August 2008

NMFS-SWR-HCD

Sonoma Creek Watershed

Area	Hydrologic Units	Calwater Subbasins ---	(Planning Watersheds)
93,563 Acres	18050002	2206400101	Upper Sonoma Creek (12131 Acres)
37,864 Hectares	4th Field **HUC**	2206400102	Upper Calabazas (11562 Acres)
146 Square Miles		2206400103	Bear Creek (5292 Acres)
	2206	2206400104	Lower Calabazas (12064 Acres)
Location	4th Field **Calwater**	2206400201	Mouth of Sonoma Creek (32462 Acres)
Sonoma County		2206400202	Nathanson Creek (9176 Acres)
		2206400203	Haraszthy Creek (6464 Acres)
		2206400204	Champlin Creek (4410 Acres)

Species Potential	Miles of Streams with Species Present
Central California Coast **Steelhead**	Steelhead
Interior San Francisco Bay Diversity Stratum	87
- Independent Population	NOAA Fisheries, Critical Habitat Redesignation, 2005
Central California Coast **Coho**	Coho
San Francisco Bay Diversity Stratum	0
- Dependent Population	CDFG, Coho Distribution, May 2007

Critical Habitat

Central California Coast Steelhead	87 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		14
Intermittent Stream	245	2 - Impassable
Perennial Stream	63	3 - Not a Barrier
Canal / Ditch	59	3 - Partial Barriers
Artificial Path	41	2 - Temporal Barriers
		4 - Unknow Barrier Status

[A]USGS National Hydrography Dataset, High Resolution, 2004. 1:24,000

[C]Passage Assessment Database, Pacific States Marine Fisheries Commission, 2005

USGS Gaging Stations[B]	Number of Barriers[C]
11458400	296
Sonoma Creek near Kenwood	14 Dams
11458500	132 Water Rights Diversions
Sonoma Creek at Agua Caliente	99 Road Crossings (17 Impassable, 53 Temp. &/or Partially Impassable)
	36 Natural Barriers (Chutes, Falls, Log Jams, etc. (35 Impassable))

[C]Passage Assessment Database, Pacific States Marine Fisheries Commission, 2006

EPA Total Maximum Daily Load Classification (**TMDL**)[I]

Low Priority - Pathogens Medium Priority - Nutrients, Sediment/Siltation

Sources: Agriculture, Construction/Land Development, Urban Runoff/Storm Sewers,

[I]State Water Resources Control Board, 2003

Approriated Waterways[J]

"…on Sonoma Creek below the gaging station at Boyes Hot Springs upstream." is Fully appropriated (7/1 to 9/30)

[J]California State Water Resources Control Board, 1998.

Average Annual **Precipitation**[E]	Average Annual **Precipitation Range**[E]
36.5"	18 - 65"

[E]California Mean Annual Precipitation Zones, 1900-1960, CA Department of Forestry, 1990

Roads[A]	Miles
Roads in Watershed	
Secondary and connecting road, state highways	30
Local, neighborhood, and rural road, city street, unseparated	450
Vehicular trail, 4WD	0
Driveway or service road	13
Total Miles	

Road Density	
Miles of Roads per SqMi of Watershed	3.4
Miles of Roads per SqMi of 100m Riparian Buffer*	3.4

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

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

Slope[D]	Acres	Percent of watershed
Lands of 0-2 percent slope	22,058	24%
Lands of 2-4 percent slope	10,275	11%
Lands of 4-10 percent slope	11,895	13%
Lands of 10-15 percent slope	7,641	8%
Lands of 15-30 percent slope	19,668	21%
Lands of 30-60 percent slope	19,675	21%
Lands of 60-100 percent slope	2,337	2%
Lands of 100-117 percent slope	14	0%
Elevation Range	0 - 2730 ft.	0 - 832 m

[D]Slope derived from USGS 10 meter Digital Elevation Models (DEM's)

Vegetation[G]	Acres	Percent of watershed
Agriculture	28,415	30%
Annual grassland	16,240	17%
Barren	242	0%
Conifer Forest		
Closed Cone-Pine-Cypress	796	1%
Douglas Fir	1,572	2%
Montane Hardwood-Conifer	101	0%
Redwood	425	0%
Hardwood Forest		
Montane Hardwood	24,434	26%
Montane Riparian	620	1%
Hardwood Woodland		
Coastal Oak Woodland	1,161	1%
Valley Foothill Riparian	272	0%
Shrub	9,498	10%
Urban	8,236	9%
Water	415	0%
Wetland	1,176	1%

[G]Multi-source Land Cover Data (2002 v2), CA Department of Forestry, 2002. 100 meter Grid

Land Ownership[H]	Acres	Percent of watershed
Private	81,896	89%
Local (City / County Park)	155	0%
State (Fish & Game)	686	1%
State (Parks & Recreation)	5,264	6%
State (Other)	1,557	2%
Federal (BLM)	43	0%
Federal (Military)	2,410	3%

[H]Management Landscape, CA Department of Forestry, 2002

Population[I]	Housing[I]	
Total Population within the watershed -- 42,682 People	Total Housing Units within the watershed -- 18,857 Houses	
	Housing Density	
	0 to Less than 1 Housing Unit / 160 Acres	27%
	1 Unit / 160 Acres to 1 Unit / 20 Acres	42%
	1 Unit / 20 Acres to 1 Unit / 5 Acres	19%
	1 Unit / 5 Acres to 2 Units / Acre	10%
	2 Units / Acres to Greater than or Equal to 5 Units / Acre	3%

