



Garcia River Watershed

Area	Hydrologic Units	Calwater Subbasins ---	(Planning Watersheds)
72,875 Acres	18010108	1113700101	Lamour Creek (6550 Acres)
29,491 Hectares	4th Field HUC	1113700102	Little Penney (3972 Acres)
114 Square Miles		1113700103	Victoria Fork (4929 Acres)
	1113	1113700104	Inman Creek (5481 Acres)
Location	4th Field Calwater	1113700105	Pardaloe Creek (10473 Acres)
Mendocino County		1113700201	East of Eureka Hill (3425 Acres)
		1113700202	North of Gualala Mtn. (2626 Acres)
		1113700203	South Fork Garcia River (5595 Acres)
		1113700204	Rolling Brook (8000 Acres)
		1113700205	North Fork Garcia River (10373 Acres)
		1113700206	Hathaway Creek (7498 Acres)
		1113700207	Signal Creek (3954 Acres)

Species Potential	Miles of Streams with Species Present
Northern California Steelhead Central Coastal Diversity Stratum - Independent Population	<u>Steelhead</u> 70 NOAA Fisheries, Critical Habitat Redesignation, 2005
Central California Coast Coho Navarro Point-Gualala Point Diversity Stratum - Independent Population	<u>Coho</u> 33 CDFG, Coho Distribution, May 2007
California Coastal Chinook Central Coastal Diversity Stratum - Potentially Independent	<u>Chinook</u> 25 NOAA Fisheries, Critical Habitat Redesignation, 2005

Critical Habitat	Miles of Stream
Northern California Steelhead	70 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)
California Coastal Chinook	25 Miles of Stream

Coho Intrinsic Potential	Miles
Km of Historical Coho IP (21.5 C mask)	76
% of IP (21.5 C Mask) with Current Coho Distribution	50%

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		0
Intermittent Stream	126	
Perennial Stream	102	
Artificial Path	14	

^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
11467600	34
Garcia River near Point Arena	14 Diversions 15 Road Crossings (3 Temp. &/or Partially Impassable) 5 Natural Barriers (Chutes, Falls, Log Jams, etc. (2 Impassable))
	^C Passage Assessment Database, Pacific States Marine Fisheries Commission, 2008

EPA Total Maximum Daily Load Classification (TMDL) ^I
High Priority - Temperature
Sources: Habitat Modification, Removal of Riparian Vegetation, Streambank Modification/Destabilization, Nonpoint Source
^I State Water Resources Control Board, 2003

Average Annual Precipitation ^E	Average Annual Precipitation Range ^E
60.3"	45 - 75"

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

Roads ^A	(US Census Bureau (TIGER))	Miles
Roads in Watershed		
Primary Road / Highway		
Secondary and connecting road, state highways		3
Local, neighborhood, and rural road, city street, unseparated		220
Vehicular trail, 4WD		2
Driveway or service road		21
Total Miles		

Road Density	(US Census Bureau (TIGER))	
Miles of Roads per SqMi of Watershed		2.2
Miles of Roads per SqMi of 100m Riparian Buffer*		2.8

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

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

Roads ^{A1}	(Timber Harvest Plans)	Miles
Roads in Watershed		
Abandoned Seasonal		1
Bridge		0
Existing Permanent (rocked)		118
Existing Seasonal		484
Existing Temporary & 4WD		52
Proposed Permanent (rocked)		
Proposed Seasonal		2
Proposed Temporary & 4WD		0
Reconstructed Seasonal		
Secondary Road (2-3 lanes)		20

Road Density	(Timber Harvest Plans)	
Miles of Roads per SqMi of Watershed		5.9
Miles of Roads per SqMi of 100m Riparian Buffer*		6.2

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

^{A1}California Department of Forestry, Timber Harvest Plans for Garcia Watershed, 2006



Slope^D	Acres	Percent of watershed
Lands of 0-2 percent slope	2,092	3%
Lands of 2-4 percent slope	1,428	2%
Lands of 4-10 percent slope	3,551	5%
Lands of 10-15 percent slope	2,885	4%
Lands of 15-30 percent slope	11,482	16%
Lands of 30-60 percent slope	35,009	48%
Lands of 60-100 percent slope	16,205	22%
Lands of > 100 percent slope	537	1%

Elevation Range	0 - 2703 ft.	0 - 824 m
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^DSlope derived from USGS 10 meter Digital Elevation Models (DEM's)

Vegetation^G	Acres	Percent of watershed
Agriculture	1,060	1%
Annual grassland	6,264	9%
Barren	175	0%
Conifer Forest		
Closed Cone-Pine-Cypress	808	1%
Douglas Fir	10,630	15%
Montane Hardwood-Conifer	2,234	3%
Redwood	37,026	51%
Hardwood Forest		
Montane Hardwood	12,869	18%
Montane Riparian	687	1%
Hardwood Woodland		
Blue Oak Woodland	2	0%
Coastal Oak Woodland	32	0%
Shrub	897	1%
Urban	173	0%

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

Erodability of Watershed^F	Acres	Percent of watershed
Erosion Potential 6	41,464	57%
Erosion Potential 8	31,402	43%

^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	72,741	99%
State (Parks & Recreation)	335	0%
Federal	113	0%

^HManagement Landscape, CA Department of Forestry, 2002

Area Under a Timber Harvest Plan^A past 10 years		Area Under a Timber Harvest Plan^A past 20 years (1987-2006)	
11,200	15%	39,463	54%

^ACalifornia Department of Forestry, Timber Harvest Plans for Garcia Watershed, 2006



Population¹

Total Population within
the watershed -- 852 People

Housing¹

Total Housing Units within the watershed -- 376 Houses

Housing Density

0 to Less than 1 Housing Unit / 160 Acres	86%
1 Unit / 160 Acres to 1 Unit / 20 Acres	13%
1 Unit / 20 Acres to 1 Unit / 5 Acres	1%
1 Unit / 5 Acres to 2 Units / Acre	
2 Units / Acres to Greater than or Equal to 5 Units / Acre	

¹Census 2000 Block Data (Migrated), CA Department of Forestry, 2003



Garcia River

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	1063	282					6432		193			
	S			5		2							
	P					2							
	M					2							
	D			15		2	7						
	Total	1063	282	20		8	7	6432	0	193	0		8005
Seedling	S												
	P												
	M												
	D												
	Total								0				0
Sapling	S			707		788							
	P			292		1033							
	M			803		1806							
	D			3432		1732	20						
	Total			5234		5359	20						10613
Pole	S			390		326							
	P			591		250							
	M			1147		331							
	D			7119		1147	17						
	Total			9247		2054	17		0				11318
Small Tree	S			217		227							
	P			272		247							
	M			583		596							
	D			7455		2372	10		907				
	Total			8527		3442	10		907				12886
Medium/Large Tree	S			1258		111							
	P			959		111							
	M			2708		311							
	D			7107		2175							
	Total			12032		2708							14740
Multi Layered	D			15585									
	Total			15585.0									15585
Grand Total by Species Type		1063	282	50645	0	13571	54	6432	907	193	0	0	73147

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%	0%					9%		0%			
	S			0%		0%							
	P					0%							
	M					0%							
	D			0%		0%	0%						
	Total	1%	0%	0%	0%	0%	0%	9%	0%				11%
Seedling	S												
	P												
	M												
	D												
	Total												0%
Sapling	S			1%		1%							
	P			0%		1%							
	M			1%		2%							
	D			5%		2%	0%						
	Total			7%		7%	0%						15%
Pole	S			1%		0%							
	P			1%		0%							
	M			2%		0%							
	D			10%		2%	0%						
	Total			13%		3%	0%						15%
Small Tree	S			0%		0%							
	P			0%		0%							
	M			1%		1%							
	D			10%		3%	0%		1%				
	Total			12%		5%	0%		1%				18%
Medium/Large Tree	S			2%		0%							
	P			1%		0%							
	M			4%		0%							
	D			10%		3%							
	Total			16%		4%							20%
Multi Layered	D			21%									
	Total			21%									21%
Grand Total by Species Type		1%	0%	69%	0%	19%	0%	9%	1%	0%	0%	0%	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%

Garcia River

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

California Department of Forestry and Fire Protection; veg02_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	150.7	69.2			2.5		#####		27.2			
	S P M D Total			2.5		2.5		#####		27.2			1577
Seedling	S P M D Total												0
	S P M D Total			185.3	195.2	76.6	279.2	222.4	506.6	993.4	469.5		2928
Sapling	S P M D Total			1477.7	1450.5								2928
	S P M D Total			79.1	140.8	163.1	89.0	350.9	121.1	2201.7	350.9	2.5	3499
Pole	S P M D Total			2794.8	701.8	2.5							3499
	S P M D Total			76.6	86.5	86.5	86.5	155.7	140.8	1937.3	598.0		3168
Small Tree	S P M D Total			2256.1	911.8								3168
	S P M D Total			350.9	29.7	242.2	17.3	830.3	66.7	1719.9	518.9	177.9	3954
Medium/Large Tree	S P M D Total			3143.2	632.6					177.9			3954
	D Total			3627.5									3628
Multi Layered	D Total			3627.5									3628
	Grand Total by Species Type		151	69	13302	0	3699	2	1324	178	27	0	0

