



Ten Mile River Watershed

Area	Hydrologic Units	Calwater Subbasins ---	(Planning Watersheds)
76,579 Acres	18010108	1113130101	Vickanne (2990 Acres)
30,990 Hectares	4th Field HUC	1113130102	Patsy Creek (6655 Acres)
120 Square Miles		1113130201	Booth Gulch (3257 Acres)
	1113	1113130202	Lower Middle Fk Ten Mile (3748 Acres)
Location	4th Field Calwater	1113130203	Bear Haven Creek (6611 Acres)
Mendocino County		1113130204	Upper Middle Fk Ten Mile (7798 Acres)
		1113130301	Redwood Creek (5038 Acres)
		1113130302	Churchman Creek (6673 Acres)
		1113130303	Campbell Creek (7899 Acres)
		1113130304	Upper SF Ten Mile River (5236 Acres)
		1113130401	Little North Fork (4960 Acres)
		1113130402	Bald Hill Creek (10345 Acres)
		1113130501	Mill Creek (4466 Acres)
		1113130502	Mouth of Ten Mile River (902 Acres)

Species Potential	Miles of Streams with Species Present
Northern California Steelhead North-Central Coastal Diversity Stratum - Independent Population	<u>Steelhead</u> 95 NOAA Fisheries, Critical Habitat Redesignation, 2005
Central California Coast Coho Lost Coast-Navarro Point Diversity Stratum - Independent Population	<u>Coho</u> 71 CDFG, Coho Distribution, May 2007
California Coastal Chinook North-Central Coastal Diversity Stratum - Independent Population	<u>Chinook</u> 49 NOAA Fisheries, Critical Habitat Redesignation, 2005

Critical Habitat	Miles of Stream
Northern California Steelhead	95 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	49 Miles of Stream

Miles of Waterway ^A	Miles	Number of Dams ^C
Naturally Occurring Waterways		0
Intermittent Stream	143	
Perennial Stream	104	
Artificial Path	5	

^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
11468600	15
Middle Fork Ten Mile River near Fort Bragg	0 Dams 1 Road Crossing (Not a Barrier) 8 Natural Barriers (Chutes, Falls, Log Jams, etc.) 5 Diversions (Unknown Barrier Status)

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



EPA Total Maximum Daily Load Classification (TMDL)¹

Low Priority - Temperature High Priority - Sediment / Siltation

Sources: Silviculture, Harvesting/Restoration/Residue Management, Logging Road Construction/Maintenance, Habitat Modification, Removal of Riparian Vegetation, Streambank Modification/Destabilization, Nonpoint Source

¹State Water Resources Control Board, 2003

Average Annual Precipitation^E

56.7"

Average Annual Precipitation Range^E

40 - 85"

^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		0
Secondary and connecting road, state highways		1
Local, neighborhood, and rural road, city street, unseparated		281
Vehicular trail, 4WD		21
Driveway or service road		0
Total Miles		

Road Density	(US Census Bureau (TIGER))	
Miles of Roads per SqMi of Watershed		2.5
Miles of Roads per SqMi of 100m Riparian Buffer*		3.7

*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		11
Bridge		
Existing Permanent (rocked)		138
Existing Seasonal		648
Existing Temporary & 4WD		18
Proposed Permanent (rocked)		0
Proposed Seasonal		50
Proposed Temporary & 4WD		1
Reconstructed Seasonal		
Secondary Road (2-3 lanes)		1

Road Density	(Timber Harvest Plans)	
Miles of Roads per SqMi of Watershed		7.2
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 Ten Mile Watershed, 2006

Slope^D	Acres	Percent of watershed
Lands of 0-2 percent slope	548	1%
Lands of 2-4 percent slope	565	1%
Lands of 4-10 percent slope	1,615	2%
Lands of 10-15 percent slope	1,840	2%
Lands of 15-30 percent slope	13,706	18%
Lands of 30-60 percent slope	42,900	56%
Lands of 60-100 percent slope	14,992	20%
Lands of > 100 percent slope	411	1%

Elevation Range	0 - 3215 ft.	0 - 980 m
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^DSlope derived from USGS 10 meter Digital Elevation Models (DEM's)

Vegetation^G	Acres	Percent of watershed
Annual grassland	3,922	5%
Barren	20	0%
Conifer Forest		
Douglas Fir	3,091	4%
Montane Hardwood-Conifer	605	1%
Ponderosa Pine	7	0%
Redwood	57,820	75%
Hardwood Forest		
Montane Hardwood	8,755	11%
Montane Riparian	509	1%
Hardwood Woodland		
Blue Oak Woodland	2	0%
Shrub	1,754	2%
Urban	2	0%
Water	47	0%
Wetland	104	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 7	39,653	52%
Erosion Potential 8	21,414	28%
Erosion Potential 9	15,510	20%

^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	76,561	100%
State (Parks & Recreation)	18	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 16 years (1990-2006)
32,851 43% of watershed	44,747 58% of watershed

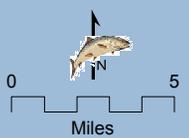
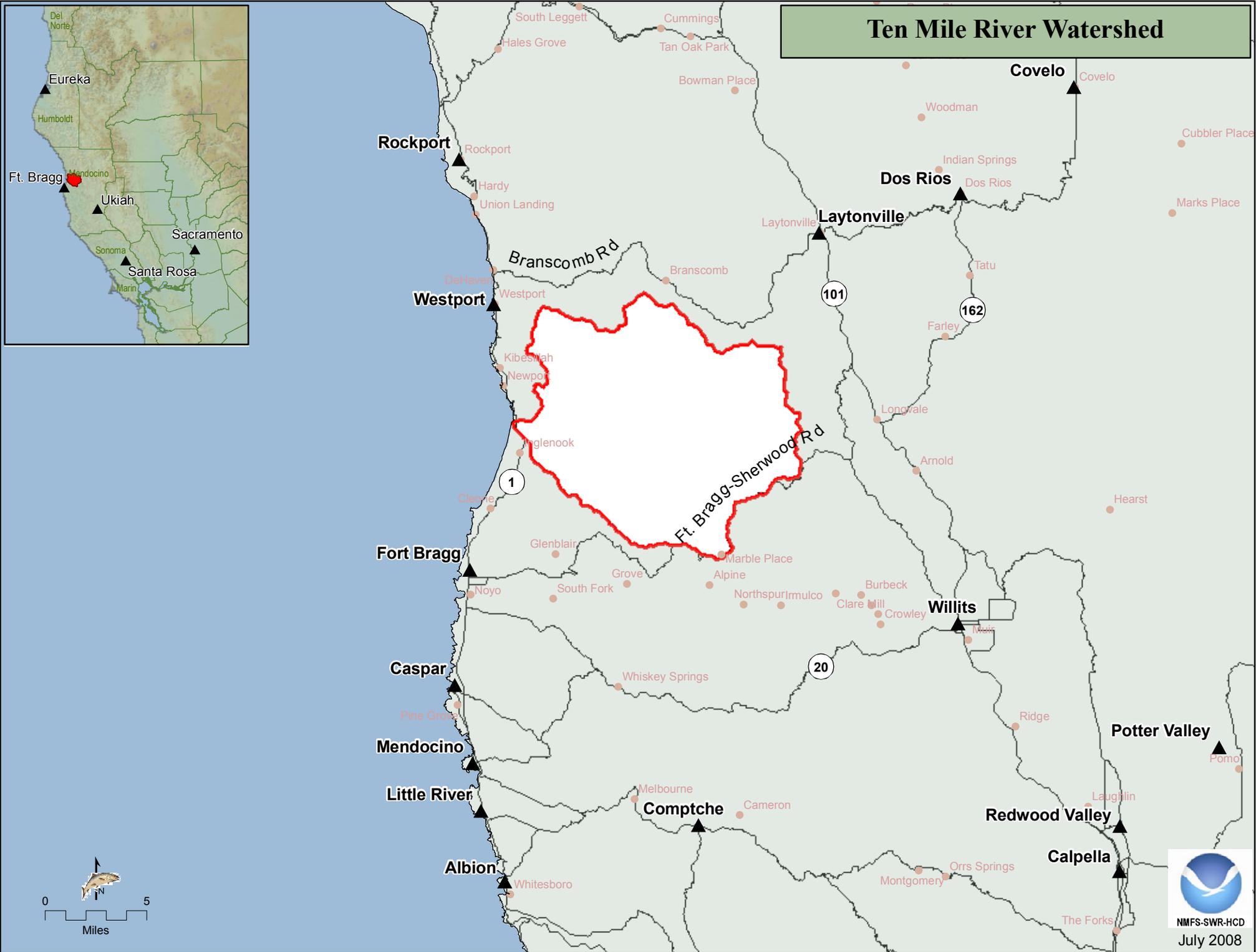
^ACalifornia Department of Forestry, Timber Harvest Plans for Ten Mile Watershed, 2006

Population^I	Housing^I
Total Population within the watershed -- 179 People	Total Housing Units within the watershed -- 117 Houses
	Housing Density
	0 to Less than 1 Housing Unit / 160 Acres 95%
	1 Unit / 160 Acres to 1 Unit / 20 Acres 5%
	1 Unit / 20 Acres to 1 Unit / 5 Acres
	1 Unit / 5 Acres to 2 Units / Acre
	2 Units / Acres to Greater than or Equal to 5 Units / Acre

