establish a vernal pool complex similar to what likely historically occurred at the site and to create credits that can be purchased to compensate for unavoidable impacts to similar habitats in the region. A review of the 1937 historical aerial photo of the property indicates that it once supported a number of wetlands/Waters of the United States, including vernal pools, seasonal wetlands, seasonal wetland swales, and intermittent/ephemeral drainages. However, sometime in the mid-century the site was leveled and used as contour rice and later as irrigated pasture, removing most of the historic wetlands on the site. The Bank will provide a combination of vernal pool, seasonal wetland, and swale habitats interspaced by annual grassland upland habitats, re-establishing a vernal pool complex similar to what occurred in the area historically. Some wetland signatures are visible on the 1937

aerial of the area (**Figure 3**). If appropriate soils are still present (leveling may have removed proper soils), 1937 wetland signatures will be used to restore wetlands in their historic locations and configuration to the extent practicable. There appears to be some potential for riparian restoration along the Ravine, however, the incised nature of the Ravine limits the extent of any large riparian tree species growth. Overall, the Bank is a re-establishment project and will provide an expected gain in aquatic resource area and functions. The Bank design is consistent with the Recovery Plan (USFWS 2005) and the proposed PCCP.

5.2. Conceptual Design

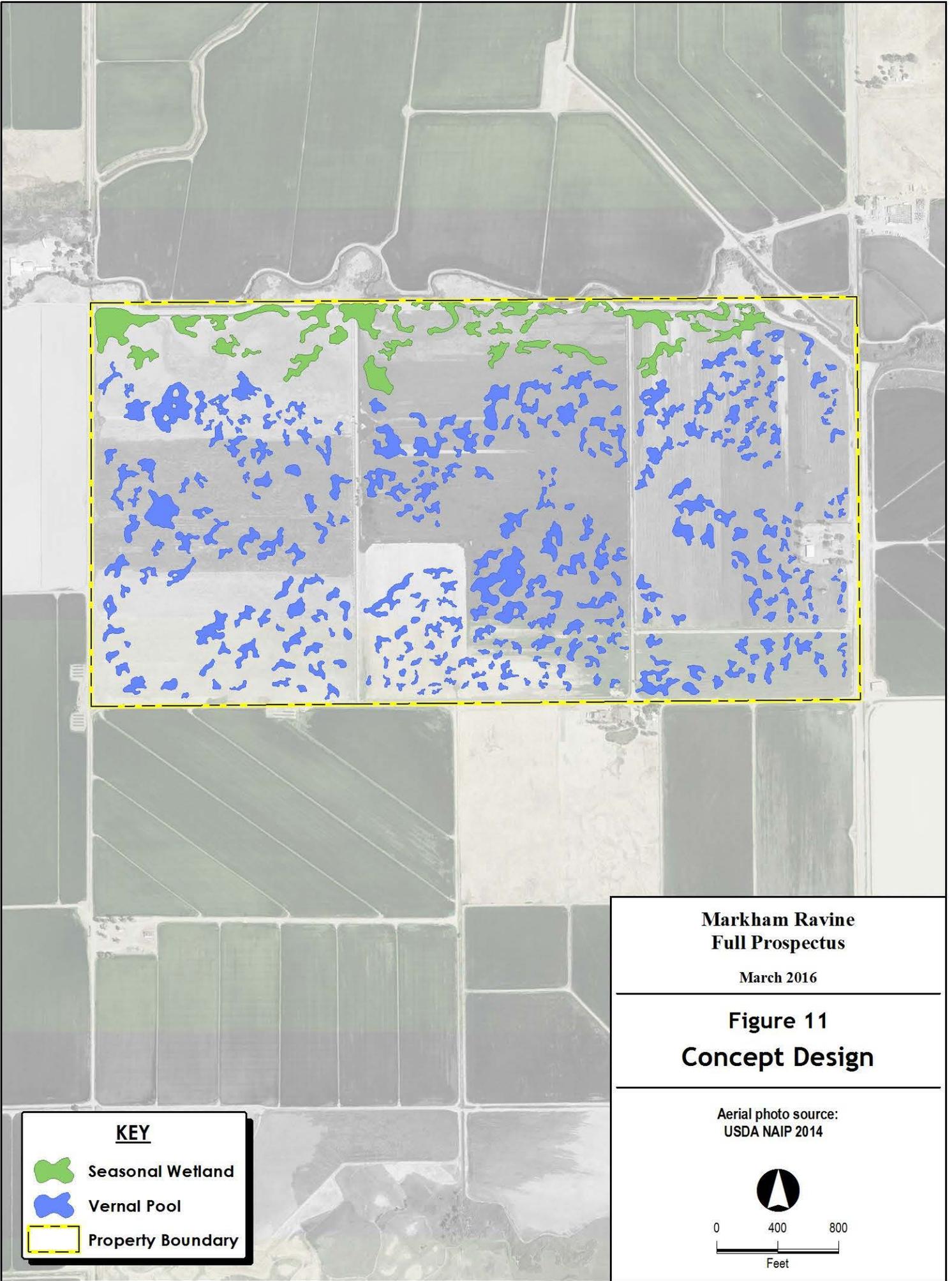
The Bank design re-establishes a vernal pool complex that historically replicates the character and densities that occurred in the landscape prior to conversion to agricultural fields. When technically feasible, the proposed layout would be placed over vernal pools observed in the 1937 aerial photograph. The vernal pool complex design includes vernal pools and seasonal wetlands connected by swales and intermixed with annual grassland uplands (**Figure 11**). The design and density of the vernal pool complex proposed for the Bank was influenced by a density analysis conducted by WES in 2016 (**Exhibit G**). Four reference sites in proximity to the Bank were identified and their wetlands were mapped. These sites were selected as appropriate reference sites for the Bank due to their landscape position, historic presence of vernal pool complexes, topography, and soil characteristics.

In addition to vernal pool and seasonal wetland re-establishment, areas of California blackberry (*Rubus ursinus*) will be planted at the Bank to provide enhanced breeding habitat for TCBB. The annual grassland uplands will provide foraging habitat for TCBB and SWHA as well as nesting and foraging habitat for BUOW. Further details on the design of these habitats are provided below.

5.2.1. Vernal Pool Habitat

Re-establishment of approximately 36 acres of vernal pool habitat interconnected by a series of vernal pool swales is the primary design component of the Bank. Detailed soils analyses were conducted at the site to determine appropriate soils for vernal pool re-establishment, inch depth to restrictive (e.g., duripan) layer. Wetland signatures visible from the 1937 aerial photo were digitized in ArcGIS to map historic wetland locations and extents. Data was collected on the property using a real time kinematic (RTK) system to assess on-site elevations to subinch accuracy. This data was used to geolocate vernal pools on the Bank property so that the vernal pools and swales will be characteristic of the sizes and shapes of many historic wetland signatures as possible. The goal is to create a functioning, viable, and natural appearing vernal pool complex. Soil excavated to create vernal pool basins will be distributed across the uplands to create slight topographic relief from the Bank's currently leveled landscape. No vernal pools will be placed within the power line easement that crosses the property. WES intends to obtain vernal pool inoculum from local development projects that have unavoidable impacts to vernal pool habitat permitted by USACE and USFWS.

The vernal pools at the Bank are expected to fill through direct precipitation and, to a lesser extent, from local surface runoff and subsurface flows across the restrictive layer. Ponding duration is expected to replicate natural vernal pool formations in the area, with the onset of ponding generally occurring in late November and dry-down occurring by mid-March or early



KEY

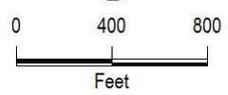
-  Seasonal Wetland
-  Vernal Pool
-  Property Boundary

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**Figure 11
Concept Design**

Aerial photo source:
USDA NAIP 2014



April (around 16 to 18 weeks of continuous inundation). As the depth to the restrictive layer varies across the site, the depth and duration of ponding in the re-established pools will also vary.

The re-established vernal pools and vernal pool swales will support plant and animal species typical of these habitats that occur Southeastern Sacramento Valley Vernal Pool Region. Plants that are likely to become established in the vernal pools and vernal swales include Fremont's goldfields (*Lasthenia fremontii*), white-headed navarretia (*Navarretia leucocephala*), creeping spike rush (*Eleocharis macrostachya*), coyote thistle (*Eryngium vaseyi*), slender popcorn flower (*Plagiobothrys stipitatus*), annual hairgrass (*Deschampsia danthonioides*), wooly marbles (*Psilocarphus brevissimus*), annual rabbit's foot grass (*Polypogon monspeliensis*), ryegrass (*Festuca perennis*), rush (*Juncus* spp.), and buttercup (*Ranunculus* spp.). The re-established vernal pools and swales are also expected to provide habitat for a variety of vernal pool invertebrate species, including listed large branchiopods.

5.2.2. Seasonal Wetland Habitat

The Bank design includes about 10 acres of seasonal wetland re-establishment interconnected by a series of seasonal wetland swales in the northern part of the property, adjacent to the Ravine. The data collected on the site's soils, topography, and historic wetland signatures (as described in **Section 5.2.1.** above) were used to create the layout and design of the seasonal wetlands and swales. The soils along in this area are conducive for seasonal wetlands due to their deeper depth to restrictive layer and seasonal saturation/influence from the nearby Ravine. Additionally, the informal (non-engineered) berm that lies between the Ravine and the Bank has small, cattle-induced low points and culverts that allow floodwater to enter and exit the Bank during high flow events. Soil excavated to create wetland basins will be distributed across the uplands to create slight topographic relief from the Bank's currently leveled landscape. No seasonal wetlands will be placed within the power line easement that crosses the property.

