



A view of the Baylands looking north. Photo by SF Baykeeper, Robb Most, and LightHawk.

Local Assessments Section I: **SANTA CLARA** *Operational Landscape Unit*

JURISDICTIONS WITHIN THIS SECTION

Alameda County
Santa Clara County

Fremont
San Jose
Sunnyvale
Santa Clara
Milpitas



HOW TO USE THE LOCAL ASSESSMENTS



WHO IS THIS FOR?

Anyone interested in understanding their local shared vulnerabilities to flooding and sea level rise.

Local jurisdictions

- Cities
- Counties
- Special Districts
- Utilities Providers

Stakeholder Groups

- Non-profits/NGOs
- For-profits/Private
- Associations
- Interested Parties

General Public

- Residents

State/Regional

- Caltrans
- MTC/ABAG

HOW IS IT ORGANIZED?



Local assessments are organized by four regional systems assessed: Transportation, Vulnerable Communities, Priority Development Areas (PDAs), and Priority Conservation Areas (PCAs).

Each part of the local assessment provides varying levels of details at three scales: 1) Operational Landscape Unit (OLU), 2) Individual Descriptions, and 3) Shared Stories of Vulnerabilities in Focus Areas/Areas of Impact. This assessment can be reviewed in whole, or individual parts can be reviewed separately depending on interest and level of detail desired.



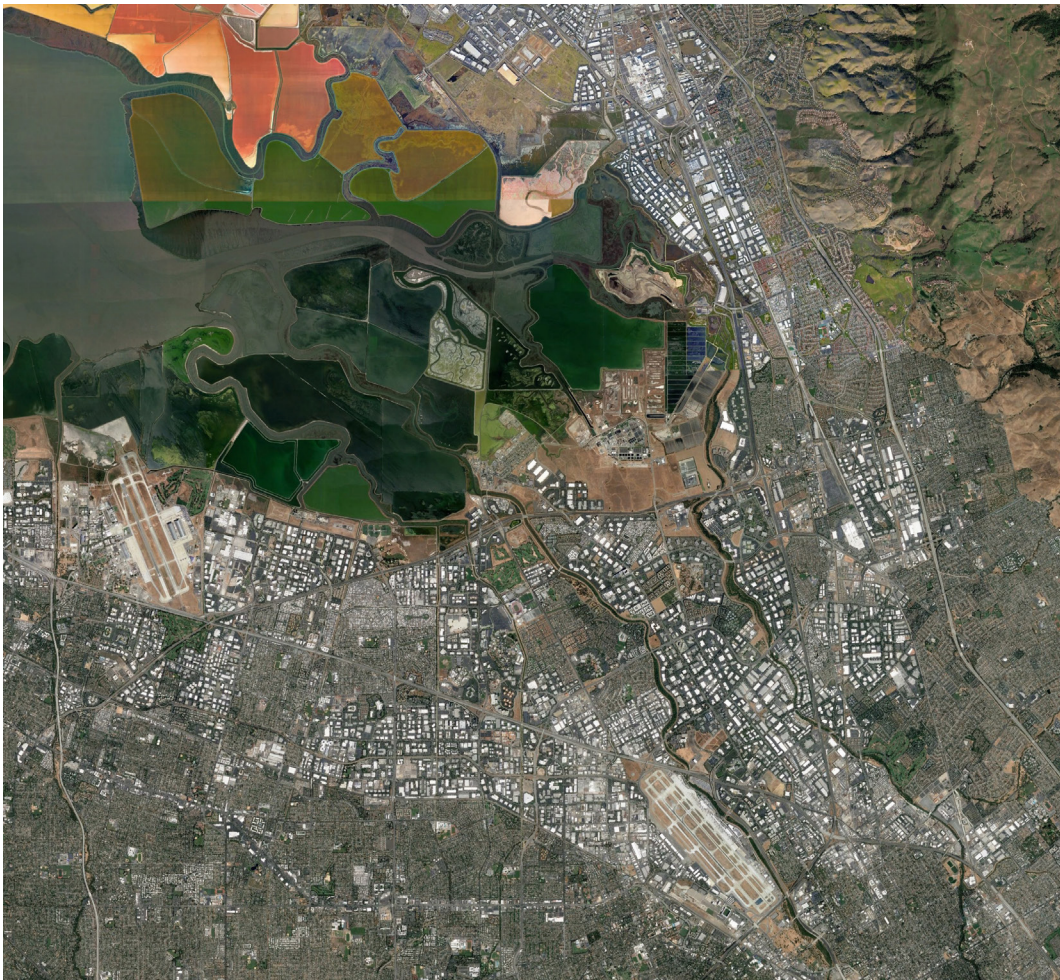
WHAT'S IN THIS ASSESSMENT?

WHERE ARE WE IN THE REGION?	3
WHAT REGIONAL SYSTEMS ARE HERE?	5
WHAT WAS ASSESSED?	6
Transportation	6
Vulnerable Communities.....	8
Priority Development Areas (PDAs).....	12
Priority Conservation Areas (PCAs).....	14
FOCUS AREAS AND AREAS OF IMPACT	
Focus Area A: South Bay Baylands and Shoreline.....	20
ENDNOTES	31

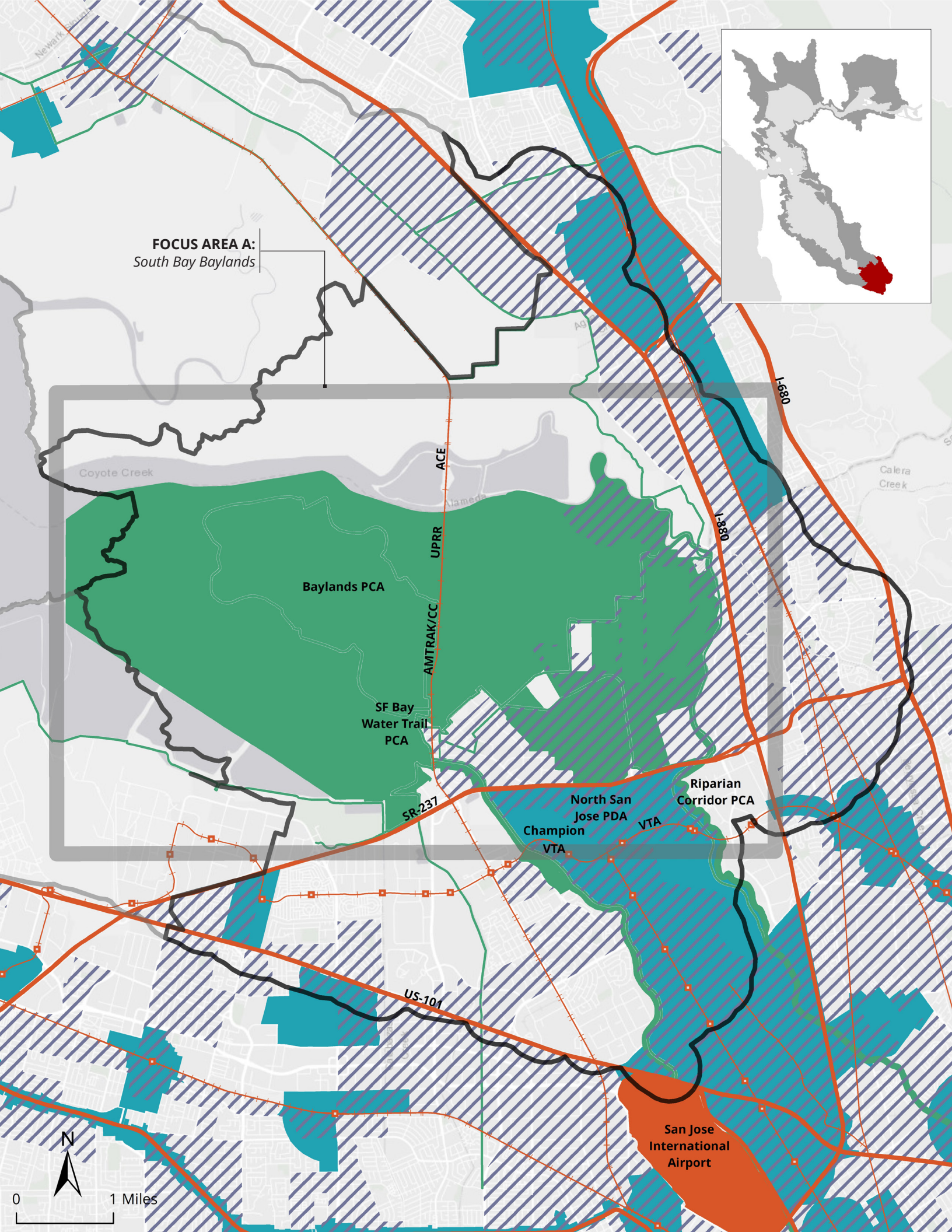
Where are we in the region?

The Santa Clara OLU is located in both Santa Clara and Alameda Counties and encompasses the southernmost portion of the San Francisco Bay shoreline. This OLU encompasses diverse communities, landscapes, and uses, including vulnerable communities, high density housing, single family homes, commercial and industrial businesses, a large wastewater treatment plant (the largest advanced wastewater treatment plant in the western U.S.), recreation, local and regional transportation, and ecological restoration.