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



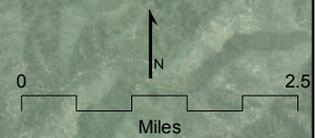
Ten Mile River Watershed





NMFS-SWR-HCD
July 2008

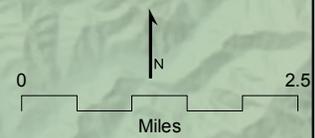
Ten Mile River Watershed





NMFS-SWR-HCD
July 2008

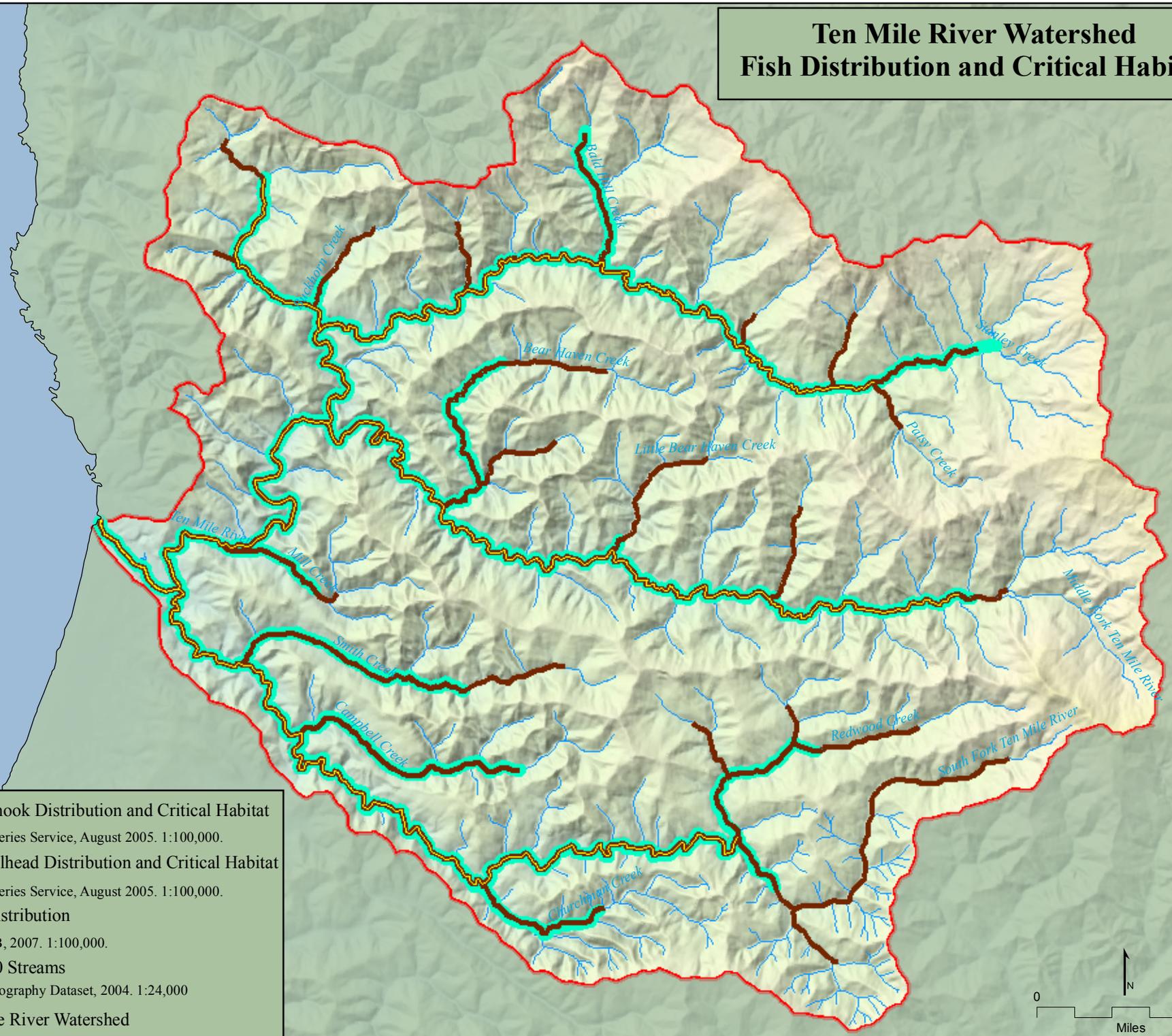
Ten Mile River Watershed CalWater Planning Watersheds



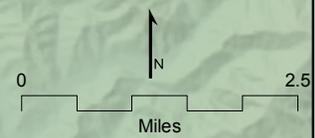


NMFS-SWR-HCD
July 2008

Ten Mile River Watershed Fish Distribution and Critical Habitat



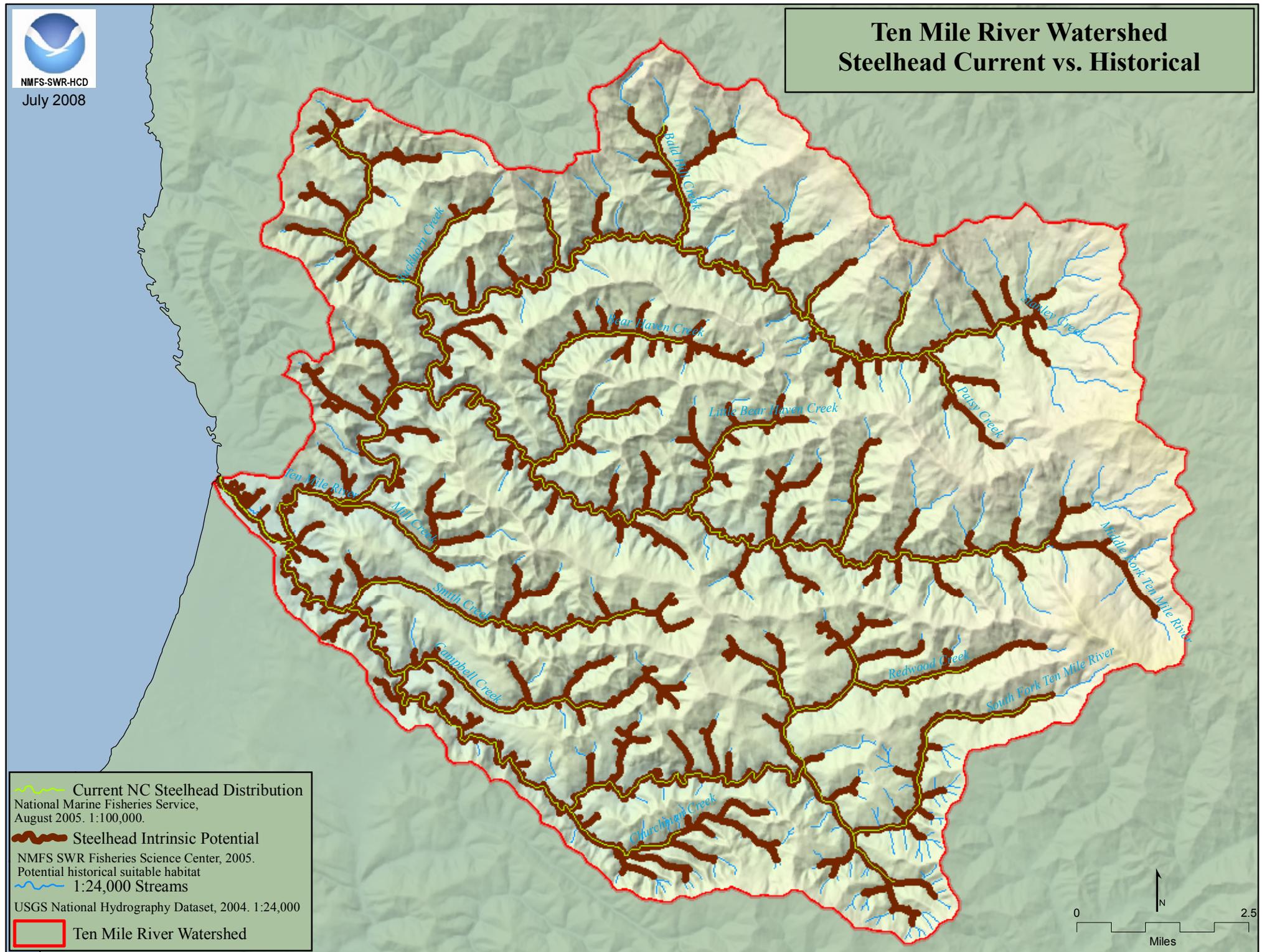
-  CC Chinook Distribution and Critical Habitat
National Marine Fisheries Service, August 2005. 1:100,000.
-  NC Steelhead Distribution and Critical Habitat
National Marine Fisheries Service, August 2005. 1:100,000.
-  Coho Distribution
CDFG - NCNCR-ISB, 2007. 1:100,000.
-  1:24,000 Streams
USGS National Hydrography Dataset, 2004. 1:24,000
-  Ten Mile River Watershed





NMFS-SWR-HCD
July 2008

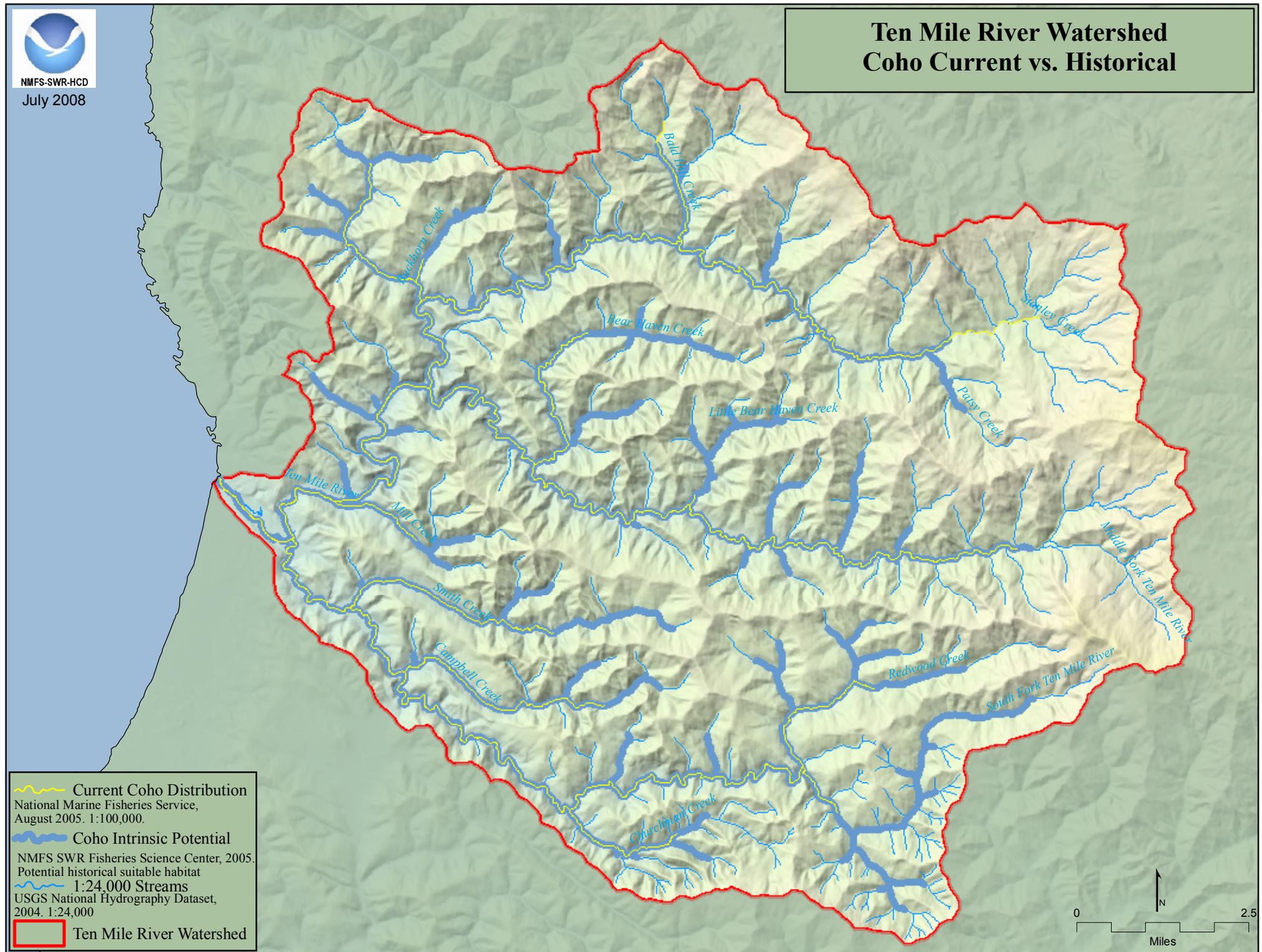
Ten Mile River Watershed Steelhead Current vs. Historical





NMFS-SWR-HCD
July 2008

Ten Mile River Watershed Coho Current vs. Historical





NMFS-SWR-HCD
July 2008

Ten Mile River Watershed Chinook Current vs. Historical

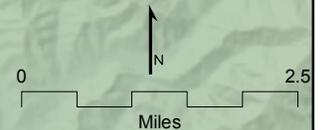


Current CC Chinook Distribution
National Marine Fisheries Service,
August 2005. 1:100,000.