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%	0%			0%		7%		0%			
	S P M D Total			0%		0%		7%		0%			8%
Seedling	S P M D Total												0%
	S P M D Total			1%	1%	0%	1%	1%	3%	5%	3%		16%
Sapling	S P M D Total			8%	8%								16%
	S P M D Total			0%	1%	1%	0%	2%	1%	12%	2%		19%
Pole	S P M D Total			15%	4%								19%
	S P M D Total			0%	0%	1%	1%	10%	3%				17%
Small Tree	S P M D Total			12%	5%								17%
	S P M D Total			2%	0%	1%	0%	4%	0%	9%	3%	1%	21%
Medium/Large Tree	S P M D Total			17%	3%				1%				21%
	D Total			19%									19%
Multi Layered	D Total			19%									19%
	Grand Total by Species Type		1%	0%	71%	0%	20%	0%	7%	1%	0%	0%	0%

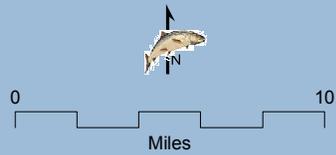
SIZE	Description	Diameter at Breast Height (DBH)
Not Determined		N/A
Seedling		Less Than 1 inch
Sapling		1 to 6 inches
Pole		6 to 11 inches
Small Tree		11 to 24 inches
Medium/Large Tree		Greater Than 24 inches
Multi Layered		Size 5 Over Size 4 Or 3; Total Tree Crown Closure Greater Than 60%

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%



NMFS-SWR-HCD
July 2008

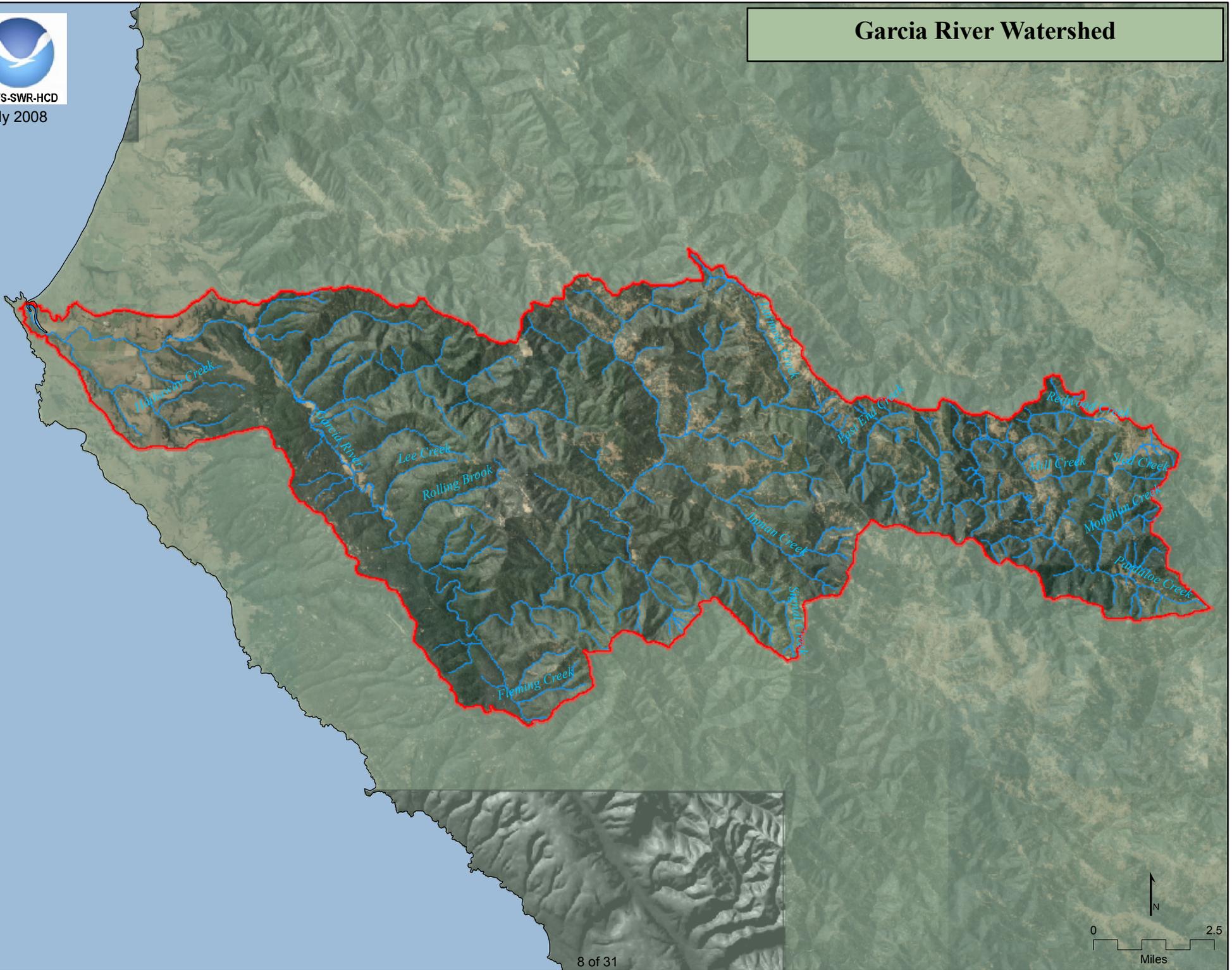
Garcia River Watershed





NMFS-SWR-HCD
July 2008

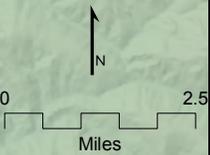
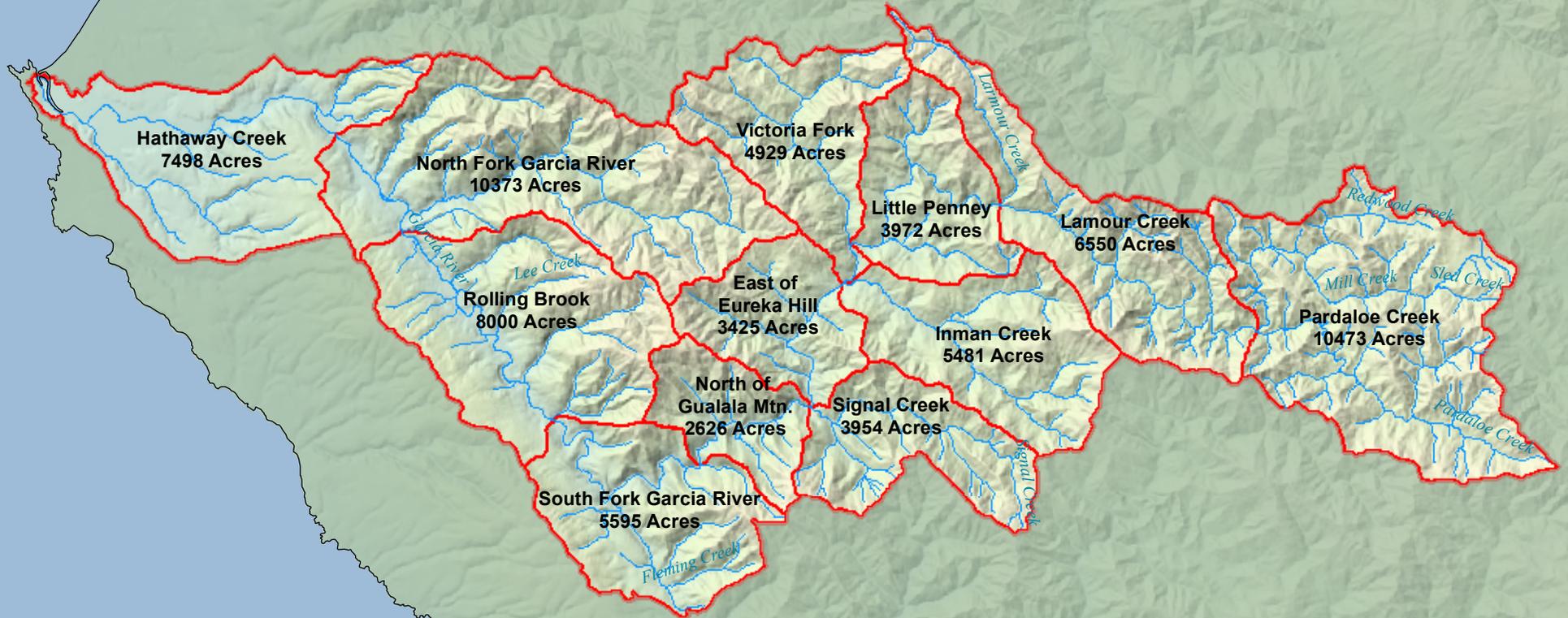
Garcia River Watershed





