

# Delta Annex Chapter 8 Reclamation District 556

## 8.1 Introduction

This chapter of the Delta Annex details the hazard mitigation planning elements specific to the Reclamation District 556 (RD 556), a new 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 the RD 556. This chapter of the Delta Annex provides additional information specific to RD 556, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

## 8.2 Planning Process

As described above, the District followed the planning process detailed in Section 556 of the Base Plan. In addition to providing representation on the Sacramento County Hazard Mitigation Planning Committee (HMPC), RD 556 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 8-1. Additional details on plan participation and RD 556 representatives are included in Appendix A.

*Table 8-1 RD 556 Planning Team*

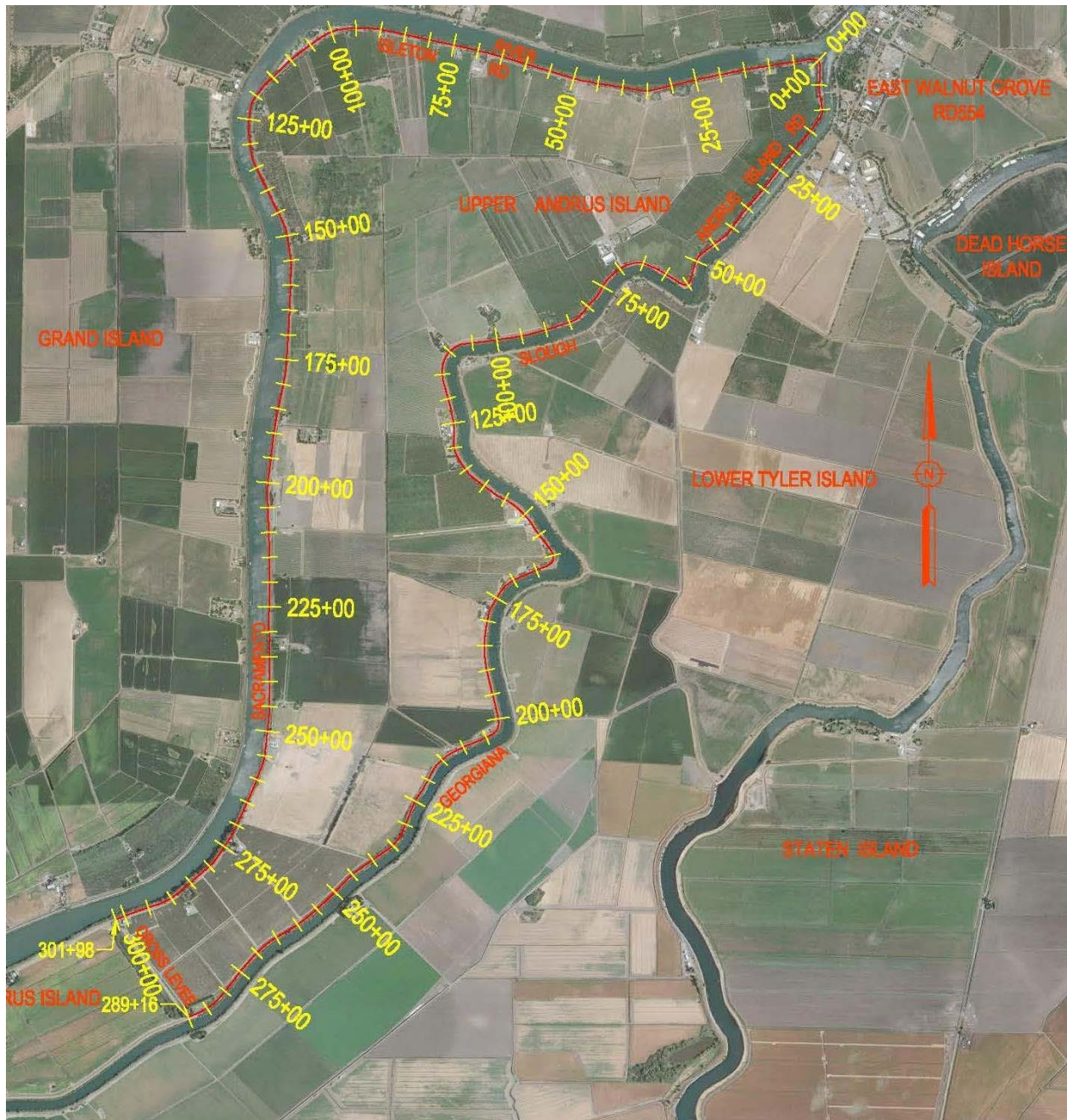
Name	Position/Title	How Participated
Emily Pappalardo	Project Manager	Attended meetings, collected data, drafted text, reviewed draft docs
Gilbert Labrie	District Engineer	Collected data, reviewed draft docs