The seasonal wetlands at the Bank are expected to fill through direct precipitation and, to a lesser extent, from surface runoff subsurface flow, over bank flow from the Ravine. Ponding duration is designed to be short duration seasonal inundation, with the onset of ponding generally occurring in late November and dry-down occurring by mid-March or early April (around 6 to 18 weeks of continuous inundation).

The re-established seasonal wetlands and seasonal wetland swales will support plant and animal species typical of these habitats in the region. Plants that are likely to become established in the vernal pools and vernal swales include Fitch's spikeweed (*Centromadia fitchii*), vinegar weed (*Trichostema lanceolatum*), Mediterranean barley (*Hordeum marinum*), turkey mullein (*Croton setigerus*), ryegrass, mannagrass (*Glyceria declinata*), rush, hairy hawkbit (*Leontodon saxatilis*), hyssop loosestrife (*Lythrum hyssopifolium*), annual hairgrass, and amaranth (*Amaranthus* spp.).

5.2.3. Upland Habitat and California Blackberry Habitat

Once wetland re-establishment activities are completed, annual grassland uplands and swales will provide foraging habitat for SHWA, BUOW, and TCBB. Additionally, during wetland re-establishment activities, approximately 3-5 artificial BUOW burrows will be installed on higher locations across the Bank to provide nesting habitat for BUOW. Artificial burrows will be placed in areas that are expected to have higher grazing levels (e.g., near a cattle corral or watering

station) to provide the lower vegetative cover amounts preferred by BUOW. The preservation of existing patches of Himalayan blackberry and the addition of new plantings of California blackberry will occur to promote further TCBB nesting.

5.3. Permitting

The following permits for construction of the Bank may be required:

- 1) USACE, Nationwide Permit 27
- 2) USFWS, Endangered Species Act (ESA) Section 7 Consultation
- 3) Central Valley Regional Water Quality Control Board, 401 Certification
- 4) CDFW, Lake and Streambed Alteration Agreement Section 1600
- 5) Central Valley Flood Protection Board, Encroachment Permit, Section 404
- 6) Central Valley Regional Water Quality Control Board, Section 402 Storm Water Pollution Prevention Plan
- 7) County of Placer, California Environmental Quality Act (CEQA)
- 8) County of Placer, Grading Permit

5.4. Performance Standards and Monitoring Methods

The purpose of performance monitoring is to determine if the overall goal of vernal pool and seasonal wetland re-establishment are being accomplished and when to develop and implement corrective measures, if necessary. “Success Criteria” are the ecological indicators that are measured in order to document the establishment of vernal pools and seasonal wetlands within the Bank. The minimum achievements of ecological success (“Performance Standards”) developed for the re-established vernal pools and re-established seasonal wetlands are outlined below.

5.4.1. USFWS/USACE 404 Vernal Pool Re-established Habitat

Vernal pool habitat will be re-established at the Bank and will provide wetlands/Waters of the United States and vernal pool fairy shrimp habitat. Performance Standards for this habitat type, “Vernal Pool Re-established Habitat”, are outlined in **Table 2** and described below.

Table 2. Vernal Pool Re-established Habitat Performance Standards						
Success Criteria	Performance Standard*	Interim Performance Standards				Final Performance Standard
		Year 1	Year 2	Year 3	Year 4	Year 5
Hydrology	Extent (aerial photo or field effort)	X				X
	Acreage (jurisdictional delineation)			X		X
Flora-1	The percent relative cover of Vernal Pool Endemic Species ¹ within the monitored re-established pools will fall within or above the range of values for the reference pools for each monitored year.		X	X	X	X
Flora-2	Absolute cover of Wetland Plant Species ² within the monitored re-established pools will be greater than 50% by Year 5.					X
Flora-3	The percent relative cover of Invasive Plant Species ³ within the re-established pools will fall within or below the range of values for the reference pools for each monitored year and will not exceed 50%.		X	X	X	X
*If remedial actions are implemented, the Performance Standards must be met for three years following remedial actions without human intervention.						

5.4.1.1. Hydrology

The hydrology of the re-established vernal pools will be monitored in years one, three, and five following the methodology outlined in **Section 5.5.1** below to document ponding acreage. In years one and five, a wet-season aerial photo or field efforts will be used to determine if the pools are ponding as appropriate. In years three and five, the extent of ponding of all re-established pools will be determined using a jurisdictional wetland delineation. Hydrology will also be measured for a subset of re-established pools via staff gauges in years one, two, three, and five to support the hydrology component of the aerial photo and jurisdictional delineation.

¹ “Vernal Pool Endemic Species” are defined in Appendix 1 of the *California Rapid Assessment Method (CRAM) for Wetlands, Version 6.1. Individual Vernal Pools Field Book* (CWMW 2013) or future updated publication.

² “Wetland Plant Species” are defined by USACE’s *National Wetland Plant Lists* (Lichvar 2013, Lichvar et al. 2014, or future updated publication), where OBL, FACW, and FAC categories are considered wetland plant species as follows:

Categories found in the USACE National Wetland Plant Lists:

- Obligate Wetland (OBL)* = occur almost always in wetlands (>99% probability).
- Facultative Wetland (FACW)* = usually occur in wetlands (67%-99% probability).
- Facultative (FAC)* = equally likely to occur in wetlands and non-wetlands (34%-66% probability).
- Facultative Upland (FACU)* = usually occur in non-wetlands (67%-99% probability).
- Obligate Upland (UPL)* = occur almost always in non-wetlands (>99% probability).

³ “Invasive Plant Species” are those defined as invasive and having a “High” and/or “Red Alert” status in the California Invasive Plant Council’s *California Invasive Plant Inventory, Online Database* (Cal-IPC 2015) or future updated publication.

The Performance Standards for these criteria are anticipated to be met within the first year following completion of establishment activities unless drought conditions occur.

5.4.1.2. *Flora*

The flora of a the re-established vernal pools will be monitored in years two, three, four and five following the methodology outlined in **Section 5.5.1** below to verify that the re-established pools are supporting appropriate vegetation for their wetland type. The percent relative cover of Vernal Pool Endemic Species and Invasive Plant Species will be monitored for a subset of the re-established pools in years two and four and all re-established pools in years three and five, and must fall within the range exhibited by the reference pools (described in **Section 5.5.1**).

Additionally, all re-established pools must have greater than 50% absolute cover of Wetland Plant Species by year five. These Performance Standards accommodate the gradual development of plant communities similar in composition and cover to reference pools.

5.4.1.3. *Listed Large Branchiopods*

As the habitat establishment occurring at the Bank is intended to contribute to the recovery and future survival of listed large branchiopods, a listed branchiopod occupancy objective for the re-established vernal pools is proposed. Due to the uncertainty that inoculum will be obtained and used during vernal pool re-establishment, there may not be a source seeds and cysts with which to jumpstart development of natural flora and fauna communities in the pools. Therefore, an objective of 0–5% listed large branchiopods occupancy is proposed. A re-established pool must only be occupied once during the monitoring period to be considered occupied. It should be noted that this percent occupancy is an objective and not a binding Performance Standard established by the signatory agencies.

The calculation for this percentage will be as follows:

$$\% \text{ Occupancy} = \frac{\text{total \# of re-established vernal pools supporting listed large branchiopods as of the current monitoring year}}{\text{total \# re-established vernal pools}} \times 100$$

5.4.2. USACE 404 Seasonal Wetland Re-established Habitat

Seasonal wetland habitat will be restored at the Bank and will provide wetlands/Waters of the United States habitat. Performance Standards for this habitat type, “Seasonal Wetland Re-established Habitat”, are outlined in **Table 3** and described below.

Table 3. Seasonal Wetland Re-established Habitat Performance Standards						
Success Criteria	Performance Standard*	Interim Performance Standards				Final Performance Standard
		Year 1	Year 2	Year 3	Year 4	Year 5
Hydrology	Extent (aerial photo or field effort)	X				X
	Acreage (jurisdictional delineation)			X		X
Flora-1	Absolute cover of Wetland Plant Species ⁴ within the monitored re-established wetlands will be greater than 50% by Year 5.					X
Flora-2	The percent relative cover of Invasive Plant Species ⁵ within the re-established wetlands will be <40% by Year 2, <30% by Year 3, <20% by Year 4, and <10% by Year 5.		X	X	X	X

**If remedial actions are implemented, the Performance Standards must be met for three years following remedial actions without human intervention.*

5.4.2.1. Hydrology

The hydrology of the re-established seasonal wetlands will be monitored in years one, three, and five following the methodology outlined in **Section 5.5.2** below to document ponding acreage. In years one and five, a wet-season aerial photo or field efforts will be used to determine the extents of wetland ponding as appropriate. In years three and five, the extent of ponding of all re-established wetlands will be determined using a jurisdictional delineation. Hydrology will also be measured for a subset of re-established wetlands via staff gauges in years one, two, three, and five to support the hydrology component of the aerial photo and jurisdictional delineation. The Performance Standards for these criteria are anticipated to be met within the first year following completion of establishment activities unless drought conditions occur.

5.4.2.2. Flora

The flora of a the re-established seasonal wetlands will be monitored in years two, three, four and five following the methodology outlined in **Section 5.5.2** below to verify that the re-established seasonal wetlands are supporting appropriate vegetation for their wetland type. All re-established seasonal wetlands must have greater than 50% absolute cover of Wetland Plant Species by year five. These Performance Standards accommodate the gradual development of plant communities typically found in seasonal wetlands in the area.