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

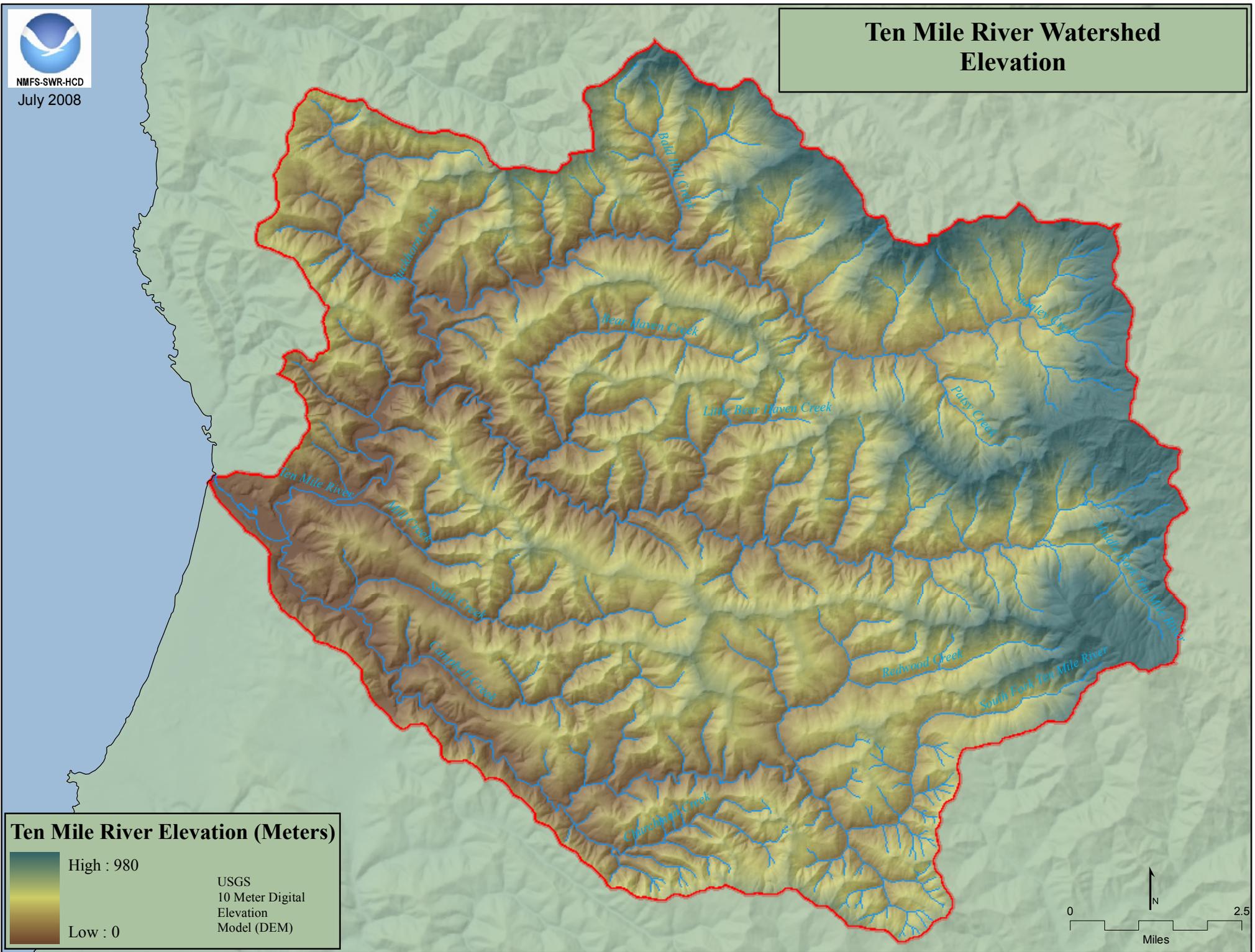
Ten Mile River Watershed



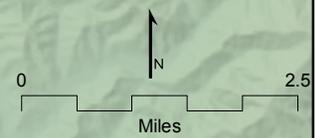
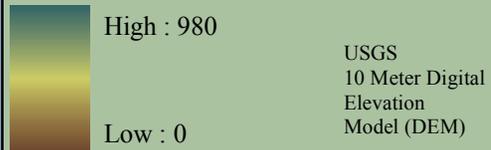


NMFS-SWR-HCD
July 2008

Ten Mile River Watershed Elevation



Ten Mile River Elevation (Meters)





NMFS-SWR-HCD
July 2008

Ten Mile River Watershed Development



Housing Density

- 0 to < 1 Housing Unit / 160 Acres (95%)
- 1 Unit / 160 Acres to 1 Unit / 20 Acres (5%)
- 1 Unit / 20 Acres to 1 Unit / 5 Acres
- 1 Unit / 5 Acres to 2 Units / Acre
- 2 Units / Acre to \geq to 5 Units / Acre

