



Lagunitas Creek Watershed

Area	Hydrologic Units	Calwater Subbasins ---	(Planning Watersheds)
69,646 Acres	18050005	2201130101	Halleck Creek (5,478 Acres)
28,185 Hectares	4th Field HUC	2201130102	Nicasio Reservoir (10,205 Acres)
109 Square Miles		2201130103	Nicasio Creek (7,936 Acres)
	2201	2201130201	Kent Lake (6,288 Acres)
Location	4th Field Calwater	2201130202	San Geronimo Creek (5,995 Acres)
Marin County		2201130203	Lower Lagunitas Ck (9,081 Acres)
		2201130204	Upper Lagunitas Ck (8,093 Acres)
		2201130301	Tomasini Canyon (9,196 Acres)
		2201130302	Olema Creek (7,374 Acres)

Species Potential	Miles of Streams with Species Present
Central California Coast Steelhead Santa Cruz Mountains Diversity Stratum - Potentially Independent Population	<u>Steelhead</u> 37 NOAA Fisheries, Critical Habitat Redesignation, 2005
Central California Coast Coho Santa Cruz Mountains Diversity Stratum - Dependent Population	<u>Coho</u> 35 CDFG, Coho Distribution, May 2007

Critical Habitat	Miles of Stream
Central California Coast Steelhead	37 Miles of Stream
Central California Coast Coho	All accessible river reaches between Punta Gorda & San Lorenzo River including 2 San Francisco Bay streams: Arroyo Corte Madera del Presidio and Corte Madera Creek (64 FR 24049)

Coho Intrinsic Potential	Miles
Km of Historical Coho IP (21.5 C mask)	137
% of IP (21.5 C Mask) with Current Coho Distribution	34%

Spence, B. C., et al., 2008. A framework for assessing the viability of threatened and endangered salmon and steelhead in the North-Central California Coast Recovery Domain. NOAA Tech Memo NMFS-SWFSC-423.

Miles of Waterway ^A	Miles	Number of Dams ^C
Naturally Occurring Waterways		26
Pipeline	1	7 - Impassable
Intermittent Stream	130	5 - Not a Barrier
Perennial Stream	80	2 - Temporal Barriers
Artificial Path	30	5 - Partial Barriers
		7 - Unknow Barrier Status

^CPassage Assessment Database,
Pacific States Marine Fisheries Commission, 2008

^AUSGS National Hydrography Dataset, High Resolution, 2004. 1:24,000

USGS Gaging Stations ^B	Number of Barriers ^C
11460440	166
Lagunitas Creek near Nicasio	26 Dams
11460600	77 Road Crossings (18 Impassable, 36 Temp. &/or Partially Impassable)
Lagunitas Creek near Pt. Reyes	46 Diversions (Unknown Barrier Status)

^CPassage Assessment Database,
Pacific States Marine Fisheries Commission, 2008



Average Annual Precipitation^E	Average Annual Precipitation Range^E
41.7"	35 - 55"

^ECalifornia Mean Annual Precipitation Zones, 1900-1960, CA Department of Forestry, 1990

Roads^A	Miles
Roads in Watershed	
Secondary and connecting road, state highways	10
Local, neighborhood, and rural road, city street, unseparated	236
Vehicular trail, 4WD	19
Driveway or service road	15
Total Miles	281

Road Density	
Miles of Roads per SqMi of Watershed	2.6
Miles of Roads per SqMi of 100m Riparian Buffer*	3.3

*Buffer is 100 meters on either side of the stream centerline

^AU.S. Census Bureau - Tiger 2000, 2002. 1:24,000

Slope^D	Acres	Percent of watershed
Lands of 0-2 percent slope	2,714	4%
Lands of 2-4 percent slope	1,935	3%
Lands of 4-10 percent slope	5,631	8%
Lands of 10-15 percent slope	4,870	7%
Lands of 15-30 percent slope	18,518	27%
Lands of 30-60 percent slope	31,281	45%
Lands of 60-100 percent slope	4,681	7%
Lands of > 100 percent slope	16	0%

Elevation Range	0-2582 ft.	0-787 m
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^DSlope derived from USGS 10 meter Digital Elevation Models (DEM's)

Vegetation^G	Acres	Percent of watershed
Barren	586	1%
Annual grassland	24,315	35%
Conifer Forest		
Closed Cone-Pine-Cypress	932	1%
Douglas Fir	11,762	17%
Montane Hardwood-Conifer	892	1%
Redwood	2,278	3%
Herbaceous	754	1%
Hardwood Forest		
Montane Hardwood	11,325	16%
Montane Riparian	20	0%
Hardwood Woodland		
Coastal Oak Woodland	7,169	10%
Eucalyptus	30	0%
Valley Foothill Riparian	1,698	2%
Shrub	3,492	5%
Urban	2,123	3%
Water	1,937	3%
Wetland	368	1%

^GMulti-source Land Cover Data (2002 v2), CA Department of Forestry, 2002. 100 meter Grid



Erodability of Watershed^F	Acres	Percent of watershed
Rank 5	16,569	24%
Rank 6	53,074	76%

^FDepartment of Conservation, Division of Mines and Geology; minimum mapping unit: approx. 8000 acres
Watersheds were rated based on slope, precipitation, and lithologic susceptibility to failure. Total erosion potential is based on a combination of the landslide potential, debris slide potential, and the surface erosion potential. Rating 0-10 [0 = Low slide potential, 10 = High slide potential]

Land Ownership^H	Acres	Percent of watershed
Private	33,579	48%
Local, Open Space	1,646	2%
Local, Water District	15,734	23%
State, Fish & Game	163	0%
State (Parks & Recreation)	2,649	4%
Federal, Military	50	0%
Federal, NPS	15,825	23%

^HManagement Landscape, CA Department of Forestry, 2002

Population^I	Housing^I
Total Population within the watershed -- 6,257 People	Total Housing Units within the watershed -- 2,651 Houses
	Housing Density
	0 to Less than 1 Housing Unit / 160 Acres 77%
	1 Unit / 160 Acres to 1 Unit / 20 Acres 14%
	1 Unit / 20 Acres to 1 Unit / 5 Acres 5%
	1 Unit / 5 Acres to 2 Units / Acre 4%
	2 Units / Acres to Greater than or Equal to 5 Units / Acre

^ICensus 2000 Block Data (Migrated), CA Department of Forestry, 2003



Lagunitas Creek

Vegetation density and age class in the entire watershed

California Department of Forestry and Fire Protection; fveg02_2. Vector digital dataset. 100m Grid, 2002.

Acres

Size	Density	Agriculture	Barren	Conifer Forest	Conifer Woodland	Hardwood Forest	Hardwood Woodland	Herbaceous	Shrub	Urban	Water	Wetland	Grand Total by Size class
Not Determined	Not Determined		588					25138		2130	1945	373	
	S												
	P				57		91						
	M				79	5	82						
	D				166	7	521						
	Total		588	302	12	694	25138	0	2130	1945	373	31182	
Seedling	S												
	P												
	M												
	D												
	Total												0
Sapling	S					7			15				
	P				67	20	2						
	M				69	361	141						
	D				175	385	452						
	Total				311	773	595		15				1694
Pole	S				10		7						
	P				7	10	2						
	M				35	151	42						
	D				1441	1838	1594		314				
	Total				1493	1999	1645		314				5451
Small Tree	S				114	10	27						
	P				193		143						
	M				825	445	247						
	D				12286	8117	5478		3133				
	Total				13418	8572	5895		3133				31018
Medium/Large Tree	S												
	P												
	M				30	7							
	D				74	7	37						
	Total				104	14	37						155
Multi Layered	D				141								
	Total				141								141
Grand Total by Species Type			588	15769	11370	8866	25138	3462	2130	1945	373		69641

SIZE	Description	Diameter at Breast Height (DBH)
Not Determined		N/A
Seedling		Less Than 1 inch
Sapling		1 to 6 inches
Pole		6 to 11 inches
Small Tree		11 to 24 inches
Medium/Large Tree		Greater Than 24 inches
Multi Layered		Size 5 Over Size 4 Or 3; Total Tree Crown Closure Greater Than 60%