⁴ “Wetland Plant Species” are defined by USACE’s *National Wetland Plant Lists* (Lichvar 2013, Lichvar et al. 2014, or future updated publication), where OBL, FACW, and FAC categories are considered wetland plant species as follows:

Categories found in the USACE National Wetland Plant Lists:

- Obligate Wetland (OBL)* = occur almost always in wetlands (>99% probability).
- Facultative Wetland (FACW)* = usually occur in wetlands (67%-99% probability).
- Facultative (FAC)* = equally likely to occur in wetlands and non-wetlands (34%-66% probability).
- Facultative Upland (FACU)* = usually occur in non-wetlands (67%-99% probability).
- Obligate Upland (UPL)* = occur almost always in non-wetlands (>99% probability).

⁵ “Invasive Plant Species” are those defined as invasive and having a “High” and/or “Red Alert” status in the California Invasive Plant Council’s *California Invasive Plant Inventory, Online Database* (Cal-IPC 2015) or future updated publication.

5.4.3. Upland Species (SWHA, BUOW, and TCBB) Foraging/Nesting Habitat

The upland vegetation on the site supports suitable dry land foraging habitat for SWHA, and SWHA have been observed nesting within 5 to 10 miles of the Bank (**Figure 8**). SWHA have been observed foraging on the Bank's pasturelands and along the Ravine corridor (Restoration Resources 2012). While no performance standards are proposed for the SWHA foraging habitat, the Bank will be managed largely through a grazing program which will maintain the SWHA foraging habitat in a healthy state; these methods will be discussed in the Interim and Long-term Management Plans submitted with the BEI.

A TCBB colony has been observed foraging and nesting within the Bank boundaries. Two patches of Himalayan blackberry growing along the Ravine at the north end of the property were documents being used by the colony in 2015 (NHC 2015). The estimated population of this colony is approximately 4,200 birds (NHC 2015). TCBB were observed foraging in pasturelands immediately surrounding the Bank. While no performance standards are proposed for the TCBB foraging habitat, the Bank will be managed largely through a grazing program which will maintain the TCBB foraging habitat in a healthy state; these are described further in **Section 5.5.3** below. Additionally, some enhancement of blackberry habitat may occur to insure the continued existence of healthy blackberry stands within the Bank that would be suitable for TCBB nesting.

Once Bank construction is completed, the upland vegetation and topography will be appropriate to support foraging and possible nesting habitat for BUOW. Existing cement culverts will be placed upside-down in appropriate locations throughout the Bank to promote use by nesting BUOW. BUOW have been observed within 10 miles of the Bank (**Figure 8**). No performance standards are proposed, however the grazing program will maintain foraging areas for BUOW.

5.5. Monitoring Methods

Successful establishment of wetlands within the Bank is anticipated to occur within five years of construction of the habitats on site. The success monitoring of the re-established habitats will take place over a five-year period following construction (i.e., Interim Management Period) to ensure performance of re-established wetlands. The goals of this monitoring are to 1) help track habitat progression towards Performance Standards, and 2) help evaluate and guide site stewardship activities.

5.5.1. Vernal Pool Monitoring Methods

5.5.1.1. Monitored Pools

Vernal pool monitoring will be performed by systematically sampling a subset of the re-established pools and comparing their function to existing vernal pools. At least 20% of the re-established pools ("Sample Pools") will be monitored during each monitoring year. The Sample Pools will be selected upon completion of construction, but prior to the initiation of year one of monitoring, and these sample locations will remain unchanged during the duration of the Interim Management Period. Sample Pools will be selected to achieve an accurate representation of all re-established pools on the site, including characteristics such as: depth, acreage, and position within the landscape. Through comparison of the re-established pools with on-site reference

pools, the ecological development of re-established habitats can be evaluated against a representative climax vegetation community.

Prior to the initiation of year one monitoring efforts, a minimum of 30 existing, natural vernal pools within the Marnier Conservation Bank will be selected as reference pools (“Reference Pools”). Based on the recommendations of Barbour et al. (2007), Reference Pools will be subjectively selected based upon acreage, depth, and position within the landscape. This will produce an accurate representation of the characteristics present across the vernal pool landscape, not just the extremes. These sample locations will remain unchanged during the duration of the Interim Management Period. Reference Pools will be monitored at the same time as re-established pools on the site using the same methodologies. Collectively, the Sample Pools and Reference Pools are referred to as “Monitored Pools.”

5.5.1.2. *Monitoring Schedule*

Monitoring of the Monitored Pools will occur over a five-year period to ensure success of the re-established habitat. Monitoring will begin during the rainy season after wetland construction is completed (**Table 4**).

Table 4. Monitoring Schedule for Vernal Pools					
Monitoring Activity	Interim Management Period (Year)				
	1	2	3	4	5
Hydrology – Aerial Photo	X				X
Hydrology – Staff Gauges – Monitored Pools	X		X		X
Jurisdictional Delineation – All Re-established Pools			X		X
Flora – Monitored Pools		X		X	
Flora – All Re-established and Reference Pools			X		X
Listed Large Branchiopods – Monitored Pools		X	X	X	X
Photo Documentation	X	X	X	X	X

5.5.1.3. *Hydrology*

All re-established pools will periodically be field-checked for ponding and aerial photography or field efforts will be used during years one and five to verify that the pools are ponding water as appropriate. After year one, floristic data can be used as an indicator for the areal extent of vernal pool hydrology. Additionally, in years three and five, a jurisdictional determination will be conducted for all re-established pools to verify ponded acreage. Additional information related to ponding depths, duration, and inundation response to rainfall events will be collected at each of the Monitored Pools through the use of staff gauges. Staff gauges will be installed at the lowest topographic point of each Monitored Pool to aid in data collection and to support the hydrology component of the aerial photo and jurisdictional delineation. Staff gauges will be monitored in years one, three, and five, following the schedule proposed in the Draft Mitigation and Monitoring Guidelines for Vernal Pools (USACE 2013). During these years, water depths of the Monitored Pools will be measured every two weeks from the onset of the rainy season until the pools dry in the spring.

5.5.1.4. *Jurisdictional Delineation*

The jurisdictional delineation provides data on hydrological function, dominant plant species, and makes a determination of the extents of each feature as a wetland/Water of the United States.

During Years three and five, a jurisdictional delineation will be conducted for all re-established wetlands in accordance with the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Arid West Region Supplement) (USACE 2008b). The boundaries of the re-established seasonal wetlands will be delineated through aerial photograph interpretation and standard field methodologies (i.e., paired data set analyses), and all wetland data will be recorded on Wetland Determination Data Forms - Arid West Region, or future updated publication. A color aerial photograph (1"=400' scale) will be used to assist with mapping and ground-truthing. Munsell Soil Color Charts (Kollmorgen Instruments Co. 1990) and the NRCS Web Soil Survey will be used to aid in identifying hydric soils in the field. The Jepson Manual, 2nd Edition (Baldwin et al. 2012), or future updated publication, will be used for plant nomenclature and identification.

5.5.1.5. *Flora*

The floristic monitoring program proposed is to conduct subsampling of the re-established pools (i.e., Sample Pools) in years two and four in combination with full floristic monitoring of all re-established pools during milestone years three and five. Monitoring in this manner allows for cost-effective monitoring during the habitat establishment process to guide management activities while allowing for full documentation of the functions of the re-established habitat to demonstrate success.

Floristic monitoring will be conducted in Monitored Pools in years two and four (see **Table 2**). The Jepson Manual, 2nd Edition (Baldwin et al. 2012), or future updated publication, will be used for plant nomenclature and identification. Floristic monitoring will be conducted in all re-established pools and Reference Pools in years three and five. Monitoring will consist of one visit in spring during the blooming period, generally between March and May. Floristic characteristics, including species richness, absolute vegetative cover, and percent relative cover of each pool monitored will be evaluated. Additionally, any re-established pool identified during hydrologic monitoring in years one and two as exhibiting performance deficiencies (e.g., limited water ponding, erosion, sedimentation) will be monitored in all subsequent years, in addition to the Monitored Pools, to determine if the pool is functioning as designed or requires remedial actions. If any re-established pools require remediation following the year three monitoring, annual monitoring will be required at these pools for the subsequent three years to determine whether improved performance has resulted from the corrective measures implemented.

Vernal pool floristic data will be collected using relevé sampling technique (Mueller-Dombois and Ellenberg 1974). Using the relevé method, monitoring personnel identify all plant species within the pool being monitored and then assign cover values to each species. This method results in a complete inventory of the pool flora of each pool surveyed and also necessitates careful evaluation of community structure that can add value to the overall monitoring effort. Pool success will be based in part on a comparison of species composition and percent cover at the Sample Pools and how they compare to on-site Reference Pools, as well as the prevalence of Vernal Pool Endemic Species included in Appendix 1 of the California Rapid Assessment Method (CRAM) for Wetlands, Version 6.1. Individual Vernal Pools Field Book (CWMW 2013) or a future updated publication.

Invasive plant species are those species that can effectively displace re-established native vernal pool vegetation. For this region, the most likely invasive species in vernal pools is mannagrass. Other nonnative species commonly encountered in vernal pools include Mediterranean barley (*Hordeum marinum*), ryegrass (*Festuca perennis*), and hairy hawkbit (*Leontodon saxatilis*), which are frequent invaders of vernal pools that have insufficient hydrology due to either physical structure or climatic variability. However, these species are opportunistic invaders that will not persist under a typical vernal pool hydrologic regime. Pools that continue to be dominated by these opportunistic species will not meet Performance Standards for relative cover of Vernal Pool Endemic Species.

5.5.1.6. *Listed Large Branchiopods*

The Monitored Pools will be surveyed in years two, three, four, and five for listed vernal large branchiopods or until occupancy objectives are met. A minimum of three visits will be made each Monitoring Year during the wet season to sample for listed large branchiopods. Sampling will consist of dip-netting each Monitored Pool to determine species presence. The first visit will be made early in the wet season (generally late December to January) to improve the chances of detecting the vernal pool fairy shrimp. The last visit will be made late in the season (generally March to April) to improve the detection of vernal pool tadpole shrimp. Species occurrence will be summarized by pool and included in the Annual Monitoring Report.