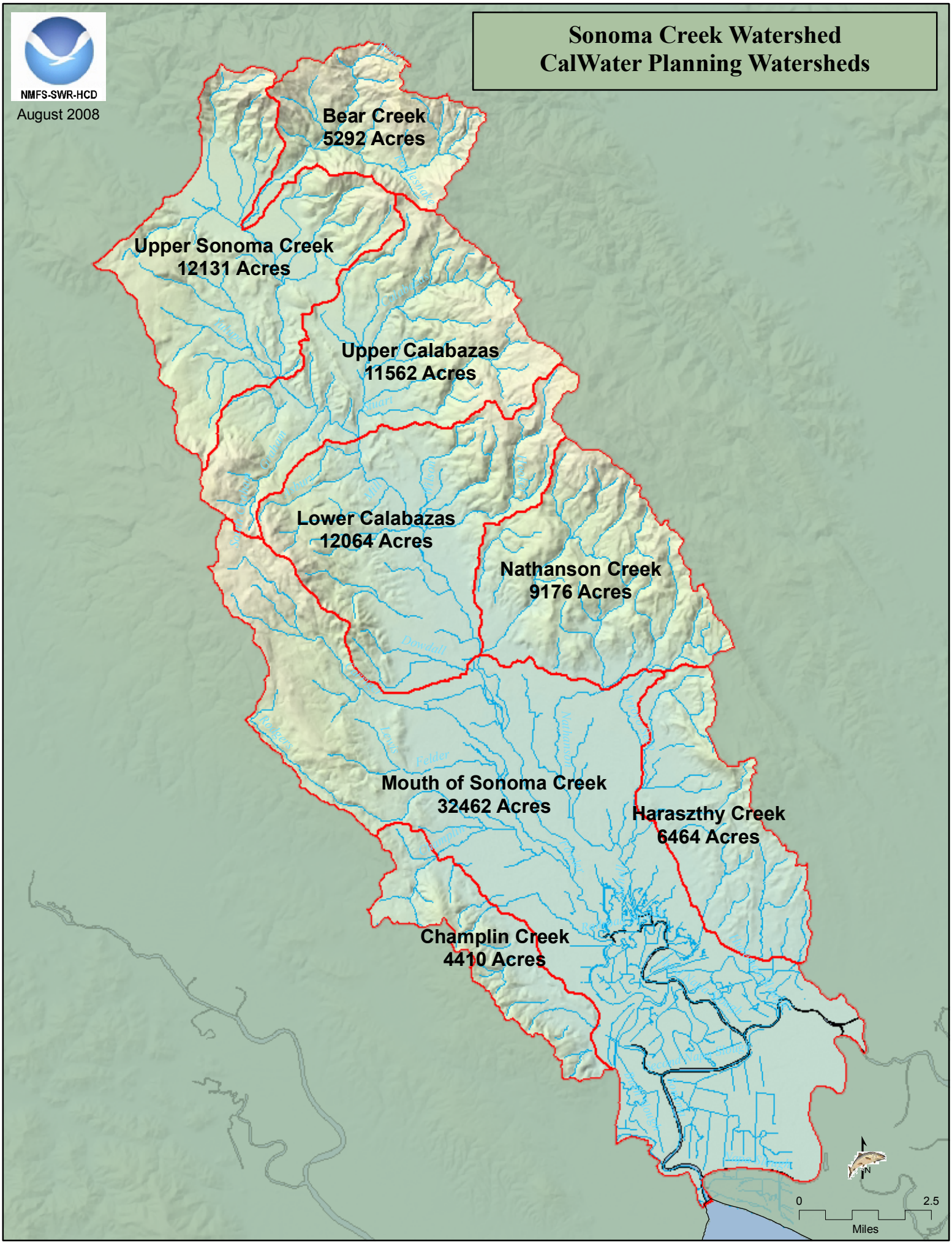
[I]Census 2000 Block Data (Migrated), CA Department of Forestry, 2003

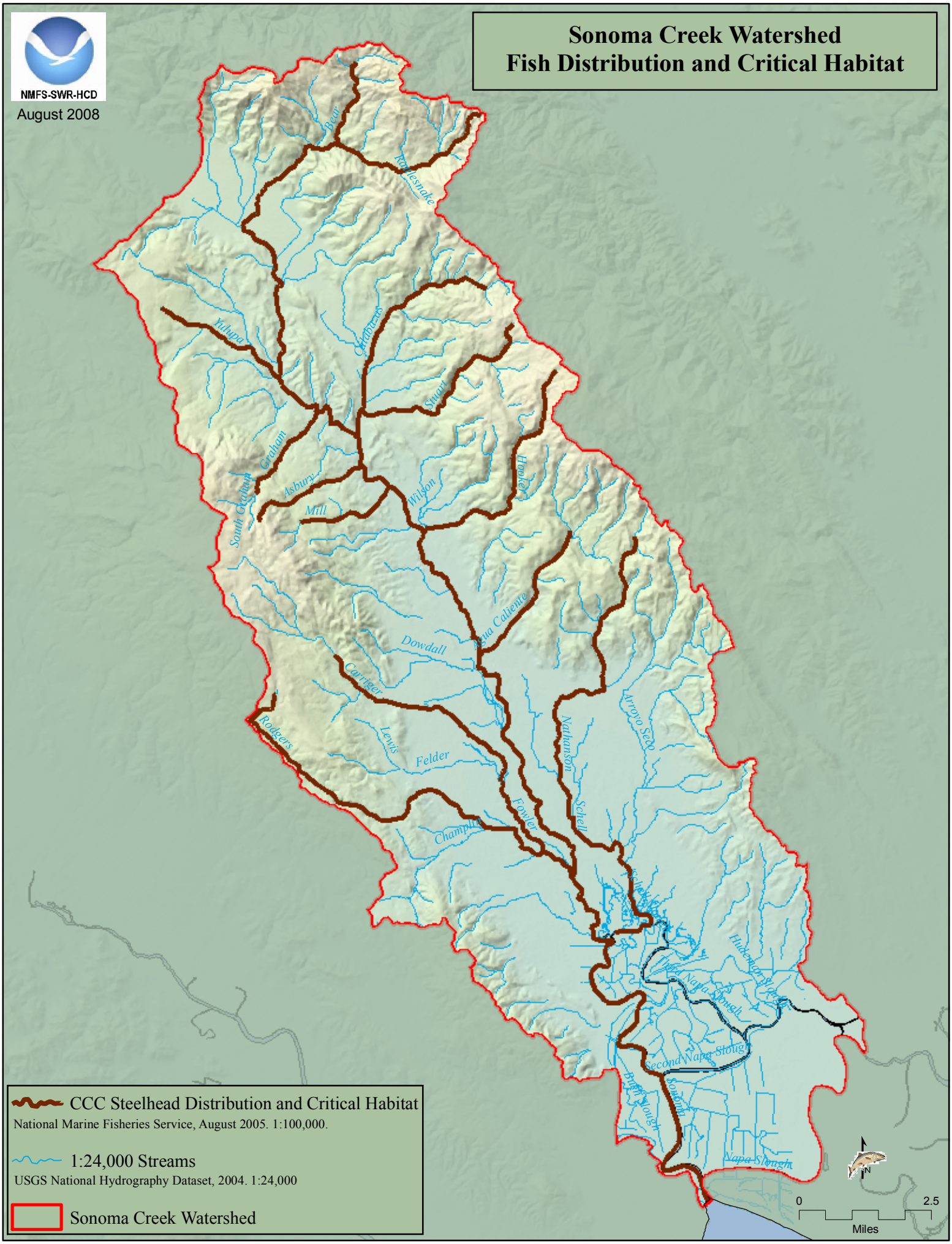
Sonoma Creek Watershed
NMFS-SWR-HCD
August 2008
Calistoga
Santa Rosa
Sonoma
Napa
Petaluma
Vallejo
San Rafael
Richmond
NAPA
SONOMA
MARIN
CONTRA COSTA
12
121
101
116
37
580
Eureka
Ft. Bragg
Ukiah
Sacramento
Santa Rosa
Del Norte
Humboldt
Mendocino
Lake
Sonoma
Napa
Solano
Marin
0
5
Miles