Percent

Size	Density	Agriculture	Barren	Conifer Forest	Conifer Woodland	Hardwood Forest	Hardwood Woodland	Herbaceous	Shrub	Urban	Water	Wetland	Grand Total by Size class		
Not Determined	Not Determined			1%				36%		3%	3%	1%			
	S														
	P				0%		0%								
	M				0%		0%								
	D				0%		0%	1%							
	Total			1%	0%	0%	1%	36%	3%	3%	1%	45%			
Seedling	S														
	P														
	M														
	D														
	Total												0%		
Sapling	S						0%		0%						
	P						0%	0%	0%						
	M						0%	1%	0%						
	D						0%	1%	1%						
	Total						0%	1%	1%	0%			2%		
Pole	S						0%		0%						
	P						0%	0%	0%						
	M						0%	0%	0%						
	D						2%	3%	2%	0%					
	Total						2%	3%	2%	0%			7%		
Small Tree	S						0%	0%	0%						
	P						0%	0%	0%						
	M						1%	1%	0%						
	D						18%	12%	8%	4%					
	Total						19%	12%	8%	4%			45%		
Medium/Large Tree	S														
	P														
	M														
	D														
	Total												0%		
Multi Layered	D														
	Total												0%		
Grand Total by Species Type					1%	23%		16%	13%	36%	5%	3%	3%	1%	100%

SIZE (SHRUB)	Desc.	Crown Decadence	DENSITY	Description
Not Determined		N/A		None
Seedling Shrub		Seedlings or sprouts < 3 years	S	10 to 24%
Young Shrub		None	P	25 to 39%
Mature Shrub		1 - 25%	M	40 to 59%
Decadent Shrub		> 25%	D	60 to 100%

Lagunitas Creek

Vegetation within Riparian Buffer (100 meter on either side of stream)

California Department of Forestry and Fire Protection; fveg02_2. Vector digital dataset. 100m Grid, 2002.

Acres														
Size	Density	Agriculture	Barren	Conifer Forest	Conifer Woodland	Hardwood Forest	Hardwood Woodland	Herbaceous	Shrub	Urban	Water	Wetland	Grand Total by Size class	
Not Determined	Not Determined		225.0					4376.0	761.0	#####		131.0		
	S													
	P			22.0			47.0							
	M			37.0			32.0							
	D			59.0		5.0	351.0							
	Total		225.0	118.0	5.0	430.0	4376.0	761.0	#####		131.0	7380		
Seedling	S													
	P													
	M													
	D													
	Total												0	
Sapling	S													
	P			2.0										
	M			5.0		82.0	74.0							
	D			40.0		42.0	252.0							
	Total			47.0		124.0	326.0						497	
Pole	S			7.0			5.0							
	P						2.0							
	M			5.0		27.0	30.0							
	D			329.0		457.0	773.0		57.0					
	Total			341.0		484.0	810.0		57.0				1692	
Small Tree	S			20.0		5.0	25.0							
	P			44.0			74.0							
	M			59.0		116.0	99.0							
	D			2918.0		1878.0	2535.0		591.0					
	Total			3041.0		1999.0	2733.0		591.0				8364	
Medium/Large Tree	S													
	P													
	M			15.0										
	D			35.0			10.0							
	Total			50.0			10.0						60	
Multi Layered	D			47.0										
	Total			47.0									47	
Grand Total by Species Type			0	225	3644	0	2612	4309	4376	648	761	1334	131	18040

SIZE	Description	Diameter at Breast Height (DBH)
Seedling		Less Than 1 inch
Sapling		1 to 6 inches
Pole		6 to 11 inches
Small Tree		11 to 24 inches
Medium/Large Tree		Greater Than 24 inches
Multi Layered		Size 5 Over Size 4 Or 3; Total Tree Crown Closure Greater Than 60%

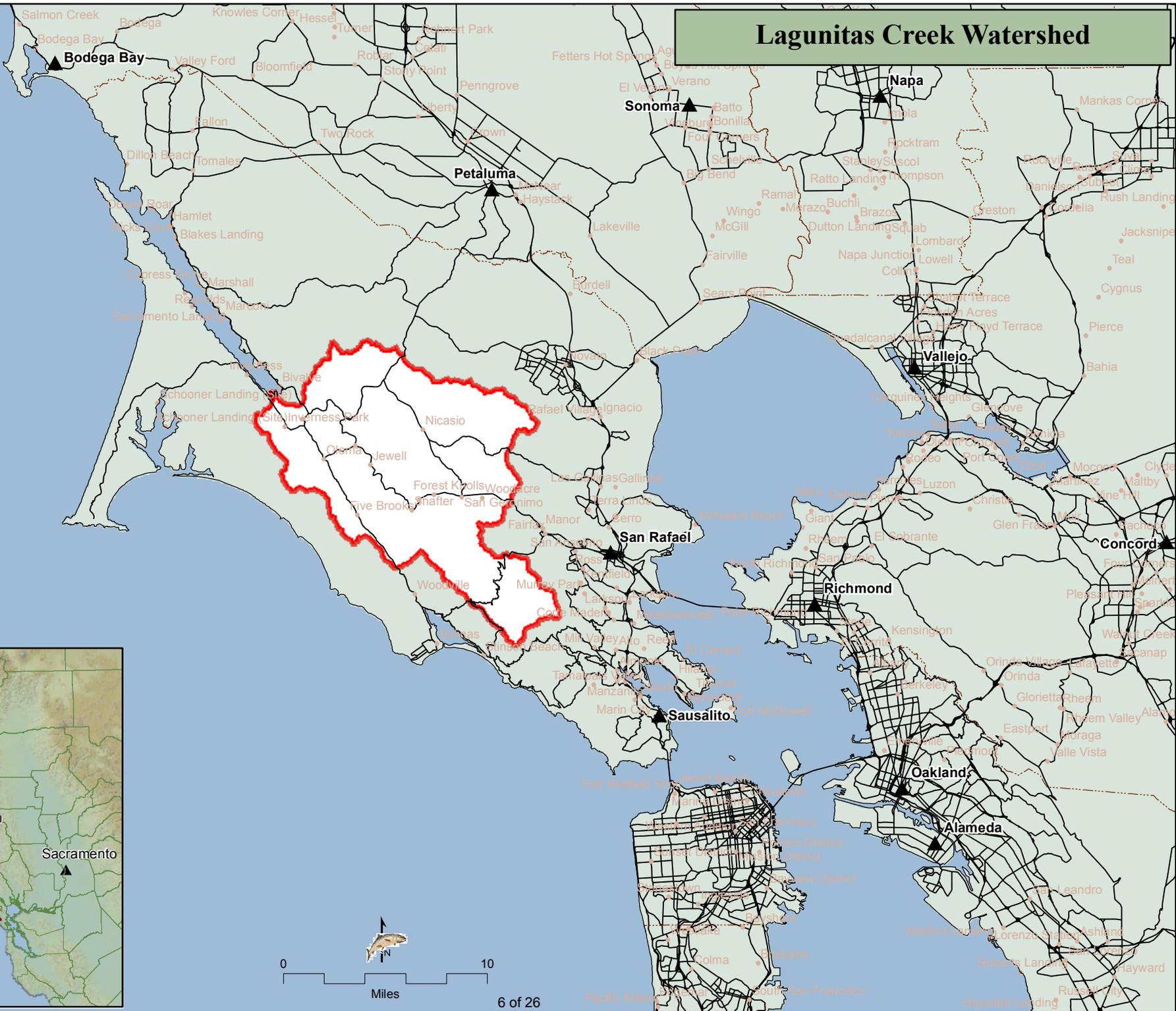
Percent														
Size	Density	Agriculture	Barren	Conifer Forest	Conifer Woodland	Hardwood Forest	Hardwood Woodland	Herbaceous	Shrub	Urban	Water	Wetland	Grand Total by Size class	
Not Determined	Not Determined		1%					24%		4%	7%	1%		
	S													
	P			0%			0%							
	M			0%			0%							
	D			0%		0%	2%							
	Total		1%	1%	0%	2%	24%		4%	7%	1%	41%		
Seedling	S													
	P													
	M													
	D													
	Total												0%	
Sapling	S													
	P													
	M					0%	0%	0%						
	D					0%	0%	1%						
	Total					0%	1%	2%					3%	
Pole	S			0%			0%							
	P			0%		0%	0%							
	M			0%		0%	0%							
	D			2%		3%	4%		0%					
	Total			2%		3%	4%		0%				9%	
Small Tree	S			0%		0%	0%							
	P			0%		0%	0%							
	M			0%		1%	1%							
	D			16%		10%	14%		3%					
	Total			17%		11%	15%		3%				46%	
Medium/Large Tree	S													
	P													
	M					0%								
	D					0%	0%							
	Total					0%	0%						0%	
Multi Layered	D			0%										
	Total			0%									0%	
Grand Total by Species Type			0%	1%	20%	0%	14%	24%	24%	3%	4%	7%	1%	100%

