United States Army Corps of Engineers

Lead Federal Agency

Levee Evaluation for the American River Common Features Project in Sacramento, Sutter, and Yolo Counties (October 2021)

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Management Summary

The American River Common Features Project (ARCF) is a cooperative effort between the U.S. Army Corps of Engineers, Sacramento District (Corps), Sacramento Area Flood Control Agency (SAFCA), and the Central Valley Flood Protection Board (CVFPB) designed to reduce flood risk to the Sacramento metropolitan area. The multi-year project involves improvements to several levees located on the American and Sacramento rivers within Yolo, Sutter and Sacramento counties.

This document presents an evaluation of the historic levees within the ARCF area of potential effects (APE). Situated within the greater Sacramento Metropolitan area, the levees within the ARCF APE are part of the much larger Sacramento River Flood Control Plan (SRFCP), a system of water management infrastructure that has shaped the modern history of the Sacramento Valley. SRFCP Levee Units 115, 117, 118, 124 and 125 are within the ARCF APE. Levee Units 115 and 117 have been previously determined eligible for the National Register of Historic Places (NRHP) through consensus determination (COE 120203C, October 20, 2020). The Corps has evaluated the remaining levee units in this report. The Corps finds Units 118, 124 and 125 not eligible for listing as historic properties on the NRHP. Although the levees are significant for their association with the SRFCP, they lack the integrity to communicate this significance. Units 124 and 125 were also identified as contributing elements to the Reclamation District 1000, a Rural Historic Landscape (RD 1000 RHL). The Corps finds Units 124 and 125 non-contributing to the RD 1000 RHL due to loss of integrity in the face of urban development. This analysis applies only to the historic significance of the levee units. A summary of the levee eligibility status within the ARCF APE is presented in the table below.

Levee within ARCF APE	Historic Associations	Eligibility Status	Consensus Determination
SRFCP Unit 115	SRFCP	Eligible	October 20, 2020 (COE 120203C)
SRFCP Unit 117	SRFCP	Eligible	October 20, 2020 (COE 120203C)
SRFCP Unit 118 Part 1	SRFCP	Not Eligible	Submitted for review in this document
SRFCP Unit 118 Part 2	SRFCP	Not Eligible	Submitted for review in this document
SRFCP Unit 124	SRFCP, Contributing to the RD 1000 RHL	Not Eligible	Submitted for review in this document
SRFCP Unit 125	SRFCP, Contributing to the RD 1000 RHL	Not Eligible	Submitted for review in this document

The focus of this document is the evaluation of the historic levee system within the ARCF APE, however the Corps is submitting the multiple property documentation form in order to present a broader historical context for the levees within the ARCF APE. The Corps is not seeking to nominate the SRFCP to the NRHP at this time, instead the multiple property documentation form serves as a determination of eligibility only. The SRFCP evaluation framework may be used as a guide to evaluate levees within the larger SRFCP. Note that levees not part of the SRFCP may not be evaluated using the

framework presented in this document. The Corps is also submitting a re-evaluation of the RD 1000 RHL to the California State Historic Preservation Officer (SHPO) for review and concurrence.

Content is presented in four parts. Part 1 consists of a context of the SRFCP, an analysis of the levee property type follows in Part 2. Evaluations of SRFCP Levee Units 118, 124 and 125 are presented in Part 3. Part 4 is a re-evaluation of the RD 1000 RHL. Enclosed in the appendices are the SRFCP multiple property documentation form (Appendix I) and Department of Parks and Recreation (DPR) Series 523 forms for the previously unevaluated SRFCP Levee Units within the APE (Appendix II).

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Introduction

Summary of Current Undertaking: The ARCF

The American River Common Features Project (ARCF) is a cooperative effort between the U.S. Army Corps of Engineers, Sacramento District (Corps), Sacramento Area Flood Control Agency (SAFCA), and the Central Valley Flood Protection Board (CVFPB) designed to reduce flood risk to the Sacramento metropolitan area. The multi-year project involves improvements to several levees located on the American and Sacramento rivers within Yolo, Sutter and Sacramento counties (Figure 1).[1]

The ARCF is intended to improve flood risk management for the City of Sacramento and surrounding areas. Improvements to levees would be implemented along the Sacramento and American Rivers and within the Natomas Basin. The APE for the project is located in Sacramento, Sutter and Yolo Counties, California. The five main parts of the construction area are briefly described below and numbered on Figure 1:

1. Approximately 12 miles of the north and south banks of the American River, immediately upstream from the confluence with the Sacramento River

2. Arcade Creek, the Magpie Creek Diversion Channel, and the east bank of the Natomas East Main Drainage Canal (NEMDC) (collectively referred to as the East Side Tributaries)

3. The east bank of the Sacramento River, downstream from the American River to the Town of Freeport, where the levee ties into Beach Lake Levee

4. The Sacramento Weir and Bypass, north of the City of West Sacramento

5. Levees surrounding the Natomas Basin, including the Natomas Cross Canal (NCC) South Levee, the Sacramento River East Levee between the NCC and the confluence of the American River, the NEMDC East Levee, and the Pleasant Grove Creek Canal (PGCC) West Levee.

The ARCF and the Sacramento River Flood Control Plan

The levees within the ARCF APE are part of the much larger Sacramento River Flood Control Plan (SRFCP), a system of water management infrastructure that has shaped the modern history of the Sacramento Valley (Figures 2-3). The SRFCP, completed between 1911 and 1961, transformed the Sacramento Valley from a seasonal floodplain to an urban and agricultural center. The system functions due to a coordinated re-routing of floodwaters from major rivers through manmade infrastructure. Levees along the Sacramento, American, Feather, Bear and Yuba Rivers direct overflow to the Butte Basin and the Sutter and Yolo Bypasses. During periods of flooding, the overflow areas function as a single waterway, diverting flood waters through channels and weirs towards a final release in Suisun Bay.[2]

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[1] Barry Scott, "American River Common Features Project General Reevaluation Report Historic Properties Management Plan" (Sacramento: GEI Consultants, July 2017), ES-1.

[2] Anne Baker and Erin Brehmer, *American River Watershed Common Features General Reevaluation Report Environmental Impact Statement* (Sacramento, USACE, December 2015), 81.

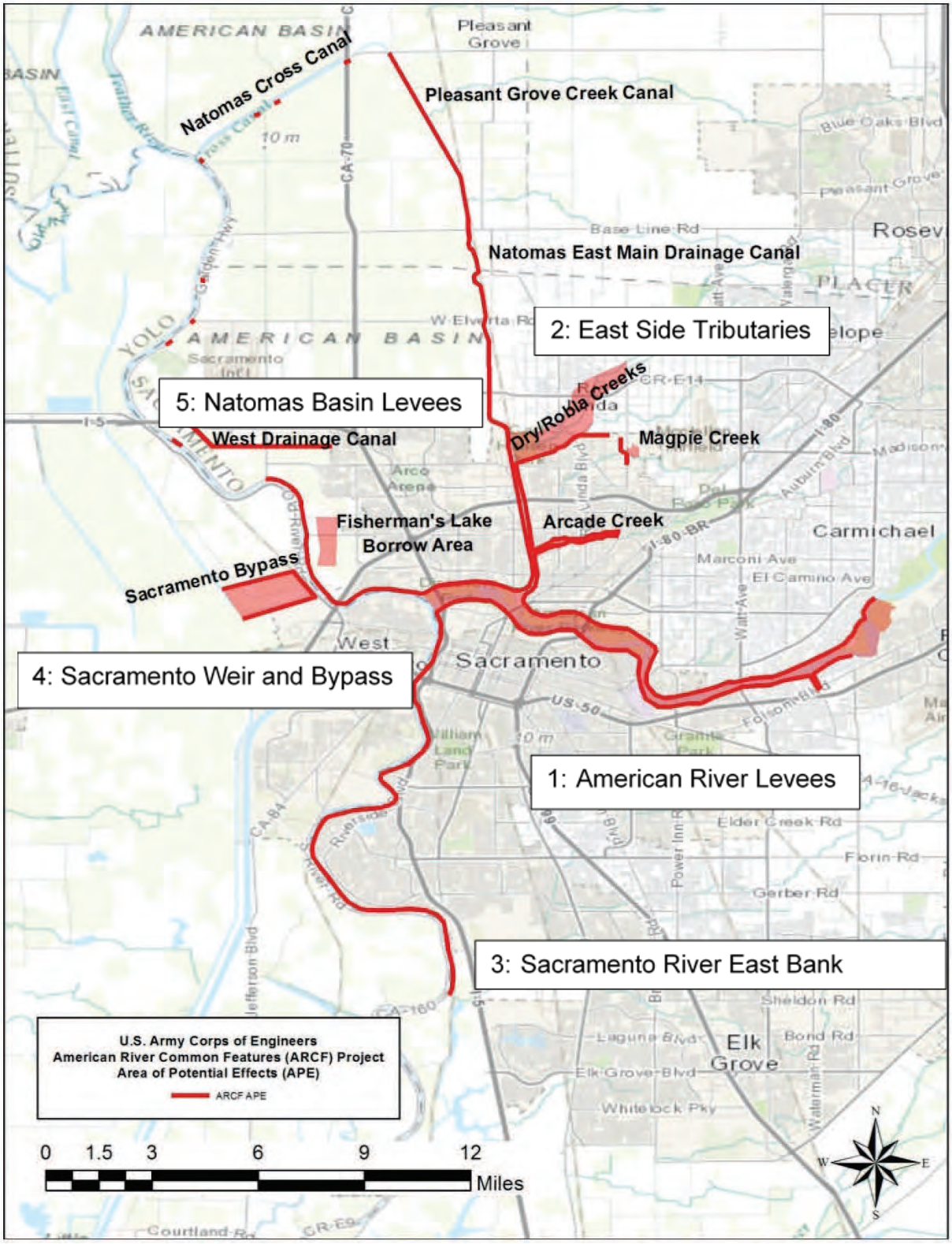

Figure 1: ARCF General Reevaluation Report Project APE

Barry Scott. *American River Common Features Project General Reevaluation Report Historic Properties Management Plan*. Sacramento: GEI Consultants, July 2017.

Figure 2: SRFCP System Overview

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

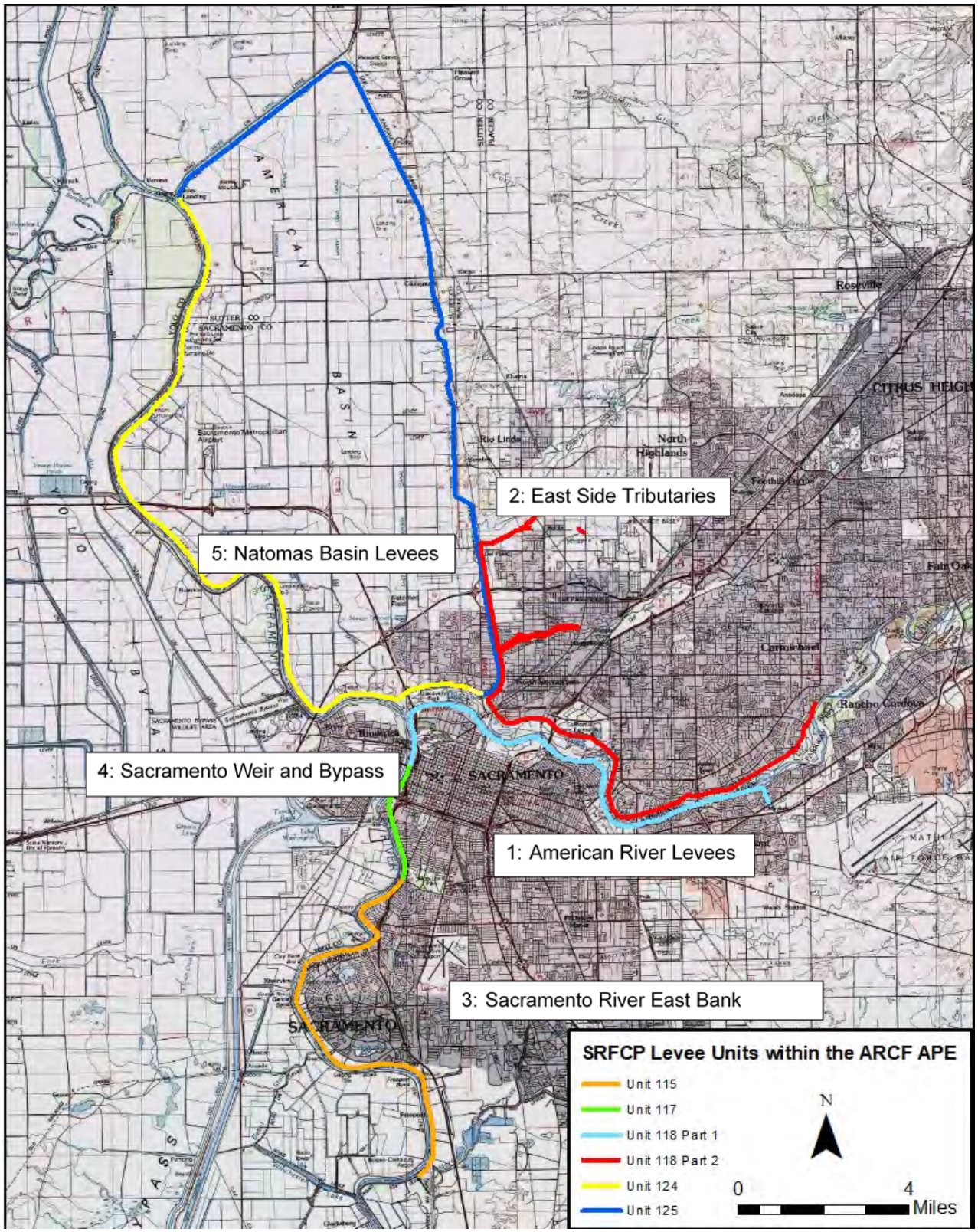

Figure 3: SRFCP Levee Units within the ARCF APE
Map on File at U.S. Army Corps of Engineers, Sacramento District Office

Previous Consultation

It is clear that SRFCP levees have played a significant role in the modern development of the Sacramento Valley, however there has not been a comprehensive evaluation or inventory of the levee system. The significance of the SRFCP levees within the ARCF APE was the subject of correspondence between the Corps and the SHPO in January through March of 2020. In letters dated January 28 and February 5, 2020, the SHPO observed that under the Programmatic Agreement (PA) for the ARCF, Stipulation III.B.(2), the Corps "shall prepare a historic context and HPTP for recordation of the Sacramento and American River levees as historic structures within the APE in order to evaluate the effects of the Project [ARCF] on the levees."

The Corps responded in a letter dated March 19, 2020, stating that identification and evaluation efforts and findings of effect for the ARCF had been completed by levee reach and that this reach-by-reach approach had been carried out as prescribed in the PA, HPMP and in consultation with the SHPO. The Corps further stated that a finding of adverse effect to a levee or levees would have obligated the Corps to produce the HPTP described in Stipulation III.B.(2). The Corps observed that to date, no such adverse effect had been found. In the same letter, the Corps recognized that a document addressing the significance of the broader levee system would be of value to the ARCF and would facilitate future consultation. As a result, the Corps committed to produce this report.

Evaluation Strategy

Several previous inventories have referred to the potential for a SRFCP historic district, however no action has been taken in part due to the complexity of the task. The geographic scope and volume of potential resources to be included within district boundaries would be logistically difficult, if not impossible. In view of these challenges, this report proposes to consider potential historic properties within the SRFCP as part of a multiple property listing (MPL).

According to the guidelines of National Register Bulletin (NRB) 16B, *How to Complete the National Register Multiple Property Documentation Form*, an MPL submission consists of "related significant properties" linked by "themes, trends and patterns of history."[3] These relationships are established in two parts:

1. Historic Contexts: Historic contexts identify the themes, trends and patterns of history that are demonstrated by the multiple property submission

2. Property types: Property types link the historic context(s) to specific historic properties, making it possible to assess eligibility

[3] Antoinette J. Lee and Linda F. McClelland, "National Register Bulletin 16B: How to Complete the National Register Multiple Property Documentation Form," National Park Service, U.S. Department of the Interior (Washington D.C.: Government Printing Office, 1999), 2.

The multiple property documentation form may be used to nominate and register thematically-related properties simultaneously, or to establish the registration requirements for properties that may be nominated in the future. This approach offers a certain level of flexibility and organization that facilitates the evaluation of SRFCP resources at a realistic pace and scale. Firstly, multiple associated historic contexts are well suited to the progressive nature of SRFCP construction from 1911-1961. Secondly, an emphasis on property types allows evaluators to both identify and establish evaluation standards for the types of SRFCP infrastructure that may be included in a multiple property submission. The model of considering context and thematically-related property types provides a framework for project-driven evaluations that are typical of SRFCP repairs and maintenance.

To that end, the Corps is evaluating the levees using the framework and context of the SRFCP MPL. The Corps is not nominating the SRFCP MPL to the National Register at this time, instead the information is presented as a determination of eligibility and a broader context for the evaluation of the levees within the ARCF APE.

Within the body of the document, Part 1 is a historic context for the SRFCP system as a whole. Part 2 addresses evaluation methods for the levee property type, including potential cumulative effects to the levees. Part 3 consists of evaluations of SRFCP Levee Units 118, 124 and 125 within the ARCF APE. Units 124 and 125 were also identified as contributing elements to the RD 1000 RHL, as a result, Part 4 is a re-evaluation of the RD 1000 RHL. Enclosed in the appendices are the SRFCP multiple property documentation form (Appendix I) and Department of Parks and Recreation (DPR) Series 523 forms for the previously unevaluated SRFCP Levee Units within the APE (Appendix II).

Levee Unit Designations

In determining the evaluation status of the ARCF levees, it became clear that the SRFCP levee system is segmented according to a number of schemas. The numbered system of units put in place by the SRFCP is the most common designation used by previous evaluations, and will be used to evaluate the levees within the ARCF APE and in the SRFCP MPL (Figure 2). Parts of SRFCP Units in the following document are referred to as “segments,” “portions” or “sections” interchangeably.

Note that other systems of levee segmentation appear in the Corps-maintained National Levee Database (NLD) online. The NLD divides SRFCP Units by a variety of reclamation districts, management districts, flood control districts and more localized units. Similarly, pre-SRFCP historic names and project-defined levee “reaches,” have been evaluated over the course of previous project and repair work.

Methodology and Source Material

A review of existing source material has been the primary methodology for this report. Photographs, both modern and historical, informed the discussion of visual character of the SRFCP system. Evaluation of the SRFCP levees was guided by

standards documented in National Register bulletins released by the National Park Service.

Primary source material consisted of newspapers, gathered from the Library of Congress “Chronicling America” online archive and the California Digital Newspaper Collection. Additional source material included hydrology studies, operation and maintenance manuals, maps and images the national and California legislative record. Many of these primary sources are available online and on file at the Corps Sacramento District Office. Cultural resources surveys of different parts the SRFCP have been completed over the course of repair work from approximately the 1970s forward. A records search for the ARCF APE conducted through the California Historical Resources Information System in 2019, returned approximately 90 reports and over 350 recorded sites. Comprehensive overviews of the SRFCP are presented in a number of books and scholarly articles concerning the broader history of water management infrastructure in California.

1. Statement of Historic Contexts: SRFCP

1.1. Introduction

The purpose of the following section is to lay the foundation for a SRFCP MPL in accordance with NRB 16B, *How to Complete the National Register Multiple Property Documentation Form*. A completed multiple property documentation form based on the text is attached in Appendix I. Note that the multiple property documentation form serves as an eligibility determination statement only, the Corps is not nominating the SRFCP to the NRHP at this time. The significant historic contexts for the SRFCP are: State Support of the SRFCP 1911-1961, Federal Support of the SRFCP 1917-1961, Post-New Deal construction 1935-1961. Additional sections regarding the Central Valley, early levees and pre-SRFCP regulations, provide background to contextualize three historic contexts.

1.2. California's Central Valley

The Central Valley is a defining feature of interior California. Surrounded by the Coast Ranges to the west and the Sierra Nevada to the east, the Central Valley stretches from Redding to Bakersfield and measures approximately 20,000 square miles.[4] In modern history, the Central Valley has become the agricultural center of the state, where cultivation of over 250 types of crops generates approximately $17 billion in annual revenue.

The massive region is fed by the Sacramento River to the north and the San Joaquin River to the south. Correspondingly, the Central Valley can be divided into the northern Sacramento River Basin and the southern San Joaquin River Basin, defined by the Delta Region where the Sacramento and San Joaquin rivers meet in the Carquinez Strait and flow into the San Francisco Bay (Figure 4). Prior to manmade water management structures, the low-lying Central Valley was a semi-arid floodplain. Today, approximately 75% of the irrigated land in the state lies in the Central Valley due to human intervention.[5]

The levees within the ARCF are part of the SRFCP. The SRFCP, authorized by the state legislature in the California Flood Control Act of 1911 and later authorized by Congress under the Flood Control Act of 1917, was one of the first comprehensive water management infrastructure projects in California.[6] The SRFCP system extends throughout the Sacramento River Basin north of Tehama through to Rio Vista.[7] Construction on the project began in 1911, and was completed by the early 1960s (Figures 5-11).[8] In order to situate the levees of the ARCF project within the SRFCP,

[4] "California's Central Valley: Regional Overview," US Geological Service, accessed June 25, 2020, https://ca.water.usgs.gov/projects/central-valley/about-central-valley.html.
[5] Ibid.
[6] Joseph J. Hagwood Jr., *The California Debris Commission* (Sacramento, CA: US Army Corps, 1981), 82.
[7] Mitch Russo, *Sacramento River Flood Control Plan Weirs and Flood Relief Structures* (Sacramento: State of California Department of Water Resources, December 2010), 2.
[8] Graham Bradner and Emilie Singleton, "The Origin and Evolution of the California State Plan of Flood Control Levee System," (paper presented at the 85th annual meeting of International Commission on Large Dams, Prague, July 3-7, 2017), 5.

the following context focuses on the evolution of water management infrastructure in the Sacramento Valley starting with the post-gold rush era and ending with the completion of the SRFCP.

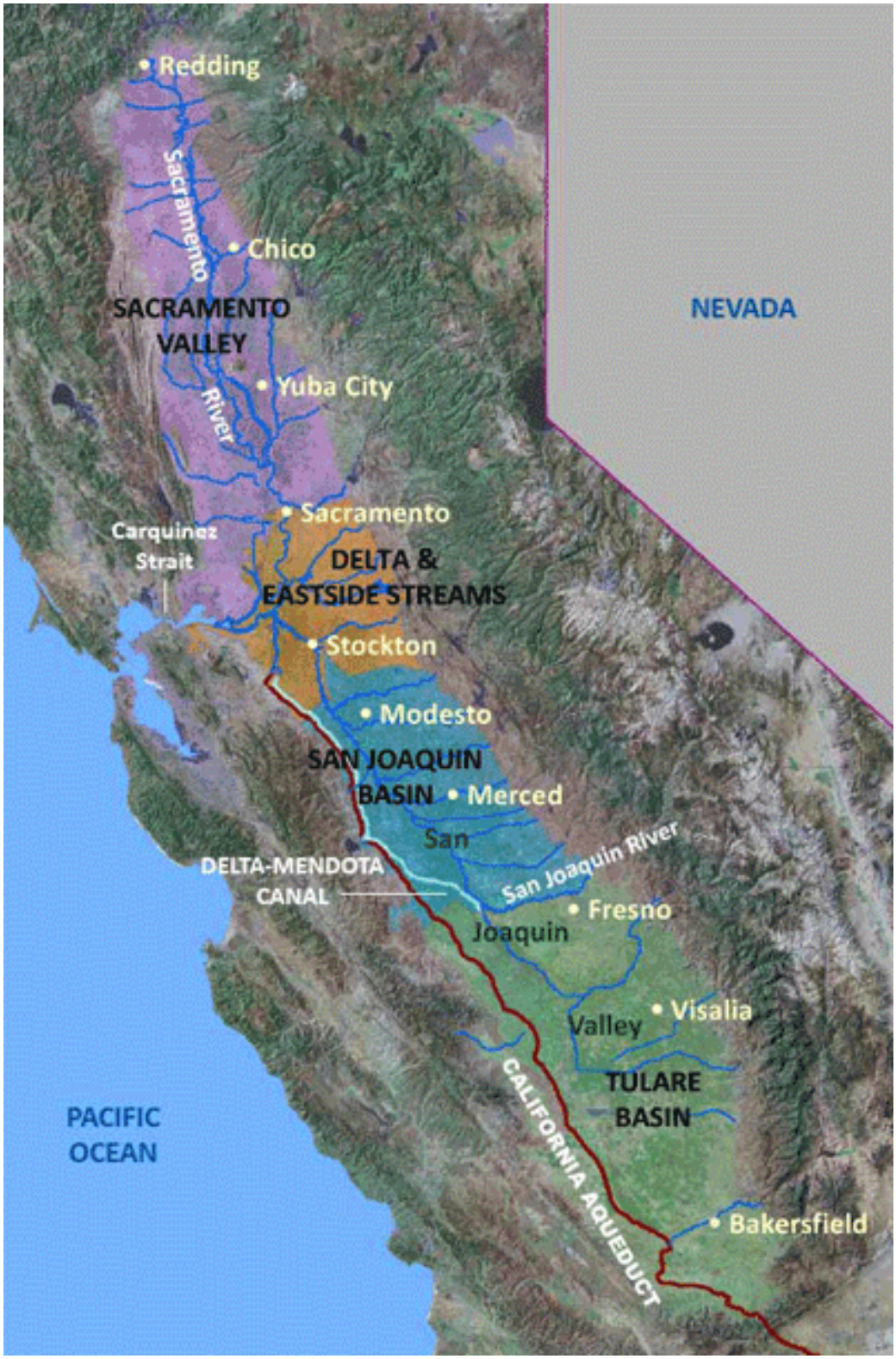

Figure 4: California's Central Valley

California Water Science Center, US Geological Society

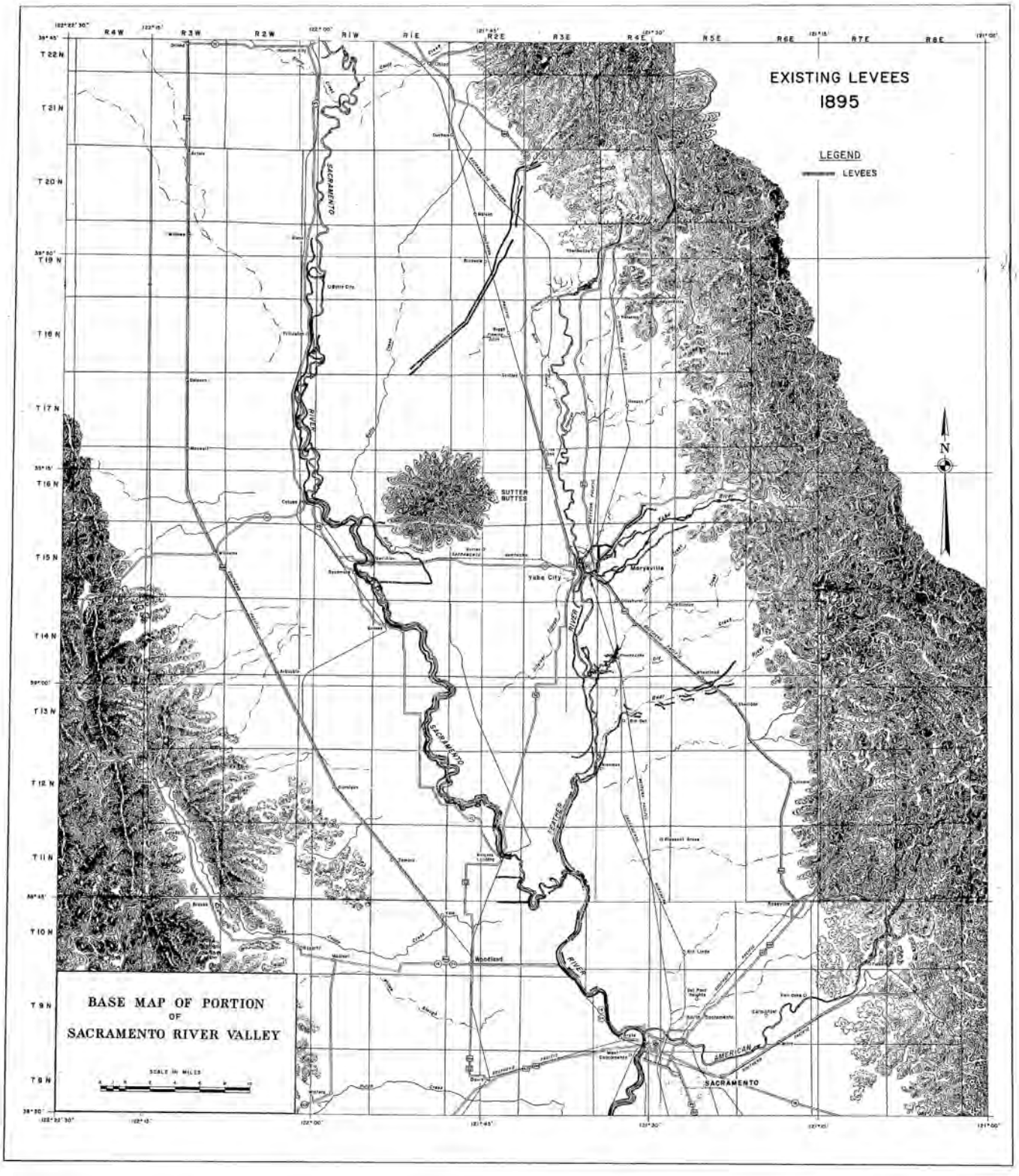

Figure 5: Existing Levees, Pre-SRFCP, 1895

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

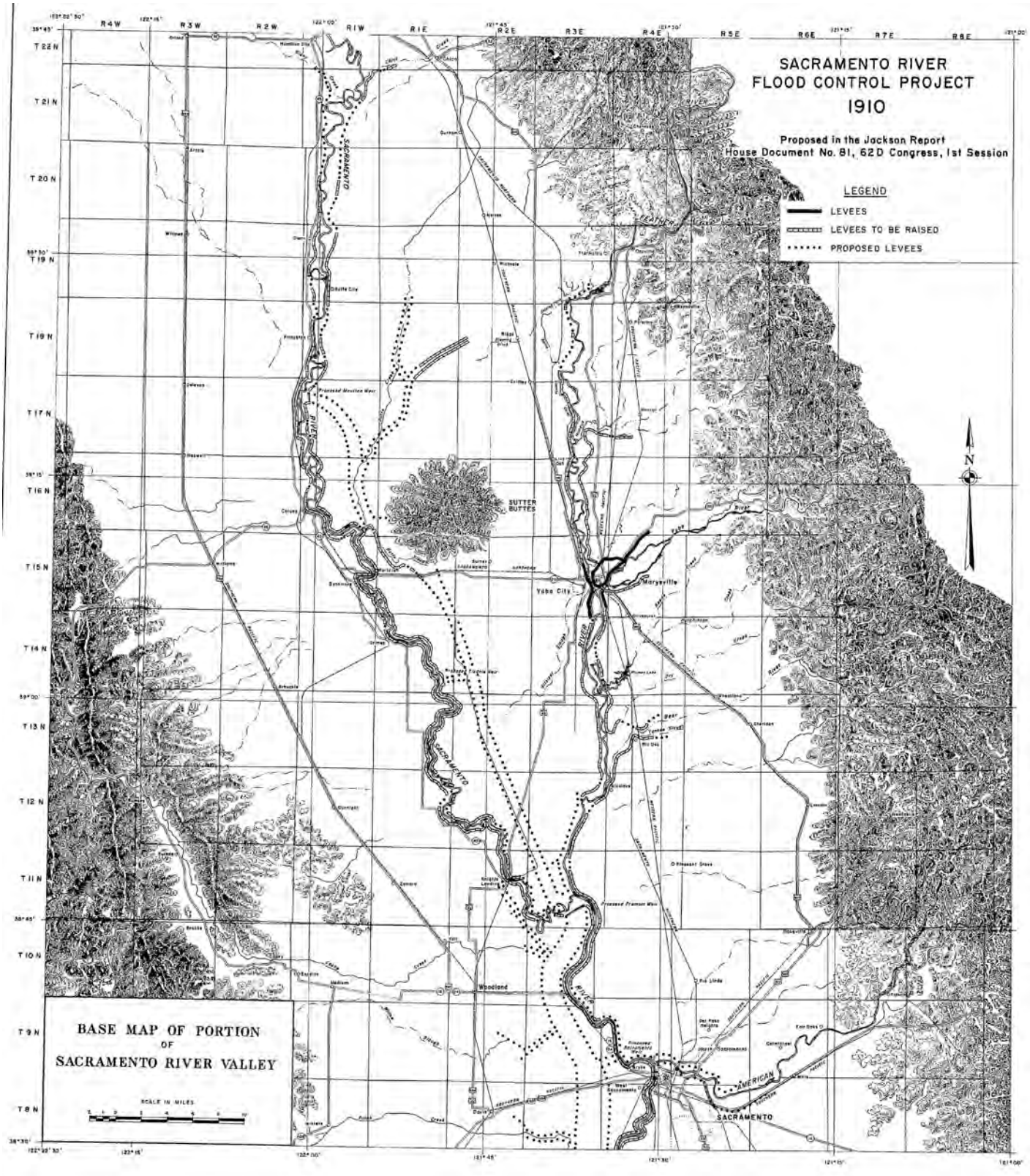

Figure 6: SRFCP Levees, 1910

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

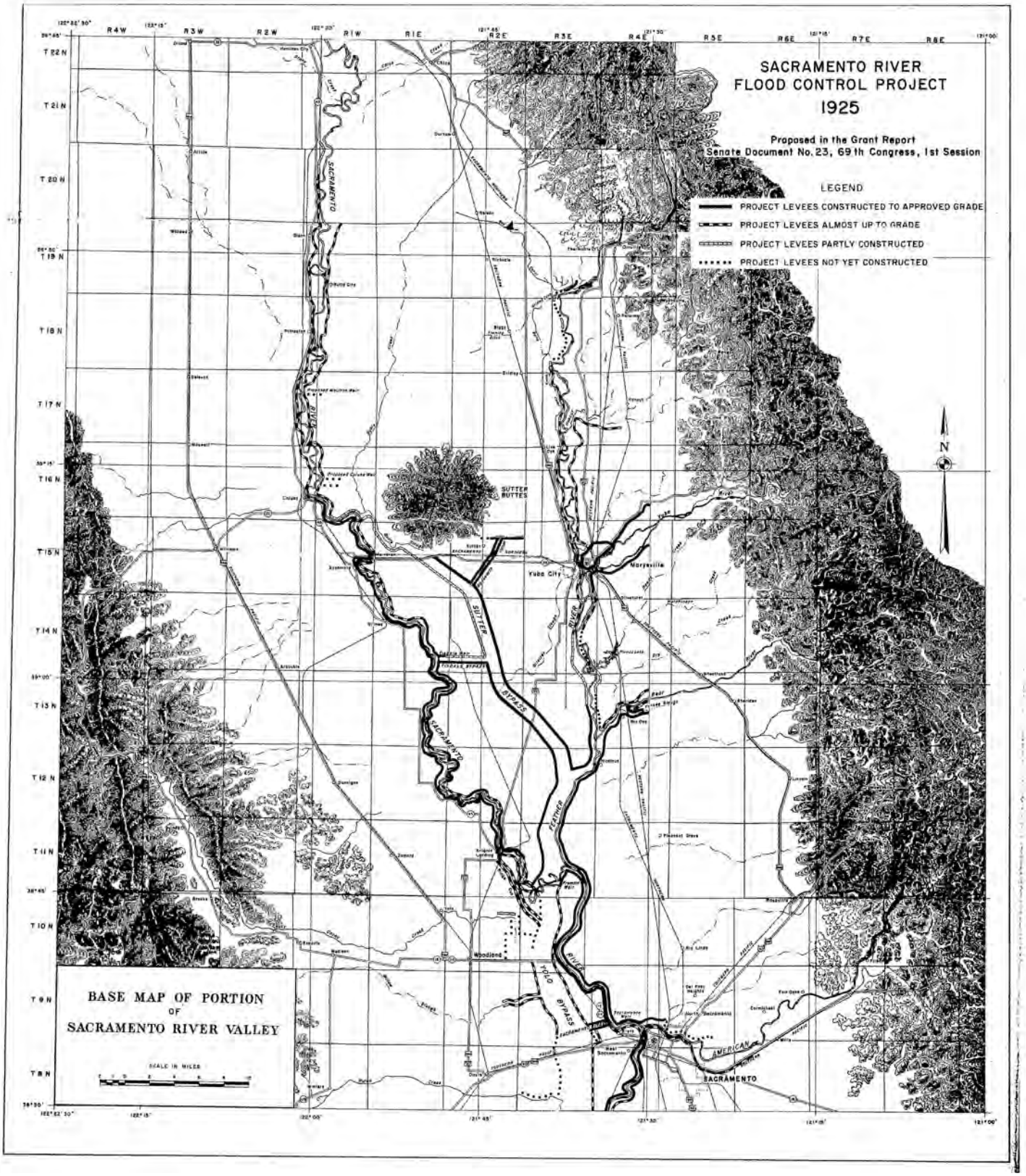

Figure 7: SRFCP Levees, 1925

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

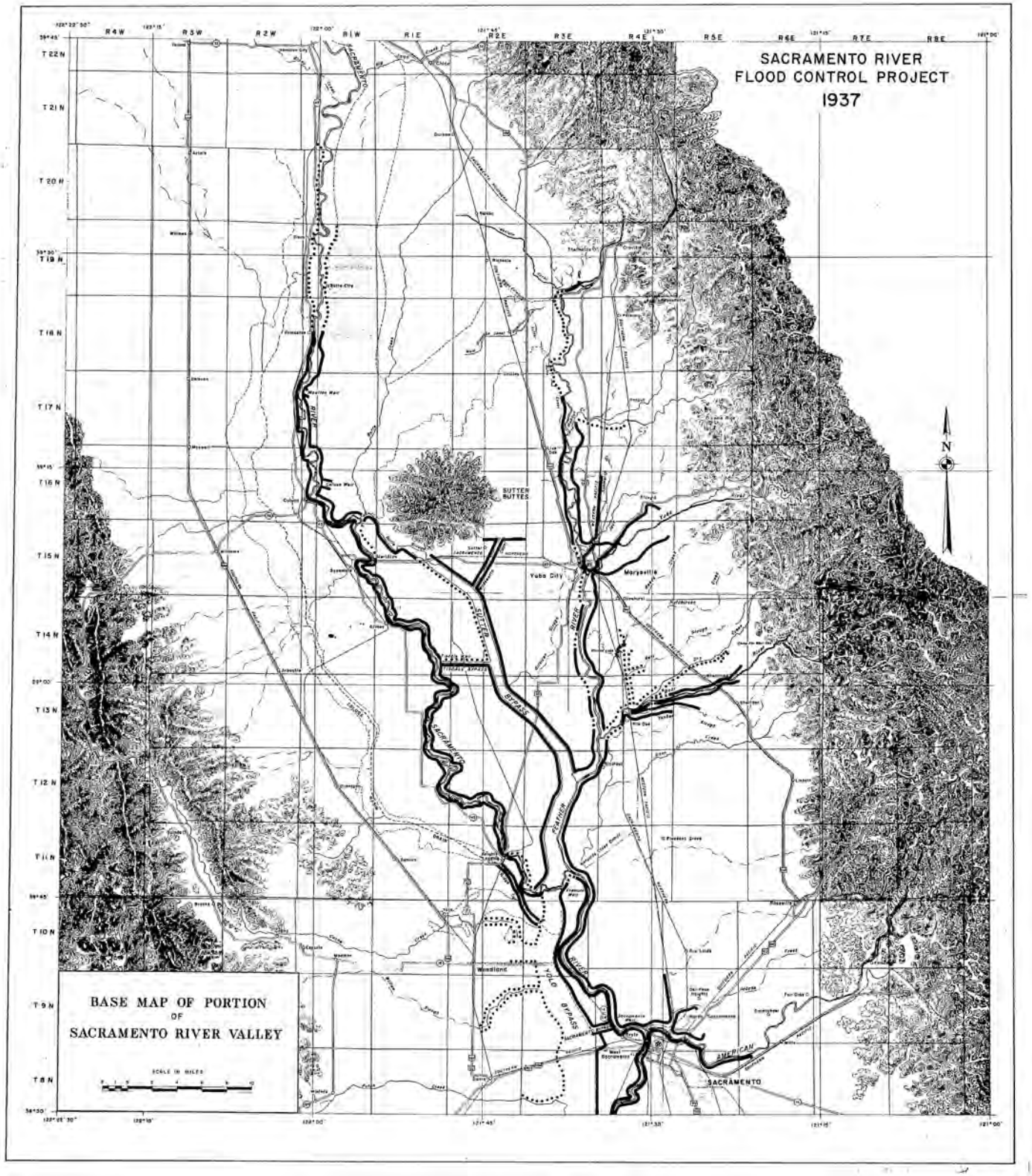

Figure 8: SRFCP Levees 1937

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

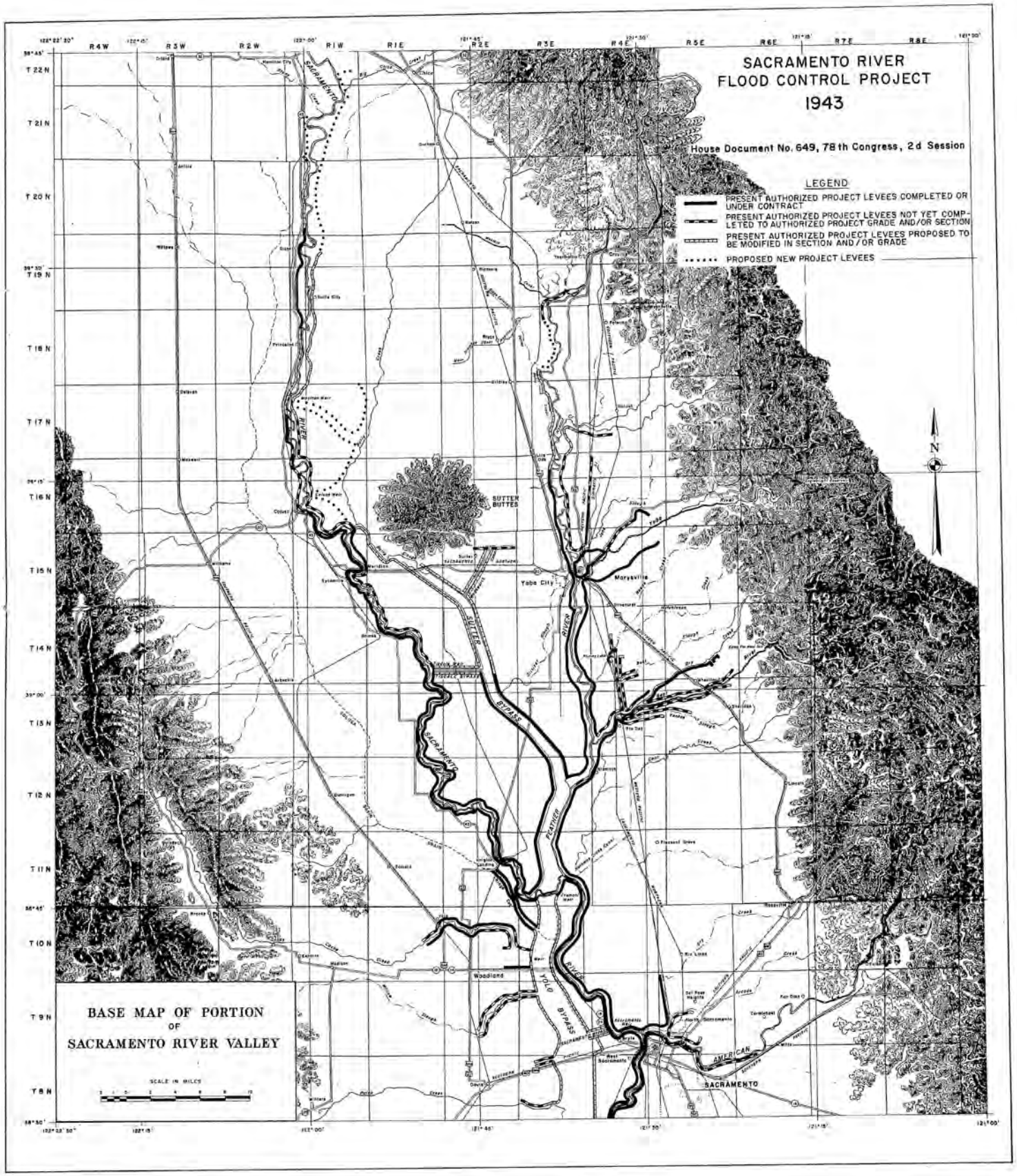

Figure 9: SRFCP Levees 1943

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

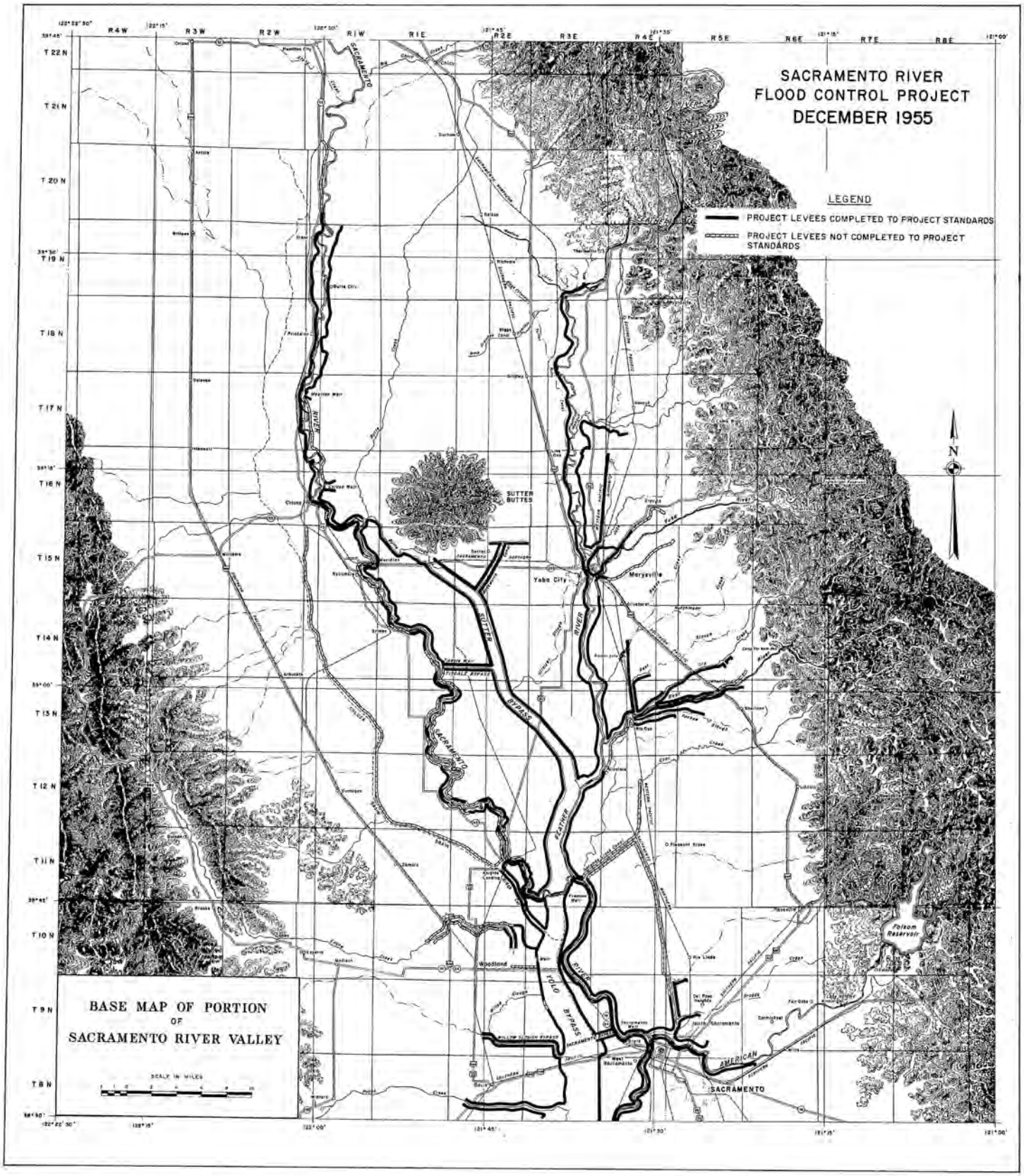

Figure 10: SRFCP Levees 1955

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

1.3. Water Management in the Central Valley 1850-1910

1.3.1. The Gold Rush and Farming in the 1850s

Throughout the mid-1800s the combination of mining, population growth and development led to dramatic changes to waterways in the Sacramento Valley.[9] Agriculture emerged as a leading industry in California during the 1850s and 1860s as gold rush boomtowns busted, and would-be miners turned to industries that supplied the incoming wave of emigrants.[10] The rich soils of the Central Valley were swiftly cultivated into fields of grain and wheat.[11] Although profitable, the new settlements were located on floodplains, and growing farms and towns inevitably became inundated with increasing severity. In 1850, the fledgling city of Sacramento flooded when the American and Sacramento Rivers crested simultaneously. During most of the month of January, witnesses reported widespread transportation by boat and buildings being swept from their foundations.[12] Despite this devastating flood in Sacramento and the surrounding farmland, the city continued to grow and was subject to many more floods into the 1910s (Figure 11).

The growth of farms and cities in the floodplains of the Sacramento Valley marked a flood prone pattern of settlement that would continue to flourish along the banks of the American and Sacramento Rivers. Sustained growth in chronically flooded areas may appear counterintuitive from the modern perspective, but this pattern reflected a common mid-19th century emphasis on "reclaimed" land and development popular on the political stage. According to this post-industrial mindset, floodplains and wetlands were considered inherently unproductive, and by draining these "swamplands" through manmade infrastructure, the lands could and should be profitably developed. Throughout the mid-1800s, Congress passed a series of Swamp Land Acts, legislation that transferred titles to swamp and overflow lands from the federal government to the states. The intent of the legislation was to put swamplands in the hands of private landowners who would drain inundated areas through manmade infrastructure and develop the land for agricultural or other commercial use.[13]

The first Swamp Land Act, also known as the Arkansas Swamp Land Act, was intended to regulate floodplains primarily in the South and the Midwest. Flood control efforts in Arkansas, Alabama, Florida, Mississippi and Missouri had been previously conducted by independent landowners and were often mired in corruption. Under the legislation, the title for swamp and overflowed lands was given to the states.[14] Although communities along the Mississippi continued to be the focus of the Swamp Land Acts, the federal regulation had a dramatic impact to California landowners. Following the

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[9] Jeffrey F. Mount, *California Rivers and Streams: The Conflict Between Fluvial Process and Land Use* (Berkley: University of California Press, 1995), 190.
[10] Hope Schear and Patrick O'Day, *Cultural Resources Survey and Assessment Report American River Common Features, Reach D Project Sutter County, California* (Sacramento: US Army Corps, 2017), 21.
[11] Robert Kelley, *Battling the Inland* Sea (Berkley: University of California Press, 1998), 61.
[12] William Willis, *History of Sacramento California* (Los Angeles: Historic Record Company, 1913), 160.
[13] "Swamp & Overflow Lands," California State Lands Commission, last modified October 19, 2018, accessed April 20, 2020, https://www.slc.ca.gov/land-types/.
[14] "Enactment of the 1850 Swamp Land Act," University of Richmond Digital Scholarship Lab, Accessed May 20, 2021, https://historyengine.richmond.edu/episodes/view/1711.

