

Watershed Characterization

March 2009



Redwood Creek Watershed

Area	Hydrologic Units	Calwater Subbasins ---	(Planning Watersheds)
5,616 Acres	18050005	2201300003	Fern Creek (5616 Acres)
2,273 Hectares	4th Field HUC		
9 Square Miles			

Location	4th Field Calwater
Marin County	

Species Potential	Miles of Streams with Species Present
Central California Coast Steelhead North Coastal Diversity Stratum - Dependent Population	<u>Steelhead</u> 4 NOAA Fisheries, Critical Habitat Redesignation, 2005
Central California Coast Coho Coastal Gualala Diversity Stratum - Dependent Population	<u>Coho</u> 6 CDFG, Coho Distribution, May 2007

Critical Habitat	
Central California Coast Steelhead	4 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)

Miles of Waterway ^A	Miles	Number of Dams ^C
Naturally Occurring Waterways		0
Intermittent Stream	8	
Perennial Stream	12	

^CPassage Assessment Database, Pacific States Marine Fisheries Commission, 2005

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

USGS Gaging Stations ^B	Number of Barriers ^C
11460150 Redwood Creek Near Tamalpais	18
	0 Dams 6 Road Crossings 1 Natural Barrier 11 Diversions

^CPassage Assessment Database, Pacific States Marine Fisheries Commission, 2006

Average Annual Precipitation ^E	Average Annual Precipitation Range ^E
35.2"	27.5 - 45"

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



Roads^A	Miles
Roads in Watershed	
Primary Road / Highway	
Secondary and connecting road, state highways	4
Local, neighborhood, and rural road, city street, unseparated	33
Vehicular trail, 4WD	3
Driveway or service road	
Total Miles	

Road Density	
Miles of Roads per SqMi of Watershed	4.5
Miles of Roads per SqMi of 100m Riparian Buffer*	5.2

*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	42	1%
Lands of 2-4 percent slope	37	1%
Lands of 4-10 percent slope	184	3%
Lands of 10-15 percent slope	242	4%
Lands of 15-30 percent slope	1,406	25%
Lands of 30-60 percent slope	3,284	58%
Lands of 60-100 percent slope	419	7%
Lands of 100-117 percent slope	3	0%

Elevation Range	0 - 2,589 ft.	0 - 789 m

^DSlope derived from USGS 10 meter Digital Elevation Models (DEM's)

Vegetation^G	Acres	Percent of watershed
Annual grassland	655	12%
Barren	96	2%
Conifer Forest		
Closed Cone-Pine-Cypress	2	0%
Douglas Fir	766	14%
Montane Hardwood-Conifer	193	3%
Redwood	801	14%
Hardwood Forest		
Montane Hardwood	91	2%
Hardwood Woodland		
Coastal Oak Woodland	776	14%
Eucalytus	25	0%
Valley Foothill Riparian	121	2%
Herbaceous	161	3%
Shrub	1,816	32%
Urban	57	1%
Water	5	0%
Wetland	49	1%

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

Erodability of Watershed^F	Acres	Percent of watershed
Watershed not Rated		

^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	267	5%
Local (Water District)	917	16%
State (Parks & Recreation)	2,936	52%
Federal (NPS)	1,453	26%
Federal (Military)	43	1%

^HManagement Landscape, CA Department of Forestry, 2002

Population ^I	Housing ^I
Total Population within the watershed -- 393 People	Total Housing Units within the watershed -- 146 Houses
	Housing Density
	0 to Less than 1 Housing Unit / 160 Acres 97%
	1 Unit / 160 Acres to 1 Unit / 20 Acres
	1 Unit / 20 Acres to 1 Unit / 5 Acres
	1 Unit / 5 Acres to 2 Units / Acre 3%
	2 Units / Acres to Greater than or Equal to 5 Units / Acre

