

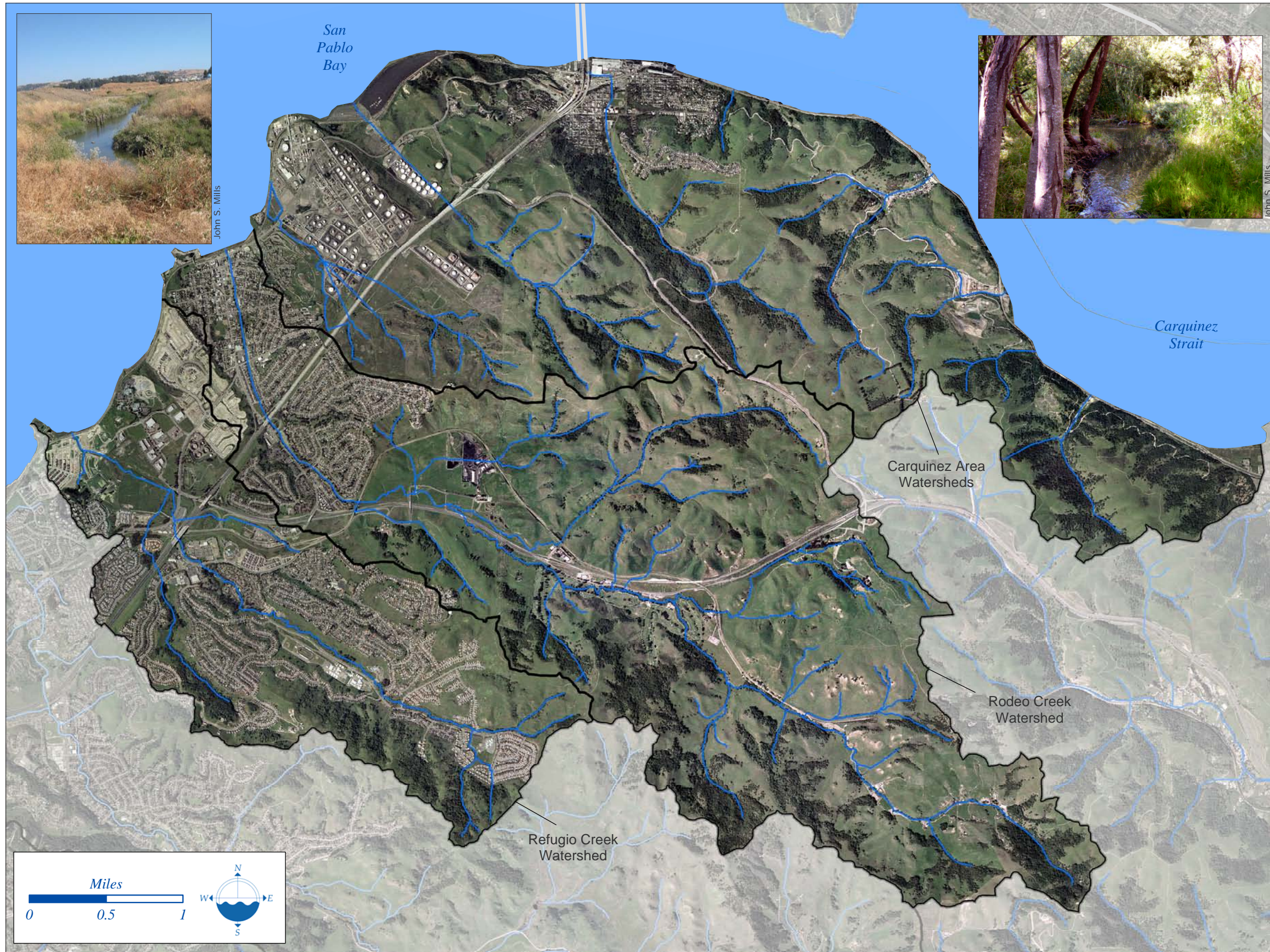


Chapter 7

Refugio, Rodeo and Carquinez Area Watersheds



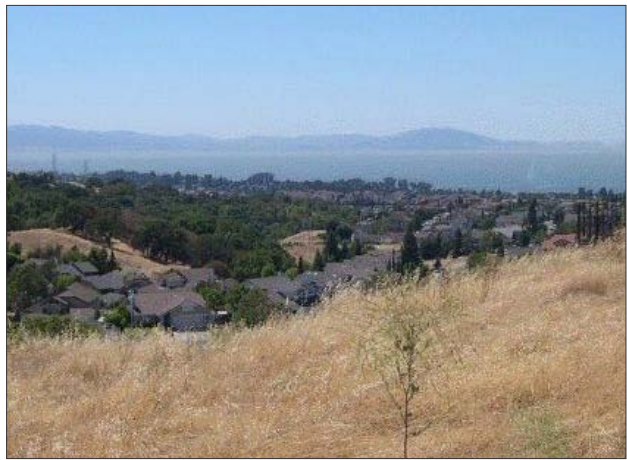
Refugio Creek, Rodeo Creek and the various drainages that flow into the Carquinez Strait are located in northwest Contra Costa County. Together, the watersheds encompass 16,348 acres of diverse landcover including pristine oak-covered hills, an interstate highway, ranches, heavy industry, towns and new residential development. The City of Hercules and the communities of Rodeo, Crockett and Port Costa are located in the watershed.