Source: RD 556

## 8.3 Community Profile

The community profile for RD 556 is detailed in the following sections. Figure 8-1 displays a map and the location of RD 556 boundaries within Sacramento County.

Figure 8-1 Reclamation District 556 Map



### 8.3.1. RD 556 Overview, Background, and History

Reclamation District 556 was established in September 8, 1983 by the Water Code section 50000 et seq. There are five trustees that are elected every four years. The terms are staggered.

The District is currently under the FEMA Flood Zone designation AE. Meaning the District has a greater than 1% chance annually that it will flood, restricting development.

## 8.4 Hazard Identification

RD 556'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 556 (see Table 8-2).

*Table 8-2 RD 556—Hazard Identification*

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Significance
Agricultural Hazards	Significant	Occasional	Critical	Low
Bird Strike	Limited	Unlikely	Negligible	Low
Climate Change	Limited	Occasional	Negligible	Low
Dam Failure	Extensive	Unlikely	Catastrophic	Medium
Drought and Water Shortage	Significant	Likely	Limited	Medium
Earthquake	Limited	Occasional	Limited	Low
Earthquake: Liquefaction	Significant	Occasional	Limited	Medium
Flood: 100/200/500-year	Extensive	Occasional	Catastrophic	High
Flood: Localized Stormwater Flooding	Limited	Highly Likely	Limited	High
Landslides	Limited	Unlikely	Limited	Low
Levee Failure	Significant	Occasional	Critical	High
River/Stream/Creek Bank Erosion	Significant	Highly Likely	Negligible	Medium
Severe Weather: Extreme Temperatures – Cold/Freeze	Extensive	Likely	Limited	Low
Severe Weather: Extreme Temperatures – Heat	Extensive	Highly Likely	Limited	Low
Severe Weather: Fog	Extensive	Highly Likely	Limited	Medium
Severe Weather: Heavy Rains and Storms (Thunderstorms, Hail, and Lightning)	Extensive	Highly Likely	Critical	Medium
Severe Weather: Wind and Tornadoes	Extensive	Highly Likely	Limited	Medium
Subsidence	Limited	Occasional	Negligible	Low
Volcano	Limited	Unlikely	Negligible	Low
Wildfire:(Burn Area/Smoke)	Limited	Likely	Limited	Medium
<b>Geographic Extent</b> <b>Limited:</b> Less than 10% of planning area <b>Significant:</b> 10-50% of planning area <b>Extensive:</b> 50-100% of planning area		<b>Magnitude/Severity</b> <b>Catastrophic—</b> More than 50 percent of property severely damaged; shutdown of facilities for more than 5560 days; and/or multiple deaths <b>Critical—</b> 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 <b>Limited—</b> 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 <b>Negligible—</b> 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		
<b>Probability of Future Occurrences</b> <b>Highly Likely:</b> Near 100% chance of occurrence in next year, or happens every year. <b>Likely:</b> Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. <b>Occasional:</b> Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. <b>Unlikely:</b> Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.		<b>Significance</b> <b>Low:</b> minimal potential impact <b>Medium:</b> moderate potential impact <b>High:</b> widespread potential impact		

## 8.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile RD 556’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 4.556 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 556 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.