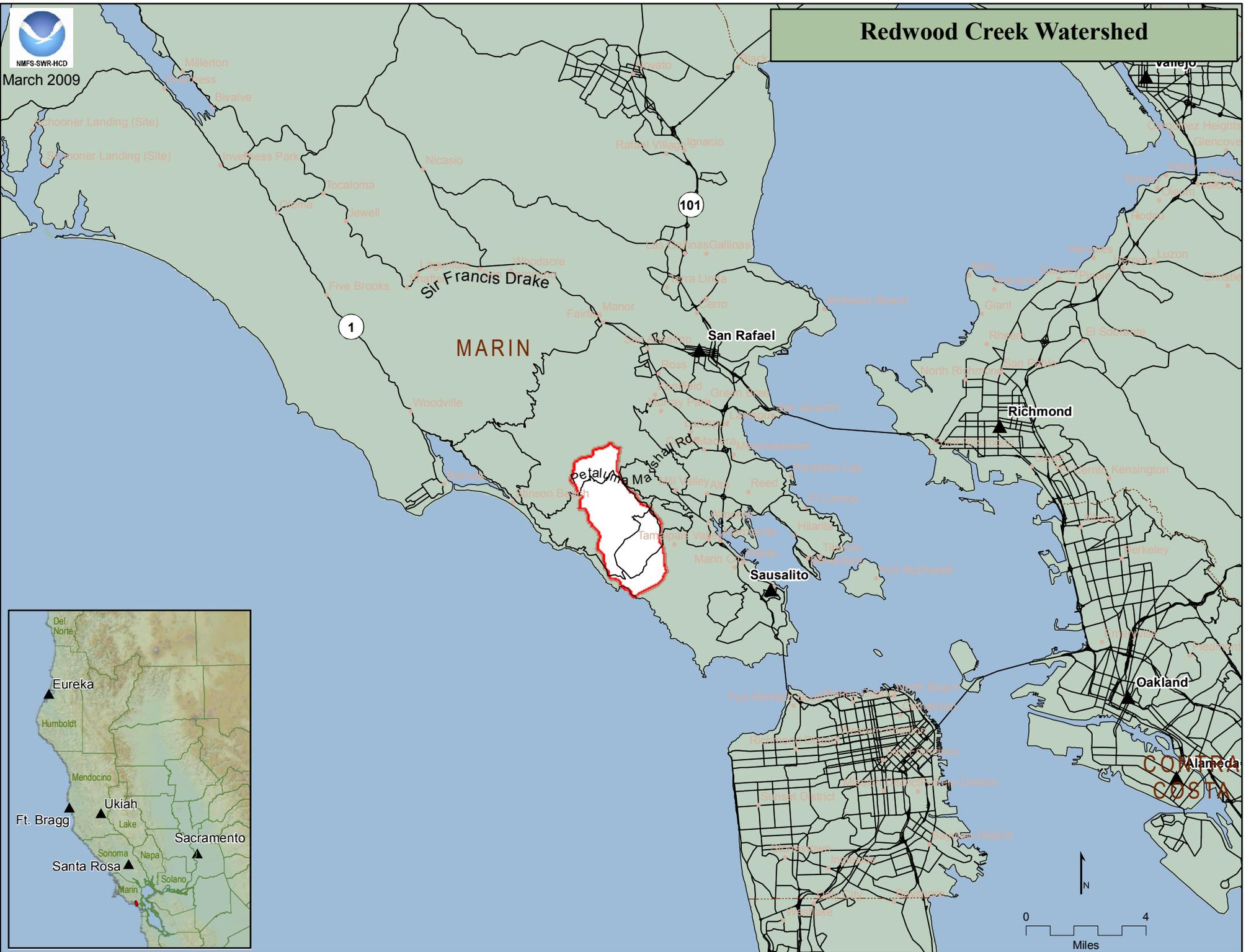
^ICensus 2000 Block Data (Migrated), CA Department of Forestry, 2003





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Redwood Creek Watershed

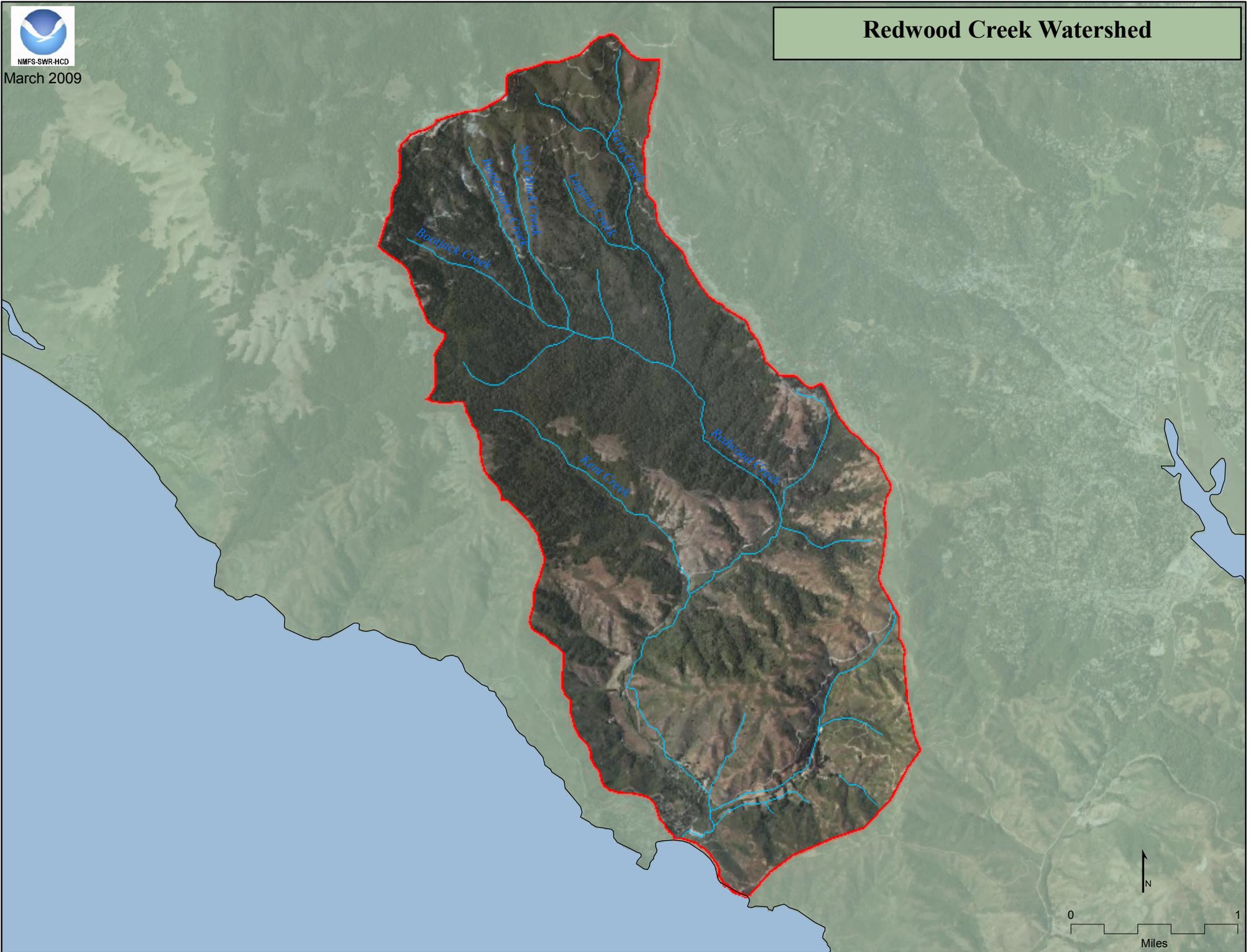




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Redwood Creek Watershed

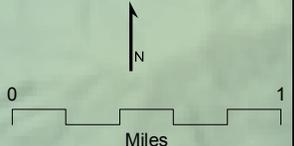




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Redwood Creek Watershed CalWater Planning Watersheds