SIZE (SHRUB)	Desc.	Crown Decadence	DENSITY	Description
Not Determined		N/A	S	10 to 24%
Seedling Shrub		Seedlings or sprouts < 3 years	P	25 to 39%
Young Shrub		None	M	40 to 59%
Mature Shrub		1 - 25%	D	60 to 100%
Decadent Shrub		> 25%		



NMFS-SWR-HCD
June 2008

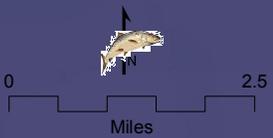
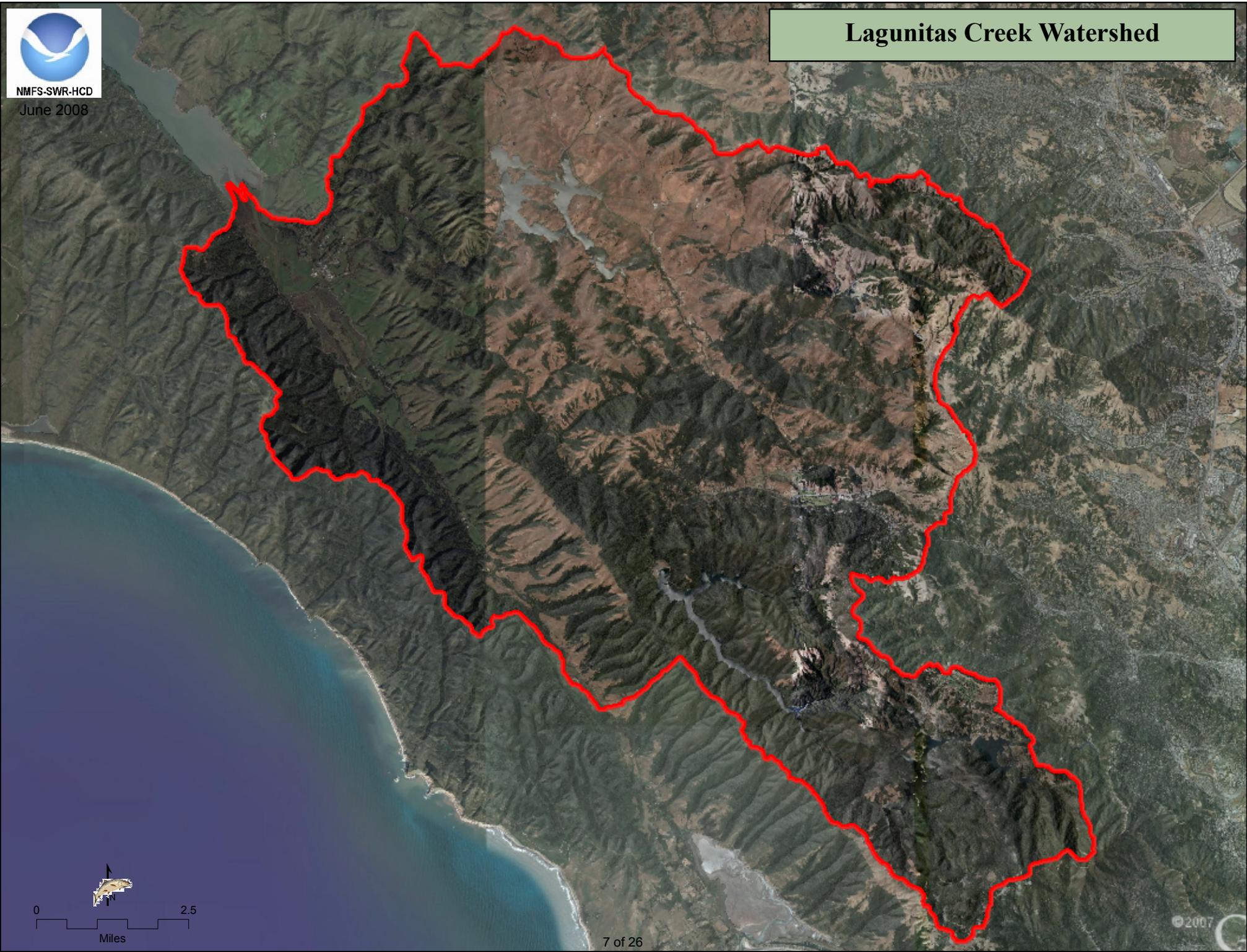
Lagunitas Creek Watershed