Refugio Creek Watershed Vital Statistics	
Watershed Size	3,116 acres
Length of Longest Branch of Creek	4.52 miles
Total Channel Length in Watershed	9.17 miles
Average Annual Rainfall	19 inches
Estimated Mean Daily Flow	4.2 cfs
Estimated 100-Year Flood Flow	N/A
Highest Elevation in Watershed	780 feet
Population (estimated)	15,400 people
Estimated Percent Impervious	50 %
Recognized Pollutants of Concern	N/A *

Rodeo Creek Watershed Vital Statistics	
Watershed Size	6,657 acres
Length of Longest Branch of Creek	8.35 miles
Total Channel Length in Watershed	31.64 miles
Average Annual Rainfall	21 inches
Estimated Mean Daily Flow	7.0 cfs
Estimated 100-Year Flood Flow	N/A
Highest Elevation in Watershed	1,100 feet
Population (estimated)	8,900 people
Estimated Percent Impervious	20 %
Recognized Pollutants of Concern	Diazinon**

*Refugio Creek has not been specifically identified in the State's 303(d) list of Impaired Water Bodies.
 **Rodeo Creek is listed as an Impaired Water Body in the State's 303(d) list. Diazinon is the Pollutant of Concern.



John S. Mills

Refugio Creek Channel Length Statistics*

	Miles	Percent
Length of Longest Branch of Creek	4.52	
Total Channel Length in Watershed	9.17	
Type of Bank or Channel:		
Natural (no obvious reinforcements)	7.58	82.7%
Concrete	1.33	14.6%
Earth (constructed)	0.25	2.7%
Riprap	0.00	0.0%
Underground	1.33	14.6%

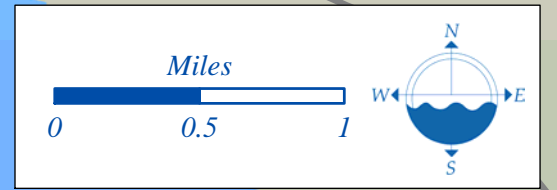
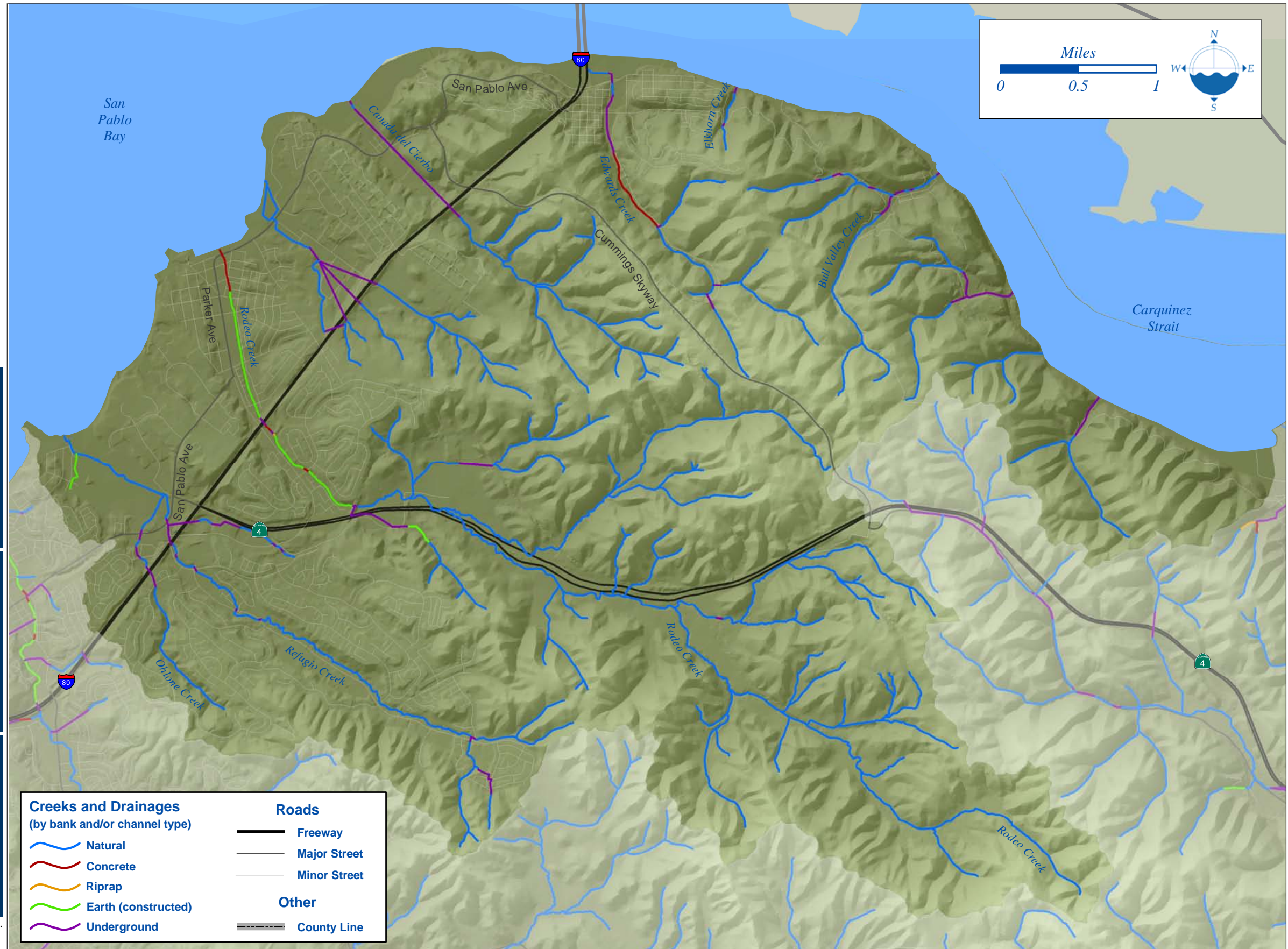
Rodeo Creeks Channel Length Statistics*

	Miles	Percent
Length of Longest Branch of Creek	8.35	
Total Channel Length in Watershed	31.64	
Type of Bank or Channel:		
Natural (no obvious reinforcements)	28.71	90.7%
Concrete	1.25	3.9%
Earth (constructed)	1.50	4.7%
Riprap	0.00	0.0%
Underground	0.88	2.8%

Carquinez Area Channel Length Statistics*

	Miles	Percent
Length of Longest Branch of Creek	2.86	
Total Channel Length in Watershed	26.95	
Type of Bank or Channel:		
Natural (no obvious reinforcements)	21.81	80.9%
Concrete	5.13	19.1%
Earth (constructed)	0.00	0.0%
Riprap	0.00	0.0%
Underground	4.56	16.9%

*Data relate to mapped channels only. Does not include storm drains. Bank type for segments shorter than 100 feet was not mapped.