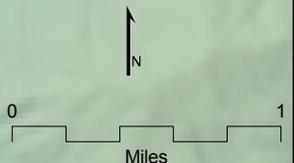
NMFS-SWR-HCD

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Redwood 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, 2007. 1:100,000.
-  1:24,000 Streams
USGS National Hydrography Dataset, 2004. 1:24,000
-  Walker Creek Watershed

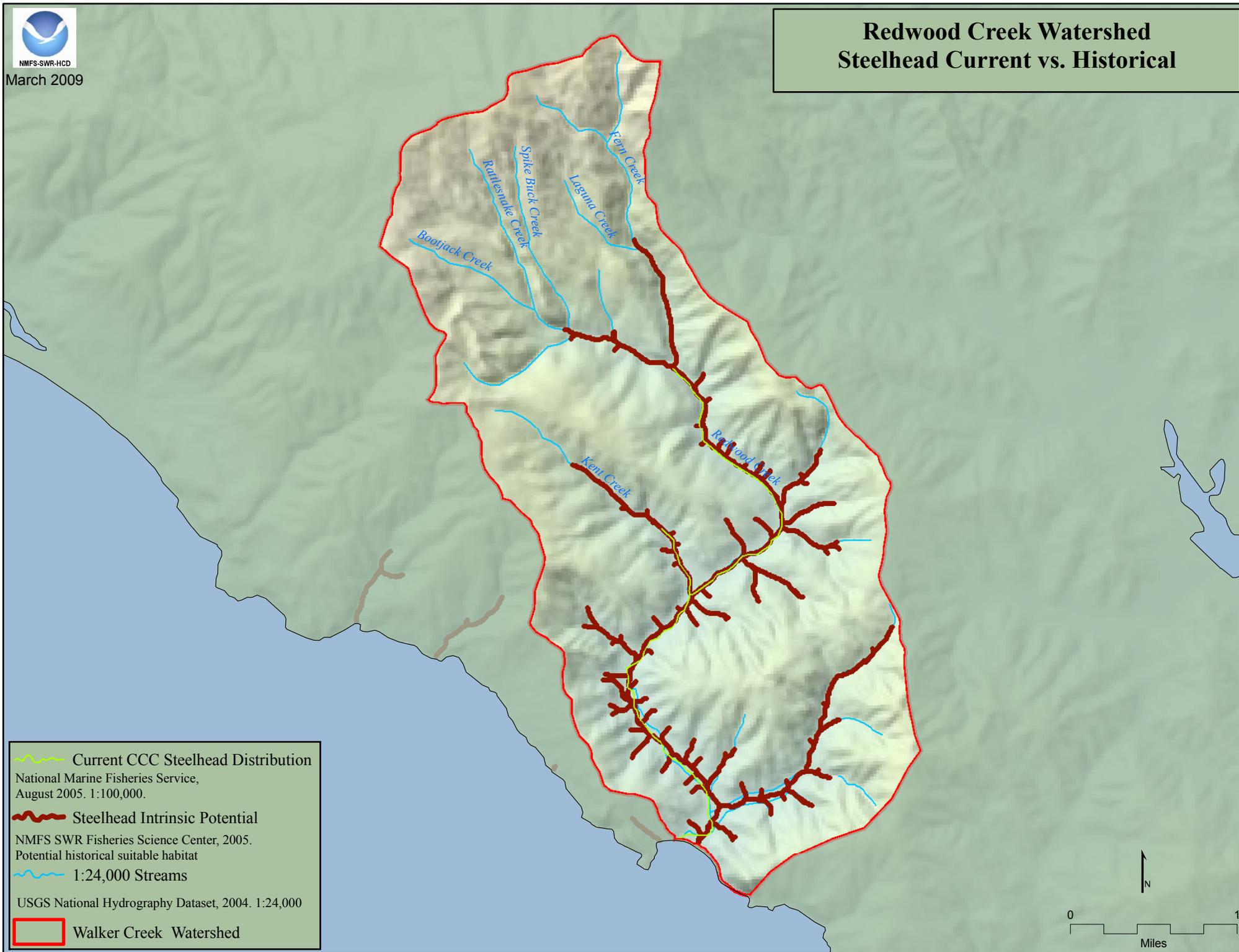




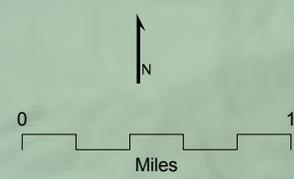
NMFS-SWR-HCD

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Redwood 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
-  Walker Creek Watershed





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Redwood Creek Watershed Coho Current vs. Historical