NMFS-SWR-HCD
June 2008

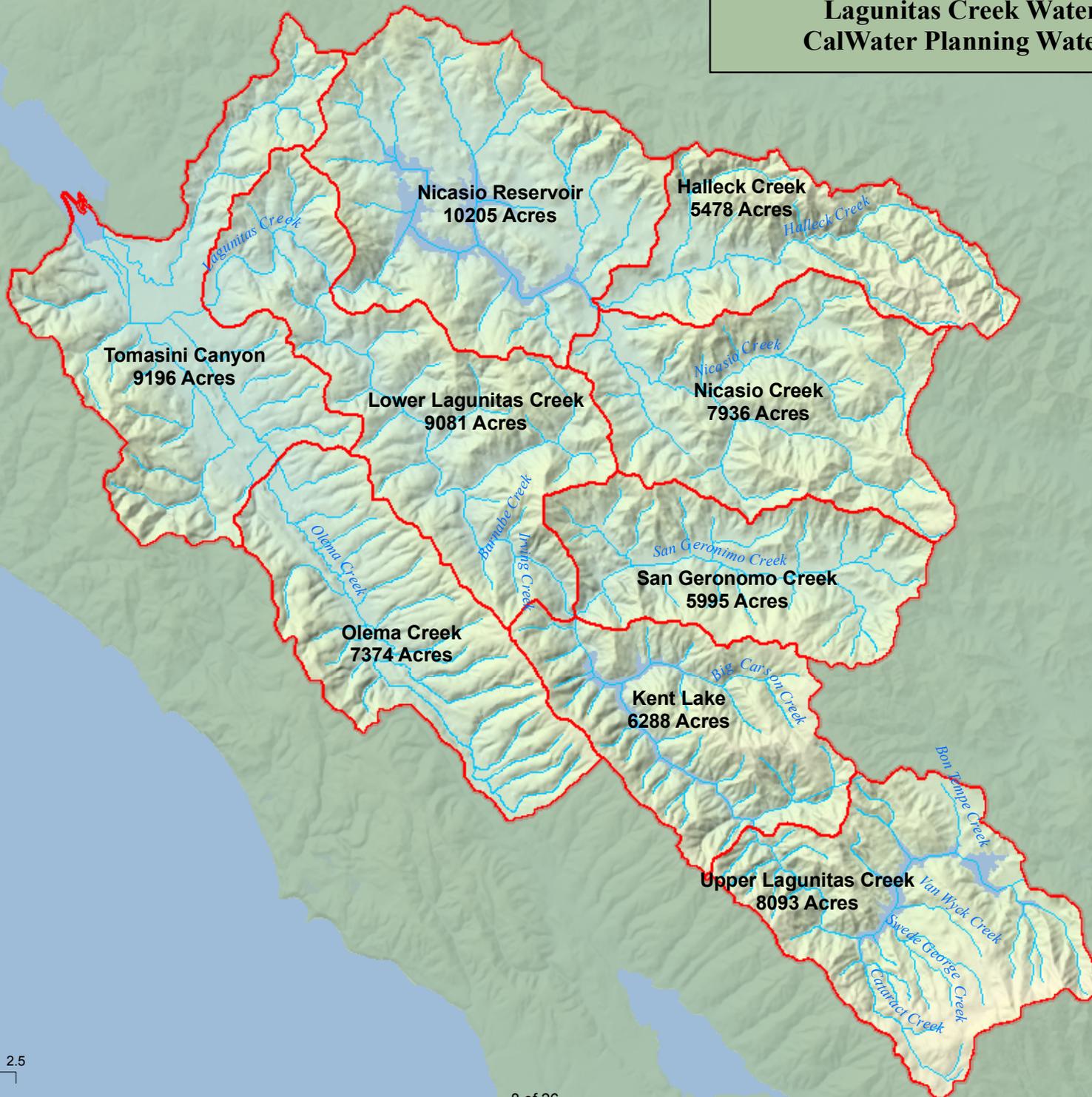
Lagunitas Creek Watershed





NMFS-SWR-HCD
June 2008

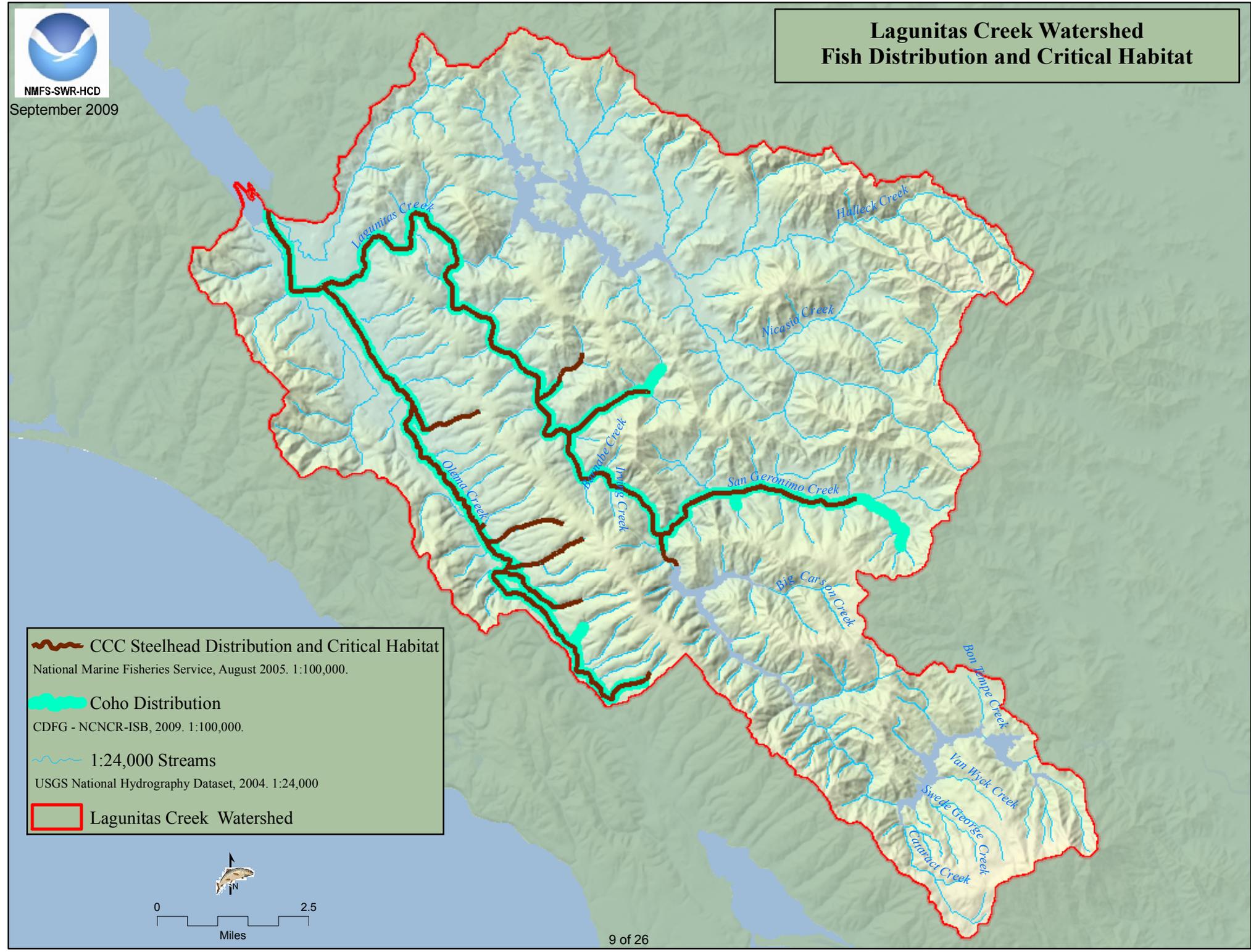
Lagunitas Creek Watershed CalWater Planning Watersheds



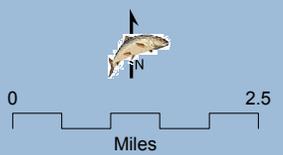


NMFS-SWR-HCD
September 2009

Lagunitas Creek Watershed Fish Distribution and Critical Habitat



-  CCC Steelhead Distribution and Critical Habitat
National Marine Fisheries Service, August 2005. 1:100,000.
-  Coho Distribution
CDFG - NCNCR-ISB, 2009. 1:100,000.
-  1:24,000 Streams
USGS National Hydrography Dataset, 2004. 1:24,000
-  Lagunitas Creek Watershed



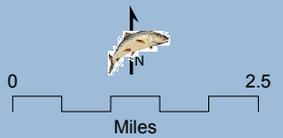


NMFS-SWR-HCD
June 2008

Lagunitas Creek Watershed Steelhead Current vs. Historical



-  Current CCC Steelhead Distribution
National Marine Fisheries Service, August 2005. 1:100,000.
-  Steelhead Intrinsic Potential
NMFS SWR Fisheries Science Center, 2005.
Potential historical suitable habitat
-  1:24,000 Streams
USGS National Hydrography Dataset, 2004. 1:24,000
-  Lagunitas Creek Watershed



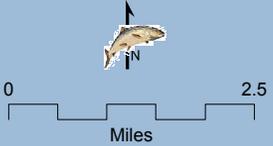


NMFS-SWR-HCD
September 2009

Lagunitas Creek Watershed Coho Current vs. Historical



-  **Current Coho Distribution**
CDFG - NCNCR-ISB, 2009. 1:100,000.
-  **Coho Intrinsic Potential**
NMFS SWR Fisheries Science Center, 2005.
Potential historical suitable habitat
-  **1:24,000 Streams**
USGS National Hydrography Dataset,
2004. 1:24,000
-  **Lagunitas Creek Watershed**