5.5.1.7. *Photo Documentation*

In conjunction with the above-described monitoring activities, photographs of re-established and reference vernal pools will be taken. The photo points are intended to provide a photographic history of the re-established habitats. Photo points will be re-established prior to the commencement of vernal pool establishment activities. The GPS location of each photo point will be collected in the field, along with a compass direction of each photo, and photos will be taken from these locations annually (see **Table 4**).

5.6. **Seasonal Wetland Monitoring Methods**

Seasonal Wetland monitoring will be performed annually for the re-established wetlands as detailed below.

5.6.1. Monitoring Schedule

Monitoring of the Monitored Wetlands will occur over a five-year period to ensure success of the re-established habitat. Monitoring will begin during the rainy season after wetland construction is completed (**Table 5**).

Table 5. Monitoring Schedule for Seasonal Wetlands					
Monitoring Activity	Interim Management Period (Year)				
	1	2	3	4	5
Hydrology – Aerial Photo	X				X
Hydrology – Staff Gauges – Monitored Wetlands	X		X		X
Jurisdictional Delineation – All Re-established Wetlands			X		X
Flora – All Re-established Wetlands	X	X	X	X	X
Photo Documentation	X	X	X	X	X

5.6.2. Hydrology

All re-established wetlands will periodically be field-checked for ponding and aerial photography or field efforts will be used during years one and five to verify that the wetlands are ponding water as appropriate. After year one, floristic data can be used as an indicator for the areal extent of wetland hydrology. Additionally, in years three and five, a jurisdictional determination will be conducted for all re-established wetlands to verify ponded acreage. Additional information related to ponding depths, duration, and inundation response to rainfall events will be collected at each of the Monitored Wetlands through the use of staff gauges. Staff gauges will be installed at the lowest topographic point of each Monitored Wetland to aid in data collection and to support the hydrology component of the aerial photo and jurisdictional delineation. Staff gauges will be monitored in years one, three, and five. During these years, water depths of the Monitored Wetlands will be measured every two weeks from the onset of the rainy season until the wetlands dry in the spring.

5.6.3. Jurisdictional Delineation

The jurisdictional delineation provides data on hydrological function, dominant plant species, and makes a determination of the extents of each feature as a wetland/Water of the United States. During Years three and five, a jurisdictional delineation will be conducted for all re-established wetlands in accordance with the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and the Arid West Region Supplement (USACE 2008b). The boundaries of the re-established seasonal wetlands will be delineated through aerial photograph interpretation and standard field methodologies (i.e., paired data set analyses), and all wetland data will be recorded on Wetland Determination Data Forms - Arid West Region, or future updated publication. A color aerial photograph (1"=400' scale) will be used to assist with mapping and ground-truthing. Munsell Soil Color Charts (Kollmorgen Instruments Co. 1990) and the NRCS Web Soil Survey will be used to aid in identifying hydric soils in the field. The Jepson Manual, 2nd Edition (Baldwin et al. 2012), or future updated publication, will be used for plant nomenclature and identification.

5.6.4. Flora

The floristic monitoring program proposed will conduct annual floristic monitoring of all re-established wetlands during the five-year monitoring period. Monitoring will consist of one visit in spring during the blooming period, generally between March and May. Absolute cover will be evaluated via visual estimation and will be based upon aerial coverage of the total vegetative aggregate, excluding non-vegetative cover such as bare ground, rocks, and algal matting. The relative cover of invasive plant species in each re-established wetland will be calculated as follows:

$$\% \text{ Relative Cover of Invasive Species} = \frac{\text{Absolute Cover of } \underline{\text{All Plant Species in Wetland}}}{\text{Absolute Cover of } \underline{\text{Invasive Plant Species in Wetland}}} \times 100$$

The Jepson Manual, 2nd Edition (Baldwin et al. 2012), or future updated publication, will be used for plant nomenclature and identification.

5.6.5. Photo Documentation

In conjunction with the above-described monitoring activities, photographs of re-established seasonal wetlands will be taken. The photo points are intended to provide a photographic history of the re-established and existing habitats. Photo points will be re-established prior to the commencement of vernal pool establishment activities. The GPS location of each photo point will be collected in the field, along with a compass direction of each photo, and photos will be taken from these locations annually (**Table 5**).

5.6.6. Upland Species (SWHA, BUOW, and TCBB) Monitoring Methods

Nest and foraging habitat suitability mapping surveys will be conducted every five years to document the use of the Bank by SWHA, BUOW, and TCBB species. The surveys will include inspection of all viable nesting trees, shrubs and burrows within the Bank during the breeding season by qualified professionals capable of differentiating raptor and blackbird nests, as well as an assessment of the foraging habitat suitability of the site. The extent to which the Bank is used for foraging by these species is a function of prey accessibility and availability (Estep 2009). The foraging habitat suitability survey consists of completing several transects across the Bank to observe density of standing cover, signs of rodent activity, including microtine runways, rodent burrows, and pocket gopher mounds. Observations of insect availability will also be included within the survey transects. The habitat suitability survey will be conducted along the annual Landscape Survey transects (500 feet apart). Additional visual assessment of accessible lands within a one mile radius will be conducted for nesting and foraging activities.

5.7. Crediting Approach

The entire Bank is focused on re-establishment of vernal pool complex intermixed with an annual grassland upland. This includes the re-establishment of vernal pools and of seasonal wetlands interconnected by swales, the preservation of existing TCBB nesting habitat, and the re-establishment of annual grassland upland areas for BUOW nesting and foraging and TCBB and SWHA foraging. The USACE credit area covers re-established vernal pools and seasonal wetland areas. The USFWS credit area covers re-established vernal pools and listed large branchiopods. The CDFW credit area covers only the upland areas that are used by foraging SWHA. The proposed PCCP crediting area spans the entire Bank, habitat type and species. A crosswalk for the proposed PCCP credits and associated Regulatory credit types for the Bank are found in **Table 6**.

Table 6. Credit Crosswalk Table					
Credit Type	Included	Agency			
		USACE	CDFW	USFWS	PCCP*
Seasonal Wetland Re-establishment	404 seasonal wetlands, seasonal wetland in vernal pool complex*, seasonal swales*	X			X
Vernal Pool Re-establishment	Vernal pool re-establishment, listed large branchiopods	X		X	X
Upland Habitat and Species	SWHA upland foraging, TCBB nesting and foraging*, BUOW foraging*, grassland*, foraging raptors*		X		X

* Categories specific only to the proposed PCCP Constituent Habitats other categories may fit into the PCCP Constituent Habitats as well, but are not specific to the PCCP alone.

5.7.1. Mitigation Bank Credit Proposal

WES is proposing that three separate Credit types be developed with the Crediting nomenclature used to meet the respective federal and state regulations. The Credit types will be based on the preserved upland and re-established wetland landscape settings that will be subject to natural precipitation processes. The Crediting types, amounts, and governing jurisdictions are listed in **Table 7**.

Credit Type	Agency				Credits
	USACE	CDFW	USFWS	PCCP*	
Seasonal Wetland Re-establishment	X			X	10
Vernal Pool Re-establishment	X		X	X	36
Upland Habitat and Species (SWHA, TCBB & BUOW)		X		X	254
Total:					300

** These credit types have specific categories that are specific to the proposed Placer County Conservation Plan (PCCP) as shown in Table 6, Credit Crosswalk Table*

- 1) Seasonal Wetland Re-establishment Credits: a re-establishment area that would offset direct impacts regulated by Section 404 the federal Clean Water Act (CWA).
- 2) Vernal Pool Re-establishment Credits: a re-establishment area that would offset direct impacts regulated by the CWA, Section 7 of the Endangered Species Act (ESA) and/or Section 10 of the ESA covered by the proposed PCCP.
- 3) Upland Habitat and Species Credits would offset indirect impacts to foraging and/or nesting habitat as regulated by the California Endangered Species Act (CESA) such as SWHA, TCBB, and BUOW.

5.7.2. United States Fish and Wildlife Service Credit Proposal

Vernal Pool Re-establishment Credits are being proposed to support the species recovery as part of the Recovery Plan (USFWS 2005) for impacts regulated by the USFWS. The Recovery Plan defines vernal pool re-establishment as “the construction of a vernal pool in an area that was not a vernal pool in the recent past (within the last 100 to 200 years) and that is isolated from existing vernal pools”. Although vernal pool re-establishment is not the preferred method of conservation, it is listed as a recovery tool and when used in conjunction with preservation within the Vernal Pool Core Areas can help to “maintain the range of vernal pool habitat” where none now exists (USFWS 2005). The Bank meets these criteria for vernal pool re-establishment. At the time the Recovery Plan was adopted, data on the success of created vernal pools (including those that were re-established) was only about 10 years old. Today we have close to 20 years of data on created vernal pool landscapes and their success rates.

5.7.3. Placer County Conservation Plan Credit Proposal

The proposed PCCP Reserve Area is broken up into Communities with specific Constituent Habitats (Placer County 2013). These Constituent Habitats correspond with the habitats that will be developed on the Bank. **Table 6** shows the correlation between proposed PCCP Constituent Habitats and proposed Bank Credits. This collaboration creates the ability for Placer County to secure the required conservation and mitigation lands needed to fulfil the goals of the PCCP.

5.8. Bank Service Areas

The Bank is located within the proposed PCCP boundary and on the western edge of the Southeastern Sacramento Valley Vernal Pool Region as drawn in the California Department of Fish and Game's California Vernal Pool Assessment Preliminary Report (Keeler-Wolf et al. 1998; "Vernal Pool Preliminary Report").