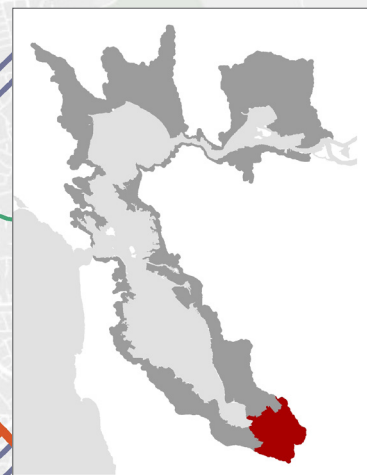
Large areas within this OLU were historically used for salt production and are now part of the South Bay Salt Pond Restoration Project, one of the largest wetland restoration projects in the country.¹ There are many berms throughout the bayland areas in the OLU. The ponds and associated earthen berms, although not built to any engineering standard, have served as de facto flood protection for the entire shoreline of South Bay. This includes the San Jose neighborhood of Alviso and the City of Milpitas, infrastructure such as wastewater treatment plants, recycled water facilities, landfills and hazardous waste sites, and natural areas such as the salt ponds, parks, and creeks.



Approximate area of the Santa Clara OLU. Map data © 2019 by Google.



FOCUS AREA A:
South Bay Baylands

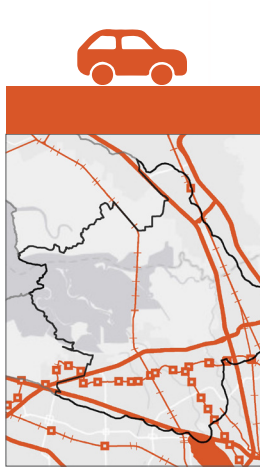


What regional systems are here?

Operational Landscape Unit (OLU) boundaries were used to organize and help identify regionally significant assets that were co-located together (Methodology can be found in Section 3.0 Local Assessments).

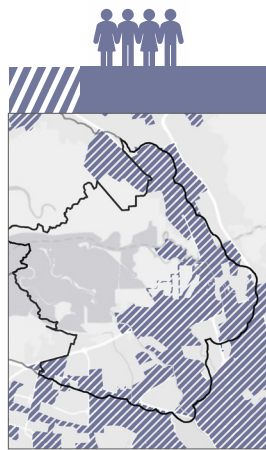
The map on page 4 shows the entire OLU, including all the regional systems present. Colors are used throughout this document to help navigate across these four regional systems. Individual assets that were assessed as part of this local vulnerability assessment are listed in the bullets below and can also be found on the labels on the map (Figure 1i).

◀ **Figure 1i. MAP OF REGIONAL SYSTEMS AND LIST OF INDIVIDUAL ASSETS ASSESSED WITHIN BELOW:**



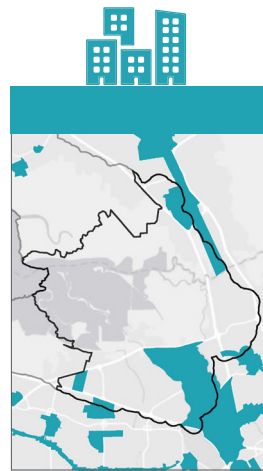
TRANSPORTATION

- Union Pacific Railroad (UPRR)
- US-101
- SR-237
- Amtrak/Capitol Corridor
- Santa Clara Valley Transportation Authority Light Rail and Facilities



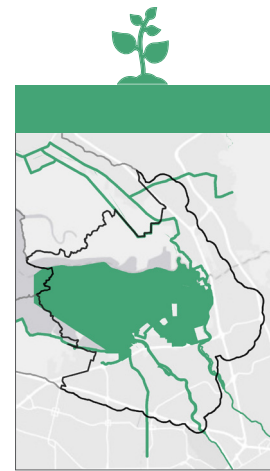
VULNERABLE COMMUNITIES

- Alviso, Milpitas & San Jose Community



PRIORITY DEVELOPMENT AREAS (PDAs)

- North San Jose PDA



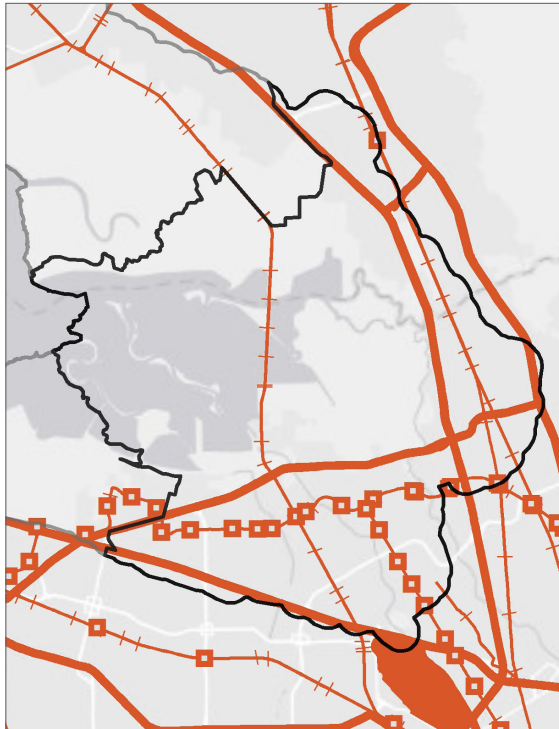
PRIORITY CONSERVATION AREAS (PCAs)

- Baylands PCA
- Riparian Corridor PCA
- Regional Trail Systems Gaps PCA
- San Francisco Bay Trail PCA



What was assessed?


TRANSPORTATION



UPRR heads north through salt ponds & US-101. Map data © 2019 by Google.

Union Pacific Railroad • The Union Pacific Railroad (UPRR) is an important heavy freight rail supporting the reliable movement of goods to markets across the Bay Area. In this OLU, the primary use of these rails is for passenger rail service including all Amtrak, Capitol Corridor, and Altamont Corridor Express (ACE), which provide important commuter service in the region and beyond. The rail line intersects salt ponds and managed wetlands and serves as a secondary flood protection structure for various areas including the Alviso neighborhood. UPRR track segments begin to see limited exposure at 12" total water level (TWL) including at areas near the Alviso salt ponds.

Amtrak/Capital Corridor • UPRR owned track in this area serves as critical passenger rail and commuter rail services by Amtrak/Capital Corridor routes, which connect San Jose to Sacramento and provide transit connections across the region. In this OLU, track segments providing commuter service begin to see limited exposure at 12" total water level (TWL) including at areas near the Alviso Salt Ponds.



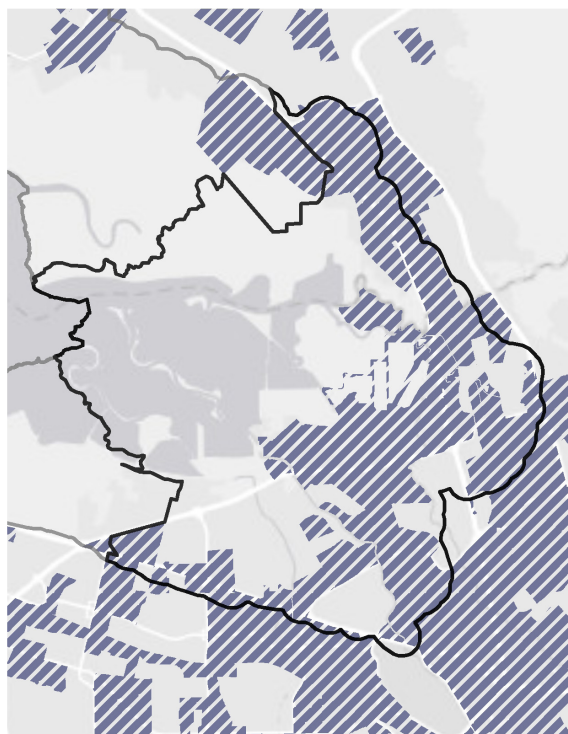
SR-237 • SR-237 provides a key east-west artery along the southern bayshore, linking US-101, I-880, and I-680, providing connections across North San Jose to areas including Milpitas, Alviso, Santa Clara, Sunnyvale, and Mountain View. SR-237 also includes a Valley Transit Authority Express Lane. SR-237 averages 104,500 vehicles² and 5,900 trucks³ per day. Starting at 24" TWL, SR-237 is exposed between Zanker and Great America Parkway. Additional large exposure areas near Lawrence Expressway occur at 48" TWL.

US-101 • US-101 is a primary north-south transportation artery through the San Francisco Peninsula to Sunnyvale and Santa Clara, providing important access to and from this OLU, including connections to -237 and I-880. It provides commuter transportation service for local, regional, and inter-regional automobile and truck traffic, averaging 174,500 vehicles⁴ and 7,408 trucks⁵ per day. It is also a designated emergency route for the Bay Area.⁶ Within the boundary of this OLU, US-101 is not directly exposed to flooding, however flooding of US-101 to the north and south impacts access to this area. At 36" TWL, US-101 is inundated north of the OLU near San Antonio Road in Palo Alto.