### 8.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section 0, includes a description as to how the hazard affects the RD 556 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.

### 8.5.2. Vulnerability Assessment

This section identifies RD 556’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 8-3 lists critical facilities and other District assets identified by the RD 556’s planning team as important to protect in the event of a disaster. RD 556’s physical assets, valued at over \$105 million, consist of the buildings and infrastructure to support the RD 556 operations.

*Table 8-3 RD 556’s Critical Facilities, Infrastructure, and Other District Assets*

Name of Asset	Facility Type	Address/ Coordinates	Replacement Value	Hazard Info
Levee	Infrastructure	n/a	\$100,000,000	
Cross-Levee	Infrastructure	n/a	\$5,000,000	

Name of Asset	Facility Type	Address/ Coordinates	Replacement Value	Hazard Info
Pump Station	Infrastructure	38°12'04.75" 121°32'40"	\$500,000	

Source: RD 556

### *Natural Resources*

The District is primarily comprised of cultivated lands within the interior of the island. Some riparian habitat can be found on the waterside slope of the levees.

### *Historic and Cultural Resources*

There are no registered historical sites. But the bucolic nature of the historic farm homes surrounded by crops within the island adds to cultural value of the Delta as place.

### *Growth and Development Trends*

Due to zoning and floodplain restrictions, essentially no growth has occurred on the island in recent history. For this reason no growth is expected.

### **8.5.3. Vulnerability to Specific Hazards**

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table 8-2 as high or medium significance hazards. Impacts of past events and vulnerability of the RD 556 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 similar to those described in Section 4.556 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. There are approximately 11.2 miles of project levees and 0.46 miles of cross levee separating Upper Andrus from the rest of Andrus Island. The levee system is subject to riverine flooding. However, it is unlikely the levee system will fail due to overtopping. A high water situation could increase the hydraulic gradient within the levee that could result in under or through seepage. Seepage, if left unchecked, can result in levee failure and subsequent flooding. The District owns a pumping station that is critical for island drainage. If the drainage system becomes compromised the District could experience localized flooding. If the system becomes compromised in a flood situation, damages could be worse than anticipated.

An estimate of the vulnerability of RD 556 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.

### *Dam Failure*

**Likelihood of Future Occurrence**—Unlikely

**Vulnerability**—Medium

### Hazard Profile and Problem Description

While unlikely, it is possible that dam failure can create a high water situation in the adjacent channels that could put the levee system at risk of failure from overtopping, under seepage, through seepage or debris impact. Given the distance from the dam system, a dam surge could dissipate prior to reaching this point in the Delta and result in a minor change in water elevation.

### Past Occurrences

There are no past occurrences of dam failure.

### Vulnerability to Dam Failure

#### Assets/Critical Facilities at Risk

The levees are at the highest risk to this hazard.

#### Natural Resources at Risk

Riparian habitats that border the channel can be lost due to erosive forces of high flows from dam failure.

#### Historic and Cultural Resources at Risk

Historic homes could be lost as a result of flooding due to dam failure.

### Future Development

It is unlikely future development will occur provided existing zoning codes and the District's FEMA flood designation that limits building on grade. The District does not control any building that may occur in the areas protected by the levee system. The District only can control whether the levees meet certification standards and the ongoing maintenance of these levees.

## *Drought and Water Shortage*

**Likelihood of Future Occurrence**–Likely

**Vulnerability**–Medium

### **Hazard Profile and Problem Description**

This hazard could disrupt crop irrigation. Prolonged disruption could result in the loss of a crop that year. In the event that orchards or vineyards experience disruption in irrigation, they could be lost for multiple years until they are replanted and begin producing a crop between 3 to 5 years. Agriculture is the primary industry on the island. Agricultural users pay assessments for levee maintenance and improvements. If agriculture is lost the District will not be able to cover levee maintenance or make any necessary improvements.