Swamp Land Act of 1850, much of the land in the Central Valley became state land. The State of California then sold 320-acre parcels at $1.00 to private parties on the condition that the landowner would “reclaim” the land through cultivation and flood management. By the 1870s, most of the floodplains of the Sacramento Valley had become privately owned farmland.[15]

[15] Alex Reed Westhoff, *The Sacramento Delta National Heritage Corridor*, (master’s thesis, University of California, Berkeley, 2008), 9.

Figure 11: Inundation of the State Capitol, City of Sacramento
San Francisco, A. Rosenfield, 1862, California State Library Picture Collection

Individual landowners who were tasked with cultivating and draining swampland built primitive levees to protect farms and property. These early levees, however, were not particularly well constructed. Furthermore, the unsystematic nature of levee construction, along property lines rather than geographic features, ultimately intensified flooding in the valley.[16] Throughout the 1850s, the rise of cities and agriculture in the Sacramento Valley diminished floodplains that had previously absorbed inundations from the banks of the Sacramento and American rivers, further intensifying flooding. During the 1860s, the already deteriorating natural system of flood protection in the Sacramento Valley was additionally stressed by hydraulic mining, upstream in the Sierra Nevada.[17]

1.3.2. Hydraulic Mining in the Sierra Nevada

One of the most dramatic disruptions to the waterways of the Sacramento Valley was the build-up of debris caused by hydraulic mining. Hydraulic mining, introduced in the Sierra Nevada gold fields in 1853, was an industrialized strategy that used a system of reservoirs, dams and high powered hoses to wash away entire hillsides in order to access deeply buried gold deposits.[18] Unlike the small scale placer mining methods used by the first wave of gold seekers, hydraulic mining produced an enormous amount of debris that washed into local waterways.[19] By the 1860s and 1870s, debris from hydraulic mining clogged tributaries and eventually the Sacramento and San Joaquin rivers. The debris resulted in navigation challenges and severe flooding in the low lying and increasingly agricultural Central Valley.[20] One witness to a Central Valley flood in 1865 described an “inland sea” measuring 20 miles wide and 250 miles long.[21]

As flooding worsened in the 1880s, farmers were often at odds with miners in verbal, and later legal, debates about the destructive effects of hydraulic mining. Following a devastating flood in February of 1878, farmers across the Sacramento Valley founded the Anti-Debris Association to advocate against hydraulic mining.[22] An 1882 court case in Marysville signaled the end to legal hydraulic mining when Edward Woodruff, a Marysville property owner, filed a lawsuit against the North Bloomfield Mine of the Yuba River for property damage. The presiding judge issued a permanent injunction against hydraulic mining on the Yuba River in 1884.[23] Known as the “Sawyer Decision,” the injunction effectively halted legal hydraulic mining in the state, however the damages from hydraulic mining continued to wreak havoc on communities downstream.[24] Debris continued to clog waterways and severe floods continued to be part of life in the Central Valley through the early 1900s.[25]

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[16] Mount, *California Rivers and Streams: The Conflict Between Fluvial Process and Land Use,* 206.
[17] Mount, 190.
[18] Andrew C. Isenberg, *Mining California: An Ecological History* (New York: Hill and Wang, 2005), 24.
[19] Mount, 190.
[20] Mount, 192.
[21] Ibid.
[22] Philip Garone, *The Fall and Rise of the Wetlands of California’s Great Central Valley* (Berkley: University of California Press, 2011), 108.
[23] Hagwood Jr., *The California Debris Commission*, 25.
[24] Mount, 207.
[25] Mount, 193.

1.3.3. Early Levee Systems in the Sacramento Valley

The prevalence of flooding in growing Central Valley communities resulted in some centralized efforts to build water management systems. Officials at municipal levels worked to build and repair levees, re-route rivers and clear debris. In the growing city of Sacramento, for example, the city government funded levee construction along the south bank of the American River in 1850 and 1852. The levees would shortly be destroyed by flood waters in 1852 and 1853.[26] Sacramento officials also supported a project to re-channel a portion of the American River. The Embarcadero business district, located near the northern area of the city grid, was chronically flooded by the American River. Faced with this problem, city officials funded the creation of a new channel that redirected the river flow ½ mile north, away from the growing Embarcadero business district.[27] Between 1846 and 1868 roughly 2 miles of the American River in the same vicinity of the Embarcadero district were further altered to create a swifter current in order to scour mining debris from the riverbed.[28] These flood control structures, implemented by local governments, would lead to the first centralized effort for flood management in the state: the Board of Swampland Commissioners.

1.3.4. Board of Swampland Commissioners 1861-1866

The Board of Swampland Commissioners (Board) was established with the passage of California State Legislature Assembly Bill (AB) 54 on May 31, 1861. AB 54 was intended to provide centralized management for swamplands allocated to the state through the Swamp Lands Acts. According to the legislation, infrastructure overseen by the Board was intended to ensure effective flood control and divert any surplus water for agricultural purposes.[29] Essential to the management of these lands was the Board, an elected body of engineers who would manage water infrastructure around the state in coordination with local reclamation districts. Under the legislation, reclamation districts were formed by landowners who would petition the state to form the district. The Reclamation district would be managed at the local level through taxation and infrastructure maintenance. The Board of Swampland Commissioners, in turn, would appoint an engineer to each district tasked with designing a reclamation plan for the district.[30]

The first elected public commission in the state, the Board of Swampland Commissioners signaled a shift from individual reclamation attempts and a step towards centralized flood control. The need for water management infrastructure, however,

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[26] Nathan Hallam, “Planning Sacramento’s Townsite, 1853-1870,” in *River City and Valley Life: An Environmental History of the Sacramento Region*, eds. Christopher J. Castaneda and Lee M.A. Simpson (Pittsburgh: University of Pittsburgh Press, 2013), 66.
[27] Kenneth Owens, “River City: Sacramento’s Gold Rush Birth and Transfiguration,” *River City and Valley Life: An Environmental History of the Sacramento Region*, eds. Christopher J. Castaneda and Lee M. A. Simpson (Pittsburgh: University of Pittsburgh Press, 2013), 56.
[28] “Sacramento Area Flood History” Sacramento Area Flood Control Agency, accessed May 1, 2020, http://www.safca.org/history.html.
[29] Jeffrey Rosenthal, Sharon Waechter et al., *Evaluation of Four Historic-Era Cultural Resources, Located in the Natomas Basin, Reach H Project Area, Sacramento County, California* (Davis: Far Western Anthropological Research Group, Inc. August 2008), 4-5.
[30] Garone, 79.

swiftly outpaced the capacity of the Board. Throughout the 1860s, communities along the American and Sacramento Rivers continued to flood due to poor infrastructure and planning. The primary flaw of the levee system promoted by the Board was its reliance on the "single-channel" system. In other words, the Board envisioned a system where overflow was diverted to main rivers that were heavily reinforced by tall levees. This single-channel system ran counter to the natural floodplains of the Sacramento Valley where flood waters were partially absorbed by sloughs and floodplains. When flood waters were artificially diverted exclusively through main rivers in a single channel, the overflow created higher flood stages and deeper, swifter rivers that overtopped the levees. The Board of Swampland Commissioners disbanded in 1866, turning flood management over to county governments.[31]

1.3.5. The Green Act of 1868

Under county governance, water management infrastructure was again haphazard and fallible. Political sentiment against the Board of Swampland Commissioners and was worsened by rising debt in swampland districts, unpopular taxation and protestations from farmers who depended on seasonal flooding to irrigate grain fields or to replenish grasses for grazing livestock.[32] The final blow to early centralized flood planning came in the form of the Green Act.

The Green Act, passed by the California Legislature in 1868, removed acreage limits from swampland purchases. After the Green Act, individuals amassed thousands of acres of land, which, in turn, allowed the same swampland owners to form their own reclamation districts, building more flood control structures along property lines.[33] The passage of the Green Act also signaled a change in the political climate: the concept of state-level management of flood infrastructure became unpopular for the next 50 years, leaving private landowners to build and manage more levees. Throughout this period, settlements and farms continued to grow on high ground and natural levees. Farmers chose to cultivate quick growing or water-resistant crops that could thrive in periodic flooding; some farmers grew small cattle herds on a seasonal basis. Uncoordinated levee building left the Sacramento Valley virtually unprotected from flooding until the early 1900s.[34] Flooding, along with the related concerns of irrigation, water supply and navigability, loomed large in local and state debates through the early 1900s.[35]

1.4. Associated SRFCP Historic Contexts

1.4.1. State Support of the SRFCP 1911-1961

Effective flood control in the Central Valley was not implemented until 1911 when the SRFCP was executed under the California Flood Control Act. The comprehensive infrastructure of channels, levees, weirs and sloughs was made possible by two trends converging in California: the first was the synthesis of hydrological research of Central

[31] Barry Scott, "American River Common Features Project General Reevaluation Report Historic Properties Management Plan," 3-6.
[32] Garone, 80-81.
[33] Robert Kelley, *Battling the Inland Sea*, 62.
[34] Kelley, 59-62.
[35] Mount, *California Rivers and Streams: The Conflict Between Fluvial Process and Land Use*, 193.

Valley waterways, the second was a return to centralized governance of water resources.

From an engineering standpoint, the 1911 design of the SRFCP was a departure from the conventional wisdom of the time. The SRFCP is based on a network of bypasses that diverts floodwaters through channels, weirs and sloughs. This system differed from the popular "single channel" levee system which was based on the hydrology of the Mississippi River. Under the single channel system, high levees were built to divert flood waters along a single waterway. Single channel levees had contained floodwaters in the Midwest and became the gold standard for flood prevention from the 1860s through the early 1910s, particularly within the Corps.[36] The single channel strategy may have been well suited to the relatively slow-moving Mississippi, but hydrological studies of the Sacramento Valley revealed a different set of conditions. The waters of the chronically inundated Sacramento Valley, already running high due to hydraulic mining debris, would not easily be contained by a system of levees alone. Instead, a number of California-based engineers designed the current system of bypasses, which mimics the natural system of flood plains.[37]

Precursors to the SRFCP design were presented in a number of reports. One of the first known proposals was written in 1868 by Will Green, the Colusa County surveyor. Green, an expert on the Sacramento River, proposed a system of locks and canals in a system of controlled overflows.[38] The state legislature ultimately rejected Green's plan. Another similar proposal would be presented to the state legislature a decade later by William Hammond Hall, the first state engineer. Hall, a Corps-trained engineer, was appointed to his position in 1878, following a devastating February flood in the Sacramento Valley.[39] With an eye towards flood prevention, the California governor tasked Hall with the responsibility of studying and reporting on the hydrology of Central Valley waterways. Hall presented his exhaustive investigation to the state legislature in 1880. In his report, Hall acknowledged damage caused by hydraulic mining debris and documented the natural state of seasonally inundated floodplains along Central Valley waterways. Like Green, Hall proposed a system of levees, debris dams and drainage basins to manage floodwaters in the Central Valley. In order to manage the flood control infrastructure, Hall also advocated for centralized, state administration of the system.[40]

The structural concept of bypasses, as an alternative to a single channel, gained traction with the legislature, and the plan was approved in 1880. Politically speaking, however, centralized management of such a system remained a source of contention. The Drainage Act of 1880 was declared unconstitutional by the California Supreme Court due to the proposed transfer of legislative authority to the executive branch of government, and as a result of the 1881 court ruling, Hall's plan was not implemented.[41]

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[36] Garone, *The Fall and Rise of the Wetlands of California's Great Central Valley*, 108.
[37] Mount, 297.
[38] Garone, 108.
[39] Ibid.
[40] Garone, 110.
[41] Hagwood Jr., 22.

William Hammond Hall served as the state engineer until 1889, and continued to advocate for state control of water management infrastructure.[42] Hall also mentored the next generation of engineers who would further lay the groundwork for the SRFCP.

Continuing inundation problems caused by haphazard flood control efforts led to another examination of California's waterways. In 1893, the newly minted state Commissioner of Public Works requested another study and coordinated plan for flood risk reduction in the Central Valley. The authors of the plan, Marsden Manson and C.E. Grunsky, engineers who had worked under Hall, proposed a system of bypasses and drainage basins based on the same conclusions presented in Hall's 1880 report. The Manson-Grunsky report, completed in 1895, was not implemented due to nationwide financial troubles that endured through the 1890s.[43] The Manson-Grunsky plan met additional resistance from the state-appointed Dabney Commission through the early 1900s. The Dabney Commission, led by Corps officer T.G. Dabney, would steer state flood planning towards a levee-only system for the next decade. Dabney and his fellow commissioners, Henry B. Richardson and H.M. Chittenden, were all veterans of managing floodwaters along the Mississippi River and all three subscribed exclusively to the single-channel levee strategy, informed by the hydrology of the Mississippi.[44] Levees continued to be built along the banks of the Sacramento River throughout the early 1900s until conviction in the single channel system was blown by the floods of 1907 and 1909. In those years, approximately 600,000 cubic feet per second (cfs) of flood waters broke the Dabney levees and inundated the Sacramento Valley.[45]

1.4.1.1. California Flood Control Act of 1911

Following the 1907 flood, the federally appointed California Debris Commission commissioned another study of the hydrology of the Sacramento Valley. Thomas H. Jackson came to similar conclusions as Manson and Grunsky, proposing a centrally managed system of bypasses and levees that would serve waterways and communities across the Sacramento Valley. Jackson's report, completed in 1910, presented the flood control system that would come to be known as the SRFCP.

The California legislature approved the SRFCP when the California Flood Control Act of 1911 adopted the infrastructure proposed in the Jackson Report. The 1911 legislation also created the California Reclamation Board, a state authority with the ability to regulate reclamation districts and infrastructure along the Sacramento River. A subsequent Flood Control Act in 1913 expanded the authority of the California Reclamation Board to the Central Valley. Within the first few years of the Flood Control Act of 1911, state-funded water management infrastructure was built across the valley. Using floating mechanical dredges to extract material from the riverbed, crews completed the massive levees of the Sutter Bypass and the Yolo Bypass by 1923, (Figure 12).[46]

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[42] Garone, 108.
[43] Garone, 110.
[44] Karen M. O'Neill, *Rivers by Design: State Power and Origins of U.S. Flood Control* (Durham: Duke University Press, 2006), 106.
[45] Garone, 111.
[46] Garone, 113.

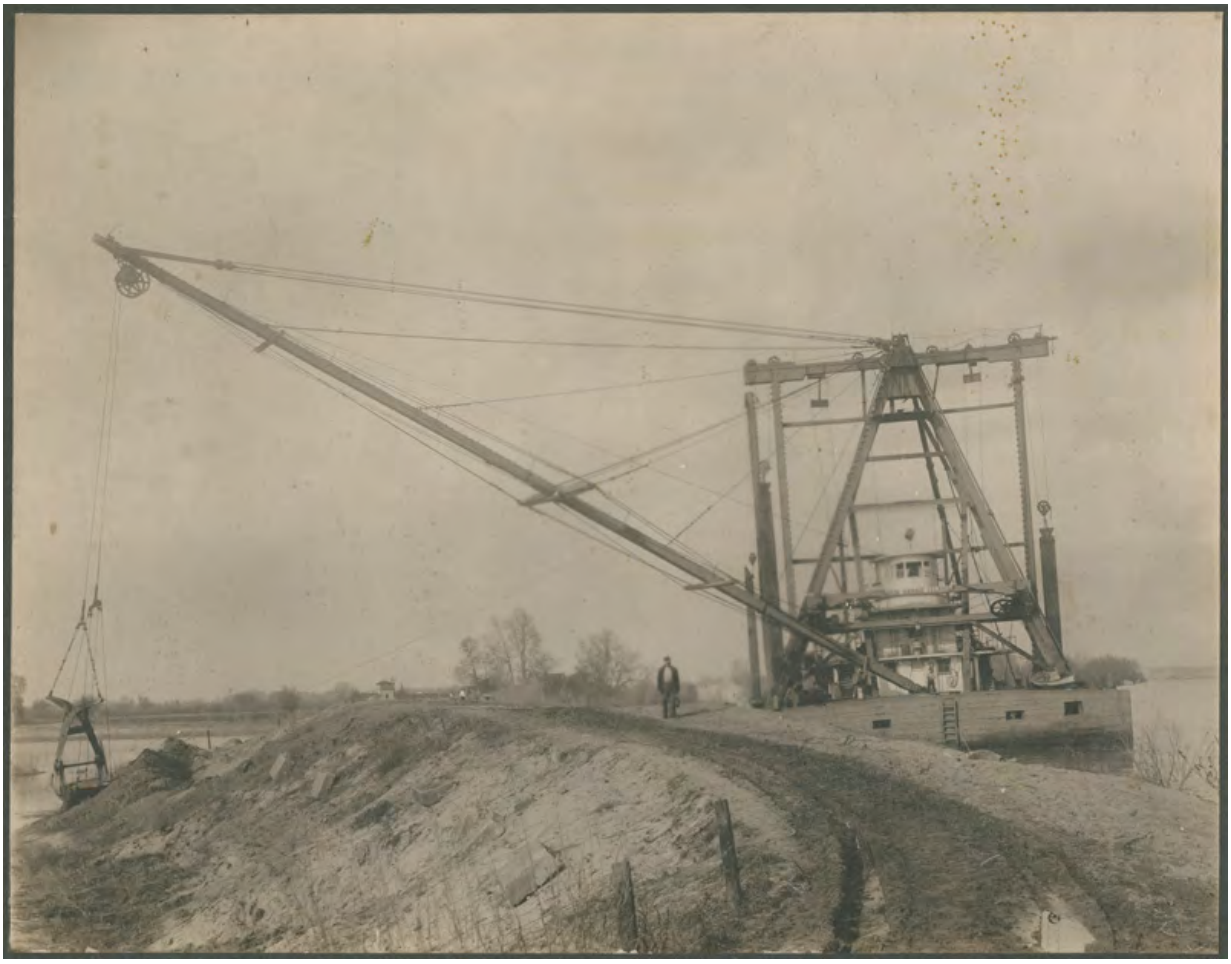

Figure 12: Clam-Shell Dredge, “New Grand Island,” July 14, 1912

California State Library Picture Collection, Folio F869 W335 P56 1910

1.4.2. Federal Support of the SRFCP 1917-1961

The beginnings of the SRFCP were rooted in the machinations of state and local governments. The SRFCP did not receive formal federal support until Congress passed the Flood Control Act of 1917. In reality, however, federal participation in flood control had begun early in California due to an ongoing tension between ambitions to revive the California mining industry and the environmental havoc wreaked by hydraulic mining.

The permanent injunction against hydraulic mining issued by the California court system in 1884 signaled the end of hydraulic mining. However, in the following years, members of Congress hoped to revive mining in California through less destructive methods. The California Debris Commission (CDC) was created by the passage of the federal Caminetti Act of 1893.[47] Its purpose was to ensure that hydraulic miners mitigated the impacts of their mining, thus making such mining sustainable. It soon became clear, however, that non-destructive hydraulic mining was unrealistic. Neither individuals nor small companies could afford the cost of debris dams, equipment and maintenance that would be required to prevent debris from flowing into California waterways.[48]

The failed revival of hydraulic mining put an emphasis on the secondary responsibilities of the CDC: the rehabilitation of rivers affected by hydraulic mining and flood relief. From the beginning, the CDC was granted broad authority to prevent destructive hydraulic mining practices, but instead, the CDC focused this authority toward flood control and navigability. The first CDC commissioners, appointed by President Cleveland, were Corps engineers, setting a precedent for Corps leadership that would eventually lead to the establishment of the Corps Sacramento District.[49]

Early projects of the CDC included the rehabilitation of the Yuba River, a tributary of the Feather and Sacramento Rivers severely clogged by hydraulic mining debris.[50] From the early to mid-1900s, the CDC constructed debris-barrier dams including the Daguerre Point Dam (1906), and dredged a new channel bordered by training walls for the Yuba River.[51] Between 1915 and 1916, the CDC dredged 17 million cubic yards of material from the Sacramento River between Cache Slough and Rio Vista.[52] CDC projects, in turn, highlighted the need for a comprehensive system of water management infrastructure throughout the Sacramento Valley, as seen in the CDC-sponsored Jackson Report.[53]

[47] Garone, 110.
[48] Hagwood Jr., 65.
[49] Hagwood Jr., 31.
[50] Hagwood Jr., 42.
[51] Ryan S. Bezerra and Yvonne M. West, “Submerged in the Yuba River: The State Water Resources Control Board’s Prioritization of the Governor’s Commissions Proposals,” *McGeorge Law Review* Vol. 36, Issue 2 (2005): 332.
[52] Hagwood Jr., 54.
[53] Hagwood Jr., 31 110.

1.4.2.1. Flood Control Act of 1917

In 1911, when the State of California began to implement the infrastructure recommended by the Jackson Report, federal funding could not be allocated to state flood control efforts, such as the SRFCP. This changed when devastating floods on the Mississippi in 1913 and 1914 brought national attention to the issue of flooding. Congress passed the Flood Control Act of 1917 and funds were appropriated to projects along the Sacramento, Ohio and Mississippi Rivers.[54] Congress stipulated that upon receiving federal funding, local governments would contribute one dollar for every two federal dollars spent, would be responsible for obtaining right-of-way for water management infrastructure and once in place, would take responsibility for maintaining the infrastructure. Administration of the funding and the construction effort was left largely to the Corps. The War Department and Chief of Engineers were responsible for dispensation of the funding. The act also authorized the Corps to conduct studies of the watersheds in question, now known as feasibility studies, to determine whether it was advisable for the federal government to take part in proposed projects.[55]

This pattern of construction by the Corps, followed by management by local entities, continues to be the model for the SRFCP. Within the ARCF, for example, the levees of the right (north) bank of the American River Flood Control District (ARFCD) were first built by private and state entities. Severe floods in North Sacramento during the 1920s led to the establishment of the ARFCD by the California Legislature, and the construction of several levees.[56] During the 1950s, the Corps improved the existing levees, bringing them to federal construction standards. The newly improved “project levees” were then transferred to the state.[57]

1.4.3. Post-New Deal Construction 1935-1961

The Depression Era ushered in a period of appropriations for large infrastructure projects under the New Deal.[58] Many of the civil works projects in the Sacramento Valley were designed to ameliorate flood control and reclamation throughout California, while also stimulating the economy. The desire for flood control was a leading impetus for construction of the SRFCP, but a dual consideration was reclamation. As a result of the linked history of flood control and reclamation in the Central Valley, the following paragraphs present a brief account of reclamation efforts with an emphasis on regulations and infrastructure that overlapped with flood control measures.

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[54] Joseph L. Arnold, *Evolution of the 1936 Flood Control Act* (Ft. Belvoir: US Army Corps of Engineers Office of History, 1988), 14.
[55] Arnold, *Evolution of the 1936 Flood Control Act*, 14-15.
[56] US House of Representatives, House Doc. 205, 77th Cong., 1st sess., "Public No. 738, 1936. Interim Survey, Flood Control Sacramento and San Joaquin River Valleys, California. Sacramento River Within Existing Flood Control Project." Prepared by the Board of Engineers for Rivers and Harbors, Washington D.C., March 3, 1941.
[57] “Operation and Management Manual Sacramento River Flood Control Plan, American River no.1,” on file at U.S. Army Corps of Engineers, Sacramento District, Sacramento, CA, 76.
[58] Mount, 196

1.4.3.1. Reclamation

State and federal reclamation regulations, along with flood control, drove patterns of land ownership and development in the Sacramento Valley. In many cases, the levees and infrastructure that were built to reduce flood risk also contributed to reclamation. The concept of “reclaimed” land that drove the Swamp Land Acts of the mid-1800s emphasized the role of infrastructure used both to drain swampland and, in the Central Valley, to cultivate crops. The disorganized levee building that followed the termination of the State Board of Swampland Commissioners in 1866 and the Green Act of 1868 were injurious to centralized flood risk reduction and reclamation efforts. With the passage of the California Flood Control Act of 1911, the state created the California Reclamation Board, that, similar to the Board of Swampland Commissioners, would regulate the construction of levees and reclamation districts in the state.

Under the SRFCP, reclamation districts and flood control measures were coordinated by the California Reclamation Board based on the Jackson Plan. This centralized approach resulted in a more effective strategy for flood control and reclamation. The authority of the California Reclamation Board continued to grow after 1911, expanding to regulate privately built levees. In 1913, board members could mandate that private levees were constructed according to the standards of the Jackson Plan.[59]

With the rise in successful reclamation efforts, California agricultural interests sponsored a study that outlined an expansive irrigation system for the Central Valley. The Central Valley Project (CVP) was first proposed to the California legislature by agricultural businessmen during the early 1920s. Similar to the SRFCP, the CVP was a comprehensive system of water management infrastructure, managed at the state level. The legislature supported the plan, passing the California Central Valley Project Act in 1933, however the stock market crash of 1929 had deprived the state of funding to support such a project.[60] In the face of bankruptcy, federal funding paved the way for the federal Bureau of Reclamation to take the reins and gain a foothold in California water management (Figure 13).

[59] Scott, 3-6.
[60] Mount, 197

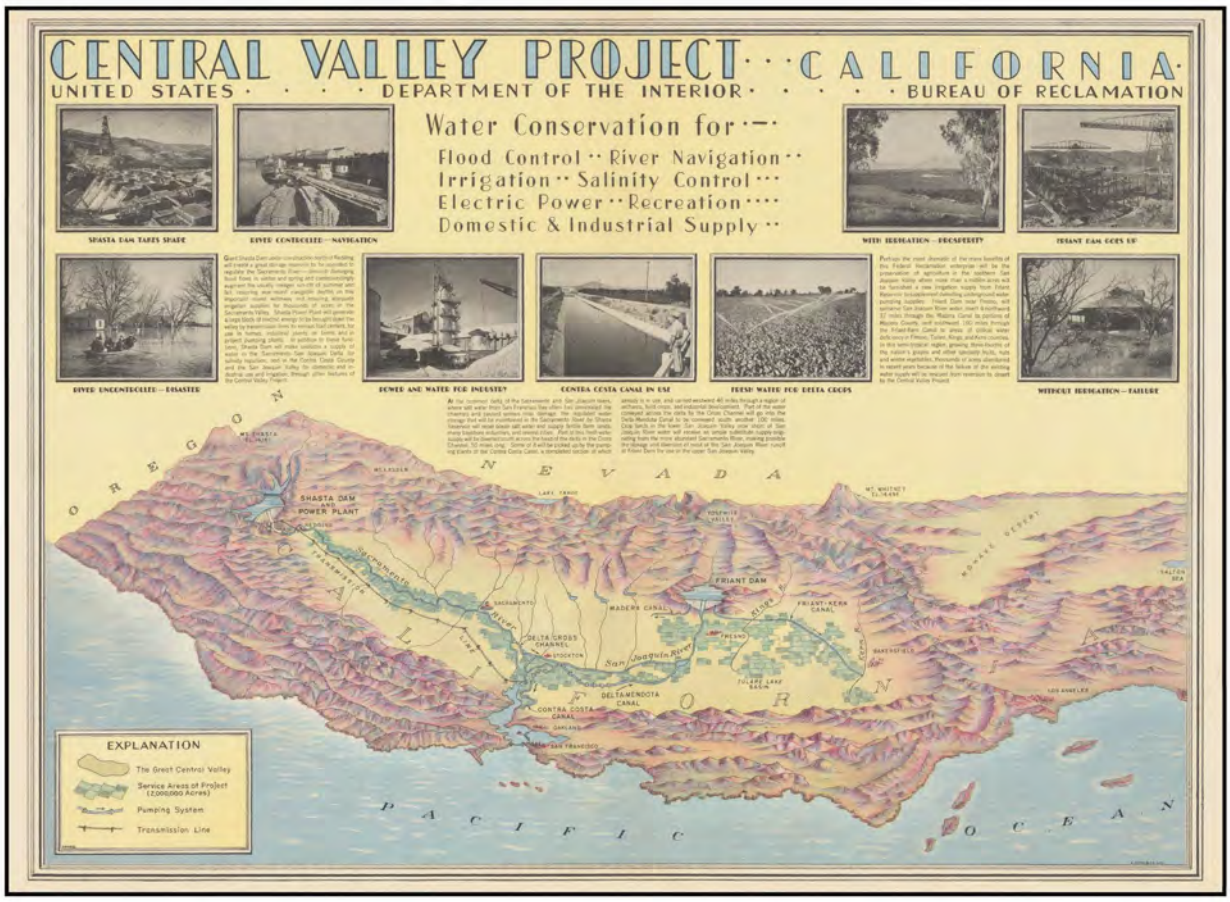

Figure 13: 1938 Map of the Central Valley Project

U.S. Bureau of Reclamation A Hoen & Company, lithographer

1.4.3.2. Federal Civil Works Projects

As federal funding flowed to the Corps and the Bureau of Reclamation, projects such as the SRFCP and the CVP expanded to serve a growing population.[61] Reclamation in particular continued to be politically popular through the 1940s. Widespread droughts and population growth in the 1930s created a demand for federally subsidized irrigation waters.[62] During the 1940s, the war effort would draw on agricultural products in the irrigated farmlands of the Central Valley and the electrical power generated by newly constructed dams.[63] The purposes of the Bureau of Reclamation and the Corps in the Central Valley were separate, however some of the infrastructure, particularly the Folsom Dam, would concurrently serve the needs of the SRFCP and the CVP.

Legislation of the 1930s paved the way for large, federally funded reclamation projects in the Sacramento Valley. The CVP was transferred to the Bureau of Reclamation under the Rivers and Harbors Act of 1935, and funded under the Emergency Relief Appropriation Act of 1935. Concurrently with the rise of the reclamation projects, the Corps also received increasing authority to manage floodwaters. Under the Flood Control Act of 1936, the Corps adopted flood control as a leading mission. Instead of acting with a non-federal sponsor, the Corps was given the authority to build infrastructure, including dams and levees, to protect citizens and property in flood zones.[64] When the CVP was reauthorized under the Rivers and Harbors Act of 1937, the project had three objectives that were tailored to the missions of both the Bureau of Reclamation and the Corps:

1. Regulate rivers and improve flood control and navigation (Corps)
2. Provide water for irrigation and domestic use (Bureau of Reclamation)
3. Generate power (Bureau of Reclamation) [65]

Construction on the CVP began in 1937 when crews broke ground on the Contra Costa Canal. The canal began delivering water in 1940 and was completed in 1948.[66] The CVP consists of a network of canals, power plants, tunnels and conduits, but some of the most visible projects were reservoirs and dams. In the Sacramento Valley, the Shasta Dam, located near Redding on the Sacramento River, and the Folsom Dam, located in Folsom, on the American River, were major projects that contributed to both reclamation and flood control. Construction of Shasta Dam began in 1938 and was completed in 1945. Considered the foundation of the CVP system, the Shasta Dam was

[61] "A Brief History." US Bureau of Reclamation, last updated August 15, 2018. https://www.usbr.gov/history/borhist.html
[62] Mount, 196.
[63] Graham Bradner and Emilie Singleton, "The Origin and Evolution of the California State Plan of Flood Control Levee System," 5.
[64] Mount, 196.
[65] "About the Central Valley Project," U.S. Bureau of Reclamation, last updated August 3, 2020. https://www.usbr.gov/mp/cvp/about-cvp.html.
[66] "A Brief History." U.S. Bureau of Reclamation, last updated August 15, 2018. https://www.usbr.gov/history/borhist.html.

built to provide power as well as flood protection.[67] The Shasta Dam continues to be the largest reservoir in California, holding a maximum capacity of 4,552,000 acre-feet.[68] Although not part of the SRFCP, the Shasta Dam and Reservoir contributes to flood control along the northern Sacramento River. Folsom Dam, on the other hand, was authorized by Congress in 1944 and added to the SRFCP as a flood control structure. The dam and reservoir function to equalize the flow of water from the American River watershed to the Sacramento River, releasing water in dry periods and storing overflow during periods of flooding.[69] Folsom Dam also functions as a reclamation project, storing water for domestic use, irrigation and electrical power as part of the CVP. [70] Folsom Dam was completed by the Corps in 1955 and turned over to the Bureau of Reclamation for operation.

Construction on the SRFCP also continued to expand throughout the valley. By 1944, 980 miles of levees had been added to the SRFCP and the system was considered nearly 90 percent complete.[71] The Flood Control Act of 1944 expanded on the 1936 Flood Control Act to designate the responsibilities of flood control and navigation to the Corps. The low-lying, flood prone, agricultural Central Valley continued to be a major focus for the Corps and the Bureau of Reclamation. Between 1936 and 1975, the Corps built North Fork Dam (1939), Englebright Dam (1941), Mariposa Dam (1948), Owens Dam (1949), Burns Dam (1950), Farmington Dam and Reservoir (1951), Isabella Dam (1953), Bear Dam (1954), Pine Flat Dam (1954), Success Dam (1961), Terminus Dam (1962), Black Butte Dam (1963), New Hogan Dam (1963), Martis Creek Dam (1972), Hidden Dam (1974) and Buchanan Dam (1975).[72] Large scale federal reclamation and flood control projects tapered in the late 1960s, and the Corps and the Bureau of Reclamation shifted staff and resources towards managing existing projects rather than constructing new ones.[73] By 1961, the infrastructure of the SRFCP was deemed completed and the Corps turned towards managing the existing system.

Beginning in 1961, annual inspections of the SRFCP levees were conducted by the Corps, the California Reclamation Board, and the California Department of Water Resources (DWR).[74] At a national level, policy changes in the early 1960s also led to new approaches to federal flood protection in the United States. In 1966, the Federal Task Force on Flood Control Policy observed that the purpose of federal flood control projects had shifted from providing flood relief to existing communities, to paving the way for property development.[75] Concurrently, a 1966 report by the National Resources

[67] "Shasta Dam Construction," US Bureau of Reclamation, last updated July 21, 2020. https://www.usbr.gov/mp/ncao/dam-work.html.
[68] Bradner and Singleton, 6.
[69] "Folsom Dam," California Department of Parks and Recreation, accessed August 20, 2020 https://www.parks.ca.gov/?page_id=882.
[70] Ibid.
[71] Kelley, 309.
[72] "Dam Safety Program," U.S. Army Corps of Engineers Sacramento District, accessed March 4, 2020. https://www.spk.usace.army.mil/Missions/Civil-Works/Dam-Safety-Program/.
[73] "A Brief History." US Bureau of Reclamation, last updated August 15, 2018.
[74] Scott, 4-13.
[75] Chris Elfring et al., *Flood Risk Management and the American River Basin: An Evaluation* (Washington D.C.: National Academy Press, 1995), 165.

Planning Board promoted flood management alternatives including wetland conservation, planned land use and evacuation systems. Many of these non-structural measures were adopted in the National Flood Insurance Act of 1968.[76] As a result of these policy changes, modifications and maintenance of large flood control projects, such as the SRFC, were driven by structural deterioration from the 1960s forward. The levees of the SRFCP in particular have required substantial repairs after major flooding in 1986 and 1997, and additional measures were taken to identify and repair weaknesses in the system after Hurricane Katrina brought renewed national attention to levee safety in 2005.[77]

1.4.4. SRFCP Context Conclusion

Today, manmade water management structures have allowed Californians to transform the floodplains of the Central Valley into urban areas and agricultural land. These structures altered the course of massive floodplains that had existed for thousands of years. Almost two centuries of water management infrastructure have resulted in the rerouting of all major rivers in California, and the diversion of approximately 60% of the water in California by thousands of miles of levees, over 1,400 dams and miles of canals and aqueducts.[78]

The system of levees, dams and channels that made it possible to build the modern Sacramento Valley is now necessary to protect the "reclaimed" land from the natural course of the Sacramento and American Rivers. This dependence, however, has not translated to stability. Even with centralized government plans and advances in engineering, Sacramento and New Orleans are the two American cities that are the most vulnerable to catastrophic flooding.[79]

The probability of flooding depends on the efficacy of manmade barriers that protect converted floodplains. Water management infrastructure, while transformative, requires frequent cyclical maintenance to remain effective. Levees are subject to erosion, underseepage, cracking and rodent infestation.[80] Canals can be clogged by debris, vegetation and invasive species.[81] Dams are susceptible to structural deterioration, and may be breached due to increased runoff upstream or sediment build-up in the corresponding reservoir.[82] Throughout the history of water management in the Sacramento Valley, maintenance and improvements have ensured that levees, canals

[76] Elfring et al., 22.
[77] Scott, 1-2, 1-3.
[78] Mount, 6
[79] Allan James and Michael Bliss Singer, "Development of the Lower Sacramento Valley Flood Control System," *Natural Hazards Review,* Vol. 9(3) (August 2008), 125.
[80] "Levee Owner's Manual for Non-Federal Flood Control Works," U.S. Army Corps of Engineers, accessed March 4, 2021, March 2006, vi. https://www.lrh.usace.army.mil/Portals/38/docs/civil%20works/Levee%20Owners%20Manual.pdf.
[81] "Canal Operation and Maintenance: Vegetation," U.S. Bureau of Reclamation, November 2017, accessed March 4, 2021, 2. https://www.usbr.gov/assetmanagement/docs/Canal_Vegetation.pdf
[82] "Living With Dams: Know Your Risks," Federal Emergency Management Agency, updated February 2013, accessed August 2020. https://www.fema.gov/media-library-data/20130726-1845-25045-7939/fema_p_956_living_with_dams.pdf

and dams function according to their original purpose. Over time, levees in the SRFCP have been raised, widened and enhanced by floodwalls, pumping systems and new stabilization measures to ensure functionality. Additional modifications have included bike paths, roads and boat docks to enhance transportation and recreational opportunities.

Given the prevalence of levee improvements and cyclical maintenance within the SRFCP, the levees that are the subject of this evaluation appear very differently from their original construction. The combination of continued dependence on levees in the SRFCP and changes due to maintenance, repair and development in the surrounding landscape, leads to a tension between the undeniable significance of levees in the Sacramento Valley and a relatively low level of integrity according to the Secretary of Interior's Standards. The sections below provide guidelines for evaluating the levees of the SRFCP and offer recommendations for incorporating eligible properties into an MPL for the SRFCP.

2 Property Type: Levees

2.1 Levee Property Type

Levees are some of the most ubiquitous structures within the SRFCP. Miles of levees extend along the banks of the Sacramento and American Rivers and associated tributaries from the Chico area, toward the Contra Costa Canal. In accordance with NRB 16B, *How to Complete the National Register Multiple Property Documentation Form*, the following section establishes the physical characteristics, associative qualities and information potential that the levee property type must demonstrate to qualify for National Register consideration. The following sections define the basic characteristics of the SRFCP levees and provide guidance for determining the appropriate associated context and period of significance. The aspects of integrity (location, design, setting, materials, workmanship, feeling, and association) are also defined and examined in relation to the levee property type.

Levees are defined by the National Flood Insurance Program as manmade structures, often earthen embankments, designed to contain, control or divert the flow of water to provide protection from temporary flooding.[83] The basic principle of building earthen embankments has been a standard approach to levee construction in the Sacramento Valley since the 1850s, though advances in construction vehicles, materials and geotechnical testing have resulted in changes to levee construction within the associated SRFCP historic contexts.

2.1.1 Early Levee Construction c. 1850-1870

Throughout the 1850s to the 1870s, levees built to protect the new farms in the Sacramento Valley were constructed of the soils at hand. The thick organic soils that were ideal for agriculture served as poor levee building material, shrinking and expanding with water, resulting in cracks and frequent washouts. These early levees constructed with wheelbarrows and shovels were a labor intensive effort often carried out by Chinese workers.[84] These early levees were likely reinforced through a number of vernacular measures. Records from the late 1800s indicate that it was common to cover levees with revetments made of brush and secured with wire to prevent erosion. Levee builders would also add a layer of stone, known as riprap, to stabilize levee slopes during this early construction era.[85]

2.1.2 Construction Equipment c. 1870-1910

Levee building methods and materials improved in the 1870s, when clamshell dredges powered by steam engines could extract alluvial soils from the river channel.[86] The sturdier composition of silt, clay, sand and gravel in alluvial soil served as a better building material. Machinery also allowed substantial levees to be constructed more quickly. Throughout the 1870s and 1890s, a number of inventions in the Sacramento-

[83] "What is a Levee?" Federal Emergency Management Agency, accessed November 5, 2020. https://www.fema.gov/media-library-data/1568748487875-7cdd8673b92cbbda840f7b981a37d399/What_is_a_Levee_0512_508.pdf
[84] Alex Reed Westhoff, *The Sacramento Delta National Heritage Corridor*, 10.
[85] "New Levee Work" *Sacramento Daily Union*, February 11, 1881.
[86] Ibid.

San Joaquin Delta dramatically increased earth moving capacity in levee construction. Patents for a variety of hydraulic dredges were granted as early as 1884.[87] The caterpillar tractor, patented in 1907, was designed to move heavy loads across the soft soils in the Central Valley.[88] Levee protection also evolved through the turn of the century. Concrete also became widely used by the 1910s, commonly poured on levee toes to stabilize the levees.[89]

2.1.3 Levee Design c. 1900s-1960s

The hydrological studies of the early 1900s provided the research to create informed standards for levee construction. At the time of the 1917 Flood Control Act, levee designs were based on three primary factors:

1. Design discharge or channel capacity: the maximum capacity that a waterway can accommodate without flooding
2. Water surface profile: measure of variations in flow depth based on high and low flow stages
3. Freeboard capacity: the distance between the water surface profile and the top of the levee; a "minimum freeboard requirement" was integrated into Corps standards.[90]

As-built drawings from SRFCP units show that the levees were built in a trapezoidal shape with a flat surface at the crest of the levee and a roughly 2:1 slope on the landside and 3:1 slope on the water side. The same trapezoidal shape of the SRFCP levees has remained similar to original construction, however, the size and materials of levees continues to evolve with changes in the hydrology of the watershed. Slurry walls, in particular, have become more common since they were introduced to the United States during the 1960s.[91] Additional design elements have reflected changing priorities such as transportation and recreation along the levees.

2.1.4 Levee Materials c. 1870s-1980s

Dredged alluvial materials from the riverbeds were used throughout the Associated SRFCP Historic Contexts. While these soils were superior to land-based organic soils of the 1870s, they were also sandy and subject to erosion. When Corps-built levees were turned over for state operation in the 1920s, work crews would often stabilize banks using riprap or concrete within the first few years of construction.[92] The discipline of geotechnical engineering emerged during the 1920s, and within the following decades,

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[87] Richard L. Hindle and Neeraj Bhatia, "Territory and Technology: A Case Study and Strategy from the California Delta," *The Plan Journal* 2, no. 2 (2017): 249.
[88] Richard L. Hindle and Neeraj Bhatia, "Territory and Technology: A Case Study and Strategy from the California Delta," 252.
[89] "City Negligent, Flood Danger Grows Acute," *Sacramento Union,* March 30, 1916.
[90] *Sacramento River Flood Control Plan, California Mid-Valley Area, Phase III Design Memorandum*, Vol. I, U.S. Army Corps of Engineers, (Sacramento: U.S. Army Corps, 1995) 1-3.
[91] "Slurry Wall: Behind the Engineering Feat that Made the WTC Possible," 9/11 Memorial, accessed January 14, 2021, https://www.911memorial.org/connect/blog/slurry-wall-behind-engineering-feat-made-wtc-possible.
[92] Scott, 3-43.

soil composition became a consideration in levee construction.[93] Guidelines for soils composition remained general however. The 1949 and 1951 *Operations and Management Manuals* for the Sacramento and American Rivers of the SRFCP advised that levee repairs should be carried out using "fill made in 6-inch layers of earth free from brush, roots, sod or other unsuitable material," the manual also recommended stone protection.[94] Modern methods of geotechnical core sampling and the introduction of materials such as jet grout emerged during the 1970s and 1980s.[95] Erosion due to sandy soil composition has continued to be a challenge to levee integrity within the SRFCP.[96]

2.2 **Period of Significance**

According to guidance presented in NRB 16A, *How to Complete the National Register Form,* a period of significance is defined as "the length of time when a property was associated with important events, activities, or persons, or attained the characteristics which qualify it for National Register listing. Period of significance usually begins with the date when significant activities or events began giving the property its historic significance; this is often a date of construction."[97]

In determining a period of significance for the SRFCP levees, a tension exists between the consideration of the system as a whole versus the discrete units that transformed the immediate area prior to project completion. On one hand, the period of significance for the entire SRFCP levee system could date from the beginning of construction in 1911 to 1961 when the levees, bypasses and weirs of the system were deemed complete by the Corps. The infrastructure of the SRFCP as a whole has effectively channeled floodwaters that would have inundated the Sacramento Valley though the Butte, Sutter and Yolo basins towards Suisun Bay.[98] This birdseye view and broad period of significance demonstrates the original intent of the Green, Hill, Manson-Grunsky and Jackson Plans.

Given the broad range of construction dates, ownership and maintenance, however, it is also appropriate to determine different periods of significance for discrete units of the levee system. Construction and formal support of the Jackson Report began in stages, with the California Flood Control Act of 1911 at the state level and the Flood

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[93] Ben H. Fartherree, *History of Geotechnical Engineering at the Waterways Experiment Station* 1932-2000, U.S. Army Engineer Research and Development Center (Vicksburg: US Army Corps, 2006), accessed November 6, 2020, https://erdc-library.erdc.dren.mil/jspui/handle/11681/15250.
[94] Operation and Management Manual Sacramento River Flood Control Plan: American River Part No. 1, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 20.
[95] Giorgio Guatteri, et al., "Advances in the Construction and Design of Jet Grouting Methods in South America" (paper presented at the International Conference on Case Histories in Geotechnical Engineering, Missouri University of Science and Technology, 1988), 1037. Accessed March 4, 2021, https://scholarsmine.mst.edu/icchge/2icchge/icchge-session5/3
[96] *Sacramento River Flood Control Plan, California Mid-Valley Area, Phase III Design Memorandum*, Vol. I, U.S. Army Corps of Engineers, 1-3.
[97] Linda F. McClelland and Carol D. Schull, "National Register Bulletin 16A: How to Complete the National Register Form" (Wasington D.C.: Government Printing Office, 1997) 42.
[98] Garone, 112

Control Act of 1917 at the federal level. Furthermore, some levees transformed surrounding areas long before the completion of the SRFCP. Levee Units 124 and 125 of the Natomas Basin, for example, were built between 1911 and 1939, as part of an effort to transform the area into an agricultural center. Given their history, the Natomas levees are closely associated with Reclamation District (RD) 1000 and have been listed as a contributing element to the RD 1000 Rural Historic Landscape as well as being part of the SRFCP.[99]

In view of the gradual evolution of the SRFCP and the overlapping development of reclamation districts, irrigation districts, privately built levees and state-built levees that make up the SRFCP, the Corps proposes to consider the period of significance of the SRFCP levees by levee unit. The period of significance for levee units that are evaluated as part of the SRFCP MPL must fall within the broader SRFCP Historic Contexts dating from 1911-1961. The Corps anticipates that periods of significance will be related to levee construction, incorporation into the broader SRFCP, or the effect of the levees on the surrounding landscape. Information about construction and modification of many of the levee units is available in Operation and Management Manuals, on file at the Corps Sacramento District office.

2.3 **Significance**

According to guidance presented in NRB 15*: How to Apply the National Register Criteria for Evaluation,* an historic property evaluated within its historic context must prove significant under one or more of the four criteria for evaluation. These include association with important historic events (Criterion A); association with important historic persons (Criterion B); representativeness of important design and/or construction methodologies (Criterion C); and ability to yield important information about history (Criterion D).

To be considered eligible for listing under **Criterion A**, a property must be associated with one or more events important in the defined historic context. Levees within the SRFCP are potentially significant under Criterion A because of their role in early flood control in California and their role in large-scale federally funded flood control improvement in the state. Population growth and economic prosperity in the Sacramento area were made possible and continue to be made possible by reclamation of seasonal floodplains.

Criterion B applies to properties that are associated with individuals important to history, and are the principal historic properties associated with those individuals during the time period when they achieved significance. Levees are unlikely to be significant under Criterion B.

[99] Denise Bradley and Michael Corbett, *Rural Historic Landscape Report for Reclamation District 1000 for the Cultural Resources Inventory and Evaluations for the American River Watershed Investigation, Sacramento and Sutter Counties*, California (Chico: Dames & Moore Inc., January 1996).

Properties may be eligible under **Criterion C** if they embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic values; or represent a significant and distinguishable entity whose components may lack individual distinction. This criterion applies to properties significant for their physical design or construction, including such elements as architecture, landscape architecture, engineering, and artwork. Levees are unlikely to be eligible for listing in the NRHP under this criterion. Levee construction methods were rudimentary, and levees are unlikely to be distinguished by their individual engineering design (i.e., the engineering of any single levee) under Criterion C. Elements of drainage and bypass infrastructure of the SRFCP, however, may be significant under Criterion C because the bypass system of the Jackson Plan represented a departure from the widely accepted 1900s era single channel levee system, designed for the Mississippi River. The functional success of the SRFCP continues to be based on the weirs, bypasses and channels that allow excess water to escape, mimicking the system of floodplains that characterized the natural hydrology of the Central Valley.

Properties are eligible under **Criterion D** if they have yielded, or are likely to yield, important information about prehistory and/or history. This criterion is most often applicable for archaeological sites. For buildings, structures, and objects to be eligible under Criterion D, they must be, or must have been, the principal source of important information to inform the applicable investigation. Levees are unlikely to be eligible as built-environment resources under Criterion D but they may in some cases contain or overlay archeological sites.

In previous consultations related to ARCF levees and Criterion D, cultural representatives from the United Auburn Indian Community (UAIC) have stated that mounds built by previous generations of Native Americans were constructed along the same waterways that are now part of the ARCF. UAIC's representatives have identified or described these mounds as vernacular architecture, which are contained within the modern levee system. Given that the overall structure of the mounds is obscured by modern water management infrastructure, further information from UAIC would be necessary to fully identify and evaluate them as Native American architecture. Evaluation of such sites is outside the scope of this document, which addresses levees only as historic-era built environment resources. Archaeological sites within, under, or adjacent to levees would be evaluated per ARCF project phase by qualified archaeologists in consultation with Native American tribes and other appropriate consulting parties.

2.4 Integrity

According to guidance presented in the NRB 15: *How to Apply the National Register Criteria for Evaluation,* a property must have historic significance *and* must retain integrity of historic features necessary to convey its significance to qualify for listing in the NRHP. To retain overall historic integrity, a property must possess several, and usually most, of the seven aspects of integrity.

Location: where the historic property was constructed. The relationship between the property and its location is often important to understanding why the property was created. The location, complemented by its setting, is particularly important in recapturing the sense of history. Except in rare cases, the relationship between a property and its historic associations is destroyed if the property is moved. Many levees are in the same locations as they were during the period(s) of significance; some have been moved from those original alignments in support of flood risk management. The historic alignments are documented on historic maps and in other primary sources, which can be used to verify integrity of location.