NMFS-SWR-HCD
July 2008

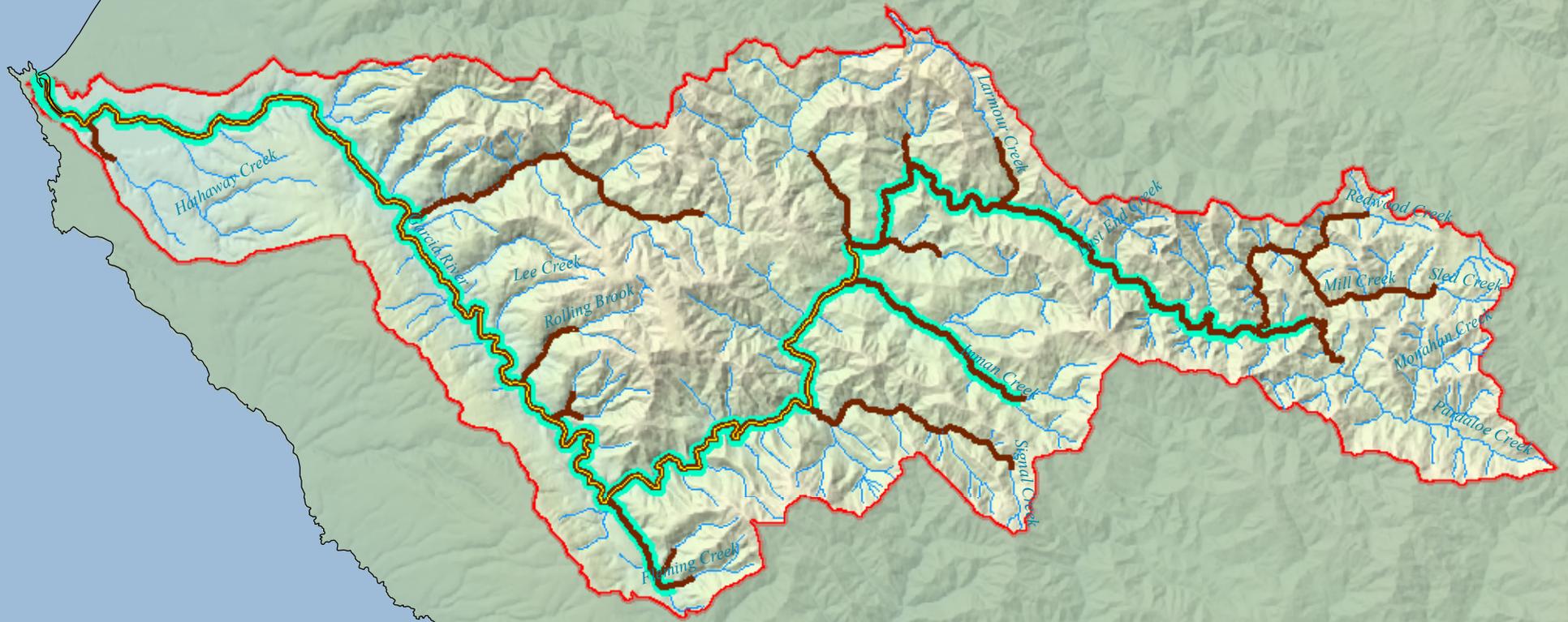
Garcia River Watershed CalWater Planning Watersheds



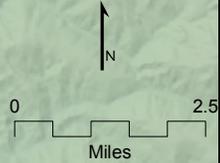


NMFS-SWR-HCD
September 2009

Garcia River Watershed Fish Distribution and Critical Habitat



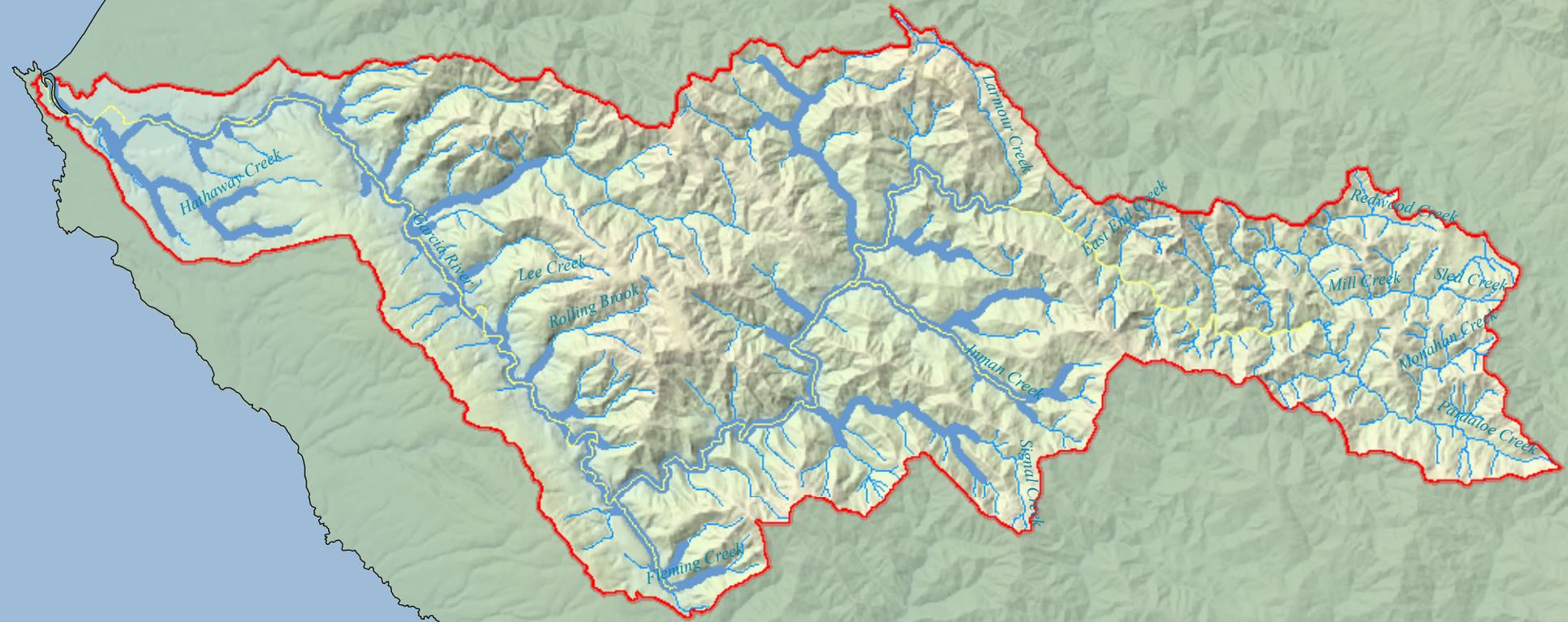
-  CC Chinook Distribution and Critical Habitat
National Marine Fisheries Service, August 2005. 1:100,000.
-  NC Steelhead Distribution and Critical Habitat
National Marine Fisheries Service, August 2005. 1:100,000.
-  Coho Distribution
CDFG - NCNCR-ISB, 2009. 1:100,000.
-  1:24,000 Streams
USGS National Hydrography Dataset, 2004. 1:24,000
-  Garcia River Watershed





NMFS-SWR-HCD
September 2009

Garcia River Watershed Coho Current vs. Historical

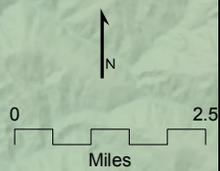


 Current Coho Distribution
 CDFG - NCNCR-ISB, 2009. 1:100,000.

 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

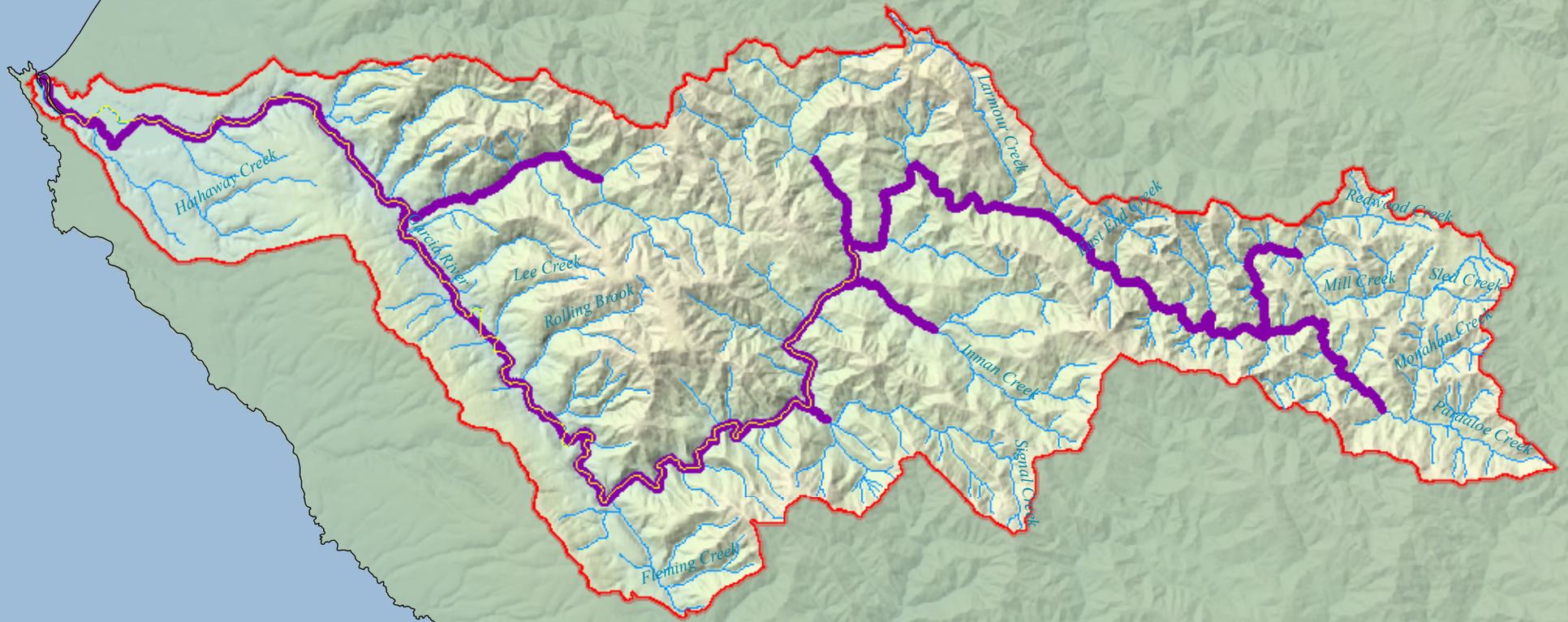
 Garcia River Watershed





NMFS-SWR-HCD
July 2008

Garcia River Watershed Chinook Current vs. Historical

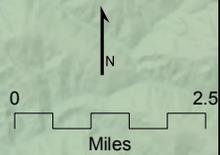


Current Chinook Distribution
National Marine Fisheries Service,
August 2005. 1:100,000.