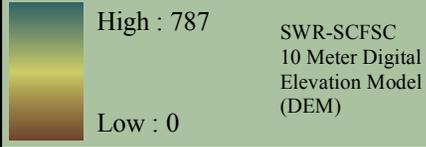




NMFS-SWR-HCD
June 2008

Lagunitas Creek Watershed Elevation

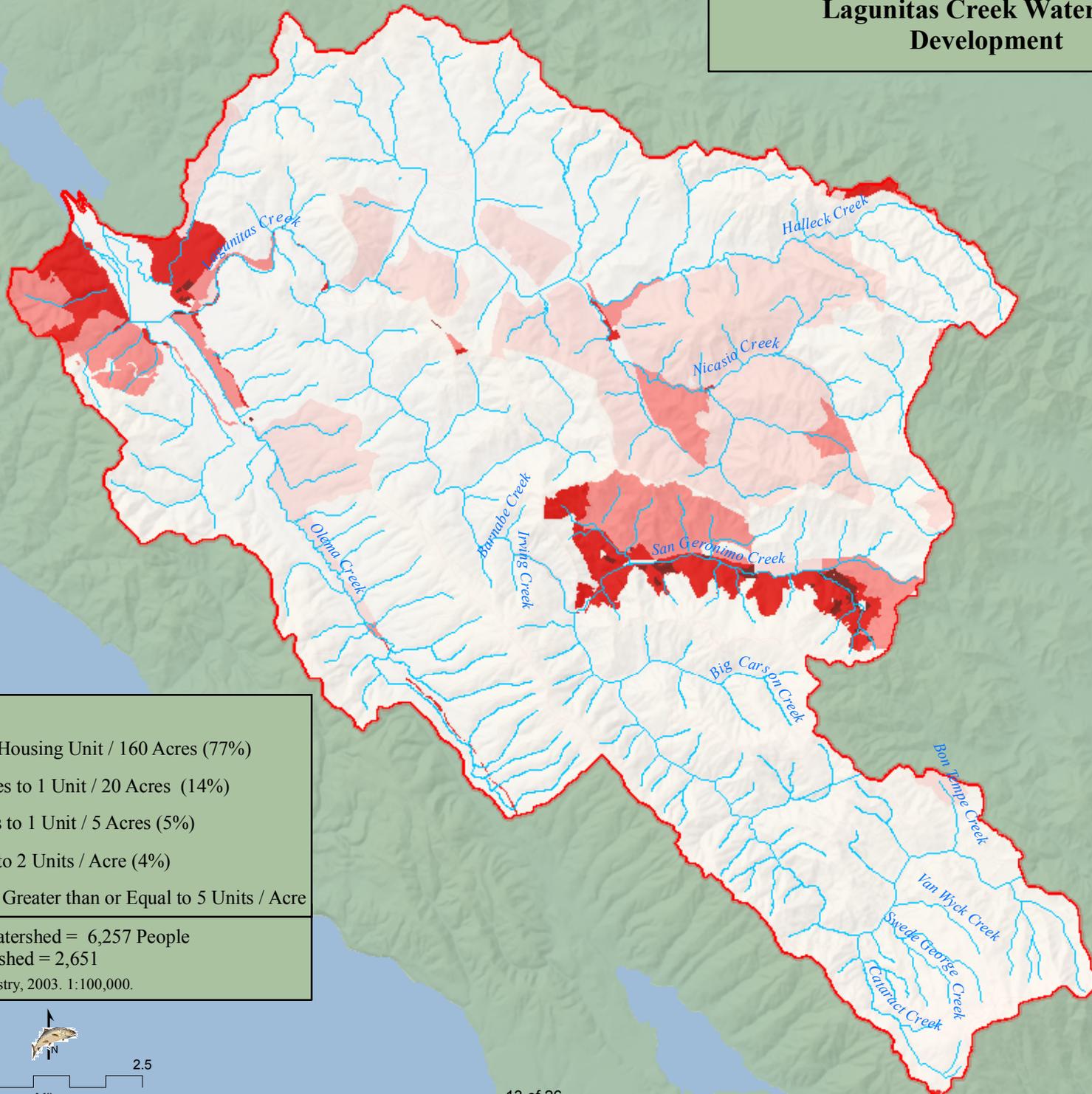
Lagunitas Creek Elevation (Meters)





NMFS-SWR-HCD
June 2008

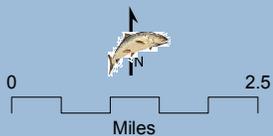
Lagunitas Creek Watershed Development



Housing Density

- 0 to Less than 1 Housing Unit / 160 Acres (77%)
- 1 Unit / 160 Acres to 1 Unit / 20 Acres (14%)
- 1 Unit / 20 Acres to 1 Unit / 5 Acres (5%)
- 1 Unit / 5 Acres to 2 Units / Acre (4%)
- 2 Units / Acre to Greater than or Equal to 5 Units / Acre

Population within the Watershed = 6,257 People
Houses within the Watershed = 2,651
California Department of Forestry, 2003. 1:100,000.





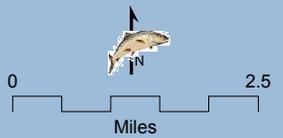
NMFS-SWR-HCD
June 2008

Lagunitas Creek Watershed Ownership



Ownership
California Department of Forestry, 1999. 1:100,000.

- Private
- Local, Open Space Preserve
- Local, Water District
- State, Fish & Game
- State, Parks & Recreation
- Federal, Military
- Federal, NPS





NMFS-SWR-HCD
June 2008

Lagunitas Creek Watershed Road Density

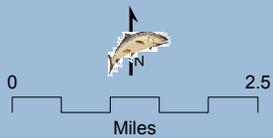


 Road
 U.S. Census Bureau - Tiger 2000, 2002. 1:24,000

Road Density (Miles of Road per Square Mile of Watershed)

	0.88 - 1.50
	1.51 - 2.50
	2.51 - 3.25
	3.26 - 6.34

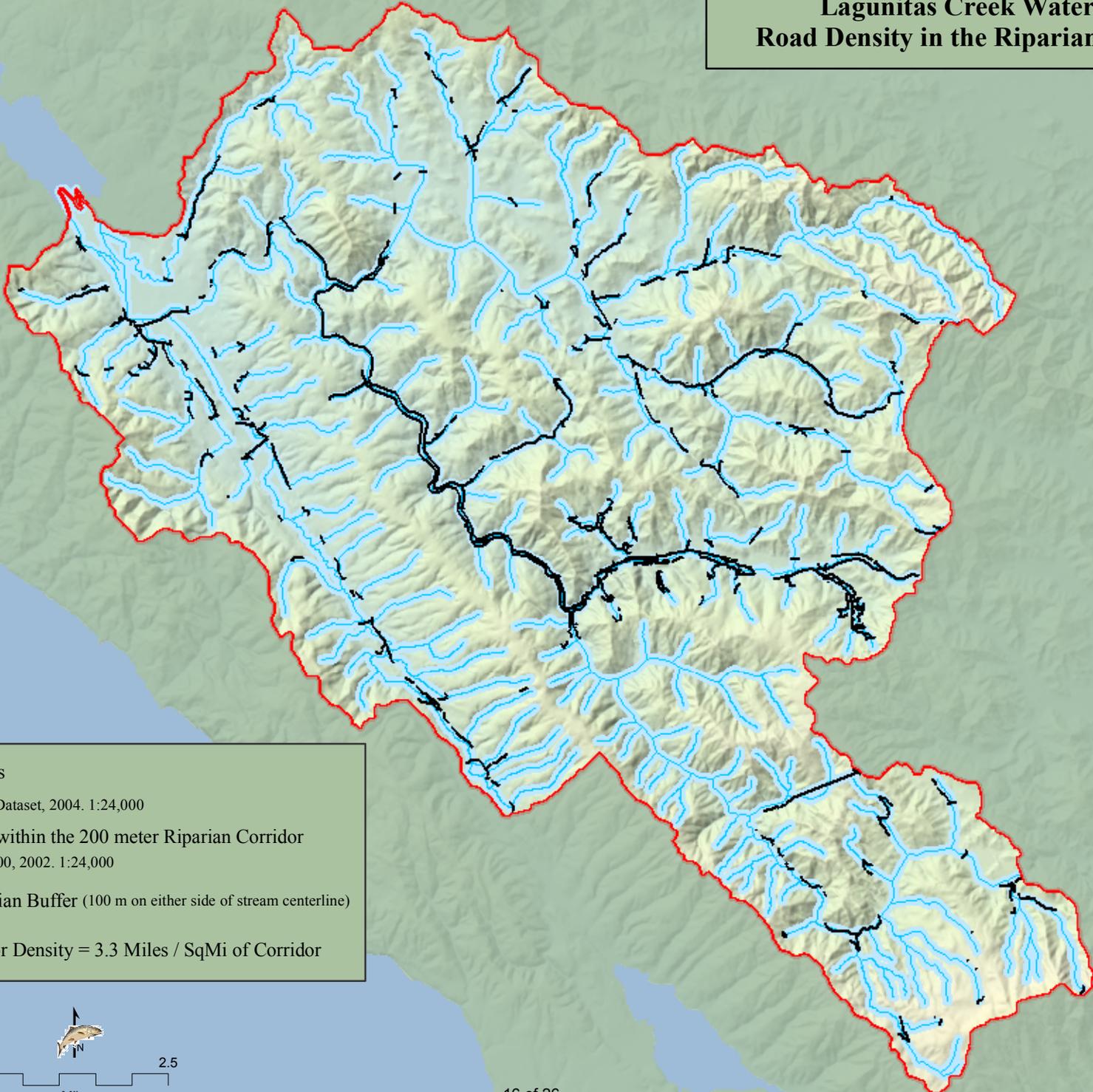
Overall Watershed
 Density = 2.6 Miles / SqMi