Design: the combination of elements that make up the form, plan, space, structure, and style of a property. Design results from conscious decisions made during the original conception and planning of a property or its significant alteration. Design includes organization of space, proportion, scale, technology, ornamentation, and materials. It reflects historic functions and technologies as well as aesthetics. It includes such considerations as the structural system; massing; arrangement of spaces; textures and colors of surface materials; and arrangement of plantings. Integrity of design is anticipated to vary widely among SRFCP levees. While some may retain the proportion, scale, technology, and materials from their period of significance, these aspects may have been heavily altered for others (e.g., enlarged proportions, changed textures and colors of surface materials on levees with addition of paving and riprap).

Setting: Setting is the physical environment of a historic property – its character and its relationship to surrounding features and open space. Setting often reflects the basic physical conditions under which a property was built and the functions it was intended to serve. Features of the setting include topographic features, vegetation, paths, fences, relationships between buildings, and open space. These features and their relationships should be examined not only within the exact boundaries of the property, but also between the property and its surroundings. This is important for districts. The integrity of setting for levees is expected to vary widely. The levees' setting has changed drastically in some areas, while in others its setting now may be similar to that during the period(s) of significance. Elements of the setting that have changed since the period of significance are expected to include roads, paths, vegetation, and other built environment features, much of this driven by urban and suburban development and modernization.

Materials: The physical elements combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property. The choice and combination of materials reveal the preferences of those who created the property and indicate the availability of particular types of materials and technologies. A property must retain the key exterior materials dating from the period of its historic significance. Materials added to levees after the period of significance, such as riprap, and paved roadways, etc., diminish integrity of materials.

Workmanship: Workmanship is the physical evidence of the craftsmanship of a particular culture or people during a given period in history or prehistory. It is the evidence of artisans' labor and skill in constructing or altering a building, structure, object, or site. Discussion of workmanship is minimally applicable in a discussion of levee integrity, given the low level of craftsmanship required for their construction. This lack of historic workmanship diminishes the likelihood that levees be considered eligible for listing in the NRHP individually; levees are more likely to be eligible as features that contribute to historic landscapes or other types of historic districts.

Feeling: Feeling is a property's expression of the aesthetic or historic sense of a particular period of time. It results from the presence of physical features that, taken together, convey the property's historic character. Given the lack of physical characteristics that identify historic levees as historic, integrity of feeling for levees is closely linked to integrity of setting, which places the levee within its historic context and communicates the significance of the levee in a way that the levee's own physical characteristics usually cannot.

Association: Association is the direct link between an important historic event or person and a historic property. A property retains association if it *is* the place where the event or activity occurred and is sufficiently intact to convey that relationship to an observer. Like feeling, association requires the presence of physical features that convey a property's historic character. In many cases, the physical appearance of a levee does not convey a sense of historic character because modern levees tend to look the same as historic levees. The levee is more likely to retain integrity of association in a setting that is intact from the period of significance.

Guidelines for assessing the integrity of a potential historic property are found in NRB 15, *How to Apply the National Register Criteria for Evaluation*. The first step is to define the essential physical features that must be present for a property to communicate its historic significance and determine whether those features are visible enough to convey their significance. It is not necessary for a property to retain all its historic physical features or characteristics, but the property must retain the essential physical features that enable it to convey its historic identity. These are the features that define why a property is significant and when it was significant. They are the features without which a property can no longer be identified as, for instance, a late 19th century dairy barn or an early 20th century commercial district. Historic- and current-era levees are often very similar in appearance, making it difficult for the levee in and of itself to convey a sense of history. In absence of prominently historic-era infrastructure (e.g. pumphouses and weirs) in or on the levee, the levee's setting is generally what communicates that it is of the historic era and not of recent construction.

Each type of property depends on certain aspects of integrity more than others to express historic significance. For properties significant under Criterion A, integrity of

design and materials may not be as important. A basic integrity test for a property associated with an important event or person is whether a historical contemporary would recognize the property as it exists today.

Given the low level of visual distinction of the historic-era levee, in most cases the levee's setting is the aspect of integrity that would enable a historical contemporary to recognize the levee. Finally, even if a property is physically intact, its integrity is questionable if its significant features are concealed under modern construction. Addition of nonhistoric riprap, roads, height, and width may diminish the historic integrity of levees as they conceal the historic shape, dimensions, and surface appearance.

The levee property type within the SRFCP MPL is unlikely to retain sufficient integrity to demonstrate its significance, however historic-era levees within the SRFCP have also shaped landscapes, and occasionally these landscapes have been determined eligible for the NRHP. Historic-era levees may be contributing elements to one or more historic landscapes, such as a historic district or rural historic landscape. In these cases, a levee may be historically significant as a contributing element in addition to or instead of being historically significant in its own right. For a historic landscape to retain integrity, the majority of the components that make up the landscape's historic character must possess integrity even if they are individually undistinguished. In addition, the relationships among the landscape's components must be substantially unchanged since the period of significance. When evaluating the impact of intrusions upon the integrity of the landscape, it is necessary to consider the relative number, size, scale, design, and location of components that do not contribute to significance. A landscape is not eligible if it contains so many alterations or new intrusions that it no longer conveys the sense of a historic environment, and a component of a landscape cannot contribute to the significance if it has been substantially altered since the period of the landscape's significance.

2.5 Assessment of Adverse Effects

An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register. An adverse effect finding indicates that an undertaking will diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, and/or association. Adverse effects need not be proximal in time to the undertaking and include reasonably foreseeable effects that may occur later in time, be farther removed in distance or be cumulative. Activities that could foreseeably adversely affect project levees are discussed below. Levees within the SRFCP are regularly maintained and repaired, and the effects of each undertaking should be assessed by project. The potential project activities mentioned below are not exhaustive, but the discussion provides a guide for assessing effects to levees.

Activities likely to adversely affect integrity of location include those associated with a change of levee alignment. The extent of change in alignment should be considered

when assessing the project's effects, as well as what that change means for spatial relationships between the levee and other landscape features.

Several types of activities are likely to adversely affect integrity of design. These include changes to the proportions of levees—e.g., increased or decreased levee height or footprint; changes in textures/colors of surface materials, including addition of materials such as paved roads; and addition/modification of pumping infrastructure. Addition of small features such as culverts or gates would be unlikely to cause an adverse effect. Activities likely to adversely affect integrity of materials include addition of surface materials that do not date to the period of significance, such as riprap, vegetation, and pavement.

Activities likely to adversely affect integrity of setting and feeling include activities that result in changes to vegetation coverage; change in use of adjacent open land; and addition of built environment features around the levee. Activities that may affect integrity of association include those resulting in changes to or end of levee function (i.e., retiring or replacing the levee as part of flood control infrastructure).

Project activities are unlikely to adversely affect integrity of workmanship. Workmanship is not typically key in communicating the significance of levees, though rarely levees may have important examples of masonry work or other important constructed features, and modifications to these could adversely affect such levees.

3 ARCF Levees

3.1 SRFCP Levee Units within the ARCF Eligibility Status

Several of the SRFCP Levees within the ARCF APE have been previously evaluated. The section below provides a summary of the evaluation status of SRFCP Levees within the ARCF APE (Figure 14). Evaluations of SRFCP Units 118, 124 and 125 are presented in the following sections.

SRFCP Unit 115: SRFCP Unit 115 was determined eligible through consensus determination in a letter from the SHPO to the Corps dated October 20, 2020 (COE 120203C). The evaluation and updated DPR forms were submitted in a report titled *Cultural Resources Inventory and Evaluation Report American River Common Features 2016 Project, Sacramento River East Levee, Contract 1 Phase*, completed by GEI Consulting in October 2019.

SRFCP Unit 117: SRFCP Unit 117 was determined eligible through consensus determination in a letter from the SHPO to the Corps dated October 20, 2020 (COE120203C). The evaluation and updated DPR forms were submitted in a report titled *Cultural Resources Inventory and Evaluation Report American River Common Features 2016 Project, Sacramento River East Levee, Contract 1 Phase*, completed by GEI Consulting in October 2019.

SRFCP Unit 118 Part 1: Isolated sections of SRFCP Unit 118 Part 1 (P-34-00509) have been recorded as part of previous projects, however the full unit has not been included in a single evaluation. An evaluation of SRFCP Unit 118 Part 1 follows in the below paragraphs and is documented in the attached DPR forms. The Corps has evaluated the SRFCP Unit 118 Part 1 not eligible for the NRHP.

SRFCP Unit 118 Part 2: Isolated sections of SRFCP Unit 118 Part 2 (P-34-00508) have been recorded as part of previous projects, however the full unit has not been included in a single evaluation. An evaluation of SRFCP Unit 118 Part 2 follows in the below paragraphs and is documented in the attached DPR forms. The Corps finds SRFCP Unit 118 Part 2 not eligible for the NRHP.

SRFCP Units 124 and 125 (RD 1000): Levee Units 124 and 125 (P-34-00490) were first built when Reclamation District 1000 (RD 1000) was established in 1911 under the California Flood Control Act of 1911. RD 1000 (P-34-00490), located in the Natomas Basin, was developed by the Natomas Company with the intention to modify the floodplain with levees and drainage infrastructure to accommodate agricultural development. The RD 1000 levees were added to the SRFCP in 1951. As such, SRFCP Levee Units 124 and 125 have significance within the context of the SRFCP, they were also determined to be contributing elements to RD 1000, a rural historic landscape (RHL), delineated in 1994. Given this potential dual eligibility, the Corps considered the levees both within the context of the SFRCP and the RD 1000 RHL. The Corps finds the levees non-contributing to the RD 1000 RHL. Furthermore, as units of the SRFCP, the Corps finds Units 124 and 125 not eligible for listing as a historic property on the NRHP.

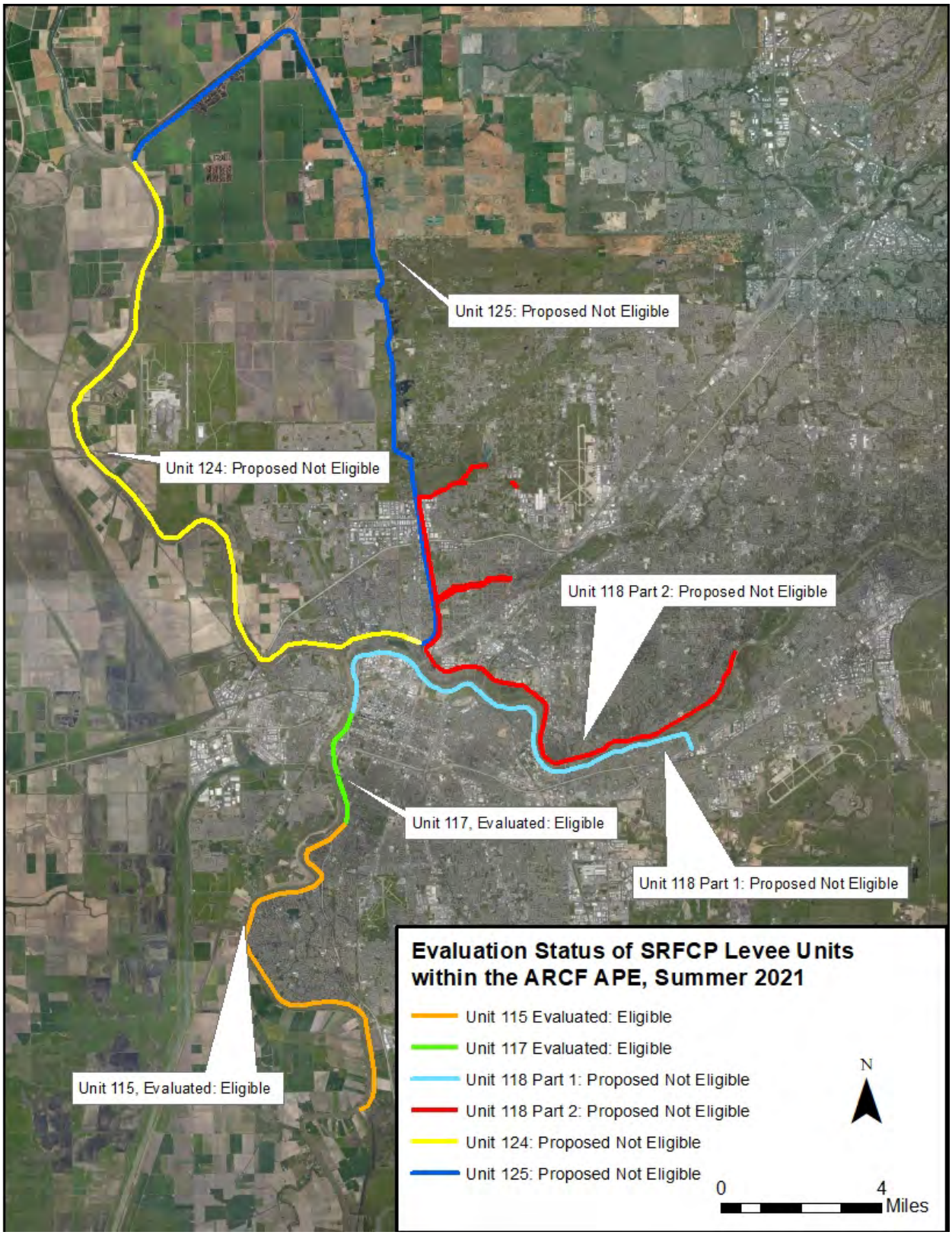

Figure 14: Evaluation Status of SRFCP Levee Units within the ARCF APE, SRFCP Levee Units proposed not eligible are evaluated in this report

3.2 SRFCP Levee Unit 118

SRFCP Levee Unit 118 consists of two discontiguous levee systems, Unit 118 Part 1 and Part 2 located along the north and south banks of the American River and the NEMDC (Figure 15). Parts 1 and 2 fall under the same Associated SRFCP Historic Context: Post-New Deal Construction 1935-1961 based on the dates they were incorporated into the SRFCP, but there are several differences between the two Parts. Unit 118 Parts 1 and 2 were added to the SRFCP in different years and serve to protect different communities. As a result of these differences in location and SRFCP incorporation, Unit 118 Parts 1 and 2 are considered separately in the following descriptions, construction histories and determinations of eligibility.

3.2.1 Description: Unit 118 Part 1

The levees of Unit 118 Part 1 of the SRFCP mitigate flood risk in the northern districts of the City of Sacramento, East Sacramento and La Riviera. Measuring approximately 11.5 miles, the levee system begins near Riviera Park and continues along the south bank of the American River towards Tower Bridge on the east bank of the Sacramento River (Figure 16).[100] On the water side, the levees are bordered by the American River Parkway and riparian areas. The land side is occupied by the City of Sacramento and residential areas. The earthen levees measure between 39 to 44 ft. in height and are generally trapezoidal in shape. Over 75% of the system is reinforced by slurry cutoff walls. Paved roads and recreational trails run along the crest of the levees.[101]

Several bridges and roads, notably Interstate 5, cross over or through the levee system, which is located in a densely populated area. A number of gaps in the levee unit allow access to these roads and bridges. One additional gap in the eastern end of the unit, near Mayhew Slough, allows storm water to be directed into the American River through a drainage channel.[102] During flooding, closure structures block any openings in the levees. Flood protection provided by the levees of Unit 118 Part 1 is enhanced by a pumping system.[103]

[100] "Operation and Management Manual Sacramento River Flood Control Plan Unit No. 118 Part 1," on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 1.
[101] "Operation and Management Manual Sacramento River Flood Control Plan Unit No. 118 Part 1," 23.
[102] "Operation and Management Manual Sacramento River Flood Control Plan Unit No. 118 Part 1," 25.
[103] "Levee System Overview: American River Flood Control District," National Levee Database. U.S. Army Corps of Engineers, accessed August 25, 2020, https://levees.sec.usace.army.mil/#/levees/system/5205000392/summary.

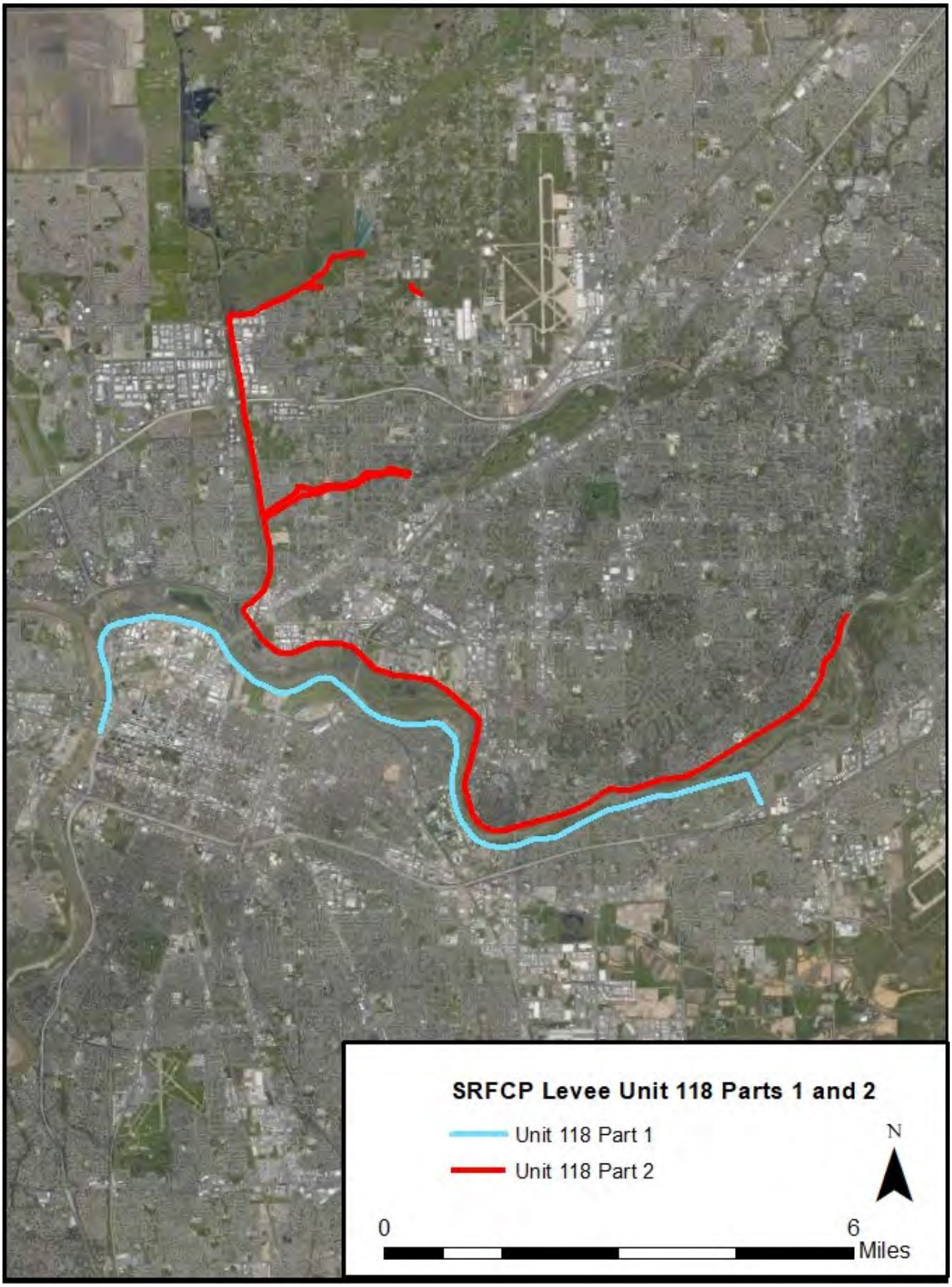

Figure 15: SRFCP Levee Unit 118 Parts 1 and 2

Figure 16: SRFCP Unit 118 Part 1

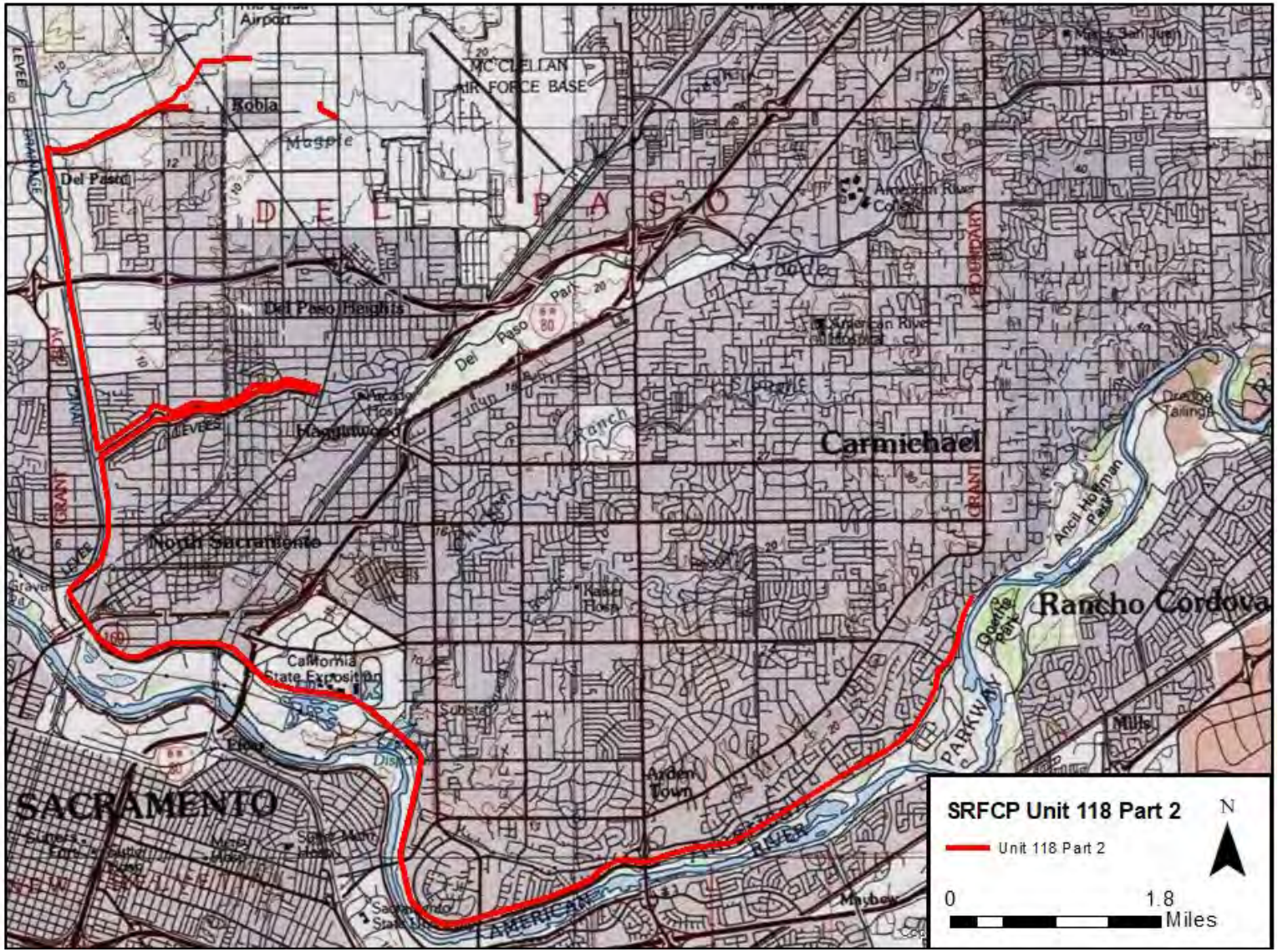

Figure 17: SRFCP Unit 118 Part 2

3.2.2 Description: Unit 118 Part 2

The levees of Unit 118 Part 2 of the SRFCP serve to mitigate flood risk in the neighborhoods of Arden-Arcade, North Sacramento and Del Paso Heights.[104] The system, measuring approximately 23 miles, begins on the northern (right) bank of the American River near the William B. Pond Recreation Area and continues downstream for approximately 11 miles to reach the NEMDC. The levee wall then curves north to form the east levee (left bank) of the NEMDC, extending just under 4 miles, to end at Dry Creek (Figure 17).

Two levee walls extend east from the NEMDC. One is located along the north and south banks of Arcade Creek for approximately 3 miles, ending near the Hagginwood neighborhood. The second levee extends along the south bank of Dry Creek, approximately 2.3 miles, from Hansen Ranch to Bell Acqua Park, south of the Rio Linda Airport. A discontiguous levee section measuring approximately 0.25 miles is located along the Magpie Creek Diversion Channel, near Raley Boulevard.[105] The Magpie Creek Diversion Channel is designed to divert floodwaters from Magpie Creek to Dry Creek, where overflow may be conveyed to the NEMDC. The NEMDC diverts water from Dry Creek, Arcade Creek and Natomas to the Sacramento River at Discovery Park, located near the confluence of the Sacramento and American Rivers.[106]

Levees in Unit 118 Part 2 are generally trapezoidal in shape and measure between 3 and 26 ft. in height. Sections of the levee system also differ in materials and construction. Levees along the American River and the south bank of Arcade Creek are built of compacted soil and concrete floodwalls. The remaining levees at the NEMDC, Arcade Creek, Dry Creek and Magpie Creek are primarily constructed of compacted soil, with the exception of a small section of concrete flood wall located near Hagginwood. The paved American River Bike Trail runs along the crown of the American River levees.[107]

Two openings in the American River levees allow traffic from the North Sacramento Freeway and Del Paso Boulevard to pass through. The levee openings are filled with panels during times of flooding and traffic is rerouted.[108] Similarly, the Union Pacific Railroad runs parallel to the western side of the NEMDC levees, with the tracks located to the east of the levee walls. During dry periods, locomotives may pass through openings in the levees at Arcade and Dry Creeks. During flooding, the openings are filled by panels to provide flood protection.[109]

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[104] "Operation and Management Manual Sacramento River Flood Control Plan Unit No. 118 Part 1," on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 15.
[105] "Levee System Overview: American River Flood Control District: Dry Creek, NEMDC, Arcade Creek," National Levee Database. US Army Corps of Engineers, accessed August 25, 2020, https://levees.sec.usace.army.mil/#/levees/system/5205000392/summary
[106] Ibid.
[107] Ibid.
[108] Ibid.
[109] Ibid.

3.2.3 Construction History Unit 118: Introduction

Levee Unit 118 Parts 1 and 2 are part of the SRFCP. Prior to incorporation into the SRFCP in the 1950s, levee systems on the north (right) and south (left) banks of the American River had been part of the landscape for decades. With the establishment of the City of Sacramento in 1850, a series of levees, measuring approximately 3 ft. high were constructed on the south bank of the American River.[110] Scattered local levees were also built on the North Bank of the American River by the 1900s, however it was after severe floods in the 1920s that a comprehensive plan of levee construction in the area was implemented by the American River Flood Control District (ARFCD), established in 1927.[111] Between 1925 and 1937, levees were built along the north bank of the American River, from the NEMDC to approximately the location of the current California Exposition and State Fair (Cal Expo) (Figures 18-22). On the south bank, the existing levee system was improved and moved to align more closely with the riverbed.[112]

By 1943, a wall of ARFCD levees on the south bank of the American River extended approximately 10.5 miles from the confluence of the Sacramento and American Rivers to Mayhew Slough, located near the present-day location of the Mayhew Drain closure (Figure 21). On the north bank, a smaller, “C” shaped levee was built near the present-day location of Cal Expo and continued along the American River, curving up along the NEMDC and then east along Arcade creek. The 1943 Corps map, drafted for the SRFCP, notably coded the ARFCD levees as “present authorized project levees not yet completed to authorized project grade and/or section.” Improvements to add the ARFCD levees to the SRFCP began during the late 1940s, and both units were added to the SRFCP by 1955.[113]

[110] Nathan Hallam, “Planning Sacramento’s Townsite, 1853-1870,” in *River City and Valley Life: An Environmental History of the Sacramento Region*, eds. Christopher J. Castaneda and Lee M.A. Simpson (Pittsburgh: University of Pittsburgh Press, 2013), 66.
[111] “Who We Are,” American River Flood Control District, accessed November 23, 2020, https://www.arfcd.org.
[112] Sacramento River Flood Control Plan Maps 1895-1955, US Army Corps of Engineers, on file at the US Army Corps, Sacramento District office.
[113] Operation and Management Manual Sacramento River Flood Control Plan Unit No. 118 Part 1, 8.

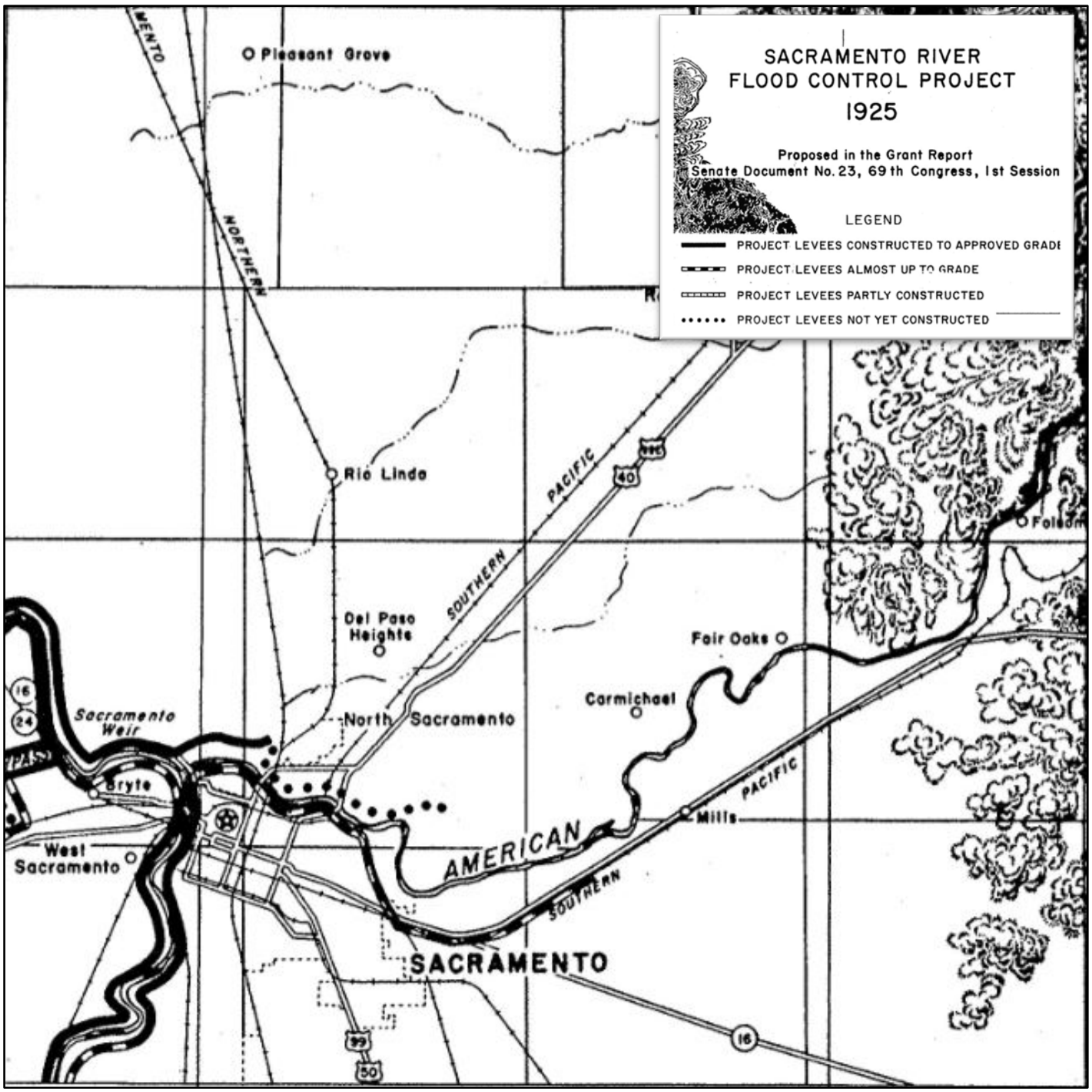

Figure 18: 1925 Map Showing location of SRFCP Unit 118

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

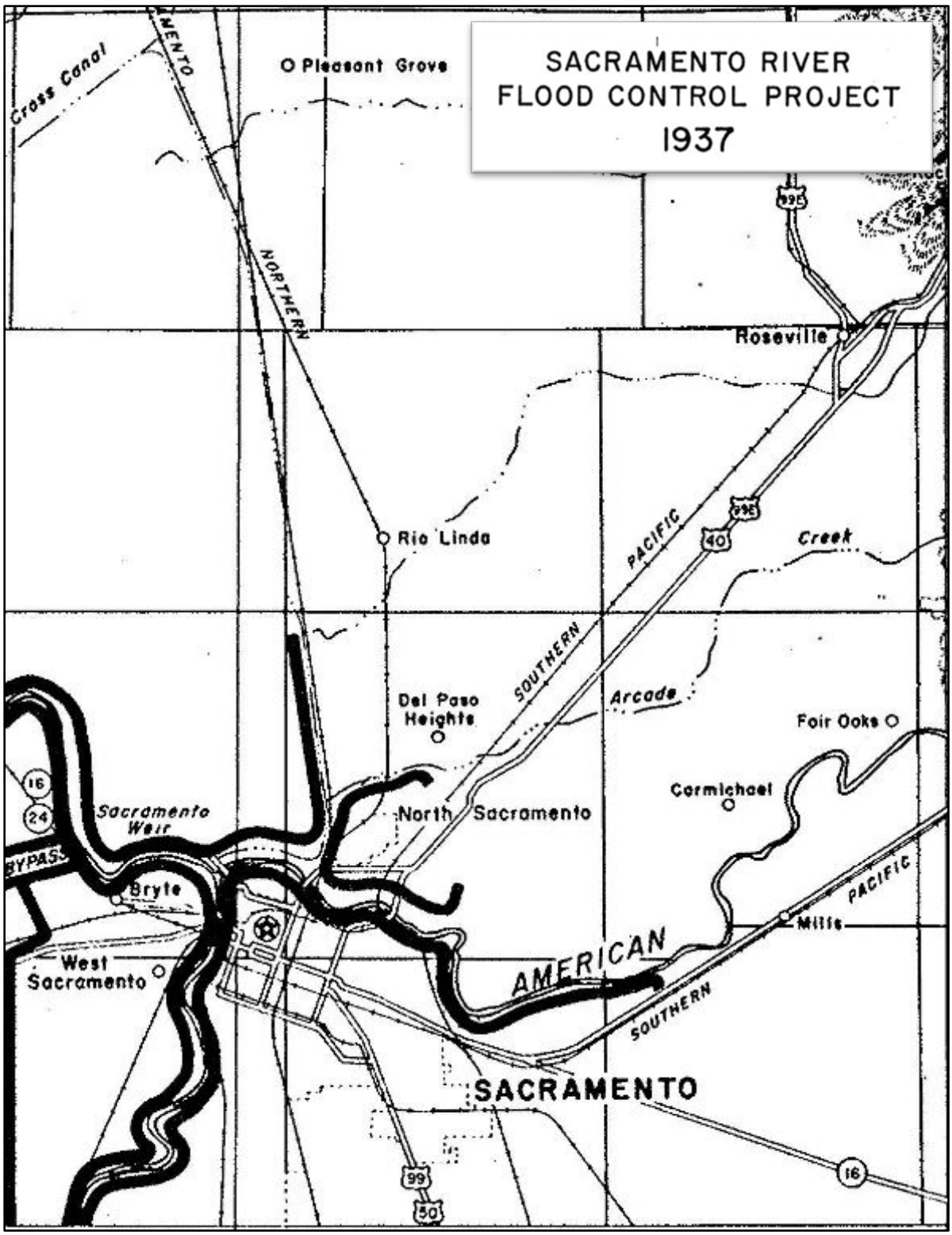

Figure 19: 1937 Map Showing location of SRFCP Unit 118

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

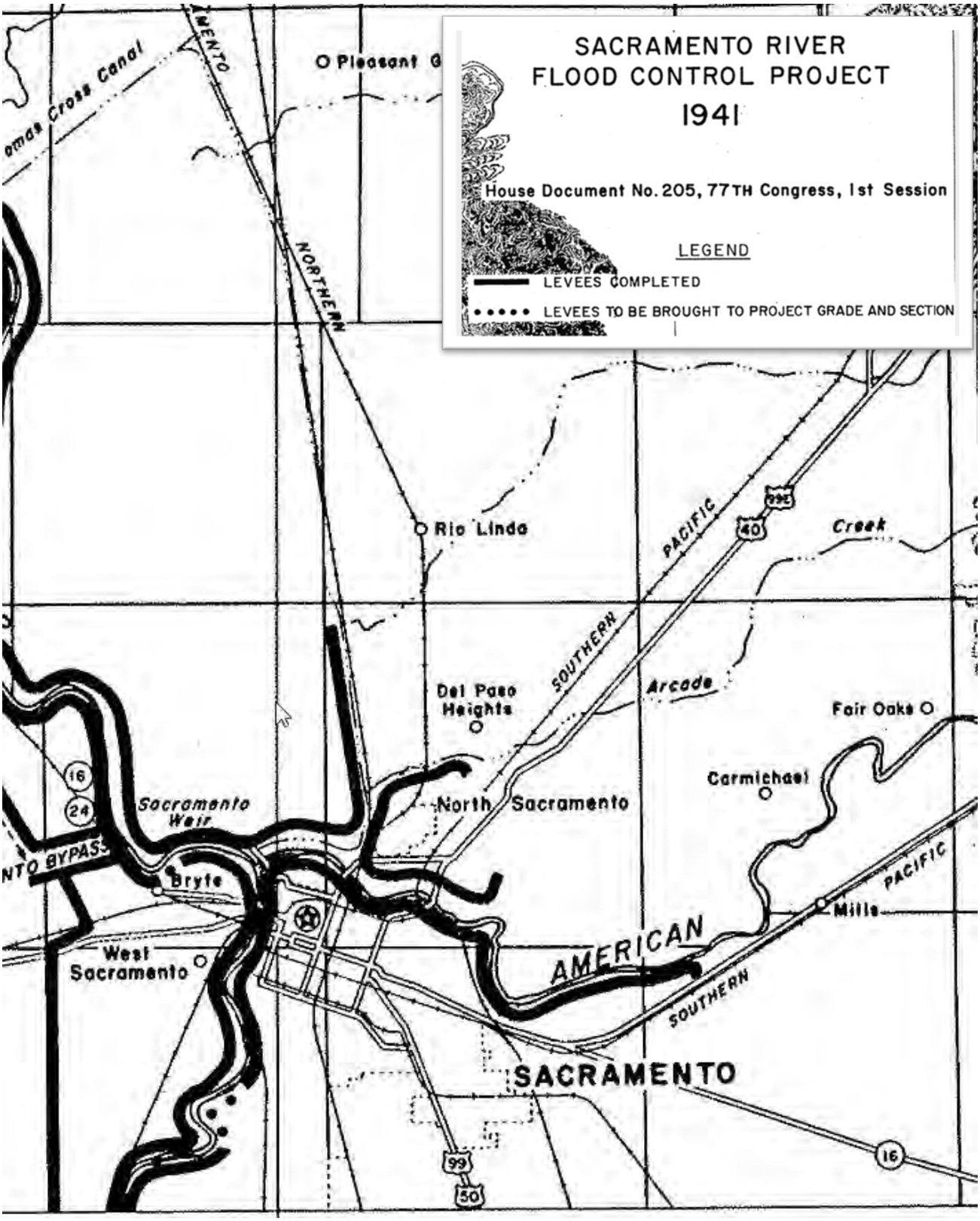

Figure 20: 1941 Map Showing location of SRFCP Unit 118

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

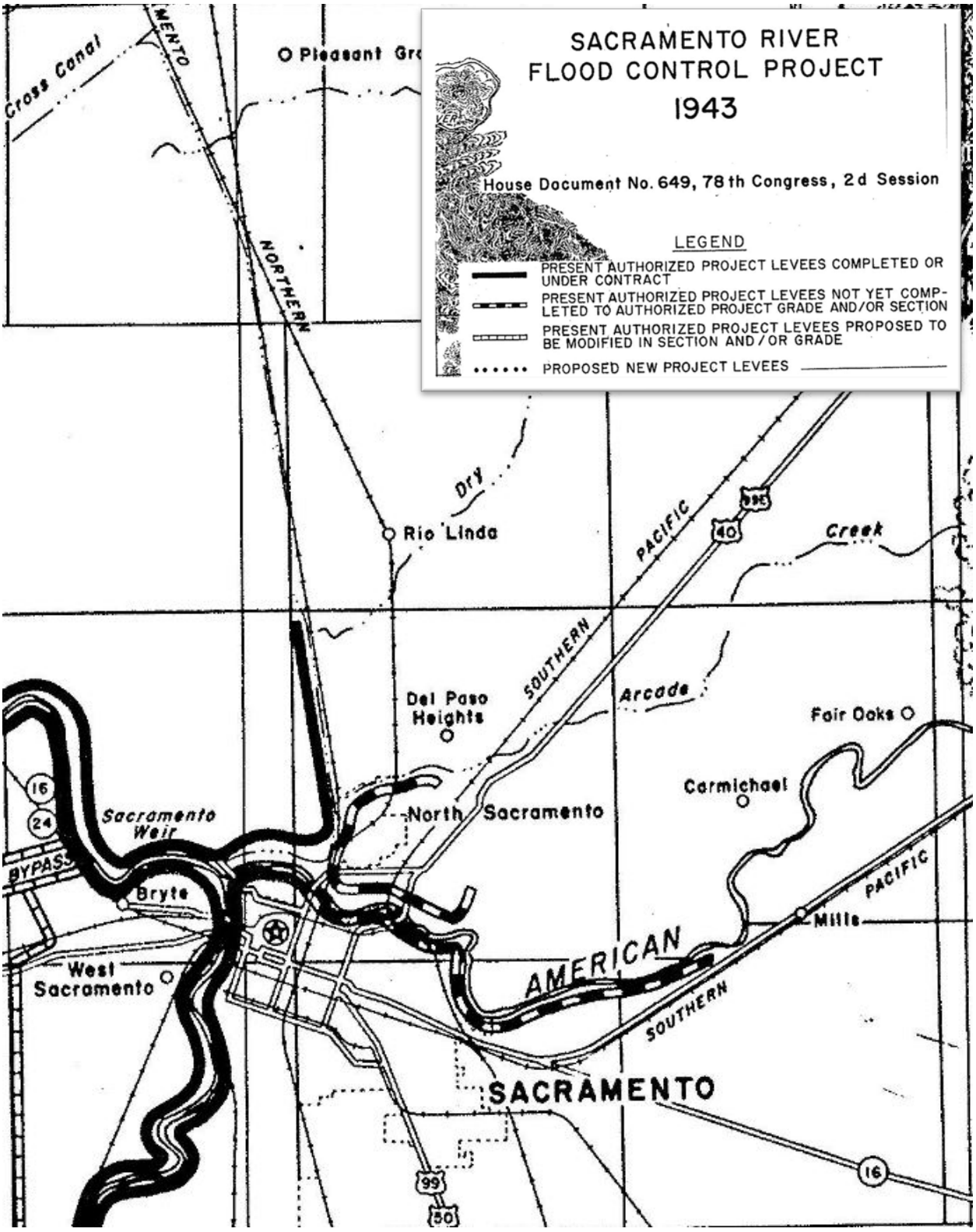

Figure 21: 1943 Map Showing location of SRFCP Unit 118

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

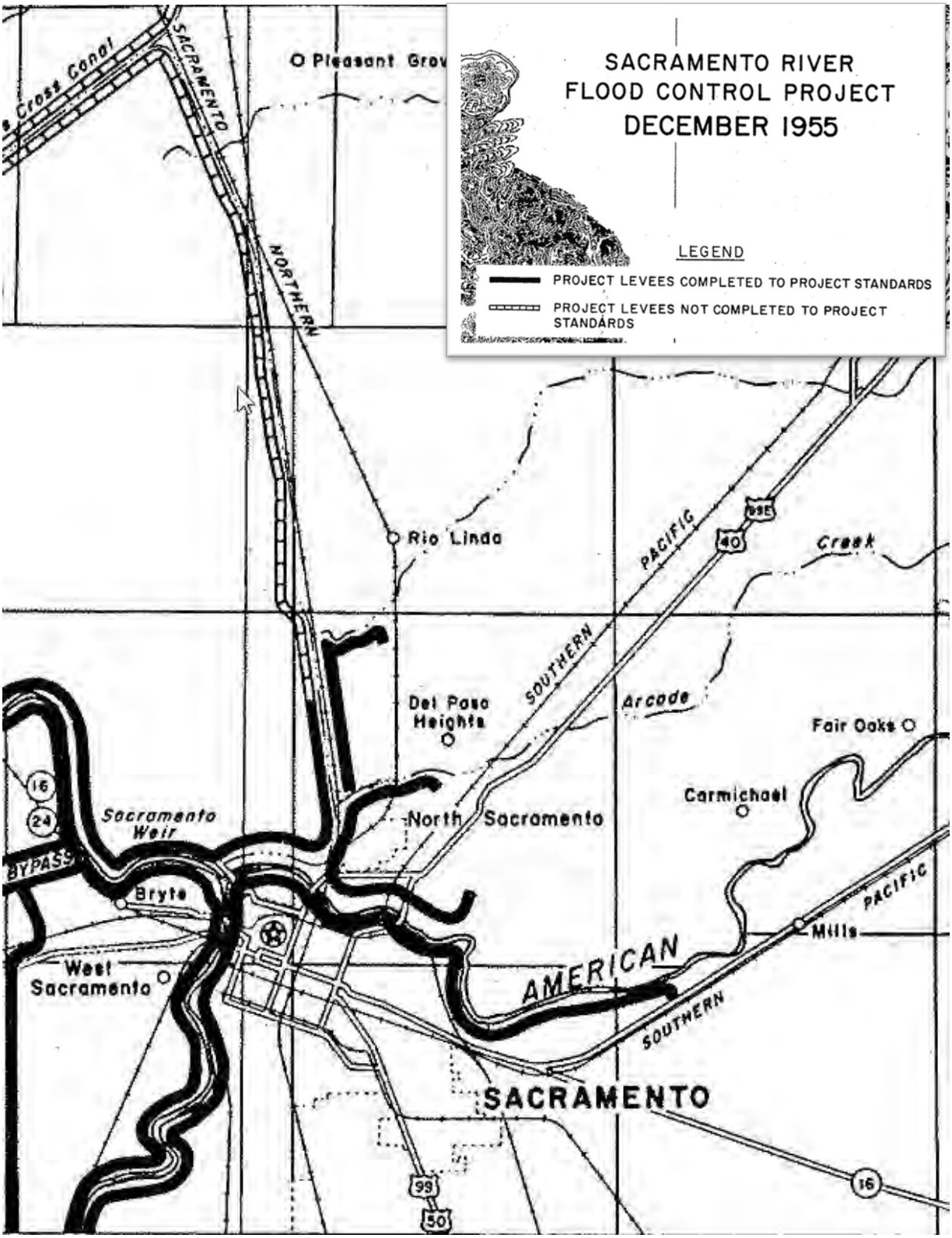

Figure 22: 1955 Map Showing location of SRFCP Unit 118

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

3.2.3.1 *Construction History: Unit 118 Part 1*

Unit 118 Part 1 was incorporated into the SRFCP in 1951 after the existing levee was improved between 1948 and 1951. In accordance with the Flood Control Act, the levee unit was transferred to the State Reclamation Board on behalf of the State of California. [114] Following the incorporation of the levees into the SRFCP, the Corps continued to make improvements to the levee unit. Improvements from 1965 forward have included the addition of stone protection and embankments and miscellaneous levee rehabilitation. A series of major improvements between 2010 and 2016 included levee raises, the construction of the Mayhew Drain closure structure, jet grout and cutoff walls.[115]

3.2.3.2 *Construction History: Unit 118 Part 2*

Unit 118 Part 2 was first incorporated into the SRFCP in 1955 after the Corps improved a number of existing levees. In accordance with the Flood Control Act, the levee unit was transferred to the State Reclamation Board on behalf of the State of California following those improvements. The levees were regulated by the CVFPB then operated and managed by the American River Flood Control District and the CA DWR.

When the levees were completed in 1955, the unit was less expansive than the current configuration. In 1955, Unit 118 Part 2 ended approximately 3.5 miles east of the NEMDC, with a section that curved slightly north around the current site of the California Exposition and State Fair.[116] Between 1955 and 1958, an additional 8.15 mile section of levees was built east toward Carmichael Bluffs. This is the current configuration that exists on the north bank of the American River. When the levee extension to Carmichael Bluffs was completed in 1958, a 3,500 ft. section of levee that had extended north around the current Cal Expo was rendered ineffectual. In 1990, the ARCF, with no objection from the Corps, abandoned the Cal Expo section of levee.[117] Following the incorporation of the levees into the SRFCP, the Corps continued to make improvements to the levee unit. Additional stone bank protection and several paved patrol roads were added to the levees between 1962 and 1970. A number of improvements between the late 1990s and 2010s added cutoff walls, jet grout and added materials to widen, strengthen, and raise levee walls.[118]

3.2.4 NRHP Evaluation Unit 118 Part 1

3.2.4.1 *Significance*

The period of significance for Unit 118 Part 1 dates from 1951 to 1961. It was in 1951 that improvements to the levee were completed to Corps standards and the levee unit was transferred from the Corps to the State of California in accordance with the Flood Control Act of 1917, as amended.[119] Unit 118 Part 1 was transferred to the

[114] The State Reclamation Board was later known as the Central Valley Flood Protection Board (CVFPB)
[115] Operation and Management Manual Sacramento River Flood Control Plan Unit No. 118 Part 1, 10.
[116] Operation and Management Manual Sacramento River Flood Control Plan Unit No. 118 Part 2, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 26.
[117] Operation and Management Manual Sacramento River Flood Control Plan Unit No. 118 Part 1, 3-4.
[118] Operation and Management Manual Sacramento River Flood Control Plan Unit No. 118 Part 1, 54-61.
[119] Operation and Management Manual Sacramento River Flood Control Project Unit No. 118 Part 1, 72.

SRFCP during the era of Post-New Deal Construction when water management infrastructure received broad political and popular support at the federal level. This period of significance ends in 1961 when the SRFCP was deemed complete, and new types of flood risk management strategies were adopted as alternatives to big infrastructure.

Unit 118 Part 1 is significant under **Criterion A** given that the levee unit is part of the SRFCP. The SRFCP, constructed between 1911 and 1961, was the first large-scale flood control project implemented in California. The SRFCP continues to foster population growth and economic development through reclamation of seasonal floodplains. Unit 118 Part 1 is not significant under **Criterion B** because the levees are not associated with the lives of significant persons in our past. The design and construction of system, as well as modifications were not by any one individual or individuals with particular significance at the local state or national levels. Unit 118 Part 1 is not significant under **Criterion C** because the levees do not embody the distinctive characteristics of a type, period or method of construction, nor do they represent the work of a master, possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction. The levees of Unit 118 Part 1 are constructed of common materials have been repaired and modified using typical methods and technology. Furthermore, the levees are not characteristic elements of the bypass system that distinguishes the design of the SRFCP in the Central Valley. Unit 118 Part 1 is not significant under **Criterion D** because the levees are unlikely to show or yield information important to history within the period of significance. Note that this assessment of Criterion D applies to historic-era significance only.