Santa Clara Valley Transportation Authority Light Rail and Facilities: Santa Clara Valley Transportation Authority (VTA) owns and operates a light rail system that is a regionally significant transportation network providing east-west and north-south connections in Santa Clara County. In 2018, the average weekday ridership was 117,055 and the total annual boarding riders was 8.6 million.⁷ VTA connects with other regionally significant commuter rail including the Altamont Corridor Express (ACE), Capitol Corridor Intercity Rail Service, Caltrain, and Bay Area Rapid Transit (BART), and is accessed by major highways, including I-880, I-680, I-280, and US-101. The light rail relies on electrical substations for power. In this OLU the main area of exposure occurs at 24" TWL from salt ponds A9-A12 near the San Jose-Santa Clara Wastewater Treatment Plant affecting VTA's Champion Station. Electrical substations that power the light rail are impacted at 36" TWL. VTA maintenance and operations facilities are essential for the daily operation of the VTA system and the River Oaks (96" TWL) and Cerone (108" TWL) Divisions will be susceptible to flooding. VTA also operates bicycle routes (first exposed at 12" TWL) and bus service (first exposed at 12" TWL) with 27.6 million riders as of 2018. VTA also operates an expressway on SR-237 which is exposed at 48" TWL.



VULNERABLE COMMUNITIES



Alviso is adjacent to the salt ponds. Map data © 2019 by Google.

Alviso, Milpitas & San Jose • For the purposes of this report, 17 block groups were assigned to a functional community called “Alviso, Milpitas & San Jose.” The block groups that were assessed can be referenced in the Appendix. This is a placeholder designation for a set of block groups that have a moderate, high, or highest social vulnerability ranking within the Alviso, Milpitas, San Jose area. We have provided some history and context for these areas, primarily gathered via desktop research, and in some cases stakeholder and community vetting. This should be considered a starting point. Before this is used for any planning purposes, this data should be ground-truthed and vetted with the communities considered. Similarly, block groups or communities with a similar vulnerability rank could and likely will have very different needs, considerations, and capacities that are critical to bring into the planning process.

Alviso is a small community of around 2,000 people⁸ in the most northern part of the City

SOCIAL VULNERABILITY RANK:

- ☐ Low
- ☒ **Moderate ***
- ☒ **High**
- ☒ **Highest**

*In block groups considered, this ranking occurred most frequently.
Data Source: ART Bay Area Regional Community Vulnerability Indicators, BCDC (2018).

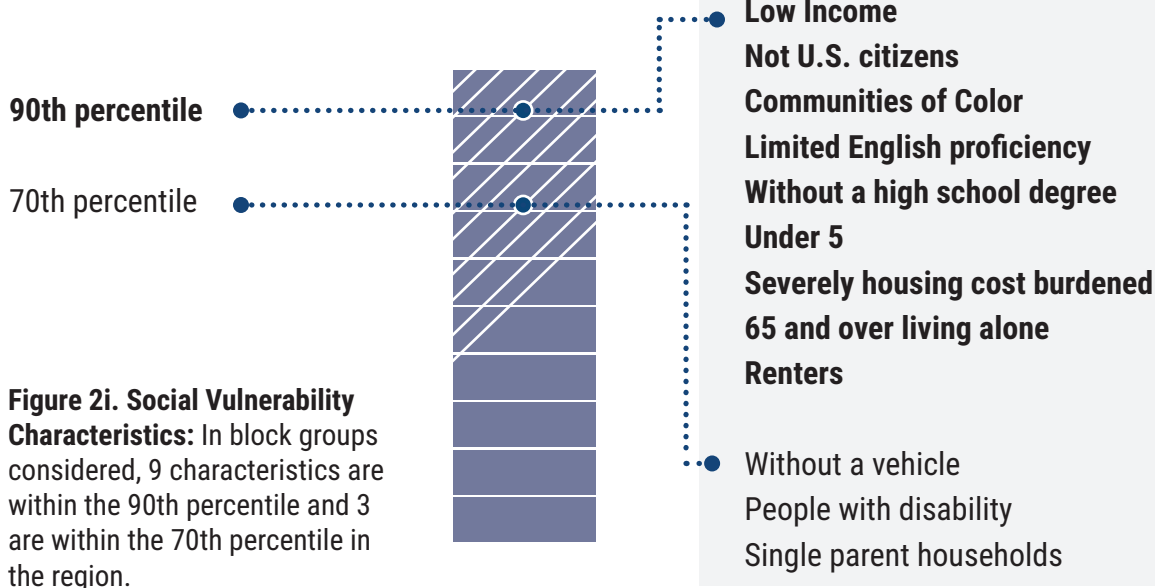
of San Jose and is comprised of one assessed census block group. Its residents have high rates of limited English proficiency households, immigrants, and people without a high school degree all of which can impact ability to access services especially in the event of a flood. An aging housing stock and older population makes the community more vulnerable to hazards from flooding.

Seventeen block groups are considered moderate, high, or highest social vulnerability. Nine social vulnerability characteristics are exhibited in at least one block group in the 90th percentile, with three characteristics in the 70th percentile in the region (Figure 2i).

Alviso is 94th percentile when looking at land and water contamination factors, which characterizes this area as *Highest Contamination Vulnerability*. The presence of toxic substances—primarily mercury and asbestos—are due to legacy industrial uses in the area and the placement of fill soils containing asbestos in levees. There are 6 closed landfills and 2 active landfills near Alviso.

In this section, social vulnerability was used as the starting place for analysis. Contamination burden was assessed only for the block groups

SOCIAL VULNERABILITY PERCENTILES IN ALVISO, MILPITAS, & SAN JOSE



GENTRIFICATION AND DISPLACEMENT RISK:

- ☒ Moderate High Income - At Risk of Exclusion
- ☒ Low and Moderate High Income - Not Losing Low Income Households
- ☒ At Risk of Gentrification and/or Displacement
- ☒ Ongoing Gentrification and/or Displacement *

*In block groups considered, this ranking occurred most frequently. *Data Source: ART Bay Area Regional Community Vulnerability Indicators, BCDC (2018).*



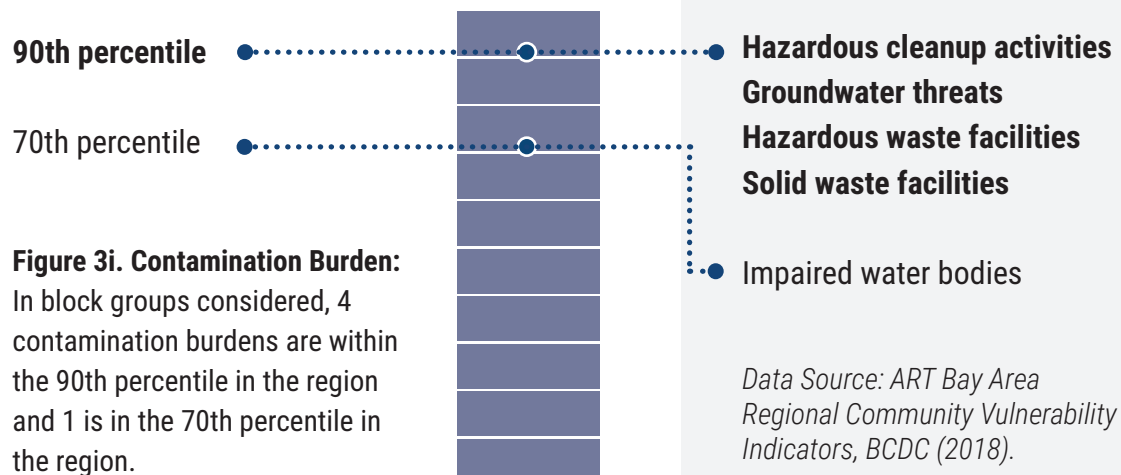
included in the functional community groupings. This means that there could be block groups that score in the moderate, high, or highest for contamination burden that were not also in the designated functional community grouping that were not considered. In short, we only look at areas that have contamination burden if they are also ranked as socially vulnerable.

There are four contamination burdens exhibited in at least one block group at the 90th percentile (Figure 3i), with one in the 70th percentile. Those in the 90th percentile are bolded.

The area is protected from fluvial flooding by engineered levees along the Guadalupe River, which have been raised multiple times, following previous serious floods in 1983, 1986, and 1995. The U.S. Army Corp of Engineers, Santa Clara Valley Water District and others will be constructing an engineered flood risk management levee along the bay shoreline to protect the community from tidal flooding, known as the South Bay Shoreline Project (Phase 1).⁹ The city's Flood Hazard Area Ordinance requires habitable spaces in new residential development to be above the 100-year flood elevation, so many newer, or renovated homes are either on 9 feet mounds or have no habitable spaces on the first floor.¹⁰

Critical services and facilities that provide sanitation, community cohesion, and emergency services will also be impacted by flooding. First exposure of assessed critical

CONTAMINATION BURDEN PERCENTILES IN ALVISO, MILPITAS, SAN JOSE



facilities begins at 12" TWL (Table 1i).