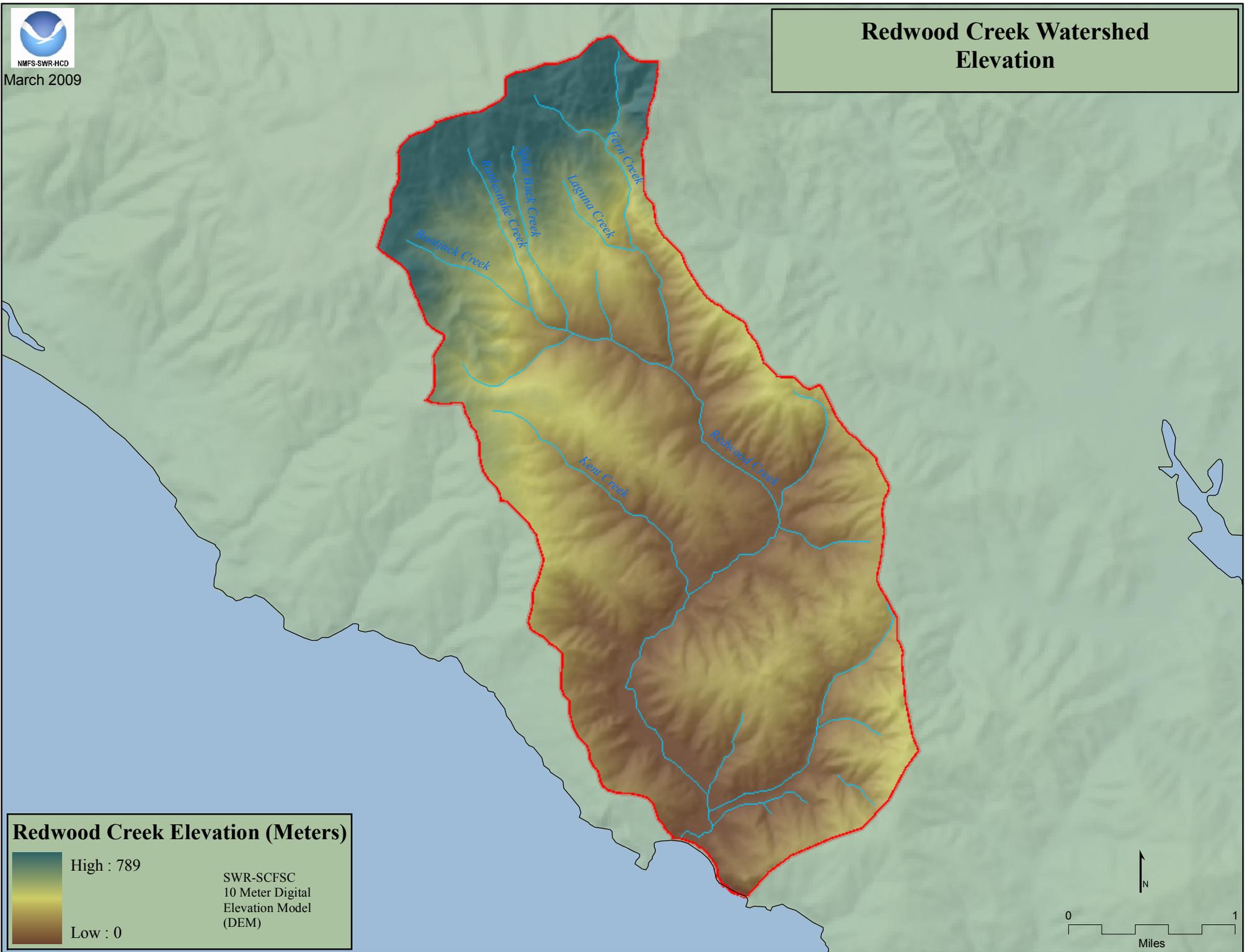




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Redwood Creek Watershed Elevation



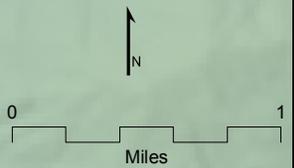
Redwood Creek Elevation (Meters)



High : 789

Low : 0

SWR-SCFSC
10 Meter Digital
Elevation Model
(DEM)