3.2.4.2 *Integrity*

The levees are currently in fair condition; large trees, pipes, utility poles and animal burrows have increased the possibility of seepage and levee failure. Due to the location and construction methods of Unit 118 Part 1, floodwaters are likely to rise high on the levees during the rainy season, which increases the probability of seepage and erosion.[120] Levees require frequent cyclical maintenance to remain effective and as such, the levees of Unit 118 have been raised, widened and enhanced by floodwalls, pumping systems and new stabilization measures to ensure functionality. Additional modifications have included bike paths and roads to enhance transportation and recreational opportunities.

Given the prevalence of levee improvements and cyclical maintenance within Unit 118 and the SRFCP as a whole, the levees that are the subject of this evaluation appear very differently from their original construction. The levees retain a relatively low level of integrity according to the Secretary of Interior's Standards in all standards apart from location and association. To retain overall integrity, a property must possess several, and usually most, of the seven aspects of integrity.

[120] "Levee System Overview: City of Sacramento, American River Left Bank," National Levee Database, US Army Corps of Engineers, accessed August 27, 2020. https://levees.sec.usace.army.mil/#/levees/system/5205000441/summary.

The levee retains a moderate integrity of location. The alignment of Unit 118 Part 1 remains the same as it was during the period of significance, although the levee footprint has been enlarged since 1961. Similarly, the levee retains a moderate to low level of association. The levee remains strongly associated with its original purpose as a flood control structure, however, the physical appearance of Unit 118 Part 1 does not convey a sense of its historic character because modern levees tend to look the same as historic levees. The levee is more likely to retain integrity of association in a setting that is intact from the period of significance. Materials, workmanship and design of the levee are low due to cyclical maintenance and improvements that that have heightened, widened and added new materials to the levee. Setting and feeling in particular have been compromised by urban development in the City of Sacramento and North Sacramento since the 1960s.

3.2.4.3 *Determination of Eligibility*

In view of this analysis, the Corps finds Unit 118 Part 1 not eligible for listing as a historic property on the NRHP. While the levees of Unit 118 Part 1 are significant, they do not retain sufficient integrity to communicate their significance.

3.2.5 NRHP Evaluation Unit 118 Part 2

3.2.5.1 *Significance*

The period of significance for Unit 118 Part 2 dates from 1958 to 1961. The levee unit was transferred from the Corps to the State of California in accordance with the Flood Control Act of 1917, as amended, on December 15, 1955.[121] However, between 1955 and 1958, the levees were extended approximately eight miles east from the present-day Cal Expo location to Carmichael Bluffs under a Corps contract. The 1958 extension resulted in the current configuration of SRFCP Levee Unit 118 Part 2.[122] Unit 118 Part 2 was transferred and completed during the era of Post-New Deal Construction when water management infrastructure received broad political and popular support at the federal level. This period of significance ends in 1961 when the SRFCP was deemed complete, and new types of flood risk management strategies were adopted as alternatives to big infrastructure.

Unit 118 Part 2 is significant under **Criterion A** given that the levee unit is part of the SRFCP. The SRFCP, constructed between 1911 and 1961, was the first large-scale flood control project implemented in California. The SRFCP continues to foster population growth and economic development through reclamation of seasonal floodplains. Unit 118 Part 2 is not significant under **Criterion B** because the levees are not associated with the lives of significant persons in our past. The design and construction of system, as well as modifications were not by any one individual or individuals with particular significance at the local state or national levels. Unit 118 Part 2 is not significant under **Criterion C** because the levees do not embody the distinctive

[121] W.J. Ely, Col, District Engineer, US Army Corps of Engineers, Sacramento District, to California Reclamation Board December 15, 1955, Sacramento River Flood Control Project Unit No. 118 Part 2, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA.
[122] Operation and Management Manual Sacramento River Flood Control Project Unit No. 118 Part 2, 15.

characteristics of a type, period or method of construction, nor do they represent the work of a master, possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction. The levees of Unit 118 Part 2 are constructed of common materials have been repaired and modified using typical methods and technology. Furthermore, the levees are not characteristic elements of the bypass system that distinguishes the design of the SRFCP in the Central Valley. Although the levees along Dry Creek, Magpie Creek and the NEMDC serve to divert floodwaters to bypass systems the construction of these levees does not differ substantially from other levee segments within the Unit. Unit 118 Part 2 is not significant under **Criterion D** because the levees are unlikely to show or yield information important to history within the period of significance. Note that this assessment of Criterion D applies to historic-era significance only.

3.2.5.2 *Integrity*

The current condition of the levees is fair to poor. The north bank of the American River has a number of unauthorized encroachments and is showing signs of erosion due to the swifter currents of the river. Levees located above Arcade Creek within Unit 118 Part 2 are deteriorating due to extensive animal burrows, culverts in disrepair and vegetation overgrowth.[123] Levees require frequent cyclical maintenance to remain effective and as such, the levees of Unit 118 have been raised, widened and enhanced by floodwalls, pumping systems and new stabilization measures to ensure functionality. Additional modifications have included bike paths and roads to enhance transportation and recreational opportunities.

Given the prevalence of levee improvements and cyclical maintenance within Unit 118 and the SRFCP as a whole, the levees that are the subject of this evaluation appear very differently from their original construction. The levees retain a relatively low level of integrity according to the Secretary of Interior's Standards in all standards apart from location and association. To retain overall integrity, a property must possess several, and usually most, of the seven aspects of integrity.

The levee retains a moderate integrity of location. The alignment of Unit 118 Part 2 remains the same as it was during the period of significance, although the levee footprint has been enlarged since 1955. Similarly, the levee retains a moderate to low level of association. The levee remains strongly associated with its original purpose as a flood control structure, however, the physical appearance of Unit 118 Part 2 does not convey a sense of its historic character because modern levees tend to look the same as historic levees. The levee is more likely to retain integrity of association in a setting that is intact from the period of significance. Materials, workmanship and design of the levee are low due to cyclical maintenance and improvements that that have heightened, widened and added new materials to the levee. Setting and feeling in particular have been compromised by urban development in the City of Sacramento and North Sacramento since the 1950s.

[123] "Levee System Overview: American River Flood Control District."

3.2.5.3 *Determination of Eligibility*

In view of this analysis, the Corps finds Unit 118 Part 2 not eligible for listing as a historic property on the NRHP. While the levees of Unit 118 Part 2 are significant, they do not retain sufficient integrity to communicate their significance.

3.3 **SRFCP Units 124 and 125**

Located in Natomas, the northwest part of the City of Sacramento, Units 124 and 125 form a ring of levees designed to protect the Natomas Basin from flood risk (Figure 23). The closed levee system, measuring approximately 42 miles, was originally constructed in 1914 to provide flood protection for Reclamation District 1000 (RD 1000), which later became known as Natomas. RD 1000 continues to operate under a board of Trustees. The levees of RD 1000 were incorporated into the SRFCP in 1951.

Within the SRFCP system, the Natomas Basin levees are divided into two units, however within RD 1000, levees were also commonly segmented by rough cardinal direction: the Cross Canal Levee to the north, the East Levee to the east and southeast, and the River Levee to the west and southwest (Figure 24). For the purposes of this evaluation, the Natomas ring levees will be considered by SRFCP Unit, although references may be made to the Cross Canal, East and River levees, as appropriate.

RD 1000 was delineated as a Rural Historic Landscape (RHL) in 1994, and the levees were designated as contributing elements to the RD 1000 RHL. Levee Units 124 and 125 are also part of the SRFCP, and as such they are considered significant under Criterion A for the associated SRFCP Historic Context: Post-New Deal Construction 1935-1961. Given this potential dual significance, the Corps has considered the levee units both within the context of the RD 1000 RHL and the SRFCP. A re-evaluation of the RD 1000 RHL follows in Part 4. The sections below present a brief physical description, construction history and integrity assessment of the existing levees.

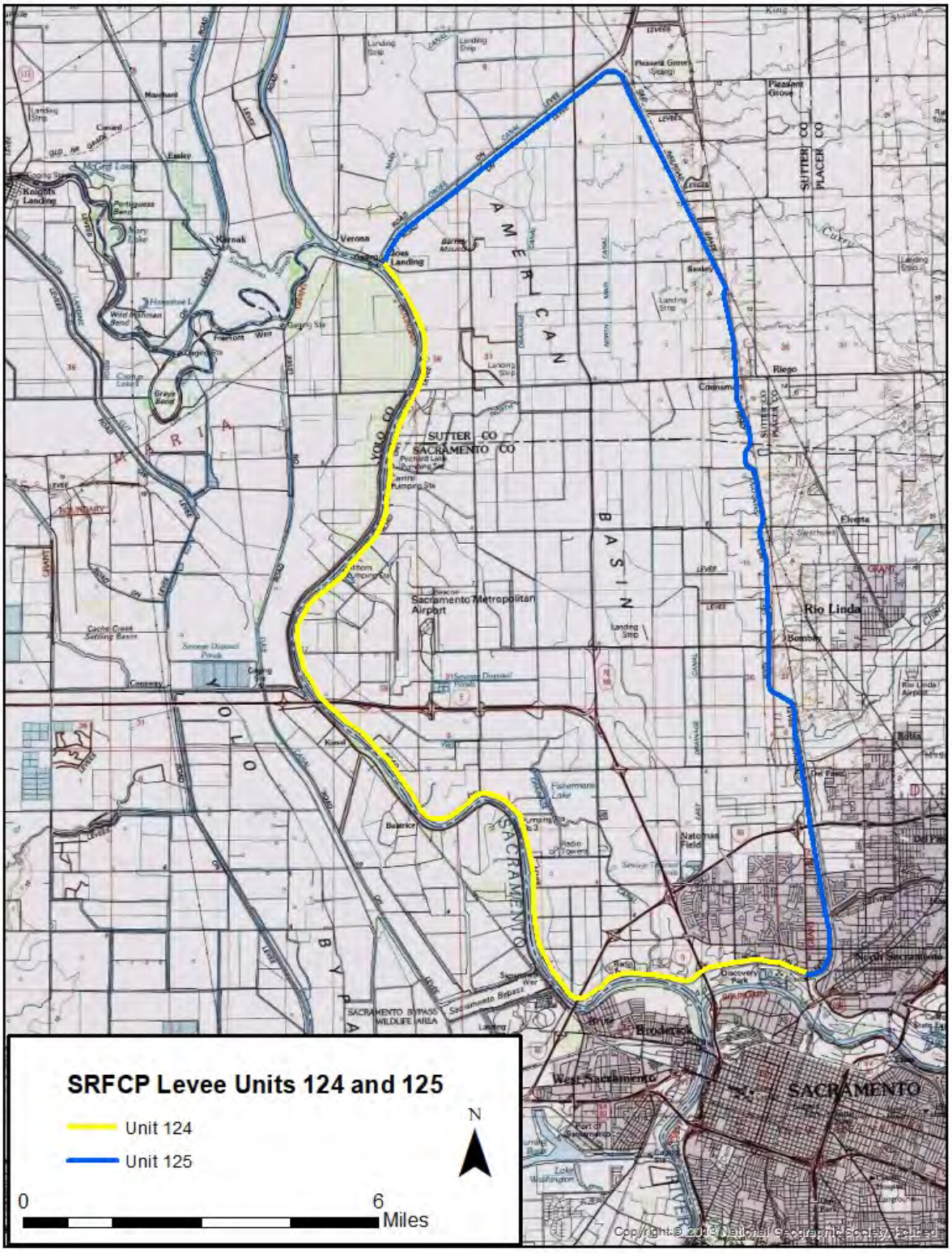

Figure 23: SRFCP Levee Units 124 and 125

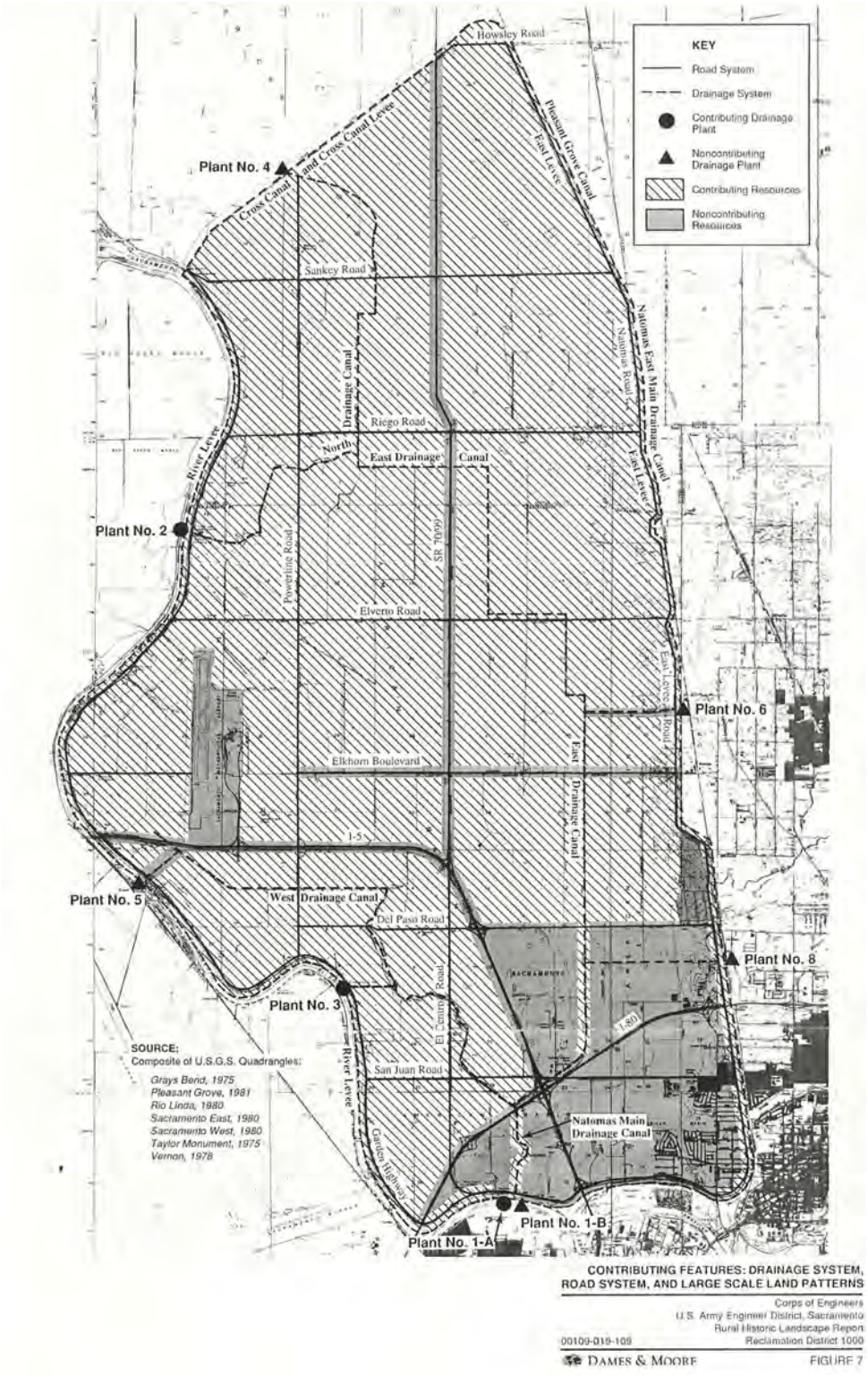

Figure 24: RD 1000 Contributing Elements (1995)

Denise Bradley and Michael Corbett. Rural Historic Landscape Report for Reclamation District 1000

3.3.1 Description & Construction History: Unit 124

3.3.1.1 *Description*

The levees of Unit 124, measuring approximately 20 miles, comprise the southern and western side of the Natomas ring system, extending along the American River from Northgate Boulevard west towards Interstate 80 (I-80), and north along the Sacramento River to its confluence at the Natomas Cross Canal (Figure 25). The earthen levees measure between 39 to 44 ft. in height and are generally trapezoidal in shape. Slurry cutoff walls reinforce most of the unit. The paved two-lane Garden Highway runs along the crown of the levee from the southern portion of the unit north towards the Cross Canal. I-80 and Interstate 5 (I-5) cross over the levees. Several pumping plants enhance the flood protection provided by the Natomas ring levees and are located adjacent to the levee walls of Unit 124.[124]

On the water side of Unit 124, the levees are bordered by homes and numerous private boat docks built along the shore, a portion of the American River Parkway is present at the southeastern portion of Unit 124. The community of Natomas is located on the land side of the levee. At the turn of the century Natomas was best known as an agricultural center, but within the past five decades Natomas has developed into a residential, industrial and commercial center. The northern region of Natomas, north of the Sacramento International Airport, remains primarily agricultural.

3.3.1.2 *Construction History*

Scattered levees were built along the Sacramento River in the current location of the River Levee as early as 1895 when farms were first established in Natomas during the post gold-rush era (Figure 26). Following the adoption of the California Flood Control Act of 1911, RD 1000 was approved by the California Reclamation Board. Levee construction for RD 1000 was accomplished under the auspices of the Natomas Company, a private land developer, in 1914. The earthen levees were first constructed of dredged material from the Sacramento River using a suction dredge.[125] The paved Garden Highway was built across the levee crown between 1923 and 1925.[126]

The RD 1000 levees were formally incorporated into the SRFCP in 1951.[127] Following the incorporation into the SRFCP, frequent maintenance and improvements including levee raises, stone protection, bank sloping, selective clearing and emergency repairs ensured continued flood protection.[128] I-80 and I-5 were completed during the

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[124] Operation and Management Manual Sacramento River Flood Control Project Unit No. 124, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 10.
[125] Denise Bradley and Michael Corbett, 21.
[126] Operation and Management Manual Sacramento River Flood Control Project Unit No. 124, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, Drawing No. 50-13-2810. Denise Bradley and Michael Corbett, 31-2.
[127] Operation and Management Manual Sacramento River Flood Control Project Unit No. 124, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 82.
[128] Operation and Management Manual Sacramento River Flood Control Project Unit No. 124, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 29.

mid-1960s and 1970s.[129] Between 1951 and the late 1970s, levee repairs were limited to relatively routine cyclical maintenance. After the 1980s, however, new materials and methods of construction were applied to further strengthen the levees. Over 12 miles of levee berms were added during the early 1980s, and slurry walls were added to reinforce the length of the Garden Highway between the 1980s and 2010.[130] The Garden Highway and adjacent pumping system have also undergone numerous repairs and improvements from the 1970s forward.[131]

[129] Steven M. Avella, *The Good Life: Sacramento's Consumer Culture* (San Francisco: Arcadia Publishing, 2008), 29.
[130] Operation and Management Manual Sacramento River Flood Control Project Unit No. 124, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 10.
[131] Denise Bradley and Michael Corbett, 31-2.

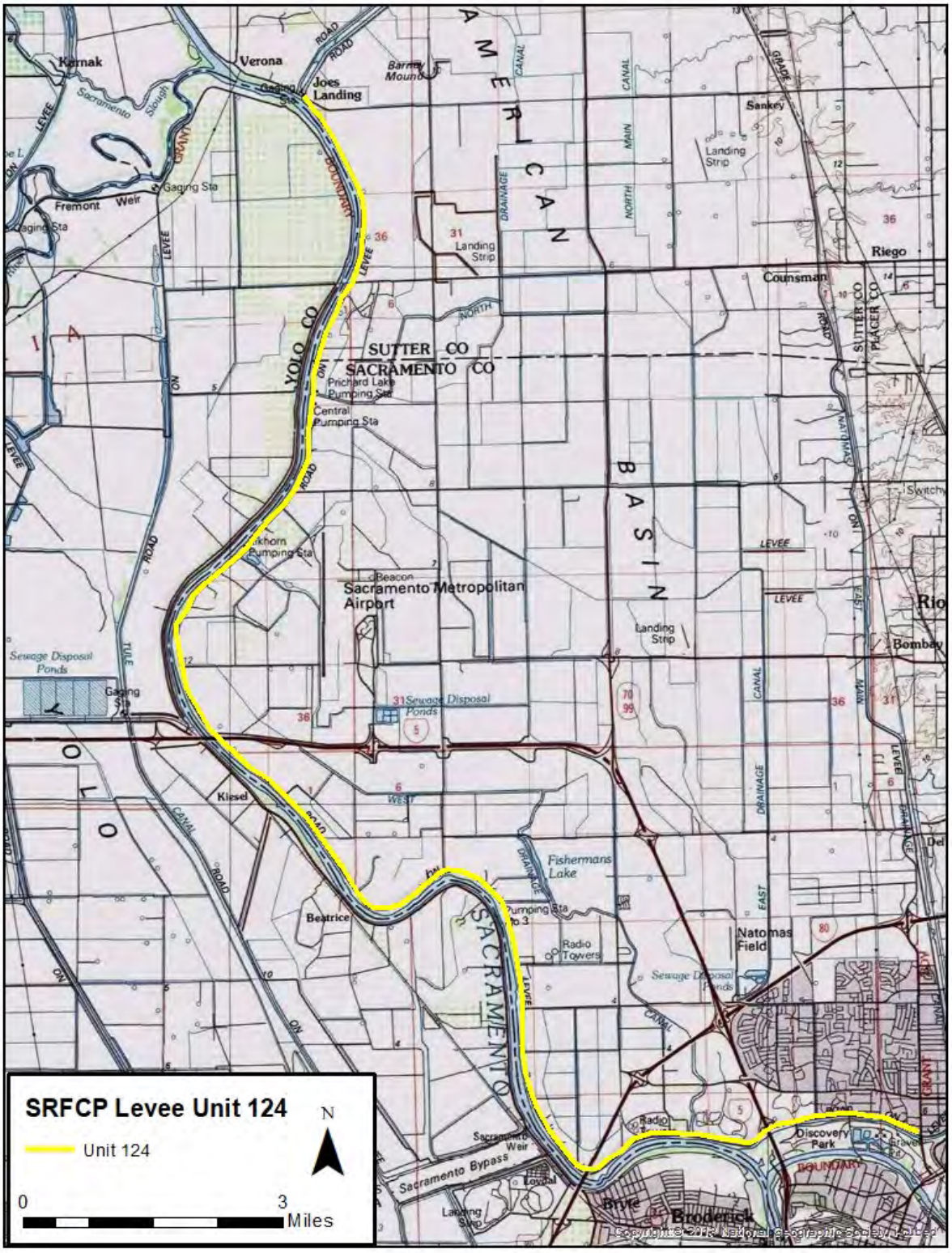

Figure 25: SRFCP Levee Unit 124

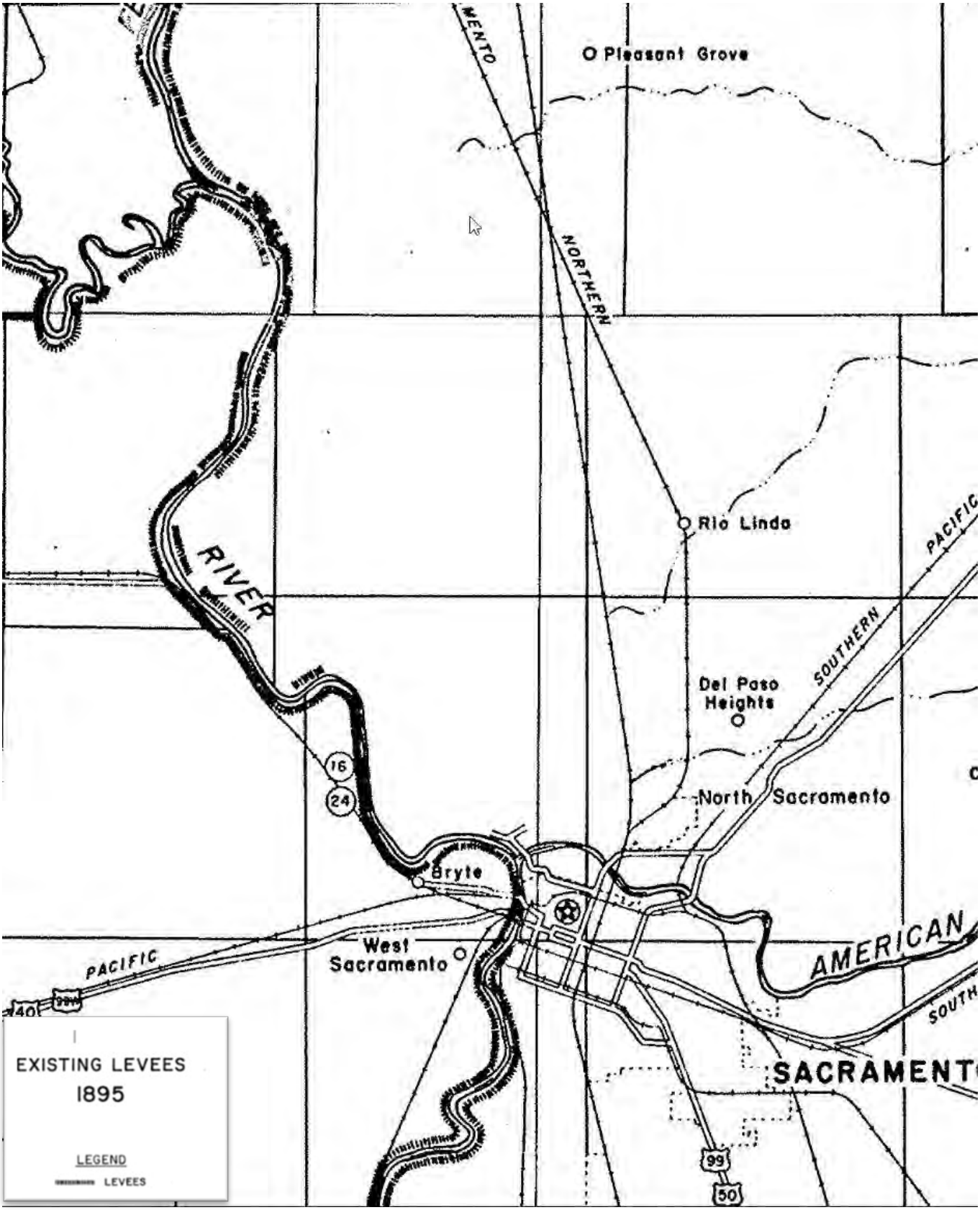

Figure 26: 1895 Map Showing location of SRFCP Units 124 and 125

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

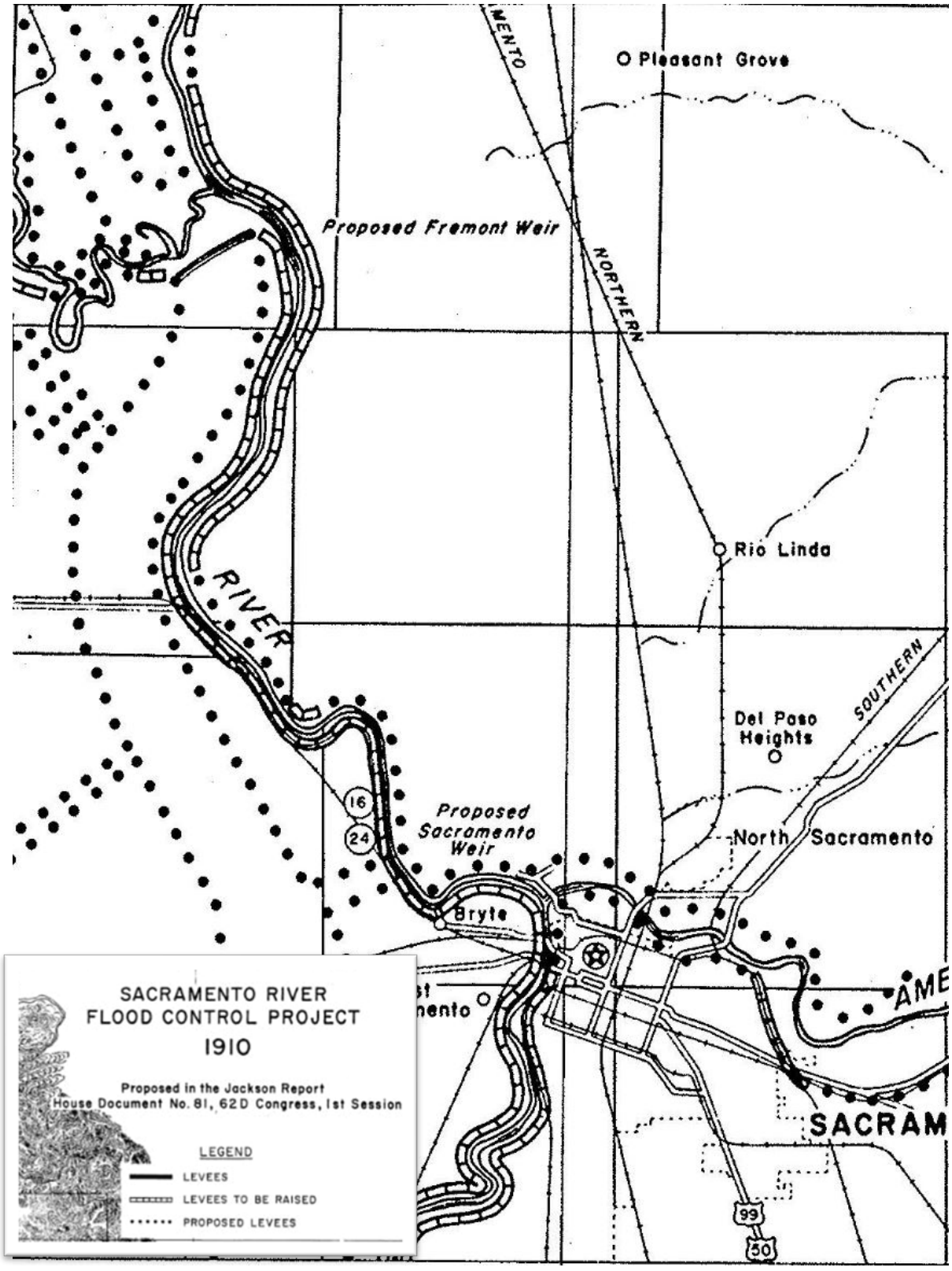

Figure 27: 1910 Map Showing location of SRFCP Units 124 and 125

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

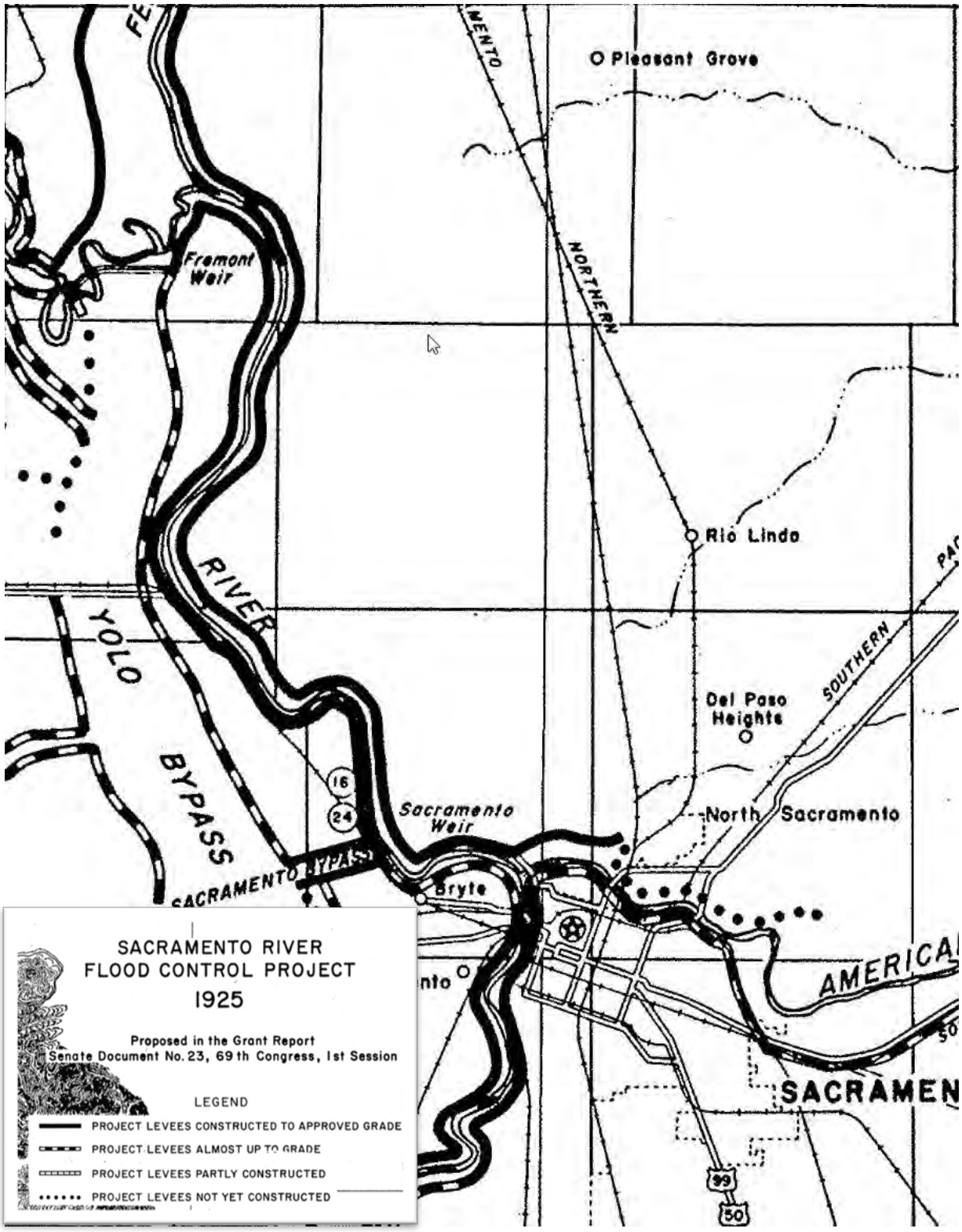

Figure 28: 1925 Map Showing location of SRFCP Units 124 and 125

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

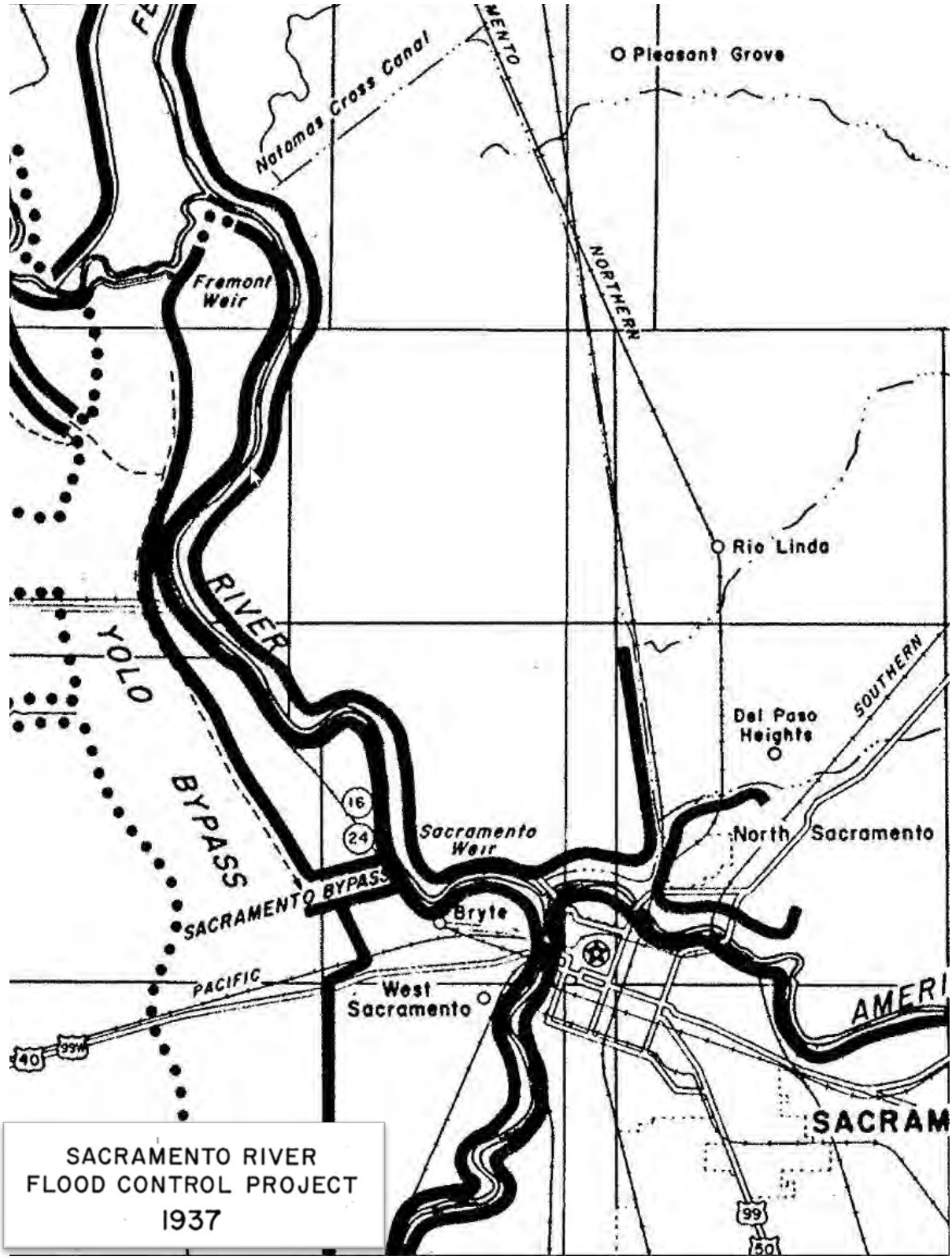

Figure 29: 1937 Map Showing location of SRFCP Units 124 and 125

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

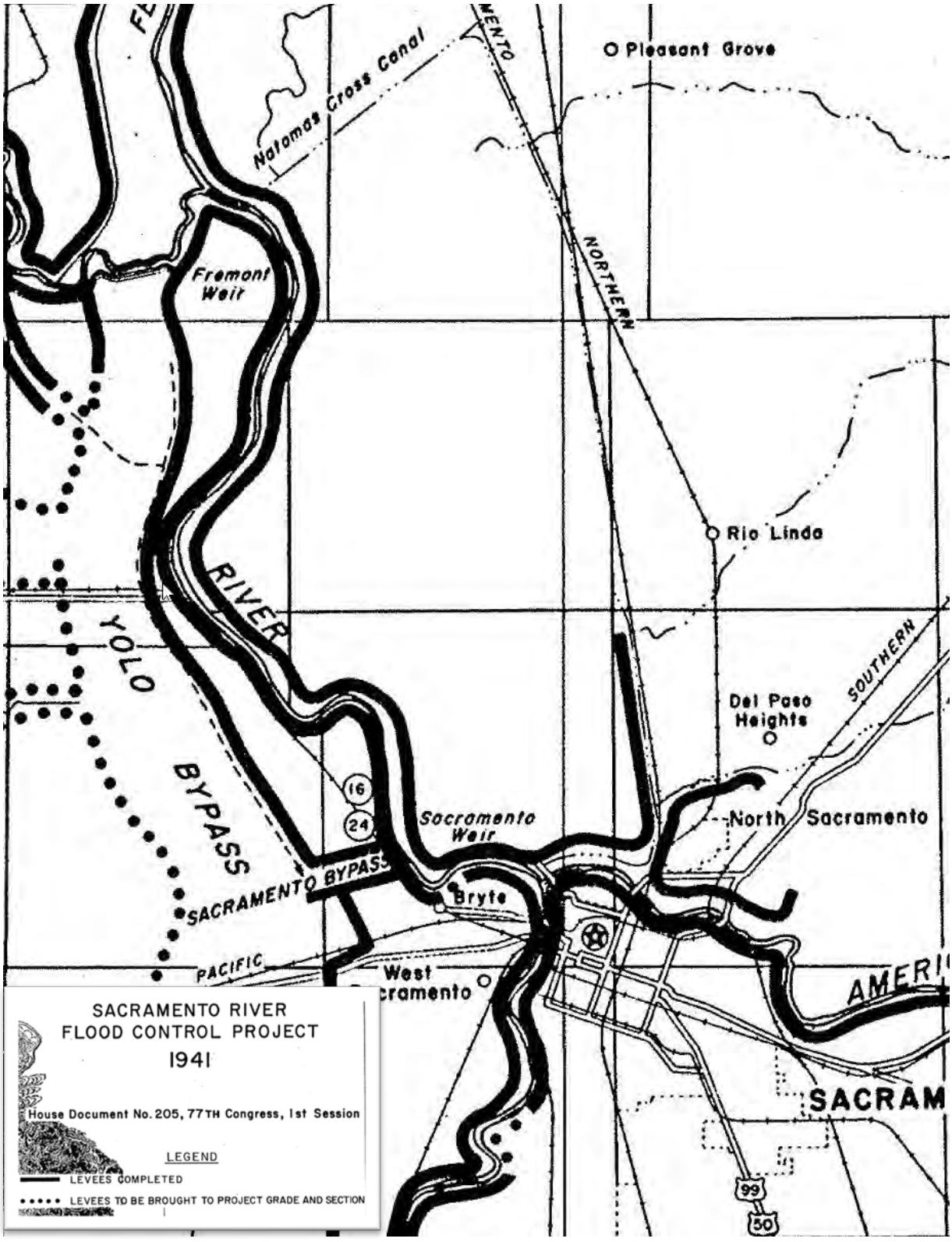

Figure 30: 1941 Map Showing location of SRFCP Units 124 and 125

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

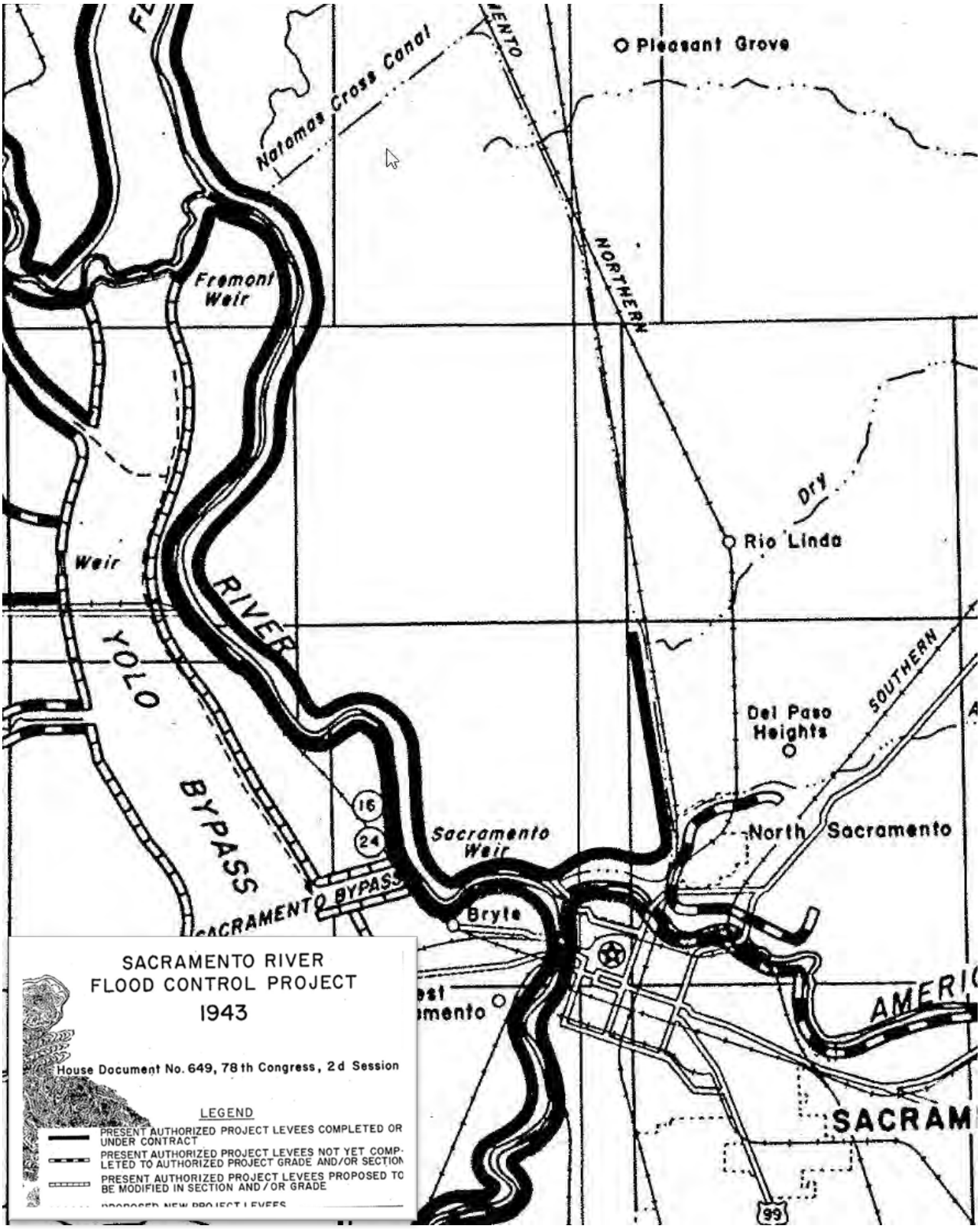

Figure 31: 1943 Map Showing location of SRFCP Units 124 and 125

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

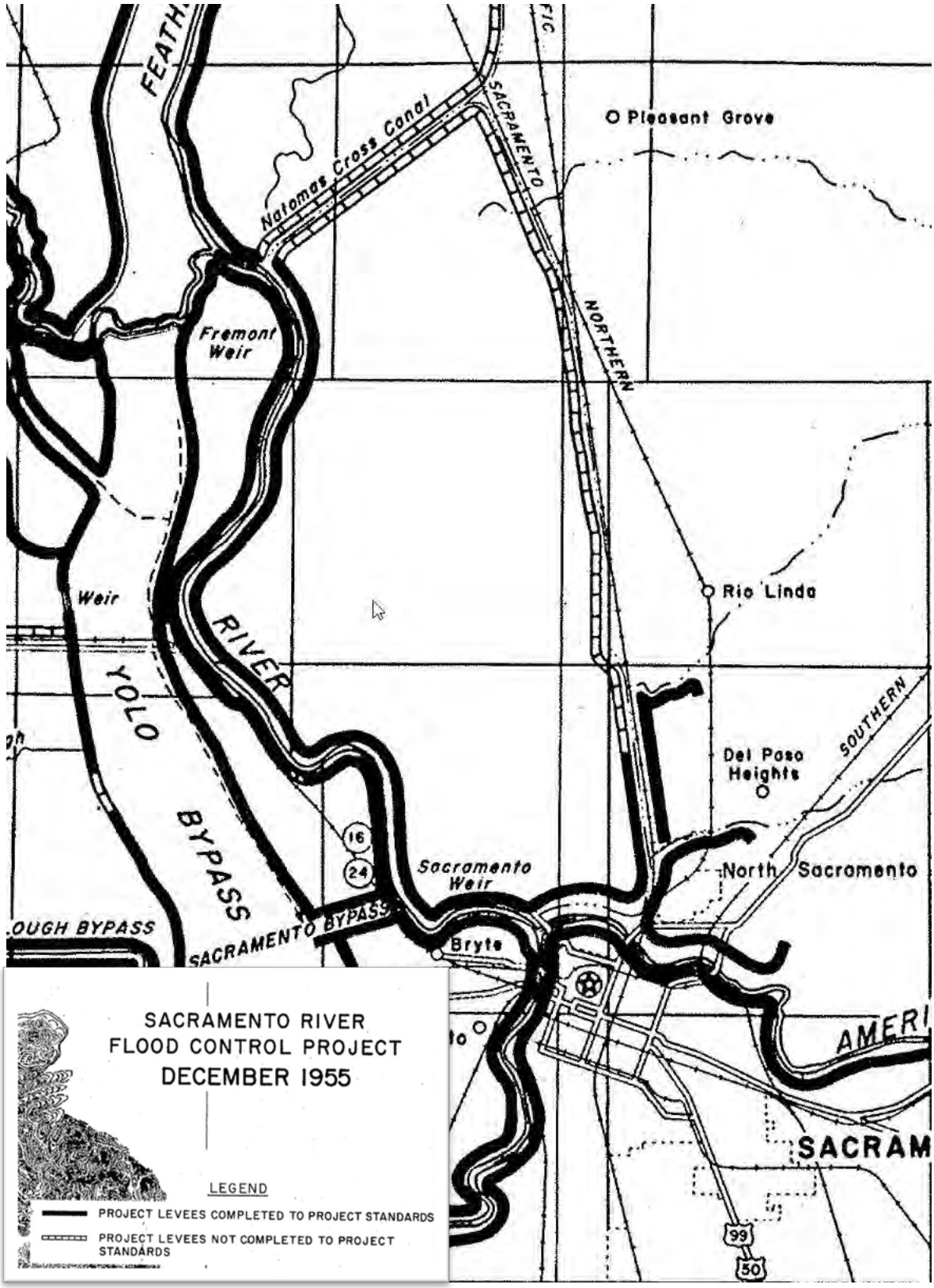

Figure 32: 1955 Map Showing location of SRFCP Units 124 and 125

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

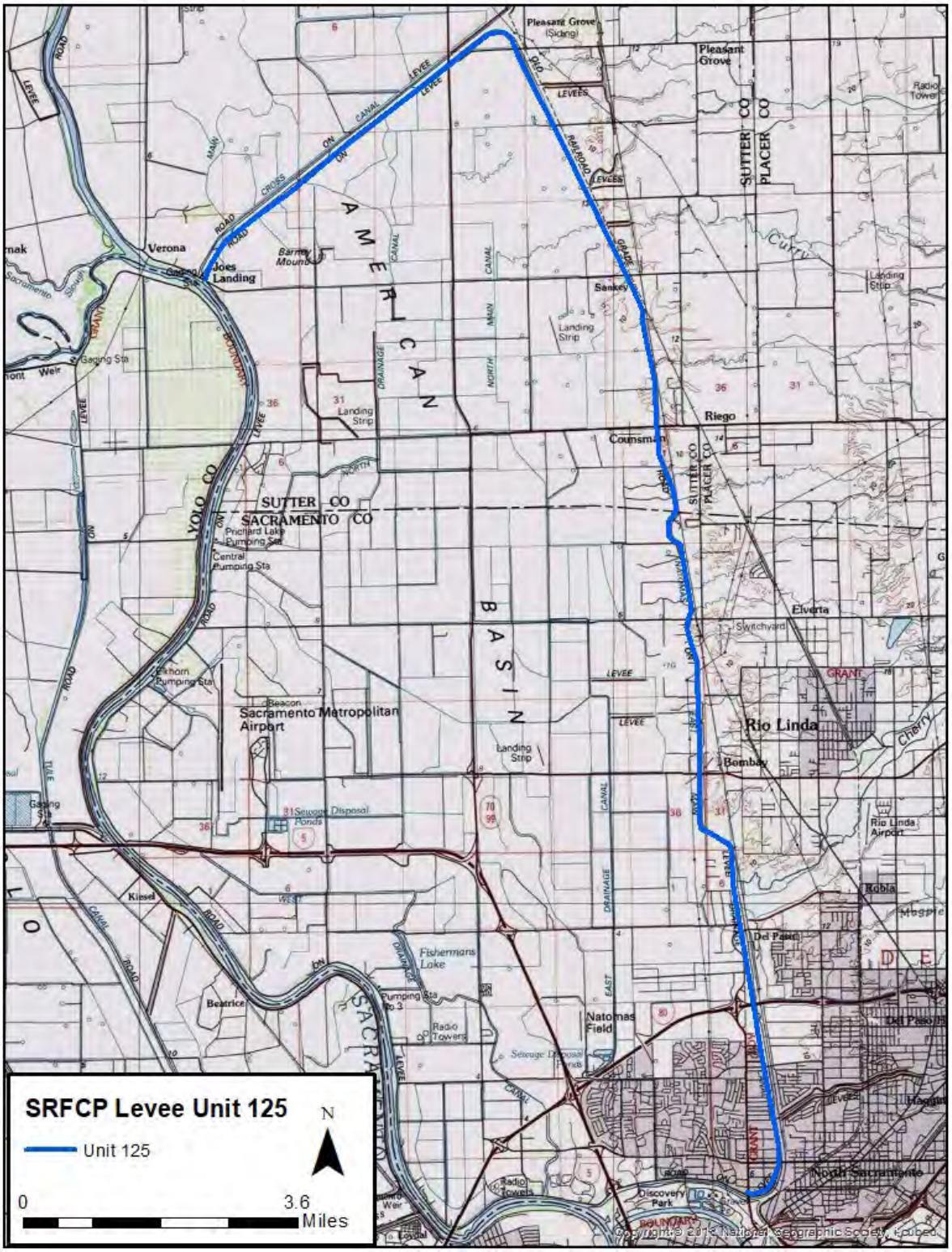

Figure 33: SRFCP Levee Unit 125

3.3.2 Description & Construction History: Unit 125

3.3.2.1 *Description*

The levees of Unit 125, measuring approximately 21.5 miles long, comprise the northern and eastern side of the Natomas levee system (Figure 33). At the northern end of the unit, the levees border the Natomas Cross Canal and extend south along the Natomas East Main Drainage Canal. The earthen levees measure between 39 to 44 ft. in height and are generally trapezoidal in shape. Slurry cutoff walls reinforce most of the unit. Howsley and Natomas Roads, both paved two lane roads, are located on the crowns of the Cross Canal and East Levees, respectively. Over 10 bridges cross Unit 125, connecting Natomas with communities to the east. Several pumping plants enhance the flood protection provided by the Natomas ring levees and are located adjacent to the levee walls of Unit 125.[132]

On the water side of Unit 125, the Cross Canal levee creates the south side of the channel along with the levees of RD 1001 on the northern side of the channel. Similarly, Unit 125 levees along the NEMDC form the western walls of the channel along with the levees of SRFCP Unit 118 Part 2. The community of Natomas is located on the land side of the levee. Within the past three decades the southern region of Natomas has developed into a residential, industrial and commercial center; the northern region of Natomas remains primarily agricultural.