Population within the Watershed = 179 People
Houses within the Watershed = 117

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





NMFS-SWR-HCD
July 2008

Ten Mile River Watershed Ownership

Forest Industrial Ownership

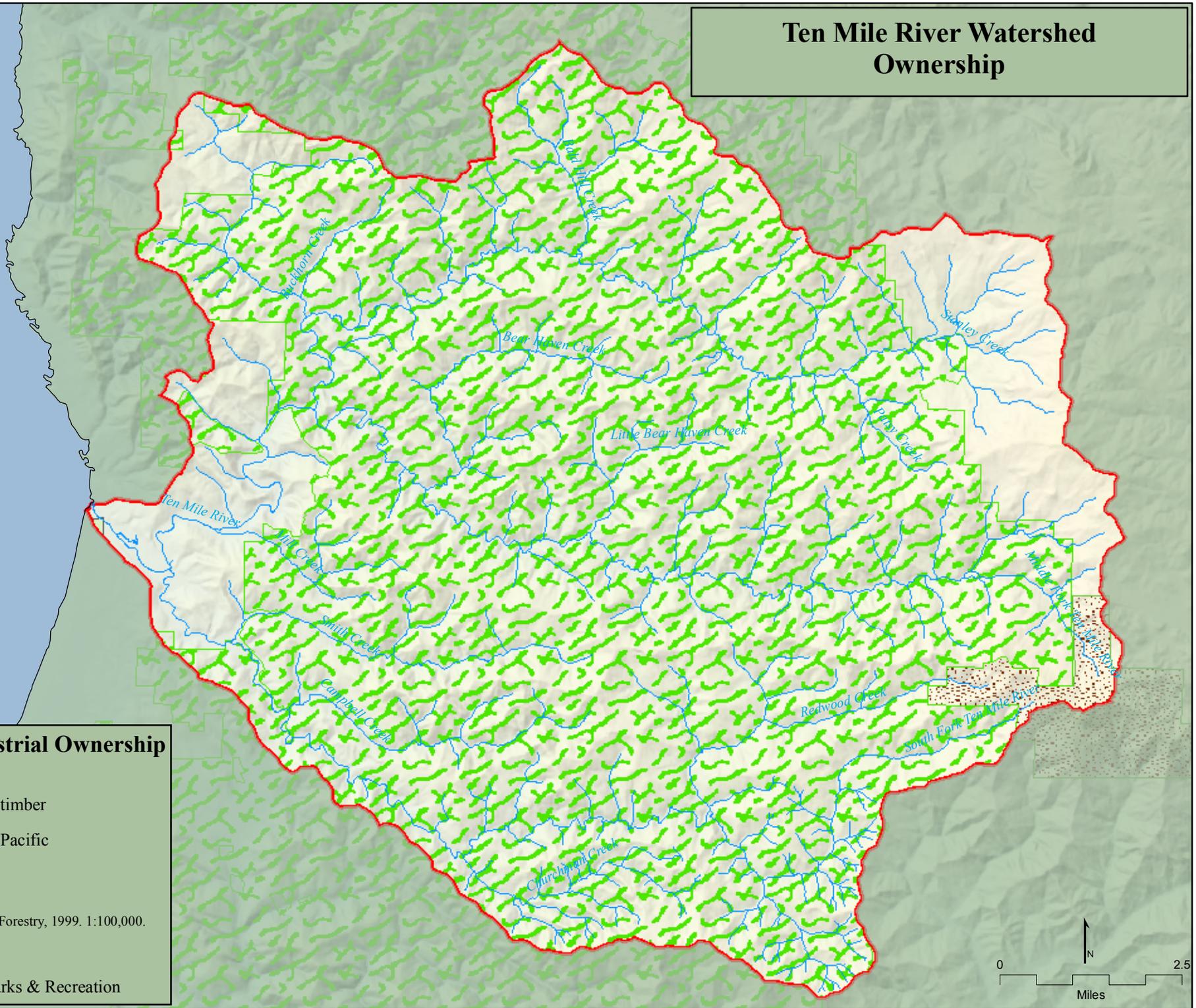
USFWS 2000

-  Barnum timber
-  Georgia Pacific

Ownership

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

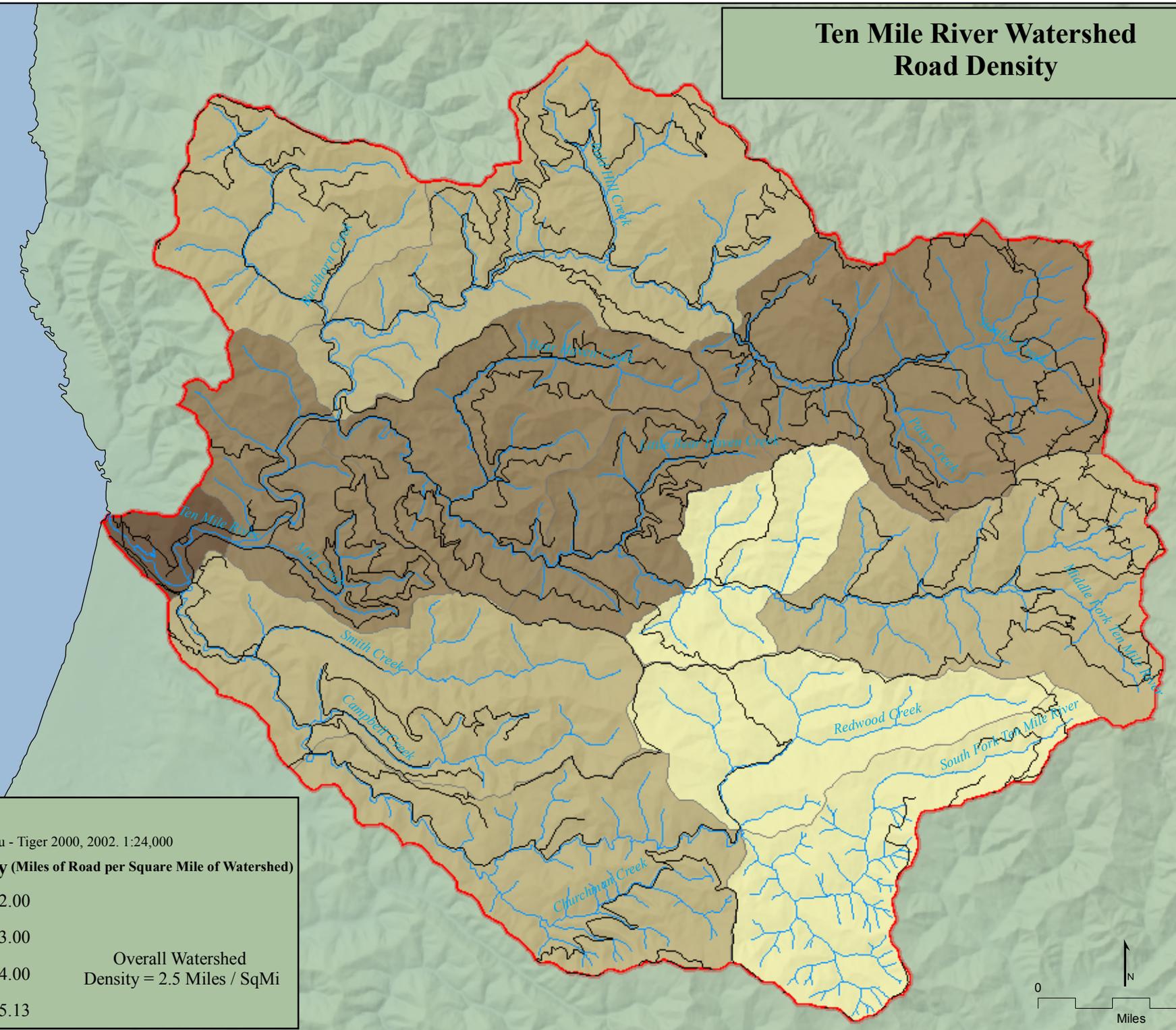
-  Private
-  State, Parks & Recreation





NMFS-SWR-HCD
July 2008

Ten Mile River Watershed Road Density

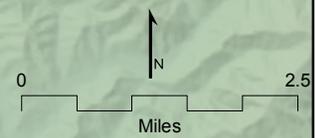


 Road
U.S. Census Bureau - Tiger 2000, 2002. 1:24,000

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

	1.16 - 2.00
	2.01 - 3.00
	3.01 - 4.00
	4.01 - 5.13

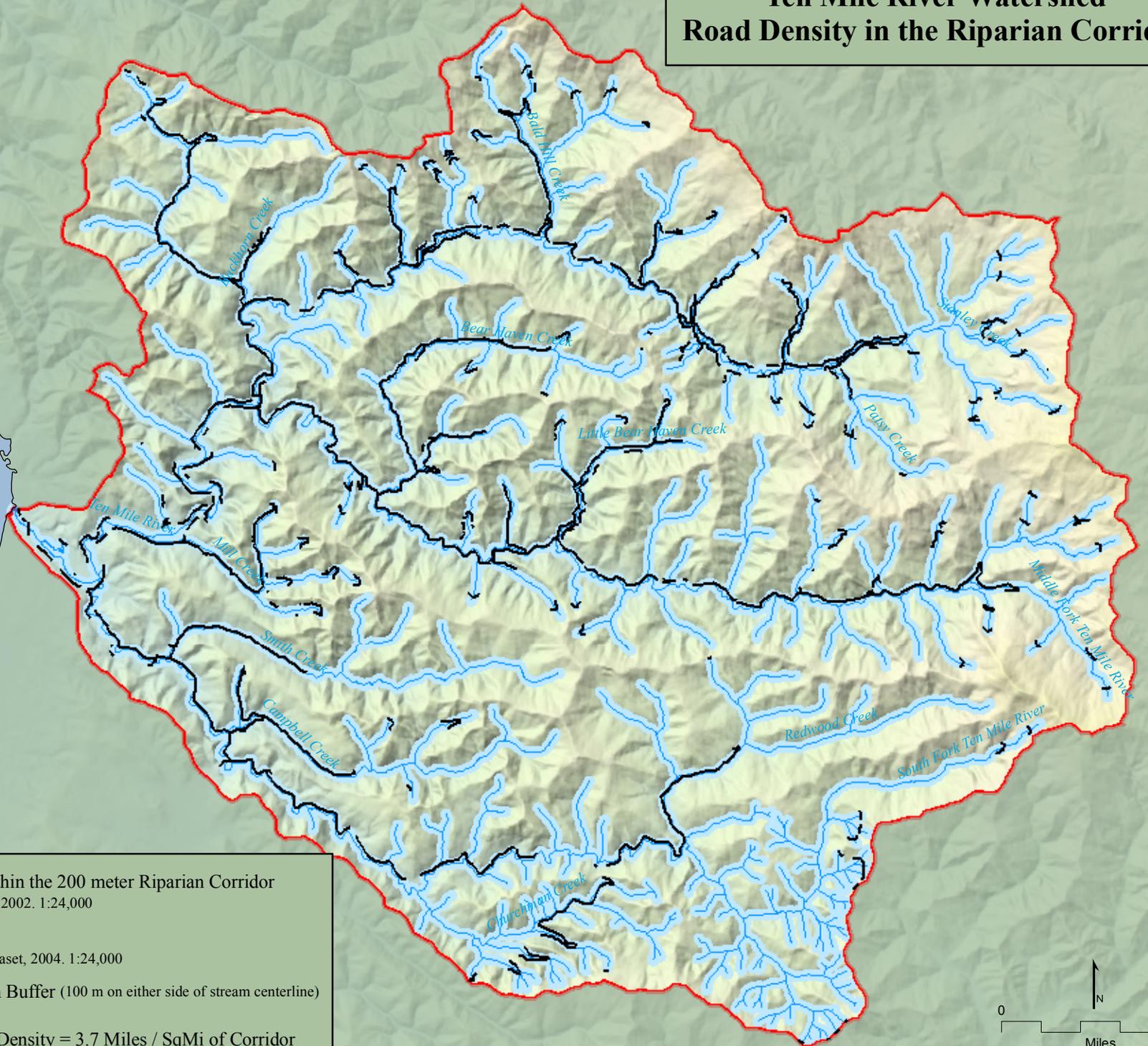
Overall Watershed
Density = 2.5 Miles / SqMi





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Ten Mile River Watershed Road Density in the Riparian Corridor

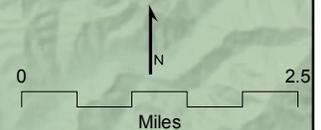


 Road Segments within the 200 meter Riparian Corridor
U.S. Census Bureau - Tiger 2000, 2002. 1:24,000

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

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

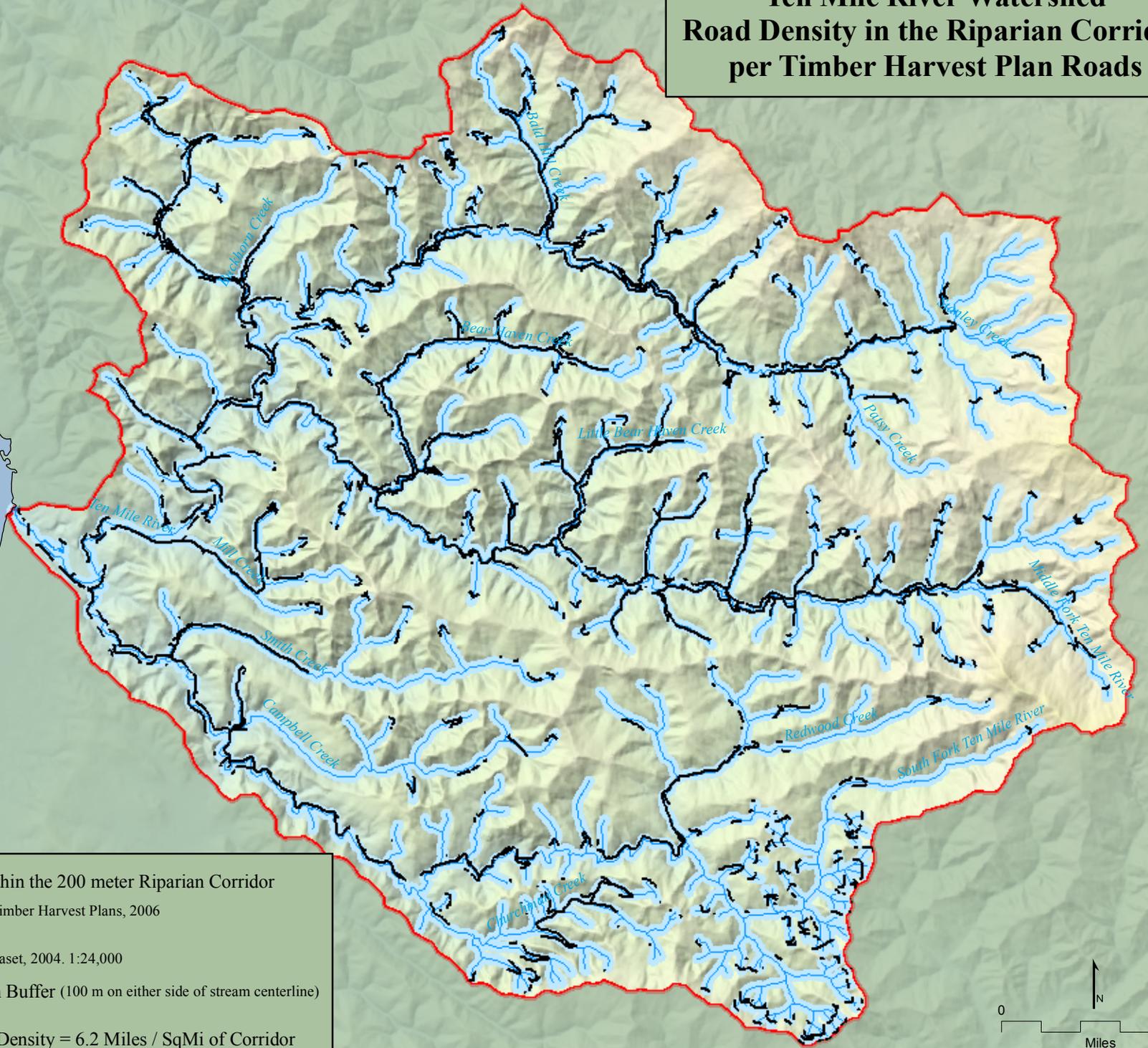
Overall Riparian Corridor Density = 3.7 Miles / SqMi of Corridor