### **Past Occurrences**

Although California did recently experience an extended drought, agriculture in this District remained largely unaffected due to senior water rights and riparian water rights. Some farmers voluntarily cut water use by 25% in the Delta in response to the drought in the Summer of 2015.

### **Vulnerability to Drought and Water Shortage**

#### **Assets/Critical Facilities at Risk**

None.

#### **Natural Resources at Risk**

None.

#### **Historic and Cultural Resources at Risk**

None.

#### **Future Development**

It is unlikely future development will occur provided existing zoning codes and the District's FEMA flood designation that limits building on grade. Further, future development is not likely to be affected by drought conditions.



## *Earthquake: Liquefaction*

**Likelihood of Future Occurrence**—Occasional

**Vulnerability**—Medium

### **Hazard Profile and Problem Description**

In the event an earthquake is intense enough to result in shaking that could cause the sandy soils to liquefy, the levees could resettle, move off their foundations and possibly fail. Failure could compromise the levee system and result in flooding.

### **Past Occurrences**

None.

### **Vulnerability to Earthquake: Liquefaction**

#### **Assets/Critical Facilities at Risk**

The levees are at the highest risk to this hazard.

#### **Natural Resources at Risk**

Riparian habitats that border the channel can be lost due to a destabilization of the bank from liquefaction. Liquefaction could also introduce substantial sediment into the waterway through the destabilization of soils. Sedimentation could impact sensitive aquatic species.

#### **Historic and Cultural Resources at Risk**

Historic homes could be lost as a result of compromised foundations from soil liquefaction.

### **Future Development**

It is unlikely future development will occur provided existing zoning codes and the District's FEMA flood designation that limits building on grade. The District does not control any building that may occur in the areas protected by the levee system, that can be compromised during an earthquake or liquefaction event. The District only can control whether the levees meet certification standards and the ongoing maintenance of these levees.

### *Flood: 100/200/500-year*

**Likelihood of Future Occurrence**—Occasional

**Vulnerability**—High

#### **Hazard Profile and Problem Description**

A 100/200/500-year flood event could cause flooding within the District. A high water event, depending on the water elevation, could cause failure due to overtopping but more realistically could increase hydraulic gradients within the levee section resulting in landside seepage or boils. Continued seepage, if left unaddressed, could erode the levee and result in failure. Heavy flows could also cause erosion and scour on the waterside bank that could undermine the levee and cause failure.

#### **Past Occurrences**

1986 was the closest the District came to experiencing a 100-year flood. The District has not experienced a 200 or 500-year flood.

#### **Vulnerability to Flood: 100/200/500-year**

##### **Assets/Critical Facilities at Risk**

The levee system and pumping station are vulnerable to a 100/200/500-year flood, as the flows could exceed the capacity of both the levee system and the pumping station that is needed to drain the island.

##### **Natural Resources at Risk**

Riparian habitats that border the channel can be lost due to erosive forces of high flows from 100/200/500-year flows.

##### **Historic and Cultural Resources at Risk**

Historic homes could be lost as a result of flooding due to a 100/200/500 year flood event.

##### **Future Development**

It is unlikely future development will occur provided existing zoning codes and the District's FEMA flood designation that limits building on grade. The District does not control any building that may occur in the areas protected by the levee system, which can be compromised during a flood event. The District only can control whether the levees meet certification standards and the ongoing maintenance of these levees.

### *Flood: Localized Stormwater Flooding*

**Likelihood of Future Occurrence**—Highly Likely

**Vulnerability**—High

#### **Hazard Profile and Problem Description**

Localized stormwater flooding can occur during heavy rains or seepage events that exceed the District's drainage capabilities. Lower areas around the island may be subject to minor flooding.

#### **Past Occurrences**

Some form of localized stormwater flooding occurs during most heavy rains. The most likely time this could have occurred in the past was during the wet year in 2006.

#### **Vulnerability to Flood: Localized Stormwater Flooding**

##### **Assets/Critical Facilities at Risk**

Localized flooding can overtax the District's pumping system and create for a more hazardous situation involving the levee system by limiting the ability for inspection.