Creeks and Drainages (by bank and/or channel type)

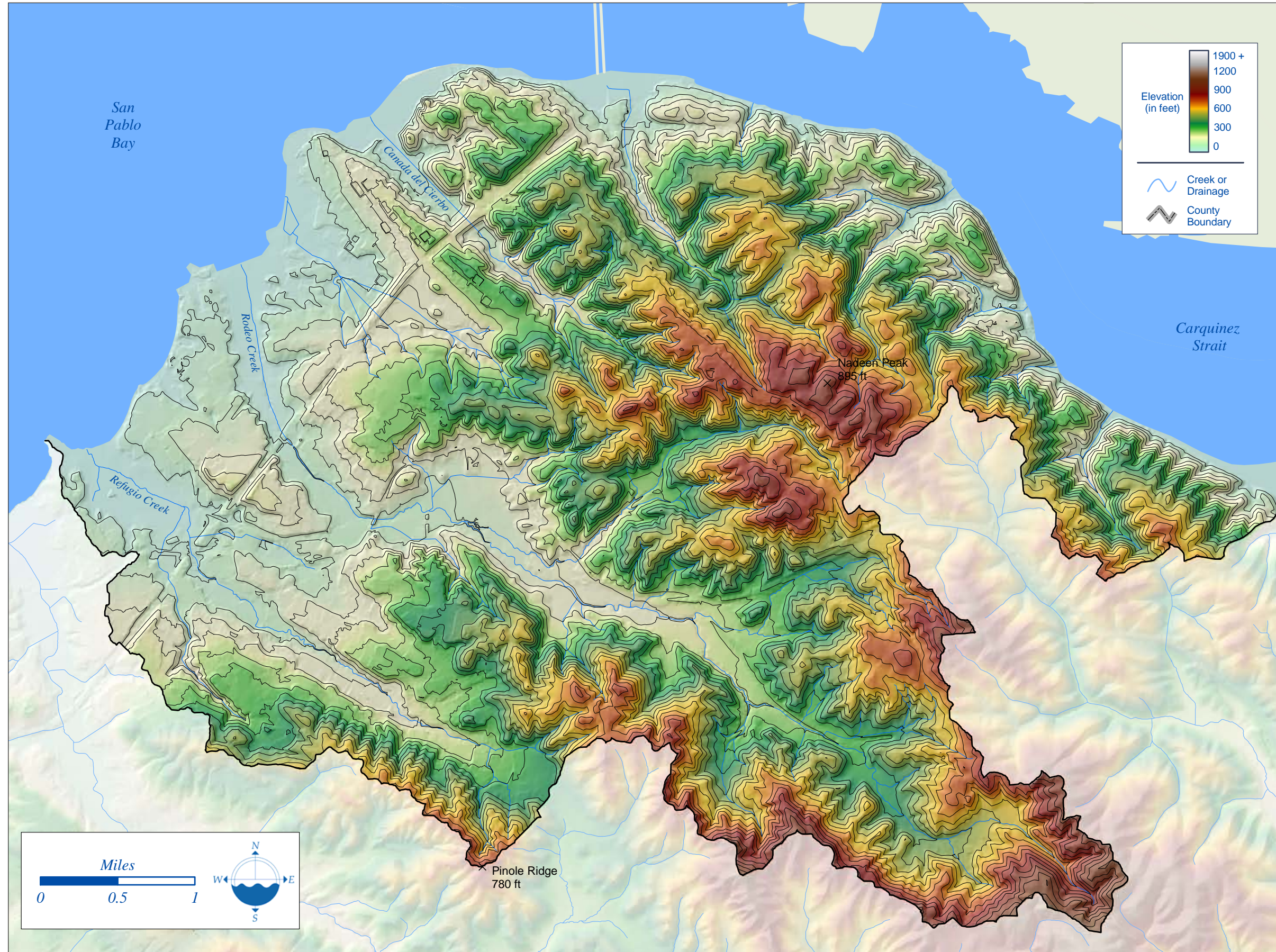
- Natural
- Concrete
- Riprap
- Earth (constructed)
- Underground

Roads

- Freeway
- Major Street
- Minor Street

Other

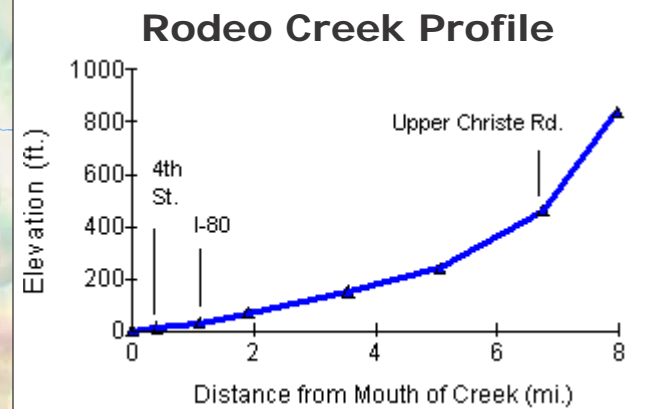
- County Line



Refugio Creek (4.52 miles), Rodeo Creek (8.35 miles), Canada del Cierbo Creek (2.86 miles) and Edwards Creek (2.0 miles) trend north-west and resemble other West County drainages in that they juxtapose a rural upper watershed with an urbanized and/or industrialized lower watershed. However, these watersheds located at the northwest tip of Contra Costa County do not have flatland areas in their lower reaches characteristic of the watersheds of Pinole, San Pablo, and Wildcat Creeks.