NMFS-SWR-HCD
June 2008

Lagunitas Creek Watershed Road Density in the Riparian Corridor

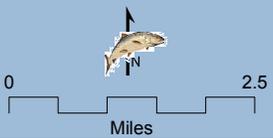


 1:24,000 Streams
USGS National Hydrography Dataset, 2004. 1:24,000

 Road Segments within the 200 meter Riparian Corridor
U.S. Census Bureau - Tiger 2000, 2002. 1:24,000

 200 Meter Riparian Buffer (100 m on either side of stream centerline)

Overall Riparian Corridor Density = 3.3 Miles / SqMi of Corridor



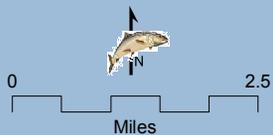
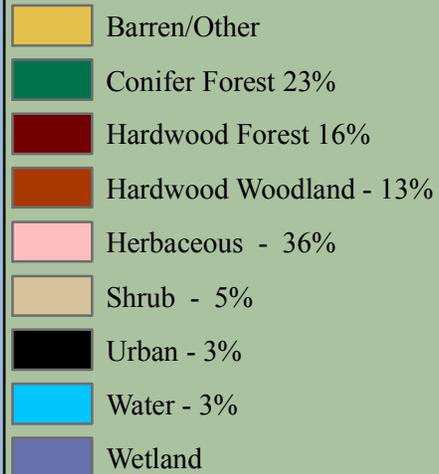


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June 2008

Lagunitas Creek Watershed Vegetation

WHR13 Vegetation Classification

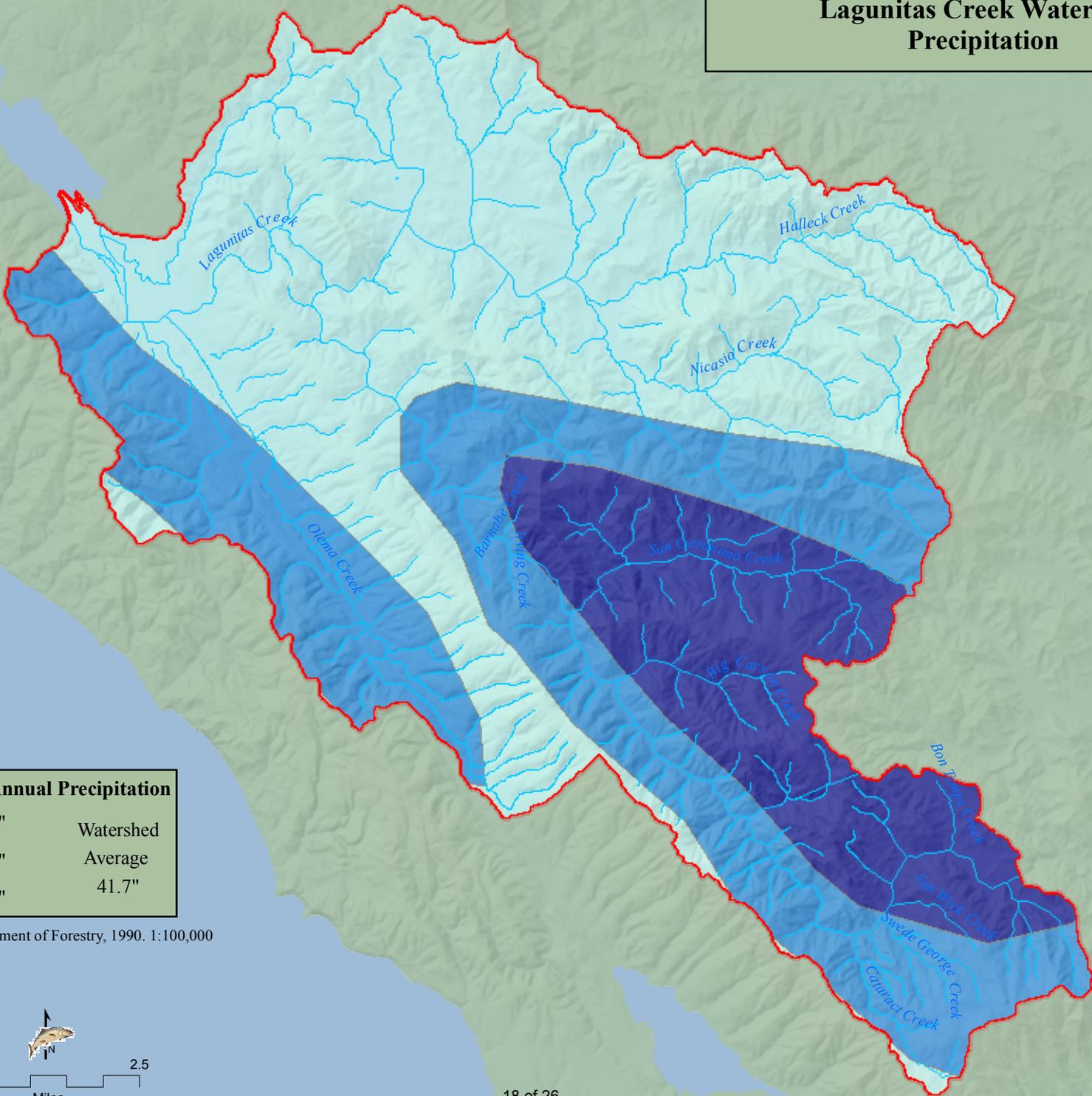
California Department of Forestry, 2002.100 meter Grid





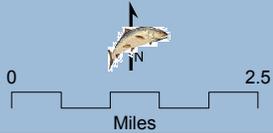
NMFS-SWR-HCD
June 2008

Lagunitas Creek Watershed Precipitation



1900-1960 Annual Precipitation	
Light Blue	to 35" Watershed
Medium Blue	to 45" Average
Dark Blue	to 55" 41.7"

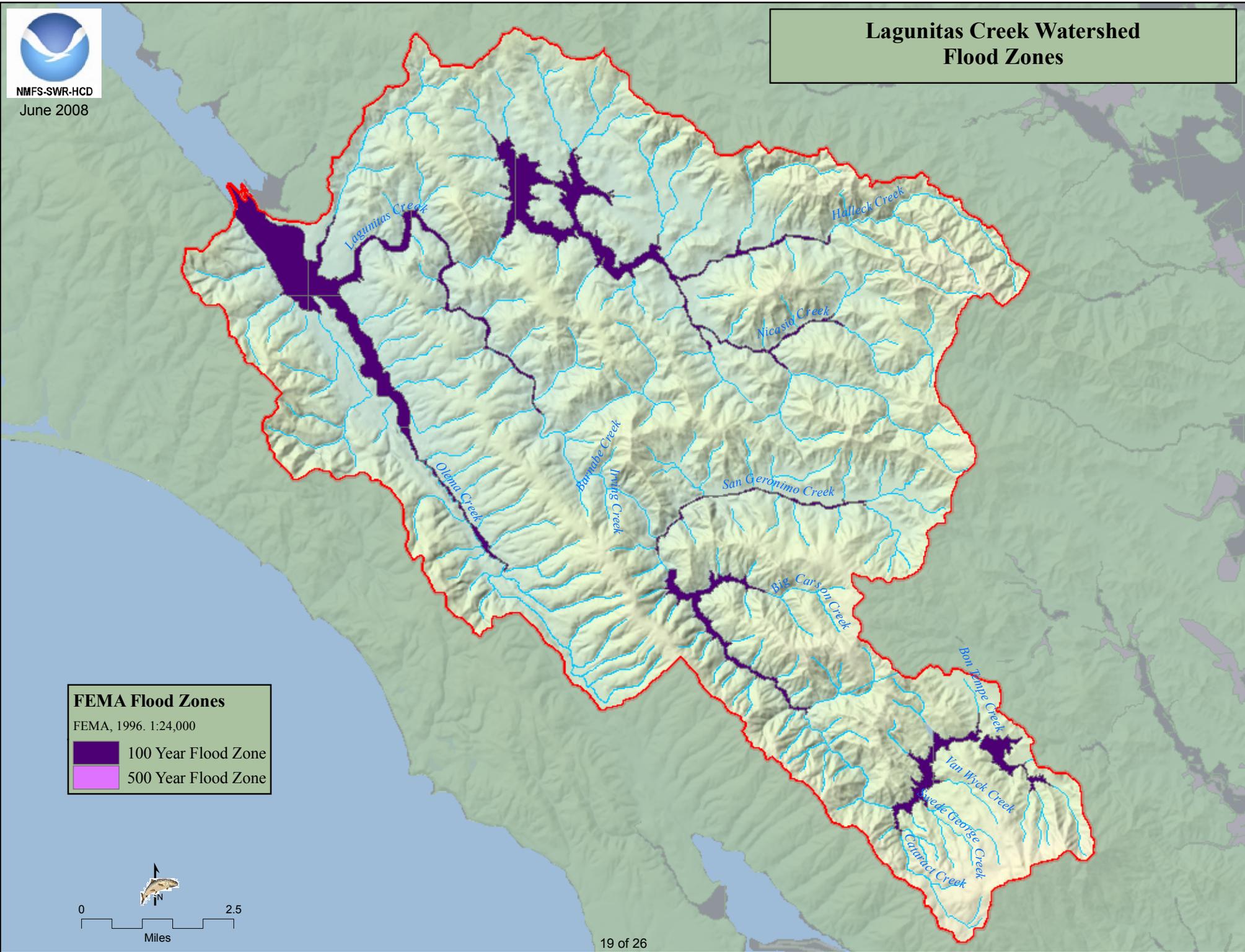
California Department of Forestry, 1990. 1:100,000