##### **Natural Resources at Risk**

None

##### **Historic and Cultural Resources at Risk**

Historic homes could be subject to localized stormwater flooding.

##### **Future Development**

It is unlikely future development will occur provided existing zoning codes and the District's FEMA flood designation that limits building on grade. The District does not control any building that may occur in the areas protected by the levee system, which can be compromised during flood events. The District only can control whether the levees meet certification standards and the ongoing maintenance of these levees.

### *Levee Failure*

**Likelihood of Future Occurrence**—Occasional

**Vulnerability**—High

#### **Hazard Profile and Problem Description**

Levee failure could result in inundation of the District and could also result in the flooding of

### Past Occurrences

None.

### Vulnerability to Levee Failure

#### Assets/Critical Facilities at Risk

Levees and district pumping plant. An island inundation can create an open water situation where a large fetch could develop and erode the interior of other levees within the District. Inundation of the drainage pump can make it inoperable and require replacement.

#### Natural Resources at Risk

Waterside habitat that is adjacent to the break could be lost due to the erosive forces of the water flowing through the break.

#### Historic and Cultural Resources at Risk

Historic homes could be damaged from flooding as a result of a levee break.

#### Future Development

It is unlikely future development will occur provided existing zoning codes and the District's FEMA flood designation that limits building on grade. The District does not control any building that may occur in the areas protected by levee system. The District only can control whether the levees meet certification standards and the ongoing maintenance of these levees.

### *River/Stream/Creek Bank Erosion*

**Likelihood of Future Occurrence**–Highly Likely

**Vulnerability**–Medium

### Hazard Profile and Problem Description

River/Stream/Creek bank erosion could destabilize the levee slope and, if left unaddressed, cause levee failure through undercutting.

### Past Occurrences

Bank erosion is currently occurring on the District levees and must be remedied.

### Vulnerability to Erosion

RD 556 tends to have issues along Georgiana Slough where natural curves in the channel have created erosion issues.

### Assets/Critical Facilities at Risk

The District's levees are at risk of erosion.

### Natural Resources at Risk

Riparian benches exist along the District's levee and are at risk of being lost due to bank erosion.

### Historic and Cultural Resources at Risk

None.

### Future Development

It is unlikely future development will occur provided existing zoning codes and the District's FEMA flood designation that limits building on grade. The District does not control any building that may occur in the areas protected by the levee system, which can be compromised by erosion. The District only can control whether the levees meet certification standards and the ongoing maintenance of these levees.

### *Severe Weather: Fog*

**Likelihood of Future Occurrence**—Highly Likely

**Vulnerability**—Medium

### Hazard Profile and Problem Description

Fog can make it difficult to perform levee inspections during high water due to lack of visibility.

### Past Occurrences

Fog occurs annually.

### Vulnerability to Fog

### Assets/Critical Facilities at Risk

The levees are at risk due to the inability to perform inspections.

### Natural Resources at Risk

None.

### Historic and Cultural Resources at Risk

None.

## Future Development

It is unlikely future development will occur provided existing zoning codes and the District's FEMA flood designation that limits building on grade. The District does not control any building that may occur in the areas protected by the levee system that could be compromised during heavy fog events. The District only can control whether the levees meet certification standards and the ongoing maintenance of these levees.

## *Severe Weather: Heavy Rains and Storms (Thunderstorms, Hail, Lightning)*

**Likelihood of Future Occurrence**–Highly Likely

**Vulnerability**–Medium

## Hazard Profile and Problem Description

Heavy rains and storms can result in higher flood flows that could increase the hydraulic gradients within the levee section and result in seepage or if great enough, possibly overtopping. They can also increase flows and result in erosion of the waterside bank.

## Past Occurrences

The last heavy rain and storm event the District experienced was in 2006, 1997 and 1986. No significant damages occurred due to these high water events.