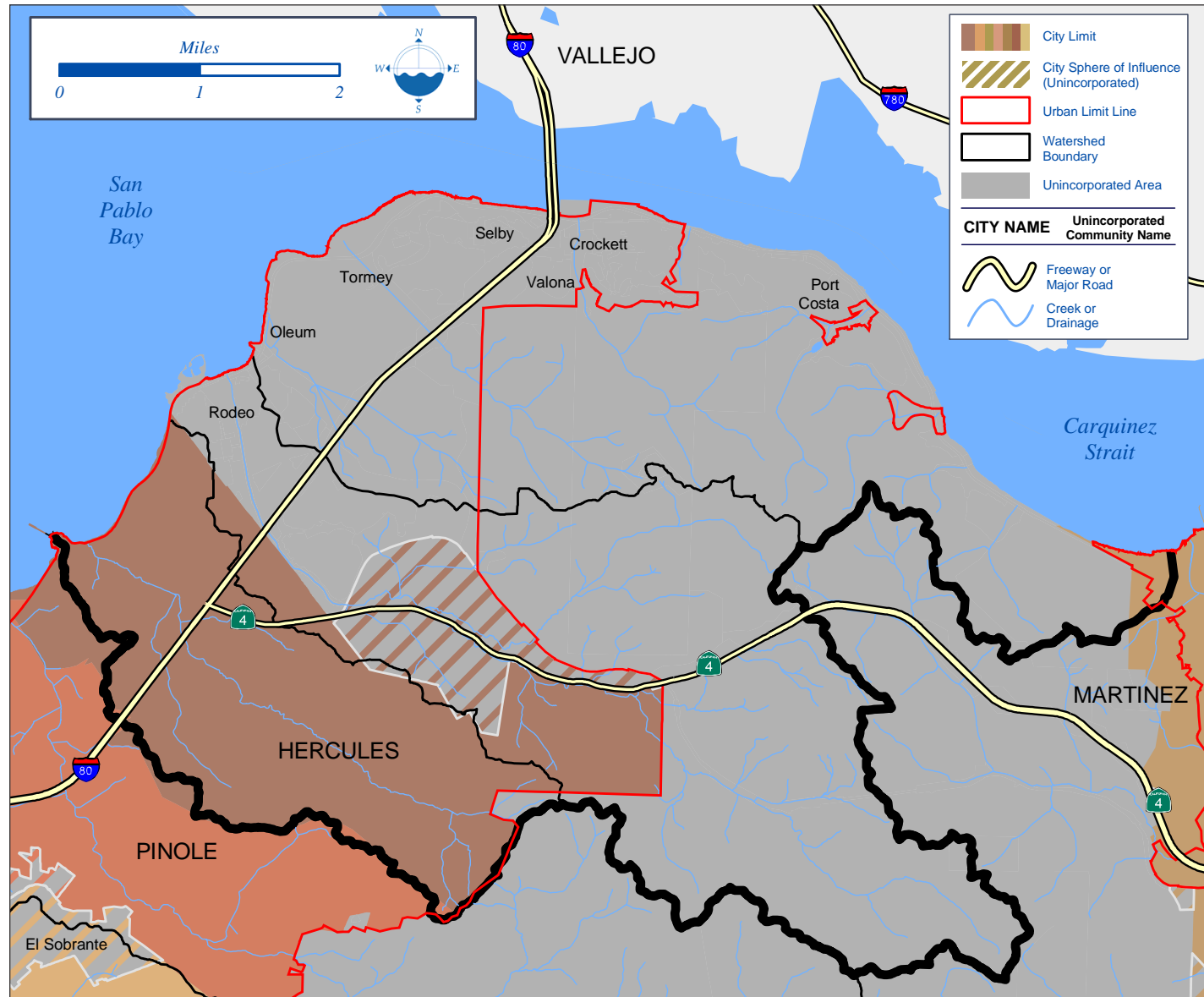
The upper watershed of Rodeo Creek and its tributaries begin in private ranchland and East Bay Regional Park District property. An industrial area and the community of Rodeo are in the lower watershed. Two smaller drainages to the north of Rodeo, including Canada del Cierbo Creek and an unnamed creek, begin in undeveloped land on the east side of Interstate 80 before being diverted underground through refinery properties.

The shorter, steeper Carquinez drainages flow from south-east to north-west following the shape of the land. These drainages are mostly unnamed except for Bull Valley Creek (2 miles), which flows north through the town of Port Costa, first filling the reservoir located just south of town. The upper watersheds of these smaller drainages also begin in East Bay Regional Park land and ranchlands before reaching residential areas and industry located on the shores of the Carquinez Strait.