Total water levels (TWLs) are used to represent various combinations of temporary and/or permanent flooding that may occur with future sea level rise. Values in the table reflect potential risks to critical facilities in the absence of adaptation planning.

EXPOSURE OF CRITICAL SERVICES AND FACILITIES IN ALVISO, MILPITAS, SAN JOSE

















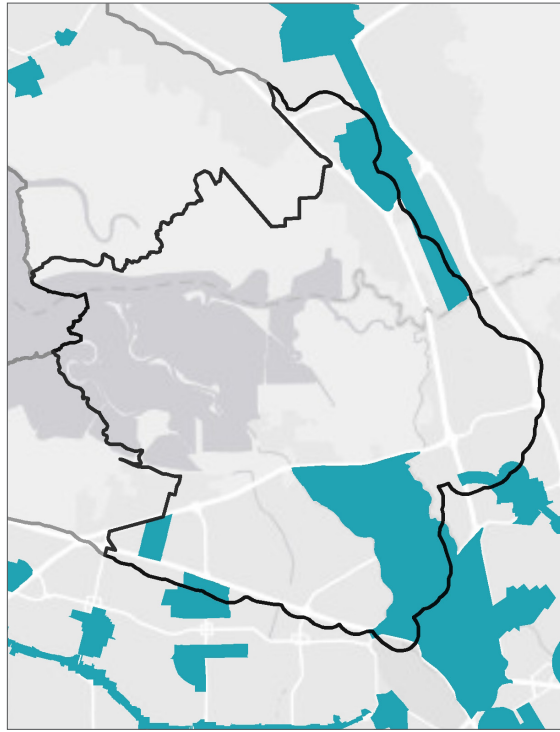
Critical Facilities/Services Impacted		12"	24"	36"	48"	52"	66"	77"	84"	96"	108"
Places of Faith	Shia Association of the Bay Area (Fortran Court, San Jose)										
	Jubilee Christian Center (Nortech Parkway, San Jose)										
	Milpitas Community Church (S Park Victoria Dr, Milpitas)										
	Bochasnwasri Shri Akshar Purushottam Swaminarayan Temple (California Cir, Milpitas)										
Health Clinics	Valley Health Center Milpitas (N Main St, Milpitas)										
Police and Fire Stations	San Jose Fire Department Station 25 (Wilson Way, Alviso)										
	Sunnyvale Fire Station 6 (Lawrence Station Rd, Sunnyvale)										
Schools	Downtown College Prep (Gold St, Alviso)										
	George Mayne Elementary School (N 1st St, Alviso)										
	Cutner Elementary School (Redwood Ave, Milpitas)										
	Anthony Spangler Elementary (N Abbott Ave, Milpitas)										
Utilities	Natural gas lines (Along SR-237 and I-880)										
	CalRecycle Santa Claire Landfill (closed) (Gold and Moffat Streets, Alviso)										
	PG&E Nortech Substation 2368 (San Jose)										
	San Jose-Santa Clara Regional Wastewater (Los Esteros Rd, San Jose)										
	Sunnyvale Water Pollution Control Plant (Borregas Ave, Sunnyvale)										

Table 1i. Critical Services and Facilities: First exposure of critical services and facilities. "M" refers to minor impacts such as impacts to access roads. Blue bars represent when asset is first exposed to flooding.



PRIORITY DEVELOPMENT AREAS (PDAS)



North San Jose. Map data © 2019 by Google.



North San Jose PDA • The 5,000-acre Regional Center North San Jose PDA encompasses a significant area of North San Jose south of the Alviso neighborhood. It lies between SR-237 in the north, Guadalupe River to the west, US-101 to the southwest, and I-880 to the east, along the North 1st Street corridor. The PDA border extends south beyond the border of the OLU. It is surrounded by many other PDAs, including the San Jose Transit Area, Berryessa Station, Downtown “Frame,” and Santa Clara Station Focus Area PDAs. It is served by local light rail transit.

Current land uses include commercial, industrial, and high-density residential, with a major industrial park at its core. The vision for this PDA includes new residential units, retail development, and creation of new jobs with leading technology industries. This area has become the preeminent location for driving industrial uses within the City of San Jose. The goal of this PDA is to continue its development as an important employment center for San Jose and to serve as a desirable location for high-tech corporations within San Jose and the Bay Area. Because of its importance as a job center, access to transit facilities, and proximity to the San Jose Airport, the North San Jose area is planned to accommodate huge job growth by 2040¹¹.



San Jose shoreline. Photo: SF Baykeeper, Robb Most, and Lighthawk.

CURRENT AND FUTURE HOUSING AND JOBS IN THE NORTH SAN JOSE PDA



Residential Housing Units

Existing in 2010:	16,885
Projections for 2040:	59,977
Percent Growth:	255%



Job Spaces

Existing in 2010:	92,778
Projections for 2040:	145,958
Percent Growth:	57%

Data Source: Plan Bay Area 2040, MTC/ABAG (2017).

This PDA is first exposed at 24" TWL, from overtopping from Guadalupe Creek and over SR-237. Flooding continues to extend along the corner of the site between SR-237 and the Guadalupe River as TWL increases.

Critical facilities that provide emergency services and utilities may be impacted by flooding (Table 2i). First impacts begin at 108" TWL.

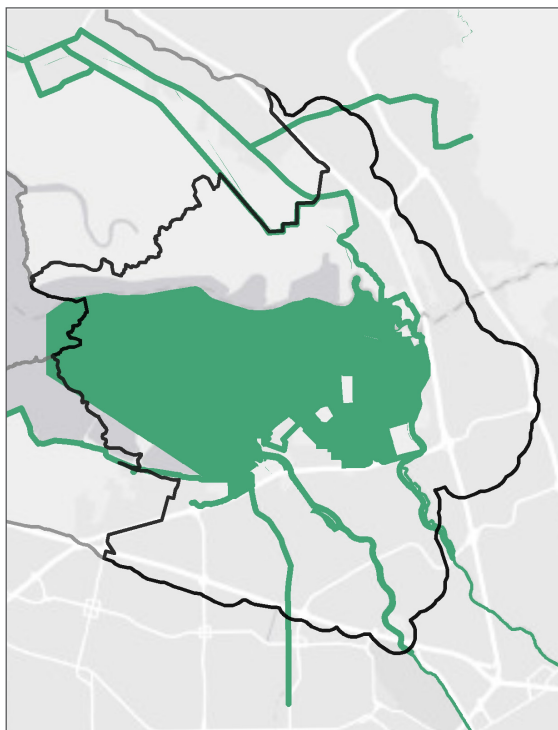
EXPOSURE OF CRITICAL FACILITIES IN THE PDA

Critical Facilities/Services Impacted		12"	24"	36"	48"	52"	66"	77"	84"	96"	108"
Police and Fire Stations	Agnews Developmental Center Fire Station (Zanker Road, San Jose)										
Utilities	Transmission lines										M

Table 2i. Critical Services and Facilities: First exposure of critical services and facilities. "M" refers to minor impacts or impacts to access roads. Blue bars represent when asset is first exposed to flooding.



PRIORITY CONSERVATION AREAS (PCAS)



Baylands PCA. Map data © 2019 by Google

Baylands PCA • The Baylands PCA is located at the very southern end of San Francisco Bay and encompasses key creeks and mouths of important watersheds: Coyote Creek, Alviso Slough, Saratoga Creek, Calabasas-San Tomas Creeks, and the Guadalupe River. The PCA includes about 75% of the former commercial salt ponds and restored tidal marshes owned and managed by the Don Edwards San Francisco Bay National Wildlife Refuge and included as part of the South Bay Salt Pond Restoration Project. Critical uses within this PCA include recreation, environmental educational activities, open space, wildlife viewing, waterfowl hunting, fishing, shoreline access, and shoreline protection. The ponds and associated earthen berms, although not built to any engineering standard, have served as de facto flood protection for the entire shoreline of South Bay.¹² The Baylands PCA is first exposed at 12" TWL, with Salt Pond A6 and A17 exposed. Many of the marshes and salt ponds are fully inundated at this level of water, and the rest of the PCA is in a disconnected, low-lying area, meaning it is highly vulnerable to flooding. At 36" TWL, all of the ponds in the Baylands PCA are completely inundated.

There are many ecosystem services including providing habitat, recreation, stormwater services of runoff retention, groundwater recharge, and flood water retention, and carbon storage (Figure 4i).



Baylands. Photo: SF Baykeeper, Robb Most, and Lighthawk.

PCA DESIGNATION:

- ☒ **Natural Landscapes**
- ☐ Agricultural Lands
- ☒ **Urban Greening**
- ☒ **Regional Recreation**

FUNCTIONS/BENEFITS:

- **Wildlife Habitat**
- **Recreation**
- **Community Health**
- **Water Supply and Quality**
- **Climate and Resilience**

Data Source: MTC/ABAG Priority Conservation Areas Program (2017).