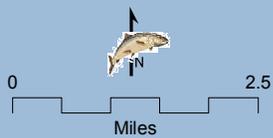
NMFS-SWR-HCD
June 2008

Lagunitas Creek Watershed Flood Zones



FEMA Flood Zones
 FEMA, 1996. 1:24,000

-  100 Year Flood Zone
-  500 Year Flood Zone





NMFS-SWR-HCD
June 2008

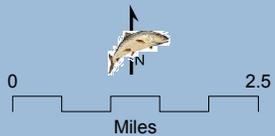
Lagunitas Creek Watershed Erosion



Erosion Potential

CA Dept of Conserv., Div. of Mines & Geology 1994

	5	1 = Low Erosion Potential
	6	10 = High Erosion Potential





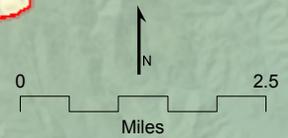
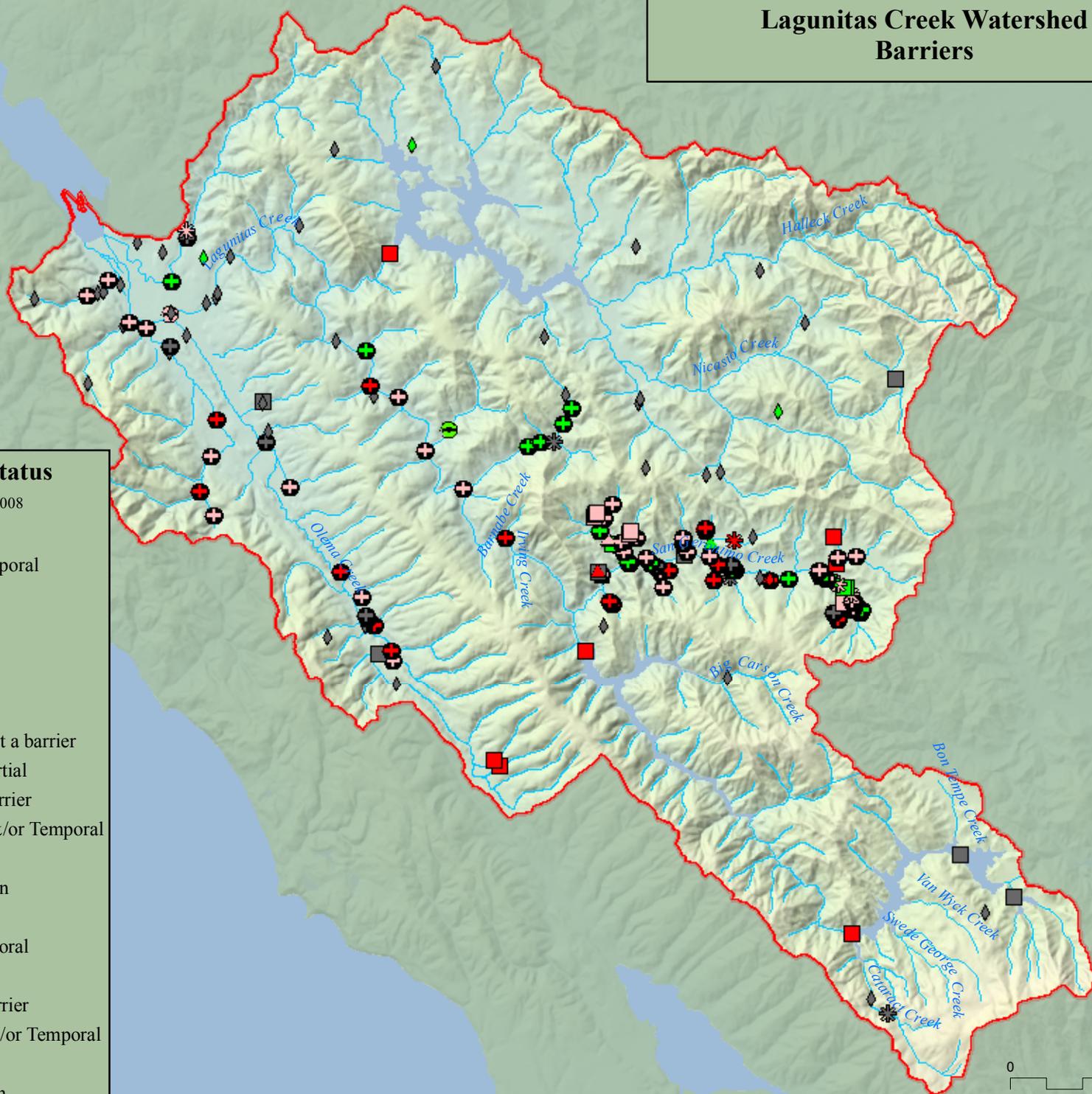
NMFS-SWR-HCD
June 2008

Lagunitas Creek Watershed Barriers

Barrier Type, Barrier Status

CA Fish Passage Assessment, PSMFC, 2008

- Dam, Not a barrier
- Dam, Partial; Dam, Temporal
- Dam, Total
- Dam, Unknown
- ◆ Diversion, Not a barrier
- ◆ Diversion, Total
- ◆ Diversion, Unknown
- ◀▶ Fish passage facility, Not a barrier
- ◀▶ Fish passage facility, Partial
- ✱ Non-structural, Not a barrier
- ✱ Non-structural, Partial &/or Temporal
- ✱ Non-structural, Total
- ✱ Non-structural, Unknown
- ▲ Other, Not a barrier
- ▲ Other, Partial &/or Temporal
- ▲ Other, Total
- + Road crossing, Not a barrier
- + Road crossing, Partial &/or Temporal
- + Road crossing, Total
- + Road crossing, Unknown