5.8.1. USFWS/USACE 404 Vernal Pool Re-establishment Service Area

Vernal Pool Regions are often used as a tool to evaluate both vernal pool impacts as well as conservation because each region contains unique biotic and abiotic attributes and ecological functions, which are largely the basis for the establishment of the Vernal Pool Regions outlined in the Vernal Pool Preliminary Report. It is recognized that vernal pools provide significant habitat functions that cross minor hydrologic boundaries, such as Hydrologic Unit Code (HUC) watershed boundaries. These habitat functions share similar plant and animal communities and hydrogeomorphic functions and are largely the basis for establishment of the Vernal Pool Regions outlined in the Vernal Pool Preliminary Report as used in the Recovery Plan. Vernal pool species are specially adapted to short-duration flooding within low-gradient landscapes that encompass the Southeastern Sacramento Valley Vernal Pool Region. The landscapes occupied by these species span the vernal pool region largely defined by landform and landscape position rather than watershed. Therefore, the Bank's proposed USFWS/USACE 404 Vernal Pool Re-established Habitat for the Bank encompasses the Southeastern Sacramento Valley Vernal Pool Region (**Figure 12**).

5.8.1.1. *Ecological Justification*

As proposed, the Bank would provide USFWS/USACE 404 Vernal Pool Re-established Habitat to offset unavoidable impacts to vernal pools and Vernal Pool Species occurring within the Southeastern Sacramento Valley Vernal Pool Region as regulated by the USFWS and USACE. This means that the Bank will provide similar wetland functions and values to that of wetlands impacted within this proposed Service Area. The mitigation will be located in the same relative geographic location and vernal pool biotic region as the impact sites.

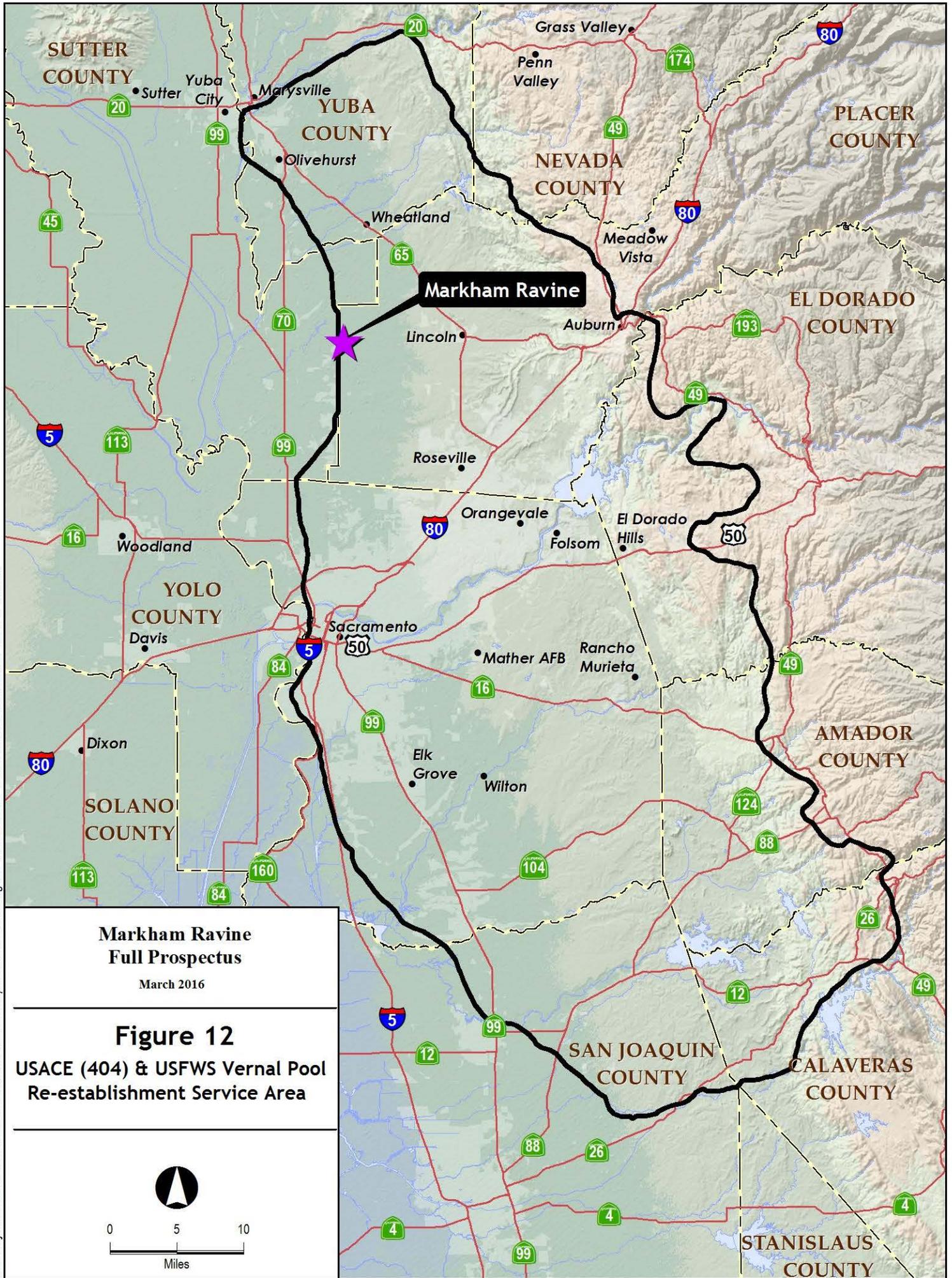
Functions provided by vernal wetlands (i.e., vernal pools and swales) can be grouped into three broad categories:

- 1) Hydrologic,
- 2) Biogeochemical, and
- 3) Habitat Support

Within the Hydrologic category functions provided by vernal wetlands include:

- Surface and shallow subsurface water storage and exchange
- Landscape hydrologic connections

Because vernal wetlands, and specifically vernal pools, operate in largely closed systems (i.e., depressions) many of the biogeochemical functions associated with other types of wetlands (i.e., removal of imported nutrients and compounds, nutrient retention and sequestration, etc.) are not present and therefore not a key factor in service area determination.

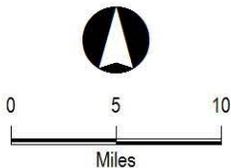


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Figure 12

**USACE (404) & USFWS Vernal Pool
Re-establishment Service Area**



Within the Biogeochemical category vernal pools provide functional capacity in only one area while swales and pools within swales (i.e., flow through wetlands) provide two functions:

- Element and compound cycling (both vernal pools and swales)
- Organic carbon export (flow-through wetlands only)

Habitat support functions of vernal wetlands are responsible for providing suitable habitat for a number of rare, threatened or endangered species. Vernal pools support the following habitat support functions:

- Plant community
- Faunal habitat
- Faunal habitat interspersions and connectivity
- Invertebrate assemblage
- Vertebrate assemblage

Characteristic vernal pool vegetation, as well as, faunal components, are both intrinsically linked to the hydrologic characteristics of the vernal wetland that supports them. Furthermore, biogeochemical functions within a vernal pool are driven by the nutrient cycling processes of characteristic biota within the vernal wetland which is also supported by the characteristic hydrologic regime. Essentially, aside from invasion by exotic plant or animal species the maintenance of vernal pool function is largely tied to maintenance of a characteristic hydrologic regime.

The characteristic vernal wetland hydrologic regime is directly related to seasonal precipitation patterns and hydrologic inputs to specific wetland features can be through one or more pathways including direct precipitation, watershed runoff (i.e., surface flow), and groundwater seepage (i.e., sub-surface flow (Raines et al. 2006)). The presence of restrictive sub-surface soil layers that are slowly permeable, or largely impermeable, promote both the retention of direct precipitation and favor perched water tables allowing for groundwater seepage. Additionally, the presence of subsoil restrictive layers promotes watershed runoff by hastening soil profile saturation within the watershed during storm events.

Because the hydrologic regime within the Bank will be similar to that of the entire region and will support similar flora and fauna we have proposed the Southeastern Sacramento Valley Vernal Pool Region as the Service Area rather than utilizing strictly a watershed approach. These habitat support functions are of region-wide importance to the Southeastern Sacramento Valley Vernal Pool Region; the re-establishment of this vernal pool complex will contribute to the goals of the Recovery Plan, and further the protection and recovery of vernal pool species within this region.

5.8.1.2. Regulatory Justification

The vernal pool re-establishment credits are intended to serve applicants with impacts to vernal pool features which are or are not, potential habitat for listed vernal pool crusteans. Often these specialized aquatic resources within the Southeastern Sacramento Valley Vernal Pool Region, are regulated by the USFWS and USACE, will benefit from both the wetland replacement and species recovery components of the Bank.

Although the Vernal Pool Re-establishment Service Area's Credits are consistent with the Vernal Pool Recovery Region, the adoption of the "Mitigation Calculator" used by USACE staff to assist in evaluating mitigation proposals may help offset any concerns regarding impact site proximity to the Bank. The mitigation calculator is silent on approved service areas and rather focuses on actual watersheds and proximity of compensation to impact sites to determine ratios for applicants. In addition, the Sacramento District has been consistent with their policy that no impact can be mitigated outside (even slightly) an approved service area – a larger service area including the entire the Southeastern Sacramento Valley Vernal Pool Region would help applicants meet their regulatory requirements without the 'out of service area' issues while compensation ratios could be adjusted via the standard operating procedure (SOP) for mitigation ratios (i.e., the mitigation calculator).

Finally, the Bank is being developed in close coordination with the proposed PCCP. Therefore, we propose to offer vernal pool re-establishment credits to the PCCP complementary entity first to provide an opportunity to serve Placer County projects (this would be done through a Right of First Refusal offered at the time of credit release).