Chinook Intrinsic Potential
NMFS SWR Fisheries Science Center, 2005.
Potential historical suitable habitat

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

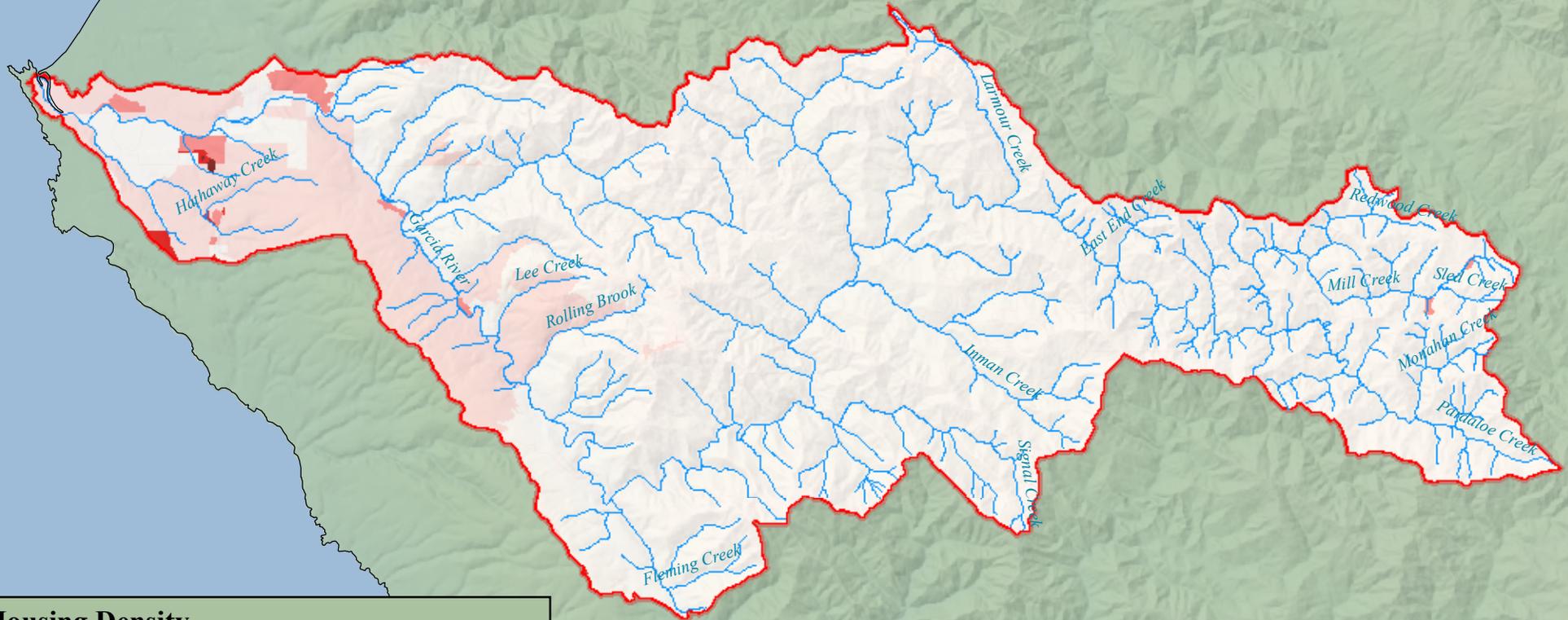
Garcia River Watershed





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July 2008

Garcia River Watershed Development

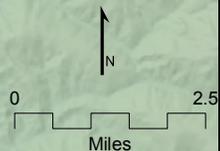


Housing Density

- 0 to Less than 1 Housing Unit / 160 Acres (86%)
- 1 Unit / 160 Acres to 1 Unit / 20 Acres (13%)
- 1 Unit / 20 Acres to 1 Unit / 5 Acres (1%)
- 1 Unit / 5 Acres to 2 Units / Acre
- 2 Units / Acre to Greater than or Equal to 5 Units / Acre

Population within the Watershed = 852 People
Houses within the Watershed = 376

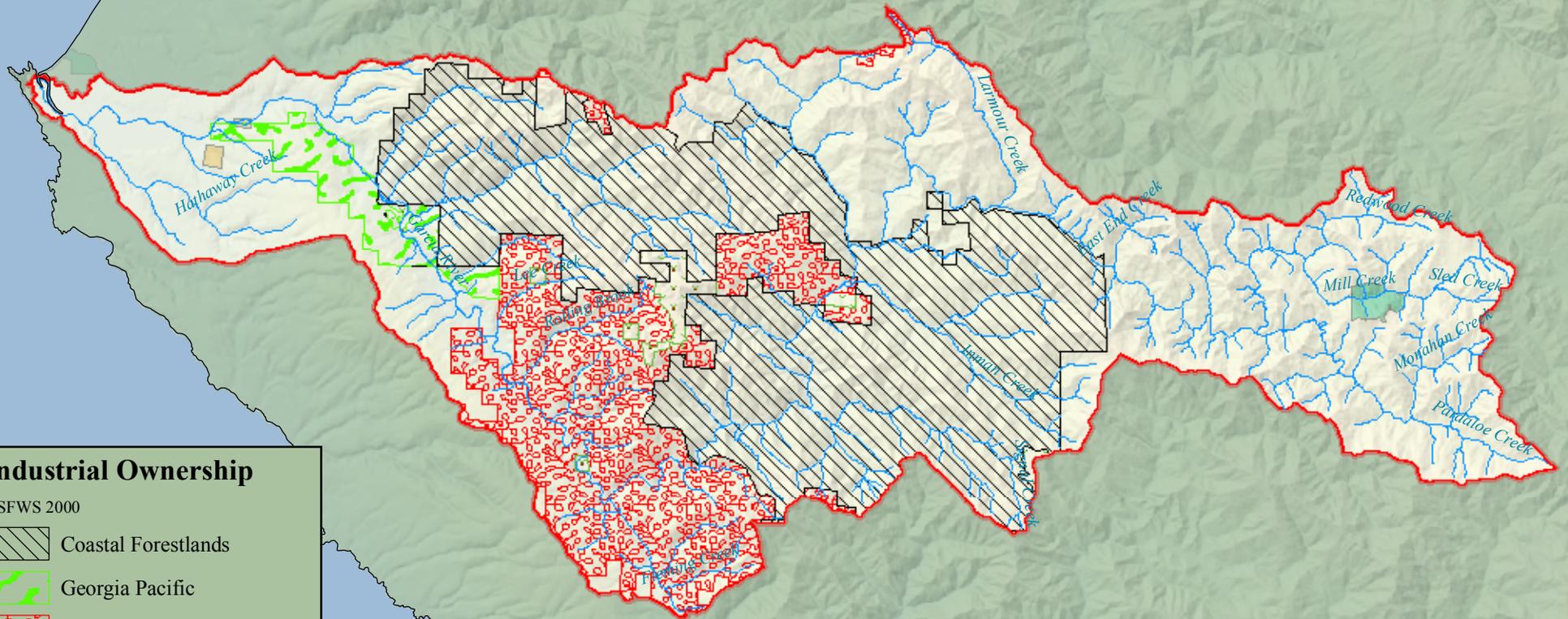
California Department of Forestry, 2003. 1:100,000.