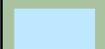
NMFS-SWR-HCD
July 2008

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

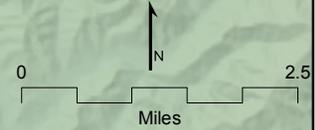


 Road Segments within the 200 meter Riparian Corridor
California Department of Forestry, Timber Harvest Plans, 2006

 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





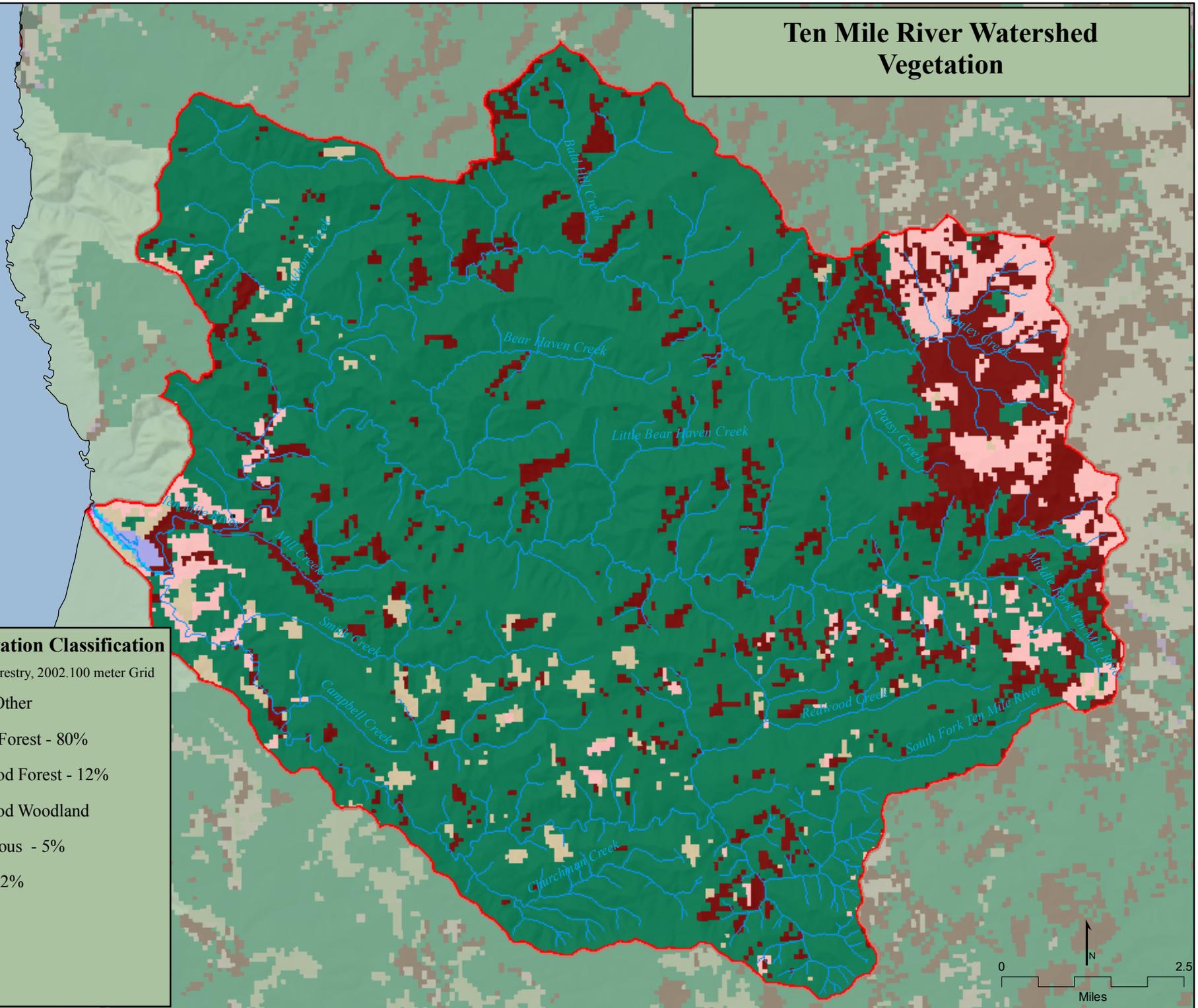
NMFS-SWR-HCD
July 2008

Ten Mile River Watershed Vegetation

WHR13 Vegetation Classification

CA Department of Forestry, 2002.100 meter Grid

- Barren/Other
- Conifer Forest - 80%
- Hardwood Forest - 12%
- Hardwood Woodland
- Herbaceous - 5%
- Shrub - 2%
- Urban
- Water
- Wetland





NMFS-SWR-HCD
July 2008

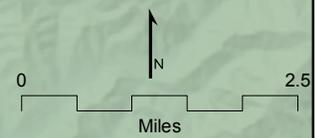
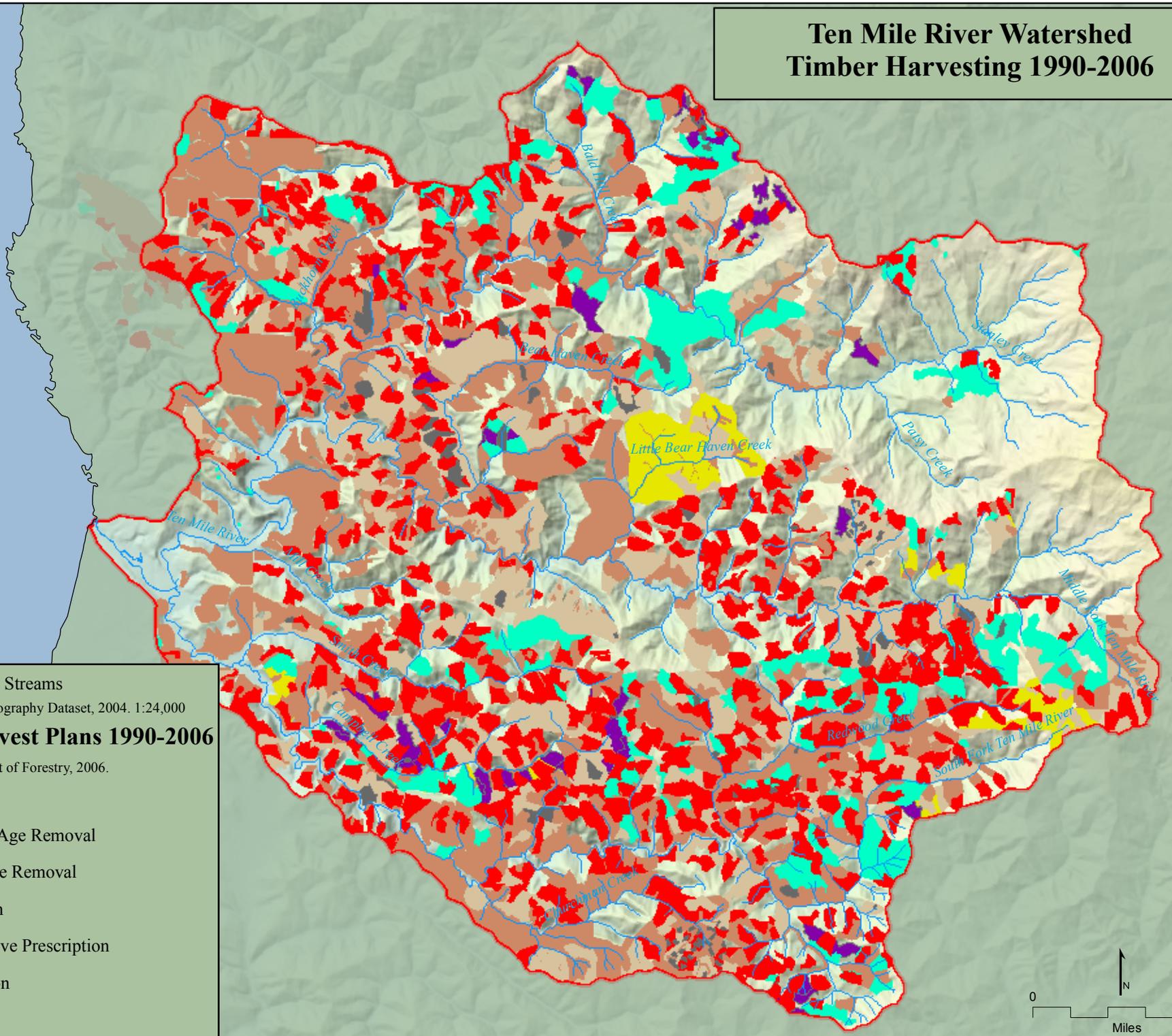
Ten Mile River Watershed Timber Harvesting 1990-2006

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

Timber Harvest Plans 1990-2006

California Department of Forestry, 2006.

- Clearcut
- Uneven Age Removal
- Even Age Removal
- Selection
- Alternative Prescription
- Transition
- Out

