

Delta Annex Chapter 12 Reclamation District 2111

12.1 Introduction

This new chapter to the Delta Annex details the hazard mitigation planning elements specific to the Reclamation District 2111 (RD 2111), a new 2016 participating jurisdiction to the Sacramento County Local Hazard Mitigation Plan (LHMP) Update. This chapter of the Delta Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by RD 2111. This chapter of the Delta Annex provides additional information specific to RD 2111, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this District.

12.2 Planning Process

As described above, the District followed the planning process detailed in Section 3 of the Base Plan. In addition to providing representation on the Sacramento County Hazard Mitigation Planning Committee (HMPC), RD 2111 formulated its own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table 12-1. Additional details on plan participation and RD 2111 representatives are included in Appendix A.

Table 12-1 RD 2111 Planning Team

Name	Position/Title	How Participated
Daniel Wilson	President	Attended meetings, collected data, drafted text and reviewed draft documents
Chiles Wilson	Trustee	Attended meetings, collected data, drafted text and reviewed draft documents
Dixie Wilson	Trustee	Attended meetings, collected data, drafted text and reviewed draft documents
Bill Darcie	Project Manager	RSN, Inc.

Source: RD 2111

12.3 Community Profile

The community profile for RD 2111 is detailed in the following sections. Figure 12-1 displays a map and the location of RD 2111 boundaries within Sacramento County.

12.3.1. RD 2111 Overview and Background

Reclamation District No. 2111, Dead Horse Island is near the town of Walnut Grove, several miles to the west of Interstate 5 between Sacramento and Stockton. The District is protected by approximately 13,650 feet of non-project levee. The District has one landowner, who holds all of the lands within. Dead Horse Island is surrounded by Dead Horse Cut to the east, the North Mokelumne River to the south, and Snodgrass Slough to the north and west. The island is accessible by bridge from Staten Island, which connects to the southwest most portion of Dead Horse Island. The levee crown road is an all-weather gravel surface, and in one portion of the Island veers off the crown to avoid an existing structure; the levee crown is still accessible to truck traffic if necessary in a flood event, and the required levee crown width for access is provided adjacent to the structure.

Reclamation District No. 2111 is responsible for maintaining the levee and drainage system that provides flood protection for Dead Horse Island, shown in Figure 12-1. The District was formed in 1980, and encompasses an area of 211 acres, surrounded by 2.58 miles of non-project levee, all located within Sacramento County. The District's Board of Trustees is made up of three Trustees who meet annually, or as necessary.

Dead Horse Island is located in the North Delta and is bordered by Dead Horse Cut to the east, the North Mokelumne River to the south, and Snodgrass Slough to the north and west. The District is located within the boundaries of the North Delta Water Agency. Emergency ingress and egress routes are via a private road on Staten Island off North Walnut Grove Road immediately east of the bridge over the North Fork of the Mokelumne River.

Dead Horse Island is located just downstream of the Delta Cross Channel. Water from the Sacramento River flows into both the South Fork and North Fork of the Mokelumne Rivers around the perimeter of Dead Horse Island as it flows toward the State and Federal Water Project Pumps near the City of Tracy. The Reclamation District No. 2111 levees provide the conduit for this water to enter both the North Fork and South Fork of the Mokelumne River, and are important to the proper function of the State and Federal Water Projects.

None of the waterways immediately surrounding Dead Horse Island is a significant commercial marine transportation route, but every waterway around Dead Horse Island is navigable during certain times of the year. A private dock and lagoon serve the Island at approximately Station 6+00. There are also two marinas across the waterways from the Island: a marina called "Wimpy's" near the southeast corner of the Island, and Walnut Grove marina across from the westernmost point of the Island. These marinas are major hubs for recreational boating in the area, and there is substantial boat traffic in the channels surrounding Reclamation District No. 2111, which increases the erosion to which the District levees are subject. The waterways surrounding Reclamation District No. 2111 are used extensively by recreational boaters and by marine contractors that perform levee maintenance, flood fight response and other construction activities.

12.4 Hazard Identification

RD 2111's planning team identified the hazards that affect the District and summarized their geographic extent, probability of future occurrences, potential magnitude/severity, and significance specific to RD 2111 (see Table 12-2).