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July 2008

Garcia River Watershed Ownership



Industrial Ownership

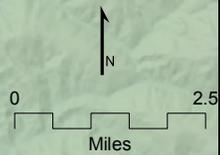
USFWS 2000

-  Coastal Forestlands
-  Georgia Pacific
-  Mendocino Redwoods
-  Other

Ownership

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

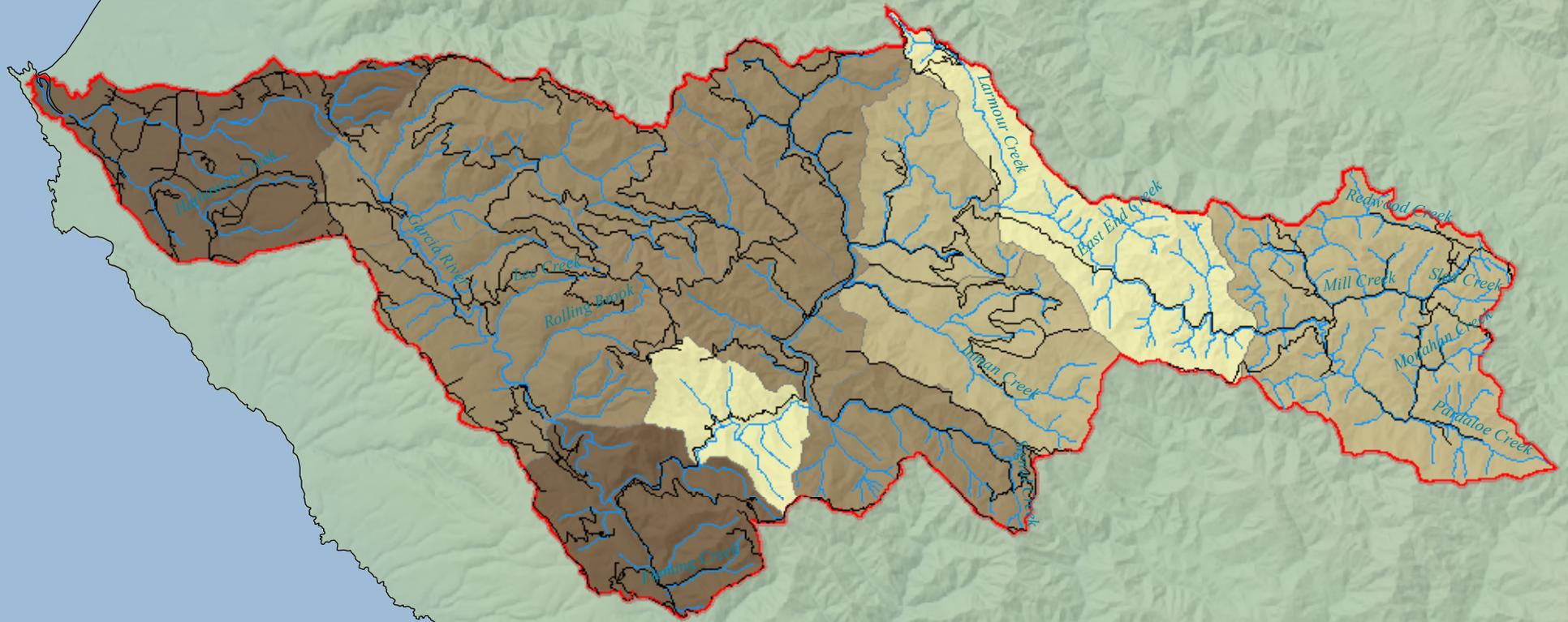
-  Private
-  State, Parks & Recreation
-  Federal, BIA
-  Federal, Military





NMFS-SWR-HCD
July 2008

Garcia River Watershed Road Density



Road

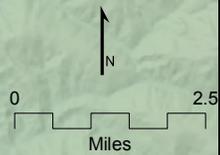
U.S. Census Bureau - Tiger 2000, 2002. 1:24,000

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

RdDensity

	1.19 - 1.50
	1.51 - 2.00
	2.01 - 2.50
	2.51 - 3.10

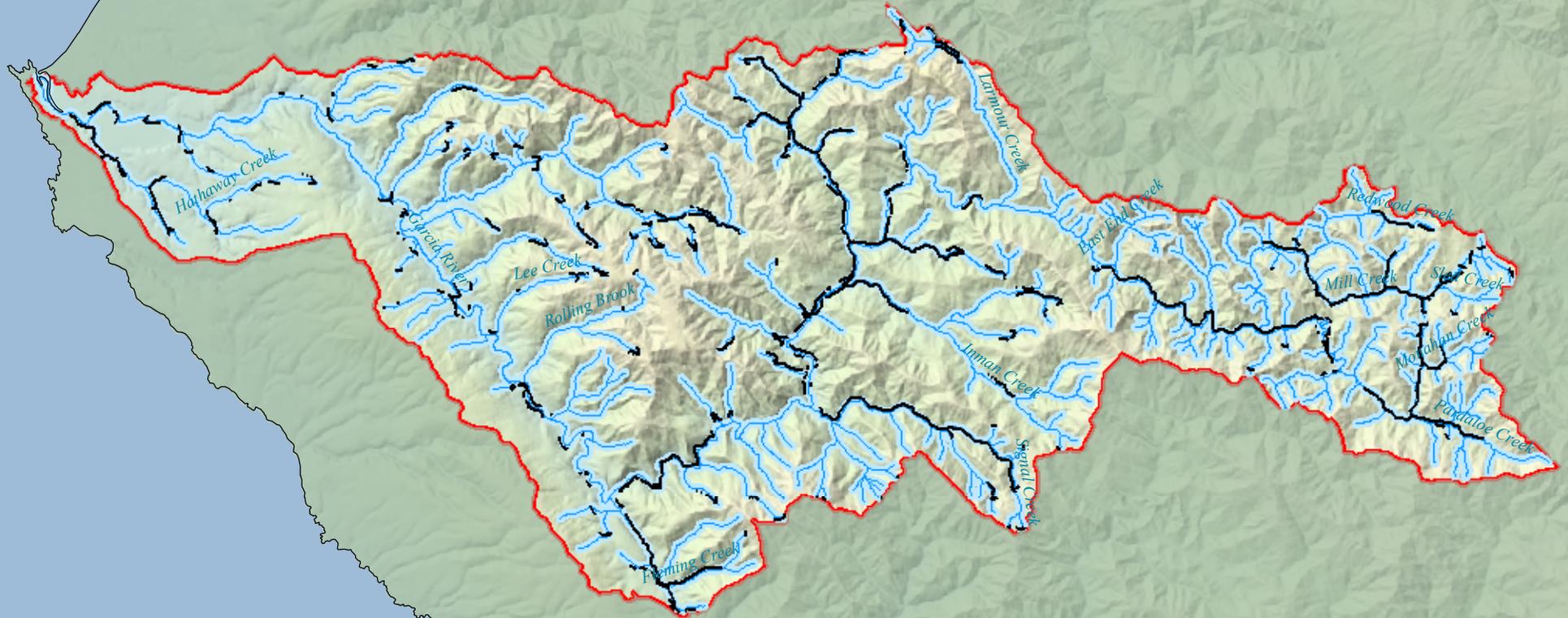
Overall Watershed
Density = 2.2 Miles / SqMi





NMFS-SWR-HCD
July 2008

Garcia River Watershed Road Density in the Riparian Corridor



 Road Segments within the 200 meter Riparian Corridor

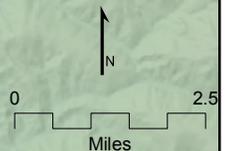
U.S. Census Bureau - Tiger 2000, 2002. 1:24,000

 1:24,000 Streams

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

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

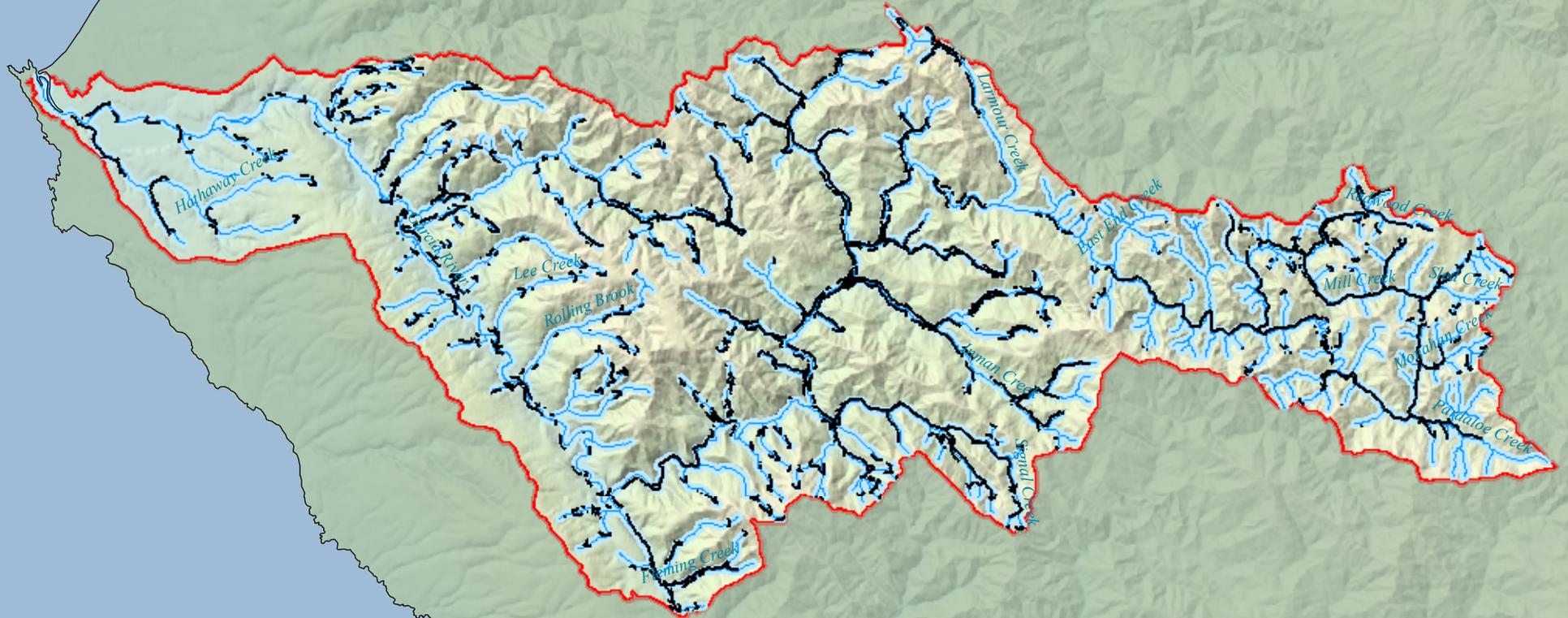
Overall Riparian Corridor Density = 2.8 Miles / SqMi of Corridor