3.3.2.2 *Construction History*

Few levees were built in the area of Unit 125 when RD 1000 was established in 1911. Construction on the East Levee began in 1912 under the auspices of the Natomas Company, a private land developer, and was completed in 1914.[133] The earthen levees were first constructed of dredged material from the Sacramento River using clamshell dredges and horse drawn excavators.[134] The Natomas/East Levee road was built along the East Levee by the Natomas Company within the period of significance. [135] Between 1925 and 1939, levees of the southern portion of Unit 125 were improved to meet SRFCP standards. Improvements included widening the levee crowns from 20 ft. to 40 ft. (Figures 26-32).[136]

The RD 1000 levees were formally incorporated into the SRFCP in 1951.[137] Following incorporation, the Corps identified areas needing improvement in the majority of Unit 125 (Figure 32). Between 1957 and 1958, a series of contractors completed

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[132] Operation and Management Manual Sacramento River Flood Control Project Unit No. 124, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 10.
[133] Bradley and Corbett, 20.
[134] Denise Bradley and Michael Corbett, 21.
[135] Operation and Management Manual Sacramento River Flood Control Project Unit No. 124, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, Drawing No. 50-13-2810. Denise Bradley and Michael Corbett, 31-2.
[136] Bradley and Corbett, 22.
[137] Operation and Management Manual Sacramento River Flood Control Project Unit No. 124, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 82.

grading and surfacing on existing levees.[138] Between 1958 and the late 2000s, levee repairs were limited to relatively routine cyclical maintenance.[139] Between 2007 and 2010 cutoff walls, constructed of soil-cement bentonite, were added along the Cross Canal Levee and several miles of the East Levee.[140] Within the same time period, levees had been raised and slopes had been flattened. [141] The East Levee Road and adjacent pumping system have also undergone numerous repairs and improvements from the 1970s forward, a portion of the Arden-Garden Connector, built during the late 1990s crosses the very southern end of the levee.[142]

3.3.3 Historic Context: The SRFCP and RD 1000

The history of Units 124 and 125 within the context of the SRFCP is presented in the previous section. The levee units are also contributing elements to the RD 1000 RHL. A thorough re-evaluation of the Natomas levee system is presented in Part 4. Elements of the RHL context as they pertain to the RD 1000 levee system are summarized below.

3.3.4 RD 1000 RHL Period of Significance

The period of significance for the RD 1000 RHL dates from 1911 to 1939. RD 1000 was determined significant at the state level under Criterion A, due to its association with "the history of reclamation and flood control within the Sacramento Valley during the late 19th and early 20th centuries. The culmination of this history was the Sacramento Flood Control Plan."[143] According to the *Rural Historic Landscape Report,* integrity of the district is preserved in the "drainage system (levees, canals, and pumps) and the road system, both components of Natomas' reclamation plan for RD 1000, [which] provided the framework for the spatial pattern of the district."[144] Within the levee boundaries, land development within the period of significance was marked by large, single-crop agricultural fields.[145] Although agriculture was not directly associated with reclamation in the significance of the RHL, the existence of agricultural fields has contributed to the integrity of the landscape.

3.3.5 Periods of Significance: SRFCP Units 124 and 125

Levee Units 124 and 125 fall under two periods of significance. The first period of significance, associated with the RD 1000 RHL, dates from 1911 to 1939. The year 1911 marked the approval of RD 1000 by the state legislature. In 1939, the final pumping system in the original 1912 design was completed. The second period of

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[138] Operation and Management Manual Sacramento River Flood Control Project Unit No. 125, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 7.
[139] Ibid.
[140] Operation and Management Manual Sacramento River Flood Control Project Unit No. 125, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 7-8.
[141] Operation and Management Manual Sacramento River Flood Control Project Unit No. 124, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 10.
[142] Denise Bradley and Michael Corbett, 31-2.
[143] Denise Bradley and Michael Corbett, *Rural Historic Landscape Report for Reclamation District 1000*, 64.
[144] Bradley and Corbett, iv.
[145] Bradley and Corbett, 41.

significance, associated with the SRFCP, dates from 1951 to 1961. The RD 1000 levees were transferred to the SRFCP in 1951, during the era of Post-New Deal Construction when water management infrastructure received broad political and popular support at the federal level. This period of significance ends in 1961 when the SRFCP was deemed complete, and new types of flood risk management strategies were adopted as alternatives to big infrastructure.

3.3.6 Significance: SRFCP Unit 124

RD 1000 was an early example of a modern reclamation district, approved after the passage of the California Flood Control Act. Similarly, the SRFCP, was the first large-scale flood control project implemented in California. Both RD 1000 and the SRFCP continue to foster population growth and economic development through the systematic drainage of seasonal floodplains in Natomas and the Central Valley. Units 124 and 125 are significant under **Criterion A** at the state level as part of the RD 1000 RHL and as part of the SRFCP. Both flood risk management projects are associated with events that have made a significant contribution to the broad patterns of California history.

Units 124 and 125 are not significant under **Criterion B** because the levees are not associated with the lives of significant persons in our past. The design and construction of system, as well as modifications were not by any one individual or individuals with particular significance at the local state or national levels. Unit 124 and 125 are not significant under **Criterion C** because the levee does not embody the distinctive characteristics of a type, period or method of construction, nor does it represent the work of a master, possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction. The levees are constructed of common materials and have been repaired and modified using typical methods and technology. Furthermore, regarding the SRFCP, the levees do not demonstrate characteristic elements of the bypass system that distinguishes the SRFCP design. Units 124 and 125 are not significant under **Criterion D** because the levees are not a significant or likely source of important information about historic-era levee construction, or the materials or technologies employed in their construction and operation. Note that this assessment of Criterion D applies to historic-era significance only.

3.3.7 Integrity: SRFCP Unit 124

Although significant under Criterion A, the integrity of Unit 124 is low. Unit 124 remains in roughly the same location since completion of construction in 1914 and transfer to the SRFCP in 1951. The addition of levee berms during the 1980s have changed the levee footprint. Similarly, the integrity of design, materials and workmanship of the levees are poor due to the addition of berms, levee raises, slurry walls, the I-5 and I-80 overpasses and improvements to the Garden Highway outside of the periods of significance. The integrity of the setting, feeling and association of Unit 124 has also declined due to modern development.

The River Levee also formed the southern and western boundary of the district.[146] A cursory discussion of integrity appeared in the 1996 *Rural Historic Landscape Report*. The location, materials and design of the RD 1000 levees were determined to "remain unchanged." [147] The report, however was written prior to the addition of slurry cutoff walls in 1996 and 2000. [148] The 1996 evaluation also overlooked the levee raises, addition of the I-80 and I-5 overpasses and the 1980s era berms. In another section of the same report, areas of modern development were delineated and determined to be non-contributing. When the RHL was delineated during the mid-1990s, development was limited to areas between I-5 and I-80 and the Sacramento Airport, approximately 16% of the district (Figure 24). [149]

A building boom in the intervening years has resulted in an expansion of industrial areas and residential subdivisions along major highways that connect Natomas to Sacramento. Modern development now occupies roughly 30% of the district as a whole, and has expanded north along I-5 (Figure 34). Housing developments in particular have added new road systems within the RHL, compromising the "large-scale land patterns" that differentiated the RHL from surrounding urban centers. Approximately 75% of Unit 124 borders a mosaic of farm fields and residential subdivisions, 30% of the levee directly abuts areas of development that are non-contributing to RD 1000.

Setting, feeling and association range from high to low. The levee located north of the Sacramento Airport, approximately 25% of Unit 124, borders farm fields that demonstrate the characteristic landscape of the RHL and of the SRFCP. This northern section of Unit 124 retains a high integrity of setting, feeling and association. The remaining 75% of the levee borders a mosaic of farm fields and residential subdivisions, 30% of the levee directly abuts areas of development that are non-contributing to RD 1000. These developed areas retain a low integrity of setting and feeling. Given that the levee was identified as the physical and visual boundary of the RD 1000 RHL, and only 25% of the levee abuts the large scale land patterns that characterize the district, it appears that the southern and western portion of the RD 1000 RHL is more closely defined by the boundaries of developed areas rather than the River Levee. The overall integrity of setting and feeling are low, integrity of location is moderate, and association with flood management is high.

3.3.8 Determination of Eligibility: SRFCP Unit 124

The Corps finds the RD 1000 River Levee non-contributing to the RD 1000 RHL. Furthermore, the enclosed re-evaluation of RD 1000 proposes to consider RD 1000 within the context of the SRFCP MPL, rather than a separate RHL. Within the context of the SRFCP, the Corps finds Unit 124 not eligible for listing as a historic property on the NRHP.

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[146] Bradley and Corbett, 48.
[147] Bradley and Corbett, 22.
[148] Operation and Management Manual Sacramento River Flood Control Project Unit No. 124, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 10.
[149] Bradley and Corbett, iv.

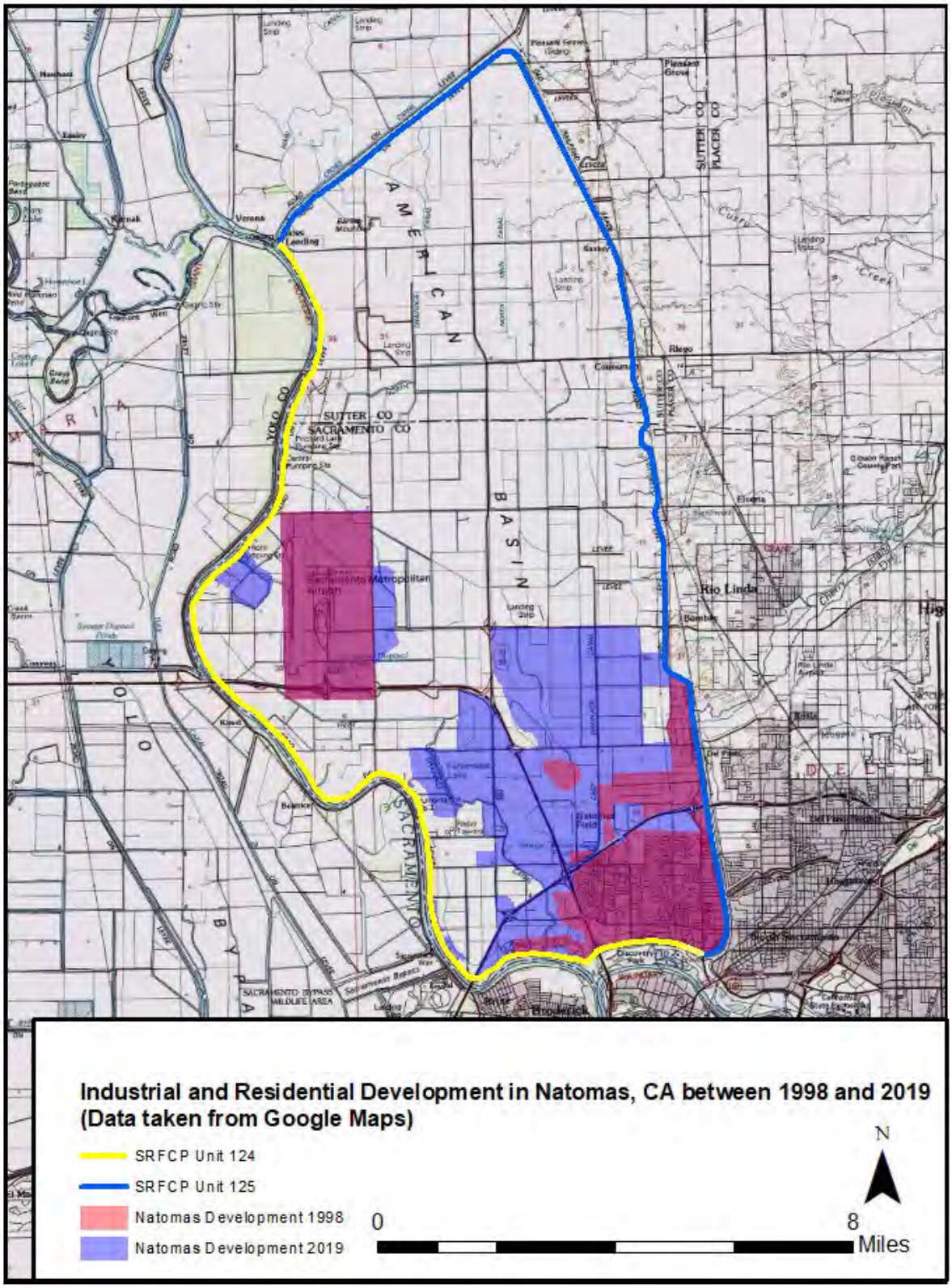

Figure 34: Industrial and Residential Development in Natomas, CA (1998-2019)

3.3.9 Integrity: SRFCP Unit 125

Although significant under Criterion A, the integrity of Unit 125 is moderate and varies by region. Unit 125 remains in roughly the same location since completion of construction in 1914 and transfer to the SRFCP in 1951. The integrity of design, materials and workmanship of the levee is poor due to the levee raises, slurry walls, the I-5 and State Route 99/70 overpasses and improvements to the East Levee Road outside of the periods of significance. The integrity of the setting, feeling and association of Unit 125 has also declined due to modern development.

A cursory discussion of integrity appeared in the 1996 *Rural Historic Landscape Report*. The location, materials and design of the RD 1000 levees were determined to "remain unchanged." [150] The report, however was written prior to the addition of slurry cutoff walls in between 2007 and 2010. [151] The 1996 evaluation also overlooked the levee raises, addition of the I-5 and State Route 99/70 overpasses. In another section of the same report, areas of modern development were delineated and determined to be non-contributing. When the RHL was delineated during the mid-1990s, development was limited to areas between I-5 and I-80 and the Sacramento Airport, approximately 16% of the district (Figure 24). [152]

A building boom in the intervening years, however, has resulted in an expansion of industrial areas and residential subdivisions along major highways that connect Natomas to Sacramento. Modern development now occupies roughly 30% of the district as a whole (Figure 34). Housing developments along I-80 and I-5 in particular have added new road systems within the RHL, compromising the "large-scale land patterns" that differentiated the RHL from surrounding urban centers.

Approximately 70% of Unit 125 borders farm fields that demonstrate the characteristic landscape of the RHL. The levee south of the Sacramento Airport and West Elkhorn Boulevard, approximately 30% of the levee, directly abuts areas of development that are non-contributing to RD 1000. As a result, setting, feeling and association range from high to low. The northern section of Unit 125 retains a high integrity of setting, feeling and association. Developed areas to the south, by contrast, retain a low integrity of setting and feeling. The overall integrity of setting and feeling are low to moderate, integrity of location is moderate, and association with flood management is high.

3.3.10 Determination of Eligibility: SRFCP Unit 125

The Corps finds the RD 1000 East Levee and Cross Canal Levee, non-contributing to the RD 1000 RHL. Furthermore, the enclosed re-evaluation of RD 1000 proposes to consider RD 1000 within the context of the SRFCP MPL, rather than a separate RHL.

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[150] Bradley and Corbett, 22.
[151] Operation and Management Manual Sacramento River Flood Control Project Unit No. 124, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 10.
[152] Denise Bradley and Michael Corbett, iv.

Within the context of the SRFCP, the Corps finds Unit 125 not eligible for listing as a historic property on the NRHP.

3.4 **Conclusion**

The content in this section is designed to present an evaluation of the historic levees within the ARCF APE. The ARCF APE, situated within the greater Sacramento Metropolitan area, encompasses SRFCP Levee Units 115, 117, 118, 124 and 125. Two of the levee units, Units 115 and 117, have been previously determined NRHP eligible through consensus determination (COE 120203C, October 20, 2020). The Corps is submitting determinations of eligibility for the remaining levee units: Unit 118, Parts 1 and 2, Units 124 and 125. A summary of the levee eligibility status within the ARCF APE is presented in the table below.

Levee within ARCF APE	Historic Associations	Eligibility Status	Consensus Determination
SRFCP Unit 115	SRFCP	Eligible	October 20, 2020 (COE 120203C)
SRFCP Unit 117	SRFCP	Eligible	October 20, 2020 (COE 120203C)
SRFCP Unit 118 Part 1	SRFCP	Not Eligible	Submitted for review in this document
SRFCP Unit 118 Part 2	SRFCP	Not Eligible	Submitted for review in this document
SRFCP Unit 124	SRFCP, Contributing element to the RD 1000 RHL	Not Eligible	Submitted for review in this document
SRFCP Unit 125	SRFCP, Contributing element to the RD 1000 RHL	Not Eligible	Submitted for review in this document

The history of the levees within the ARCF APE is associated with the development of the Sacramento Valley-wide SRFCP. Units 124 and 125 were also identified as contributing elements to the RD 1000 RHL. Under the SRFCP, the Corps finds Units 118, 124 and 125 not eligible for listing as historic properties on the NRHP. Although the levees are significant for their association with the SRFCP, they lack the integrity to communicate this significance. Furthermore, the Corps finds Units 124 and 125 non-contributing to the RD 1000 RHL due to loss of integrity in the face of urban development.

In order to properly evaluate the levees within the ARCF APE, the Corps is submitting a re-evaluation of the RD 1000 RHL, delineated in 1994 (Part 4). The Corps is also submitting a SRFCP multiple property documentation form that includes associated SRFCP Historic Contexts, and a description of the levee property type (Appendix I). The focus of this document is the evaluation of the historic levee system within the ARCF APE, the SRFCP multiple property documentation form is presented as a determination of eligibility and a broader context for the evaluation of the levees within the ARCF APE. The Corps is not nominating the SRFCP MPL to the National Register at this time. DPR Series 523 forms for the previously unevaluated SRFCP Levee Units within the APE are included in Appendix II.

4 Re-Evaluation of the Reclamation District 1000 Rural Historic District

4.1 RD 1000 RHL General Description & Summary of Re-Evaluation

The RD 1000 RHL was delineated in 1994 and further analyzed in a 1996 report entitled: *Rural Historic Landscape Report for Reclamation District 1000 for the Cultural Resources Inventory and Evaluations for the American River Watershed Investigation, Sacramento and Sutter Counties, California* (*Rural Historic Landscape Report*), written by Denise Bradley and Michael Corbett of Dames & Moore Incorporated.[153] The RD 1000 RHL was determined significant at the state level under Criterion A due to its association with "the history of reclamation and flood control within the Sacramento Valley during the late 19th and early 20th centuries," that culminated in the Sacramento River Flood Control Plan.[154] The period of significance for the RD 1000 RHL dates from 1911 to 1939.

The primary physical characteristics of the RHL are the drainage system, road system and large-scale land patterns formed by the intersection of roads and reclamation infrastructure. According to the *Rural Historic Landscape Report,* integrity of the district is preserved in the "drainage system (levees, canals, and pumps) and the road system, both components of Natomas' reclamation plan for RD 1000, [which] provided the framework for the spatial pattern of the district."[155]

The paragraphs below re-evaluate the eligibility of the RD 1000 RHL, particularly in view of urban development between the mid-1990s and the present. For further historical context, please refer to the attached Rural Historic Landscape Report or the SRFCP Multiple Property Documentation Form.

4.2 Secretary of Interior's Standards: Rural Historic Landscapes

A rural historic landscape is a geographical area that historically has been used by people or shaped or modified by human activity, occupancy, or intervention that possesses a significant concentration, linkage, or continuity of areas of land use, vegetation, buildings and structures, roads and waterways, and natural features. RHLs are listed in the NRHP as sites or historic districts. Rural historic landscapes are generally characterized by large acreage and a comparatively small number of buildings and structures differentiate rural historic landscapes from other kinds of historic properties. Spatial organization, concentration of historic characteristics, and evidence of the historic period of development distinguish a rural historic landscape from its immediate surroundings. The 11 characteristics of RHLs are:

- Land uses and activities
- Patterns of spatial organization

[153] Denise Bradley and Michael Corbett, *Rural Historic Landscape Report for Reclamation District 1000 for the Cultural Resources Inventory and Evaluations for the American River Watershed Investigation, Sacramento and Sutter Counties, California* (Chico: Dames & Moore Inc., January 1996).
[154] Denise Bradley and Michael Corbett, *Rural Historic Landscape Report for Reclamation District 1000*, 64.
[155] Bradley and Corbett, iv.

- Response to the natural environment
- Cultural traditions
- Circulation networks
- Boundary demarcations
- Vegetation related to land use
- Buildings, structures, and objects
- Clusters
- Archaeological sites
- Small-scale elements

Decisions about historic integrity require professional judgment about whether a property reflects the spatial organization, physical components, and historic associations that it attained during its period(s) of significance (POS). Historic integrity requires that the various characteristics that shaped the land during the historic period be present today in much the same way they were historically (though no property will look exactly like it did during the POS).

NRB 30: *How to Evaluate and Nominate Rural Historic Landscapes* discusses the seven aspects of integrity as they apply to RHLs.

Location refers to the area where significant activities that shaped a property occurred.

Design of an RHL results from conscious and unconscious decisions over time about land use, roadways, buildings, structures, and vegetation, as well as functional organization of vegetation and topography. Historic boundary demarcations, circulation networks, and uses (or closely related new uses) are part of design.

Setting refers to large-scale features such as bodies of water, mountains, rock formations, and woodlands, and small-scale ones such as plants, trees, gateposts, fences, milestones, springs, ponds, and equipment.

Materials refers to construction materials of buildings, outbuildings, roadways, fences, and other structures. Vegetation similar to historic species will generally convey integrity of setting.

Workmanship is exhibited in how people have fashioned the environment for functional and decorative purposes, including in buildings, fences, and agricultural practices.

Feeling is communicated by features dating from the period of significance.

Association is generally augmented by continued use and occupation if traditional practices are carried on. Changes that generally diminish an RHL's historic integrity include abandonment and realignment of roads and canals; widening and resurfacing historic roadways; changes in land use and management; nonhistoric land uses; loss of

vegetation related to land use; deterioration/ demolition/ relocation/ modification/ replacement of buildings and structures; construction of new buildings and structures; disturbance of archaeological sites; loss of boundary demarcations and small-scale features.

Different degrees of integrity can be expected for different types of historic properties from different contexts. Repeated loss of buildings, structures, roadways, and small-scale elements, as well as gradual changes to boundaries and land uses, may cumulatively destroy integrity. New construction and incompatible land uses cause the greatest damage. In the Sacramento area, such alterations are common as development continues in the region.

4.3 Significance

The RD 1000 RHL was determined eligible at the state level under Criterion A because RD 1000 "was one of the first of the large, modern reclamation districts [in California]". RD 1000 was also "a part of the system for flood control of the Sacramento River," that was realized in the SRFCP.[156] The Corps agrees that the water management infrastructure of RD 1000 is significant at the state level for reclamation. The explanation of reclamation, provided in the *Rural Historic Landscape Report* however, is imprecise and fails to distinguish the significance of RD 1000 from other Central Valley landscapes made possible by water management infrastructure. The investigation below explores the evolution of the meaning of "reclamation" in California within the period of significance (1910-1939) and examines the significance of RD 1000 within the broader context of Central Valley reclamation and flood control efforts.

4.3.1 Reclamation vs. Flood Control

In the *Rural Historic Landscape Report*, "reclamation" is defined broadly in terms of wetland that was drained or "reclaimed" in order to promote development.[157] This mid-19th century concept was a driving force in state and federal policy through the early 20th Century. Reclamation, in the sense of land development, was the impetus for the Swamp Land Acts of the 1850s, the Green Act of 1868 and notably the California Flood Control Act of 1911 that precipitated RD 1000.[158] In post-gold rush California, infrastructure on "reclaimed" land often signified levees and channels designed for flood control.

Severe flooding was a perennial problem in the Central Valley from the 1850s through the early 1900s. Expanding settlement on floodplains and clogged waterways caused by hydraulic mining resulted in severe floods notably in Sacramento, Marysville and Yuba City.[159] One witness to a Central Valley flood in 1865 described an "inland

[156] Bradley and Corbett, 65.
[157] Bradley and Corbett,15
[158] Mount, 193.
[159] Kelley, 61.

sea" measuring 20 miles wide and 250 miles long.[160] Flood control and navigability quickly became a priority of the Corps-led California Debris Commission (CDC) founded in 1893 under the Caminetti Act.[161] The California Flood Control Act of 1911 established state support for the SRFCP followed by federal support through the Flood Control Act of 1917.

By the early 1900s, however, the meaning of "reclamation," particularly at the federal level, had begun to shift from land development to signify water management. Agriculture and population growth, particularly in the West, introduced the concerns of limited water supply. Irrigation, drinking water, and later hydroelectric power, fell under the purview of the US Reclamation Service in the early 1900s.[162] The US Reclamation Service, later the US Bureau of Reclamation, established in 1902, was tasked with the purpose to study the feasibility of water use projects in the West, primarily irrigation.[163] President Roosevelt and Congressional proponents of the new agency advanced the idea of recapturing "wasted" water from runoff and snowmelt.[164]

Appropriations for reclamation studies and large infrastructure, most notably the Hoover Dam, were granted to the Bureau of Reclamation throughout the 1920s and 1930s.[165] At the same time that the Bureau of Reclamation began its work in the West, California agricultural interests sponsored a study to design an irrigation system for the Central Valley. The resulting Central Valley Project (CVP) was presented to the California legislature in the 1920s. Like the SRFCP, the CVP was a comprehensive system of infrastructure, including canals, dams and reservoirs, managed at the state level. The state legislature supported the plan, passing the California Central Valley Project Act in 1933.[166] Funding shortfalls due to the Great Depression caused the project to be transferred from the state to the Bureau of Reclamation in 1935.[167] For the next 40 years, the Bureau of Reclamation worked to construct and incorporate canals, dams and reservoirs across the Central Valley into the CVP.[168] The split between flood control and reclamation was solidified at the federal level by the Flood Control Act of

[160] Kelley, 61.
[161] Hagwood Jr., 31.
[162] Mount, 194.
[163] Arthur W. Page, "The Real Conquest of the West: The Work of the United States Reclamation Service," *The World's Work*, eds. Arthur W. Page, Walter H. Page, Vol. 15 1908 (9691-9704), 9691. https://www.google.com/books/edition/The_World_s_Work/hKPvxXgBN1oC?hl=en&gbpv=1&pg=PA9691&printsec=frontcover
[164] "A Brief History." US Bureau of Reclamation, last updated August 15, 2018, https://www.usbr.gov/history/borhist.html
[165] Mount, 194, 196
[166] Mount, 197
[167] Mount, 196.
[168] "Central Valley Project," U.S. Bureau of Reclamation, last updated November 12, 2020, https://www.usbr.gov/mp/cvp/.

1936, which allocated flood control as a guiding mission of the Corps and water use or "reclamation" as the primary objective of the Bureau of Reclamation.[169]

4.3.2 Management of California Reclamation Districts & RD 1000

Reclamation Districts in California reflect this history of flood control, reclamation and evolving partnerships at the local, state and federal levels. Broadly speaking, California Reclamation Districts are responsible for construction and maintenance of infrastructure within the district. Governed under the California Reclamation District Act in Water Code section 50000, modern reclamation districts are authorized to reclaim land through flood control, drainage and water supply. As such, each district is administered by an elected board of trustees. The district may maintain water management infrastructure, such as maintenance canals, levees, irrigation works and pumping plants, in addition to roads and bridges that provide access to this infrastructure.[170] The State Reclamation Board inspects and monitors the flood control infrastructure in reclamation districts, particularly the levees, to ensure that they are maintained appropriately. [171] Generally speaking major projects, such as levee construction, are implemented through partnerships between the Corps, the State and regional flood control agencies.[172]

Although California reclamation districts have the authority to manage flood control and water use, (most commonly irrigation), many were built to mitigate flooding and continue with this mission. This is true for RD 1000.[173] Today, the mission statement on the RD 1000 website reads, "Reclamation District No. 1000's mission is flood protection for the Natomas Basin providing for the public's health and safety by operating and maintaining the levees, and the District's canals and pump stations in a safe, efficient and responsible manner."[174] The RD 1000 Board of Trustees "meets its flood protection mission by operating and maintaining:

- The perimeter levee system to prevent exterior floodwaters from entering the Natomas Basin

- The District's interior canal system to collect the stormwater runoff and agricultural drainage from within the Natomas Basin

[169] Mount, 196
[170] Craig W. Wilson, "Local Water Governance in the Delta," California Water Boards State Water Resources Control Board, April 8, 2014, 13. https://cawaterlibrary.net/document/local-water-governance-in-the-delta/.
[171] Craig W. Wilson, "Local Water Governance in the Delta," 3.
[172] Peter Brundage, "Municipal Service Review and Sphere of Influence Update: Reclamation District No. 1000" (Sacramento: Sacramento Local Agency Formation Commission, February, 2010) 28.
[173] Wilson, 13.
[174] "RD 1000: Our Mission," Reclamation District 1000, accessed December 3, 2020, https://www.rd1000.org/reclamation-district-1000-our-mission.

- The District's pump stations to safely discharge interior stormwater and agricultural drainage out of the Natomas Basin[175]

RD 1000 maintains the flood control system in partnership with the Central Valley Flood Protection Board, a state agency, and the Corps as Units 124 and 125 of the SRFCP.[176] Irrigation within RD 1000 is managed by the Natomas Central Mutual Water Company (NCMWC). A joint use agreement between RD 1000 and the NCMWC allows the mutual water company to collect and distribute storm water runoff from the Sacramento River. The NCMWC also contracts for CVP water deliveries with the Bureau of Reclamation during irrigation season. Irrigation waters from RD 1000 are primarily directed towards surrounding rice alfalfa and wheat fields.[177] Similarly, the road system within RD 1000 is managed by the California Department of Transportation, District 3, the City of Sacramento and Sacramento and Sutter Counties[178]

It is clear that the actions of the Natomas Company transformed RD 1000 from a perennial flood plain to an agricultural center. It is difficult, however, to differentiate the significance of RD 1000 from other reclamation districts founded after the California Flood Control Act of 1911. Like RD 1000, the neighboring RD 1001 and RD 900 were founded in 1911 by large land development companies that implemented flood control measures to transform the floodplain into agricultural land, according to the standards of the SRFCP.[179]

Management of the reclamation district has changed since the period of significance. The flood control system of RD 1000 was incorporated into the SRFCP in 1951. [180] The Natomas Company managed RD 1000 until all of the land was sold to private land owners in the 1950s and management was turned over to an elected board of trustees in 1955. [181] Both of these changes in management occurred after the identified period of significance and led to a relatively standard management and maintenance nexus that is characteristic of the SRFCP. In view of the current purpose and management of RD 1000, the Corps proposes that the significance of RD 1000 be considered, instead as part of a SRFCP MPL.

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[175] "Reclamation District 1000: Our Mission."
[176] "RD 1000 Natomas," National Levee Database, US Army Corps of Engineers, accessed February 24, 2021, https://levees.sec.usace.army.mil/#/levees/system/5205000923/summary.
[177] *Reclamation: Managing Water in the West Natomas Central Mutual Water Company; NCMWC/RD 1000 SCADA Integration Project 18-25 MP,* Environmental Assessment (Sacramento: U.S. Bureau of Reclamation Mid-Pacific Regional Office, September 2018) 3.
[178] "District 3 Current Projects," CalTrans, accessed March 1, 2021. <https://dot.ca.gov/caltrans-near-me/district-3>. "Major Street Improvements Program," City of Sacramento, 2014, accessed March 1, 2021 <https://www.cityofsacramento.org/-/media/Corporate/Files/Public-Works/Publications/Engineering/Transportation-Programming-Guide/TPGAMajorStreetImprovements2014.pdf?la=en>. Operation and Management Manual Sacramento River Flood Control Project Unit No. 125, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 129.
[179] Bradley and Corbett, 10.
[180] Operation and Management Manual Sacramento River Flood Control Project Unit No. 124, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 82.
[181] Bradley and Corbett, 14.

4.4 **Integrity**

The integrity of the RD1000 RHL rests primarily on the grid-like aesthetic character of the district, rather than land use. The authors of the 1996 *Rural Historic Landscape Report* noted that a visitor in 1921, 1937 or 1996 "would see the same overall pattern of large fields set in a grid of canals and roads, with sparsely scattered farmsteads marked by groves of trees or various agricultural structures."[182] The authors acknowledged the presence of urbanization in limited areas of the southern portion of the district, but noted that these areas were minor compared to the surrounding agricultural landscape.

RD 1000 RHL is unique in that it is defined by reclamation infrastructure: the roads, channels and levees that converted the floodplain, resulting in agricultural land use. Sale of agricultural land was the ultimate goal of the Natomas Company's investment, and the agricultural economy grew as a result of the reclamation systems.[183] The intertwined nature of reclamation and agriculture was acknowledged within the *Rural Historic Landscape Report*, but the authors ultimately concluded that agricultural aspects of RD 1000, including irrigation infrastructure, were noncontributing to the reclamation landscape.[184] This absence is notable given that agricultural fields within the period of significance comprised the majority of land use and continue to preserve the aesthetic of the "large field patterns" created by the roads and reclamation infrastructure in the northern part of the district.

Discussions related to the integrity of the physical elements of the district in the *Rural Historic Landscape Report* are cursory. The authors determined that the location, materials and design of the contributing canals, levees and roads "remain[ed] unchanged."[185] It is true that many of these elements retain a high to moderate degree of integrity of location; however, materials have changed significantly since the late 1930s due to advancements in construction methods and changes in land use and population growth. Furthermore, the definition of *design* in the *Rural Historic Landscape Report* differed from the conventions presented by the Secretary of the Interior in NRB 15: *How to Apply the National Register Criteria for Evaluation* and NRB 30: *Guidelines for Evaluating and Documenting Rural Historic Landscapes*."

The authors of the *Rural Historic Landscape Report* defined *design* as the "function" of the contributing element within the drainage system.[186] In other words, the levees, pumping system, canals and roads, retained integrity of design because they continued to provide flood protection. According to NRB guidance, however, the continued function of a levee or pump as part of a flood control system or a road as a transportation corridor, does not inherently demonstrate integrity of design. Instead

[182] Bradley and Corbett, 61.
[183] Bradley and Corbett, 39.
[184] Bradley and Corbett, 55.
[185] Bradley and Corbett, 22.
[186] Bradley and Corbett, 26.

additional factors, such as form, plan, and spatial organization, must be considered to assess design.[187] The sections below re-evaluate the integrity of the RD 1000 RHL levees, road system, canals and pumping system in light of definitions presented in NRB 30 and developments since the mid-1990s.

4.4.1 Levees

4.4.1.1 *Description and Construction History*

The levees surrounding RD 1000 and the community of Natomas measure approximately 42 miles. Within the RD 1000 RHL, levees are segmented by rough cardinal direction: the Cross Canal Levee to the north, the East Levee to the east and southeast, and the River Levee to the west and southwest (Figure 24). The earthen levees measure 39 to 44 ft. in height and are generally trapezoidal in shape with crowns measuring between 20 and 60 ft wide.[188] Slurry cutoff walls reinforce the levees, and the paved two-lane Garden Highway runs along the crown of the River Levee. I-80 and I-5 cross over the system. Several pumping plants, located adjacent to the levee walls, enhance the flood protection provided by the levees.[189]

Between 1951 and the late 1970s, levee repairs were limited to relatively routine cyclical maintenance: stone protection, grading, surfacing, levee raises, selective clearing and emergency repairs.[190] I-5 and I-80 were completed during the mid-1960s and 1970s, crossing over the southern and northern parts of the levee units.[191] Starting in the 1980s, significant improvements were made to strengthen the levees. During the 1980s, approximately 12.2 miles of levee berms, drains and slurry walls were constructed on the landslide slope of the River Levee between the Natomas Cross

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[187] Under the category of "design," guidance in the NRB 30, "Guidelines for Evaluating and Documenting Rural Historic Landscapes," refers to the "functional organization of vegetation, topography, and other characteristics of the landscape." Similarly the definition in NRB 15 "How to Apply the National Register Criteria for Evaluation," emphasized "historic functions and technologies as well as aesthetics." According to the NRB definitions, the spatial organization of the landscape is highlighted along with the function of these elements. Shifts in land use would "not seriously alter integrity if historic boundary demarcations, circulation networks and other components remain in place." For example, a field that was once used as a wheatfield that later used to pasture would not detract from the design, a field of heavily irrigated fruit trees in a former grazing land, however, would compromise the integrity of the design.

[188] "Post-Authorization Change Report and Interim General Reevaluation Report, American River Watershed, Common Features Project Natomas Basin Sacramento and Sutter Counties, CA, Appendix E," Sacramento Area Flood Control Agency, US Army Corps of Engineers, August 2010, 8. https://www.spk.usace.army.mil/Portals/12/documents/civil_works/CommonFeatures/appendix_e.pdf

[189] Operation and Management Manual Sacramento River Flood Control Project Unit No. 124, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 10.

[190] Operation and Management Manual Sacramento River Flood Control Project Unit No. 124, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 29, 31. Operation and Management Manual Sacramento River Flood Control Project Unit No. 125, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 7.

[191] Steven M. Avella, *The Good Life: Sacramento's Consumer Culture* (San Francisco: Arcadia Publishing, 2008), 29.

Canal and Powerline Road.[192] Additional slurry cutoff walls measuring 75 feet deep were added along the Garden Highway between 1996 and 2009.[193] The East Levee and Cross Canal Levee were similarly reinforced by cutoff walls between 2007 and 2010.[194] The Cross Canal Levee and the East Levees were most recently widened and heightened in 2008.[195] The Garden Highway and adjacent pumping system have also undergone numerous repairs and improvements outside of the periods of significance.[196]

4.4.1.2 *Integrity Review*

The levees were part of the original flood control infrastructure of the reclamation district and defined the western boundaries of the RHL. The levee system of RD 1000 was determined to retain a high integrity of location, materials and design in the *Rural Historic Landscape Report.* Although not directly addressed in the text, the integrity of the levees also rested on the setting. Levees near developed areas in the southern part of the RHL were determined to be non-contributing. [197] Overlooked in the *Rural Historic Landscape Report* were significant modifications to the levees between the end of the period of significance in 1939 and the mid-1990s. These evaluations were also written prior to a boom in urban development during the early 2000s and major levee repairs in the late 1990s and 2000s.

The integrity of the RD 1000 levees is low. The levees are in roughly the same location as in the late 1930s, but the addition of levee berms during the 1980s and levee widening in the early 2000s has changed the levee footprint. The integrity of design, materials and workmanship of the levees are poor due to the addition of berms, levee raises, slurry walls, the I-80 and I-5 overpasses and improvements to the Garden Highway outside of the periods of significance. Levee building techniques including slurry walls and jet grout were not widely available until 1970s and the 1980s.[198] The integrity of the setting, feeling and association of the levees south of West Elverta Road, and the Sacramento Airport, is also poor due to modern development. The River Levee and East Levee in particular, no longer serve as a visual or physical boundary for the district; rather, the district boundaries to the south and west are determined more accurately by areas of modern development. Given the lack of integrity in materials, design, workmanship, feeling, setting and association, the Corps finds that the levees of RD 1000 do not possess sufficient integrity to demonstrate their significance within the period of 1910-1939 and are no longer contributing elements to the RHL.

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[192] Operation and Management Manual Sacramento River Flood Control Project Unit No. 124, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 9.
[193] Operation and Management Manual Sacramento River Flood Control Project Unit No. 124, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 10.
[194] Operation and Management Manual Sacramento River Flood Control Project Unit No. 125, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 7-8.
[195] Operation and Management Manual Sacramento River Flood Control Project Unit No. 125, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 127-129.
[196] Denise Bradley and Michael Corbett, 31-2.
[197] Bradley and Corbett, 74.
[198] "Slurry Wall: Behind the Engineering Feat that Made the WTC Possible," 9/11 Memorial.

4.4.2 Pumping Plants

4.4.2.1 *Description and Construction History*

There are currently seven main pumping plants maintained by RD 1000, positioned along the levees (Figures 35-38). The plants serve to divert excess water from the main drainage canals into the Sacramento River.[199] Three of the seven plants were built by the Natomas Company in 1915, 1916 and 1939. Plants 1-A, 2 and 3, were designed to discharge stormwaters from the Natomas East Main Drainage Canal, the Pleasant Grove Canal, and the Cross Canal. The three plants were designated as contributing elements in the *Rural Historic Landscape Report.* The remaining plants, built after 1950, were added to enhance the drainage capabilities of the existing system and are non-contributing to the RHL. A description of both the contributing and non-contributing pumping plants is available in the attached *Rural Historic Landscape Report*.[200] The discussion below focuses on contributing Pumping Plants 1-A, 2 and 3.

Pumping Plant 1-A, originally known as Pumping Plant 1, was the first plant constructed by the Natomas Company in RD 1000. Located at the southern end of the Natomas East Main Drainage Canal the plant began operating in 1914, and was completed in 1915. Pumping Plant 1 served as the largest pump within the period of significance. An additional pumping plant, 1-B, was added to enhance the capability of Pumping Plant 1, renamed 1-A, in 1958.[201] The original machinery within Pumping Plant 1-A consisted of three centrifugal pumps run by electric motors and fed by suction pipes measuring 50 inches in diameter. Pumped water traveled to the Sacramento River through concrete conduits built under the River Levee through hand operated sluice gates measuring 5 by 7 feet (ft.).[202] The machinery and switchboard is contained in a steel-framed utility building, measuring 24 ft. tall and 30 ft. by 80 ft. The building rests on a reinforced concrete foundation, its walls are constructed of interlocking tile and the roof is of galvanized iron.[203] Pumping Plant 1-A has undergone a number of repairs. The pump motors were re-wound in 1958, between 1989 and 1991 the discharge channels were shortened and the sluice gates were replaced, the electrical controls were automated and replaced, the original intake pipes were replaced, and within the building, railings, light fixtures and doors were also replaced.[204] Pumping Plant 1-A has not been operational since the early 2000s due to outdated infrastructure.[205]

Pumping Plant 2 was constructed at the west end of the North Drainage Canal in 1916, near Pritchard Lake. The plant is located on high ground and serves as part of both the drainage and irrigation system. Pumping Plant 2 is managed jointly by RD 1000 and the Natomas Central Mutual Water Company. The water collected at Pumping Plant 2 can be released into the Sacramento River or into the gravity fed irrigation canal to irrigate the northwestern section of RD 1000. Original machinery within Pumping

[199] "Reclamation District 1000: Facilities," RD 1000*,* August, 2017, accessed March 1, 2021, https://www.rd1000.org/rd-1000-facilities.
[200] Bradley and Corbett, 20-25.
[201] Bradley and Corbett, 24.
[202] Bradley and Corbett, 25.
[203] Bradley and Corbett, 25-26.
[204] Bradley and Corbett, 26.
[205] "Reclamation District 1000: Facilities," RD 1000.

Plant 2 consisted of two centrifugal pumps run by electric motors and fed by suction pipes measuring 36 inches in diameter. Pumped water traveled to the Sacramento River through 48-inch pipes, or through two 36-inch pipes to the district irrigation canal. The machinery was originally contained in a small corrugated metal building. The plant was rebuilt in 1976 with new pumps. The corrugated metal building was demolished in 1991.[206] The plant was rebuilt and relocated in 2014 after the facility was damaged by a sinkhole during flooding in 2006.[207] The pumping plant was scheduled to receive funding for additional improvements in 2018.[208]

Pumping Plant 3 was constructed in 1939 following a severe flood that overwhelmed the existing pumping plants. Pumping Plant 3, located north of San Juan Road on the Garden Highway, was designed to drain a new branch canal that diverted water from the West Drainage Canal. The original machinery within Pumping Plant 3 consisted of three electrical vertical mix-flow pumps, a type of pump that uses a combination of centrifugal and axial force to disperse water. The original building that housed Pumping Plant 3 is no longer extant. The plant has undergone several repairs, the original pumps were replaced in 1992, the facility was refurbished again in 2001, and the capacity of the pumping plant was bolstered to accommodate increased runoff resulting from urban development.[209]

4.4.2.2 *Integrity Review*

Pumping Plants 1A, 2, and 3 were part of the flood control infrastructure of RD 1000, serving to discharge overflow water from the system of channels into the Sacramento River. The pumping system was determined to retain a high integrity of location, materials and design in the *Rural Historic Landscape Report.* [210] Overlooked in the *Rural Historic Landscape Report* were significant modifications to the pumping plant infrastructure after the period of significance ended in 1939. None of the original pumps are extant, much of the original machinery has been replaced, and two of the three original buildings have been demolished. Pumping plant 1-A is no longer operational, and Pumping Plant 3 must function at a higher capacity due to post-1990s urban development. Furthermore, the operations of the original three plants have been bolstered by an additional five plants added outside of the period of significance.

The integrity of the RD 1000 pumping plants is low. Pumping Plants 1-A, and 3 remain in the same location as in the late 1930s, but Pumping Plant 2 was re-located in 2014. The integrity of design, materials and workmanship for all plants is poor due to numerous replacements after the period of significance. The integrity of the setting, feeling and association of the plants is also poor due to modern development in the southern half of RD 1000. Given the lack of integrity in materials, design, workmanship, location, feeling, setting and association, the Corps finds that Pumping Plants 1-A, 2

[206] Bradley and Corbett, 27.
[207] "Reclamation District 1000: Facilities," RD 1000.
[208] Meeting Minutes, Reclamation District No. 1000 Board of Trustees Regular Board Meeting, Sacramento, CA, September 14, 2018, Sacramento CA, accessed March 2, 2021. https://www.rd1000.org/files/a45096d1e/September+2018+Board+Packet+%28002%29.pdf
[209] "Reclamation District 1000: Facilities," RD 1000.
[210] Bradley and Corbett, 27.

and 3 do not possess sufficient integrity to demonstrate their significance and are no longer contributing elements to the RHL.