Sonoma Creek Watershed

NMFS-SWR-HCD

August 2008

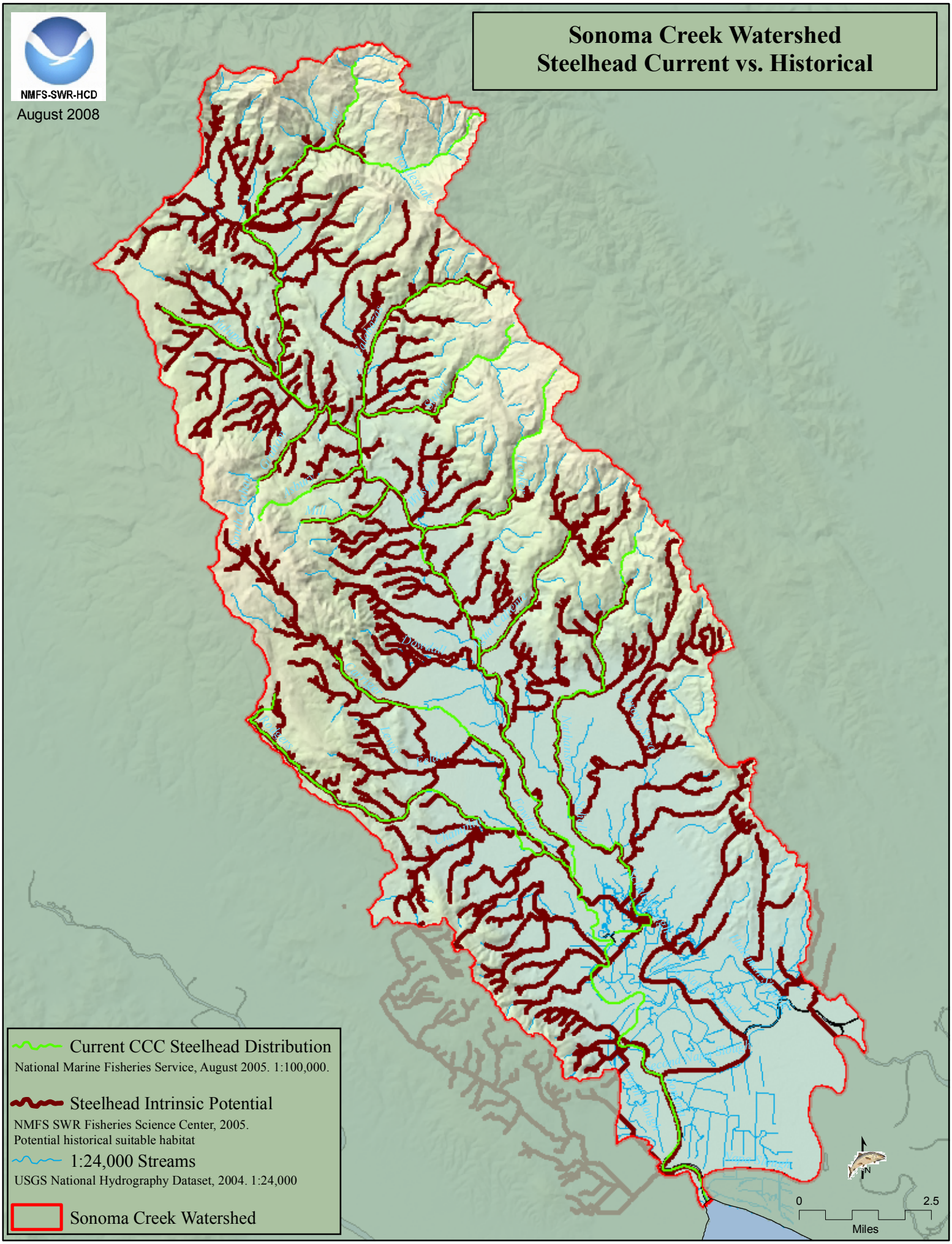

Sonoma Creek Watershed
CalWater Planning Watersheds
NMFS-SWR-HCD
August 2008
Bear Creek
5292 Acres
Upper Sonoma Creek
12131 Acres
Upper Calabazas
11562 Acres
Lower Calabazas
12064 Acres
Nathanson Creek
9176 Acres
Mouth of Sonoma Creek
32462 Acres
Haraszthy Creek
6464 Acres
Champlin Creek
4410 Acres
0
2.5
Miles