## Vulnerability to Heavy Rain and Storms

### Assets/Critical Facilities at Risk

The District levees and pumping plant are at risk of damage from heavy rains and storms.

### Natural Resources at Risk

Riparian benches could be lost from high flows as a result of heavy rains and large storms.

### Historic and Cultural Resources at Risk

None.

## Future Development

It is unlikely future development will occur provided existing zoning codes and the District's FEMA flood designation that limits building on grade. The District does not control any building that may occur in the areas protected by the levee system, which can be compromised during severe storms. The District only can control whether the levees meet certification standards and the ongoing maintenance of these levees.

## *Severe Weather: Wind and Tornadoes*

**Likelihood of Future Occurrence**–Highly Likely

**Vulnerability**–Medium

### **Hazard Profile and Problem Description**

In the event of high water, wind can create wave action that could cause erosion at the waterside bank of the District’s levees.

### **Past Occurrences**

Wind occurs on a regular basis. The hazard comes when high winds are coupled with high water, which happened in the winter of 2006.

### **Vulnerability to Wind and Tornadoes**

#### **Assets/Critical Facilities at Risk**

The District’s levees.

#### **Natural Resources at Risk**

None.

#### **Historic and Cultural Resources at Risk**

None.

### **Future Development**

It is unlikely future development will occur provided existing zoning codes and the District’s FEMA flood designation that limits building on grade. The District does not control any building that may occur in the areas protected by the levee system, which can be compromised by high wind events. The District only can control whether the levees meet certification standards and the ongoing maintenance of these levees.

## *Wildfire*

**Likelihood of Future Occurrence**–Likely

**Vulnerability**–Medium

### **Hazard Profile and Problem Description**

A wildfire could destroy private property and other such structures on the island.

### **Past Occurrences**

None.

## Vulnerability to Wildfire

### Assets/Critical Facilities at Risk

The District’s pumping station could be damaged in a fire. Furthermore the vegetation on the District levees could be burned leaving bare soil that could be subject to erosion.

### Natural Resources at Risk

Riparian and shrub scrub vegetation could be lost in a wildfire.

### Historic and Cultural Resources at Risk

Historic homes could be lost in a wildfire.

### Future Development

Future Development It is unlikely future development will occur provided existing zoning codes and the District’s FEMA flood designation that limits building on grade. The District does not control any building that may occur in the areas protected by the levee system. The District only can control whether the levees meet certification standards and the ongoing maintenance of these levees. Wildfire is unlikely to affect future development in the District.

## 8.6 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.

### 8.6.1. Regulatory Mitigation Capabilities

Table 8-4 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 556.

*Table 8-4 RD 556’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	In development	While this plan is being developed, there is unofficial protocol of those that live on the island have used over time to respond to flooding related hazards.
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)	N	
<b>Building Code, Permitting, and Inspections</b>	<b>Y/N</b>	<b>Are codes adequately enforced?</b>
Building Code	Y	Version/Year: CBC 2013
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score:
Fire department ISO rating:	N	Rating:
Site plan review requirements	N	
<b>Land Use Planning and Ordinances</b>	<b>Y/N</b>	<b>Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?</b>
Zoning ordinance	Y	Yes, the District is mostly zoned agriculture which limits development
Subdivision ordinance	N	
Floodplain ordinance	Y	Yes, Sacramento County Floodplain Ordinance restricts development in the floodplain
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	
Flood insurance rate maps	Y	AE Zone
Elevation Certificates	Y	
Acquisition of land for open space and public recreation uses	N	
Erosion or sediment control program	N	
Other	N	
<b>How can these capabilities be expanded and improved to reduce risk?</b>		
RD 556 will create a Five Year Plan to develop projects that reduce risk to life and property.		

Source: RD 556

## 8.6.2. Administrative/Technical Mitigation Capabilities

Table 8-5 identifies the department(s) responsible for activities related to mitigation and loss prevention for RD 556.