ECOSYSTEM SERVICES OF BAYLANDS PCA



Habitats

Tidal Marsh	1,240 acres
Tidal Flat	682 acres
Lagoon	4,710 acres
Depressional Wetlands	805 acres
Playa	496 acres
Transitional Zone	62 acres
Grasslands	124 acres
Brown Pelican	248 acres
Ridgway's Rail, Heron, Egret	62 acres
Snowy Plover	2,790 acres



Stormwater

Annual Runoff Retention	555 million gallons
Groundwater Recharge	44 million gallons
Flood Water Retention	184 million gallons



Carbon Storage

Acres x % weighted soil organic matter within 108" TWL	22,381
--	--------



Recreation

Approximate Visitation Rates	150 photo user days
------------------------------	---------------------

Figure 4i. Ecosystem Services of the PCA. Statistics on habitats, recreation, carbon storage and stormwater retention in PCAs. *Data by the ART Bay Area Natural Capital Project (2019).*



San Francisco Bay Trail PCA • The San Francisco Bay Trail is a 500-mile regional trail that, upon completion, will circumnavigate the bay. The trail connects people and communities to each other, to parks and open space, to home, work and recreation, and to countless areas of cultural and historic interest. It provides opportunities for health and fitness, increase transportation options, opportunities to observe, learn about, and care for the environment, and provides economic benefits to the region through increased tourism.¹³ Within this OLU there are 53.1 total miles of existing (34.7 miles, 20 segments) and proposed (18.4 miles, 16 segments) Bay Trail routes split into 36 segments. These segments pass through, or are immediately adjacent to, almost all the other ART Bay Area assets within this OLU and provide important recreation, commuting, nature viewing, and environmental education services. Nine segments of existing Bay Trail and seven proposed segments in this OLU are exposed at 12" TWL. The miles of exposed trail grow continually.

PCA DESIGNATION:

- ☒ **Natural Landscapes**
- ☐ Agricultural Lands
- ☐ Urban Greening
- ☐ Regional Recreation

FUNCTIONS/BENEFITS:

- **Recreation**
- **Community Health**
- **Economic Development**
- **Transportation**
- **Environmental Stewardship**

Data Source: MTC/ABAG Priority Conservation Areas Program (2017).



A view of the Baylands and surrounding area. Map data © 2019 by Google

San Francisco Bay Water Trail PCA

• The San Francisco Bay Area Water Trail is a network of launching and landings sites for non-motorized watercrafts (e.g. kayaks, stand-up paddleboards, wind and kite surf, etc.) around the San Francisco Bay and its major tributaries, including the San Joaquin River, Napa River, and Petaluma River.¹⁴ Within this OLU there is one Water Trail Site, the Alviso Marina County Park. This site is an officially designated Water Trail Trailhead. It is located near the southern end of the San Francisco Bay along Alviso Slough, adjacent to the salt ponds and marshes of Don Edwards San Francisco Bay National Wildlife Refuge. Alviso Slough meanders its way through the salt marshes of the Refuge and from the park it is approximately 4 miles to the open waters of the Bay. The docks of the Marina are impacted early at 12" TWL. Since docks move with rising tides, it is unclear at what water level the docks will be affected by sea level rise. It is more likely that access will be more affected than floating docks.

PCA DESIGNATION:

- ☐ Natural Landscapes
- ☐ Agricultural Lands
- ☐ Urban Greening
- ☒ **Regional Recreation**

FUNCTIONS/BENEFITS:

- **Recreation**
- **Economic Development**
- **Wildlife Habitat**

Data Source: MTC/ABAG Priority Conservation Areas Program (2017).

Riparian Corridor PCA • This PCA incorporates the riparian zone (creekside bank areas) of the Guadalupe River and Coyote Creek which pass through the heart of San Jose and are adjacent to the cities of Santa Clara and Milpitas. The riparian zone surrounding these streams serves as migration corridors and habitat for San Francisco Bay salmonid populations. These streams also serve to recharge Santa Clara County's groundwater basins and function as critical green infrastructure areas that improve water quality, absorb local flooding, support local and regional biodiversity, and provide significant recreational opportunities to residents. Finally, riparian zones like Coyote Creek and Guadalupe River have served as key elements of local municipalities' urban greening strategy. Developed areas around Guadalupe River become inundated as early as 24" TWL and downstream sections of Coyote Creek are overtopped at 24" TWL. Developed areas of Northern Milpitas are flooded at 36" TWL.

The PCA has many ecosystem services including providing habitat, recreation, stormwater services, and carbon storage (Figure 5i).

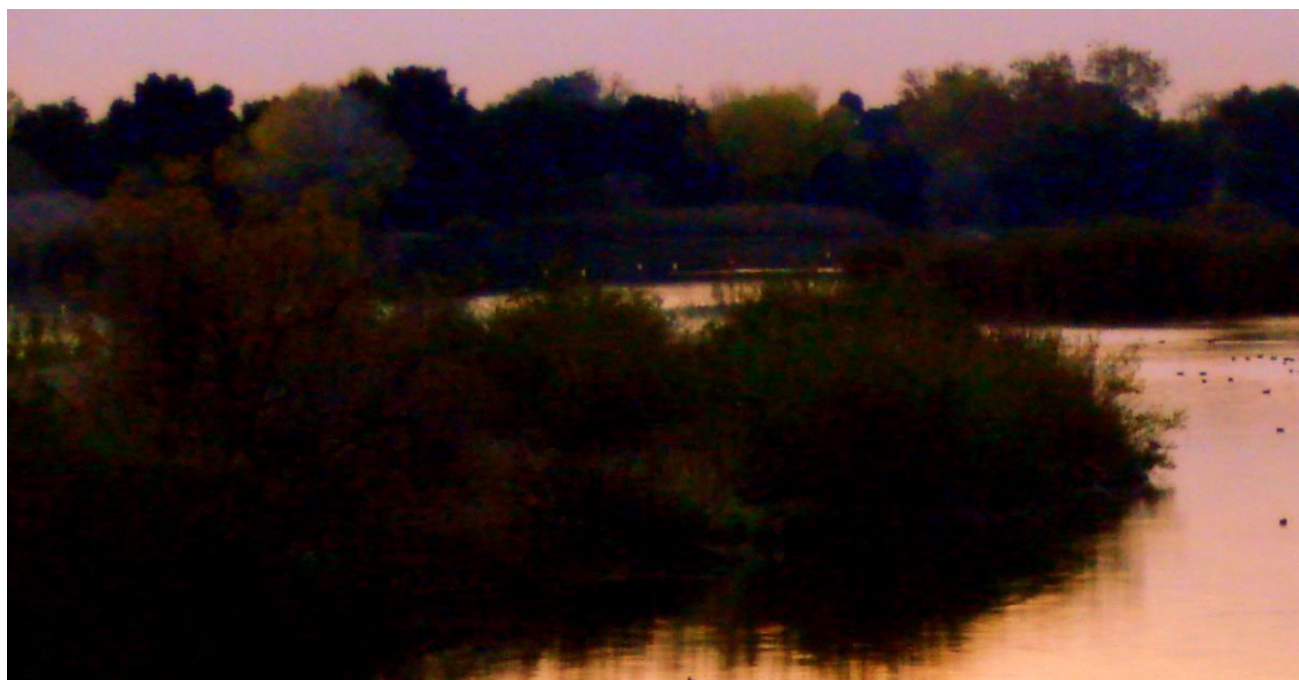
PCA DESIGNATION:

- ☒ **Natural Landscapes**
- ☐ **Agricultural Lands**
- ☒ **Urban Greening**
- ☒ **Regional Recreation**

FUNCTIONS/BENEFITS:

- **Wildlife Habitat**
- **Recreation**
- **Community Health**
- **Water Supply and Quality**
- **Climate and Resilience**

Data Source: MTC/ABAG Priority Conservation Areas Program (2017).



ECOSYSTEM SERVICES OF RIPARIAN CORRIDOR PCA



Habitats

Tidal Marsh	1,239 acres
Lagoons	4,710 acres
Playa	496 acres
Depressional Wetlands	806 acres
Transitional Zone	62 acres
Tidal Flats	682 acres
Grasslands	124 acres
Brown Pelican	248 acres
Heron, Egret & Ridgway's Rail	62 acres
Snowy Plover	2,789 acres



Stormwater

Annual Runoff Retention	2,099 million gallons
Groundwater Recharge	91 million gallons
Flood Water Retention	220 million gallons