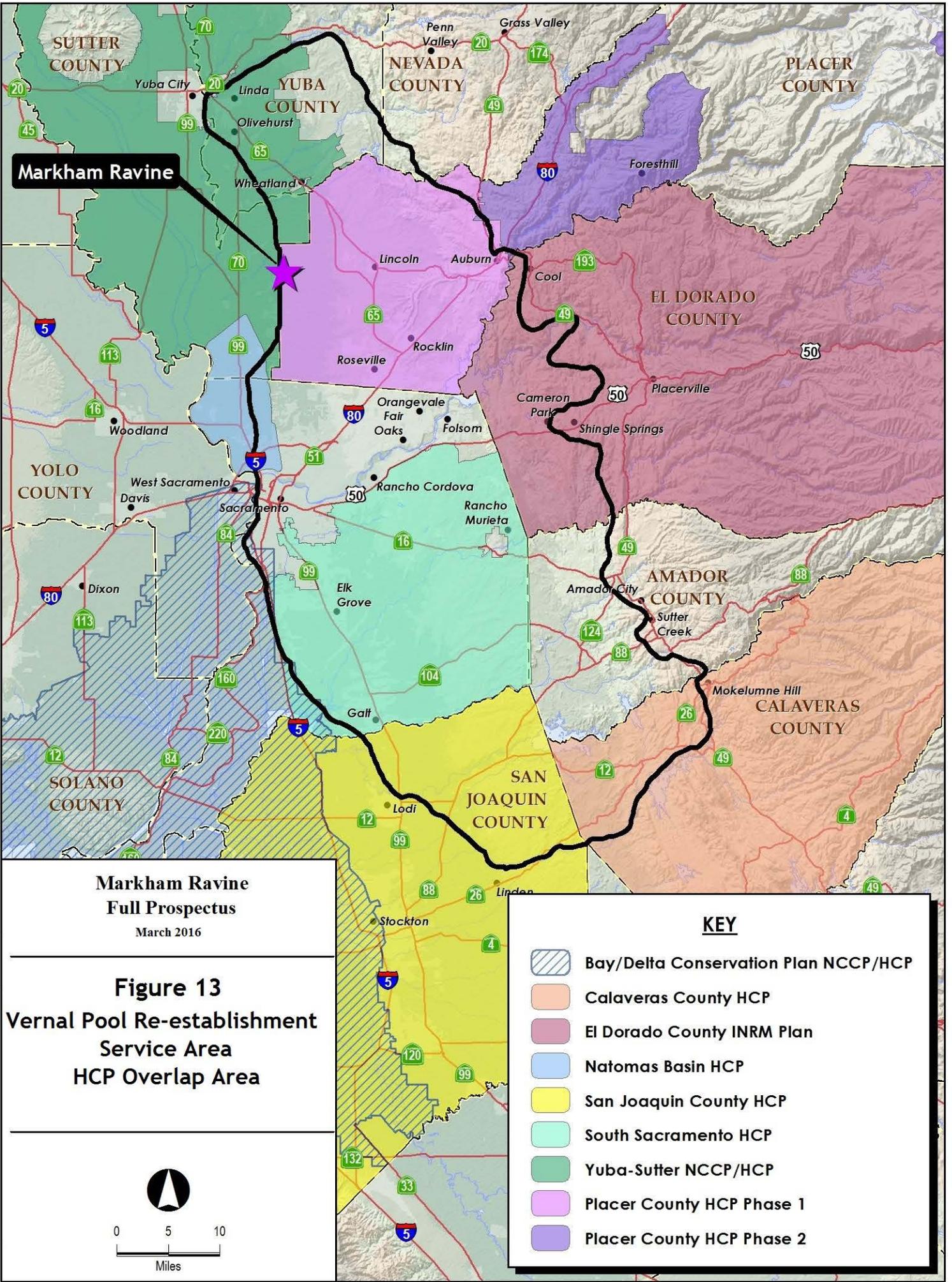
5.8.1.3. Economic Justification

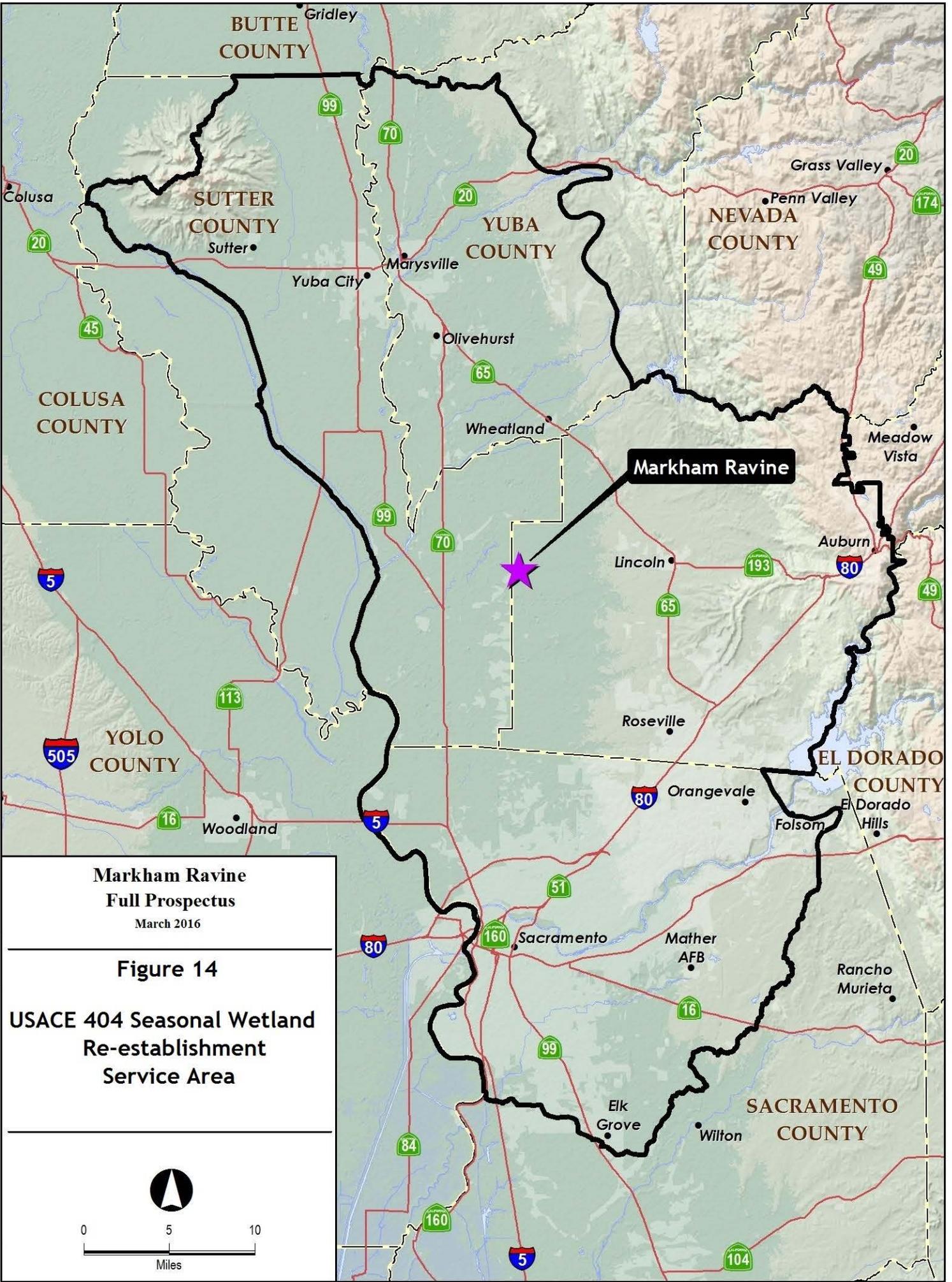
The Bank location and its Vernal Pool Re-establishment Service Area lie within several existing or planned HCP/NCCP boundaries (**Figures 13**). The majority of the Plans that overlap the Service Area are not finalized. As mentioned, the Bank would provide Placer County the first opportunity to purchase these credits but could also serve other HCP permit areas and applicants that need to satisfy impacts to vernal pool or wetland habitats. A larger service area does not guarantee any sale, however, does provide a large enough potential market to justify the capital investment and compensate for the risk that some HCPs may not allow credit sales to banks outside their boundaries. WES has experienced this de facto loss of service area before (i.e., the Cosumnes Floodplain Mitigation Bank).

Because the Bank's objective is to be consistent with and provide offsets for the proposed PCCP, the Vernal Pool Service Area boundary has been expanded to include a small portion of the western boundary of the proposed PCCP Reserve Area wherein the Bank lies (see crossed hatched area of **Figure 12**). Additionally, these credits are intended to comply with and to be considered for use for impacts regulated by the proposed PCCP.

5.8.2. USACE 404 Seasonal Wetland Re-established Habitat Service Area

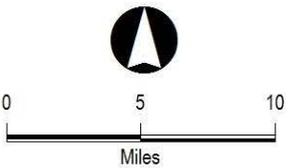
This USACE 404 Seasonal Wetland Re-established Habitat "Seasonal Wetland Service Area") (**Figure 14**) was compiled utilizing the Service Area Final Guidance for Mitigation Banks from the USACE public notice (USACE 2010). This Guidance requires that the starting point for a service area development begin with the 10-digit HUC which the site is located in. Inclusion of any additional adjoining HUC's must be justified in a stepwise approach using HUCs within the same 8-digit HUC and ecoregion as the site. If the appropriate characteristics are present, justification for any additions of adjoining, adjacent or contributing 8-digits HUCs must be presented.