*Table 8-5 RD 556's Administrative and Technical Mitigation Capabilities*

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	Drainage system is effective. Developing a tree trimming and vegetation clearing plan
Mutual aid agreements	N	
Other	N	
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	N	
Floodplain Administrator	Y	Determined via the Emergency Operations Plan
Emergency Manager	Y	Determined via the Emergency Operations Plan
Community Planner	N	
Civil Engineer	Y	Staff is trained to coordinate with agencies and perform tasks in an emergency situation
GIS Coordinator	N	
Other	N	
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Fire Station siren in Walnut Grove, phone tree, Reverse 911
Hazard data and information	Y	
Grant writing	N	
Hazus analysis	N	
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
RD 556 must organize a more appropriate warning system among trustees, public and staff. Also needs to have a plan in place to determine an Emergency Manager to coordinate Emergency Response activities.		

Source: RD 556

### 8.6.3. Fiscal Mitigation Capabilities

Table 8-6 identifies financial tools or resources that the RD 556 could potentially use to help fund mitigation activities.

**Table 8-6 RD 556'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	Y	Delta Levees Subventions program to maintain levee system.
Authority to levy taxes for specific purposes	Y	Proposition 218 provides the District with the ability to raise assessments through a vote
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	N	
Storm water utility fee	Y	Assessments for drainage
Incur debt through general obligation bonds and/or special tax bonds	N	
Incur debt through private activities	Y	Bonds from Bank of Rio Vista
Community Development Block Grant	N	
Other federal funding programs	N	
State funding programs	Y	Delta Levee Subventions Program and Delta Levee Special Projects, Proposition 84 and 1E
Other	N	
<b>How can these capabilities be expanded and improved to reduce risk?</b>		
The involvement of Federal agencies funds would help in reducing risk as well as the removal of the sunset clause on the Delta Levees Subventions Program.		

Source: RD 556

### 8.6.4. Mitigation Education, Outreach, and Partnerships

Table 8-7 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 8-7 RD 556'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.	Y	Walnut Grove Volunteer Fire Department
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	Department of Water Resources Delta Flood Emergency Preparedness, Cal OES
Natural disaster or safety related school programs	N	
StormReady certification	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?
Firewise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	N	
Other	N	
<b>How can these capabilities be expanded and improved to reduce risk?</b>		
Greater public outreach from State agencies to community organizations to provide information about emergency response.		

### 8.6.5. Other Mitigation Efforts

The US Army Corps of Engineers performed an erosion repair project along the Sacramento River levee summer 2015 to create a riparian bench and resolve erosion issues. The District will perform vegetation removal on the Sacramento River and Georgiana Slough to reveal erosion issues. Once problematic areas are identified the District will perform repair projects to improve the levee system and reduce risk.

## 8.7 Mitigation Strategy

### 8.7.1. Mitigation Goals and Objectives

RD 556 adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

### 8.7.2. Mitigation Actions

The planning team for RD 556 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. Flood Response Activities, Georgiana Slough Weir*

**Hazards Addressed:** Dam Failure, Levee Failure, Earthquake: Liquefaction, River Bank Erosion, Flood 100/200/500-year, Severe Weather: Heavy Rains, Severe Weather: Wind

**Goals Addressed:** 1, 2, 3, 4

**Issue/Background:** A weir would reroute flood flows on Upper Andrus Island to Georgiana Slough to keep Andrus, lower Andrus and Brannan Islands from flooding. This would reduce the damages from a flood event on Upper Andrus significantly as the islands are separated by a cross-levee that may be insufficient for blocking flood flows.

**Project Description:** Place a weir along Georgiana Slough upstream of the cross levee to protect the adjacent islands from flooding.

**Other Alternatives:** None

**Existing Planning Mechanism(s) through which Action Will Be Implemented:** None

**Responsible Office/Partners:** Reclamation District Board of Trustees and District Engineer Gilbert Labrie

**Cost Estimate:** In development, unknown at this time

**Benefits (Losses Avoided):** Will flood risk from levee failure, bank erosion, 100/200/500 year flood and heavy rains from downstream islands with high value property and infrastructure.