Carbon Storage

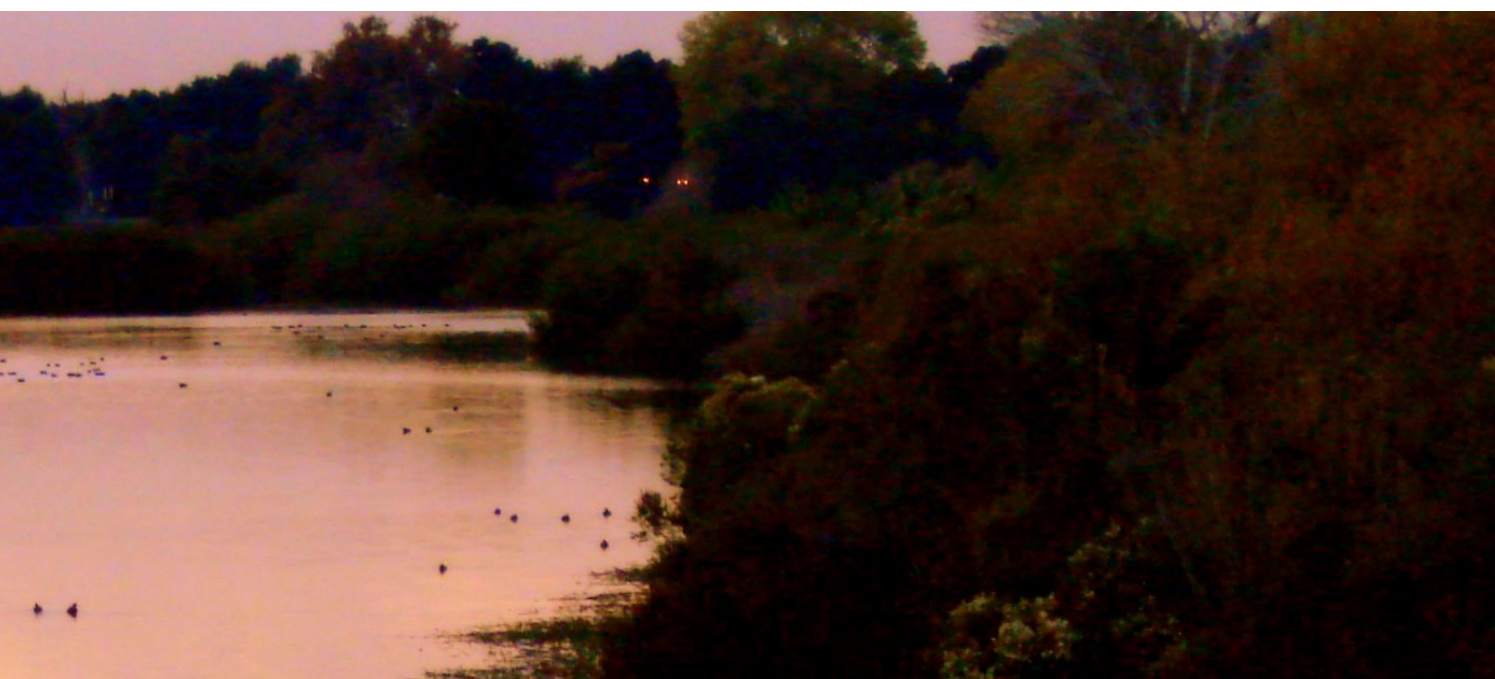
Acres x % weighted soil organic matter within 108" TWL	22,381
--	--------



Recreation

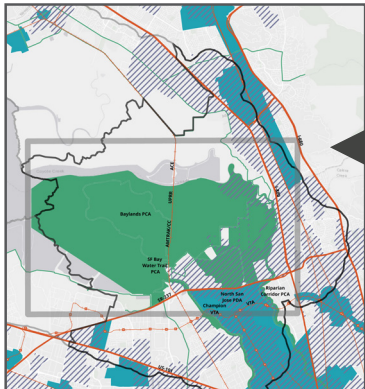
Approximate Visitation Rates	146 photo user days
---------------------------------	------------------------

Figure 5i. Ecosystem Services of the PCA. Statistics on habitats, recreation, carbon storage and stormwater retention in PCAs. Data by the ART Bay Area Natural Capital Project (2019).



Coyote Creek at sunset. Photo by Dawn Ellner is licensed under CC BY 2.0.

Focus Area A: *South Bay Baylands and Shoreline*



Location

This Focus Area encompasses the baylands, shoreline, and land areas from the Guadalupe River, Alviso Neighborhood, to the edge of the San José-Santa Clara Regional Wastewater Facility, and up to Salt Pond A18 (Figure 7i).

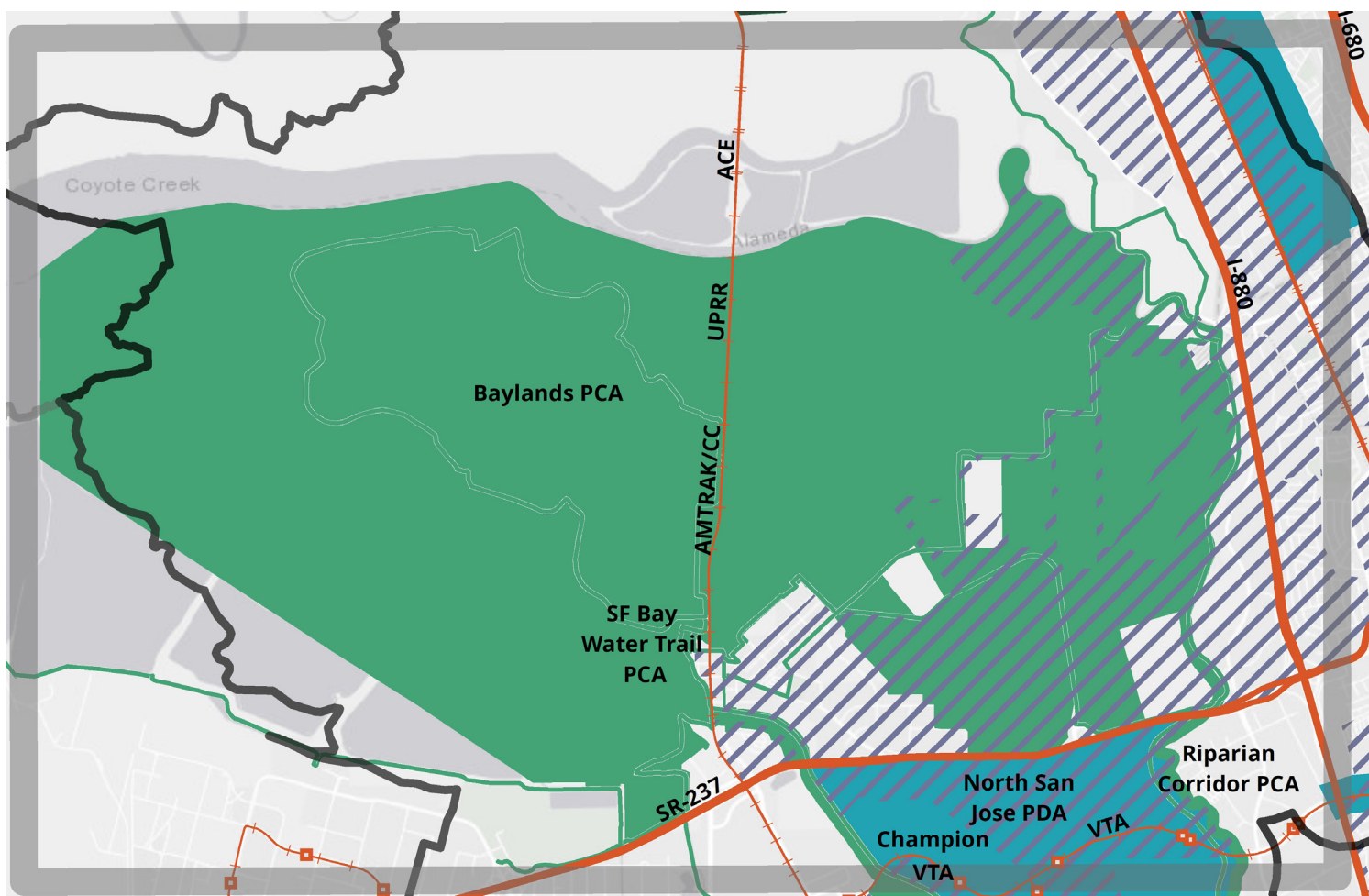


Figure 6i. Top: Identification of where Focus Area is within OLU. Bottom: Map of Focus Area containing regional systems. Individual assets assessed in this Focus Area are labeled on the map and listed on the following page.



The Baylands. Map data ©2019 by Google.

Why shared stories of vulnerability?

This Focus Area was selected because it contains a variety of regional systems, including numerous transportation routes, a PDA, multiple PCAs, and the Alviso community. Due to overlap and dependencies among these regional systems in this area, the vulnerabilities of these systems to flooding and sea level rise are discussed together in shared stories of the shoreline, overtopping, and exposure to flooding as water levels rise. The goal of communicating shared vulnerabilities and consequences is to encourage multi-benefit solutions through collaborations and coordination.

Figure 6i. MAP OF REGIONAL SYSTEMS AND LIST OF INDIVIDUAL ASSETS ASSESSED WITHIN THIS FOCUS AREA LISTED BELOW:



TRANSPORTATION

- Union Pacific Railroad (UPRR)
- SR-237
- VTA Light Rail and Facilities



VULNERABLE COMMUNITIES

- Alviso, Milpitas and San Jose Community



PRIORITY DEVELOPMENT AREAS (PDAs)

- North San Jose PDA



PRIORITY CONSERVATION AREAS (PCAs)

- Baylands PCA
- Riparian Corridor PCA
- San Francisco Bay Water Trail PCA

Shoreline today and into the future

SHORELINE TYPE STORY

What is the shoreline made up of now?

The shoreline in this Focus Area is predominately former commercial salt ponds and restored tidal marshes in the Baylands PCA.