NMFS-SWR-HCD
July 2008

Garcia River Watershed Road Density in the Riparian Corridor per Timber Harvest Plan Roads



 Road Segments within the 200 meter Riparian Corridor

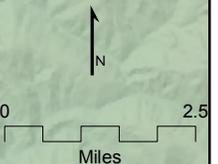
California Department of Forestry, Timber Harvest Plans 2006

 1:24,000 Streams

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

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

Overall Riparian Corridor Density = 6.2 Miles / SqMi of Corridor





NMFS-SWR-HCD
July 2008

Garcia River Watershed Vegetation

WHR13 Vegetation Classification

California Department of Forestry, 2002.100 meter Grid

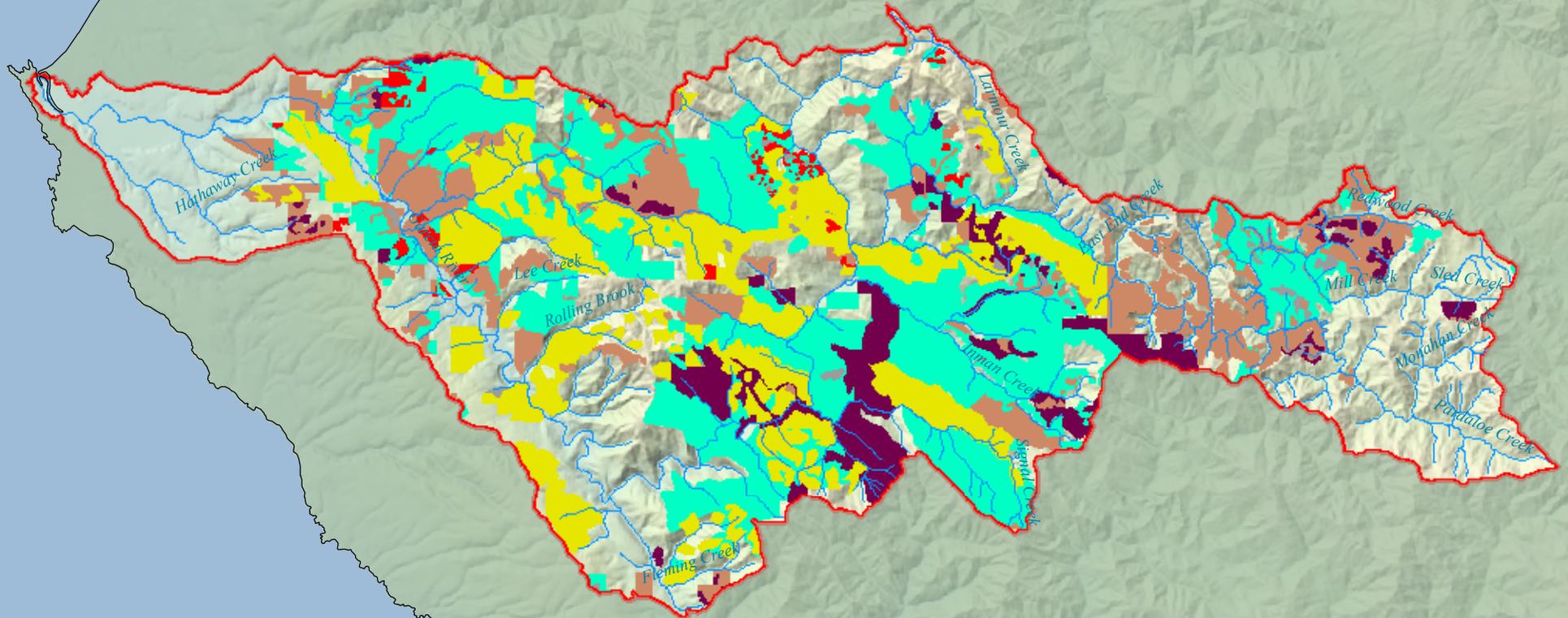
-  Agriculture - 1%
-  Barren/Other
-  Conifer Forest 70%
-  Hardwood Forest - 19%
-  Hardwood Woodland
-  Herbaceous - 9%
-  Shrub - 1%
-  Urban
-  Water





NMFS-SWR-HCD
July 2008

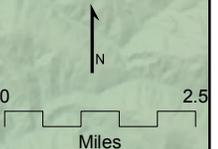
Garcia River Watershed Timber Harvesting 1987-2006



Timber Harvest Plans 1987-2006

California Department of Forestry, 2006.

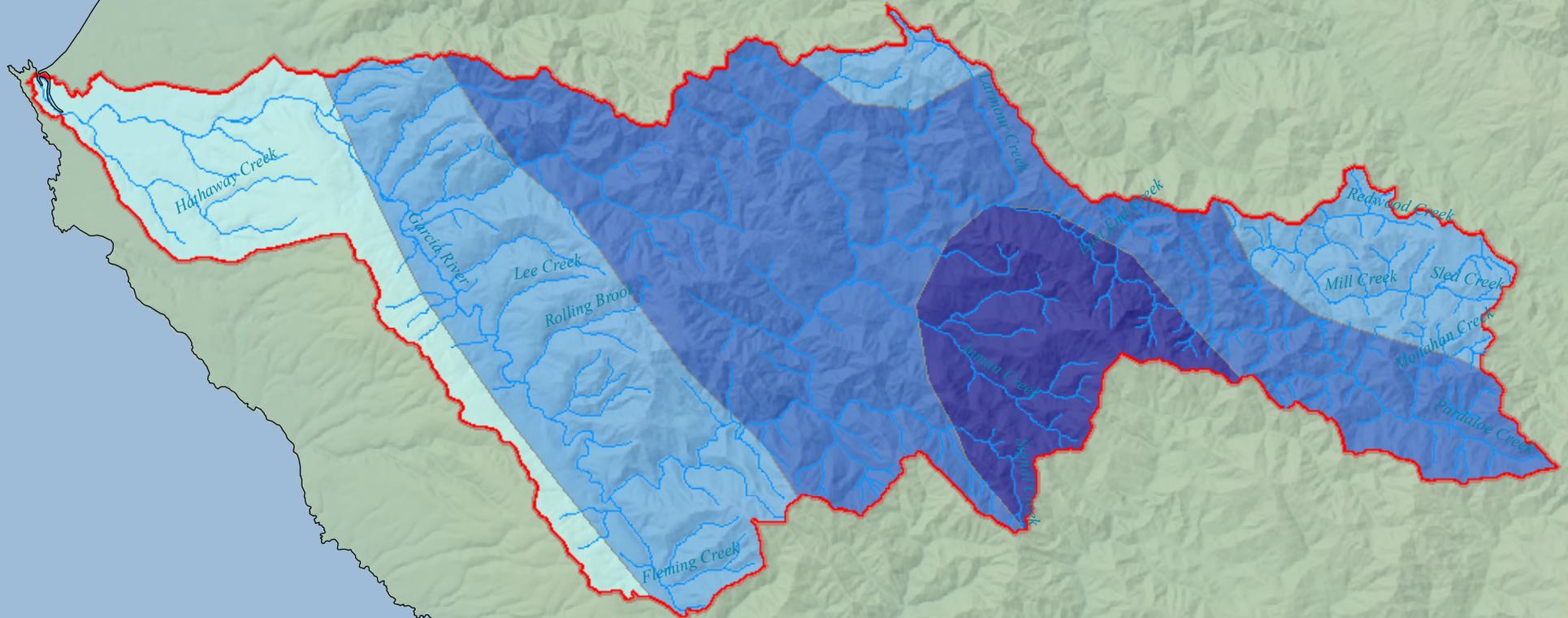
- Clearcut
- Uneven Age Removal
- Even age Removal
- Alternative Prescription
- Transition
- Outside THP