Table 12-2 RD 2111—Hazard Identification

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Significance
Agricultural Hazards	Extensive	Unlikely	Limited	Low
Bird Strike	Limited	Unlikely	Negligible	Low
Climate Change	Extensive	Unlikely	Limited	Low
Dam Failure	Extensive	Unlikely	Limited	Low
Drought and Water Shortage	Extensive	Occasional	Critical	Low
Earthquake	Extensive	Unlikely	Negligible	Low
Earthquake: Liquefaction	Significant	Unlikely	Negligible	Low
Flood: 100/200/500-year	Extensive	Occasional	Catastrophic	High
Flood: Localized Stormwater Flooding	Limited	Likely	Limited	Low
Landslides	Limited	Unlikely	Negligible	Low
Levee Failure	Extensive	Occasional	Catastrophic	High
River/Stream/Creek Bank Erosion	Significant	Likely	Limited	Medium
Severe Weather: Extreme Temperatures – Cold/Freeze	Limited	Unlikely	Negligible	Low
Severe Weather: Extreme Temperatures – Heat	Limited	Unlikely	Negligible	Low
Severe Weather: Fog	Limited	Unlikely	Negligible	Low
Severe Weather: Heavy Rains and Storms (Thunderstorms, Hail, and Lightning)	Limited	Unlikely	Negligible	Low
Severe Weather: Wind and Tornadoes	Limited	Unlikely	Negligible	Low
Subsidence	Limited	Unlikely	Critical	Low
Volcano	Extensive	Unlikely	Catastrophic	Low
Wildfire:(Burn Area/Smoke)	Limited	Unlikely	Negligible	Low
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area		Magnitude/Severity Catastrophic —More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical —25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited —10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible —Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid		
Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.		Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		

12.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile RD 2111’s hazards and assess the District’s vulnerability separate from that of the Planning Area as a whole, which has already been assessed in Sections 4.2 and 4.3 Vulnerability Assessment in the main plan. The hazard profiles in the main plan discuss overall impacts to the Planning Area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to RD 2111 is included in this Annex. This vulnerability assessment analyzes the property, population, critical facilities, and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the main plan.

12.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section 12.5.3, includes a description as to how the hazard affects RD 2111 and information on past occurrences. The intent of this section is to provide jurisdictional specific information on hazards and further describe how the hazards and risks differ across the Planning Area.

12.5.2. Vulnerability Assessment

This section identifies RD 2111’s assets at risk, including values at risk, critical facilities and infrastructure, economic assets, natural resources, historic and cultural resources, and growth and development trends.

Assets at Risk and Critical Facilities

This section considers the District’s assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this plan:

Any facility (a structure, infrastructure, equipment or service), that is adversely affected during a hazardous event may result in interruption of services and operations for the District at any time before, during and after the hazard event. A critical facility is classified by the following categories: (1) Essential Services Facilities, (2) At-risk Populations Facilities, and (3) Hazardous Materials Facilities.

Table 12-3 lists particular critical facilities and other District assets identified by RD 2111’s planning team as important to protect in the event of a disaster. RD 2111’s physical assets, valued at over \$150,000, consist of the buildings and infrastructure to support RD 2111 operations.

Table 12-3 RD 2111’s Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Address	Replacement Value	Hazard Info
Drain Pump 10	Essential Services		\$50,000	Out of floodplain
Drain Pumps	Essential Services		\$100,000	Out of floodplain

Source: RD 2111

Natural Resources

The Reclamation District No. 2111 levee provides protection for valuable habitat essential for many threatened and endangered species. In general, Delta lands, including those protected by the District's levees, provide forage and cover for local and migratory populations of birds and terrestrial wildlife including many special status species. The levees also provide important waterside habitat and shoreline for various fisheries that includes several special status species. Flooding of Delta islands destroys habitat and kills most terrestrial species present.

Historic and Cultural Resources

Per the 2015 Five-Year Plan, there are not historic or cultural resources in the District.

Growth and Development Trends

According to the District in 2011, Dead Horse Island currently supports three permanent residences and several small structures which are generally not occupied. Three fulltime residents live on the Island. The permanent residences are above the required HMP levee crown elevation. The Planning Team for the District noted that future development is limited in secondary zone of the Delta from the Delta Protection Plan.

12.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table 12-2 as high or medium significance hazards. Impacts of past events and vulnerability of the RD 2111 to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Sacramento County Planning Area). Methodologies for calculating loss estimates are the similar to those described in Section 4.3 of the Base Plan and are based on data provided by the District as described further below. In general, the most vulnerable District assets include the levees and supporting structures that the District owns.

An estimate of the vulnerability of RD 2111 to each identified priority hazard, in addition to the estimate of probability of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.

- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Flood: 100/200/500-year

Likelihood of Future Occurrence—Occasional

Vulnerability—High

Hazard Profile and Problem Description

The Reclamation District No. 2111 levee is generally overtopped or the levee is breached during large flood events due to a confluence of several waterways in the vicinity of Dead Horse Island, which is located just downstream of where the Cosumnes and Mokelumne Rivers and Dry Creek merge with Snodgrass Slough. The island is separated from the Sacramento River by one reclamation district and the flood gates for the Delta Cross Channel. Flooding of the island occurs primarily because the island is located in a hydraulic choke point in the river system that is impacted by the timing of storms, the unrestricted flows from the Cosumnes River and Dry Creek as well as the management of reservoir releases on the Mokelumne River.

Historically, flooding in the Delta has resulted from levee failures caused by the separate or coincidental occurrence of very high tides, high runoff, and river outflow through the Delta region. Strong onshore winds associated with low pressure storms increase flood potential by causing an additional rise of the water surface elevations, and can cause severe erosion on levees in a short period of time. Flood events resulting from high tides and/or high river outflow cannot be reliably predicted, and must be expected to occur in the future.

Past Occurrences

Past occurrences of flooding are detailed in the levee failure section below.

Vulnerability to Flood

Assets/Critical Facilities at Risk

Flooding of Delta islands has the potential to negatively impact water quality both locally and statewide. The largest of California's drinking water sources is the Sacramento-San Joaquin Delta and its tributaries. The Delta provides water throughout the state via the State and Federal water projects. During a flood, there is a higher potential for the waters in the Delta to be exposed to chemicals, fuel, oil, and multiple other constituents of concern that can quickly degrade water quality. Flooding can also disturb soil and soil-borne materials such as mercury and organic matter that can degrade water quality.

Dead Horse Island is located just downstream from the confluence of the Mokelumne and Cosumnes Rivers. The Cosumnes River is one of the few remaining rivers that does not have any dams, and flows are unrestricted upstream of Dead Horse Island. The Mokelumne River is controlled by several dams, with Camanche Dam being the principal flood control reservoir. McCormack Williamson Tract, located upstream to the northeast and adjacent to Dead Horse Island, has a restricted elevation levee on the upstream

end of the tract that overtops and fills McCormack Williamson Tract when the Mokelumne and Cosumnes Rivers reach an elevation of 20.0 feet (NAVD 88 datum). The flood water that is contained within McCormack Williamson Tract builds up within the Tract until it overtops and breaches the levee on the downstream end of the Tract, adjacent to Dead Horse Island. When the McCormack Williamson Tract downstream levee fails, all of the water accumulated from upstream is released in a very short time, and given the narrow channels surrounding Dead Horse Island, causes an immediate short term rise in the water surface elevations in the channels surrounding Dead Horse Island. The majority of the recent flood events on Dead Horse Island can be attributed to this type of hydraulic event that commonly occurs during flood flows on the Mokelumne and Cosumnes Rivers.

Based on past history, the District Planning Team noted that the island's levees are sufficient to protect against a 100-year flood. A 200- or 500-year flood would likely overwhelm or overtop the levees. The District Planning Team also noted that both marinas are unstable – they will break and block bridges during high water.

Should a flood breach the levees, the entirety of the assets of RD 2111 would be at risk. Levee failure is discussed later in this section. Flooding also causes erosion, which is discussed later in this section.

Natural Resources at Risk

Flooding of Delta islands destroys habitat, kills most species present, and can entrain and strand large populations of native and non-native fish species.

Historic and Cultural Resources at Risk

The Planning Team for the District noted no historic or cultural resources at risk to flooding.

Future Development

There is only one building site in the District. It is above the floodplain.

Levee Failure

Likelihood of Future Occurrence—Occasional

Vulnerability—High

Hazard Profile and Problem Description

Floods can threaten the District from several sources. Usually, the possibility of flooding can be anticipated from eight to twenty hours before the “Emergency Period” is reached. However, as demonstrated in Linda, California, in February 1986, it is possible for a levee to collapse with little or no warning when there are still four or more feet of freeboard available.