SHORELINE DEVELOPMENT STORY

How will the shoreline change in the future?

The major potential shoreline changes include:

- **The South San Francisco Bay Shoreline Project**
- **South Bay Salt Pond Restoration Project**

The South San Francisco Bay Shoreline Project and South Bay Salt Pond Restoration Project are both ongoing projects that will affect the flood protection of neighboring communities through restoration and levee building projects. The goal of the South San Francisco Bay Shoreline Project is to protect the parts of Santa Clara's shoreline with the highest potential damages and threats to human health and safety from tidal flooding, using a combination of engineered flood protection levees and wetlands.¹⁵ This project plans for outboard and internal levee breaches as well as levee re-alignments along the edges of Alviso and the Wastewater Treatment Plant, constructed to serve pedestrians and bicycles. Additionally, pedestrian bridges will be built over Artesian Slough and railroad tracks and include new Bay Trail segment along Pond A18 to connect to the Coyote Creek Lagoon Trail.¹⁶

The South San Francisco Bay Shoreline Project is coordinated with the South Bay Salt Pond Restoration Project, which seeks to restore historic wetlands on 15,100 acres of former salt ponds in the South Bay. The second phase of the South Bay Salt Pond Restoration Project began construction in May 2019.¹⁷ These new wetland restoration projects are paired with levee building, and there are proposals to build a levee in front of Alviso to protect the community.

UPRR tracks going north through the salt ponds. Photo ©2019 by Google.



Shoreline levee in Alviso. Photo by BCDG.



Current and future flooding risk

OVERTOPPING STORY

Where is water coming over the shoreline?

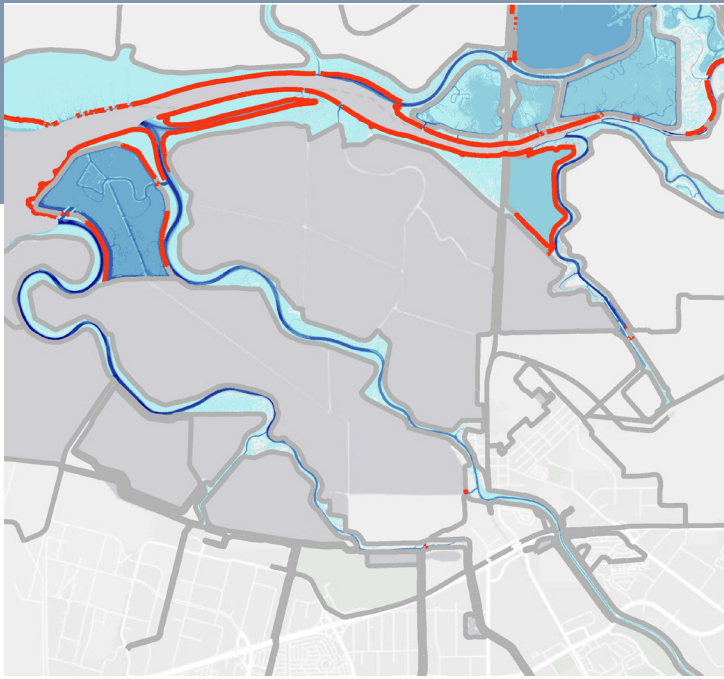
Water enters the shoreline at the Alviso Slough Baylands at the mouth of Coyote Creek at 12" TWL (Figure 7i) and also overtops a segment of the UPRR line near the Alviso Salt Ponds. At 24"

TWL the Baylands PCA is overtopped and the built shoreline is overtopped at the Alviso Neighborhood from the Alviso County Marina Park to the San José-Santa Clara Regional Wastewater Facility. At 24" TWL segments of SR-237 are also overtopped. Overtopping and flooding extent increases with increasing TWL.

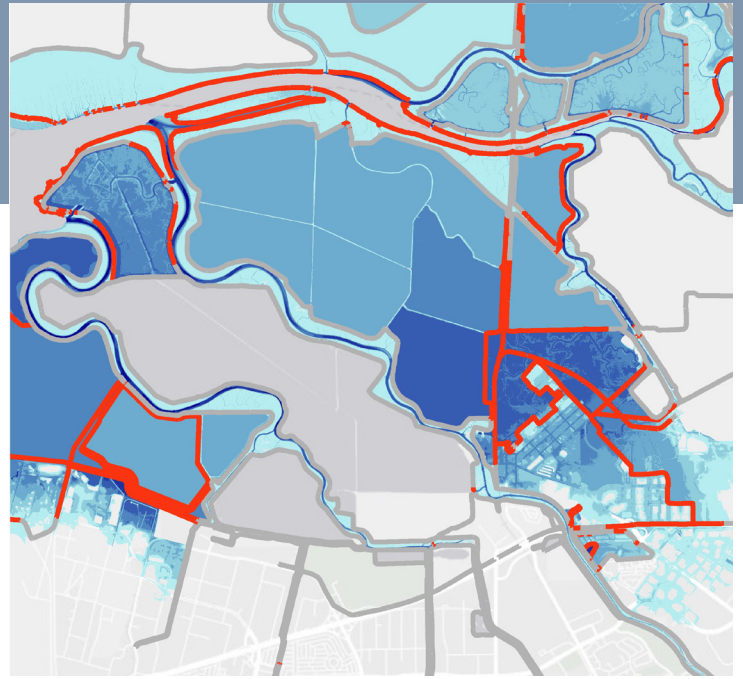
FLOODING EXPOSURE STORY

Where does flooding occur?

At 12" TWL (Figure 8i) the exposure is limited to small parts of the Alviso Marina Park and undeveloped lands in the Focus Area; however, many low-lying disconnected areas are at risk. At 24" TWL extensive areas will flood, including much of Alviso and most of the salt ponds abutting it. Transportation assets such as SR-237 and the VTA Champion Station will also be exposed. At 36" TWL, portions of the wastewater treatment plant are exposed, as are the VTA Borregas and Crossman Stations and portions of the UPRR rail line.



12" TWL



24" TWL

OVERTOPPING AND FLOODING ▲

Figure 7i. Two total water levels selected that demonstrate first overtopping and/or significant flooding thresholds. Visit the Bay Shoreline Flood Explorer (explorer.adaptingtorisingtides.org) to see more TWLs.

- No overtopping
- Overtopping
- Shallower depth of flooding
- Deeper depth of flooding

▼ FIRST FLOODING OF REGIONAL SYSTEMS ASSESSED

Regional Systems Impacted	12"	24"	36"	48"	52"	66"	77"	84"	96"	108"
Baylands PCA										
Regional Trail Systems Gap PCA										
Union Pacific Railroad (UPRR)										
VTA express lanes on SR-237										
VTA-owned bus routes										
VTA-owned bicycle routes										
VTA Light Rail & Champion Station										
Alviso Community										
North San Jose PDA										
Riparian Corridor PCA										
VTA substations										
VTA River Oaks Division										
VTA Cerone Division										

Figure 8i. First exposure of regional systems. Individual assets within the four regional systems in this area are shown and colored bars represent when each asset is first exposed to flooding impacts.

Shared vulnerabilities to flooding

SHARED VULNERABILITY STORIES

Vulnerability assessments were conducted on individual assets and then shared vulnerabilities were identified for regional systems within each focus area. The vulnerability statements below reflect shared stories of vulnerability. Our goal is to emphasize the interconnections among and across local systems, and encourage shared multi-benefits adaptation solutions.

1. Ecosystem Services & Recreation



The South Bay Salt Pond Restoration Project is one of the largest wetland restoration projects in the country and is vulnerable to near-term flooding. The Baylands PCA includes part of the South Bay Salt Pond Restoration and offers recreation, education, economic, and shoreline protection services. This PCA also provides ecosystem, water supply and quality, and climate and resilience functions. As the first line of defense, the Baylands PCA also serves to protect many inland assets from flooding hazards. Wetlands are expected to be inundated regularly; however, as water levels rise, the ecological functions of the wetlands may be affected, and the flood protection provided to adjacent communities, such as Alviso, may be reduced if interventions are not taken.

2. Vulnerable Communities



The Alviso neighborhood provides housing and services to a vulnerable community of color with limited English proficiency and a high level of single parent households. It experiences early flooding, and some parts are in a low-lying area below sea level. Alviso experiences a high level of contamination vulnerability due to the industry and six closed and two active landfills nearby. Community members and habitats may be exposed to contaminants released from contaminated lands or inadequately remediated sites. Alviso has experienced environmental discrimination and needs to be addressed in adaptation. Alviso has a fire department, school, and religious buildings at risk from flooding. Critical infrastructure, such as the San Jose-Santa Clara Regional Wastewater Facility, substations, and natural gas pipelines are also nearby.



VTA Light Rail at Champion Station. Photo by BCDC staff.