N

0 1

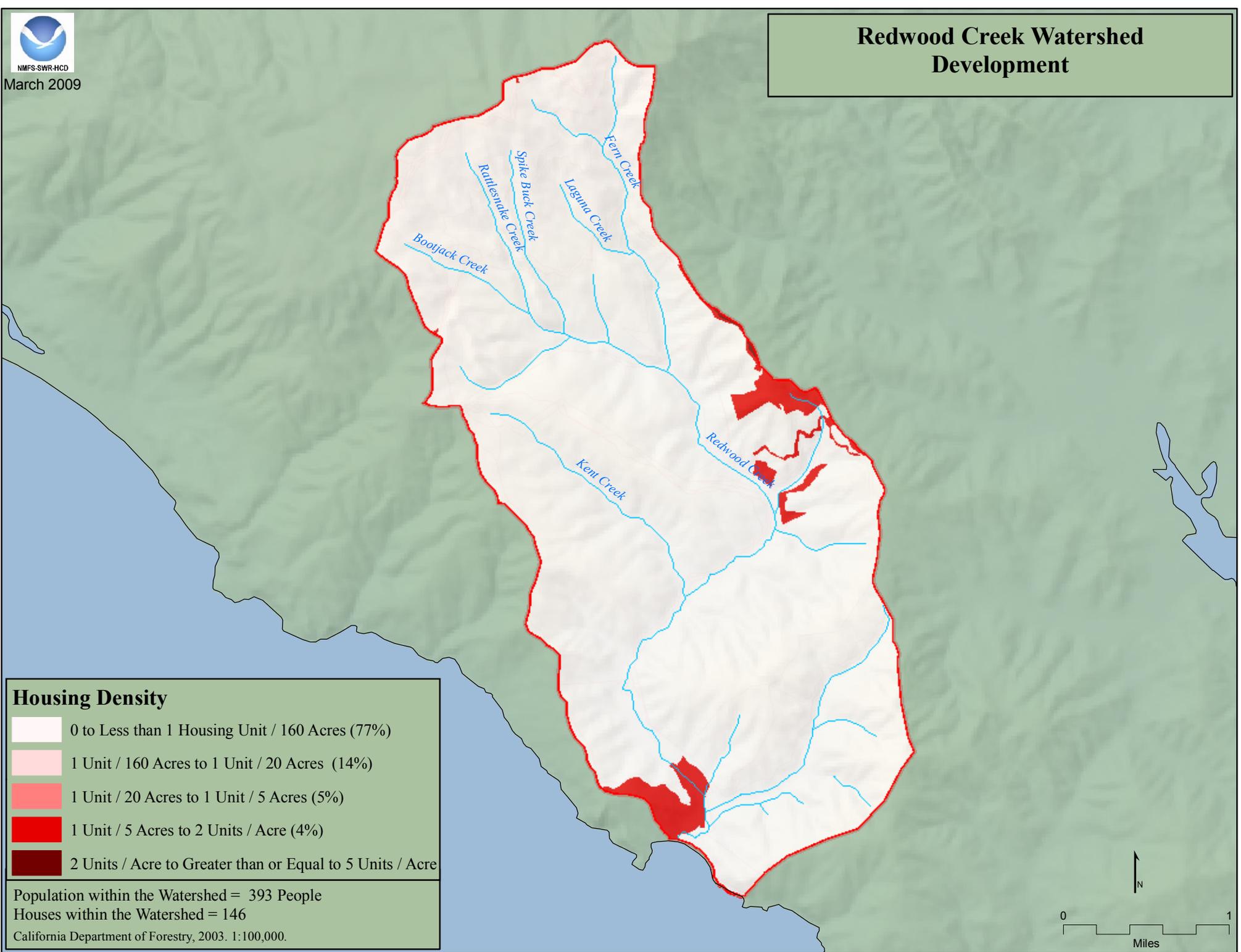
Miles



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Redwood Creek Watershed Development

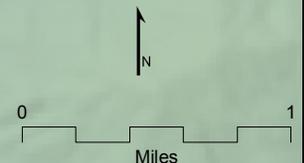


Housing Density

- 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 = 393 People
Houses within the Watershed = 146

California Department of Forestry, 2003. 1:100,000.

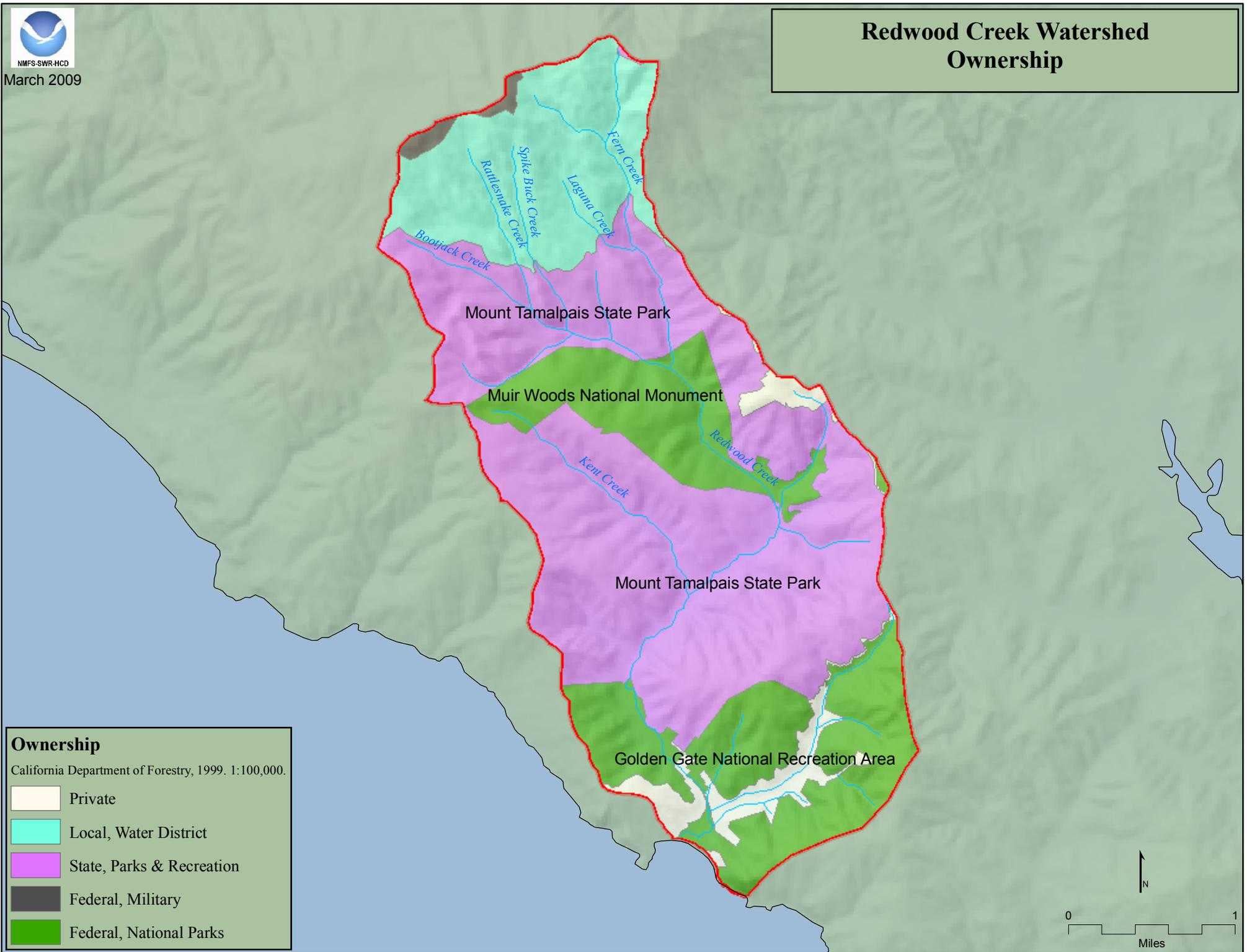




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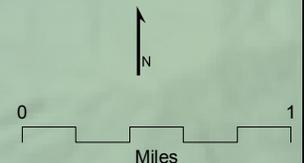
Redwood Creek Watershed Ownership