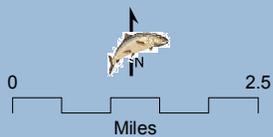
NMFS-SWR-HCD
June 2008

Lagunitas Creek Watershed Industrial Hazards



- hazardous & Solid Waste Sites
- Mine
- Gage Station

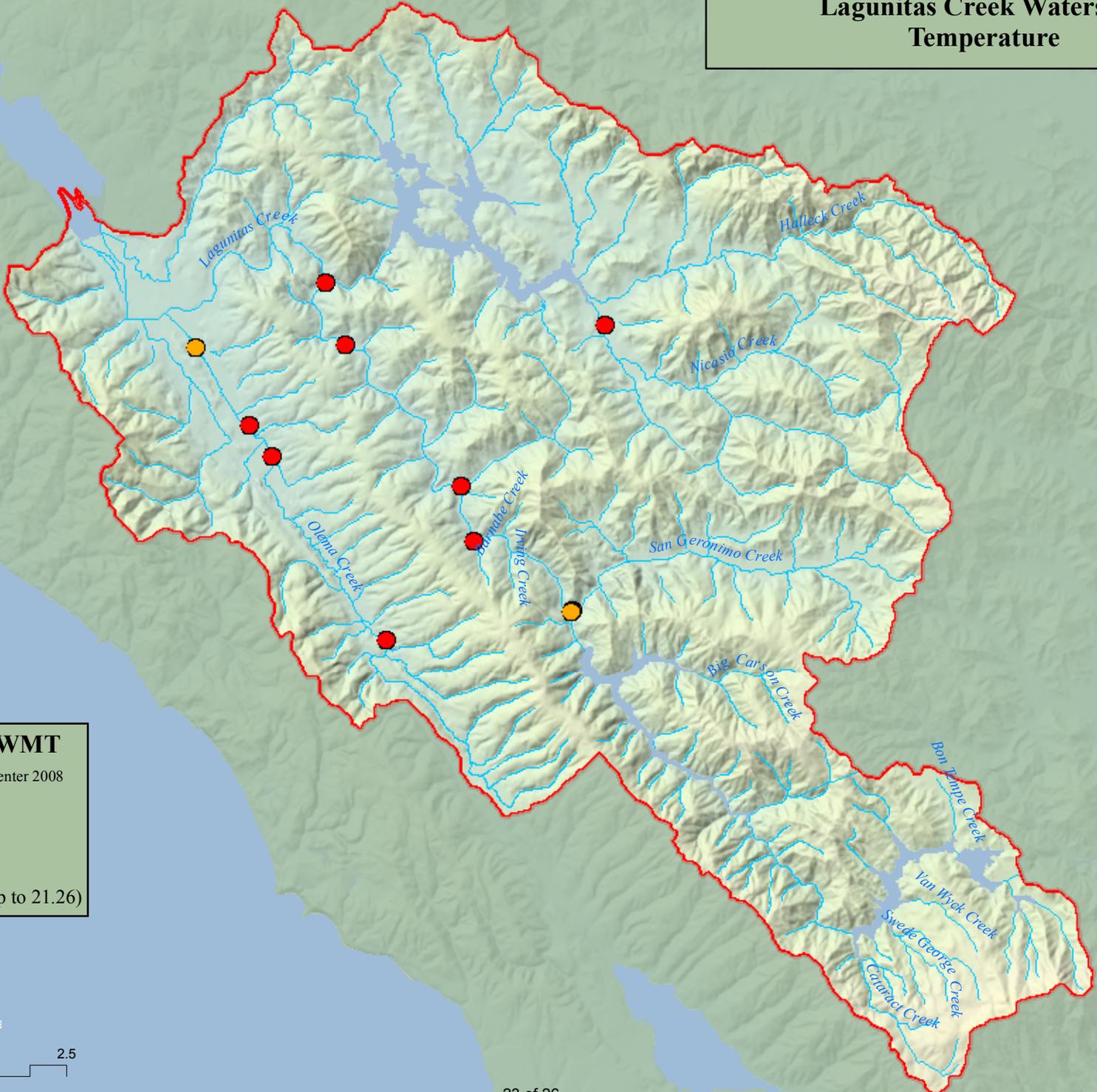
BASINS, USEPA, 2001.





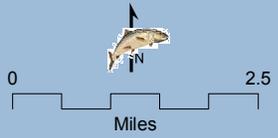
NMFS-SWR-HCD
June 2008

Lagunitas Creek Watershed Temperature



Average MWMT
Sonoma Ecology Center 2008

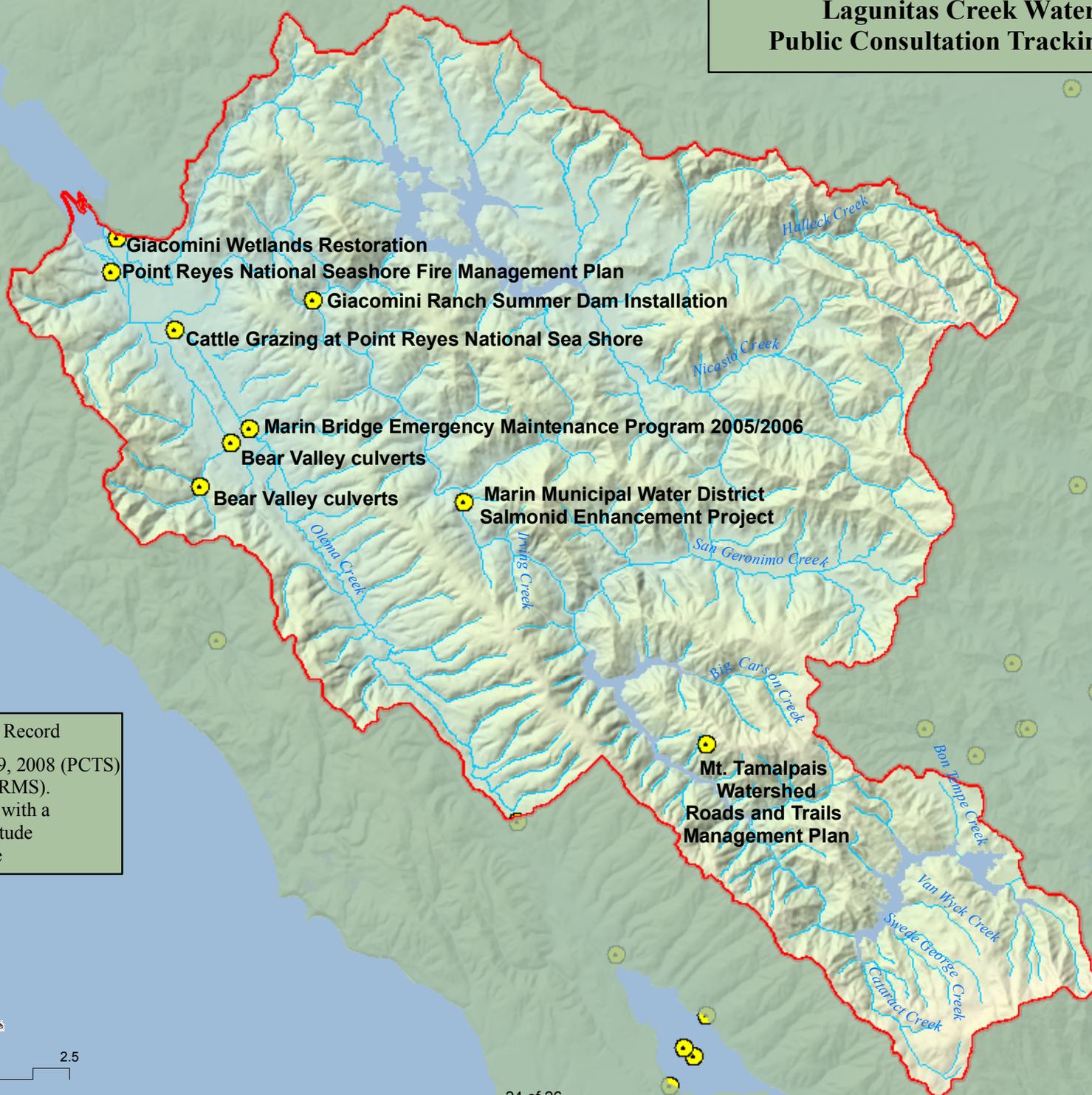
- 0 - 14
- 14 - 15
- 15 - 17
- > 17 (up to 21.26)





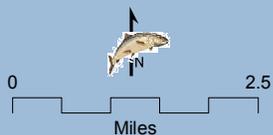
NMFS-SWR-HCD
June 2008

Lagunitas Creek Watershed Public Consultation Tracking System



● RMS / PCTS Record

Current as of May 9, 2008 (PCTS) and Jan. 25, 2008 (RMS). Only those records with a Latitude and Longitude entered appear here



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Acres (20,000 Hectares)

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