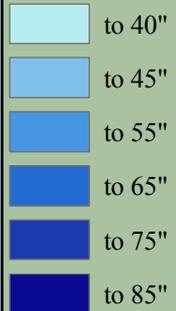




NMFS-SWR-HCD
July 2008

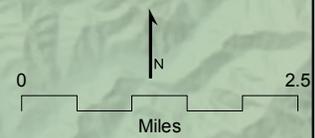
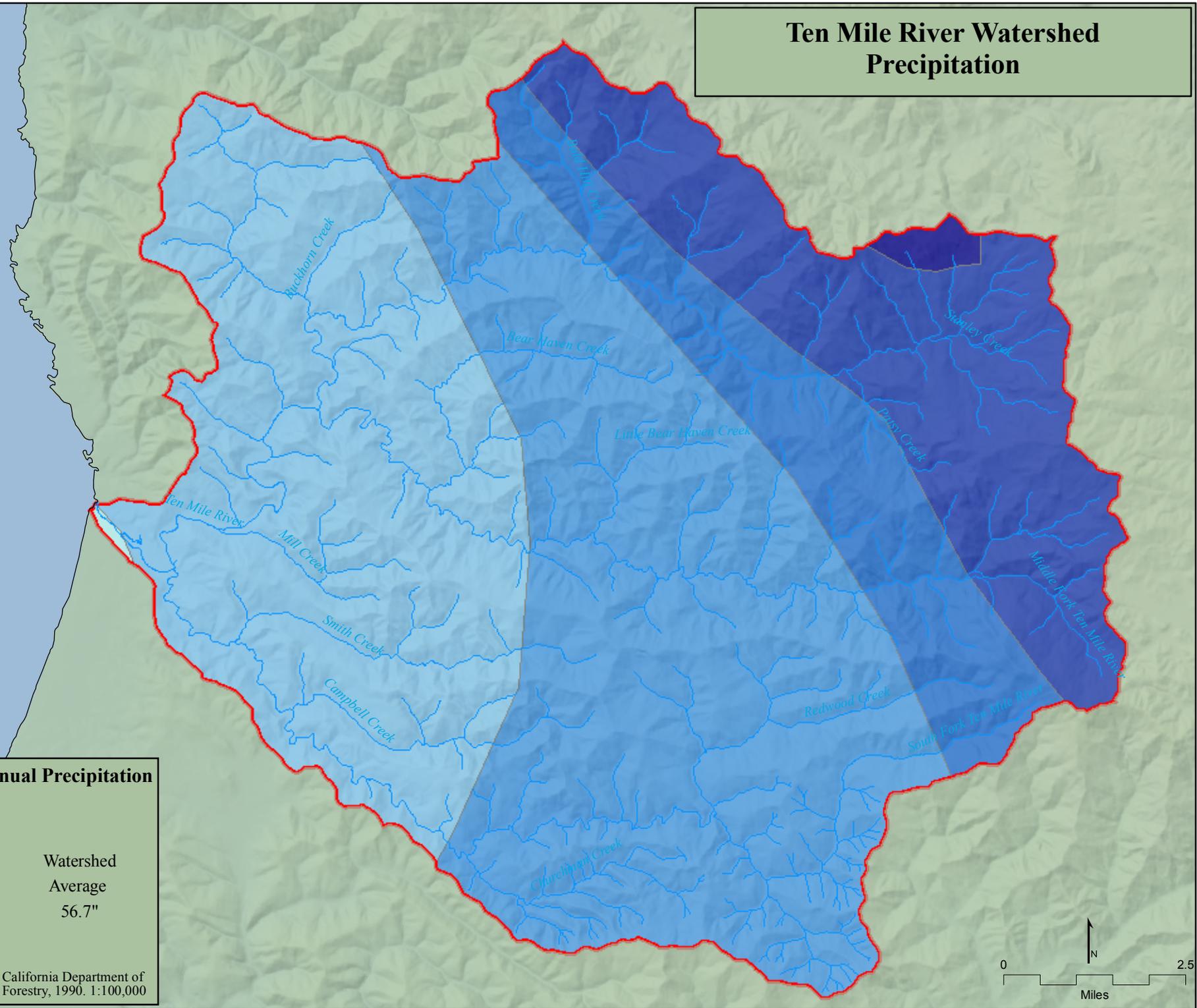
Ten Mile River Watershed Precipitation

1900-1960 Annual Precipitation



Watershed
Average
56.7"

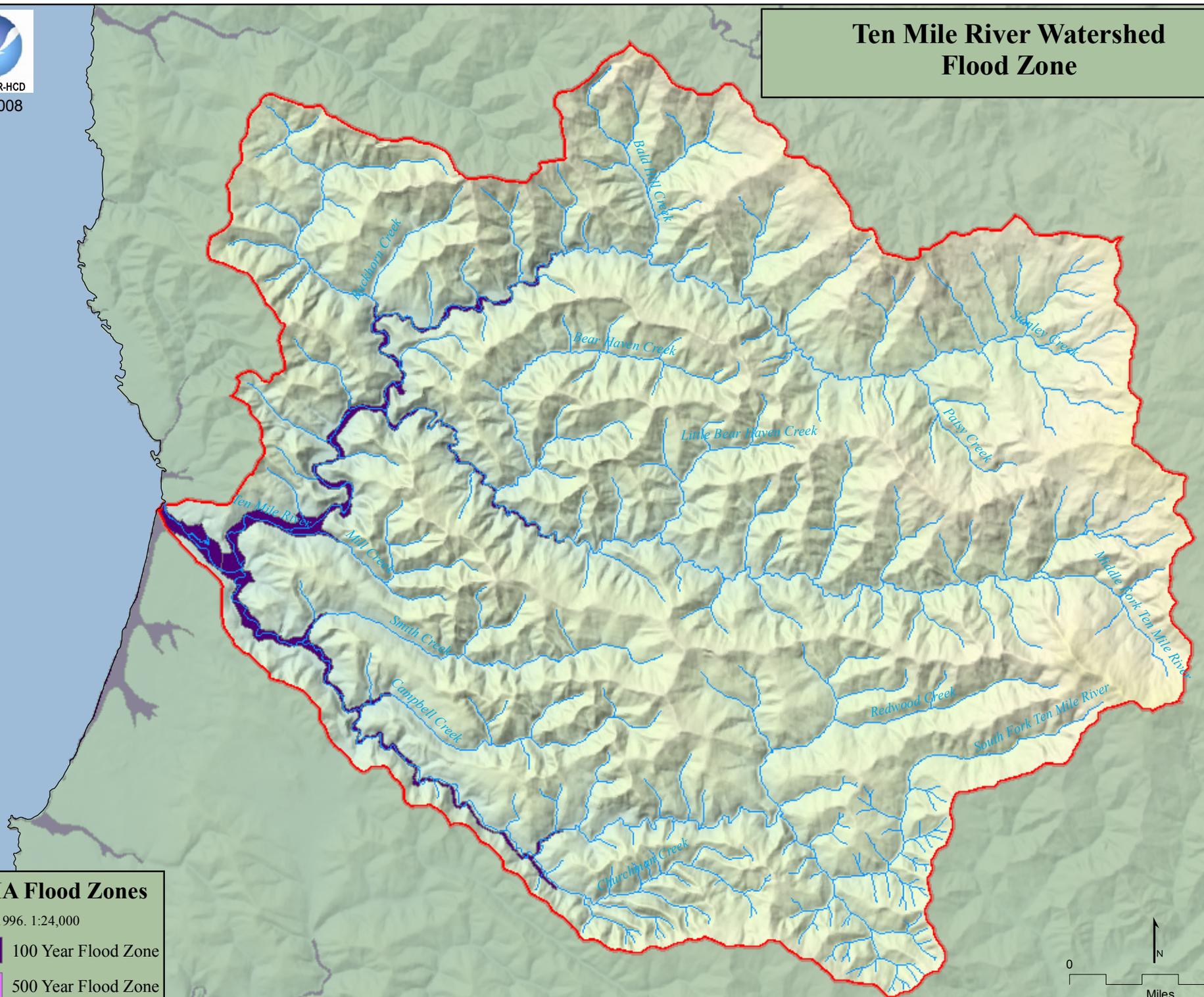
California Department of
Forestry, 1990. 1:100,000





NMFS-SWR-HCD
July 2008

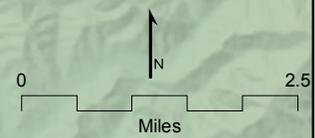
Ten Mile River Watershed Flood Zone



FEMA Flood Zones

FEMA, 1996. 1:24,000

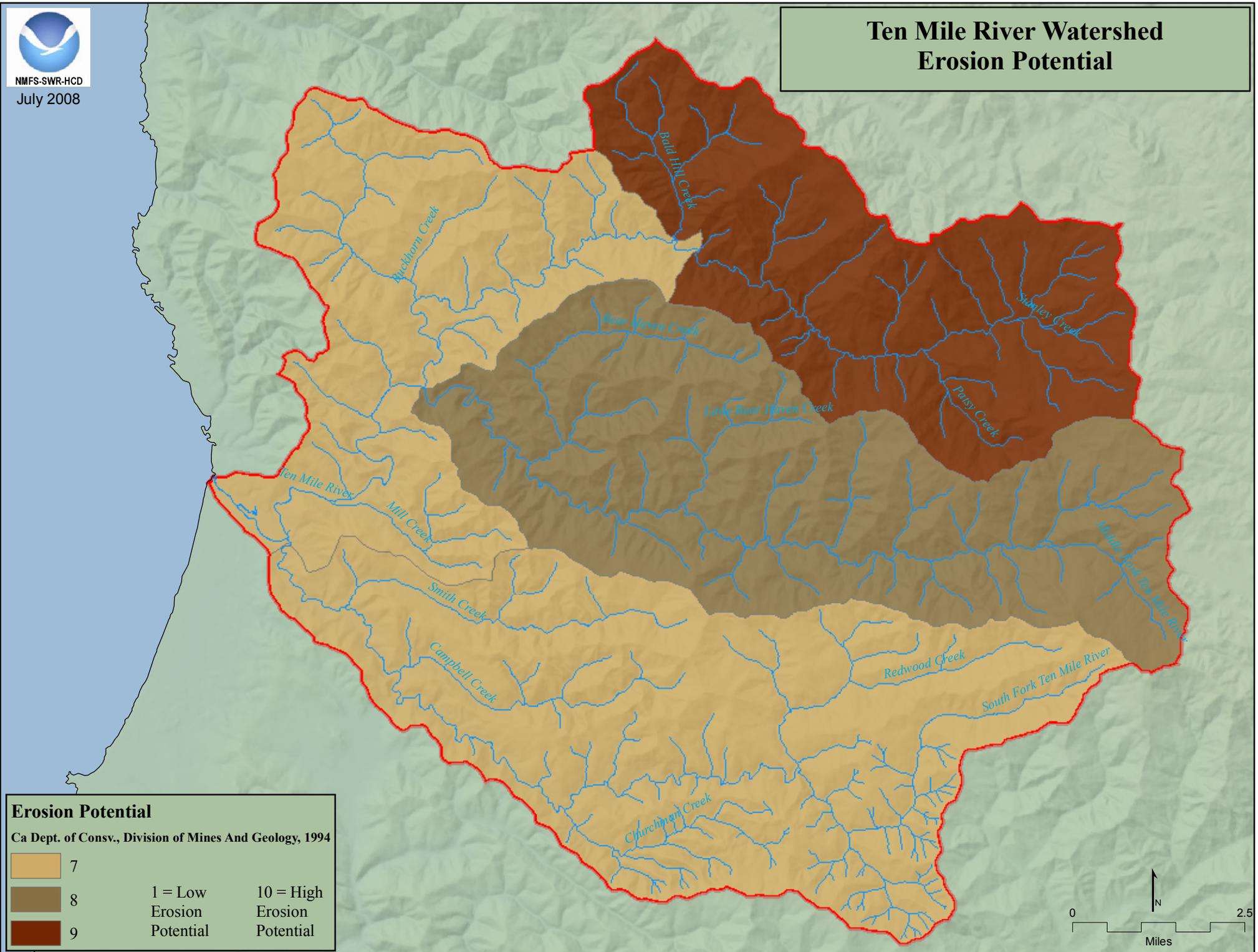
-  100 Year Flood Zone
-  500 Year Flood Zone





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July 2008

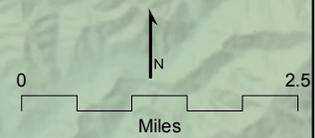
Ten Mile River Watershed Erosion Potential