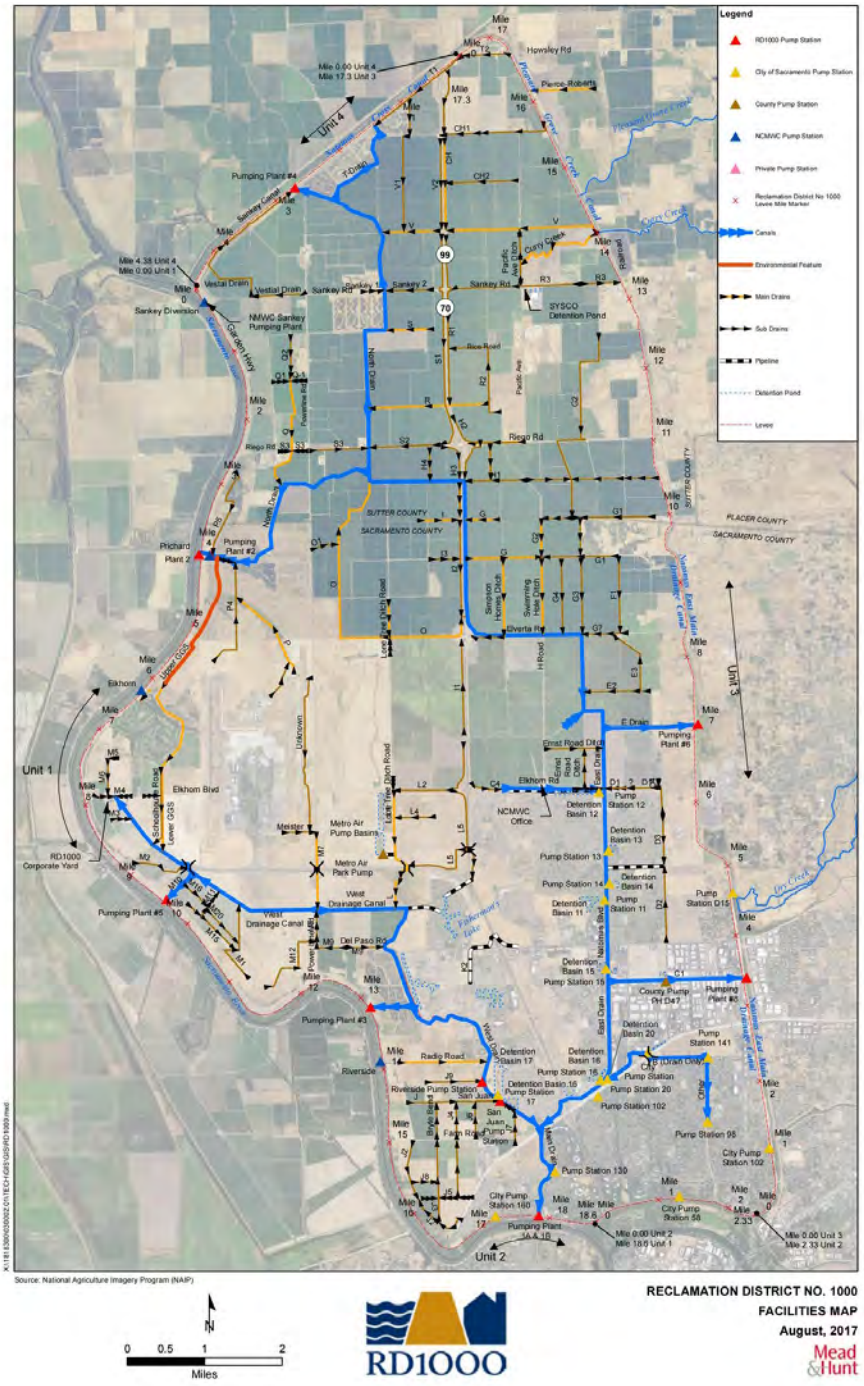

Figure 35: RD 1000 Pump and Canal System

Taken from “Reclamation District 1000: District Map,” RD 1000 website, August, 2017, accessed March 1, 2021, <https://www.rd1000.org/reclamation-district-1000-district-map

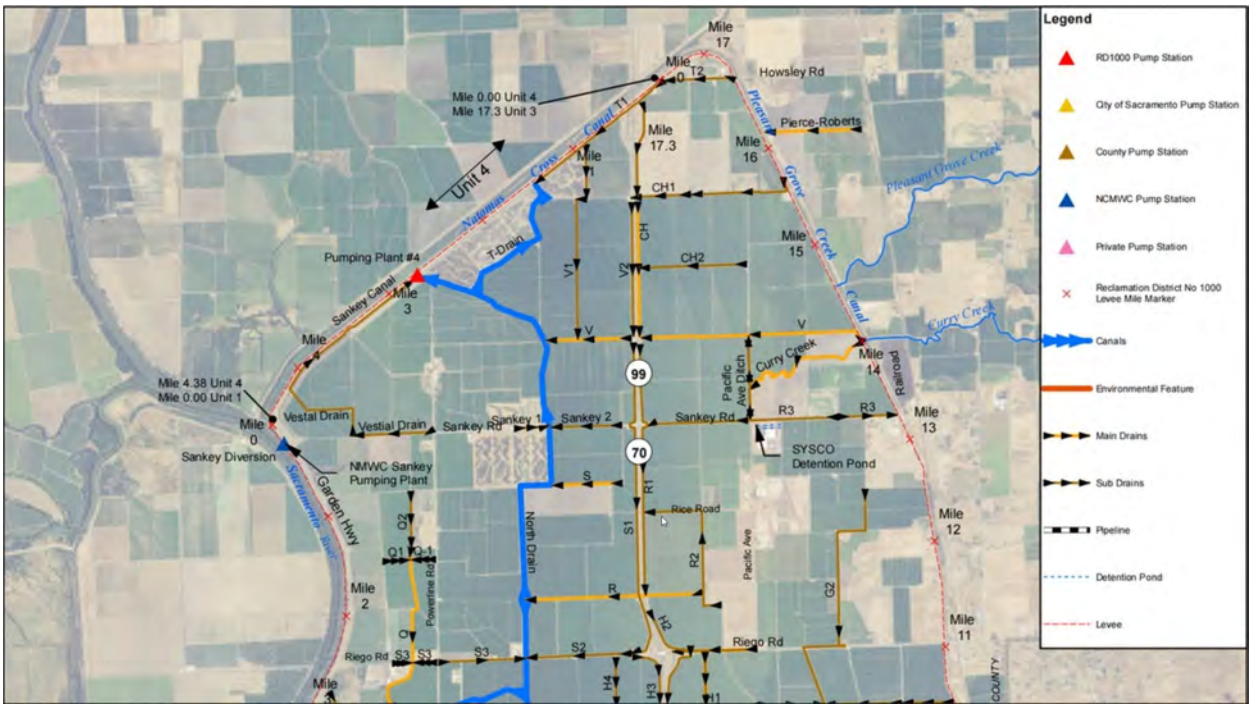

Figure 36: RD 1000 Pump and Canal System, North

Figure 37: RD 1000 Pump and Canal System, Central

Figure 38: RD 1000 Pump and Canal System, South

4.4.3 Canals

4.4.3.1 *Description and Construction History*

A network of approximately 205 miles of canals and ditches serve to drain excess stormwaters and agricultural runoff from RD 1000 to the Sacramento River. The system of exterior and interior canals functions in tandem with the RD 1000 pumping system (Figure 35-38) .[211] Three canals outside of the RD 1000 levee walls—the Pleasant Grove Canal, Natomas East Main Drainage Canal and the Cross Canal—form the north, east and south boundaries of the district and divert overflow waters to the Sacramento River. Within the levee walls of RD 1000, the North, East, and West Canals and the Natomas Main Drainage Canal redirect excess water to these exterior canals and the Sacramento River.[212] Together, the main interior canals measure approximately 30 miles. A network of additional drainage ditches throughout the district, approximately 150 miles, also feed into the interior drainage system. Ten bridges cross the Natomas East Main Drainage Canal and the Pleasant Grove Creek Canal, connecting Natomas with communities to the east. Two bridges cross the Natomas Cross Canal.[213]

The interior and exterior canals were constructed with steep vertical walls and remain primarily earthen, reinforced by rock slope protection. The most common maintenance activities in the canals have involved vegetation and erosion control, as well as sediment removal.[214] Materials for repairs have remained similar to those used during the period of significance, and stone protection continues to be part of cyclical maintenance.[215]

Alterations to the main interior canal system outside of the period of significance have most commonly been linked to new pumping plants. A branch canal was added to the West Drainage Canal south of the I-5 bridge during the mid-1960s to facilitate operations at Pumping Plant 5. The plant was constructed in 1965 and drains runoff from the Sacramento Airport.[216] A branch canal was added to the East Drainage Canal between Elverta and Elkhorn Roads when Pumping Plant 6 was constructed in 1974.[217] Another branch canal from the East Drainage Canal, located south of Del Paso Road, was built to accommodate Pumping Plant 8 in 1983.[218]

Other alterations have been spurred by the road system and development. The East Drainage Canal continues underground through a concrete culvert at the intersection of

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[211] "Introduction and Background," *Reclamation District 1000: Draft Capital Improvement Program,* May 2020, Presented at Board of Trustees Regular Board Meeting Friday June 12, 2020, 38. https://www.rd1000.org/files/54b294b33/BOT+Packet+June+2020+%28Final%29+v2.pdf
[212] Bradley and Corbett, 21.
[213] Operation and Management Manual Sacramento River Flood Control Project Unit No. 125, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 12.
[214] "Introduction and Background," *Reclamation District 1000: Draft Capital Improvement Program,* 118.
[215] John Snyder, Jeff Crawford et. al, "Water Conveyance Systems in California: Historic Context Development and Evaluation Procedures," Caltrans and JRP Historical Consulting Services (Sacramento: Cultural Studies Office, Caltrans Environmental Program, December 2000) 86.
[216] Bradley and Corbett, 28.
[217] Bradley and Corbett, 28.
[218] Bradley and Corbett, 29.

I-5 and I-80.[219] During the late 2000s, a new concrete-lined canal was added to Pumping Plant 2 to connect to the West Canal.[220] The 8 mile canal was designed to foster habitat for giant garter snakes rather than drainage or irrigation (Figure 37).[221]

The description of drainage ditches in the *Rural Historic Landscape Report* did not identify specific ditches that were part of the district. Instead, ditches were "located on rights-of-way or are owned by individual landowners...to form the individual fields within the larger spatial pattern."[222] The ditches are maintained by RD 1000, though it is clear that the location and number of drainage ditches has changed as landowners have improved their property and development in the southern end of the district has disrupted agricultural land use. Drainage ditches have remained primarily earthen, though some ditches and culverts have been reinforced by concrete outside of the period of significance.[223]

4.4.3.2 *Integrity Review*

The canals were part of the flood control infrastructure designed by the Natomas Company, and define the northern, eastern and southern boundaries of the RHL. The canal system of RD 1000 was determined to retain high integrity of location, materials and design in the *Rural Historic Landscape Report.* Overlooked in the *Rural Historic Landscape Report*, however, were modifications to the canals between the end of the period of significance in 1939 and the mid-1990s. The volume of overflow drained by the canals and ditches has increased with urban development, which has resulted in branch canals added to the original system and differences in the connecting pumping system.

The integrity of the RD 1000 canal system is moderate. The exterior canals remain in the same location as in the late 1930s. Within the interior canal system, the addition of branch canals from the 1960s forward has altered the breadth of the canal system. The drainage canals have also changed with modern development in the southern part of the district. The integrity of design, materials and workmanship of the canals are moderate, as many of the canals remain earthen. The integrity of the setting, feeling and association of the drainage system in the southern half of RD 1000, south of West Elverta Road, is poor due to modern development. Integrity for the same elements is high in northern RD 1000, where land use remains primarily agricultural. The Corps finds that the drainage system located south of Elverta Road is does not possess sufficient integrity to demonstrate significance as part of the reclamation landscape, and is no longer contributing to the RD 1000 RHL. The drainage system located north of Elverta Road retains a moderate to high level of integrity.

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[219] Bradley and Corbett, 24.
[220] Operation and Management Manual Sacramento River Flood Control Project Unit No. 125, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 133.
[221] Operation and Management Manual Sacramento River Flood Control Project Unit No. 125, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 132-133.
[222] Bradley and Corbett, 24-5.
[223] Bradley and Corbett, 54. Operation and Management Manual Sacramento River Flood Control Project Unit No. 125, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 125.

4.4.4 Road System

4.4.4.1 *Description and Construction History*

The roads within RD 1000 consist of interstate highways, two and four lane main arteries, two lane roads and some smaller, unpaved roads. The roads within RD 1000 are managed by state, county and city governments (Figure 39). [224] I-80 and I-5 cross over the southern region of RD 1000, and State Route 99/70 bisects the northern region of the district. On the periphery of the district, the two-lane Garden Highway is built on the levee crown of SRFCP Unit 124. Within SRFCP Unit 125, Howsley Road is built on the crown of the Cross Canal Levee, and the Natomas Road/East Levee Road is built on the crown of the East Levee. The Arden Garden Connector, at the southern end of SRFCP Unit 125 is a four lane highway that connects the Garden Highway to Arden Way. Within the district, the majority of the roads south of West Elverta Road lead to residential or commercial areas. Roads north of West Elverta Road lead to agricultural areas.

A grid-like road system of RD 1000 was established by the Natomas Company between 1911 and 1939 in order to access reclamation infrastructure. Most of the Natomas Company roads were completed between 1917 and the mid-1920s.[225] The road system within RD 1000, along with the canal system, established the gridlines of the RHL. Within the period of significance, the roads around the periphery of RD 1000, particularly the Garden Highway, were also marketed as a route for a scenic drive in the bucolic area.[226] In the *Rural Historic Landscape Report,* the following roads were identified as contributing elements to the RD 1000 RHL (Figures 24 and 39):

- Garden Highway from Orchard Lane north to the Cross Canal
- East Levee/Natomas Road
- Sankey Road
- Riego Road
- Elverta Road
- Elkhorn Boulevard from Garden Highway to the western boundary of the Sacramento Airport
- Del Paso Road from Powerline Road to its intersection with I-5
- San Juan Road from Garden Highway to its intersection with I-5
- Powerline Road
- El Centro Road from north of 1-80 to its intersection with Bayou Way
- Right-of-way roads within fields in the areas of contributing large scale land patterns

[224] "District 3 Current Projects," CalTrans, accessed March 1, 2021. <https://dot.ca.gov/caltrans-near-me/district-3>. "Major Street Improvements Program," City of Sacramento, 2014, accessed March 1, 2021 <https://www.cityofsacramento.org/-/media/Corporate/Files/Public-Works/Publications/Engineering/Transportation-Programming-Guide/TPGAMajorStreetImprovements2014.pdf?la=en>. Operation and Management Manual Sacramento River Flood Control Project Unit No. 125, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 129.
[225] Bradley and Corbett, 32.
[226] Bradley and Corbett, 31.

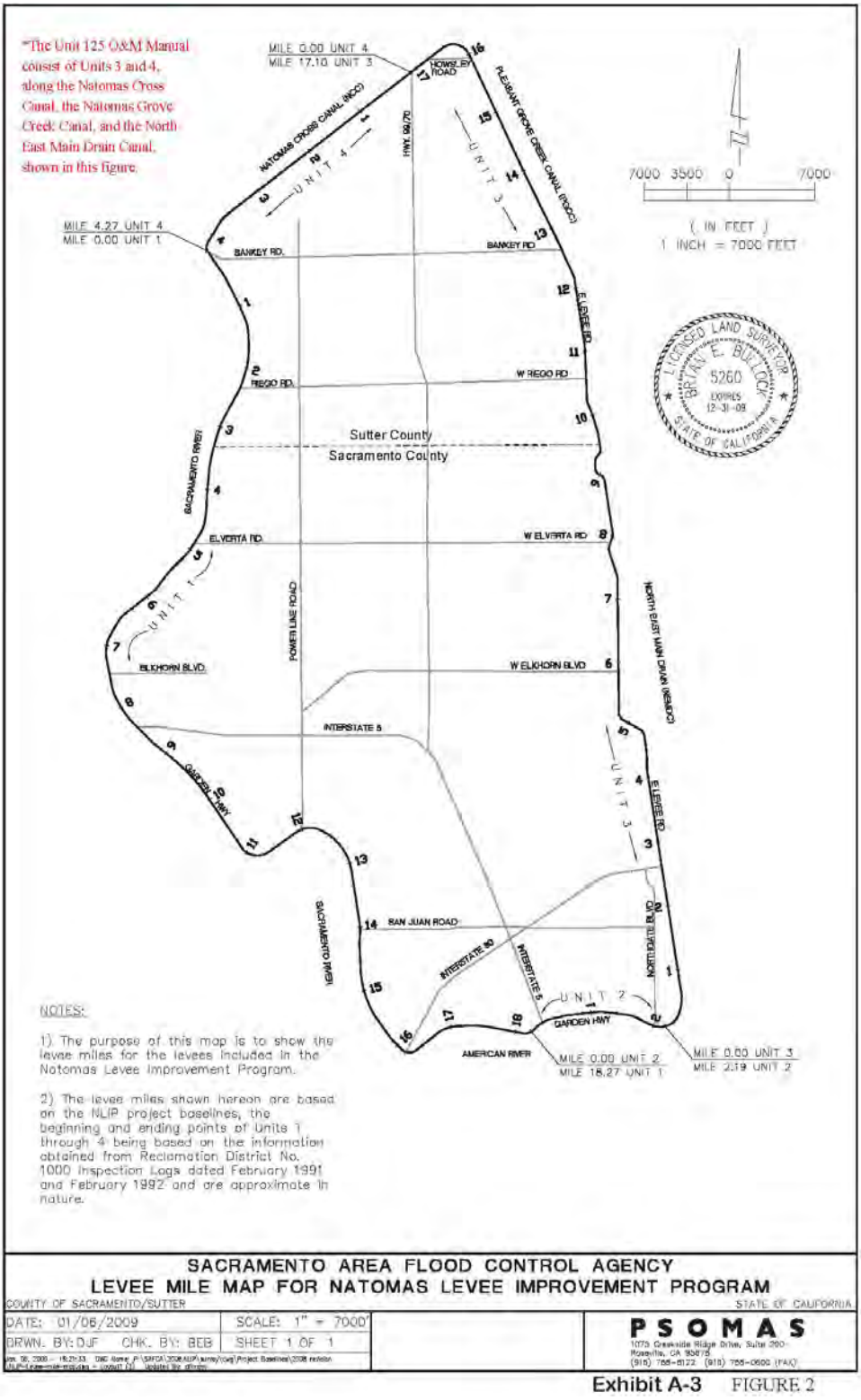


Figure 39: Outline of Modern RD 1000 Road System c. 2009

"Operation and Management Manual Sacramento River Flood Control Plan Unit No. 125," on file at U.S. Army Corps of Engineers, Sacramento District, Sacramento, CA, 18

The road system has changed dramatically since the period of significance, starting with the completion of I-80, I-5 and State Route 99/70 during the mid-1960s and 1970s.[227] More recently, the Arden Garden connector, completed in the late 1990s, connected the Garden Highway to Arden Way, a major east/west 4-lane road, changing traffic flow.[228] Numerous smaller two-lane residential roads have been added as housing developments have been built along I-5 and I-80 over the past 30 years. Furthermore, many of the contributing roads have been widened to accommodate paved shoulders or additional lanes of traffic.[229]

4.4.4.2 *Integrity Review*

The roads of RD 1000 were designed by the Natomas Company in order to access and maintain the surrounding flood control infrastructure. The roads, along with the interior drainage canals also defined the grid pattern of the district and the transportation network of RD 1000. In the *Rural Historic Landscape Report*, the road system was determined to retain a high integrity of location, materials and design. Overlooked in the *Rural Historic Landscape Report*, however, were modifications to the road system between the end of the period of significance in 1939 and the mid-1990s. Additional development within the past 30 years has also altered the road patterns and the traffic flow within the district. The driving force of road construction and improvements within RD 1000 is no longer the reclamation system, instead it is urban development.

The integrity of the RD 1000 road system is low. The contributing roads remain in the same location as in the late 1930s, but numerous alterations have resulted in connections with new road systems. Integrity of design, materials and workmanship of the roads are moderate to low, as methods of laying asphalt, and standards for road widths have changed since 1939. The integrity of the setting, feeling and association of the road system in the southern half of RD 1000, south of West Elverta Road, is low due to numerous added road networks connecting residential areas and the Sacramento International Airport to the interstate system. Integrity for the same elements is low to moderate in the northern region of RD 1000, where the district remains agricultural, but is bisected by State Route 99/70. The Corps finds that the road system of RD 1000 does not possess sufficient integrity to demonstrate significance as part of the reclamation landscape and is no longer contributing to the RD 1000 RHL.

[227] Steven M. Avella, *The Good Life: Sacramento's Consumer Culture* (San Francisco: Arcadia Publishing, 2008), 29.
[228] “Arden-Garden Connector” CEQA, State of California, accessed March 15, 2021. https://ceqanet.opr.ca.gov/1994072055/2.
[229] Bradley and Corbett, 32.

Figure 40: Modern RD 1000 Road System (North)

Source: Google Maps

Figure 41: Modern RD 1000 Road System (Central)

Source: Google Maps

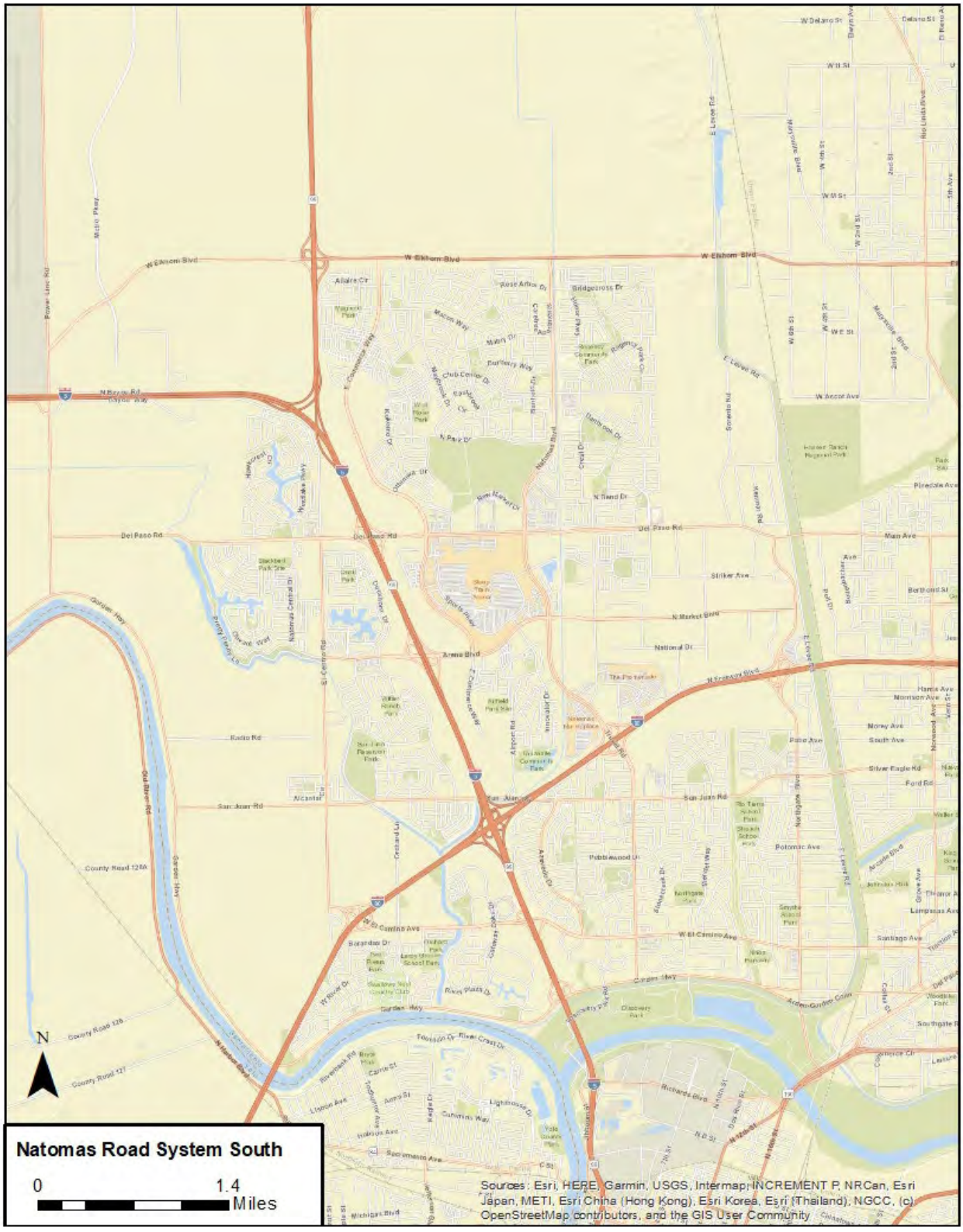


Figure 42: Modern RD 1000 Road System (South)
Source: Google Maps

4.5 **Landscape Characteristics**

In accordance with NRB 30*: How to Evaluate and Nominate Rural Historic Landscapes* the RD 1000 RHL was distinguished from its immediate surroundings by seven of the 11 RHL characteristics:

- Response to the natural environment
- Circulation networks
- Pattern of spatial organization
- Land uses and activities
- Vegetation related to land use
- Boundary demarcations
- Buildings and structures[230]

Many of these characteristics have changed due to urban development. At the time of the 1996 *Rural Historic Landscape Report*, post-World War II development was limited to the Sacramento Metropolitan Airport and a small area of southern Natomas, south of I-80 to the west of I-5 and south of Del Paso Road to the east of I-5, approximately 16% of the district.[231] These areas, identified in the map re-produced in Figure 24, were determined to be non-contributing to the RD 1000 RHL.[232]

A building boom in the intervening years, however, has resulted in an expansion of industrial areas and residential subdivisions along major highways that connect Natomas to Sacramento. Modern development now occupies roughly 30% of the district, most is concentrated in the southern and western portion of Natomas (Figure 34). Similarly, in 1996, it was estimated that agricultural use accounted for 71% of the district.[233] In 2010, the same figure had dropped to 60%.[234] Although agriculture was not directly associated with reclamation, the continued existence of agricultural fields has contributed to the preservation of the landscape characteristics. It is anticipated that development in Natomas will continue, resulting in further disruption to the “large field patterns” and “grid pattern” that characterizes the rural area (Figure 40-42).

Development and modernization has led to changes in the landscape characteristics identified in the *Rural Historic Landscape Report*: the response to the natural environment, circulation networks, patters of spatial organization, land uses and activities, vegetation related to land use, boundary demarcations and buildings and structures. Furthermore, the roads, canals, pumps and levees have been subject to maintenance that has compromised the integrity of the original structures. Levees have

[230] Bradley and Corbett, ii.
[231] Bradley and Corbett, iv.
[232] Bradley and Corbett, 41.
[233] Bradley and Corbett, 43.
[234] *Draft Supplemental Environmental Assessment, American River Watershed Common Features Natomas Basin Project Reach D, Sutter County, California,* U.S. Army Corps of Engineers, Sacramento, August 2017, 15.

been raised and widened, canals have been expanded and the original pumping system has been refurbished and expanded. The system of highways, roads and bridges has been expanded within the past 80 years, changing the way that traffic circulates within the district.

4.6 **Conclusion**

RD 1000 is roughly divided into an agricultural region to the north and a developing region to the south. The divide is marked by the Sacramento International Airport and West Elverta Road. The integrity of contributing elements and Landscape Characteristics is much higher north of West Elverta Road. In view of the relative integrity of the northern region of the RD 1000 RHL, the Corps considered recommending that the the RHL boundaries be reduced to encompass the northern region only; however, this idea for a smaller district boundary was rejected due to the nature of the RD 1000 reclamation system. The RD 1000 reclamation system was designed to work in tandem with other flood control infrastructure. The Natomas Main Drainage Canal, for example, spans the northern and southern part of RD 1000. The canal would not be effective without the protection of the surrounding levees or the drainage capabilities of the Pumping Plants 1A and 1B, which have been refurbished.

Furthermore, as observed under the discussion of significance, the flood control system of RD 1000 was incorporated into the SRFCP in 1951, and has been managed by an elected board of trustees since 1955. [235] "Reclamation" in the sense of water use is managed by the NCMWC and through contractual agreements with the Bureau of Reclamation for CVP deliveries . Both of these changes in management occurred after the period of significance and led to a relatively standard management and maintenance nexus that is characteristic of the SRFCP. In view of the current purpose and management of RD 1000, the Corps proposes that the significance of RD 1000 be considered, instead as part of a SRFCP MPL.

[235] Operation and Management Manual Sacramento River Flood Control Plan Unit No. 124, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 82.

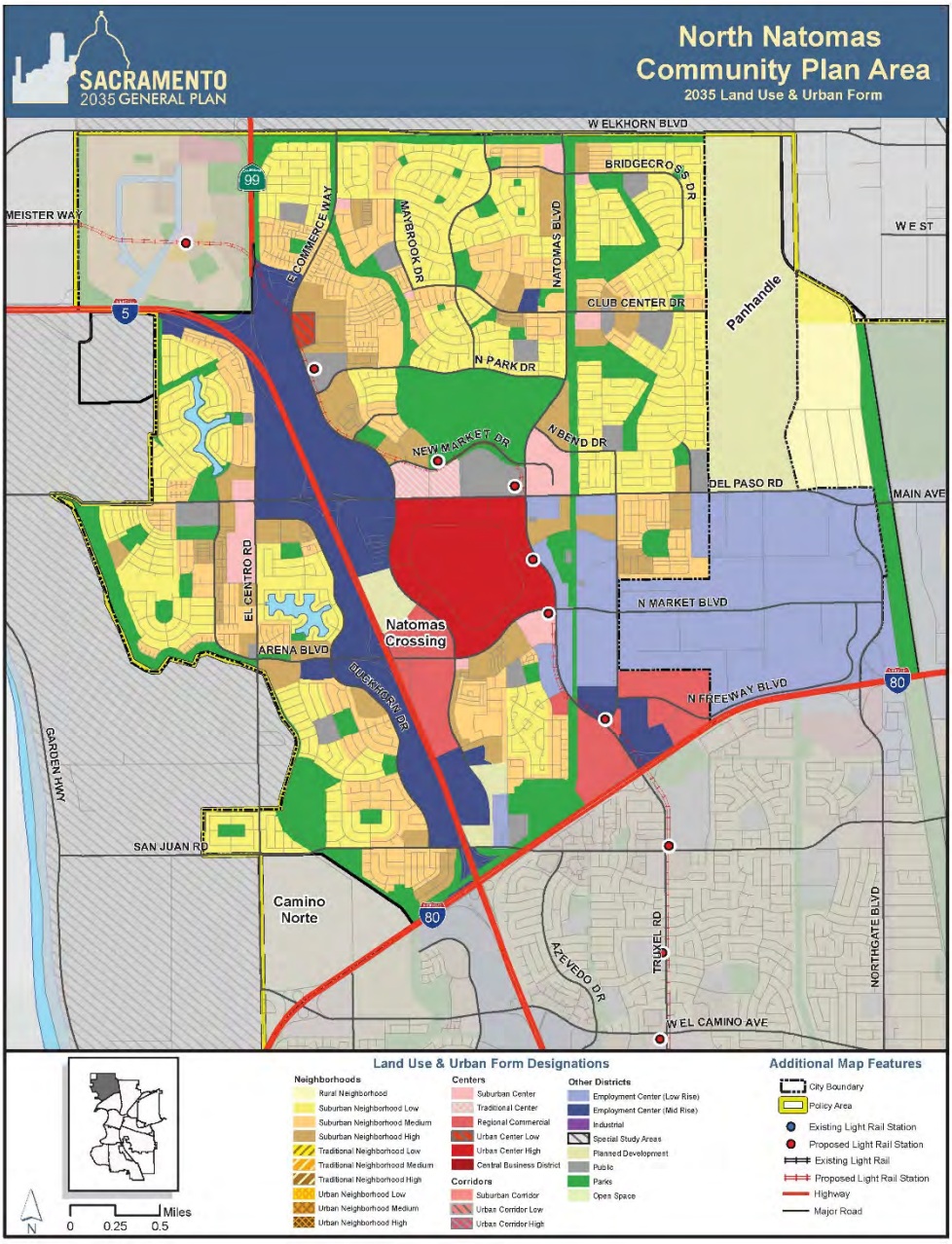
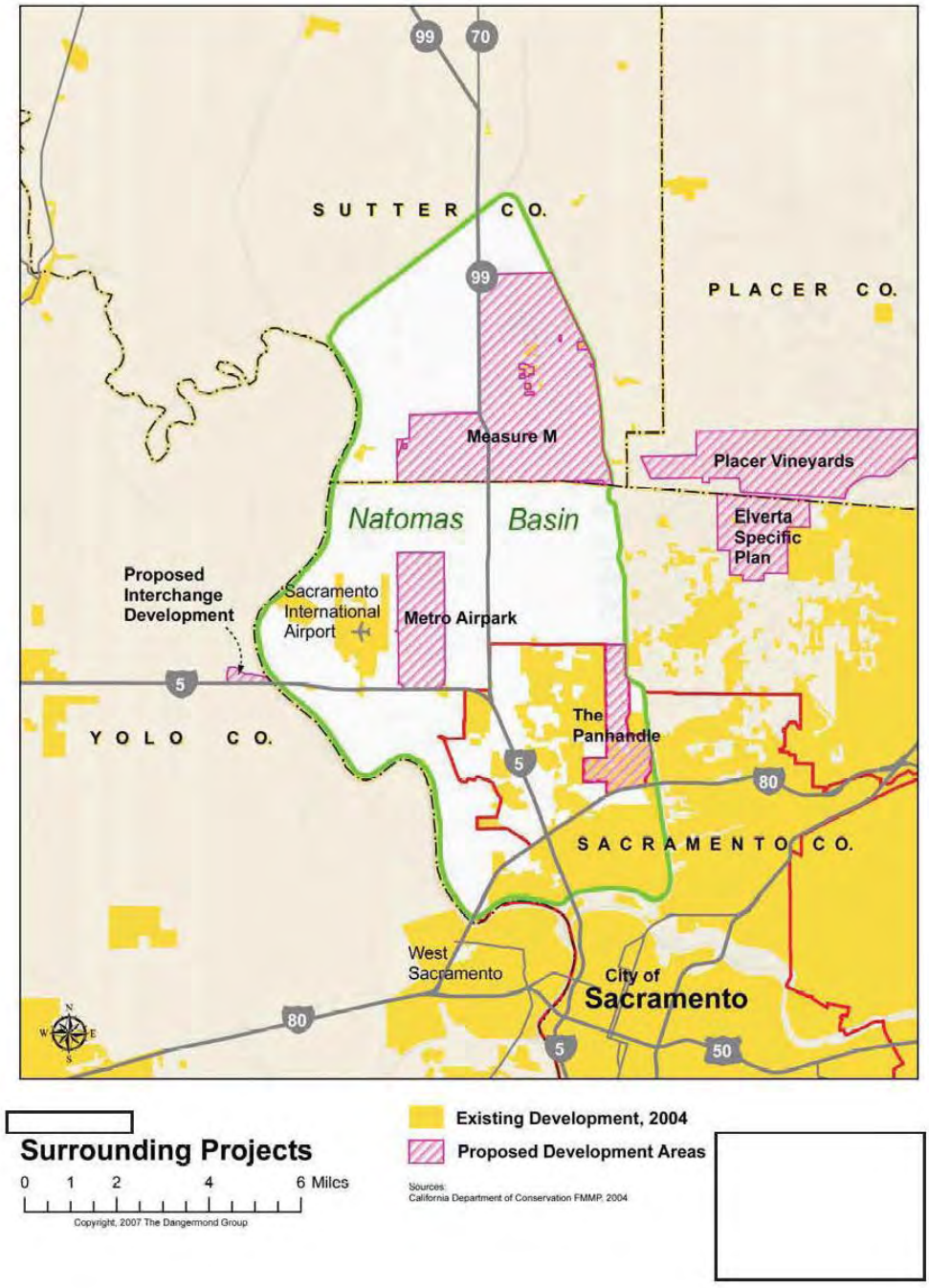


Figure NN-2

2035 General Plan Land Use & Urban Form Designations for the North Natomas Community Plan Area

Figure 43: Land Use Plan for North Natomas showing proposed development

Taken from the "North Natomas Community Plan," Sacramento 2035 General Plan, Adopted by the City of Sacramento, March 3, 2015



(Note: Greenbriar Annexation is not shown)

Figure 44: Land Use Plan for Natomas showing proposed development c.2010

Taken from the "Municipal Service Review and Sphere of Influence Update: Reclamation District No. 1000." Sacramento Local Agency Formation Commission, February, 2010

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Appendix I: SRFCP Multiple Property Documentation Form

United States Department of the Interior
National Park Service

National Register of Historic Places Multiple Property Documentation Form

This form is used for documenting property groups relating to one or several historic contexts. See instructions in National Register Bulletin *How to Complete the Multiple Property Documentation Form* (formerly 16B). Complete each item by entering the requested information.

___X__ New Submission _____ Amended Submission

A. Name of Multiple Property Listing
Sacramento River Flood Control Plan

B. Associated Historic Contexts
(Name each associated historic context, identifying theme, geographical area, and chronological period for each.)

State Support of the SRFCP 1911-1961

Federal Support of the SRFCP 1917-1961

Post-New Deal Construction of the SRFCP 1935-1961

C. Form Prepared by:
name/title: Susannah Lemke, Historian
organization: U.S. Army Corps of Engineers
street & number: 1325 J Street
city or town: Sacramento state: CA zip code: 95814
e-mail: susannah.d.lemke@usace.army.mil
telephone: 916-557-7114 date: August 30, 2021

D. Certification
As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this documentation form meets the National Register documentation standards and sets forth requirements for the listing of related properties consistent with the National Register criteria. This submission meets the procedural and professional requirements set forth in 36 CFR 60 and the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation.

_____ _____ _____
Signature of certifying official Title Date

_____
State or Federal Agency or Tribal government

I hereby certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.

_____ _____
Signature of the Keeper Date of Action

Table of Contents for Written Narrative
Create a Table of Contents and list the page numbers for each of these sections in the space below.
Provide narrative explanations for each of these sections on continuation sheets. In the header of each section, cite the letter, page number, and name of the multiple property listing. Refer to *How to Complete the Multiple Property Documentation Form* for additional guidance.

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Name of Multiple Property Listing — State

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E. Statement of Historic Contexts

1.1 Introduction

The Sacramento River Flood Control Plan (SRFCP) is a system of water management infrastructure that has shaped the modern history of the Sacramento Valley in the Central Valley of California (Figures 1-2). The SRFCP, completed between 1911 and 1961, transformed the Sacramento Valley from a seasonal floodplain to an urban and agricultural center. The system functions due to a coordinated re-routing of floodwaters from major rivers through manmade infrastructure. Levees along the Sacramento, American, Feather, Bear and Yuba Rivers direct overflow to the Butte Basin and the Sutter and Yolo Bypasses. During periods of flooding, the overflow areas function as a single waterway, diverting flood waters through channels and weirs towards a final release in Suisun Bay.[1]

1.2 California's Central Valley

The Central Valley is a defining feature of interior California. Surrounded by the Coast Ranges to the west and the Sierra Nevada to the east, the Central Valley stretches from Redding to Bakersfield and measures approximately 20,000 square miles.[2] In modern history, the Central Valley has become the agricultural center of the state, where cultivation of over 250 types of crops generates approximately $17 billion in annual revenue. The massive region is fed by the Sacramento River to the north and the San Joaquin River to the south. Correspondingly, the Central Valley can be divided into the northern Sacramento River Basin and the southern San Joaquin River Basin, defined by the Delta Region where the Sacramento and San Joaquin rivers meet in the Carquinez Strait and flow into the San Francisco Bay (Figure 2). Prior to manmade water management structures, the low-lying Central Valley was a semi-arid floodplain. Today, approximately 75% of the irrigated land in the state lies in the Central Valley due to human intervention.[3]

The SRFCP, authorized by the state legislature in the California Flood Control Act of 1911 and later authorized by Congress under the Flood Control Act of 1917, was one of the first comprehensive water management infrastructure projects in California.[4] The SRFCP system of levees, weirs and bypasses extends throughout the Sacramento River

[1] Anne Baker and Erin Brehmer, *American River Watershed Common Features General Reevaluation Report Environmental Impact Statement* (Sacramento, USACE, December 2015), 81.
[2] "California's Central Valley: Regional Overview," US Geological Service, accessed June 25, 2020, https://ca.water.usgs.gov/projects/central-valley/about-central-valley.html.
[3] Ibid.
[4] Joseph J. Hagwood Jr., *The California Debris Commission* (Sacramento, CA: US Army Corps, 1981), 82.

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National Park Service

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Basin north of Tehama through to Rio Vista.[5] Construction on the project began in 1911, and was completed by the early 1960s, (Figures 3-8).[6] The following context focuses on the evolution of water management infrastructure in the Sacramento Valley starting with the post-gold rush era and ending with the completion of the SRFCP.

1.3 Water Management in the Central Valley 1850-1910

1.3.1 The Gold Rush and Farming in the 1850s

Throughout the mid-1800s the combination of mining, population growth and development led to dramatic changes to waterways in the Sacramento Valley.[7] Agriculture emerged as a leading industry in California during the 1850s and 1860s as gold rush boomtowns busted, and would-be miners turned to industries that supplied the incoming wave of emigrants.[8] The rich soils of the Central Valley were swiftly cultivated into fields of grain and wheat.[9] Although profitable, the new settlements were located on floodplains, and growing farms and towns inevitably became inundated with increasing severity. In 1850, the fledgling city of Sacramento flooded when the American and Sacramento Rivers crested simultaneously. During most of the month of January, witnesses reported widespread transportation by boat and buildings being swept from their foundations.[10] Despite this devastating flood in Sacramento and the surrounding farmland, the city continued to grow and was subject to many more floods into the 1910s.

The growth of farms and cities in the floodplains of the Sacramento Valley marked a flood prone pattern of settlement that would continue to flourish along the banks of the American and Sacramento Rivers. Sustained growth in chronically flooded areas may appear counterintuitive from the modern perspective, but this pattern reflected a common mid-19th century emphasis on “reclaimed” land and development popular on the political stage. According to this post-industrial mindset, floodplains and wetlands were considered inherently unproductive, and by draining these “swamplands” through manmade infrastructure, the lands could and should be profitably developed. Throughout the mid-1800s, Congress passed a series of Swamp Land Acts, legislation that transferred titles to swamp and overflow lands from the federal government to the states. The intent of the legislation was to put swamplands in the hands of private landowners who would drain

[5] Mitch Russo, *Sacramento River Flood Control Project Weirs and Flood Relief Structures* (Sacramento: State of California Department of Water Resources, December 2010), 2.
[6] Graham Bradner and Emilie Singleton, “The Origin and Evolution of the California State Plan of Flood Control Levee System,” (paper presented at the 85th annual meeting of International Commission on Large Dams, Prague, July 3-7, 2017), 5.
[7] Jeffrey F. Mount, *California Rivers and Streams: The Conflict Between Fluvial Process and Land Use* (Berkley: University of California Press, 1995), 190.
[8] Hope Schear and Patrick O’Day, *Cultural Resources Survey and Assessment Report American River Common Features, Reach D Project Sutter County, California* (Sacramento: US Army Corps, 2017), 21.
[9] Robert Kelley, *Battling the Inland* Sea (Berkley: University of California Press, 1998), 61.
[10] William Willis, *History of Sacramento California* (Los Angeles: Historic Record Company, 1913), 160.

inundated areas through manmade infrastructure and develop the land for agricultural or other commercial use.[11]

The first Swamp Land Act, also known as the Arkansas Swamp Land Act, was intended to regulate floodplains primarily in the South and the Midwest. Flood control efforts in Arkansas, Alabama, Florida, Mississippi and Missouri had been previously conducted by independent landowners and were often mired in corruption. Under the legislation, the title for swamp and overflowed lands was given to the states.[12] Although communities along the Mississippi continued to be the focus of the Swamp Land Acts, the federal regulation had a dramatic impact to California landowners. Following the Swamp Land Act of 1850, much of the land in the Central Valley became state land. The State of California then sold 320-acre parcels at $1.00 to private parties on the condition that the landowner would "reclaim" the land through cultivation and flood management. By the 1870s, most of the floodplains of the Sacramento Valley had become privately owned farmland.[13]

Individual landowners who were tasked with cultivating and draining swampland built primitive levees to protect farms and property. These early levees, however, were not particularly well constructed. Furthermore, the unsystematic nature of levee construction, along property lines rather than geographic features, ultimately intensified flooding in the valley.[14] Throughout the 1850s, the rise of cities and agriculture in the Sacramento Valley diminished floodplains that had previously absorbed inundations from the banks of the Sacramento and American rivers, further intensifying flooding. During the 1860s, the already deteriorating natural system of flood protection in the Sacramento Valley was additionally stressed by hydraulic mining, upstream in the Sierra Nevada.[15]

1.3.2 Hydraulic Mining in the Sierra Nevada

One of the most dramatic disruptions to the waterways of the Sacramento Valley was the build-up of debris caused by hydraulic mining. Hydraulic mining, introduced in the Sierra Nevada gold fields in 1853, was an industrialized strategy that used a system of reservoirs, dams and high powered hoses to wash away entire hillsides in order to access deeply buried gold deposits.[16] Unlike the small scale placer mining methods used by the first wave of gold seekers, hydraulic mining produced an enormous amount of debris that

[11] Alex Reed Westhoff, *The Sacramento Delta National Heritage Corridor*, (master's thesis, University of California, Berkeley, 2008), 9.
[12] "Enactment of the 1850 Swamp Land Act," University of Richmond Digital Scholarship Lab, Accessed May 20, 2021, https://historyengine.richmond.edu/episodes/view/1711.
[13] Alex Reed Westhoff, *The Sacramento Delta National Heritage Corridor*, (master's thesis, University of California, Berkeley, 2008), 9.
[14] Mount, *California Rivers and Streams: The Conflict Between Fluvial Process and Land Use,* 206.
[15] Mount, 190.
[16] Andrew C. Isenberg, *Mining California: An Ecological History* (New York: Hill and Wang, 2005), 24.

washed into local waterways.[17] By the 1860s and 1870s, debris from hydraulic mining clogged tributaries and eventually the Sacramento and San Joaquin rivers. The debris resulted in navigation challenges and severe flooding in the low lying and increasingly agricultural Central Valley.[18] One witness to a Central Valley flood in 1865 described an "inland sea" measuring 20 miles wide and 250 miles long.[19]

As flooding worsened in the 1880s, farmers were often at odds with miners in verbal, and later legal, debates about the destructive effects of hydraulic mining. Following a devastating flood in February of 1878, farmers across the Sacramento Valley founded the Anti-Debris Association to advocate against hydraulic mining.[20] An 1882 court case in Marysville signaled the end to legal hydraulic mining when Edward Woodruff, a Marysville property owner, filed a lawsuit against the North Bloomfield Mine of the Yuba River for property damage. The presiding judge issued a permanent injunction against hydraulic mining on the Yuba River in 1884.[21] The injunction effectively halted legal hydraulic mining in the state, however the damages from hydraulic mining continued to wreak havoc on communities downstream.[22] Debris continued to clog waterways and severe floods continued to be part of life in the Central Valley through the early 1900s.[23]

1.3.3 Early Levee Systems in the Sacramento Valley

The prevalence of flooding in growing Central Valley communities resulted in some coordinated efforts to build water management systems. Officials at municipal levels worked to build and repair levees, re-route rivers and clear debris. In the growing city of Sacramento, for example, the city government funded levee construction along the south bank of the American River in 1850 and 1852. The levees would shortly be destroyed by flood waters in 1852 and 1853.[24] Sacramento officials also supported a project to re-channel a portion of the American River. The Embarcadero business district, located near the northern area of the city grid, was chronically flooded by the American River. Faced with this problem, city officials funded the creation of a new channel that redirected the river flow ½ mile north, away from the growing Embarcadero business district.[25] Between

[17] Mount, 190.
[18] Mount, 192.
[19] Ibid.
[20] Philip Garone, *The Fall and Rise of the Wetlands of California's Great Central Valley* (Berkley: University of California Press, 2011), 108.
[21] Hagwood Jr., *The California Debris Commission*, 25.
[22] Mount, 207.
[23] Mount, 193.
[24] Nathan Hallam, "Planning Sacramento's Townsite, 1853-1870," in *River City and Valley Life: An Environmental History of the Sacramento Region*, eds. Christopher J. Castaneda and Lee M.A. Simpson (Pittsburgh: University of Pittsburgh Press, 2013), 66.
[25] Kenneth Owens, "River City: Sacramento's Gold Rush Birth and Transfiguration," *River City and Valley Life: An Environmental History of the Sacramento Region*, eds. Christopher J. Castaneda and Lee M. A. Simpson (Pittsburgh: University of Pittsburgh Press, 2013), 56.

1846 and 1868 roughly 2 miles of the American River in the same vicinity of the Embarcadero district were further altered to create a swifter current in order to scour mining debris from the riverbed.[26] These small-scale flood control structures in Sacramento and elsewhere would lead to the first coordinated effort for flood management in the state: the Board of Swampland Commissioners.

1.3.4 Board of Swampland Commissioners 1861-1866

The Board of Swampland Commissioners (Board) was established with the passage of California State Legislature Assembly Bill (AB) 54 on May 31, 1861. AB 54 was intended to provide centralized management for swamplands allocated to the state through the Swamp Lands Acts. According to the legislation, infrastructure overseen by the Board was intended to ensure effective flood control and divert any surplus water for agricultural purposes.[27] Essential to the management of these lands was the Board, an elected body of engineers who would manage water infrastructure around the state in coordination with local reclamation districts. Under the legislation, reclamation districts were formed by landowners who would petition the state to form the district. The Reclamation district would be managed at the local level through taxation and infrastructure maintenance. The Board of Swampland Commissioners, in turn, would appoint an engineer to each district tasked with designing a reclamation plan for the district.[28]

The first elected public commission in the state, the Board of Swampland Commissioners signaled a shift from individual reclamation attempts and a step towards centralized flood control. The need for water management infrastructure, however, swiftly outpaced the capacity of the Board. Throughout the 1860s, communities along the American and Sacramento Rivers continued to flood due to poor infrastructure and planning. The primary flaw of the levee system promoted by the Board was its reliance on the “single-channel” system. In other words, the Board envisioned a system where overflow was diverted to main rivers that were heavily reinforced by tall levees. This single-channel system ran counter to the natural floodplains of the Sacramento Valley where flood waters were partially absorbed by sloughs and floodplains. When flood waters were artificially diverted through a single channel, the overflow created deeper, swifter rivers that overtopped the levees. The Board of Swampland Commissioners disbanded in 1866, turning flood management over to county governments.[29]

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[26] “Sacramento Area Flood History” Sacramento Area Flood Control Agency, accessed May 1, 2020, http://www.safca.org/history.html.
[27] Jeffrey Rosenthal, Sharon Waechter et al., *Evaluation of Four Historic-Era Cultural Resources, Located in the Natomas Basin, Reach H Project Area, Sacramento County, California* (Davis: Far Western Anthropological Research Group, Inc. August 2008), 4-5.
[28] Garone, 79.
[29] Barry Scott, “American River Common Features Project General Reevaluation Report Historic Properties Management Plan,” 3-6.

1.3.5 The Green Act of 1868

Under county governance, water management infrastructure was again haphazard and fallible. Political sentiment against the Board of Swampland Commissioners and was worsened by rising debt in swampland districts, unpopular taxation and protestations from farmers who depended on seasonal flooding to irrigate grain fields or to replenish grasses for grazing livestock.[30] The final blow to early centralized flood planning came in the form of the Green Act.

The Green Act, passed by the California Legislature in 1868, removed acreage limits from swampland purchases. After the Green Act, individuals amassed thousands of acres of land, which, in turn, allowed the same swampland owners to form their own reclamation districts, building more flood control structures along property lines.[31] The passage of the Green Act also signaled a change in the political climate: the concept of state-level management of flood infrastructure became unpopular for the next 50 years, leaving private landowners to build and manage more levees. Throughout this period, settlements and farms continued to grow on high ground and natural levees. Farmers chose to cultivate quick growing or water-resistant crops that could thrive in periodic flooding; some farmers grew small cattle herds on a seasonal basis. Uncoordinated levee building left the Sacramento Valley virtually unprotected from flooding until the early 1900s.[32] Flooding, along with the related concerns of irrigation, water supply and navigability, loomed large in local and state debates through the early 1900s.[33]

1.4 Associated SRFCP Historic Contexts

1.4.1 State Support of the SRFCP 1911-1961

Effective flood control in the Central Valley was not implemented until 1911 when the SRFCP was executed under the California Flood Control Act. The comprehensive infrastructure of channels, levees, weirs and sloughs was made possible by two trends converging in California: the first was the synthesis of hydrological research of Central Valley waterways, the second was a return to centralized governance of water resources.

From an engineering standpoint, the 1911 design of the SRFCP was a departure from the conventional wisdom of the time. The SRFCP is based on a network of bypasses that diverts floodwaters through channels, weirs and sloughs. This system differed from the popular “single channel” levee system which was based on the hydrology of the Mississippi River. Under the single channel system, high levees were built to divert flood

[30] Garone, 80-81.
[31] Robert Kelley, *Battling the Inland Sea*, 62.
[32] Kelley, 59-62.
[33] Mount, *California Rivers and Streams: The Conflict Between Fluvial Process and Land Use*, 193.

waters along a single waterway. Single channel levees had contained floodwaters in the Midwest and became the gold standard for flood prevention from the 1860s through the early 1910s, particularly within the Corps.[34] The single channel strategy may have been well suited to the relatively slow-moving Mississippi, but hydrological studies of the Sacramento Valley revealed a different set of conditions. The waters of the chronically inundated Sacramento Valley, already running high due to hydraulic mining debris, would not easily be contained by a system of levees alone. Instead, a number of California-based engineers designed the current system of bypasses, which mimics the natural system of flood plains.[35]

Precursors to the SRFCP design were presented in a number of reports. One of the first known proposals was written in 1868 by Will Green, the Colusa County surveyor. Green, an expert on the Sacramento River, proposed a system of locks and canals in a system of controlled overflows.[36] The state legislature ultimately rejected Green's plan. Another similar proposal would be presented to the state legislature a decade later by William Hammond Hall, the first state engineer. Hall, a Corps-trained engineer, was appointed to his position in 1878, following a devastating February flood in the Sacramento Valley.[37] With an eye towards flood prevention, the California governor tasked Hall with the responsibility of studying and reporting on the hydrology of Central Valley waterways. Hall presented his exhaustive investigation to the state legislature in 1880. In his report, Hall acknowledged damage caused by hydraulic mining debris and documented the natural state of seasonally inundated floodplains along Central Valley waterways. Like Green, Hall proposed a system of levees, debris dams and drainage basins to manage floodwaters in the Central Valley. In order to manage the flood control infrastructure, Hall also advocated for centralized, state administration of the system.[38]

The structural concept of bypasses, as an alternative to a single channel, gained traction with the legislature, and the plan was approved in 1880. Politically speaking, however, centralized management of such a system remained a source of contention. The Drainage Act of 1880 was declared unconstitutional by the California Supreme Court due to the proposed transfer of legislative authority to the executive branch of government, and as a result of the 1881 court ruling, Hall's plan was not implemented.[39] William Hammond Hall served as the state engineer until 1889, and continued to advocate for state control of water management infrastructure.[40] Hall also mentored the next generation of engineers who would further lay the groundwork for the SRFCP.