Generally, levees fail due to overtopping or collapse. A catastrophic levee failure resulting from collapse probably will occur very quickly with relatively little warning. Such a failure would occur where the levee is saturated and the high hydrostatic water pressure on the river side, coupled with erosion of the levee from

high water flows or an inherent defect in the levee, causes an almost instant collapse of a portion of the levee. Under such circumstances, structures located relatively near the break will suffer immediate and extensive damage. Several hundred yards away from the break the energy of the flood waters will be dispersed sufficiently to reduce, but not eliminate, flooding damage to structures in its path. The flood water will flow in a relatively shallow path toward any low point in the affected area. Flood water will collect in these low areas and the levels will rise as the flow continues. When the rivers are high, it is not possible to close or repair a levee break until the water surface in the river and the flooded area equalize.

A major overtopping of a levee, if flow persists, will result in severe erosion of the levee crowns on the landward side and cause levee failure over a period of minutes to several hours. A severe levee overtopping can, therefore, be considered as a levee break for the purpose of determining the extent of flooding that any area will suffer. Generally, overtopping can be predicted based on river stages and the warning given depending on the source of the flood waters

Past Occurrences

The 2015 Five-Year Plan contained detail of past occurrences of levee failure and how it affected the District. Those details are here below:

- 1900 – Dead Horse Island was initially reclaimed. The levee on the east side of the Island was constructed by dredgers, which separated the Island from McCormack Williamson Tract.
- 1907 – A flood event breached the levee on nearby Tyler Island, and likely flooded Reclamation District No. 2111 as well.
- December 1955 – Rainfall on a deep Sierra snowpack caused flooding at Reclamation District No. 2111. Levee failed and the District was inundated.
- 1957 – A flood event caused inundation at Dead Horse Island. The levee failed and the District was inundated.
- 1980 – Levee failure at approximately Station 96+00 to 97+00. Due to hydraulic conditions in this portion of the Delta, the levee was overtopped by rising floodwaters causing the failure along Snodgrass Slough opposite the Walnut Grove Marina. Reclamation District No. 2111 was inundated. The levee was temporarily repaired so that the Island could be dewatered. Complete repair of the failed levee section occurred during the following summer months and the full levee section was restored. A FEMA claim was filed, and helped to defer the costs of the repair.
- February 1986 – The east end of the Island was overtopped. In the words of one of the District trustees, this flood event caused overtopping simultaneously “all over” the District. The location of the District at the confluence of the of the Mokelumne and Cosumnes Rivers caused a huge volume of water to overwhelm the District in a very short time, and the elevation of the levee was insufficient to protect the District against this rapid floodwater rise. The levee prism also failed as a result in the rapid pressure increase from the high water. In addition to the increased flow throughout the Delta, floodwaters around the District rose even further due to an unexpected flow restriction in the North Fork of the Mokelumne River at the New Hope Bridge, where several house boats had broken loose of their moorings and lodged against the bridge (see photo). The house boats had been docked at the New Hope Marina, located upstream of the split between the North Fork and South Fork of the Mokelumne River, near the western portion of the District levee. Note the marina blocking water that caused the RD 2111 levees to fail.



Source: 2015 Five-Year Plan for RD 2111

- January 1997 – The District levee failed at approximately Station 107+00 to 110+00 just as the levee was about to be overtopped. Consequences: A levee break occurred opposite the Walnut Grove Marina during a flood event. The District was fully inundated. Several boats and sections of the dock from the Walnut Grove Marina were pulled through the levee breach into the interior of the island. Other recreational boats, house boats, and sections of dock were also pulled into the Millers Ferry Bridge, including a two story floating home which particularly threatened to reduce flows down the North Fork of the Mokelumne River, increase the flood threat to adjacent islands, and possibly destroy the bridge, cutting off one of the few available emergency evacuation routes (see photo). The large house boat was eventually destroyed and the debris was sucked under the bridge.



Source: 2015 Five-Year Plan for RD 2111

In earlier flood events, there are reports that the McCormack Williamson Tract levee was purposely breached on Dead Horse Cut prior to its overtopping, successfully attenuating the flood impacts previously anticipated to affect neighboring islands. These planned levee breaches also limited damage to the interior of the McCormack Williamson levees as the size and location of the planned breaches can be controlled, and the water surface elevation within the tract does not increase beyond the downstream high water surface elevations.

It should be noted that since 1986, significant portions of the levee system within the Legal Delta have been rehabilitated and improved, which has significantly reduced the number and frequency of levee breaches and failures during post-1986 Delta flood events.

Vulnerability to Levee Failure

Levee failures from collapse of rodent dens, seepage, falling trees, or some other mechanical failure are unpredictable and relatively uncommon. Routine levee inspections are the primary preventative measure against these types of levee failure events.