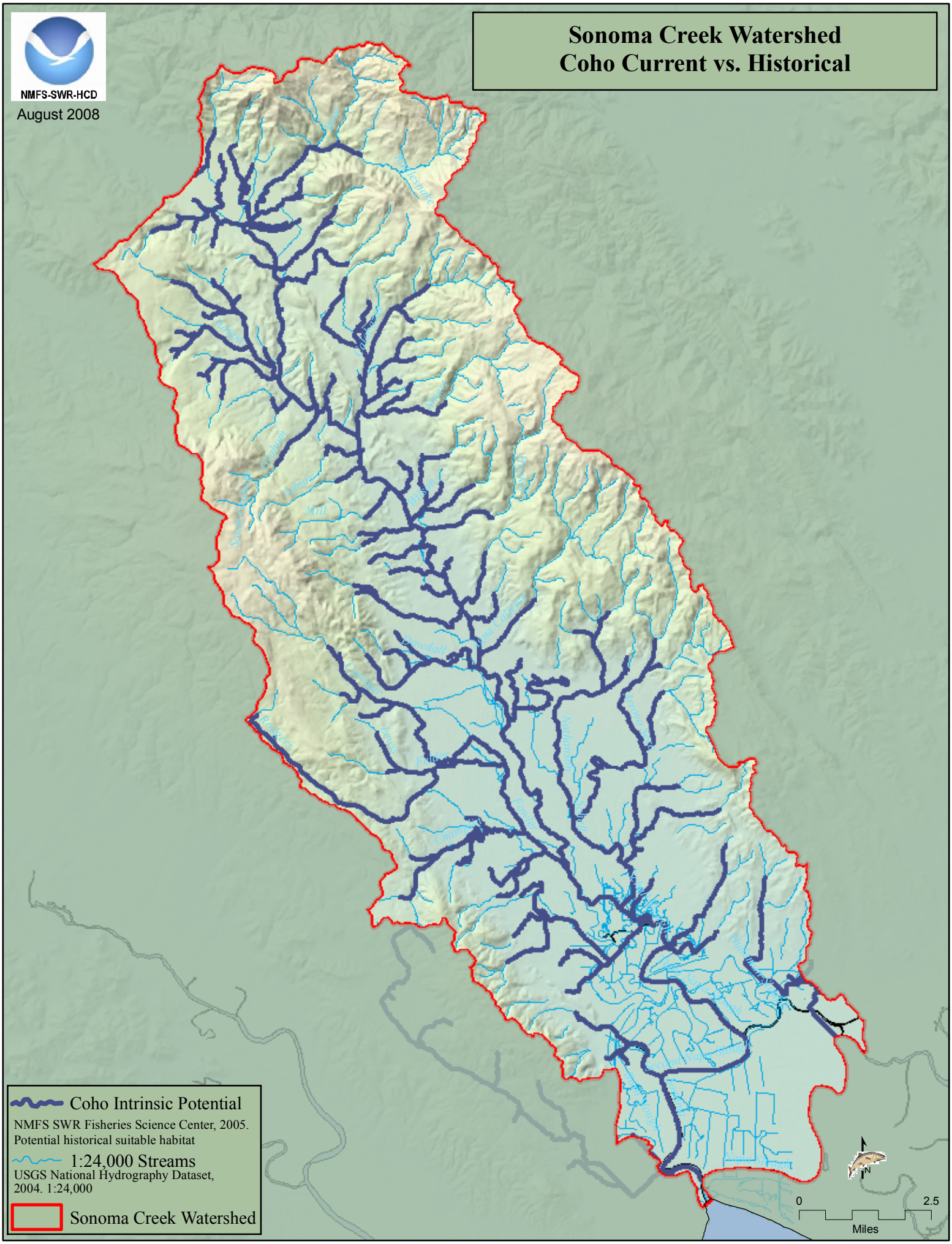

NMFS-SWR-HCD
August 2008
Sonoma Creek Watershed
Fish Distribution and Critical Habitat
Bear
Rattlesnake
Yulupa
Calabazas
Stuart
Graham
South Graham
Asbury
Mill
Wilson
Hooker
Agua Caliente
Dowdall
Carriger
Rodgers
Lewis
Felder
Nathanson
Arroyo Seco
Schell
Fowler
Champlin
Schell Slough
Hudeman Slough
Third Napa Slough
Second Napa Slough
Bush Slough
Sonoma
Napa Slough
CCC Steelhead Distribution and Critical Habitat
National Marine Fisheries Service, August 2005. 1:100,000.
1:24,000 Streams
USGS National Hydrography Dataset, 2004. 1:24,000
Sonoma Creek Watershed
0
2.5
Miles