[34] Garone, *The Fall and Rise of the Wetlands of California's Great Central Valley*, 108.
[35] Mount, 297.
[36] Garone, 108.
[37] Ibid.
[38] Garone, 110.
[39] Hagwood Jr., 22.
[40] Garone, 108.

Continuing inundation problems caused by haphazard flood control efforts led to another examination of California's waterways. In 1893, the newly minted state Commissioner of Public Works requested another study and coordinated plan for flood risk reduction in the Central Valley. The authors of the plan, Marsden Manson and C.E. Grunsky, engineers who had worked under Hall, proposed a system of bypasses and drainage basins based on the same conclusions presented in Hall's 1880 report. The Manson-Grunsky report, completed in 1895, was not implemented due to nationwide financial troubles that endured through the 1890s.[41] The Manson-Grunsky plan met additional resistance from the state-appointed Dabney Commission through the early 1900s. The Dabney Commission, led by Corps officer T.G. Dabney, would steer state flood planning towards a levee-only system for the next decade. Dabney and his fellow commissioners, Henry B. Richardson and H.M. Chittenden, were all veterans of managing floodwaters along the Mississippi River and all three subscribed exclusively to the single-channel levee strategy, informed by the hydrology of the Mississippi.[42] Levees continued to be built along the banks of the Sacramento River throughout the early 1900s until conviction in the single channel system was blown by the floods of 1907 and 1909. In those years, approximately 600,000 cubic feet per second (cfs) of flood waters broke the Dabney levees and inundated the Sacramento Valley.[43]

1.4.1.1 California Flood Control Act of 1911

Following the 1907 flood, the federally appointed California Debris Commission commissioned another study of the hydrology of the Sacramento Valley. Thomas H. Jackson came to similar conclusions as Manson and Grunsky, proposing a centrally managed system of bypasses and levees that would serve waterways and communities across the Sacramento Valley. Jackson's report, completed in 1910, presented the flood control system that would come to be known as the SRFCP.

The California legislature approved the SRFCP when the California Flood Control Act of 1911 adopted the infrastructure proposed in the Jackson Report. The 1911 legislation also created the California Reclamation Board, a state authority with the ability to regulate reclamation districts and infrastructure along the Sacramento River. A subsequent Flood Control Act in 1913 expanded the authority of the California Reclamation Board to the Central Valley. Within the first few years of the Flood Control Act of 1911, state-funded water management infrastructure was built across the valley. Using floating mechanical dredges to extract material from the riverbed, crews completed the massive levees of the

[41] Garone, 110.
[42] Karen M. O'Neill, *Rivers by Design: State Power and Origins of U.S. Flood Control* (Durham: Duke University Press, 2006), 106.
[43] Garone, 111.

Sutter Bypass and the Yolo Bypass by 1923.[44]

1.4.2 Federal Support of the SRFCP 1917-1961

The beginnings of the SRFCP were rooted in the machinations of state and local governments. The SRFCP did not receive formal federal support until Congress passed the Flood Control Act of 1917. In reality, however, federal participation in flood control had begun early in California due to an ongoing tension between ambitions to revive the California mining industry and the environmental havoc wreaked by hydraulic mining.

The permanent injunction against hydraulic mining issued by the California court system in 1884 signaled the end of hydraulic mining. However, in the following years, members of Congress hoped to revive mining in California through less destructive methods. The California Debris Commission (CDC) was created by the passage of the federal Caminetti Act of 1893.[45] Its purpose was to ensure that hydraulic miners mitigated the impacts of their mining, thus making such mining sustainable. It soon became clear, however, that non-destructive hydraulic mining was unrealistic. Neither individuals nor small companies could afford the cost of debris dams, equipment and maintenance that would be required to prevent debris from flowing into California waterways.[46]

The failed revival of hydraulic mining put an emphasis on the secondary responsibilities of the CDC: the rehabilitation of rivers affected by hydraulic mining and flood relief. From the beginning, the CDC was granted broad authority to prevent destructive hydraulic mining practices, but instead, the CDC focused this authority toward flood control and navigability. The first CDC commissioners, appointed by President Cleveland, were Corps engineers, setting a precedent for Corps leadership that would eventually lead to the establishment of the Corps Sacramento District.[47]

Early projects of the CDC included the rehabilitation of the Yuba River, a tributary of the Feather and Sacramento Rivers severely clogged by hydraulic mining debris.[48] From the early to mid-1900s, the CDC constructed debris-barrier dams including the Daguerre Point Dam (1906), and dredged a new channel bordered by training walls for the Yuba River.[49] Between 1915 and 1916, the CDC dredged 17 million cubic yards of material from the Sacramento River between Cache Slough and Rio Vista.[50] CDC projects, in turn, highlighted the need for a comprehensive system of water management infrastructure

[44] Garone, 113.
[45] Garone, 110.
[46] Hagwood Jr., 65.
[47] Hagwood Jr., 31.
[48] Hagwood Jr., 42.
[49] Ryan S. Bezerra and Yvonne M. West, “Submerged in the Yuba River: The State Water Resources Control Board’s Prioritization of the Governor’s Commissions Proposals,” *McGeorge Law Review* Vol. 36, Issue 2 (2005): 332.
[50] Hagwood Jr., 54.

throughout the Sacramento Valley, as seen in the CDC- sponsored Jackson Report.[51]

1.4.2.1 Flood Control Act of 1917

In 1911, when the State of California began to implement the infrastructure of the Jackson Report, federal funding could not be allocated to state flood control efforts, such as the SRFCP. This changed when devastating floods on the Mississippi in 1913 and 1914 brought national attention to the issue of flooding. Congress passed the Flood Control Act of 1917 and funds were appropriated to projects along the Sacramento, Ohio and Mississippi Rivers.[52] Congress stipulated that upon receiving federal funding, local governments would contribute one dollar for every two federal dollars spent, would be responsible for obtaining right-of-way for water management infrastructure and once in place, would take responsibility for maintaining the infrastructure. Administration of the funding and the construction effort was left largely to the Corps. The War Department and Chief of Engineers were responsible for dispensation of the funding. The act also authorized the Corps to conduct studies of the watersheds in question, now known as feasibility studies, to determine whether it was advisable for the federal government to take part in proposed projects.[53]

This pattern of construction by the Corps followed by management by local entities continues to be the model for the SRFCP. The levees of the right (north) bank of the American River Flood Control District (ARFCD), for example, were first built by private and state entities. Severe floods in North Sacramento during the 1920s led to the establishment of the ARFCD by the California Legislature, and the construction of several levees.[54] During the 1950s, the Corps improved the existing levees, bringing them to federal construction standards. The newly improved “project levees” were then transferred to the state.[55]

1.4.3 Post-New Deal Construction 1935-1961

The Depression Era ushered in a period of appropriations for large infrastructure projects under the New Deal.[56] Many of the civil works projects in the Sacramento Valley were designed to ameliorate flood control and reclamation throughout California, while also stimulating the economy. The desire for flood control was a leading impetus for

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[51] Hagwood Jr., 31 110.
[52] Joseph L. Arnold, *Evolution of the 1936 Flood Control Act* (Ft. Belvoir: US Army Corps of Engineers Office of History, 1988), 14.
[53] Arnold, *Evolution of the 1936 Flood Control Act*, 14-15.
[54] US House of Representatives, House Doc. 205, 77th Cong., 1st sess., "Public No. 738, 1936. Interim Survey, Flood Control Sacramento and San Joaquin River Valleys, California. Sacramento River Within Existing Flood Control Project." Prepared by the Board of Engineers for Rivers and Harbors, Washington D.C., March 3, 1941.
[55] “Operation and Management Manual Sacramento River Flood Control Project, American River no.1,” on file at U.S. Army Corps of Engineers, Sacramento District, Sacramento, CA, 76.
[56] Mount, 196

construction of the SRFCP, but a dual consideration was reclamation. As a result of the linked history of flood control and reclamation in the Central Valley, the following paragraphs present a brief account of reclamation efforts with an emphasis on regulations and infrastructure that overlapped with flood control measures.

1.4.3.1 Reclamation

State and federal reclamation regulations, along with flood control, drove patterns of land ownership and development in the Sacramento Valley. In many cases, the levees and infrastructure that were built to reduce flood risk also contributed to reclamation. The concept of “reclaimed” land that drove the Swamp Land Acts of the mid-1800s emphasized the role of infrastructure used to both to drain swampland and, in the Central Valley, to cultivate crops. The disorganized levee building that followed the termination of the State Board of Swampland Commissioners in 1866 and the Green Act of 1868 were injurious to both flood risk reduction and reclamation efforts. With the passage of the California Flood Control Act of 1911, the state created the California Reclamation Board, that, similar to the Board of Swampland Commissioners, would regulate the construction of levees and reclamation districts in the state.

Under the SRFCP, reclamation districts and flood control measures were coordinated by the California Reclamation Board based on the Jackson Plan. This coordinated approach resulted in a more effective strategy for flood control and reclamation. The authority of the California Reclamation Board continued to grow after 1911, expanding to regulate privately built levees. In 1913, board members could mandate that private levees were constructed according to the Jackson Plan.[57]

With the rise in successful reclamation efforts, California agricultural interests sponsored a study that outlined an expansive irrigation system for the Central Valley. The Central Valley Project (CVP) was first proposed to the California legislature by agricultural businessmen during the early 1920s. Similar to the SRFCP, the CVP was a comprehensive system of water management infrastructure, managed at the state level. The legislature supported the plan, passing the California Central Valley Project Act in 1933, however the stock market crash of 1929 had deprived the state of funding to support such a project.[58] In the face of bankruptcy, federal funding paved the way for the federal Bureau of Reclamation to take the reins and gain a foothold in California water management.

[57] Scott, 3-6.
[58] Mount, 197

1.4.3.2 Federal Civil Works Projects

As federal funding flowed to the Corps and the Bureau of Reclamation, projects such as the SRFCP and the CVP expanded to serve a growing population.[59] Reclamation in particular continued to be politically popular through the 1940s. Widespread droughts and population growth in the 1930s created a demand for federally subsidized irrigation waters.[60] During the 1940s, the war effort would draw on agricultural products in the irrigated farmlands of the Central Valley and the electrical power generated by newly constructed dams.[61] The purposes of the Bureau of Reclamation and the Corps in the Central Valley were separate, however some of the infrastructure, particularly the Folsom Dam, would concurrently serve the needs of the SRFCP and the CVP.

Legislation of the 1930s paved the way for large, federally funded reclamation projects in the Sacramento Valley. The CVP was transferred to the Bureau of Reclamation under the Rivers and Harbors Act of 1935, and funded under the Emergency Relief Appropriation Act of 1935. Concurrently with the rise of the reclamation projects, the Corps also received increasing authority to manage floodwaters. Under the Flood Control Act of 1936, the Corps adopted flood control as a leading mission. Instead of acting with a non-federal sponsor, the Corps was given the authority to build infrastructure, including dams and levees, to protect citizens and property in flood zones.[62] When the CVP was reauthorized under the Rivers and Harbors Act of 1937, the project had three objectives that were tailored to the missions of both the Bureau of Reclamation and the Corps:

1. Regulate rivers and improve flood control and navigation (Corps)
2. Provide water for irrigation and domestic use (Bureau of Reclamation)
3. Generate power (Bureau of Reclamation) [63]

Construction on the CVP began in 1937 when crews broke ground on the Contra Costa Canal. The canal began delivering water in 1940 and was completed in 1948.[64] The CVP consists of a network of canals, power plants, tunnels and conduits, but some of the most visible projects were reservoirs and dams. In the Sacramento Valley, the Shasta Dam, located near Redding on the Sacrament River, and the Folsom Dam, located in Folsom, on the American River, were major projects that contributed to both reclamation

[59] "A Brief History." US Bureau of Reclamation, last updated August 15, 2018. https://www.usbr.gov/history/borhist.html
[60] Mount, 196.
[61] Graham Bradner and Emilie Singleton, "The Origin and Evolution of the California State Plan of Flood Control Levee System," 5.
[62] Mount, 196.
[63] "About the Central Valley Project," U.S. Bureau of Reclamation, last updated August 3, 2020. https://www.usbr.gov/mp/cvp/about-cvp.html.
[64] "A Brief History." U.S. Bureau of Reclamation, last updated August 15, 2018. https://www.usbr.gov/history/borhist.html.

and flood control. Construction of Shasta Dam began in 1938 and was completed in 1945. Considered the foundation of the CVP system, the Shasta Dam was built to provide power as well as flood protection.[65] The Shasta Dam continues to be the largest reservoir in California, holding a maximum capacity of 4,552,000 acre-feet.[66] Although not part of the SRFCP, the Shasta Dam and Reservoir contributes to flood control along the northern Sacramento River. Folsom Dam, on the other hand, was authorized by Congress in 1944 and added to the SRFCP as a flood control structure. The dam and reservoir function to equalize the flow of water from the American River watershed to the Sacramento River, releasing water in dry periods and storing overflow during periods of flooding.[67] Folsom Dam also functions as a reclamation project, storing water for domestic use, irrigation and electrical power as part of the CVP. [68] Folsom Dam was completed by the Corps in 1955 and turned over to the Bureau of Reclamation for operation.

Construction on the SRFCP also continued to expand throughout the valley. By 1944, 980 miles of levees had been added to the SRFCP and the system was considered nearly 90 percent complete.[69] The Flood Control Act of 1944 expanded on the 1936 Flood Control Act to designate the responsibilities of flood control and navigation to the Corps. The low-lying, flood prone, agricultural Central Valley continued to be a major focus for the Corps and the Bureau of Reclamation. Between 1936 and 1975, the Corps built North Fork Dam (1939), Englebright Dam (1941), Mariposa Dam (1948), Owens Dam (1949), Burns Dam (1950), Farmington Dam and Reservoir (1951), Isabella Dam (1953), Bear Dam (1954), Pine Flat Dam (1954), Success Dam (1961), Terminus Dam (1962), Black Butte Dam (1963), New Hogan Dam (1963), Martis Creek Dam (1972), Hidden Dam (1974) and Buchanan Dam (1975).[70] Large scale federal reclamation and flood control projects tapered in the late 1960s, and the Corps and the Bureau of Reclamation shifted staff and resources towards managing existing projects rather than constructing new ones.[71] By 1961, the infrastructure of the SRFCP was deemed completed and the Corps turned towards managing the existing system.

Beginning in 1961, annual inspections of the SRFCP levees were conducted by the Corps, the California Reclamation Board, and the California Department of Water

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[65] "Shasta Dam Construction," US Bureau of Reclamation, last updated July 21, 2020. https://www.usbr.gov/mp/ncao/dam-work.html.
[66] Bradner and Singleton, 6.
[67] "Folsom Dam," California Department of Parks and Recreation, accessed August 20, 2020 https://www.parks.ca.gov/?page_id=882.
[68] Ibid.
[69] Kelley, 309.
[70] "Dam Safety Program," U.S. Army Corps of Engineers Sacramento District, accessed March 4, 2020. https://www.spk.usace.army.mil/Missions/Civil-Works/Dam-Safety-Program/.
[71] "A Brief History." US Bureau of Reclamation, last updated August 15, 2018.

Resources (DWR).[72] At a national level, policy changes in the early 1960s also led to new approaches to federal flood protection in the United States. In 1966, the Federal Task Force on Flood Control Policy observed that the purpose of federal flood control projects had shifted from providing flood relief to existing communities, to paving the way for property development.[73] Concurrently, a 1966 report by the National Resources Planning Board promoted flood management alternatives including wetland conservation, planned land use and evacuation systems. Many of these non-structural measures were adopted in the National Flood Insurance Act of 1968.[74] As a result of these policy changes, modifications and maintenance of large flood control projects, such as the SRFC, were driven by structural deterioration from the 1960s forward. The levees of the SRFCP in particular have required substantial repairs after major flooding in 1986 and 1997, and additional measures were taken to identify and repair weaknesses in the system after Hurricane Katrina brought renewed national attention to levee safety in 2005.[75]

1.4.4 Conclusion

Today, manmade water management structures have allowed Californians to transform the floodplains of the Central Valley into urban areas and agricultural land. These structures altered the course of massive floodplains that had existed for thousands of years. Almost two centuries of water management infrastructure have resulted in the rerouting of all major rivers in California, and the diversion of approximately 60% of the water in California by thousands of miles of levees, over 1,400 dams and miles of canals and aqueducts.[76]

The system of levees, dams and channels that made it possible to build the modern Sacramento Valley is now necessary to protect the “reclaimed” land from the natural course of the Sacramento and American Rivers. This dependence, however, has not translated to stability. Even with coordinated government plans and advances in engineering, Sacramento and New Orleans are the two American cities that are the most vulnerable to catastrophic flooding.[77]

The probability of flooding depends on the efficacy of manmade barriers that protect converted floodplains. Water management infrastructure, while transformative, requires frequent cyclical maintenance to remain effective. Levees are subject to erosion,

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[72] Scott, 4-13.
[73] Chris Elfring et al., *Flood Risk Management and the American River Basin: An Evaluation* (Washington D.C.: National Academy Press, 1995), 165.
[74] Elfring et al., 22.
[75] Scott, 1-2, 1-3.
[76] Mount, 6
[77] Allan James and Michael Bliss Singer, “Development of the Lower Sacramento Valley Flood Control System,” *Natural Hazards Review,* Vol. 9(3) (August 2008), 125.

underseepage, cracking and rodent infestation.[78] Canals can be clogged by debris, vegetation and invasive species.[79] Dams are susceptible to structural deterioration, and may be breached due to increased runoff upstream or sediment build-up in the corresponding reservoir.[80] Throughout the history of water management in the Sacramento Valley, maintenance and improvements have ensured that levees, canals and dams function according to their original purpose. Over time, levees in the SRFCP have been raised, widened and enhanced by floodwalls, pumping systems and new stabilization measures to ensure functionality. Additional modifications have included bike paths, roads and boat docks to enhance transportation and recreational opportunities.

Given the prevalence of levee improvements and cyclical maintenance within the SRFCP, the levees that are the subject of this evaluation appear very differently from their original construction. The combination of continued dependence on levees in the SRFCP and changes due to maintenance, repair and development in the surrounding landscape, leads to a tension between the undeniable significance of levees in the Sacramento Valley and a relatively low level of integrity according to the Secretary of Interior's Standards. The sections below provide guidelines for evaluating the levees of the SRFCP and offer recommendations for incorporating eligible properties into a MPL for the SRFCP.

[78] "Levee Owner's Manual for Non-Federal Flood Control Works," U.S. Army Corps of Engineers, accessed March 4, 2021, March 2006, vi. https://www.lrh.usace.army.mil/Portals/38/docs/civil%20works/Levee%20Owners%20Manual.pdf.
[79] "Canal Operation and Maintenance: Vegetation," U.S. Bureau of Reclamation, November 2017, accessed March 4, 2021, 2. https://www.usbr.gov/assetmanagement/docs/Canal_Vegetation.pdf
[80] "Living With Dams: Know Your Risks," Federal Emergency Management Agency, updated February 2013, accessed August 2020. https://www.fema.gov/media-library-data/20130726-1845-25045-7939/fema_p_956_living_with_dams.pdf

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Figure 1 : SRFCP System Overview

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

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Figure 2: California's Central Valley

California Water Science Center, US Geological Society

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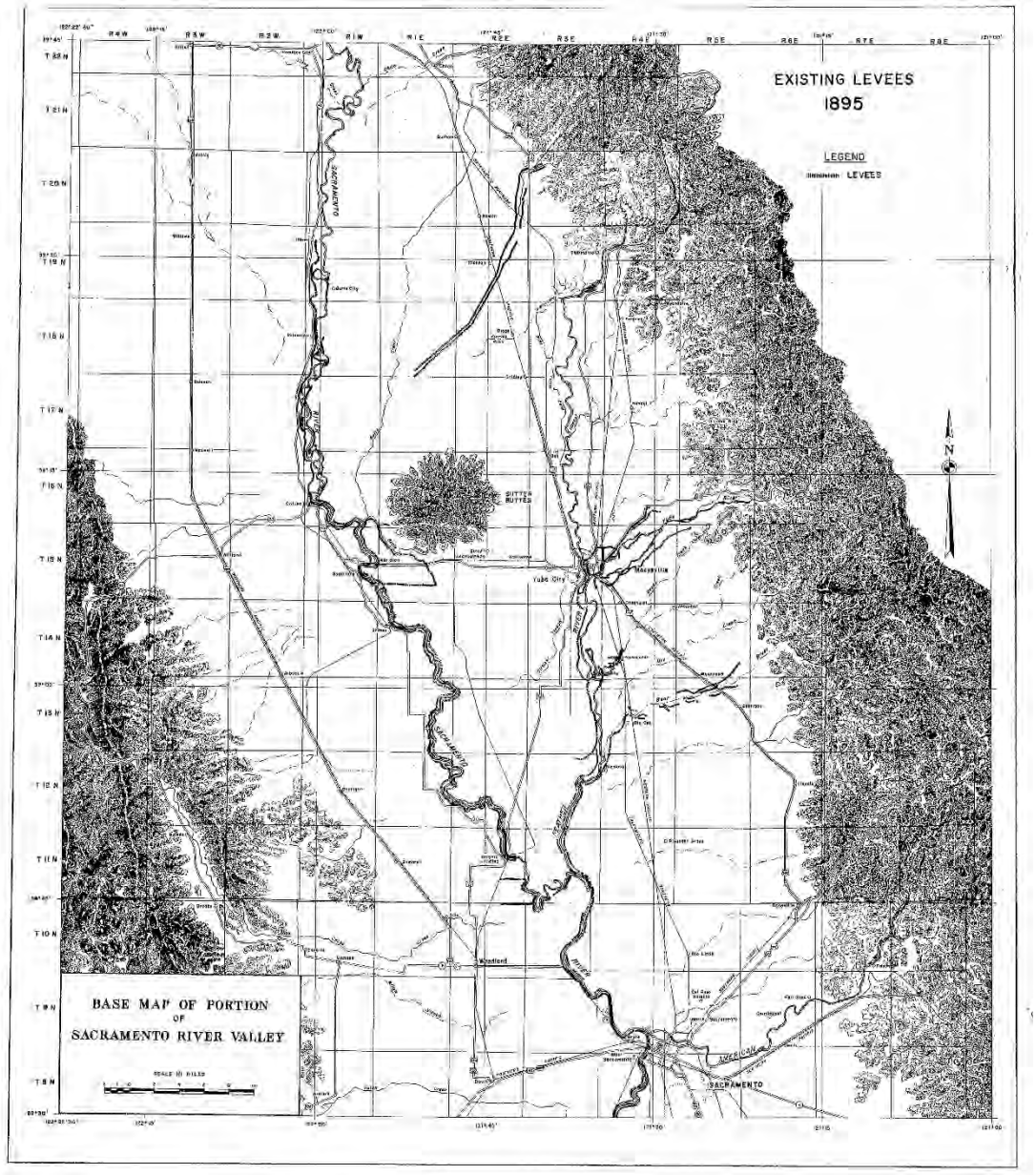

Figure 3: Existing Levees, Pre-SRFCP, 1895

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

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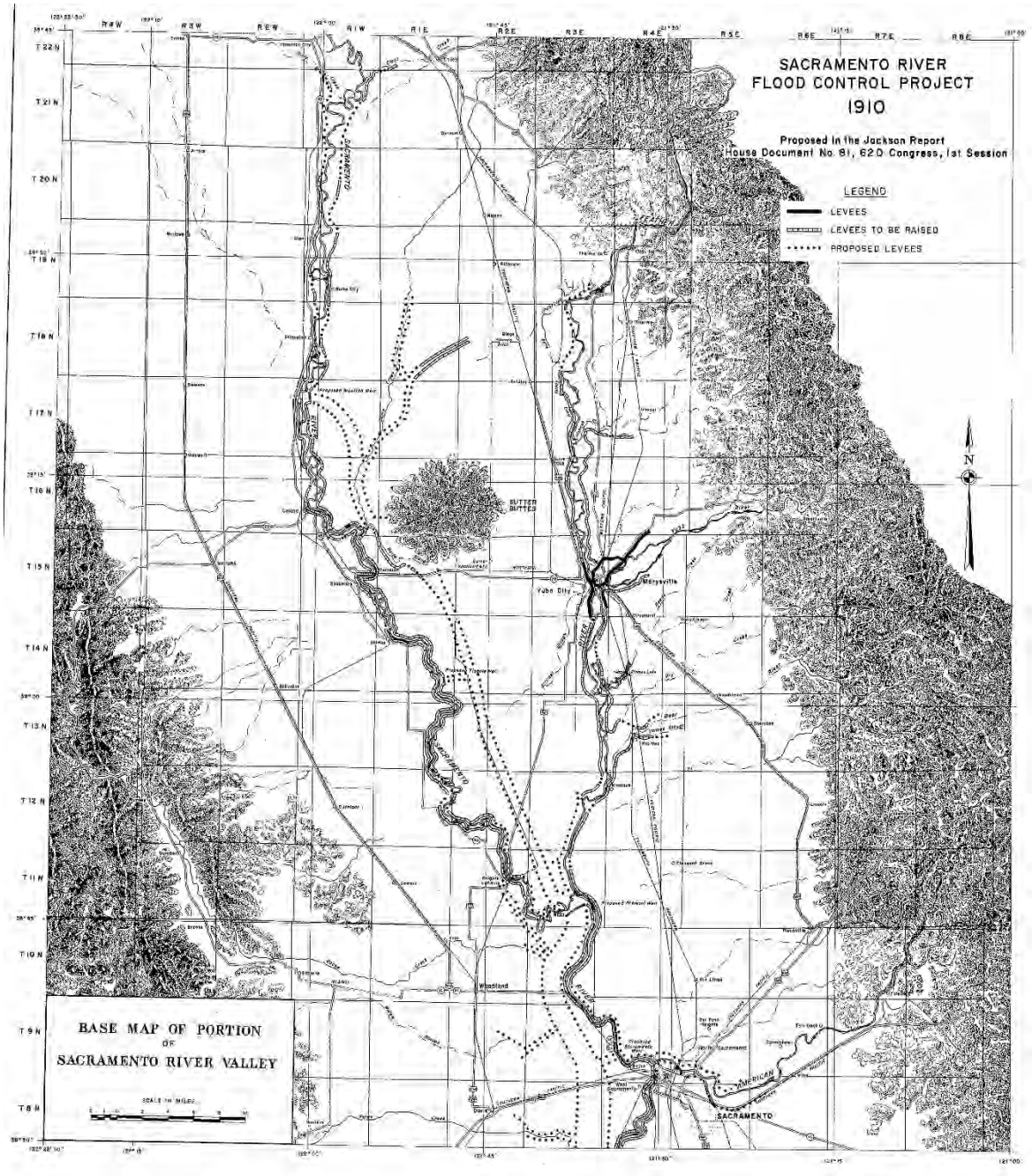

Figure 4: SRFCP Levees, 1910

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

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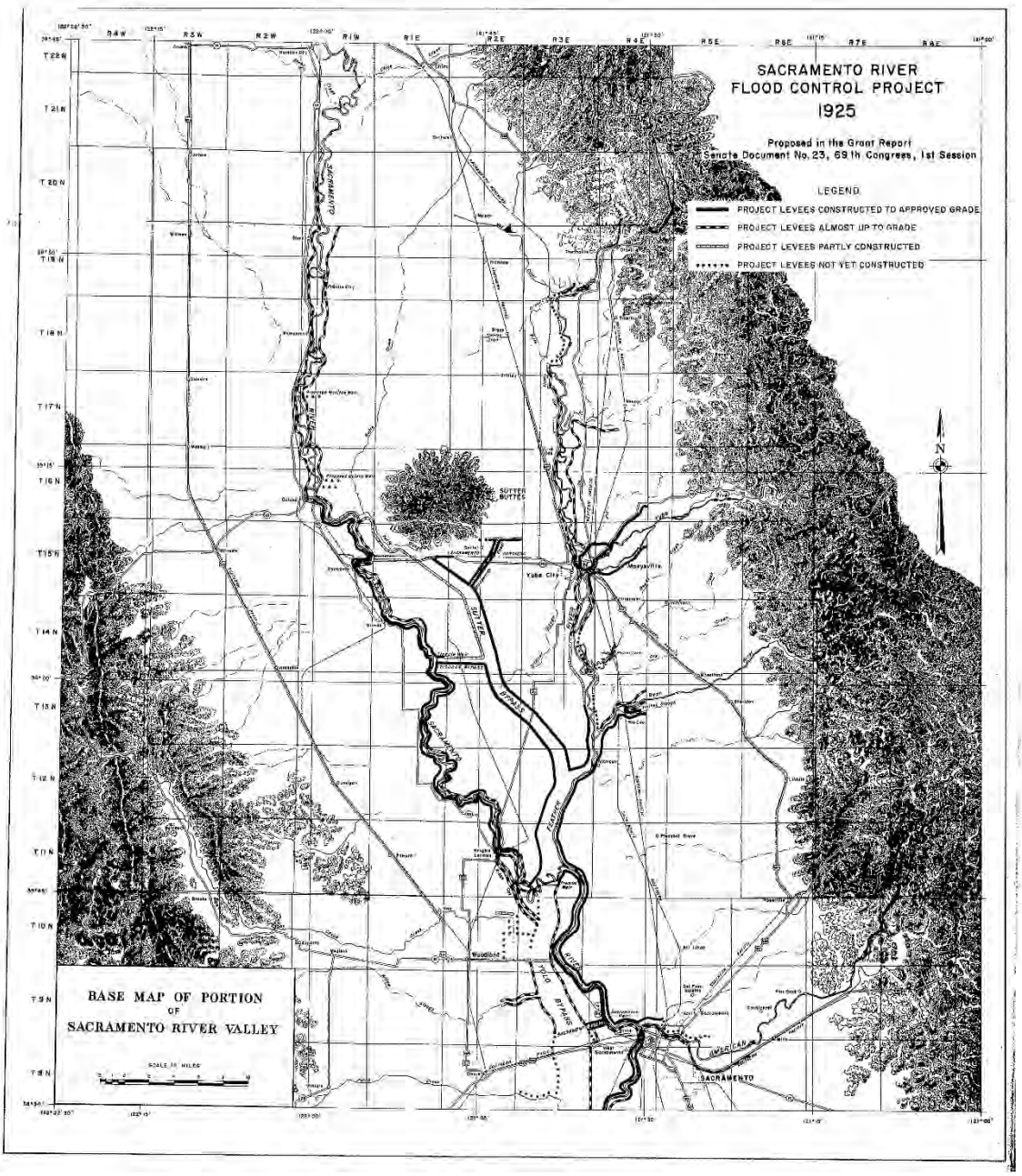

Figure 5: SRFCP Levees, 1925

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

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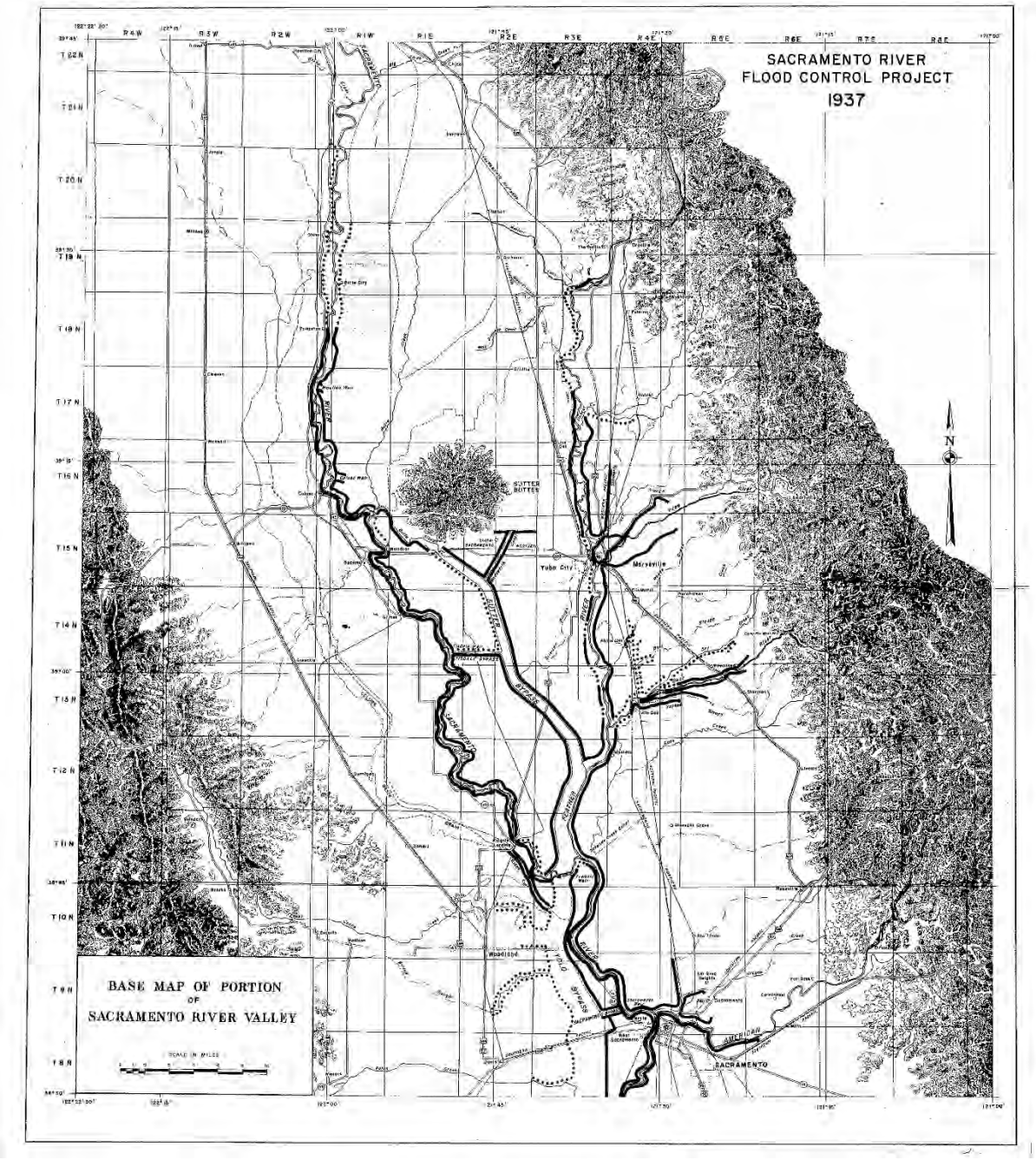

Figure 6: SRFCP Levees 1937

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

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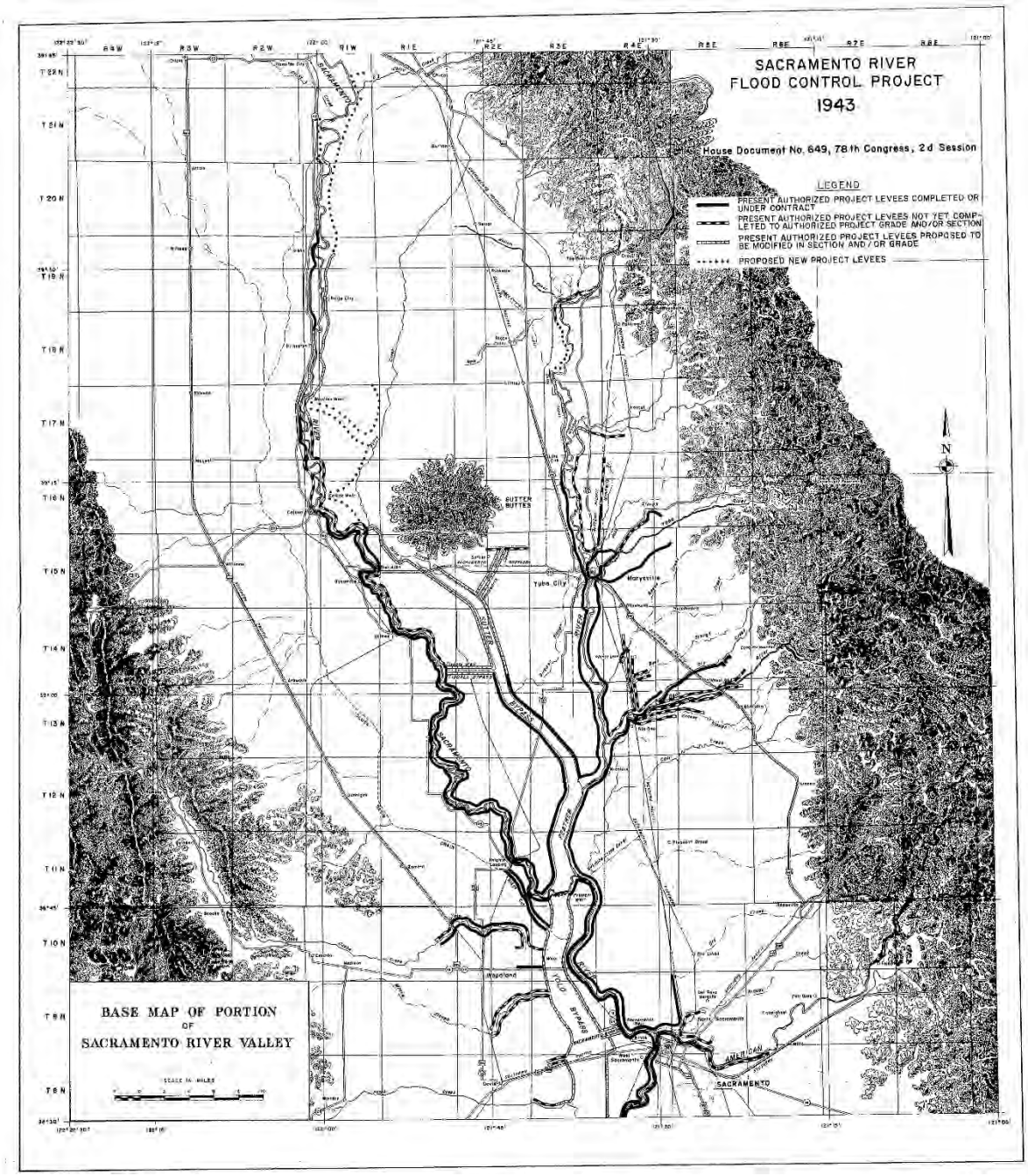

Figure 7: SRFCP Levees 1943

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

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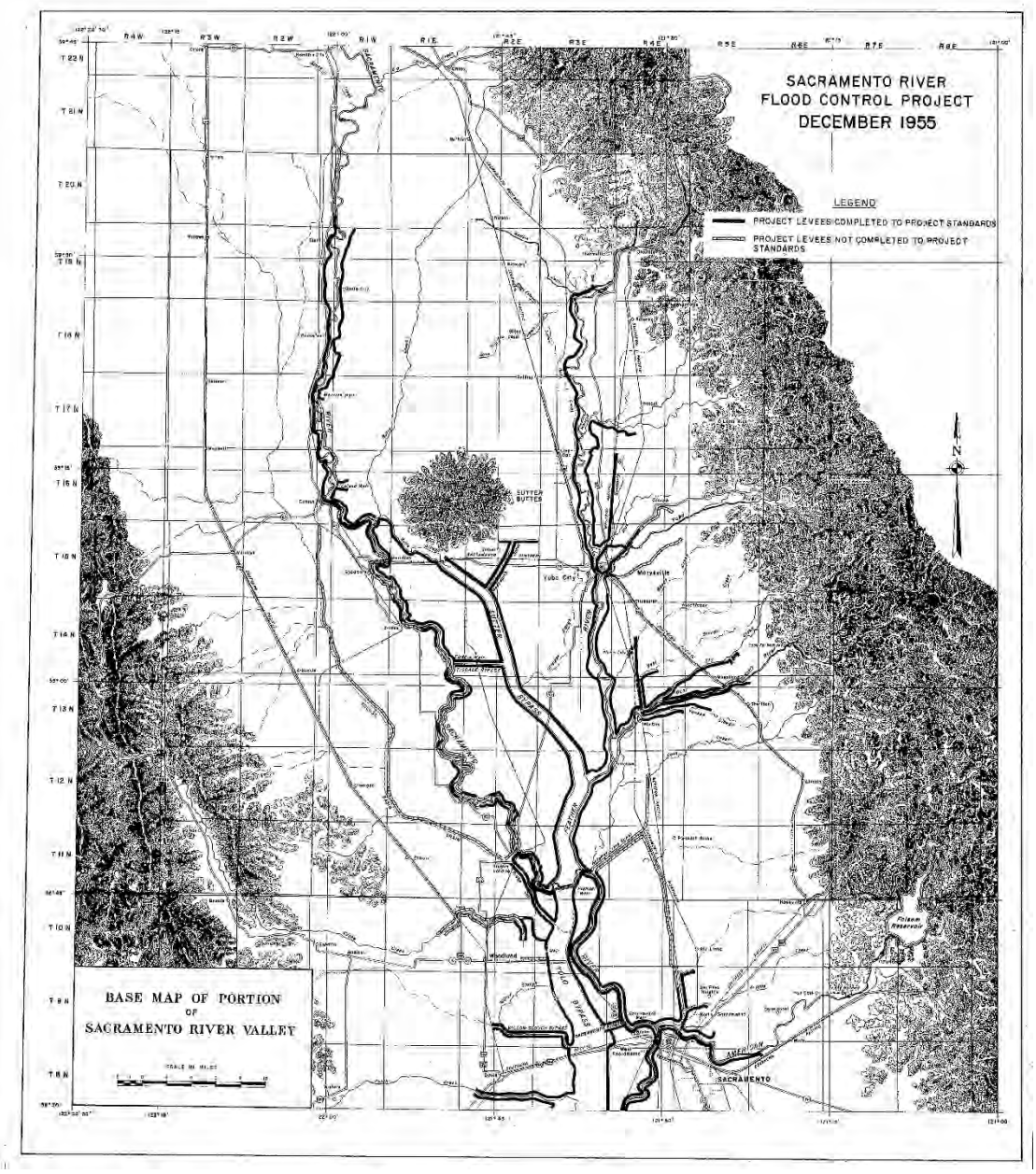

Figure 8: SRFCP Levees 1955

Map on File at U.S. Army Corps of Engineers, Sacramento District Office

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F. Associated Property Types

1.5 Levee Property Type

Levees are some of the most ubiquitous structures within the SRFCP. Miles of levees extend along the banks of the Sacramento and American Rivers and associated tributaries from the Chico area, toward the Contra Costa Canal.

Levees are defined by the National Flood Insurance Program as manmade structures, often earthen embankments, designed to contain, control or divert the flow of water to provide protection from temporary flooding.[81] The basic principle of building earthen embankments has been a standard approach to levee construction in the Sacramento Valley since the 1850s, though advances in construction vehicles, materials and geotechnical testing have resulted in changes to levee construction within the associated SRFCP historic contexts.

1.5.1 Early Levee Construction c. 1850-1870

Throughout the 1850s to the 1870s, levees built to protect the new farms in the Sacramento Valley were constructed of the soils at hand. The thick organic soils that were ideal for agriculture served as poor levee building material, shrinking and expanding with water, resulting in cracks and frequent washouts. These early levees constructed with wheelbarrows and shovels were a labor intensive effort often carried out by Chinese workers.[82] These early levees were likely reinforced through a number of vernacular measures. Records from the late 1800s indicate that it was common to cover levees with revetments made of brush and secured with wire to prevent erosion. Levee builders would also add a layer of stone, known as riprap, to stabilize levee slopes during this early construction era.[83]

1.5.2 Construction Equipment c. 1870-1910

Levee building methods and materials improved in the 1870s, when clamshell dredges powered by steam engines could extract alluvial soils from the river channel.[84] The sturdier composition of silt, clay, sand and gravel in alluvial soil served as a better building material. Machinery also allowed substantial levees to be constructed more quickly. Throughout the 1870s and 1890s, a number of inventions in the Sacramento-San Joaquin Delta dramatically increased earth moving capacity in levee construction. Patents for a variety of hydraulic dredges were granted as early as 1884.[85] The caterpillar tractor, patented in 1907, was designed to move

[81] "What is a Levee?" Federal Emergency Management Agency, accessed November 5, 2020. https://www.fema.gov/media-library-data/1568748487875-7cdd8673b92cbbda840f7b981a37d399/What_is_a_Levee_0512_508.pdf
[82] Alex Reed Westhoff, *The Sacramento Delta National Heritage Corridor*, 10.
[83] "New Levee Work" *Sacramento Daily Union*, February 11, 1881.
[84] Ibid.
[85] Richard L. Hindle and Neeraj Bhatia, "Territory and Technology: A Case Study and Strategy from the California Delta," *The Plan Journal* 2, no. 2 (2017): 249.

heavy loads across the soft soils in the Central Valley.[86] Levee protection also evolved through the turn of the century. Concrete also became widely used by the 1910s, commonly poured on levee toes to stabilize the levees.[87]

1.5.3 Levee Design c. 1900s-1960s

The hydrological studies of the early 1900s provided the research to create informed standards for levee construction. At the time of the 1917 Flood Control Act, levee designs were based on three primary factors:

1. Design discharge or channel capacity: the maximum capacity that a waterway can accommodate without flooding
2. Water surface profile: measure of variations in flow depth based on high and low flow stages
3. Freeboard capacity: the distance between the water surface profile and the top of the levee; a "minimum freeboard requirement" was integrated into Corps standards.[88]

As-built drawings from SRFCP units show that the levees were built in a trapezoidal shape with a flat surface at the crest of the levee and a roughly 2:1 slope on the landside and 3:1 slope on the water side. The same trapezoidal shape of the SRFCP levees has remained similar to original construction, however, the size and materials of levees continues to evolve with changes in the hydrology of the watershed. Slurry walls, in particular, have become more common since they were introduced to the United States during the 1960s.[89] Additional design elements have reflected changing priorities such as transportation and recreation along the levees.

1.5.4 Levee Materials c. 1870s-1980s

Dredged alluvial materials from the riverbeds were used throughout the Associated SRFCP Historic Contexts. While these soils were superior to land-based organic soils of the 1870s, they were also sandy and subject to erosion. When Corps-built levees were turned over for state operation in the 1920s, work crews would often stabilize banks using riprap or concrete within the first few years of construction.[90] The discipline of geotechnical engineering emerged during the 1920s, and within the following decades, soil composition became a consideration in levee

[86] Richard L. Hindle and Neeraj Bhatia, "Territory and Technology: A Case Study and Strategy from the California Delta," 252.
[87] "City Negligent, Flood Danger Grows Acute," *Sacramento Union,* March 30, 1916.
[88] *Sacramento River Flood Control Project, California Mid-Valley Area, Phase III Design Memorandum*, Vol. I, U.S. Army Corps of Engineers, (Sacramento: U.S. Army Corps, 1995) 1-3.
[89] "Slurry Wall: Behind the Engineering Feat that Made the WTC Possible," 9/11 Memorial, accessed January 14, 2021, https://www.911memorial.org/connect/blog/slurry-wall-behind-engineering-feat-made-wtc-possible.
[90] Scott, 3-43.

construction.[91] Guidelines for soils composition remained general however. The 1949 and 1951 *Operations and Management Manuals* for the Sacramento and American Rivers of the SRFCP advised that levee repairs should be carried out using "fill made in 6-inch layers of earth free from brush, roots, sod or other unsuitable material," the manual also recommended stone protection.[92] Modern methods of geotechnical core sampling and the introduction of materials such as jet grout emerged during the 1970s and 1980s.[93] Erosion due to sandy soil composition has continued to be a challenge to levee integrity within the SRFCP.[94]

G. Geographical Data

Sacramento Valley of California (See Figure 1)

H. Summary of Identification and Evaluation Methods

A review of existing source material has been the primary methodology for this report. Photographs, both modern and historical, informed the discussion of visual character of the SRFCP system. Primary source material consisted of newspapers, gathered from the Library of Congress "Chronicling America" online archive and the California Digital Newspaper Collection. Additional source material included hydrology studies, operation and maintenance manuals, maps and images the national and California legislative record. Many of these primary sources are available online and on file at the Corps Sacramento District Office. Cultural resources surveys of different parts the SRFCP have been completed over the course of repair work from approximately the 1970s forward. Comprehensive overviews of the SRFCP are presented in a number of books and scholarly articles concerning the broader history of water management infrastructure in California.

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[91] Ben H. Fartherree, *History of Geotechnical Engineering at the Waterways Experiment Station* 1932-2000, U.S. Army Engineer Research and Development Center (Vicksburg: US Army Corps, 2006), accessed November 6, 2020, https://erdc-library.erdc.dren.mil/jspui/handle/11681/15250.
[92] Operation and Management Manual Sacramento River Flood Control Project: American River Part No. 1, on file at US Army Corps of Engineers, Sacramento District, Sacramento, CA, 20.
[93] Giorgio Guatteri, et al., "Advances in the Construction and Design of Jet Grouting Methods in South America" (paper presented at the International Conference on Case Histories in Geotechnical Engineering, Missouri University of Science and Technology, 1988), 1037. Accessed March 4, 2021, https://scholarsmine.mst.edu/icchge/2icchge/icchge-session5/3
[94] *Sacramento River Flood Control Project, California Mid-Valley Area, Phase III Design Memorandum*, Vol. I, U.S. Army Corps of Engineers, 1-3.

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United States Department of the Interior
National Park Service

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Appendix II: Department of Parks and Recreation 523 Series Forms: SRFCP Levee Units 118 Part 1, 118 Part 2, 124 and 125

State of California ◆ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
UPDATE SHEET

Primary # P-34-00509
HRI #
Trinomial CA-SAC-482H
*NRHP Status Code 7N, 6Y

Page 1 **of** 4 ***Resource Name or #:** Sacramento River Flood Control Plan Levee Unit 118 Part 1

P1. Other Identifier: American River Flood Control District, Unit 4, American River left bank

***P2. Location:** ☐ **Not for Publication** X **Unrestricted**

***a. County** Sacramento

***b. USGS 7.5' Quad** Sacramento West, Sacramento East, Carmichael

c. Address: N/A, Sacramento, CA

d. UTM:
Northeast endpoint: Zone 10S 643365 mE/ 4270413 mN
Southeast endpoint: Zone 10S 643645 mE/ 4269828 mN
Midpoint: Zone 10S 636576 mE/ 4271449 mN
Southwest endpoint: Zone 10S 630068 mE/ 4271266 mN

e. Other Locational Data: Unit 118 Part 1 of the SRFCP mitigates flood risk in the northern districts of the City of Sacramento, East Sacramento and La Riviera. Measuring approximately 11.5 miles, the levee system begins near Riviera Park and continues along the south bank of the American River towards Tower Bridge on the east bank of the Sacramento River.