There are several standards that the levees in the Delta must meet in order to remain eligible for certain State and Federal disaster assistance programs. These include the Hazard Mitigation Plan (HMP) criteria and the Public Law 84-99 Flood Control and Coastal Emergency Act (PL 84-99) Standard for agricultural levees. The assessment below is based on the District's 2012 Hazard Mitigation Plan (HMP) Survey, performed by KSN Inc., and is corroborated by the State of California Department of Water Resources (DWR) 2007 Light Detection and Ranging (LiDAR) Survey. As of 2012, the District meets the following standards shown in Table 12-4.

Table 12-4 Reclamation District 2111 Levee Standards of Protection

Delta Agricultural Levee Standard	Feet of Levee	Percentage of Levee
Total Levee Length	13,642 feet	–
Meets HMP Standard	11,856 feet	87%
Meets PL 84-99 (Public Law 84-99 Flood Control and Coastal Emergency Act) Standard	1,786 feet	13 %

Source: 2015 Five Year Plan for RD 2111

Assets/Critical Facilities at Risk

Should the levees fail, all District assets would be at risk.

Natural Resources at Risk

Flooding of Delta islands destroys habitat, kills most species present, and can entrain and strand large populations of native and non-native fish species.

Historic and Cultural Resources at Risk

The Planning Team for the District noted no historic or cultural resources at risk to levee failure.

Future Development

There is only one building site in the District. Future development in the District is unlikely.

River/Stream/Creek Bank Erosion

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Stream bank erosion is a natural process, but acceleration of this natural process leads to a disproportionate sediment supply, stream channel instability, land loss, habitat loss and other adverse effects. As farmers settled the valleys in the 1800s, the Gold Rush drew prospectors to the hills. As mining in the Sierra Nevada turned to the more “efficient” methods of hydraulic mining, the use of environmentally destructive high-pressure water jets washed entire mountainsides into local streams and rivers. As a result, the enormous amounts of silt deposited in the riverbeds of the Central Valley increased flood risk. As a remedy to these rising riverbeds, levees were built very close to the river channels to keep water velocity high and thereby scour away the sediment. However, the design of these narrow channels has been too successful. While the Gold Rush silt is long gone, the erosive force of the constrained river continues to eat away at the levee system and stream banks within the District.

Past Occurrences

There is erosion that occurs every year on RD 2111 levees. These may worsen depending on water and wave conditions.

Vulnerability to Erosion

Assets/Critical Facilities at Risk

The entirety of the levee system in RD 2111 is at risk to erosion.

Natural Resources at Risk

The Planning Team for the District noted no natural resources at risk to flooding.

Historic and Cultural Resources at Risk

The Planning Team for the District noted no historic or cultural resources at risk to flooding.

Future Development

There is only one building site in the District. Future development is unlikely

12.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

12.6.1. Regulatory Mitigation Capabilities

Table 12-5 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the RD 2111.

Table 12-5 RD 2111's Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	N	
Capital Improvements Plan	N	
Economic Development Plan	N	
Local Emergency Operations Plan	Y	In progress.

Continuity of Operations Plan	N	
Transportation Plan	N	
Stormwater Management Plan/Program	N	
Engineering Studies for Streams	N	
Community Wildfire Protection Plan	N	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y 2015	Five-Year Plan
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	N	Version/Year:
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score:
Fire department ISO rating:	N	Rating:
Site plan review requirements	N	
Land Use Planning and Ordinances	Y/N	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	N	
Subdivision ordinance	N	
Floodplain ordinance	N	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	
Flood insurance rate maps	N	
Elevation Certificates	N	
Acquisition of land for open space and public recreation uses	N	
Erosion or sediment control program	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		

Source: RD 2111

12.6.2. Administrative/Technical Mitigation Capabilities

Table 12-6 identifies the department(s) responsible for activities related to mitigation and loss prevention for RD 2111.

Table 12-6 RD 2111's Administrative and Technical Mitigation Capabilities

Administration		Describe capability Is coordination effective?
Planning Commission	Y/N	N
Mitigation Planning Committee	Y	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	
Mutual aid agreements	Y	
Other		
Staff		Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Y/N FT/PT	N
Floodplain Administrator		N
Emergency Manager		Y
Community Planner		N
Civil Engineer		Y
GIS Coordinator		Y
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)		N
Hazard data and information		Y
Grant writing		Y
Hazus analysis		N
Other		
How can these capabilities be expanded and improved to reduce risk?		