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Figure 14
USACE 404 Seasonal Wetland
Re-establishment
Service Area



The Bank is located within the Pleasant Grove Creek-Cross Canal (“Pleasant Grove”) watershed (10-digit HUC 1802016103), and is hydrologically connected within the greater Upper Coon - Upper Auburn (8-digit HUC 18020161) watershed. The Pleasant Grove watershed drains approximately 33 square miles of western Placer and eastern Sutter Counties into the cross canal that ultimately joins the Sacramento River (Restoration Resources 2010) and support wetland habitats such as those proposed to be Re-establishment at the Bank and will serve as compensatory mitigation for impacts across a broad geographic spectrum. The Bank is intended to provide offsets for unavoidable impacts to vernal pools and 404 seasonal wetlands as regulated by the USACE. Additionally, these credits will comply with and are intended to be considered for use for impacts regulated by the proposed PCCP and the Placer County In-Lieu-Fee Program (“PCILFP”).

The Seasonal Wetland Service Area consists of the 10-digit hydrologic unit codes (HUCs) within the main Service Area (**Figure 15**):

- 1802016101 Auburn Ravine
- 1802016102 Coon Creek
- 1802016103 Pleasant Grove Creek – Cross Canal
- 1802016104 Curry Creek – Sacramento River
- 1802011101 Dry Creek
- 1802011102 American River
- 1802011103 Steelhead Creek
- 1802016304 Morrison Creek
- 1802016307 Sherman Lake- Sacramento River (portion)

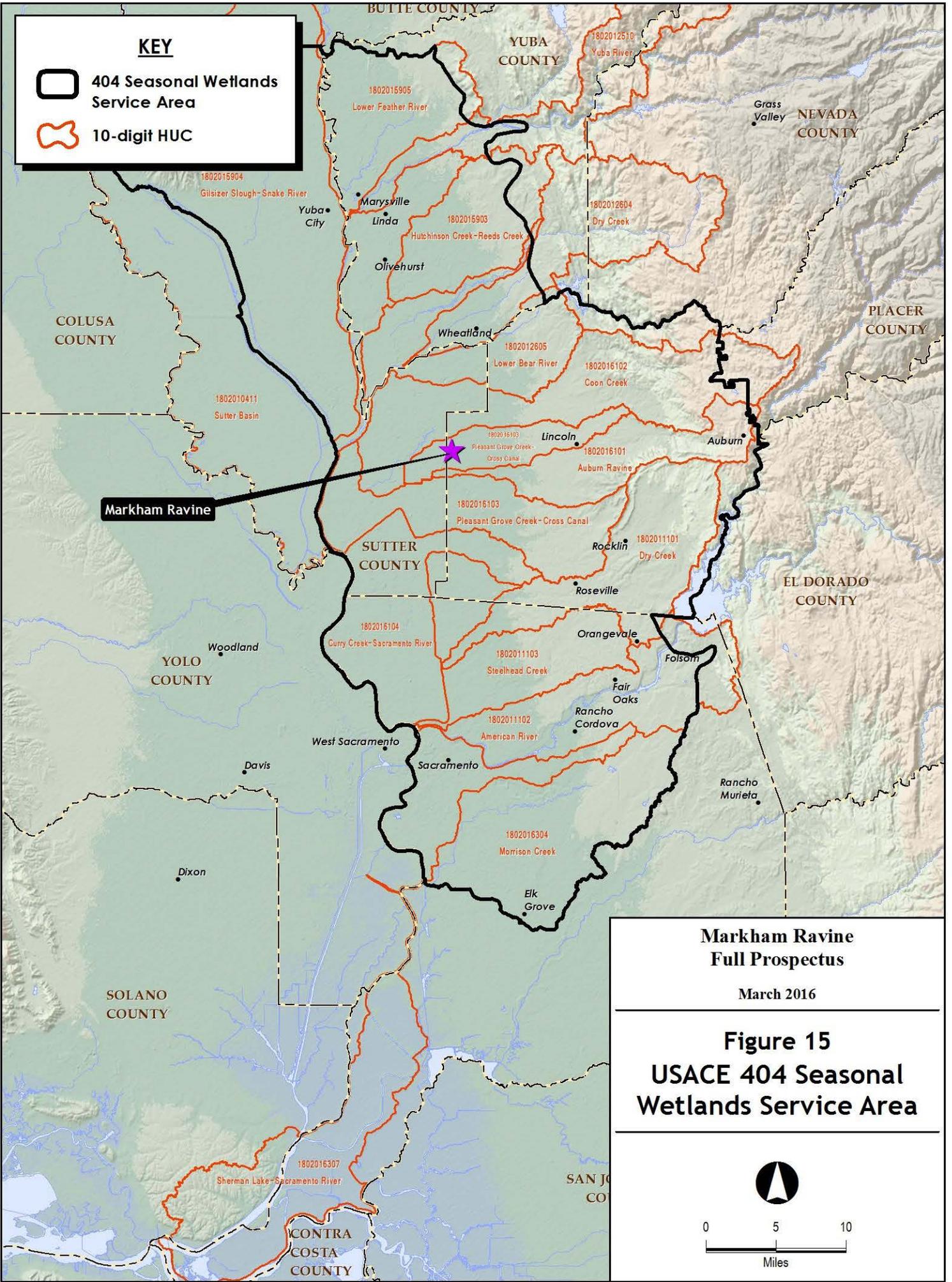
The Seasonal Wetland Service Area also consists of the additional 10-digit HUCs within the extended Service Area including:

- 1802015904 Gilsizer Slough-Snake River (portion)
- 1802012604 Dry Creek (portion)
- 1802012605 Lower Bear River (portion)
- 1802015903 Hutchinson Creek-Reeds Creek (portion)
- 1802015905 Lower Feather River (portion)
- 1802012510 Yuba River (portion)

5.8.2.1. Ecological Justification

Most of the naturally functioning wetlands once found within the Seasonal Wetland Service Area have been converted to agricultural uses, lost to development, or degraded. Additionally, many of the jurisdictional wetland impacts that occur across the Seasonal Wetland Service Area are to ditches, drains, and agricultural fields and other anthropogenic depressional wetlands that are routinely disturbed by farming and/or maintenance activities. It makes sense to compensate for these impacts at a location that was a historic wetland and in an area of compatible land uses in order to provide long-term functions and values to the watershed.

The Banks proposed Re-established Seasonal Wetlands will be representative of the floodplain and basin depressional wetland vegetation communities occurring throughout the Sacramento Valley, exclusive of vernal pools. They will provide an equivalent or enhanced wetland function to resources which could potentially be impacted in these areas. These wetlands are



KEY



404 Seasonal Wetlands Service Area



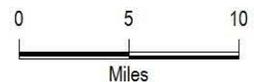
10-digit HUC

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**Figure 15
USACE 404 Seasonal
Wetlands Service Area**



characteristically inundated or saturated during the winter and spring months but remain dry the balance of the year.

Restored wetlands will provide the following improved functions:

Hydrology Functions

- Surface and shallow subsurface water storage and exchange
- Landscape hydrologic connections

Biogeochemical Functions

- Removal, conversion and release of elements and compounds
- Nutrient Cycling
- Retention of particulates

Biotic and Habitat Functions

- Maintenance of characteristic plant community
- Maintenance of characteristic faunal assemblage
- Maintenance of habitat interspersion and connectivity among wetlands

These functions at the Markham Ravine site contribute to improved aquatic resource conditions throughout the proposed Service Area