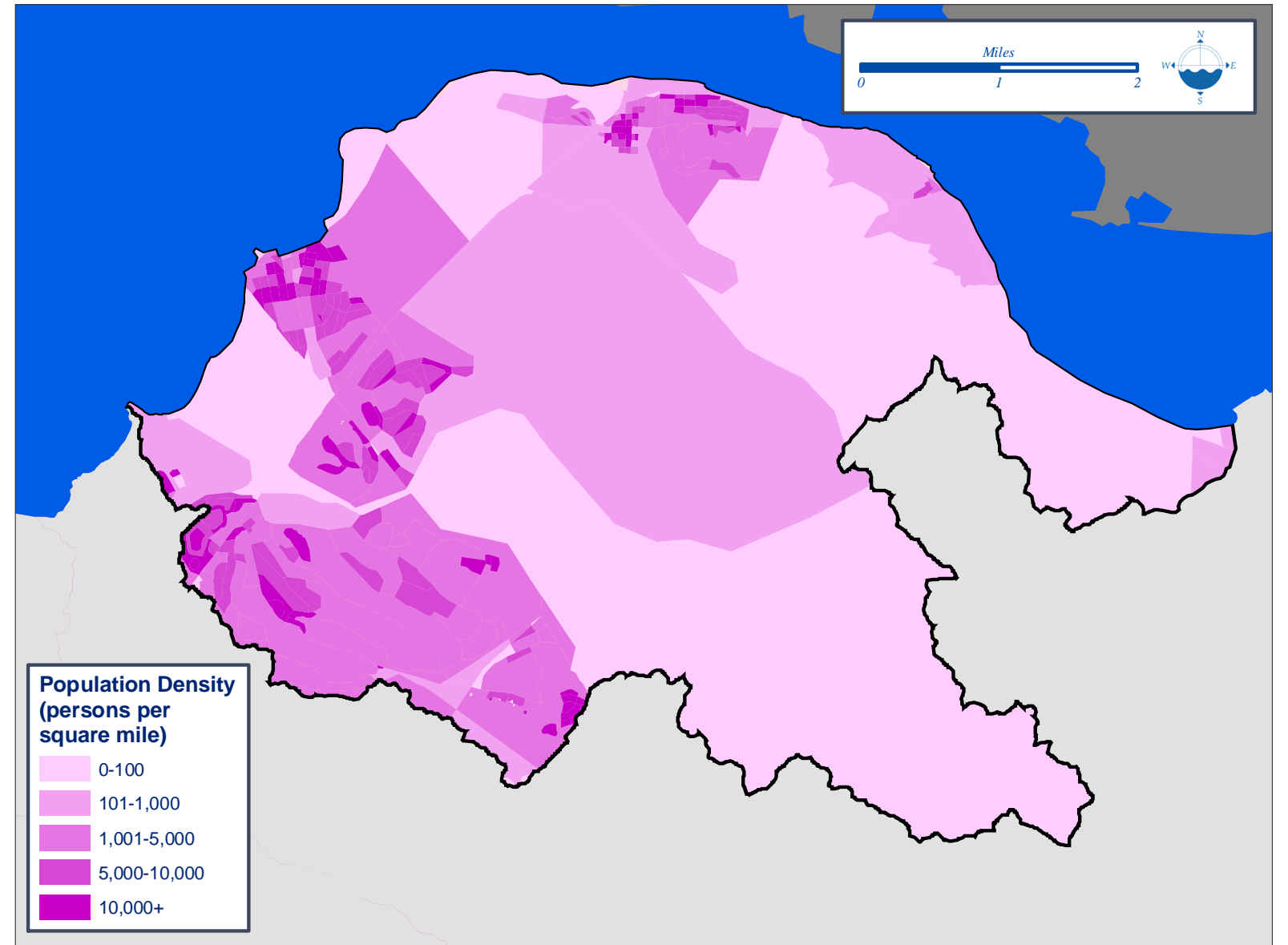




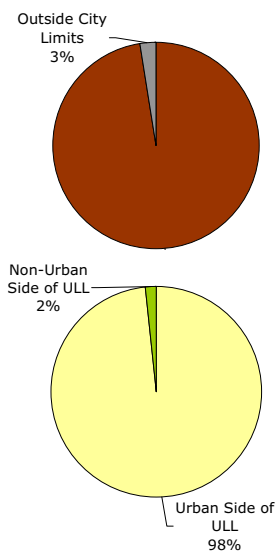
Political Boundaries



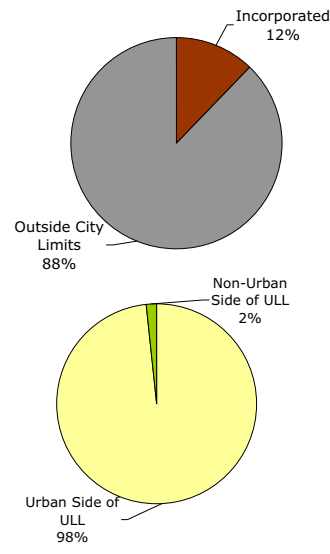
Population Density