Source: RD 2111

12.6.3. Fiscal Mitigation Capabilities

Table 12-7 identifies financial tools or resources that the RD 2111 could potentially use to help fund mitigation activities.

Table 12-7 RD 2111's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	
Authority to levy taxes for specific purposes	N	
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	N	
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	Y	RD taxes
Incur debt through private activities	N	
Community Development Block Grant	N	
Other federal funding programs	N	
State funding programs	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		

Source: RD 2111

12.6.4. Mitigation Education, Outreach, and Partnerships

Table 12-8 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table 12-8 RD 2111's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	N	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	N	
Natural disaster or safety related school programs	N	
StormReady certification	N	
Firewise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	N	

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Other	N	
How can these capabilities be expanded and improved to reduce risk?		

12.6.5. Other Mitigation Efforts

The District Planning Team noted no other mitigation efforts.

12.7 Mitigation Strategy

12.7.1. Mitigation Goals and Objectives

RD 2111 adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

12.7.2. Mitigation Actions

The planning team for RD 2111 identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included.

Action 1. Rock Slope Protection Project

Hazards Addressed: EQ, EQ Liquefaction, Flood: 100/200/500-year, Flood: Localized Stormwater Flooding, Levee Failure, River/Stream/Creek Bank Erosion, Severe Weather: Heavy Rains and Storms (Thunderstorms/Hail, Lightning), Severe Weather (Wind and Tornadoes), Subsidence

Goals Addressed: 1, 2, 3, 4

Issue/Background: The goal of this Mitigation Action is to improve the Dead Horse Island levees over the next five years to a level of protection that meets, or exceeds, the U.S. Army Corps of Engineers’ (USACE) PL84-99 Levee Standard.

Project Description: The District would like to ensure the protection of the existing levee by adding supplementary quarry stone riprap above the existing riprap to any portions of the waterside slope of the levee requiring supplementary rock slope protection. This will prevent erosion and avoid ongoing repairs to the levee structure.

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented: Permitting process, Finalizing the EIR, potential CEQA Design Process

Responsible Office/Partners: RD 2111

Project Priority: High

Cost Estimate: \$813,000

Benefits (Losses Avoided): Preservation of 2111 levee structures, Ecosystem Restoration and Habitat Enhancement Component, Reversing Land Subsidence, Ensuring Adequate and Effective Emergency Response Plans, Benefitting Water Quality, Improving Water Supply Reliability

Potential Funding: Prop 1 and 1E, 84 Funds, HMGP Grant Programs, seeking cost sharing partners for project ongoing.

Timeline: 1-10 years depending on regulatory process and funding

Action 2. HMP and PL-8499 Levee Improvement Projects

Hazards Addressed: EQ, EQ Liquefaction, Flood: 100/200/500-year, Flood: Localized Stormwater Flooding, Levee Failure, River/Stream/Creek Bank Erosion, Severe Weather: Heavy Rains and Storms (Thunderstorms/Hail, Lightning), Severe Weather (Wind and Tornadoes), Subsidence

Goals Addressed: 1, 2,3, 4

Issue/Background: The goal of this Mitigation Action is to improve the Dead Horse Island levees over the next five years to a level of protection that meets, or exceeds, the U.S. Army Corps of Engineers' (USACE) PL84-99 Levee Standard.

Project Description: The District would like to bring portions of the RD 2111 levee currently below the HMP Criteria to six inches above the PL 84-99 Standard using 2:1 landside slopes. If sufficient funding is available, the segments of levee improved during this phase will include portions of the levee that meet the HMP Criteria, but do not meet the design template for this project, due to the many relatively short stretches of levee that do not meet the PL 84-99 Standard in close proximity to longer stretches of levee that do not meet the HMP Standard. After the entire levee meets or exceeds the HMP Criteria, the District will bring any remaining portions of levee below the PL 84-99 Standard to six inches above the PL 84-99 Standard.

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented: Permitting process, Finalizing the EIR, CEQA Design Process

Responsible Office/Partners: RD 2111

Project Priority: High

Cost Estimate: \$16,000,000

Benefits (Losses Avoided): Preservation of 2111 levee structures, Ecosystem Restoration and Habitat Enhancement Component, Reversing Land Subsidence, Ensuring Adequate and Effective Emergency Response Plans, Benefitting Water Quality, Improving Water Supply Reliability

Potential Funding: Prop 1 and 1E, 84 Funds, HMGP Grant Programs, seeking cost sharing partners for project.

Timeline: 1-10 years depending on regulatory process and funding