Sonoma Creek Watershed
Steelhead Current vs. Historical

NMFS-SWR-HCD

August 2008

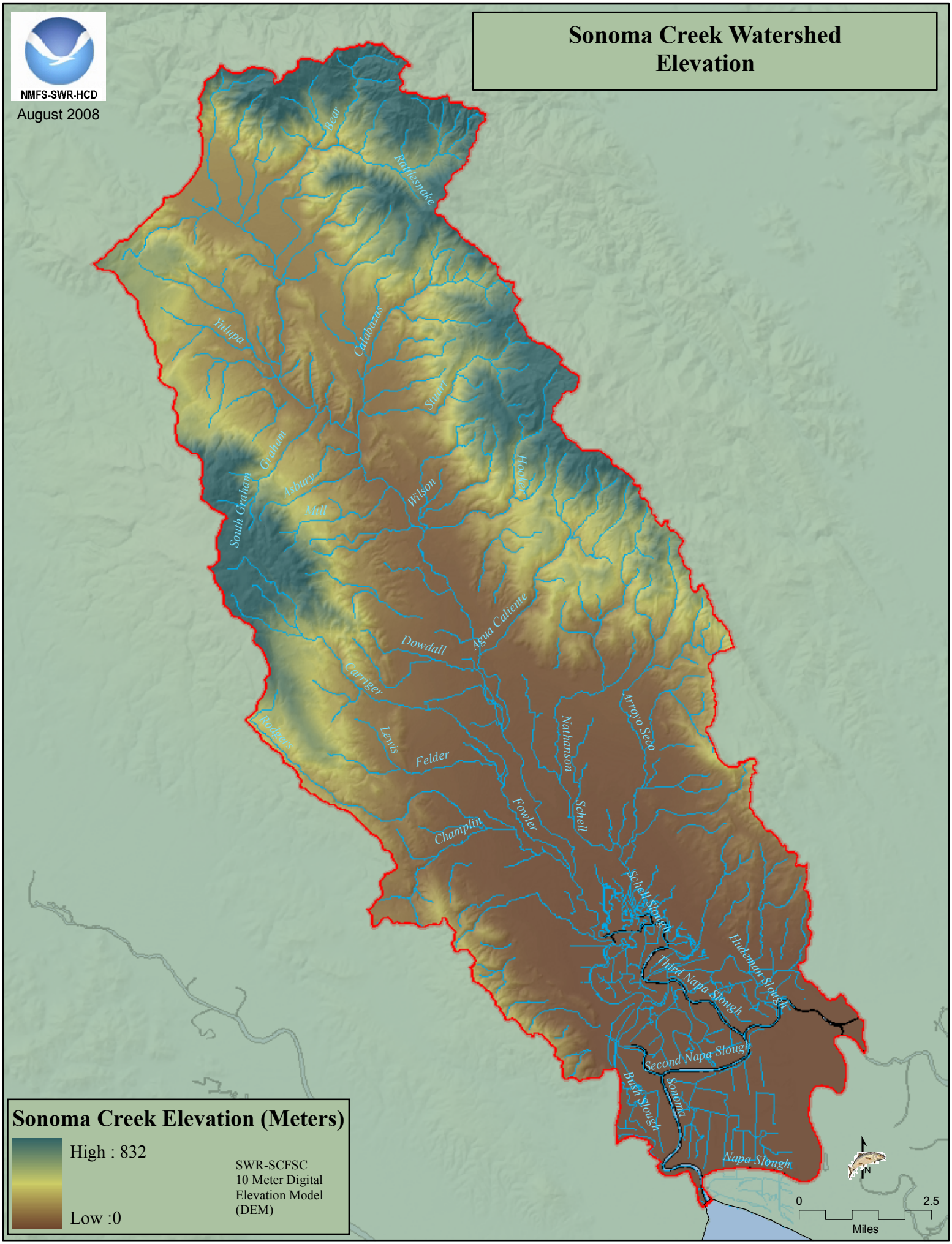



Sonoma Creek Watershed
Coho Current vs. Historical
NMFS-SWR-HCD
August 2008
Coho Intrinsic Potential
NMFS SWR Fisheries Science Center, 2005.
Potential historical suitable habitat
1:24,000 Streams
USGS National Hydrography Dataset,
2004. 1:24,000
Sonoma Creek Watershed
0
2.5
Miles
N