Erosion Potential

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

	7		
	8	1 = Low	10 = High
	9	Erosion	Erosion
		Potential	Potential





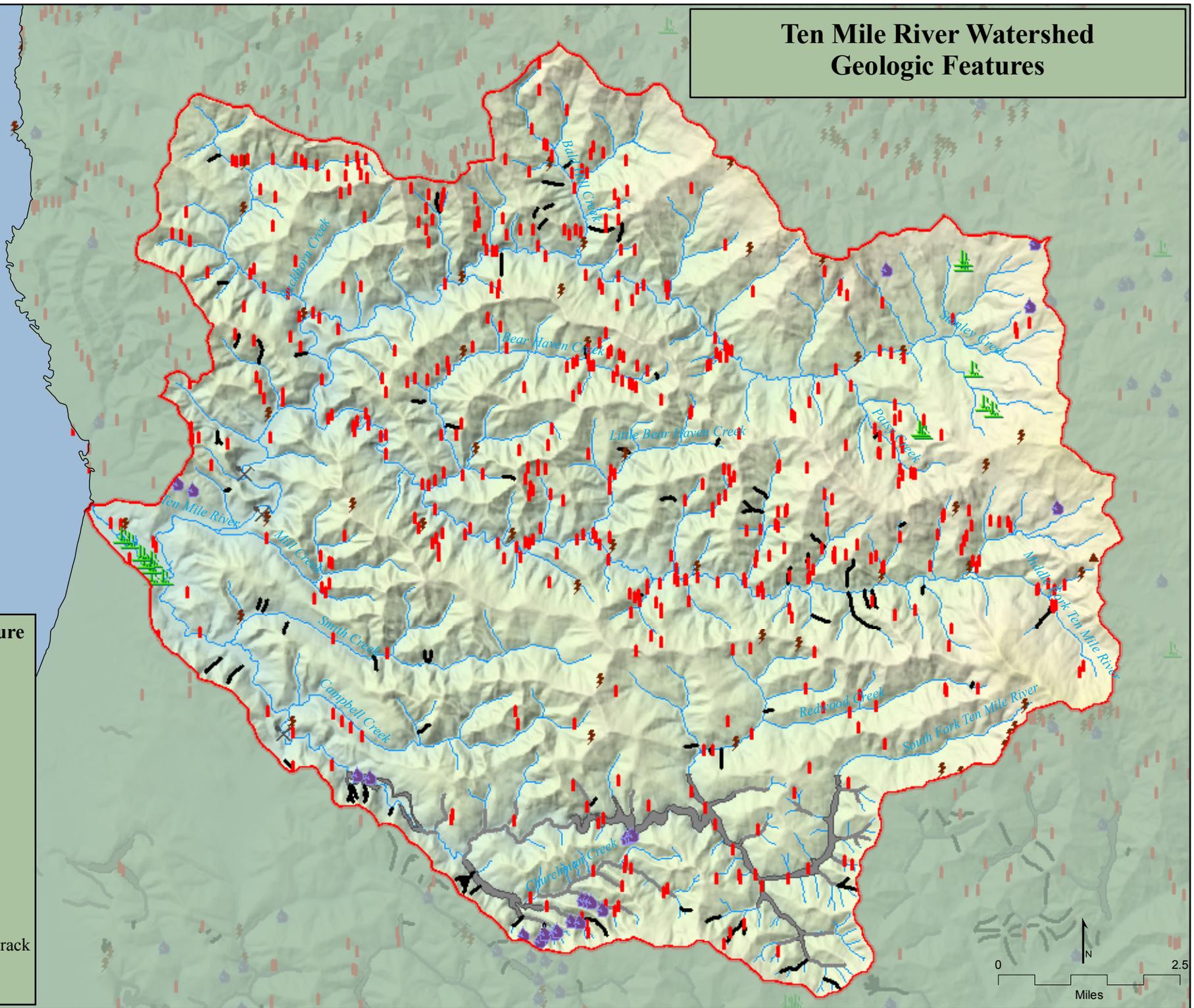
NMFS-SWR-HCD
July 2008

Ten Mile River Watershed Geologic Features

Geologic Feature

CA Geologic Survey

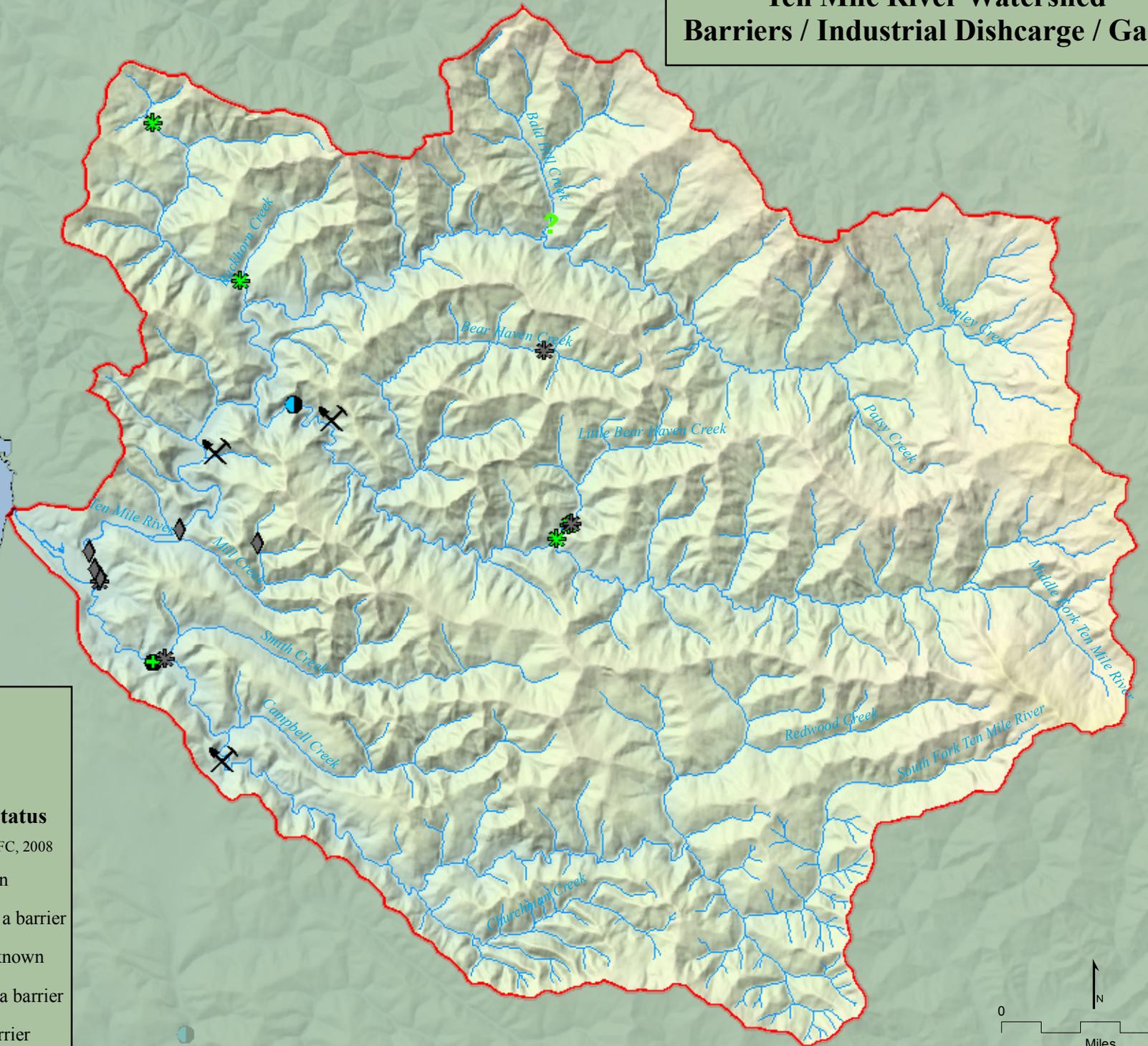
-  Dipbed
-  Dipover
-  Marsh
-  Quarry
-  Slide
-  Spring
-  Gorge
-  Torrent track
-  Gorge



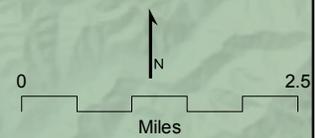


NMFS-SWR-HCD
July 2008

Ten Mile River Watershed Barriers / Industrial Discharge / Gages



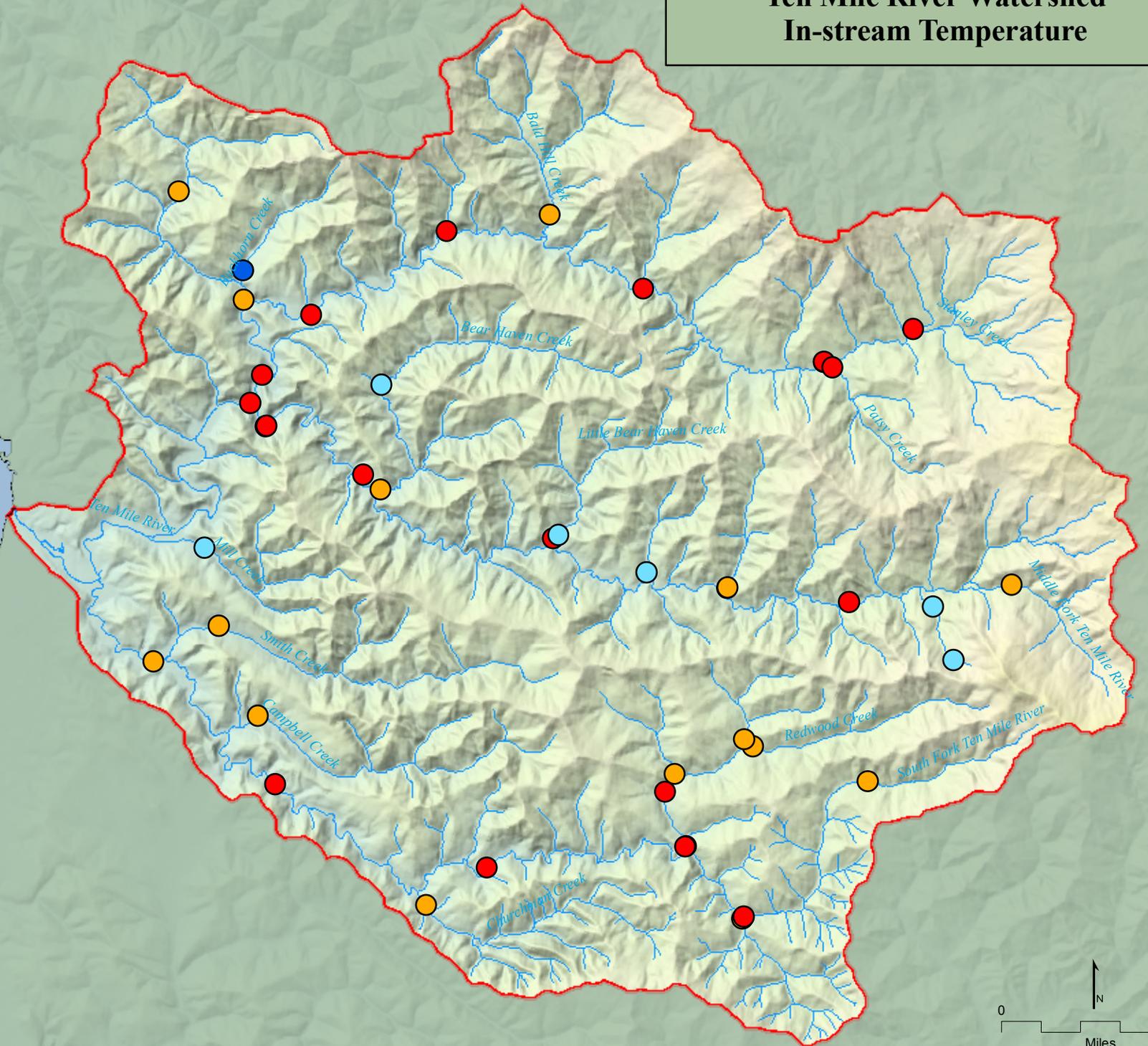
 Gage Station
 mines
 USGS 2006
Barrier Type, Barrier Status
 CA Fish Passage Assessment, PSMFC, 2008
 Diversion, Unknown
 Non-structural, Not a barrier
 Non-structural, Unknown
 Road crossing, Not a barrier
 Unknown, Not a barrier