Ownership

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

-  Private
-  Local, Water District
-  State, Parks & Recreation
-  Federal, Military
-  Federal, National Parks





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Redwood Creek Watershed Road Density

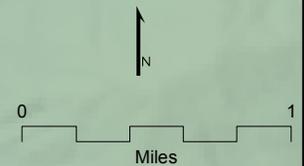


 Road

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

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

 4.5





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Redwood Creek Watershed Road Density in the Riparian Corridor



 1:24,000 Streams

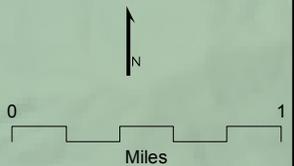
USGS National Hydrography Dataset, 2004. 1:24,000

 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 = 5.2 Miles / SqMi of Corridor

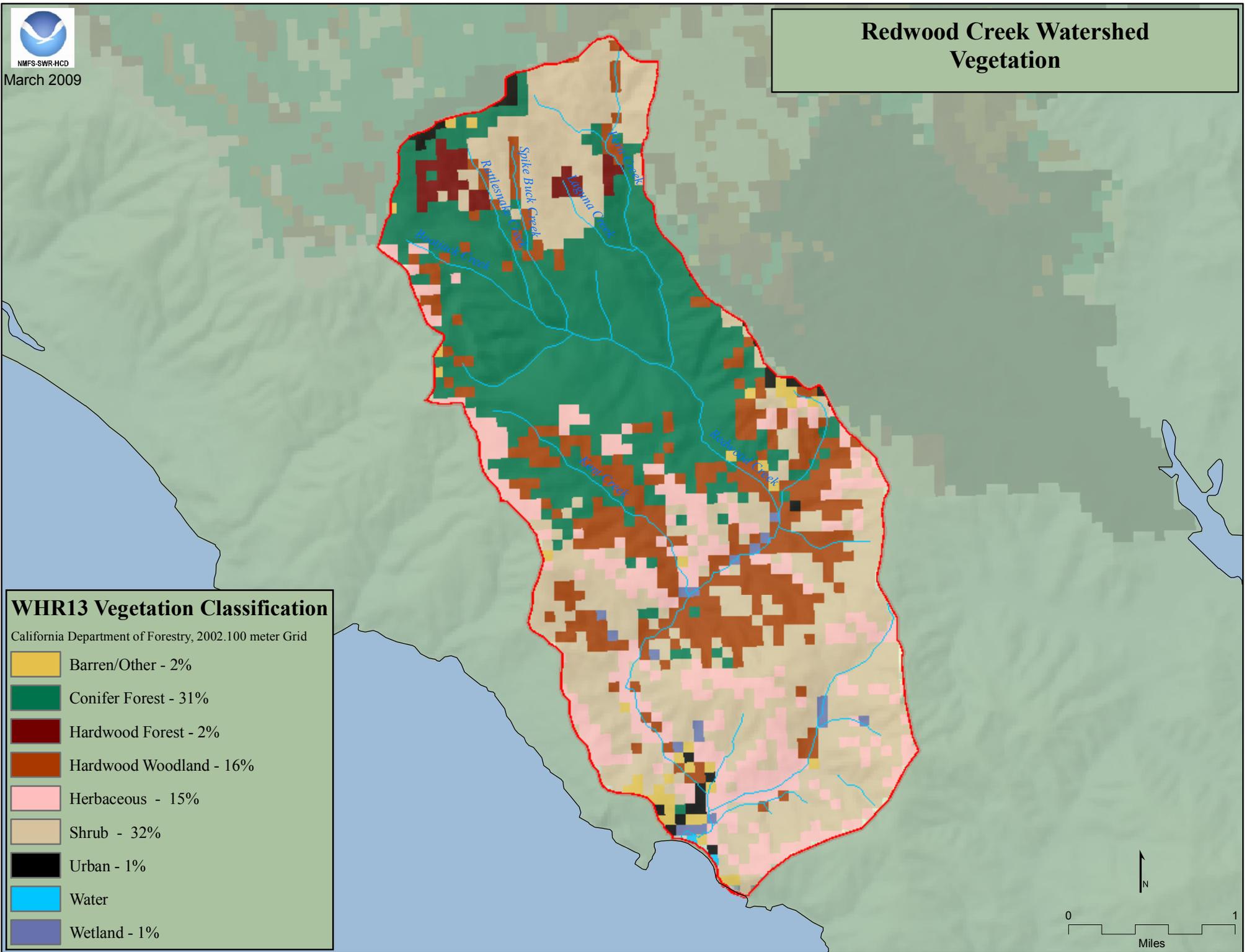




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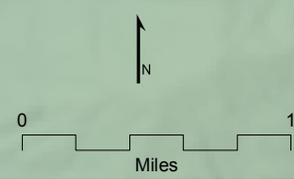
Redwood Creek Watershed Vegetation



WHR13 Vegetation Classification

California Department of Forestry, 2002.100 meter Grid

-  Barren/Other - 2%
-  Conifer Forest - 31%
-  Hardwood Forest - 2%
-  Hardwood Woodland - 16%
-  Herbaceous - 15%
-  Shrub - 32%
-  Urban - 1%
-  Water
-  Wetland - 1%