3. Movement of People and Goods

This area contains regional transportation assets critical to the region. The Union Pacific Railroad (UPRR) lines, SR-237, the VTA Champion Light Rail Station and track, VTA-owned electrical substations, bus routes, and bicycle routes will all be exposed to flooding. UPRR rails are used by Amtrak and ACE transit, which move commuters around the region and connect to the VTA Light Rail lines. These linear assets lack redundancy, further limiting already-limited transit service in the area. The existing UPRR rail line that crosses the Bay is extremely vulnerable to flooding. VTA Light Rail stations and buses connect passengers to other VTA stations, BART, transit centers, Amtrak, ACE, Caltrain, and the San Jose Airport. Disruption of SR-237 by flooding will impact the North San Jose PDA, as well as the region, by impairing workers' capacity to reach job centers in the PDA and residents' ability to commute to jobs in other parts of the Bay Area. Additionally, VTA serves as emergency transport, so disruption to the system limits functioning of the area in an emergency. Finally, Great Mall Transit Center connections would be disrupted by flooded VTA owned express lanes and tolls.



Shared consequences to flooding

SHARED CONSEQUENCE STORIES

This section translates shared vulnerability statements into stories of shared consequences. The ART program considers consequences through frames of sustainability: Society and Equity, the Economy and the Environment.



Society and Equity • Flooding will disrupt recreational activities at the Alviso County Marina Park and along the Bay Trail, which also serves as a key commuter route. Flooding impacts landward into the Alviso neighborhood will affect those living and working in a highly vulnerable community. Individuals and households that are disadvantaged or underserved experience disproportionate hardships both during and after a flood event. Disruption of schools, healthcare facilities, and other community-serving facilities can result in significant hardships for community members who may not have access to alternative services. Displaced residents may not have access to equivalent or affordable replacement housing near the jobs, schools, services, and facilities they rely on. Even temporary relocation of residents can sever long-standing neighborhood relationships, disrupting the social network that imparts collective strength and resilience. Floodwaters can leave mold, mud, waste, and other toxics behind in residences and structures; residents who are unable to move, temporarily relocate, or adequately repair their home after a flood are more vulnerable to these impacts. Contaminated sites including closed sites/brownfields that have not been fully cleaned up or have been cleaned up to less stringent upland or reuse standards pose a risk to public health if on-site contaminants are released to surrounding surface or groundwater.



Economy • Flooding onto and past SR-237 will disrupt critical highway and rail transportation. This flooding will impact the goals of the PDA by impairing workers capacity to reach job centers in the PDA and residents' ability to commute to jobs in other parts of the region.

Community members immediately affected may bear the cost of replacing or repairing belongings and homes, the cost of temporary housing or permanent relocation, increased insurance costs, and dislocation from jobs, schools and other services. Taxpayers may bear some of the expense of rebuilding even if they do not themselves live in affected areas.

Long-term evacuations could result in the permanent relocation of residents, employees, or entire business sectors outside of a community, with associated economic consequences for the neighborhoods, residents and employers that remain.

A release of contaminants from closed or active sites could strain local emergency resources and could result in high cleanup and recovery costs. Brownfields undergoing active cleanup are typically slated for redevelopment, and disruption of these sites and release of contaminants could result in loss of economic investment or potential.

Environment • Inundation of a large section of the Santa Clara shoreline from the Alviso Slough ponds and Baylands leads to potential loss of important restoration activities, habitat for wildlife, and recreational opportunities. Former salt ponds that have been restored to tidal marsh serve as habitat for marsh-dependent endangered and threatened species such as the California Ridgway's rail and salt marsh harvest mouse, which will be negatively impacted due to more frequent flooding and by rising sea levels. Marshes can accrete with normal rates of sea level rise if sufficient sediment is available in the tidal system to build up the marsh elevation; however, high rates of sea level rise may exceed the natural capacity of marshes to keep up. The conversion of tidal marsh to mudflats or open water due to sea level rise will provide habitat to waterfowl and shorebirds.



Floodwaters that pass through residential neighborhoods can pick up and carry household debris and hazardous household materials (such as cleaners, paint) that can impair water quality and habitats critical to biodiversity.

There could be significant water quality impacts if contaminants are released from Superfund and other open contaminated sites into the adjacent natural areas that support a variety of species and habitats. Contamination levels that remain on brownfield sites remediated to upland standards can be harmful to aquatic receptors, and if released to the Bay and shoreline, would have significant adverse impacts on aquatic species.

Advancing adaptation solutions

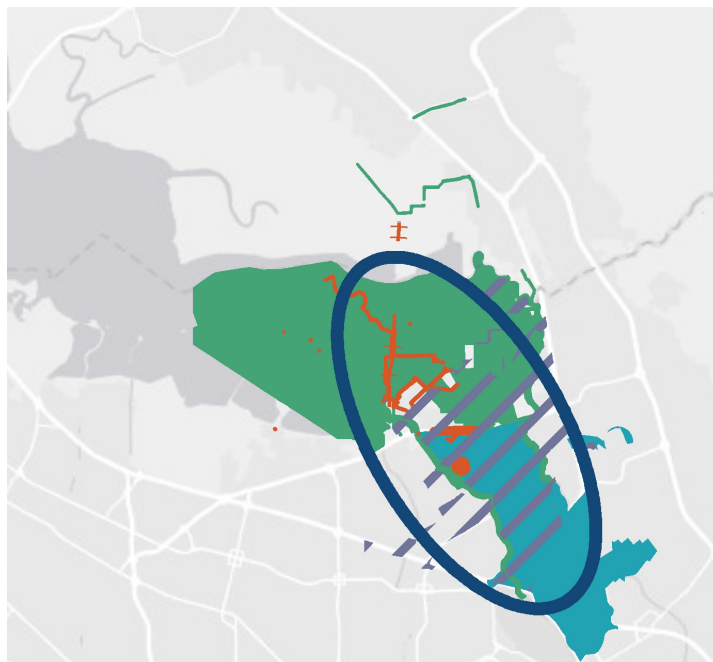
FITTING INTO REGIONAL STORY

How are local areas contributing to Regional Hot Spots?

The regional scale analysis of ART Bay Area identified clusters of highest consequences around the region, called “Regional Hot Spots.” These areas include places that contain the top five highest consequences in the region for 1) any transportation asset and 2) either a PDA or PCA, and 3) the presence of a vulnerable community block group at any given water level.

Datasets were identified for each regional system to provide a measure of consequence to quantify impacts in the event of flooding. A full list of consequences used for each regional system can be found in Chapter 2.1 Regional Hot Spots.

Regional Hot Spot at 24” TWL



- Regional Hot Spot
- Transportation Infrastructure
- Vulnerable Community
- PDA
- PCA

Figure 9i. Baylands and San Jose Hot Spot: From 24” TWL to 108” TWL, this Focus Area contains clusters of assets that have among the highest consequences of flooding in the region.

The Baylands and San Jose area is a Regional Hot Spot, meaning it contains a cluster of assets that have among the highest consequences of flooding in the region.

The Baylands and San Jose area becomes a Regional Hot Spot starting at 24” TWL, and remains a Regional Hot Spot at every total water level through 108” TWL. It is an early cluster and remains critical to the region over time (Figure 9i).

The assets driving the Baylands cluster at 24” TWL includes: the North San Jose PDA (2010 and 2040 residential units, 2010 and 2040 job spaces, and residential and job growth); lagoons, snowy plover, and tidal marsh habitat, agricultural lands, and visitation in the Baylands/Santa Clara Valley PCA; and the Bay Trail, Champion Station passenger rail station, VTA and Amtrak passenger rail lines, Union Pacific freight rail line, and truck traffic on SR-237. It also contains both social vulnerability and contamination

Chapter 4 Regional Adaptation provides adaptation responses for regional issues.

Endnotes

- 1 "South Bay Salt Pond Restoration Project," accessed August 30, 2019, <https://www.southbayrestoration.org/>.
- 2 Caltrans, "2016 Vehicle Volumes (AADT)."
- 3 Caltrans, "2016 Truck Volumes (AADTT)."
- 4 Caltrans, "2016 Vehicle Volumes (AADT)."
- 5 Caltrans, "2016 Truck Volumes (AADTT)."
- 6 "Lifeline Routes."
- 7 San Jose, "Santa Clara Valley Transportation Authority," 2013, 92.
- 8 United States Census Bureau, "2010 Census (California)."
- 9 "South Bay Salt Pond Restoration Project."
- 10 Board of Supervisors of the County of Santa Clara, "Ordinance No. NS-1100.106," Chapter VII of Division C12 of the County of Santa Clara Ordinance Code and Enacting a New Chapter VII Relating to Special Flood Hazard Areas § (2009).
- 11 City of San José, "North San José Deficiency Plan," July 2005, <http://www.sanjoseca.gov/Document-Center/View/2781>.
- 12 "South Bay Salt Pond Restoration Project."
- 13 "San Francisco Bay Trail – A 500-Mile Trail Around the Bay."
- 14 "San Francisco Bay Area Water Trail."
- 15 "South Bay Shoreline - Home," accessed November 21, 2019, <http://www.southbayshoreline.org/about.html>.
- 16 Brenda Buxton, "South San Francisco Bay Shoreline Project- Staff Recommendation" (San Francisco Bay Restoration Authority, April 11, 2018), http://www.sfbayrestore.org/sites/default/files/2019-05/Item%2015_%20South%20SF%20Shoreline%20Project.pdf.
- 17 "South Bay Salt Pond Restoration Project."