Sonoma Creek Watershed Elevation

NMFS-SWR-HCD

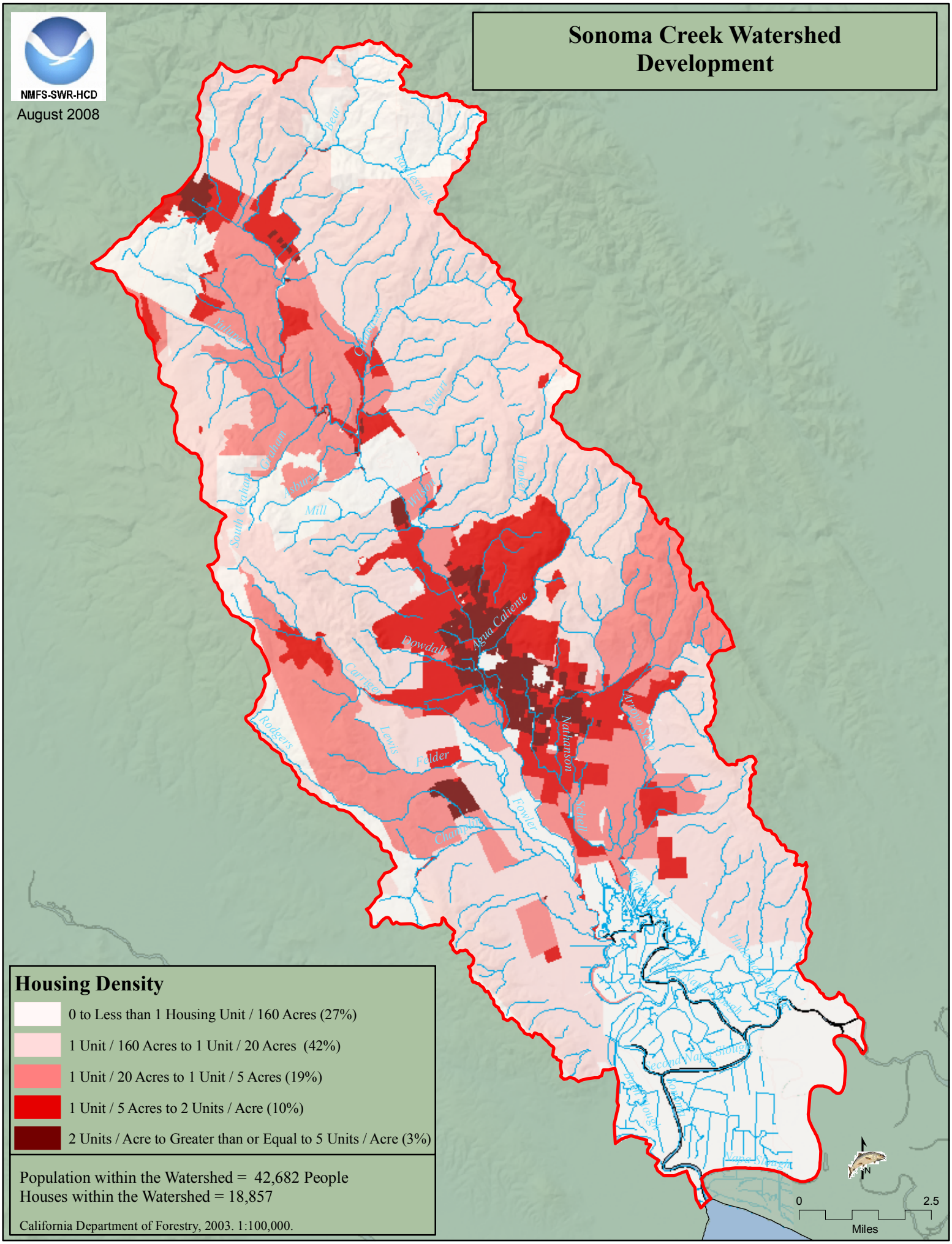
August 2008

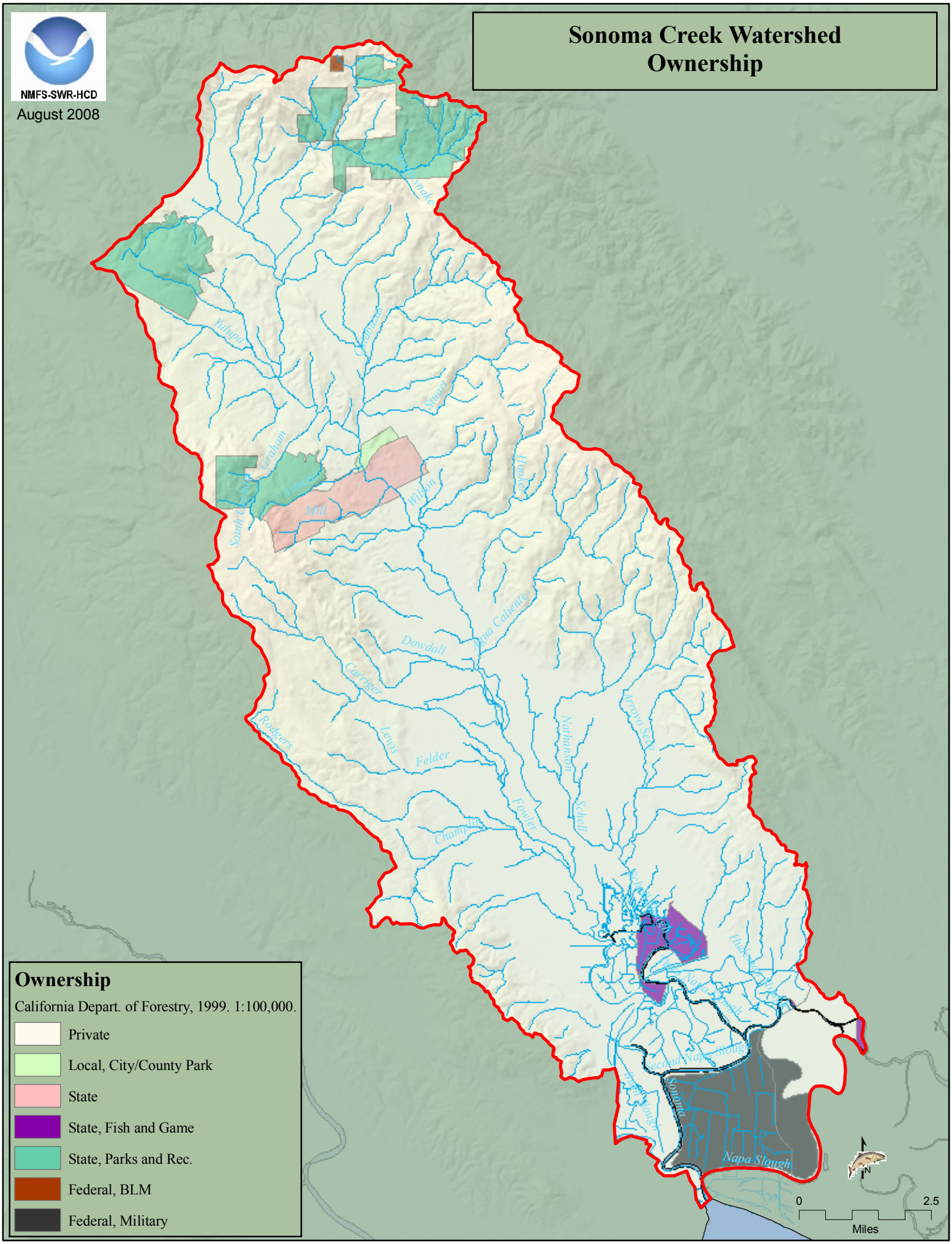


Sonoma Creek Watershed Development

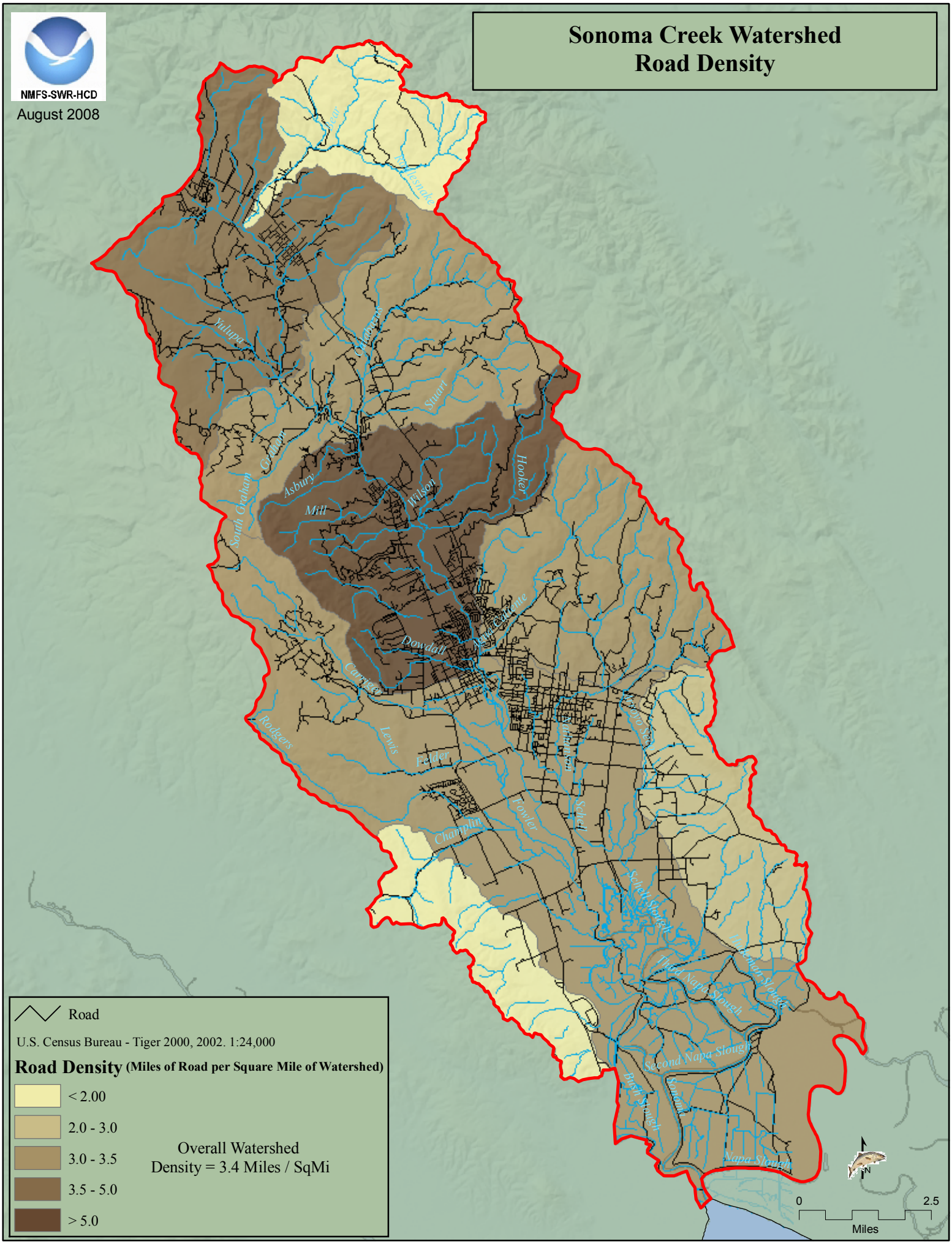
NMFS-SWR-HCD

August 2008





Sonoma Creek Watershed Ownership
NMFS-SWR-HCD
August 2008
Ownership
California Depart. of Forestry, 1999. 1:100,000.
Private
Local, City/County Park
State
State, Fish and Game
State, Parks and Rec.
Federal, BLM
Federal, Military
Yulupa
Graham
Mill
Wilson
Hooker
Dowdall
Agua Caliente
Carriger
Rodgers
Lewis
Felder
Nathanson
Arroyo Seco
Fowler
Schell
Champlin
Sonoma
Napa Slough
0
2.5
Miles