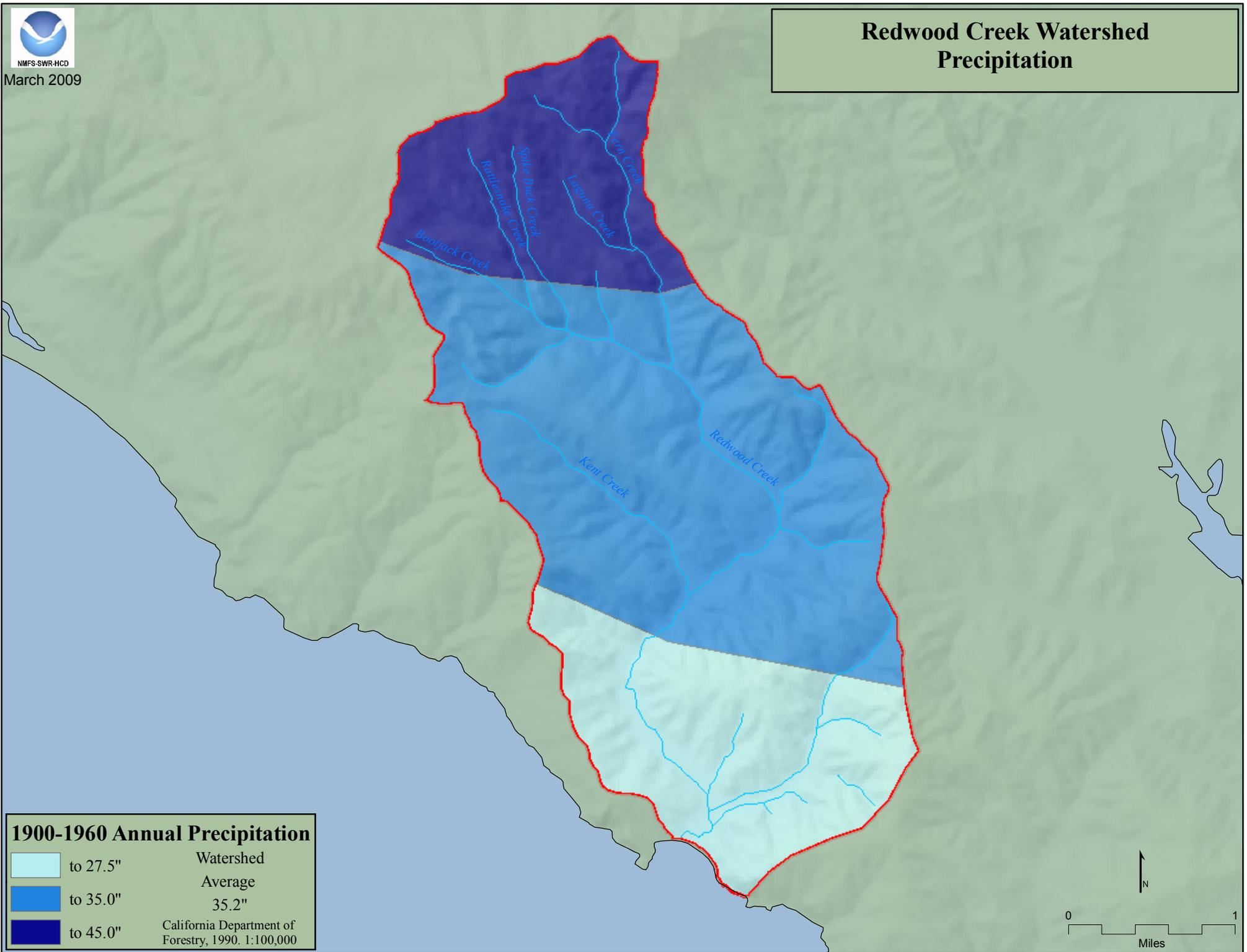




NMFS-SWR-HCD

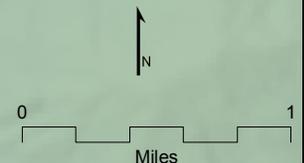
March 2009

Redwood Creek Watershed Precipitation



1900-1960 Annual Precipitation

	to 27.5"	Watershed
	to 35.0"	Average
	to 45.0"	35.2"
California Department of Forestry, 1990. 1:100,000		





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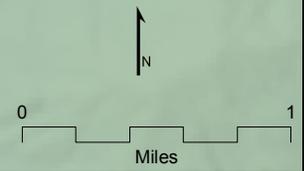
Redwood Creek Watershed Flood Zones



FEMA Flood Zones

FEMA, 1996. 1:24,000

-  100 Year Flood Zone
-  500 Year Flood Zone





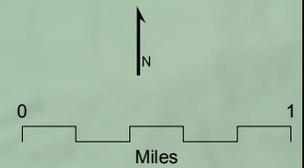
NMFS-SWR-HCD

March 2009

Redwood Creek Watershed Barriers \ Discharge \ Gages



 hazardous & Solid Waste Sites
 Gage Station
 BASINS, USEPA. 2001.
Barrier Type, Barrier Status
 CA Fish Passage Assessment, PSMFC, 2008
 Diversion, Unknown
 Non-structural, Unknown
 Road crossing, Partial
 Road crossing, Unknown





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Redwood Creek Watershed In-stream Temperature