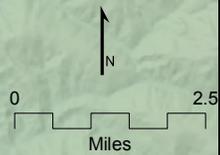
NMFS-SWR-HCD
July 2008

Garcia River Watershed Precipitation



1900-1960 Annual Precipitation

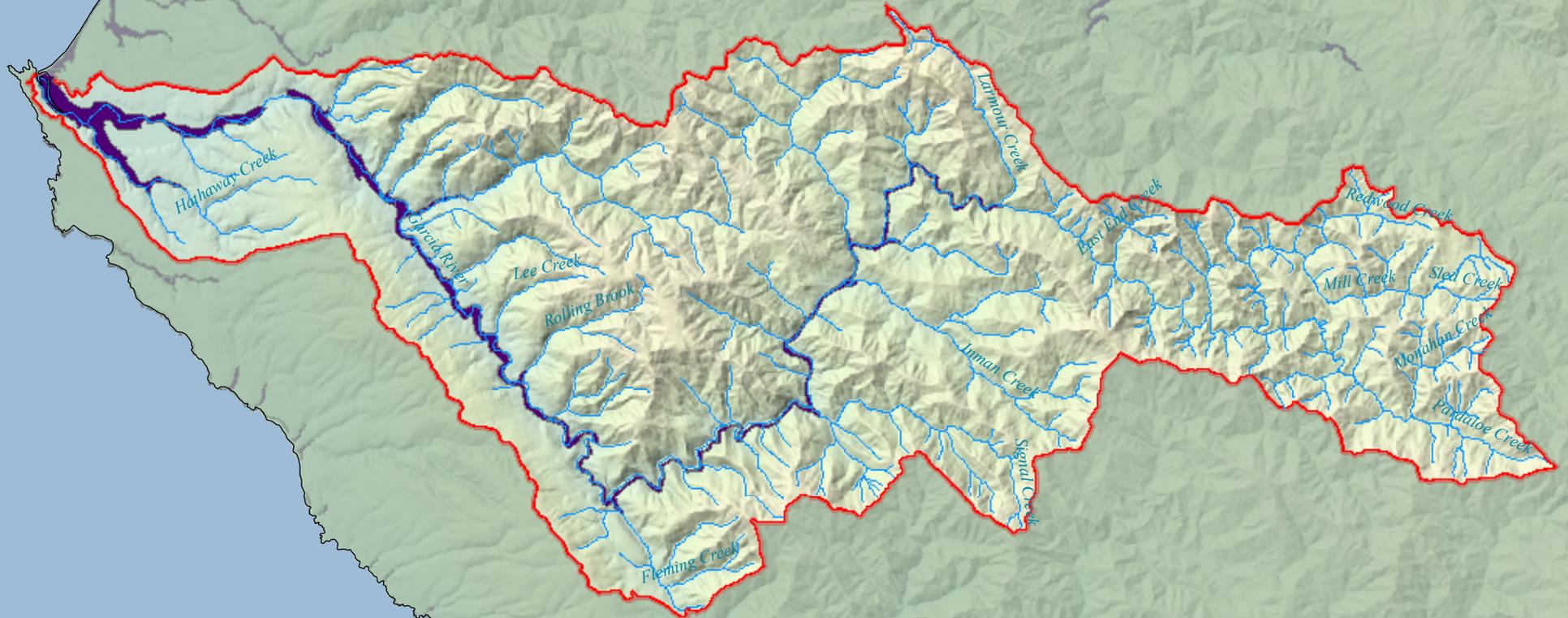
Lightest blue	to 45"	Watershed
Light blue	to 55"	Average 60.3"
Medium blue	to 65"	
Darkest blue	to 75"	California Department of Forestry, 1990. 1:100,000





NMFS-SWR-HCD
July 2008

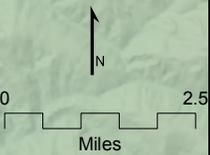
Garcia River Watershed Flood Zone



FEMA Flood Zones

FEMA, 1996. 1:24,000

-  100 Year Flood Zone
-  500 Year Flood Zone





NMFS-SWR-HCD
July 2008

Garcia River Watershed Erosion Potential / Geologic Features

Geologic Feature

CA Geologic Survey

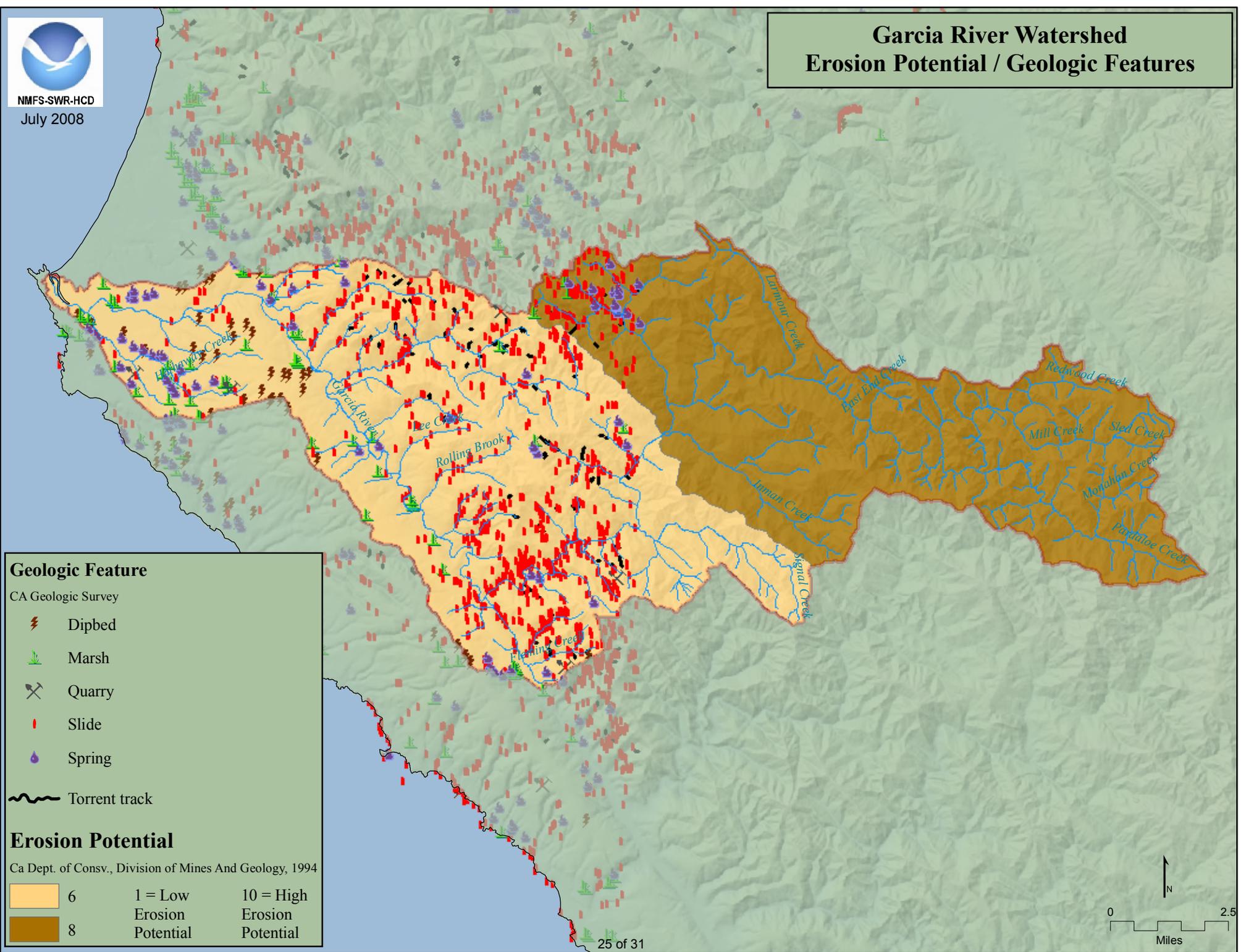
-  Dipbed
-  Marsh
-  Quarry
-  Slide
-  Spring

 Torrent track

Erosion Potential

Ca Dept. of Consv., Division of Mines And Geology, 1994

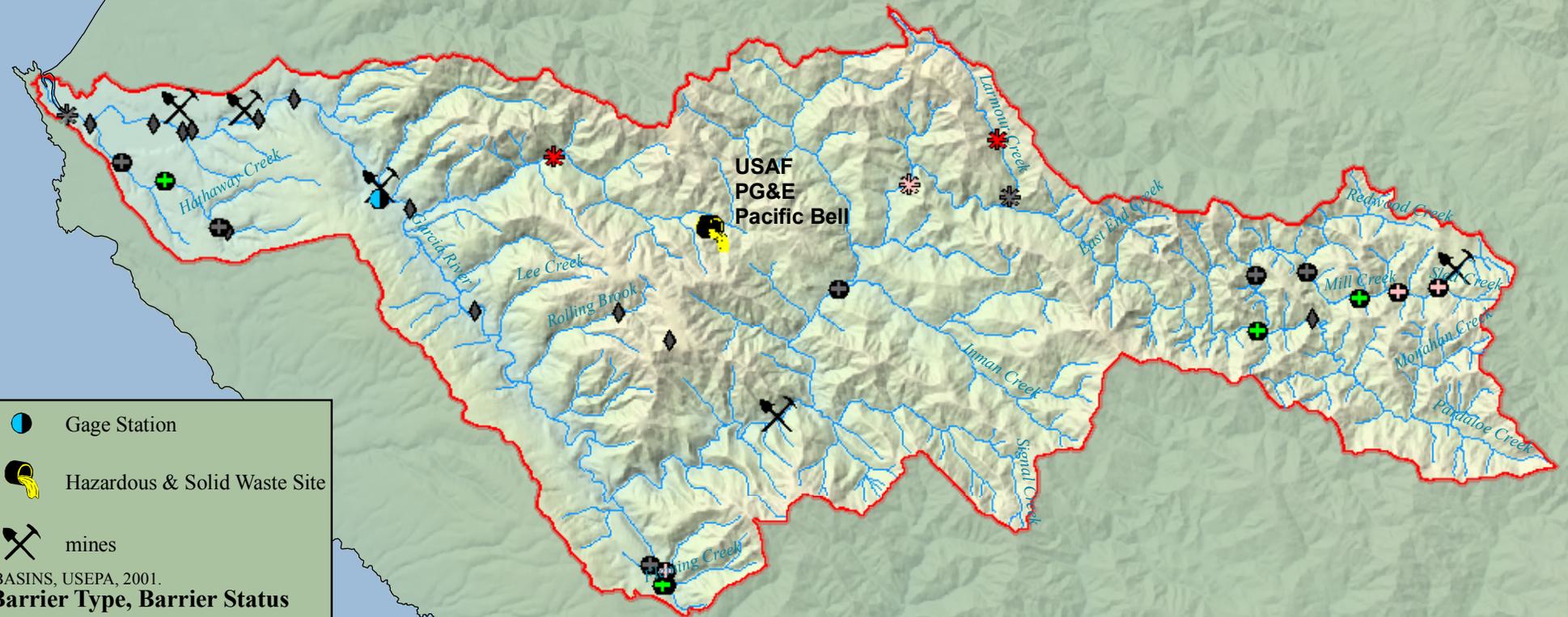
	6	1 = Low	10 = High
	8	Erosion	Erosion
		Potential	Potential