**Potential Funding:** District assessments and Delta Levees Subventions Program

**Timeline:** Summer 2017

**Project Priority:** Medium

## ***Action 2. Georgiana Slough Vegetation Management***

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**Hazards Addressed:** Levee Failure, Earthquake: Liquefaction, River Bank Erosion, Flood 100/200/500-year, Severe Weather: Heavy Rains, Severe Weather: Wind, Wildfire

**Goals Addressed:** 1, 2, 3

**Issue/Background:** Limited funding has resulted in deferred maintenance of the levees vegetation. The vegetation is so dense it covers any potential erosion areas on the levee system.

**Project Description:** Trim trees and remove dense vegetation in accordance with the Central Valley Flood Protection Plan

**Other Alternatives:** None

**Existing Planning Mechanism(s) through which Action Will Be Implemented:** None

**Responsible Office/Partners:** Reclamation District Board of Trustees and District Engineer Gilbert Labrie

**Project Priority:** High

**Cost Estimate:** \$500,000

**Benefits (Losses Avoided):** Aides in providing information for projects that will reduce in flood risk from levee failure, bank erosion, 100/200/500 year flood and heavy rains.

**Potential Funding:** District assessments and Delta Levees Subventions Program

**Timeline:** Summer 2017

**Action 3.      *Georgiana Slough Waterside Erosion Repair***

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**Hazards Addressed:** Levee Failure, Earthquake: Liquefaction, River Bank Erosion, Flood 100/200/500-year, Severe Weather: Heavy Rains, Severe Weather: Wind

**Goals Addressed:** 1, 2, 3, 4

**Issue/Background:** Scour due to high flows and channel meander has eroded and undercut the waterside bank. If left unaddressed, the slope may fail or result in underseepage that could ultimately cause levee failure and flood.

**Project Description:** These erosion areas have to initially be determined. Once they are a design will be developed. The designs will generally include filling voids at the waterside toe with rip rap and riparian bench will be enhanced with added fill. The levee slopes will be regraded and fill added to accommodate a Bulletin 192-82 critical levee section. Levee slopes will be a minimum of 2:1 landside and 3:1 water side where applicable.

**Other Alternatives:** None

**Existing Planning Mechanism(s) through which Action Will Be Implemented:** None

**Responsible Office/Partners:** Reclamation District Board of Trustees and District Engineer Gilbert Labrie

**Project Priority:** High

**Cost Estimate:** Not available.

**Benefits (Losses Avoided):** Reduction in flood risk from levee failure, bank erosion, 100/200/500 year flood and heavy rains.

**Potential Funding:** District assessments and Delta Levees Subventions Program

**Timeline:** Summer 2018

**Action 4.      *Topographic and Hydrographic Surveys and Data Collection***

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**Hazards Addressed:** Levee Failure, Earthquake: Liquefaction, River Bank Erosion, Flood 100/200/500-year, Severe Weather: Heavy Rains, Severe Weather: Wind

**Goals Addressed:** 1, 2, 3, 4

**Issue/Background:** In the development of projects, topographic and hydrographic survey data must be performed to reveal areas that need repair and maintenance. It can also be used to develop designs and estimate costs to repair the levee system.

**Project Description:** Topographic survey data will be assembled through the use of field surveys and LiDAR data. Hydrographic surveys will be performed along Georgiana Slough to reveal bank erosion.

**Other Alternatives:** None

**Existing Planning Mechanism(s) through which Action Will Be Implemented:** None

**Responsible Office/Partners:** Reclamation District Board of Trustees and District Engineer Gilbert Labrie

**Project Priority:** High

**Cost Estimate:** \$30,000

**Benefits (Losses Avoided):** Aides in providing information for projects that will reduce in flood risk from levee failure, bank erosion, 100/200/500 year flood and heavy rains.

**Potential Funding:** District assessments and Delta Levees Subventions Program

**Timeline:** 2019