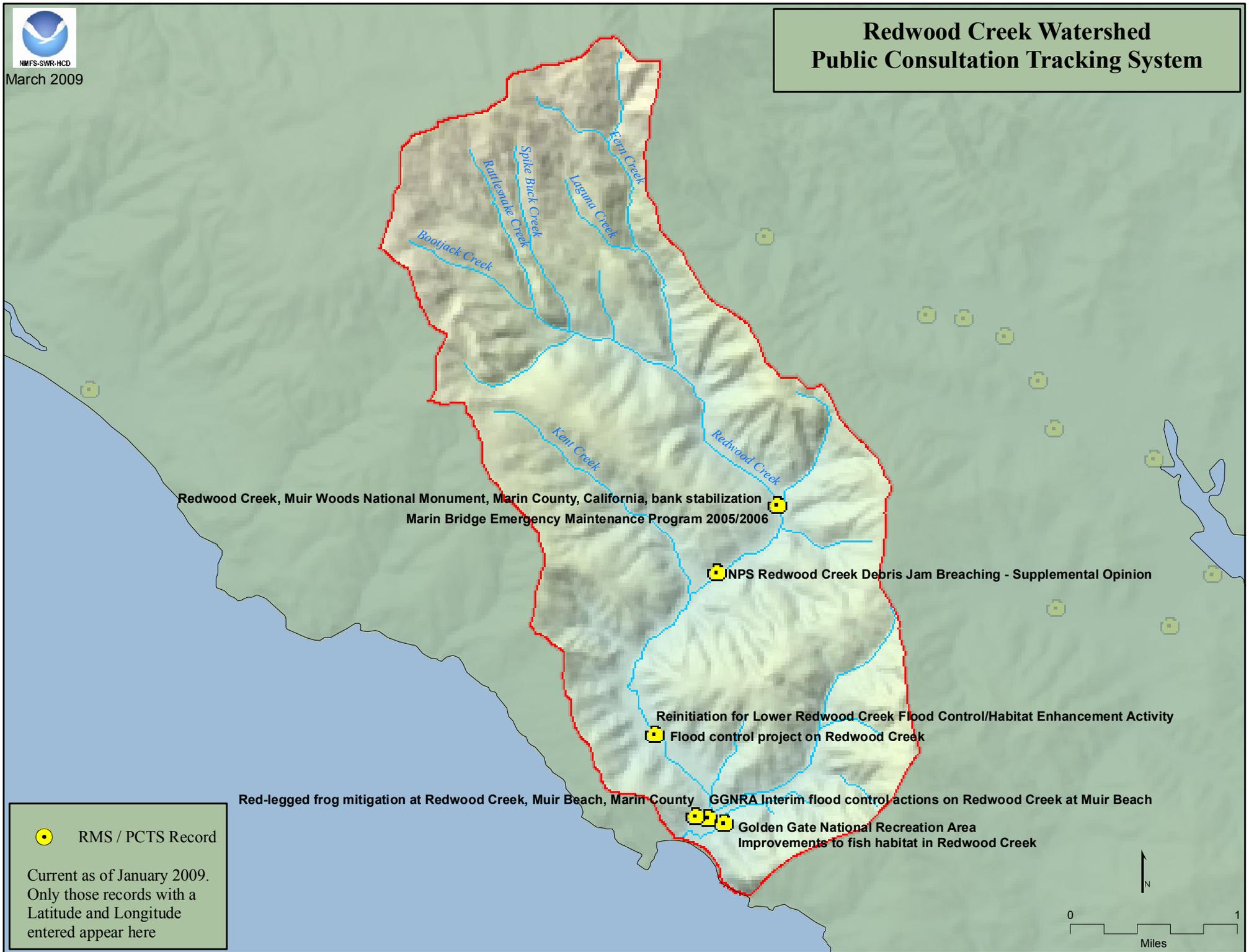




NMFS-SWR-HCD

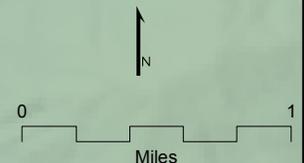
March 2009

Redwood Creek Watershed Public Consultation Tracking System



● RMS / PCTS Record

Current as of January 2009.
Only those records with a
Latitude and Longitude
entered appear here



References

Watersheds

calwater_ver2_2
vector digital data
California Watersheds (CALWATER 2.2)
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Dams

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Goslin, M.,
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<http://swfsc.noaa.gov/>

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Gaging Stations

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Precipitation

California Mean Annual Precipitation Zones, 1900-
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Vector digital data
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1:100,000
<http://frap.cdf.ca.gov/data/frapgisdata/select.asp>

Roads

TGRR00
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United States Census Bureau
1:100000
2000
<http://www.census.gov/geo/www/tiger/>

Elevation

Spln_mos_02
10 Meter Digital Elevation Model (DEM)
NOAA Fisheries, Santa Cruz Laboratory
2003

Vegetation

fveg02_2

raster digital data

Multi-source Land Cover Data

California Department of Forestry and Fire Protection

100 meter Grid

2002

<http://frap.cdf.ca.gov/data/frapgisdata/select.asp>

Land Ownership

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California Department of Forestry Forest and Rangeland Resources Assessment Program

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1:100,000

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<http://old.casil.ucdavis.edu/casil/gis.ca.gov/teale/govtowna/>

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vector digital data

California and the Department of Forestry and Fire Protection, FRAP

2003

1:100,000

<http://frap.cdf.ca.gov/data/frapgisdata/select.asp>

Imagery

Google Maps

remote-sensing image

raster digital data

2008

Historic Suitable Habitat (Steelhead, Coho)

Intrinsic Potential Model

vector digital data

NOAA Fisheries

Santa Cruz Laboratory, Santa Cruz, CA

2005

<http://swfsc.noaa.gov/>

Toxins

Hazardous_&_solid_waste_sites

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Flood Zones

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March 2008