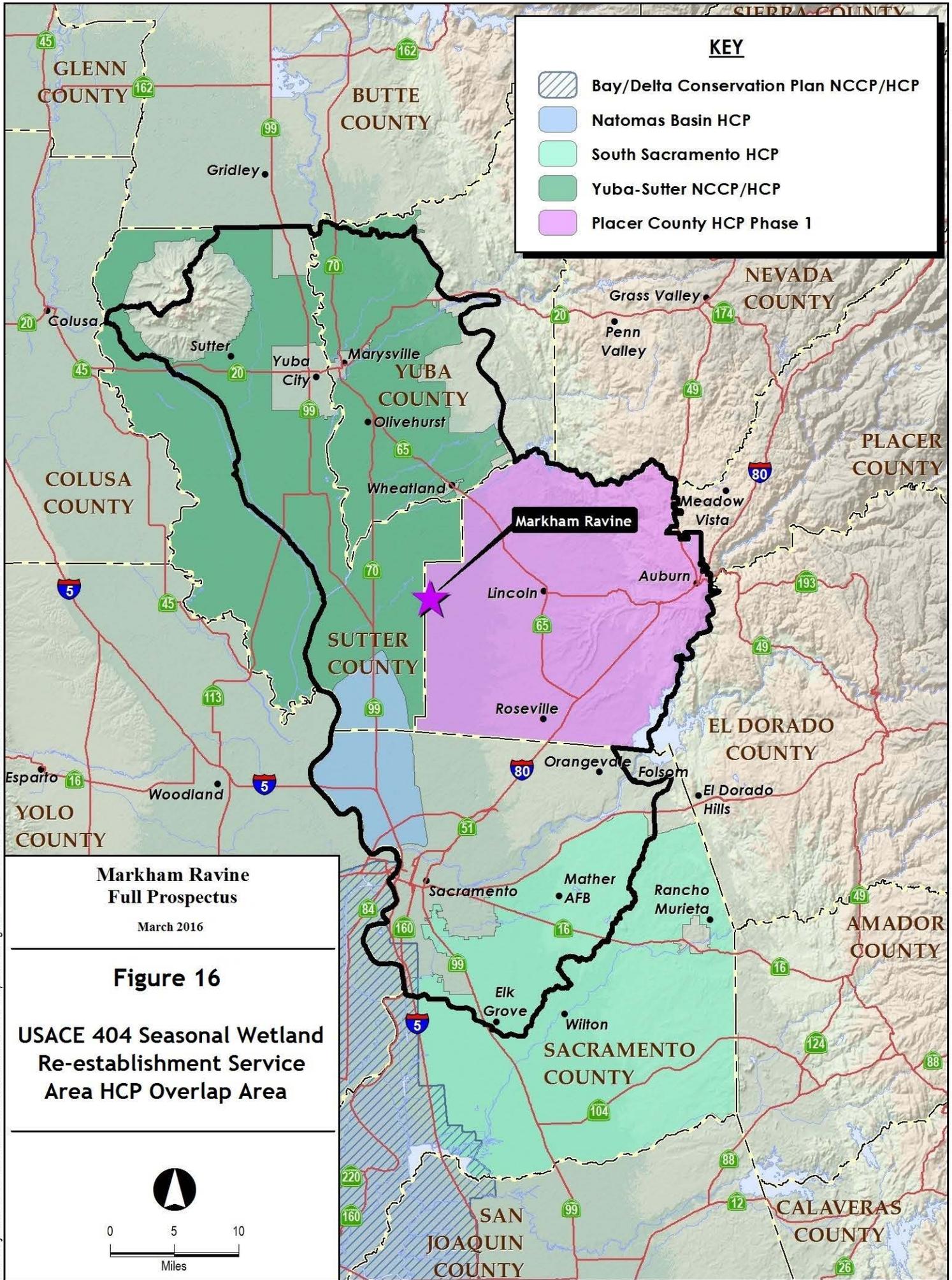
5.8.2.2. Regulatory Justification

The Seasonal Wetland Re-establishment Service Area will be used to offset unavoidable impacts to USACE regulated 404 seasonal wetlands. As mentioned above, the USACE “Mitigation Calculator” can be used to assist in evaluating mitigation proposals can also be used may help offset any concerns regarding impact vs. compensation site proximity. A larger service area extending north to the Butte County line would help applicants meet their regulatory requirements without the ‘out of service area’ issues.

As the Bank is being developed in close coordination with the proposed PCCP, we propose to offer Seasonal Wetland Re-establishment Credits to the Placer County and their projects first in order to serve Placer County projects.

5.8.2.3. Economic Justification

The Bank’s Seasonal Wetland Re-establishment Service Area lies within several existing or planned HCP/NCCP boundaries (**Figure 16**). The majority of the Plans that overlap the Service Area are not finalized. As mentioned, the Bank would provide Placer County the first opportunity to purchase the credits but could also serve other HCP permit areas and applicants that need to satisfy impacts to seasonal wetland habitats. The Bank’s Seasonal Wetland Re-establishment Service Area also overlaps with close to a dozen approved and/or proposed Banks. A larger service area does not guarantee any sale, however, does provide a large enough potential market to justify the capital investment and to reduce the risk of a future HCP dominated market.



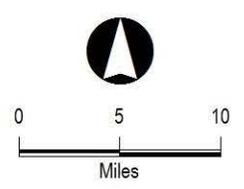
KEY

-  Bay/Delta Conservation Plan NCCP/HCP
-  Natomas Basin HCP
-  South Sacramento HCP
-  Yuba-Sutter NCCP/HCP
-  Placer County HCP Phase 1

**Markham Ravine
Full Prospectus**
March 2016

Figure 16

**USACE 404 Seasonal Wetland
Re-establishment Service
Area HCP Overlap Area**



5.8.3. Upland Habitat and Species Service Area

The proposed Upland Habitat and Species Service Area encompass the entire proposed PCILFP and PCCP Reserve Areas, and include all habitats types and species listed below and referenced in **Table 6**. These Credits are intended to offset unavoidable impacts to upland species protected under the proposed PCCP and its signatory agencies as regulated by CEQA. Habitat types correlate to the proposed PCCP's Constituent Habitats. This Service Area includes all of western Placer County (**Figure 17**). Wetland mitigation for impacts associated with the proposed PCCP for vernal pools, seasonal wetlands and similar habitats will also utilize this Service Area. Species credits are intended to comply with and to be considered for use for impacts to foraging and/or nesting raptors and upland birds including but not limited the following:

- 1) Upland Birds / Foraging Raptors
 - SWHA-Foraging, includes impacts regulated by CDFW.
 - TCBB-Nesting and Foraging
 - BUOW-Nesting and Foraging
 - Foraging and nesting Raptors (Eagles, Hawks, Owls, etc.)

Land coverage types considered for habitats related to PCCP Constituent Habitats include:

- 2) PCCP Land Coverage Types
 - Vernal Pools/Species
 - Seasonal Wetlands
 - Seasonal Wetland in vernal pool complex
 - Seasonal Swales
 - Grasslands

5.9. Long Term Stewardship

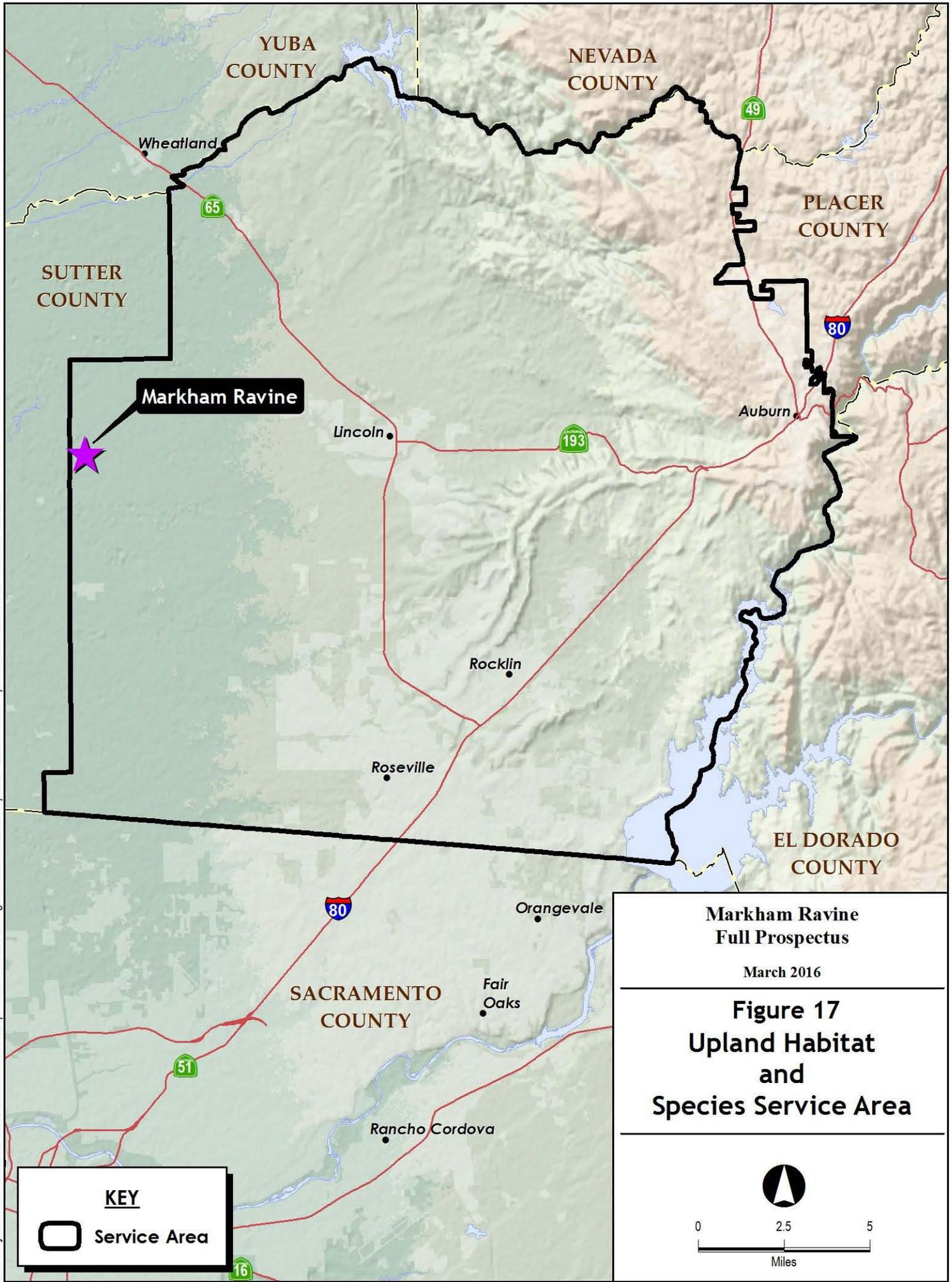
Once the Performance Standards have been met and the Endowment Fund has been fully funded for one year, the Property Owner shall implement long-term management and monitoring of the Bank Property according to the Long-term Management Plan. The Property Owner shall be obligated to manage and monitor the Bank Property in perpetuity to preserve its habitat and conservation values in accordance with the BEI, the Conservation Easement, and the Long-term Management Plan. Such activities shall be funded through the Endowment Fund. The Property Owner and the IRT members shall meet and confer upon the request of any one of them, to consider revisions to the Long-term Management Plan that may be necessary or appropriate to better conserve the habitat and conservation values of the Bank Property. WES will be the long-term Bank Manager.

5.10. Bank Enabling Instrument (BEI)

BEI template has been included as **Exhibit H** for review and approval by the IRT.

5.11. Conservation Easement

The approved California mitigation banking template for conservation easements would be used for the Bank. WES will work with an IRT approved and accepted grantee for the easement prior to and during the BEI approval process. The grantee would be approved by CDFW for holding easements for mitigation banks (**Exhibit I**).



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