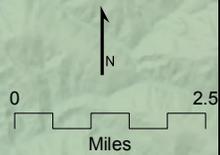


NMFS-SWR-HCD
July 2008

Garcia River Watershed Barriers / Industrial Discharge / Gages



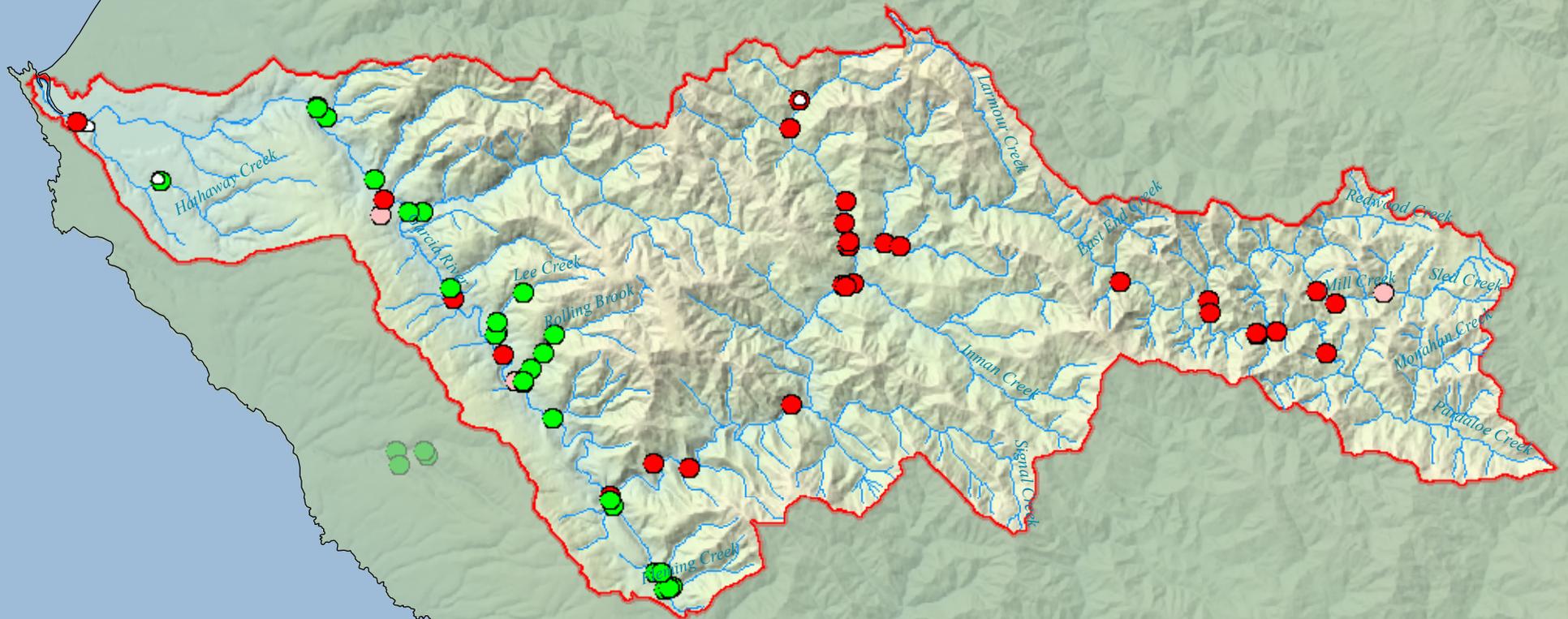
 Gage Station
 Hazardous & Solid Waste Site
 mines
 BASINS, USEPA, 2001.
Barrier Type, Barrier Status
 CA Fish Passage Assessment, PSMFC, 2008
 Diversion, Unknown
 Log jam/Falls, Partial
 Log jam/Falls, Total
 Log jam/Falls, Unknown
 Road crossing, Not a barrier
 Road crossing, Partial
 Road crossing, Unknown





NMFS-SWR-HCD
July 2008

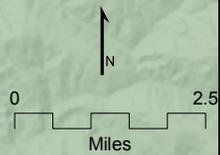
Garcia River Watershed Temperature



MWAT 1994-2001

KRIS Garcia 2003

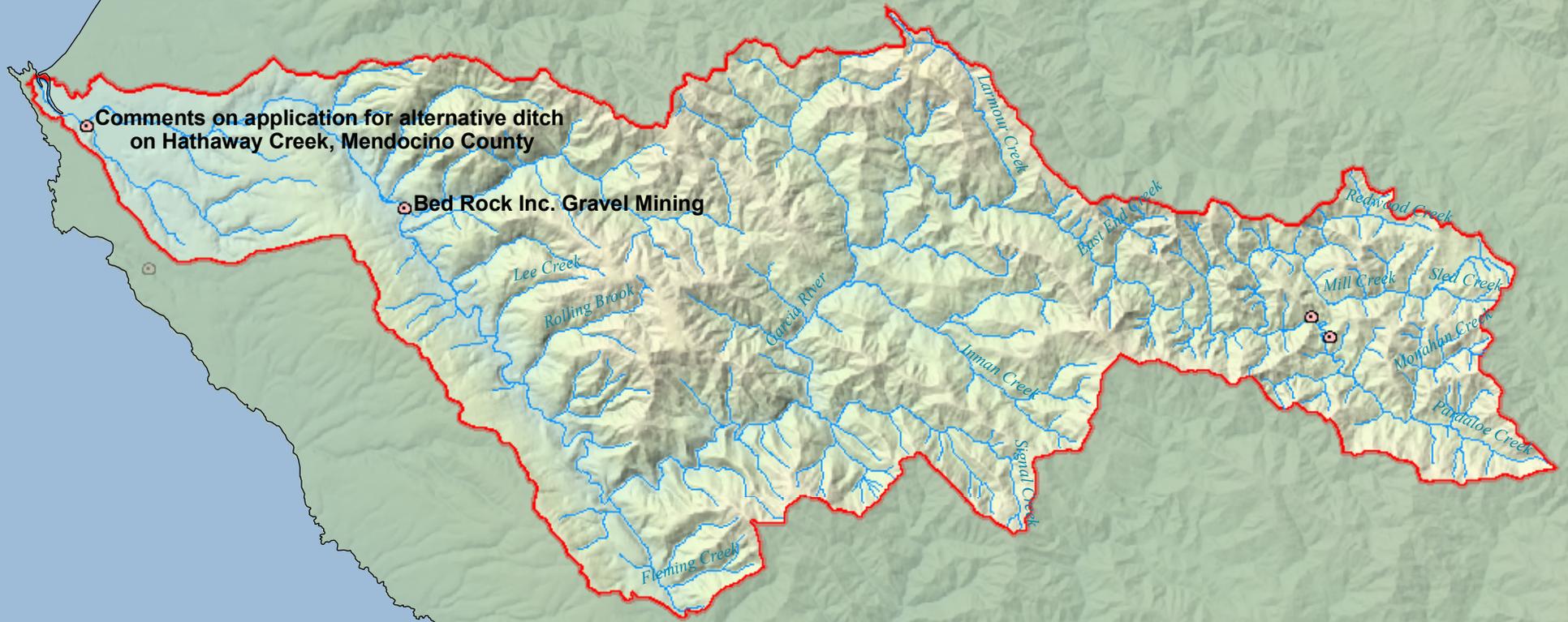
- never > 16.8° C
- some years > 16.8° C
- all years > 16.8° C
- no data





NMFS-SWR-HCD
July 2008

Garcia River Watershed Public Consultation Tracking System



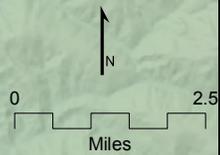
Comments on application for alternative ditch
on Hathaway Creek, Mendocino County

Bed Rock Inc. Gravel Mining

● PCTS Record

○ RMS 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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Eric Haney - CDFG - NCNCR-ISB
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August 2005
<http://swr.nmfs.noaa.gov/salmon/layers/finalgis.htm>

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