NMFS-SWR-HCD
July 2008

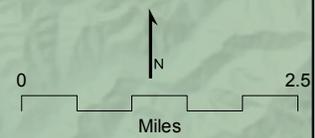
Ten Mile River Watershed In-stream Temperature



Average MWMT (°C)

AvgMWMT

- 0 - 14
- 14 - 15
- 15 - 17
- 17 - 28





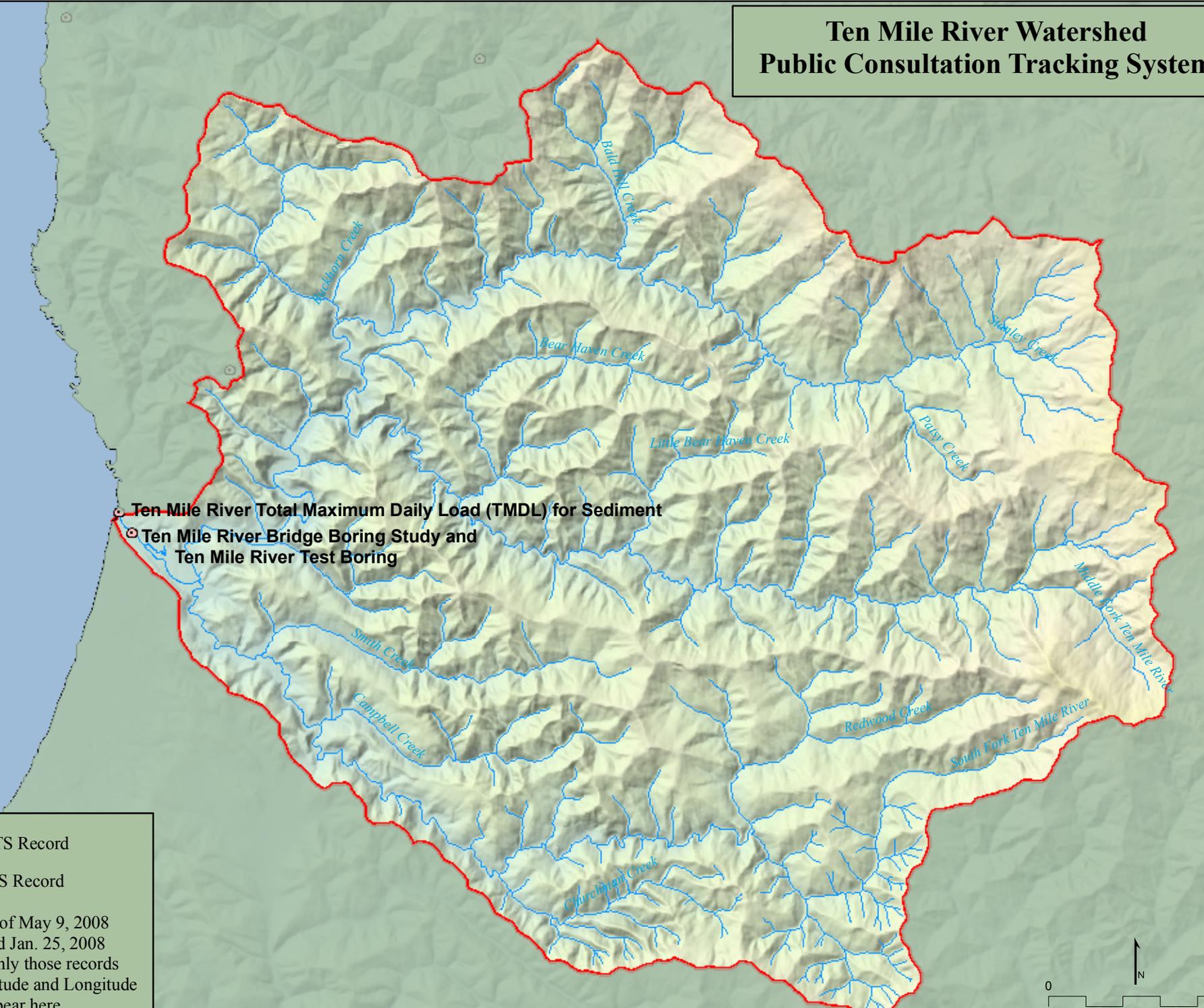
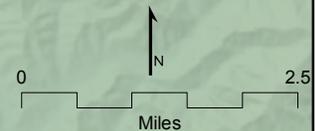
NMFS-SWR-HCD
July 2008

Ten Mile River Watershed Public Consultation Tracking System

○ Ten Mile River Total Maximum Daily Load (TMDL) for Sediment
○ Ten Mile River Bridge Boring Study and
Ten Mile River Test Boring

- 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



References

Watersheds

calwater_ver2_2
vector digital data
California Watersheds (CALWATER 2.2)
California Department of Forestry and Fire
Protection
1:24,000
1999
<http://www.ca.nrcs.usda.gov/features/calwater/>

Distribution

Coho_Distribution
vector digital data
Eric Haney - CDFG - NCNCR-ISB
1:100,000
2006
Draft
<http://www.calfish.org/>

NC_Steelhead_Distribution_06_2005
vector digital data
National Marine Fisheries Service (NOAA
Fisheries)
1:100,000
August 2005
<http://swr.nmfs.noaa.gov/salmon/layers/finalgis.htm>

CC_Chinook_Distribution_06_2005
vector digital data
National Marine Fisheries Service (NOAA
Fisheries)
1:100,000
August 2005
<http://swr.nmfs.noaa.gov/salmon/layers/finalgis.htm>

Critical Habitat

CC_Chinook_ch_06_2005
vector digital data
National Marine Fisheries Service (NOAA
Fisheries)
1:100,000
August 2005
<http://swr.nmfs.noaa.gov/salmon/layers/finalgis.htm>

NC_Steelhead_ch_06_2005
vector digital data
National Marine Fisheries Service (NOAA
Fisheries)
1:100,000

August 2005
<http://swr.nmfs.noaa.gov/salmon/layers/finalgis.htm>

Hydrology

1801 NHD Flowline
vector digital data
National Hydrography Dataset High Resolution
United States Geological Survey
1:24,000
2004

Dams

Dams_2005
vector digital data
Goslin, M.,
Santa Cruz Fishery Science Center
National Marine Fisheries Service
2005
<http://swfsc.noaa.gov/>

Barriers and Diversions

pad_september2008
vector digital data
California Fish Passage Assessment Database
Pacific States Marine Fisheries Commission
September 2006
<http://www.calfish.org/>

Gaging Stations

USGS Streamgages
vector digital data
U.S. Geological Survey
Reston, Va
2006
http://water.usgs.gov/GIS/dsdl/USGS_Streamgages-NHD_Locations_Shape.zip

Total Maximum Daily Load (TMDL)

R1_rivers_2002 303d
vector digital data
State Water Resources Control Board (SWRCB)
California Environmental Protection Agency
2002

Precipitation

California Mean Annual Precipitation Zones, 1900-1960

Vector digital data

California Department of Forestry and Fire Protection 1990

1:100,000

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

Roads

roads

vector digital data

Timber Harvest Plans

California Department of Forestry and Fire Protection

1:24,000

2006

TGRR00

vector digital data

Roads

United States Census Bureau

1:100000

2000

<http://www.census.gov/geo/www/tiger/>

Elevation

USGS DEM

10 Meter Digital Elevation Model (DEM)

Earth Resources and Science (EROS)

United States Geological Survey

<http://edc.usgs.gov/products/elevation/dem.html>

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>

Erodability

Highly Erodible Watersheds

vector digital data

Department of Conservation, Division of Mines and Geology

Minimum Mapping Unit: Approximately 8000

Acres (20,000 Hectares)

1994

<http://gis.ca.gov/catalog/BrowseRecord.epl?id=380>

Land Ownership

GOVTOWNA

vector digital data

California Department of Forestry Forest and Rangeland Resources Assessment Program

Bureau of Land Management Surface Management

1:100,000

September 1999

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

Timber Harvesting

thp_(year)

Annual Timber Harvest Plans

vector digital data

California Department of Forestry and Fire Protection

Santa Rosa, CA

1983-2001

Developed Area and Population

Census 2000 Block Data (Migrated)

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

naip_1-1_2n_s_ca045_2004_1 (Mendocino)

remote-sensing image

raster digital data

National Agriculture Imagery Program (NAIP)

USDA-FSA Aerial Photography Field Office

Salt Lake City, Utah

2004

<http://datagateway.nrcs.usda.gov/GatewayHome.html>

Historic Suitable Habitat (Coho, Chinook, Steelhead)

Intrinsic Potential Model

vector digital data

NOAA Fisheries

Santa Cruz Laboratory, Santa Cruz, CA

2005

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

Forest Industrial Ownership

nwca_own

vector digital data

United States Fish and Wildlife Service

Arcata, CA

2000

Toxins

mines

vector digital data

Better Assessment Science Integrating point and
Nonpoint Sources (BASINS)

United States Environmental Protection Agency

2001

<http://www.epa.gov/waterscience/basins/>

Temperature

MWMT_20080117_selected_watersheds

Vector digital data

Sonoma Ecology Center

2008

Geologic Features

Geopoint

vector digital data

Department of Conservation, Division of Mines and
Geology

Minimum Mapping Unit: Approximately 8000

Acres (20,000 Hectares)

1994

Gorge

vector digital data

Department of Conservation, Division of Mines and
Geology

Minimum Mapping Unit: Approximately 8000

Acres (20,000 Hectares)

1994

Records Management System (RMS)

Public Consultation Tracking System (PCTS)

National Marine Fisheries Service

Oracle Databases

2008