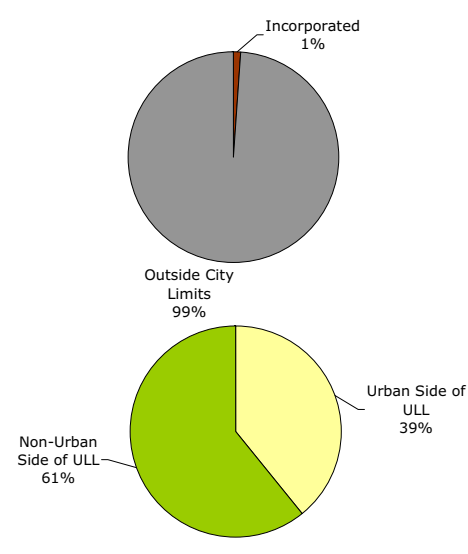
Refugio Creek Watershed



Rodeo Creek Watershed

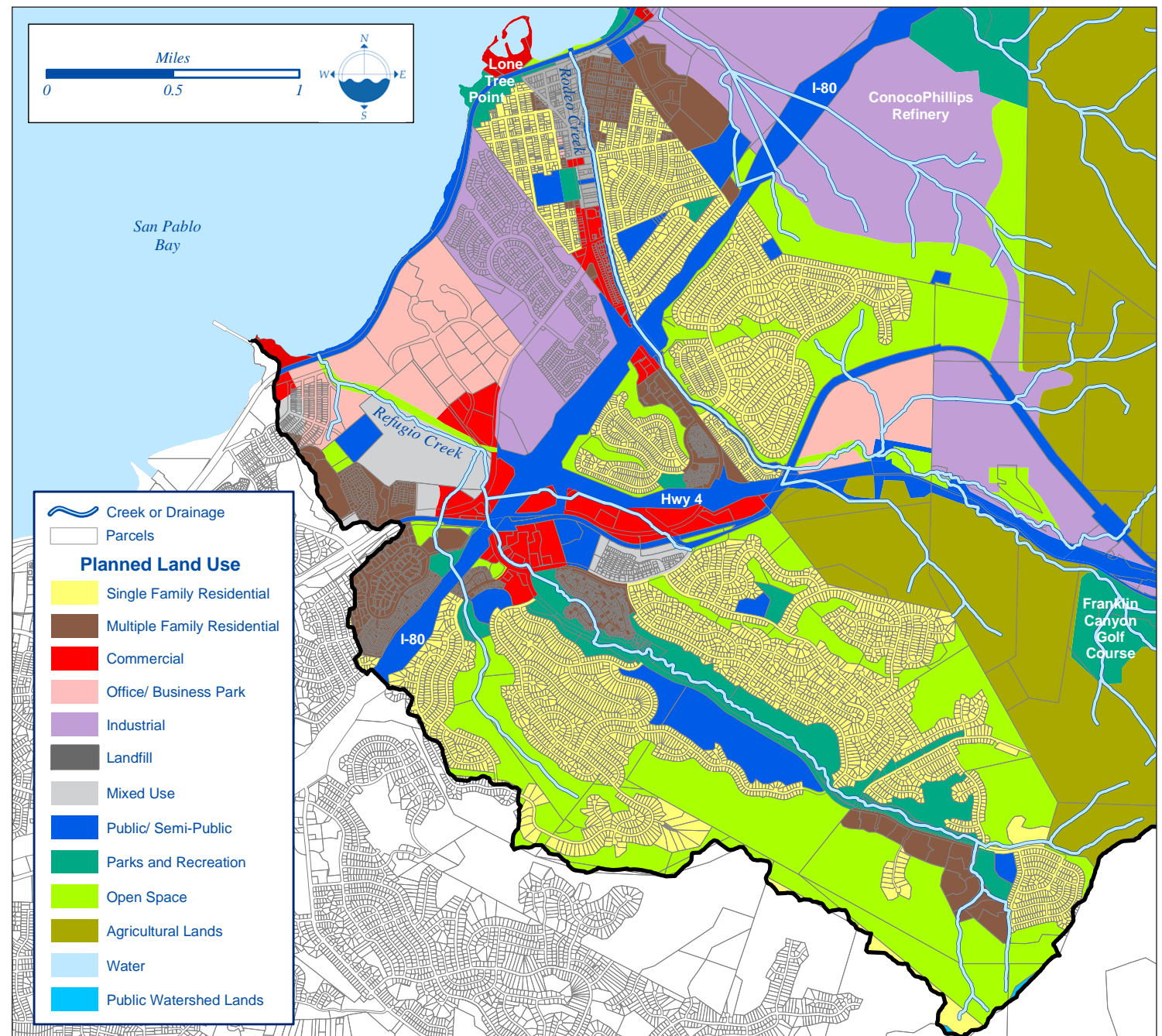
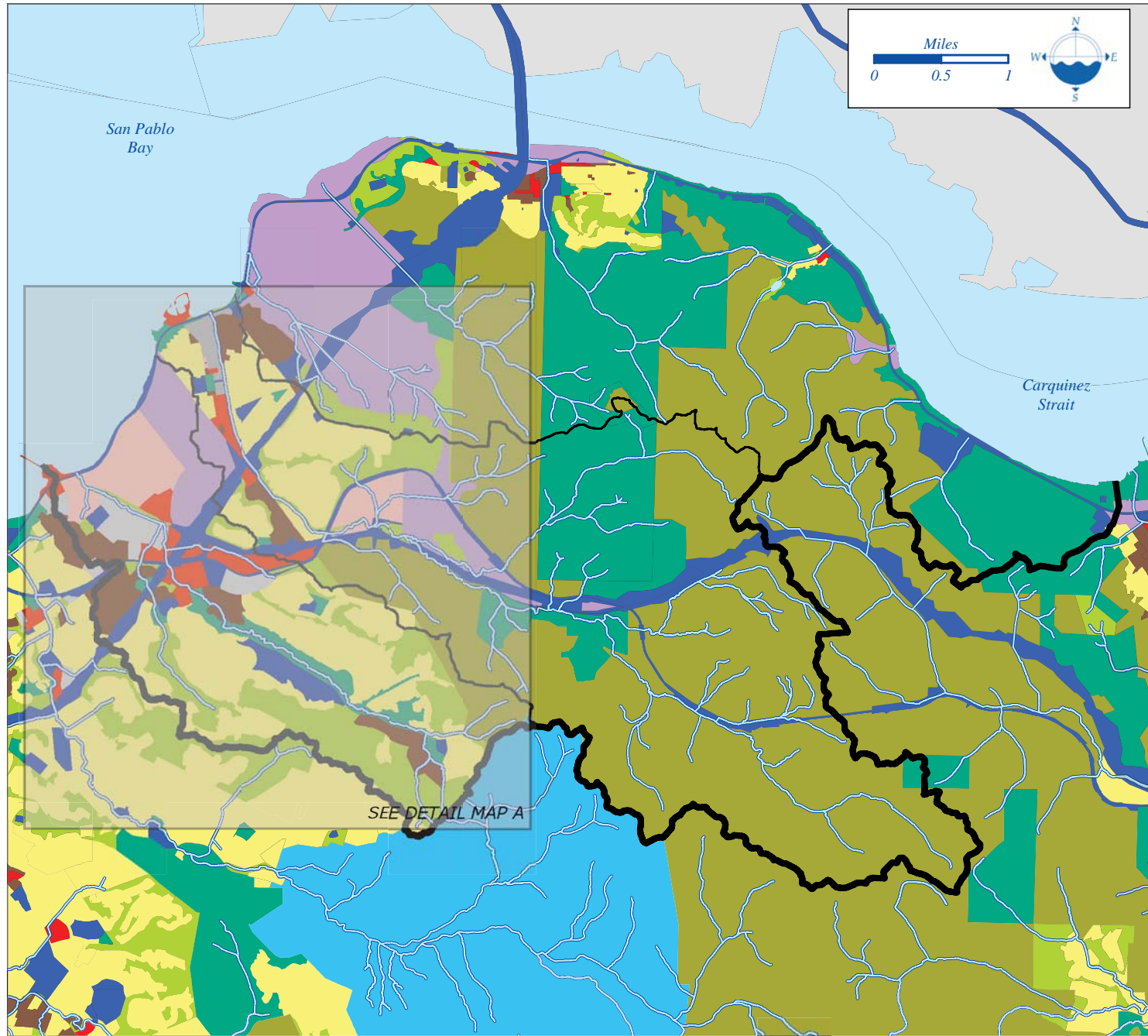