***P3a. Description:**

The earthen levee measures between 39 to 44 ft. in height and is generally trapezoidal in shape. Over 75% of the system is reinforced by slurry cutoff walls. Paved roads and recreational trails run along the crest of the levees. On the water side, the levee is bordered by the American River Parkway and riparian areas. The land side is occupied by the City of Sacramento and residential areas. Several bridges and roads, notably Interstate 5, cross over or through the levee system, which is located in a densely populated area. A number of gaps in the levee unit allow access to these roads and bridges. One additional gap in the eastern end of the unit, near Mayhew Slough, allows storm water to be directed into the American River through a drainage channel. During flooding, closure structures block any openings in the levees. Flood protection provided by the levees of Unit 118 Part 1 is enhanced by a pumping system.

***P3b. Resource Attributes:** HP 11-Engineering Structure ***P4. Resources Present:** X Structure

P5b. Description of Photo: View of SRFCP Unit 118 Levees, looking North from Guy West Bridge towards the H Street Bridge, courtesy Tim Davis 2013. Image appears in: USACE Publication "American River Watershed Common Features General Reevaluation Report, Final Environmental Impact Statement Environmental Impact Report," December 2015

***P6. Date Constructed/Age and Source:** X Historic
Period of significance: 1951-1961 SRFCP Post New Deal Construction: 1935-1961

***P7. Owner and Address:**
Central Valley Flood Protection Board
3310 El Camino Ave # 170
Sacramento, CA 95821

***P8. Recorded by:**
Susannah Lemke, Historian, US Army Corps of Engineers, Sacramento District, 1325 J Street Sacramento, CA 95814

***P9. Date Recorded:** June 1, 2021

***P10. Survey Type:** Review and aerial images

***P11. Report Citation**:

Susannah Lemke and Tatum Clinton-Selin. *Levee Evaluation for the American River Common Features Project in Sacramento, Sutter, and Yolo Counties.* U.S. Army Corps of Engineers, Sacramento District, (June 2021).

***Attachments:** ☐NONE X Location Map ☐Continuation Sheet X Building, Structure, and Object Record
☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record
☐Artifact Record ☐Photograph Record ☐ Other (List): _____

B1. Historic Name:
B2. Common Name: American River Flood Control District, Unit 4, American River left bank
B3. Original Use: Civil Works levee, Flood Protection B4. Present Use: Civil Works levee, Flood Protection
***B5. Architectural Style:** No Academic Style
***B6. Construction History:**

Levee Unit 118 Parts 1 and 2 are part of the Sacramento River Flood Control Project (SRFCP). Prior to incorporation into the SRFCP in the 1950s, levee systems on the north (right) and south (left) banks of the American River had been part of the landscape for decades. With the establishment of the City of Sacramento in 1850, a series of levees, measuring approximately 3 ft. high were constructed on the south bank of the American River. Scattered local levees were also built on the North Bank of the American River by the 1900s, however it was after severe floods in the 1920s that a comprehensive plan of levee construction in the area was implemented by the American River Flood Control District (ARFCD), established in 1927. Between 1925 and 1937, levees were built along the north bank of the American River, from the NEMDC to approximately the location of the current California Exposition and State Fair (Cal Expo). On the south bank, the existing levee system was improved and moved to align more closely with the riverbed.

By 1943, a wall of ARFCD levees on the south bank of the American River extended approximately 10.5 miles from the confluence of the Sacramento and American Rivers to Mayhew Slough, located near the present-day location of the Mayhew Drain closure. On the north bank, a smaller, "C" shaped levee was built near the present-day location of Cal Expo and continued along the American River, curving up along the NEMDC and then east along Arcade creek. The 1943 Corps map, drafted for the SRFCP, notably coded the ARFCD levees as "present authorized project levees not yet completed to authorized project grade and/or section." Improvements to add the ARFCD levees to the SRFCP began during the late 1940s, and both units were added to the SRFCP by 1955.

Unit 118 Part 1 was incorporated into the SRFCP in 1952 after the existing levee was improved between 1948 and 1951. In accordance with the Flood Control Act, the levee unit was transferred to the State Reclamation Board on behalf of the State of California. Following the incorporation of the levees into the SRFCP, the Corps continued to make improvements to the levee unit. Improvements from 1965 forward have included the addition of stone protection and embankments and miscellaneous levee rehabilitation. A series of major improvements between 2010 and 2016 included levee raises, the construction of the Mayhew Drain closure structure, jet grout and cutoff walls.

***B7. Moved?** X **No** ☐ **Yes** ☐ **Unknown** **Date:** _____ **Original Location:** _____
***B8. Related Features:** Unit 118 Part 2
B9a. Architect: Thomas H. Jackson b. Builder: U.S. Army Corps of Engineers
***B10. Significance:** **Theme**: Reclamation, Flood Control **Area** SRFCP, Sacramento
Period of Significance: 1951-1961 **Property Type** Levee **Applicable Criteria** A

The period of significance for Unit 118 Part 1 dates from 1951 to 1961. It was in 1951 that improvements to the levee were completed to Corps standards and the levee unit was transferred from the Corps to the State of California in accordance with the Flood Control Act of 1917, as amended. This period of significance falls within the associated SRFCP historic context: Post New-Deal Construction 1935-1961.

Unit 118 Part 1 is significant under **Criterion A** given that the levee unit is part of the SRFCP. The SRFCP, constructed between 1911 and 1961, was the first large-scale flood control project implemented in California. The SRFCP continues to foster population growth and economic development through reclamation of seasonal floodplains. Unit 118 Part 1 is not significant under **Criterion B** because the levees

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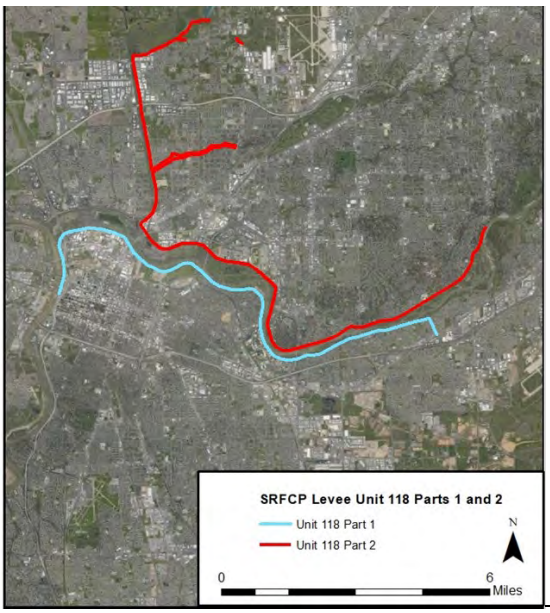

(This space reserved for official comments.)

are not associated with the lives of significant persons in our past. The design and construction of system, as well as modifications were not by any one individual or individuals with particular significance at the local state or national levels. Unit 118 Part 1 is not significant under **Criterion C** because the levees do not embody the distinctive characteristics of a type, period or method of construction, nor do they represent the work of a master, possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction. The levees of Unit 118 Part 1 are constructed of common materials have been repaired and modified using typical methods and technology. Furthermore, the levees and are not characteristic elements of the bypass system that distinguishes the design of the SRFCP in the Central Valley. Unit 118 Part 1 is not significant under **Criterion D** because the levees are unlikely to show or yield information important to history within the period of significance. Note that this assessment of Criterion D applies to historic-era significance only.

The levees are currently in fair condition; large trees, pipes, utility poles and animal burrows have increased the possibility of seepage and levee failure. Due to the location and construction methods of Unit 118 Part 1, floodwaters are likely to rise high on the levees during the rainy season, which increases the probability of seepage and erosion. Levees require frequent cyclical maintenance to remain effective and as such, the levees of Unit 118 have been raised, widened and enhanced by floodwalls, pumping systems and new stabilization measures to ensure functionality. Additional modifications have included bike paths and roads to enhance transportation and recreational opportunities.

Given the prevalence of levee improvements and cyclical maintenance within Unit 118 and the SRFCP as a whole, the levees that are the subject of this evaluation appear very differently from their original construction. The levees retain a relatively low level of integrity according to the Secretary of Interior's Standards in all standards apart from location and association. To retain overall integrity, a property must possess several, and usually most, of the seven aspects of integrity.

The levee retains a moderate integrity of location. The alignment of Unit 118 Part 1 remains the same as it was during the period of significance, although the levee footprint has been enlarged since 1961. Similarly, the levee retains a moderate to low level of association. The levee remains strongly associated with its original purpose as a flood control structure, however, the physical appearance of Unit 118 Part 1 does not convey a sense of its historic character because modern levees tend to look the same as historic levees. The levee is more likely to retain integrity of association in a setting that is intact from the period of significance. Materials, workmanship and design of the levee are low due to cyclical maintenance and improvements that that have heightened, widened and added new materials to the levee. Setting and feeling in particular have been compromised by urban development in the City of Sacramento and North Sacramento since the 1960s.

In view of this analysis, the Corps finds Unit 118 Part 1 not eligible for listing as a historic property on the NRHP. While the levees of Unit 118 Part 1 are significant, they do not retain sufficient integrity to communicate their significance.

B11. Additional Resource Attributes: (List attributes and codes) None

***B12. References:**

Susannah Lemke and Tatum Clinton-Selin. *Levee Evaluation for the American River Common Features Project in Sacramento, Sutter, and Yolo Counties.* U.S. Army Corps of Engineers, Sacramento District, (June 2021).

B13. Remarks:

***B14. Evaluator:** Susannah Lemke, Historian, U.S. Army Corps of Engineers

***Date of Evaluation:** June 1, 2021

(Sketch Map with north arrow required.)

(This space reserved for official comments.)

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
HRI#

LOCATION MAP

Primary # P-34-00509
Trinomial CA-SAC-482H

*Resource Name or # Sacramento River Flood Control Plan Levee Unit 118 Part 1

*Map Name: Sacramento West, Sacramento East, Carmichael *Scale: 1:64,265 *Date of map: 2021

* Required information

P1. Other Identifier: American River Flood Control District: American River right bank, Natomas East Main Drainage Canal, Dry & Arcade Creeks

***P2. Location:** ☐ **Not for Publication** X **Unrestricted**

***a. County** Sacramento

***b. USGS 7.5' Quad** Sacramento West, Sacramento East, Carmichael, Rio Linda

c. Address N/A, Arden-Arcade, Rio Linda

d. UTM:

American River North Bank Levee, East Endpoint: 10S 645428 mE/ 4273724 mN
American River North Bank Levee, West Endpoint: 10S 632983 mE/ 4273780 mN
Natomas East Main Drainage Canal (NEMDC) Levee, South Endpoint: 10S 632983 mE/ 4273802 mN
Natomas East Main Drainage Canal (NEMDC) Levee, North Endpoint: 10S 632695 mE/ 4279886 mN
Bell Acqua Park Levee, East Endpoint: 10S 635499 mE/ 4281116 mN
Hagginwood Levee, East Endpoint: 10S 636445 mE/ 4276599 mN
Magpie Creek Diversion Channel Levee, East Endpoint: 10S 636684 mE/ 4280285 mN
Magpie Creek Diversion Channel Levee, West Endpoint: 10S 636452 mE/ 4280507 mN

e. Other Locational Data:

The levees of Unit 118 Part 2 of the SRFCP serve to mitigate flood risk in the neighborhoods of Arden-Arcade, North Sacramento and Del Paso Heights. The system, measuring approximately 23 miles, begins on the northern (right) bank of the American River near the William B. Pond Recreation Area and continue downstream for approximately 11 miles to reach the NEMDC. The levee wall then curves north to form the east levee (left bank) of the NEMDC, extending just under 4 miles, to end at Dry Creek. Two levee walls extend east from the NEMDC. One is located along the north and south banks of Arcade Creek for approximately 3 miles, ending near the Hagginwood neighborhood. The second levee extends along the south bank of Dry Creek, approximately 2.3 miles, from Hansen Ranch to Bell Acqua Park, south of the Rio Linda Airport. A discontiguous levee section measuring approximately 0.25 miles is located along the Magpie Creek Diversion Channel, near Raley Boulevard.

***P3a. Description:**

Levees in Unit 118 Part 2 are generally trapezoidal in shape and measure between 3 and 26 ft. in height. Sections of the levee system also differ in materials and construction. Levees along the American River and the south bank of Arcade Creek are built of compacted soil and concrete floodwalls. The remaining levees at the NEMDC, Arcade Creek, Dry Creek and Magpie Creek are primarily constructed of compacted soil, with the exception of a small section of concrete flood wall located near Hagginwood. The paved American River Bike Trail runs along the crown of the American River levees.

Two openings in the American River levees allow traffic from the North Sacramento Freeway and Del Paso Boulevard to pass through. The levee openings are filled with panels during times of flooding and traffic is rerouted. Similarly, the Union Pacific Railroad runs parallel to the western side of the NEMDC levees, with the tracks located to the east of the levee walls. During dry periods, locomotives may pass through openings in the levees at Arcade and Dry Creeks. During flooding, the openings are filled by panels to provide flood protection.

***P3b. Resource Attributes:** HP 11-Engineering Structure

***P4. Resources Present:** X Structure

P5b. Description of Photo: View of SRFCP Unit 118 Levees, looking North from Guy West Bridge towards the H Street Bridge, courtesy Tim Davis 2013. Image appears in: USACE Publication "American River Watershed Common Features General Reevaluation Report, Final Environmental Impact Statement Environmental Impact Report," December 2015

***P6. Date Constructed/Age and Source:** X Historic Period of significance: 1958-1961 SRFCP Post New Deal Construction: 1935-1961

***P7. Owner and Address:** Central Valley Flood Protection

Board
3310 El Camino Ave # 170
Sacramento, CA 95821

***P8. Recorded by:** Susannah Lemke, Historian, US Army Corps of Engineers, Sacramento District, 1325 J Street Sacramento, CA 95814

***P9. Date Recorded:** June 1, 2021

***P10. Survey Type:** Review and aerial images

***P11. Report Citation**: Susannah Lemke and Tatum Clinton-Selin. *Levee Evaluation for the American River Common Features Project in Sacramento, Sutter, and Yolo Counties.* U.S. Army Corps of Engineers, Sacramento District, (June 2021).

***Attachments:** ☐NONE X Location Map ☐Continuation Sheet X Building, Structure, and Object Record
☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record
☐Artifact Record ☐Photograph Record ☐ Other (List): _____

***Resource Name or #** Sacramento River Flood Control Plan Levee Unit 118 Part 2 ***NRHP Status Code 7N, 6Y**

B1. Historic Name:

B2. Common Name: American River Flood Control District: American River right bank, Natomas East Main Drainage Canal, Dry & Arcade Creeks

B3. Original Use: Civil Works levee, Flood Protection B4. Present Use: Civil Works levee, Flood Protection

***B5. Architectural Style:** No Academic Style

***B6. Construction History:**

Levee Unit 118 Parts 1 and 2 are part of the Sacramento River Flood Control Project (SRFCP). Prior to incorporation into the SRFCP in the 1950s, levee systems on the north (right) and south (left) banks of the American River had been part of the landscape for decades. With the establishment of the City of Sacramento in 1850, a series of levees, measuring approximately 3 ft. high were constructed on the south bank of the American River. Scattered local levees were also built on the North Bank of the American River by the 1900s, however it was after severe floods in the 1920s that a comprehensive plan of levee construction in the area was implemented by the American River Flood Control District (ARFCD), established in 1927. Between 1925 and 1937, levees were built along the north bank of the American River, from the NEMDC to approximately the location of the current California Exposition and State Fair (Cal Expo). On the south bank, the existing levee system was improved and moved to align more closely with the riverbed.

Unit 118 Part 2 was first incorporated into the SRFCP in 1955 after the Corps improved a number of existing levees. In accordance with the Flood Control Act, the levee unit was transferred to the State Reclamation Board on behalf of the State of California following those improvements. The levees were regulated by the CVFPB then operated and managed by the American River Flood Control District and the CA Department of Water Resources.

When the levees were completed in 1955, the unit was less expansive than the current configuration. In 1955, Unit 118 Part 2 ended approximately 3.5 miles east of the NEMDC, with a section that curved slightly north around the current site of the California Exposition and State Fair. Between 1955 and 1958, an additional 8.15 mile section of levees was built east toward Carmichael Bluffs. This is the current configuration that exists on the north bank of the American River. When the levee extension to Carmichael Bluffs was completed in 1958, a 3,500 ft. section of levee that had extended north around the current Cal Expo was rendered ineffectual. In 1990, the ARCF, with no objection from the Corps, abandoned the Cal Expo section of levee. Following the incorporation of the levees into the SRFCP, the Corps continued to make improvements to the levee unit. Additional stone bank protection and several paved patrol roads were added to the levees between 1962 and 1970. A number of improvements between the late 1990s and 2010s added cutoff walls, jet grout and added materials to widen, strengthen, and raise levee walls.

***B7. Moved?** X **No** ☐ **Yes** ☐ **Unknown** **Date:** _____ **Original Location:** _____

***B8. Related Features:** Unit 118 Part 2

B9a. Architect: Thomas H. Jackson b. Builder: U.S. Army Corps of Engineers

***B10. Significance: Theme**: Reclamation, Flood Control **Area** SRFCP, Sacramento

Period of Significance: 1958-1961 **Property Type** Levee **Applicable Criteria** A

The period of significance for Unit 118 Part 2 dates from 1958 to 1961. The levee unit was transferred from the Corps to the State of California in accordance with the Flood Control Act of 1917, as amended, on December 15, 1955. Between 1955 and 1958, the levees were extended approximately eight miles east from the present-day Cal Expo location to Carmichael Bluffs under a Corps contract. The 1958 extension resulted in the current configuration of SRFCP Levee Unit 118 Part 2. Unit 118 Part 2 was transferred and completed during the era of Post-New Deal Construction when water management infrastructure received broad political and popular support at the federal level. This period of significance ends in 1961 when the SRFCP was deemed

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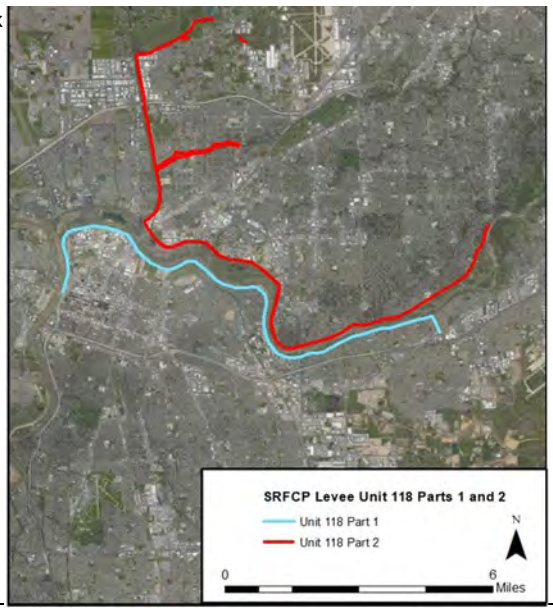


(This space reserved for official comments.)

complete, and new types of flood risk management strategies were adopted as alternatives to big infrastructure.

Unit 118 Part 2 is significant under **Criterion A** given that the levee unit is part of the SRFCP. The SRFCP, constructed between 1911 and 1961, was the first large-scale flood control project implemented in California. The SRFCP continues to foster population growth and economic development through reclamation of seasonal floodplains. Unit 118 Part 2 is not significant under **Criterion B** because the levees are not associated with the lives of significant persons in our past. The design and construction of system, as well as modifications were not by any one individual or individuals with particular significance at the local state or national levels. Unit 118 Part 2 is not significant under **Criterion C** because the levees do not embody the distinctive characteristics of a type, period or method of construction, nor do they represent the work of a master, possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction. The levees of Unit 118 Part 2 are constructed of common materials have been repaired and modified using typical methods and technology. Furthermore, the levees and are not characteristic elements of the bypass system that distinguishes the design of the SRFCP in the Central Valley. Although the levees along Dry Creek, Magpie Creek and the NEMDC serve to divert floodwaters to bypass systems the construction of these levees does not differ substantially from other levee segments within the Unit. Unit 118 Part 2 is not significant under **Criterion D** because the levees are unlikely to show or yield information important to history within the period of significance. Note that this assessment of Criterion D applies to historic-era significance only.

The current condition of the levees is fair to poor. The north bank of the American River has a number of unauthorized encroachments and is showing signs of erosion due to the swifter currents of the river. Levees located above Arcade Creek within Unit 118 Part 2 are deteriorating due to extensive animal burrows, culverts in disrepair and vegetation overgrowth. Levees require frequent cyclical maintenance to remain effective and as such, the levees of Unit 118 have been raised, widened and enhanced by floodwalls, pumping systems and new stabilization measures to ensure functionality. Additional modifications have included bike paths and roads to enhance transportation and recreational opportunities.

Given the prevalence of levee improvements and cyclical maintenance within Unit 118 and the SRFCP as a whole, the levees that are the subject of this evaluation appear very differently from their original construction. The levee retains a moderate integrity of location. The alignment of Unit 118 Part 2 remains the same as it was during the period of significance. Similarly, the levee retains a moderate to low level of association. The levee remains strongly associated with its original purpose as a flood control structure, however, the physical appearance of Unit 118 Part 2 does not convey a sense of its historic character because modern levees tend to look the same as historic levees. The levee is more likely to retain integrity of association in a setting that is intact from the period of significance. Materials, workmanship and design of the levee are low due to cyclical maintenance and improvements that that have heightened, widened and added new materials to the levee. Setting and feeling in particular have been compromised by urban development in the City of Sacramento and North Sacramento since the 1950s.

In view of this analysis, the Corps finds Unit 118 Part 2 not eligible for listing as a historic property on the NRHP. While the levees of Unit 118 Part 2 are significant, they do not retain sufficient integrity to communicate their significance.

B11. Additional Resource Attributes: None

***B12. References:**

Susannah Lemke and Tatum Clinton-Selin. *Levee Evaluation for the American River Common Features Project in Sacramento, Sutter, and Yolo Counties.* U.S. Army Corps of Engineers, Sacramento District, (June 2021).

B13. Remarks:

***B14. Evaluator:** Susannah Lemke, Historian, U.S. Army Corps of Engineers

***Date of Evaluation:** June 1, 2021

(Sketch Map with north arrow required.)

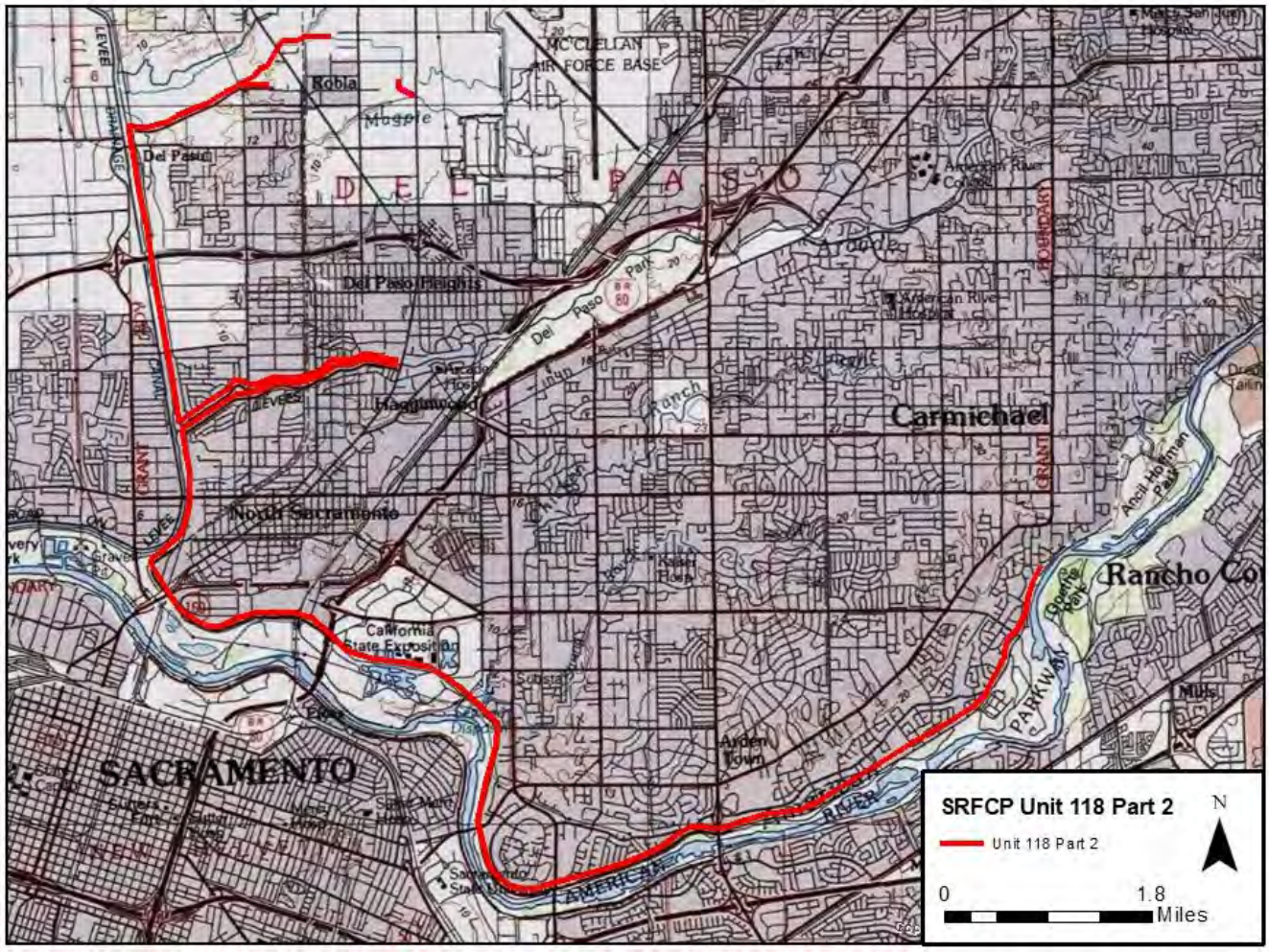
(This space reserved for official comments.)

State of California - The Resources Agency	Primary # P-34-00508	DEPARTMENT OF PARKS AND RECREATION
HRI#	**LOCATION MAP**	Trinomial
CA-SAC-481-H		

Page 5 **of** 5 ***Resource Name or #** Sacramento River Flood Control Plan Levee Unit 118 Part 2

***Map Name:** Sacramento West, Sacramento East, Carmichael, Rio Linda, CA 7.5 min Quad ***Scale:** 1:72,524

***Date of map:** 2021



State of California ♿ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # P-34-00490
HRI #
Trinomial: CA-SAC-000463/H
NRHP Status Code: 7N, 6Y
Other Listings
Review Code Reviewer Date

 ***Resource Name or #:** Sacramento River Flood Control Plan Levee Unit 124
P1. Other Identifier: Reclamation District 1000 River Levee

***P2. Location:** ☐ **Not for Publication** X **Unrestricted**

- ***a. County** Sacramento, Sutter
- ***b. USGS 7.5' Quad** Verona, Taylor Monument, Sacramento West, CA
- c. Address N/A City: Sacramento, CA
- d. UTM:
  Southeast endpoint: Zone 10S 632743 mE/ 4274046 mN
  North endpoint: Zone 10S 621339 mE/ 4293191 mN
  Midpoint: Zone 10S 621411 mE/ 4279821 mN
- e. Other Locational Data:

The levees of Unit 124, measuring approximately 20 miles, comprise the southern and western side of the Natomas levee system, extending along the American River from Northgate Boulevard west towards Interstate 80 (I-80), and north along the Sacramento River to its confluence at the Natomas Cross Canal.

***P3a. Description:**

The earthen levees measure between 39 to 44 ft. in height and are generally trapezoidal in shape. Slurry cutoff walls reinforce most of the unit. The paved two-lane Garden Highway runs along the crown of the levee from the southern portion of the unit north towards the Cross Canal. I-80 and Interstate 5 (I-5) cross over the levees. Several pumping plants enhance the flood protection provided by the Natomas ring levees and are located adjacent to the levee walls of Unit 124. On the water side of Unit 124, the levees are bordered by homes and numerous private boat docks built along the shore, a portion of the American River Parkway is present at the southeastern portion of Unit 124. The community of Natomas is located on the land side of the levee. At the turn of the century Natomas was best known as an agricultural center, but within the past five decades Natomas has developed into a residential, industrial and commercial center. The northern region of Natomas, north of the Sacramento International Airport, remains primarily agricultural.

***P3b. Resource Attributes:** HP11-Engineering Structure ***P4. Resources Present:** X Structure

P5b. Description of Photo: SRFCP Levee Unit 124 facing northwest from vicinity of I-80 overpass, Gulf South Research Corp., May 2019

***P6. Date Constructed/Age and Source:** XHistoric
Periods of significance: RD 1000 1911-1939, SRFCP 1951-1961

***P7. Owner and Address:**
Reclamation District 1000
1633 Garden Highway, Sacramento CA 95833

***P8. Recorded by:** Susannah Lemke, Historian, US Army Corps of Engineers, Sacramento District, 1325 J Street Sacramento, CA 95814

***P9. Date Recorded:** June 1, 2021

***P10. Survey Type:** Review and aerial images

***P11. Report Citation**: Susannah Lemke and Tatum Clinton-Selin. *Levee Evaluation for the American River Common Features Project in Sacramento, Sutter, and Yolo Counties.* U.S. Army Corps of Engineers, Sacramento District, (June 2021).

***Attachments:** ☐NONE X Location Map ☐Continuation Sheet X Building, Structure, and Object Record
☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record
☐Artifact Record ☐Photograph Record ☐ Other (List): _____

B1. Historic Name: Reclamation District 1000 River Levee
B2. Common Name:
B3. Original Use: Civil Works levee, Flood Protection B4. Present Use: Civil Works levee, Flood Protection
*B5. Architectural Style: No Academic Style
*B6. Construction History:

Scattered levees were built along the Sacramento River in the current location of the River Levee as early as 1895 when farms were first established in Natomas during the post gold-rush era. Following the adoption of the California Flood Control Act of 1911, RD 1000 was approved by the California Reclamation Board. Levee construction for RD 1000 was accomplished under the auspices of the Natomas Company, a private land developer, in 1914. The earthen levees were first constructed of dredged material from the Sacramento River using a suction dredge. The paved Garden Highway was built across the levee crown between 1923 and 1925.

The RD 1000 levees were formally incorporated into the SRFCP in 1951. Following the incorporation into the SRFCP, frequent maintenance and improvements including levee raises, stone protection, bank sloping, selective clearing and emergency repairs ensured continued flood protection. I-80 and I-5 were completed during the mid-1960s and 1970s. Between 1951 and the late 1970s, levee repairs were limited to relatively routine cyclical maintenance. After the 1980s, however, new materials and methods of construction were applied to further strengthen the levees. Over 12 miles of levee berms were added during the early 1980s, and slurry walls were added to reinforce the length of the Garden Highway between the 1980s and 2010. The Garden Highway and adjacent pumping system have also undergone numerous repairs and improvements from the 1970s forward.

*B7. Moved? X No ☐Yes ☐Unknown Date: Original Location:
*B8. Related Features: RD 1000, SRFCP Levee Unit 125
B9a. Architect: Architect: Hammon Engineering Company b. Builder: Natomas Company & numerous contractors
*B10. Significance: Theme: Reclamation, Flood Control Area SRFCP, Sacramento, Natomas
Period of Significance: RD 1000 1911-1939, SRFCP 1951-1961 Property Type Levee Applicable Criteria A

RD 1000 was an early example of a modern reclamation district, approved after the passage of the California Flood Control Act. Similarly, the SRFCP, was the first large-scale flood control project implemented in California. Both RD 1000 and the SRFCP continue to foster population growth and economic development through the systematic drainage of seasonal floodplains in Natomas and the Central Valley. Units 124 and 125 are significant under **Criterion A** at the state level as part of the RD 1000 RHL and as part of the SRFCP. Both flood risk management projects are associated with events that have made a significant contribution to the broad patterns of California history.

Units 124 and 125 are not significant under **Criterion B** because the levees are not associated with the lives of significant persons in our past. The design and construction of system, as well as modifications were not by any one individual or individuals with particular significance at the local state or national levels. Unit 124 and 125 are not significant under **Criterion C** because the levee does not embody the distinctive characteristics of a type, period or method of construction, nor does it represent the work of a master, possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction. The levees are constructed of common materials and have been repaired and modified using typical methods and technology. Furthermore, regarding the SRFCP, the levees do not demonstrate characteristic elements of the bypass system that distinguishes the SRFCP design. Units 124 and 125 are not significant under **Criterion D** because the levees are not a significant or likely source of important information about historic-era levee construction, or the materials or technologies employed in their construction and operation.

Although significant under Criterion A, the integrity of Unit 124 is

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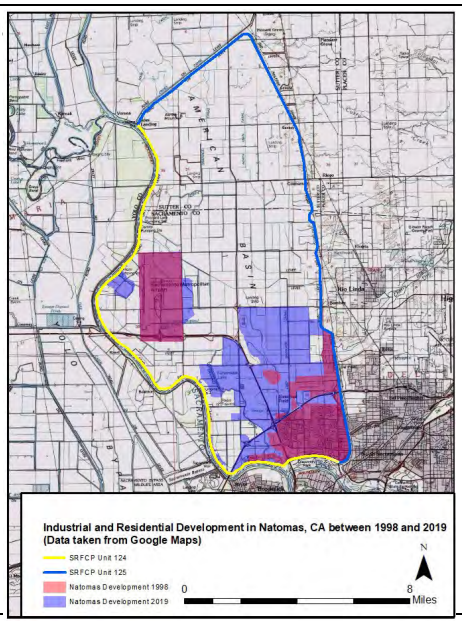
(Sketch M



low. Unit 124 remains in roughly the same location since completion of construction in 1914 and transfer to the SRFCP in 1951. The addition of levee berms during the 1980s have changed the levee footprint. Similarly, the integrity of design, materials and workmanship of the levees are poor due to the addition of berms, levee raises, slurry walls, the I-5 and I-80 overpasses and improvements to the Garden Highway outside of the periods of significance. The integrity of the setting, feeling and association of Unit 124 has also declined due to modern development.

The River Levee also formed the southern and western boundary of the district. A cursory discussion of integrity appeared in the 1996 *Rural Historic Landscape Report*. The location, materials and design of the RD 1000 levees were determined to "remain unchanged." The report, however was written prior to the addition of slurry cutoff walls in 1996 and 2000. The 1996 evaluation also overlooked the levee raises, addition of the I-80 and I-5 overpasses and the 1980s era berms. In another section of the same report, areas of modern development were delineated and determined to be non-contributing. When the RHL was delineated during the mid-1990s, development was limited to areas between I-5 and I-80 and the Sacramento Airport, approximately 16% of the district.

A building boom in the intervening years has resulted in an expansion of industrial areas and residential subdivisions along major highways that connect Natomas to Sacramento. Modern development now occupies roughly 30% of the district as a whole, and has expanded north along I-5. Housing developments in particular have added new road systems within the RHL, compromising the "large-scale land patterns" that differentiated the RHL from surrounding urban centers. Approximately 75% of Unit 124 borders a mosaic of farm fields and residential subdivisions, 30% of the levee directly abuts areas of development that are non-contributing to RD 1000.

Setting, feeling and association range from high to low. The levee located north of the Sacramento Airport, approximately 25% of Unit 124, borders farm fields that demonstrate the characteristic landscape of the RHL and of the SRFCP. This northern section of Unit 124 retains a high integrity of setting, feeling and association. The remaining 75% of the levee borders a mosaic of farm fields and residential subdivisions, 30% of the levee directly abuts areas of development that are non-contributing to RD 1000. These developed areas retain a low integrity of setting and feeling. Given that the levee was identified as the physical and visual boundary of the RD 1000 RHL, and only 25% of the levee abuts the large scale land patterns that characterize the district, it appears that the southern and western portion of the RD 1000 RHL is more closely defined by the boundaries of developed areas rather than the River Levee. The overall integrity of setting and feeling are low, integrity of location is moderate, and association with flood management is high.

The Corps finds the RD 1000 River Levee non-contributing to the RD 1000 RHL. Within the context of the SRFCP, the Corps finds Unit 124 not eligible for listing as a historic property on the NRHP.

B11. Additional Resource Attributes: (List attributes and codes) None

***B12. References:**

Susannah Lemke and Tatum Clinton-Selin. *Levee Evaluation for the American River Common Features Project in Sacramento, Sutter, and Yolo Counties.* U.S. Army Corps of Engineers, Sacramento District, (June 2021).

B13. Remarks:

***B14. Evaluator:** Susannah Lemke, Historian, U.S. Army Corps of Engineers

***Date of Evaluation:** June 1, 2021

(Sketch Map with north arrow required.)

(This space reserved for official comments.)

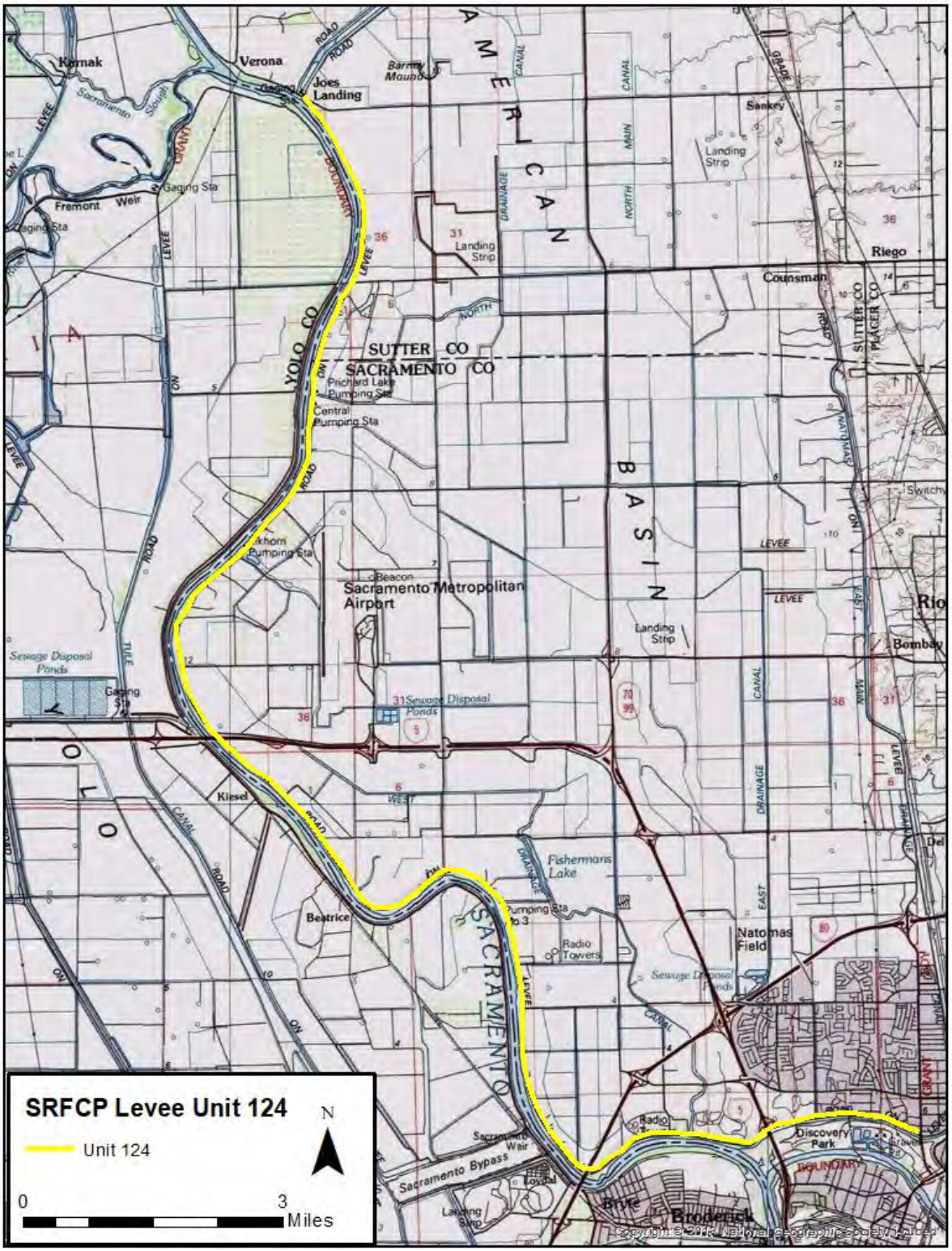
State of California - The Resources Agency Primary # P-34-00490
DEPARTMENT OF PARKS AND RECREATION HRI#

LOCATION MAP

Trinomial CA-SAC-000463/H

Page 4 **of** 4 ***Resource Name or #** Sacramento River Flood Control Plan Levee Unit 124

***Map Name:** Verona, Taylor Monument, Sacramento West, CA 7.5 min Quad ***Scale:** 1:87,030 ***Date of map:** 2021



State of California ♁ The Resources Agency	Primary # P-34-000490
DEPARTMENT OF PARKS AND RECREATION	HRI #
PRIMARY RECORD	Trinomial: CA-SAC-000463/H
	NRHP Status Code 7N, 6Y
Other Review Code	Reviewer Date Listings

 ***Resource Name or #:** Sacramento River Flood Control Plan Levee Unit 125

P1. Other Identifier: Reclamation District 1000 Cross Canal Levee, East Levee

***P2. Location:** ☐ **Not for Publication** X **Unrestricted**

***a. County** Sacramento, Sutter

***b. USGS 7.5' Quad** Verona, Pleasant Grove, Rio Linda, Sacramento East, CA

c. Address N/A City: Sacramento, CA

d. UTM:
Southeast endpoint: Zone 10S 632738mE/ 4274102 mN
Northwest endpoint: Zone 10S 621259 mE/ 4293340 mN
Midpoint: Zone 10S 630810 mE/ 4290425 mN

e. Other Locational Data: The levees of Unit 125, measuring approximately 21.5 miles long, comprise the northern and eastern side of the Natomas levee system. At the northern end of the unit, the levees border the Natomas Cross Canal and extend south along the Natomas East Main Drainage Canal.

***P3a. Description:**

The earthen levees measure between 39 to 44 ft. in height and are generally trapezoidal in shape. Slurry cutoff walls reinforce most of the unit. Howsley and Natomas Roads, both paved two lane roads, are located on the crowns of the Cross Canal and East Levees, respectively. Over 10 bridges cross Unit 125, connecting Natomas with communities to the east. Several pumping plants enhance the flood protection provided by the Natomas ring levees and are located adjacent to the levee walls of Unit 125. On the water side of Unit 125, the Cross Canal levee creates the south side of the channel along with the levees of RD 1001 on the northern side of the channel. Similarly, Unit 125 levees along the NEMDC form the western walls of the channel along with the levees of SRFCP Unit 118 Part 2. The community of Natomas is located on the land side of the levee. Within the past three decades the southern region of Natomas has developed into a residential, industrial and commercial center; the northern region of Natomas remains primarily agricultural.

***P3b. Resource Attributes:** HP11-Engineering Structure

***P4. Resources Present:**
X Structure

P5b. Description of Photo: SRFCP Unit 125 at the Natomas Cross Canal Levee, facing northeast, Hope Schear, Corps Archeologist, 2017

***P6. Date Constructed/Age and Source:** X Historic. Periods of significance: RD 1000 1911-1939, SRFCP 1951-1961

***P7. Owner and Address:**
Reclamation District 1000
1633 Garden Highway,
Sacramento, CA 95833

***P8. Recorded by:** Susannah Lemke, Historian, US Army Corps of Engineers, Sacramento District, 1325 J Street Sacramento, CA 95814

***P9. Date Recorded:** June 1, 2021

***P10. Survey Type:** Review and aerial images

***P11. Report Citation**: Susannah Lemke and Tatum Clinton-Selin. *Levee Evaluation for the American River Common Features Project in Sacramento, Sutter, and Yolo Counties.* U.S. Army Corps of Engineers, Sacramento District, (June 2021).

***Attachments:** ☐NONE X Location Map ☐Continuation Sheet X Building, Structure, and Object Record
☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record
☐Artifact Record ☐Photograph Record ☐ Other (List): _____

B1. Historic Name: Reclamation District 1000 Cross Canal Levee, East Levee
B2. Common Name:
B3. Original Use: Civil Works levee, Flood Protection B4. Present Use: Civil Works levee, Flood Protection
*B5. Architectural Style: No Academic Style
*B6. Construction History:

Few levees were built in the area of Unit 125 when RD 1000 was established in 1911. Construction on the East Levee began in 1912 under the auspices of the Natomas Company, a private land developer, and was completed in 1914. The earthen levees were first constructed of dredged material from the Sacramento River using clamshell dredges and horse drawn excavators. The Natomas/East Levee road was built along the East Levee by the Natomas Company within the period of significance. Between 1925 and 1939, levees of the southern portion of Unit 125 were improved to meet SRFCP standards. Improvements included widening the levee crowns from 20 ft. to 40 ft.

The RD 1000 levees were formally incorporated into the SRFCP in 1951. Following incorporation, the Corps identified areas needing improvement in the majority of Unit 125. Between 1957 and 1958, a series of contractors completed grading and surfacing on existing levees. Between 1958 and the late 2000s, levee repairs were limited to relatively routine cyclical maintenance. Between 2007 and 2010 cutoff walls, constructed of soil-cement bentonite, were added along the Cross Canal Levee and several miles of the East Levee. Within the same time period, levees had been raised and slopes had been flattened. The East Levee Road and adjacent pumping system have also undergone numerous repairs and improvements from the 1970s forward.

*B7. Moved? X No ☐Yes ☐Unknown Date: Original Location:
*B8. Related Features: RD 1000, SRFCP Levee Unit 124
B9a. Architect: Architect: Hammon Engineering Company b. Builder: Natomas Company & numerous contractors
*B10. Significance: Theme: Reclamation, Flood Control Area SRFCP, Sacramento, Natomas
Period of Significance: RD 1000 1911-1939, SRFCP 1951-1961 Property Type Levee Applicable Criteria A

RD 1000 was an early example of a modern reclamation district, approved after the passage of the California Flood Control Act. Similarly, the SRFCP, was the first large-scale flood control project implemented in California. Both RD 1000 and the SRFCP continue to foster population growth and economic development through the systematic drainage of seasonal floodplains in Natomas and the Central Valley. Units 124 and 125 are significant under **Criterion A** at the state level as part of the RD 1000 RHL and as part of the SRFCP. Both flood risk management projects are associated with events that have made a significant contribution to the broad patterns of California history.

Units 124 and 125 are not significant under **Criterion B** because the levees are not associated with the lives of significant persons in our past. The design and construction of system, as well as modifications were not by any one individual or individuals with particular significance at the local state or national levels. Unit 124 and 125 are not significant under **Criterion C** because the levee does not embody the distinctive characteristics of a type, period or method of construction, nor does it represent the work of a master, possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction. The levees are constructed of common materials and have been repaired and modified using typical methods and technology. Furthermore, regarding the SRFCP, the levees do not demonstrate characteristic elements of the bypass system that distinguishes the SRFCP design. Units 124 and 125 are not significant under **Criterion D** because the levees are not a significant or likely source of important information about historic-era levee construction, or the materials or technologies employed in their construction and operation.

Although significant under Criterion A, the integrity of Unit 125 is

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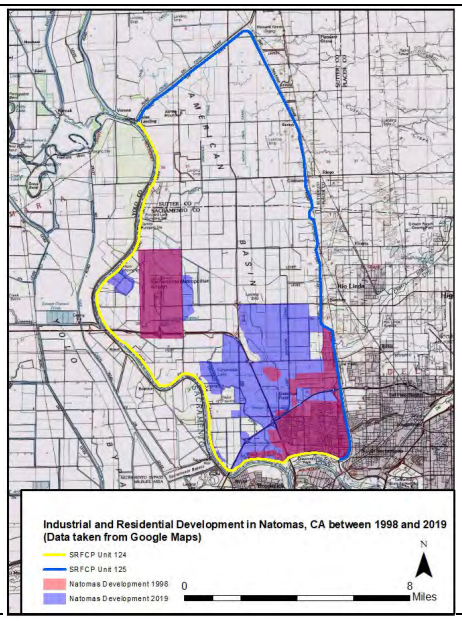

moderate and varies by region. Unit 125 remains in roughly the same location since completion of construction in 1914 and transfer to the SRFCP in 1951. The integrity of design, materials and workmanship of the levee is poor due to the levee raises, slurry walls, the I-5 and State Route 99/70 overpasses and improvements to the East Levee Road outside of the periods of significance. The integrity of the setting, feeling and association of Unit 125 has also declined due to modern development.

A cursory discussion of integrity appeared in the 1996 *Rural Historic Landscape Report*. The location, materials and design of the RD 1000 levees were determined to "remain unchanged." The report, however was written prior to the addition of slurry cutoff walls in between 2007 and 2010. The 1996 evaluation also overlooked the levee raises, addition of the I-5 and State Route 99/70 overpasses. In another section of the same report, areas of modern development were delineated and determined to be non-contributing. When the RHL was delineated during the mid-1990s, development was limited to areas between I-5 and I-80 and the Sacramento Airport, approximately 16% of the district.

A building boom in the intervening years, however, has resulted in an expansion of industrial areas and residential subdivisions along major highways that connect Natomas to Sacramento. Modern development now occupies roughly 30% of the district as a whole. Housing developments along I-80 and I-5 in particular have added new road systems within the RHL, compromising the "large-scale land patterns" that differentiated the RHL from surrounding urban centers.

Approximately 70% of Unit 125 borders farm fields that demonstrate the characteristic landscape of the RHL. The levee south of the Sacramento Airport and West Elkhorn Boulevard, approximately 30% of the levee, directly abuts areas of development that are non-contributing to RD 1000. As a result, setting, feeling and association range from high to low. The northern section of Unit 125 retains a high integrity of setting, feeling and association. Developed areas to the south, by contrast, retain a low integrity of setting and feeling. The overall integrity of setting and feeling are low to moderate, integrity of location is moderate, and association with flood management is high.

The Corps finds the RD 1000 East Levee and Cross Canal Levee, non-contributing to the RD 1000 RHL. Within the context of the SRFCP, the Corps finds Unit 125 not eligible for listing as a historic property on the NRHP.

B11. Additional Resource Attributes: (List attributes and codes) None

***B12. References:**

Susannah Lemke and Tatum Clinton-Selin. *Levee Evaluation for the American River Common Features Project in Sacramento, Sutter, and Yolo Counties.* U.S. Army Corps of Engineers, Sacramento District, (June 2021).

B13. Remarks:

***B14. Evaluator:** Susannah Lemke, Historian, U.S. Army Corps of Engineers
***Date of Evaluation:** June 1, 2021

(Sketch Map with north arrow required.)

(This space reserved for official comments.)

State of California - The Resources Agency	Primary # P-34-000490
DEPARTMENT OF PARKS AND RECREATION	HRI#
LOCATION MAP	Trinomial CA-SAC-000463/H

 ***Resource Name or #** Sacramento River Flood Control Plan Levee Unit 125

***Map Name:** Verona, Pleasant Grove, Rio Linda, Sacramento East, CA 7.5 min Quad ***Scale:** 1:98,748 ***Date of map:** 2021