Carquinez Area Watersheds



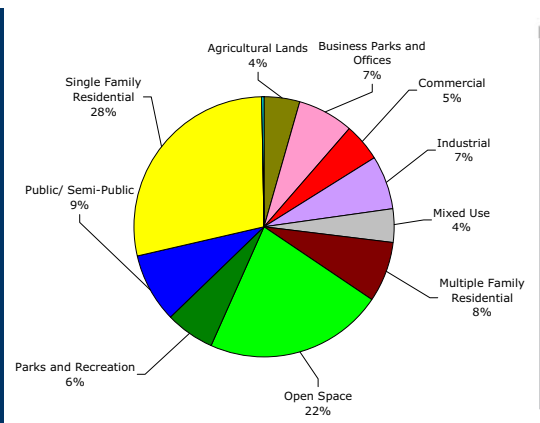
Demographic Profile for Selected Communities In or Near the Refugio, Rodeo and Carquinez Area Watersheds

Population	Crockett	Hercules	Rodeo
Total Population	3,296	19,299	8,672
Race and Ethnicity	Crockett	Hercules	Rodeo
White	77.0%	23.0%	44.5%
Hispanic or Latino	13.8%	10.8%	16.7%
Black or African American	1.6%	18.4%	13.2%
Asian	3.6%	42.6%	16.2%
Some Other Race	0.8%	1.2%	2.1%
Two or More Races	3.1%	4.0%	7.3%
Education (maximum level attained)	Crockett	Hercules	Rodeo
No High School Diploma	12.3%	9.5%	16.0%
High School Diploma or Equivalent	47.1%	44.0%	55.6%
Associate Degree	12.0%	10.6%	10.1%
Bachelor's Degree	17.9%	27.3%	13.5%
Master's or Professional School Degree	9.7%	8.4%	4.2%
Doctorate Degree	1.1%	0.2%	0.6%
Income	Crockett	Hercules	Rodeo
Median Household Income	\$60,359	\$75,196	\$60,522

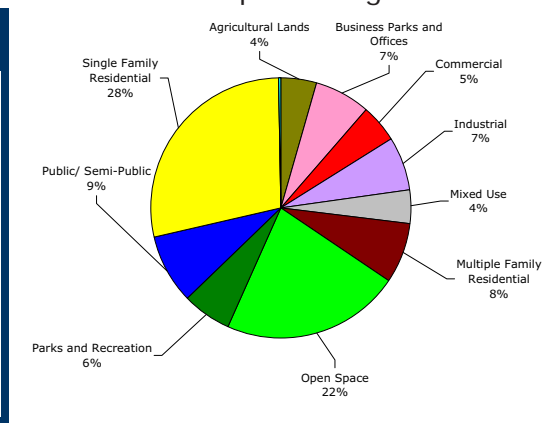


Detail Map A: Refugio and Rodeo Creeks through the Hercules area

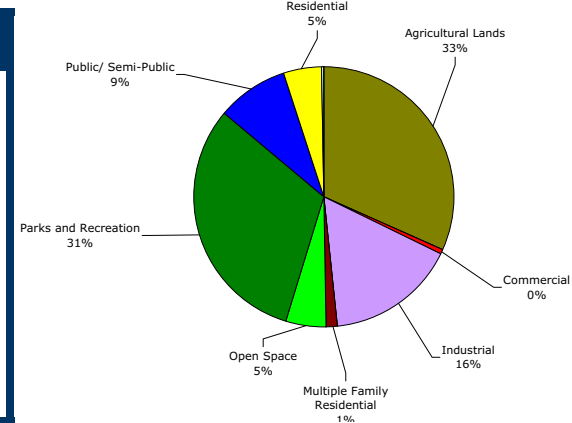
Planned Land Uses Refugio Creek Watershed		Acres
Agricultural Lands		140
Business Parks and Offices		218
Commercial		147
Industrial		206
Mixed Use		125
Multiple Family Residential		236
Open Space		693
Parks and Recreation		195
Public/ Semi-Public		265
Single Family Residential		882
Water		2
Watershed (Public)		6
Total		3,116

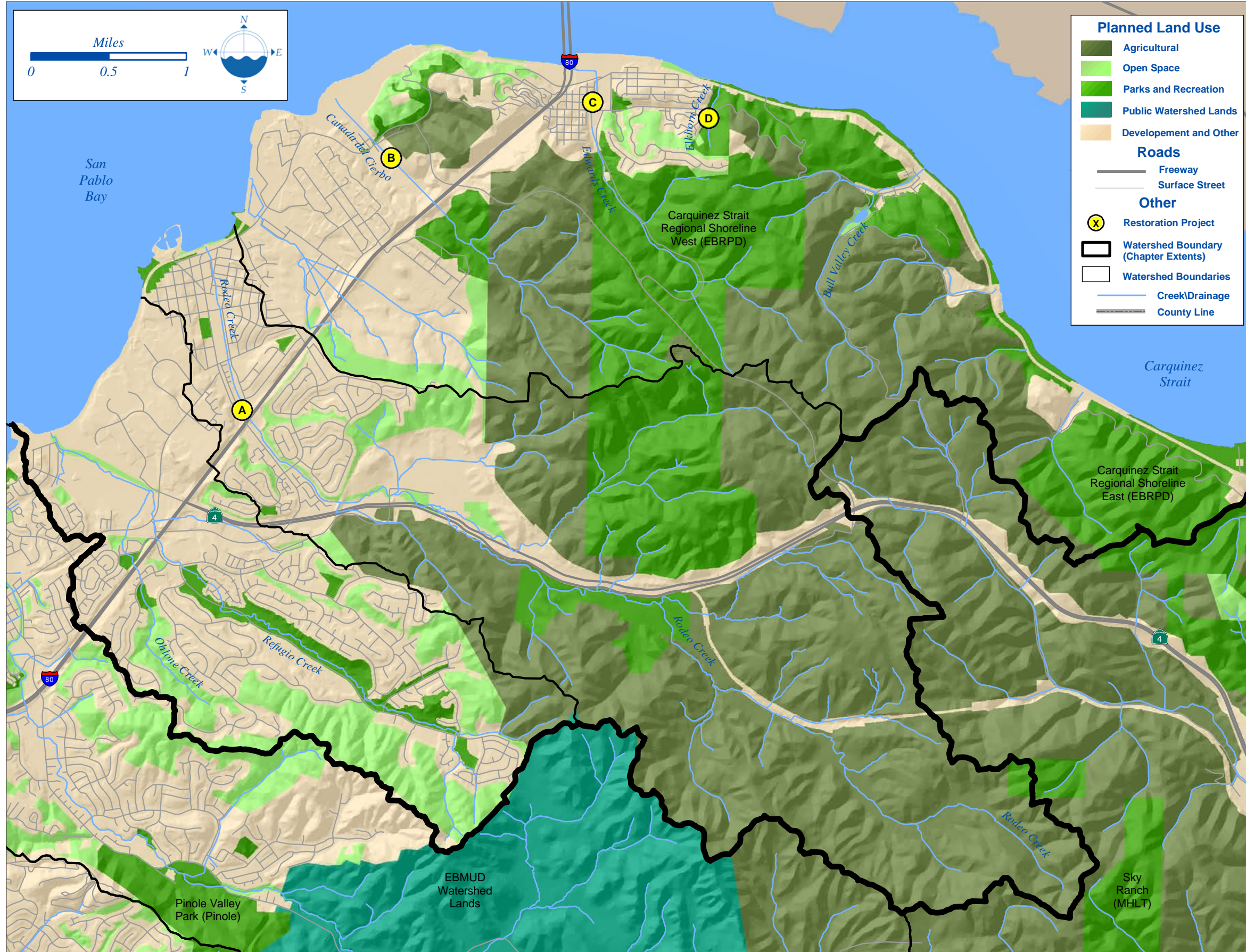


Planned Land Uses Rodeo Creek Watershed		Acres
Agricultural Lands		3,905
Business Parks and Offices		97
Commercial		50
Industrial		249
Mixed Use		45
Multiple Family Residential		82
Open Space		224
Parks and Recreation		1,004
Public/ Semi-Public		471
Single Family Residential		526
Water		0
Watershed (Public)		5
Total		6,657



Planned Land Uses Carquinez Area Watersheds		Acres
Agricultural Lands		2,088
Business Parks and Offices		1
Commercial		27
Industrial		1,072
Mixed Use		0
Multiple Family Residential		88
Open Space		326
Parks and Recreation		2,067
Public/ Semi-Public		578
Single Family Residential		306
Water		23
Watershed (Public)		0
Total		6,575





Rodeo Restoration Projects

(A) Rodeo Creek Enhancement: Enhance existing flood control channel by planting native vegetation and creating riparian habitat. Construct a detention basin upstream to offset the loss in capacity created by the riparian vegetation in the channel. This project is seeking funding. Lead Agency: Contra Costa County Flood Control. Anticipated project completion: 2008.

Carquinez Restoration Projects

(B) Canada Del Cierbo: Restore riparian habitat and re-establish creek meander to a creek that was historically rerouted for agricultural purposes. This project was funded by Contra Costa County. Anticipated project completion: 2006.

(C) Edwards Creek Native Planting: Removed non-native invasive plants and re-vegetated riparian areas with local native plants. This project was funded by the U.S. Environmental Protection Agency and the California Coastal Conservancy. Lead Agency: Carquinez Regional Environmental Education Center (CREEC) partnered with the Lindsay Wildlife Museum, Diablo Valley College and John Swett Unified School District students. Project completed: 1999.

(D) Elkhorn Creek Phase 1: Restored riparian area with emphasis on butterfly host and nectar plants. Removed non-native blackberries and re-vegetated with locally propagated native plants. This project was funded by the California Coastal Conservancy. Lead Agency: Carquinez Regional Environmental Education Center (CREEC) partnered John Swett Unified School District students. Project completed: 2002.

Organizations Active in the Watershed

Carquinez Regional Environmental Education Center (CREEC)

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Friends of Refugio and Rodeo Watersheds

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