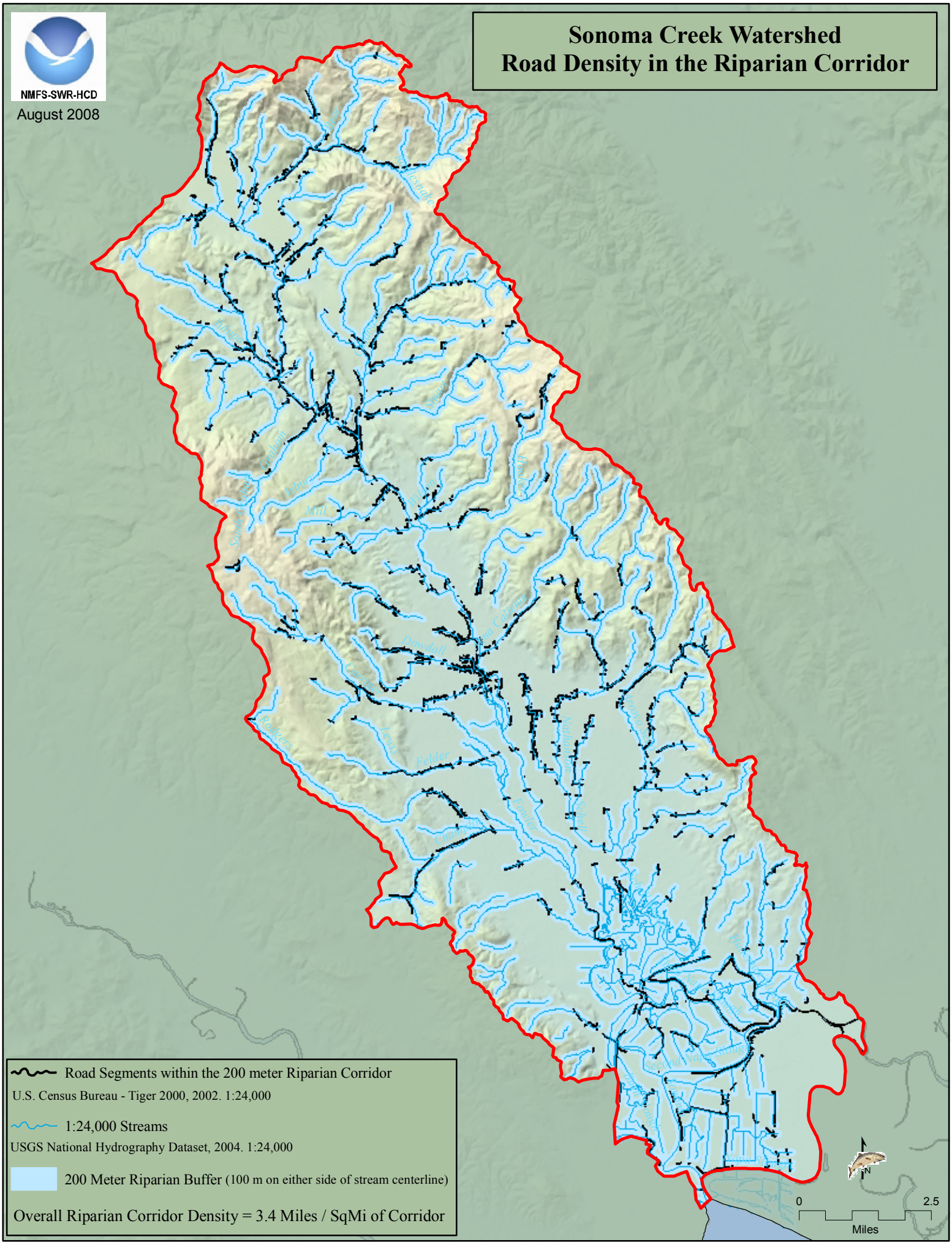


NMFS-SWR-HCD
August 2008
Sonoma Creek Watershed
Road Density
Yulupa
Stuart
Hooker
Asbury
Mill
Wilson
South Graham
Dowdall
Carriage
Rodgers
Lewis
Fowler
Champlin
Schell
Schell Slough
Third Napa Slough
Second Napa Slough
Bush Slough
Napa Slough
Road
U.S. Census Bureau - Tiger 2000, 2002. 1:24,000
Road Density (Miles of Road per Square Mile of Watershed)
< 2.00
2.0 - 3.0
3.0 - 3.5
3.5 - 5.0
> 5.0
Overall Watershed
Density = 3.4 Miles / SqMi
0
2.5
Miles

Sonoma Creek Watershed
Road Density in the Riparian Corridor

NMFS-SWR-HCD

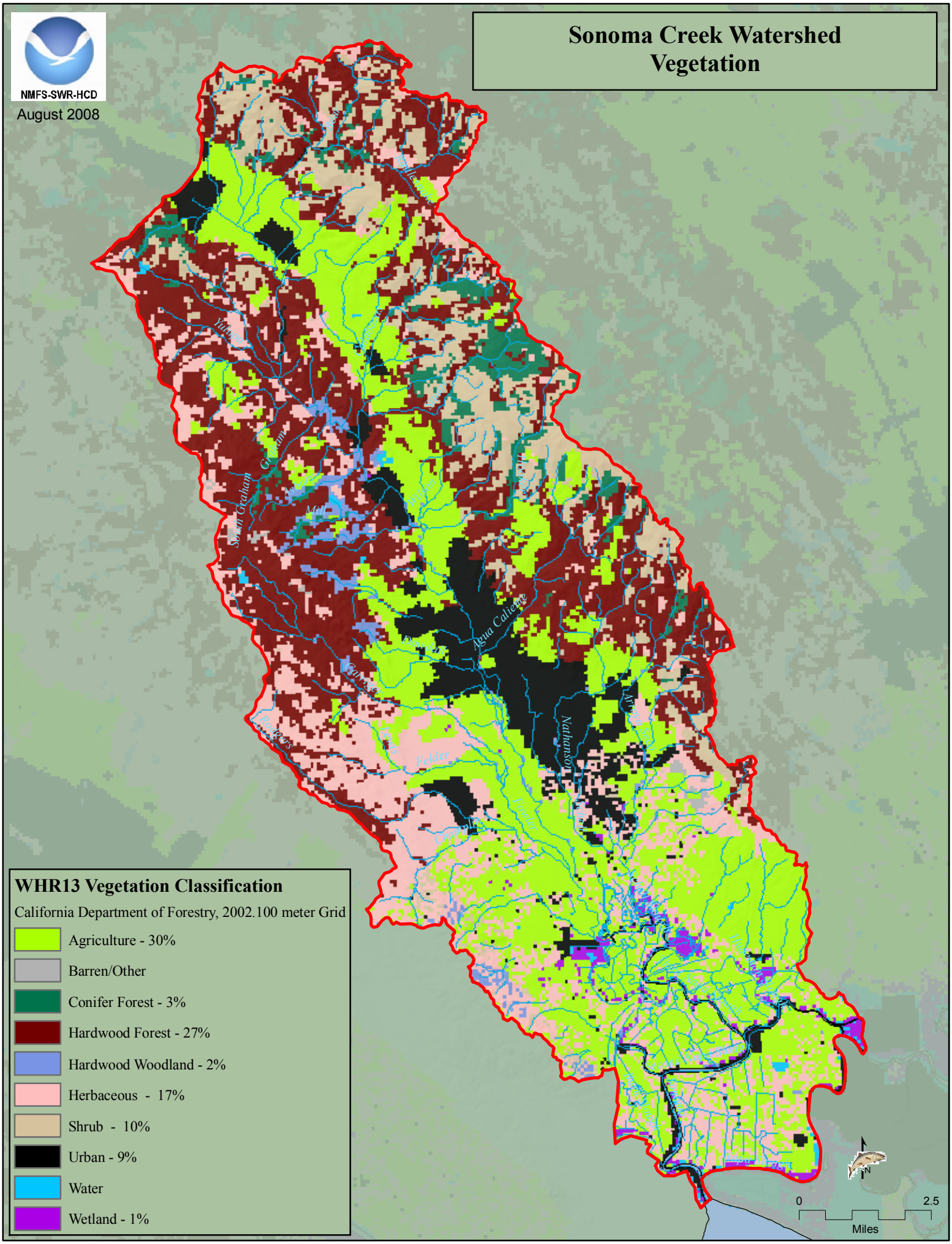
August 2008



Sonoma Creek Watershed Vegetation

NMFS-SWR-HCD

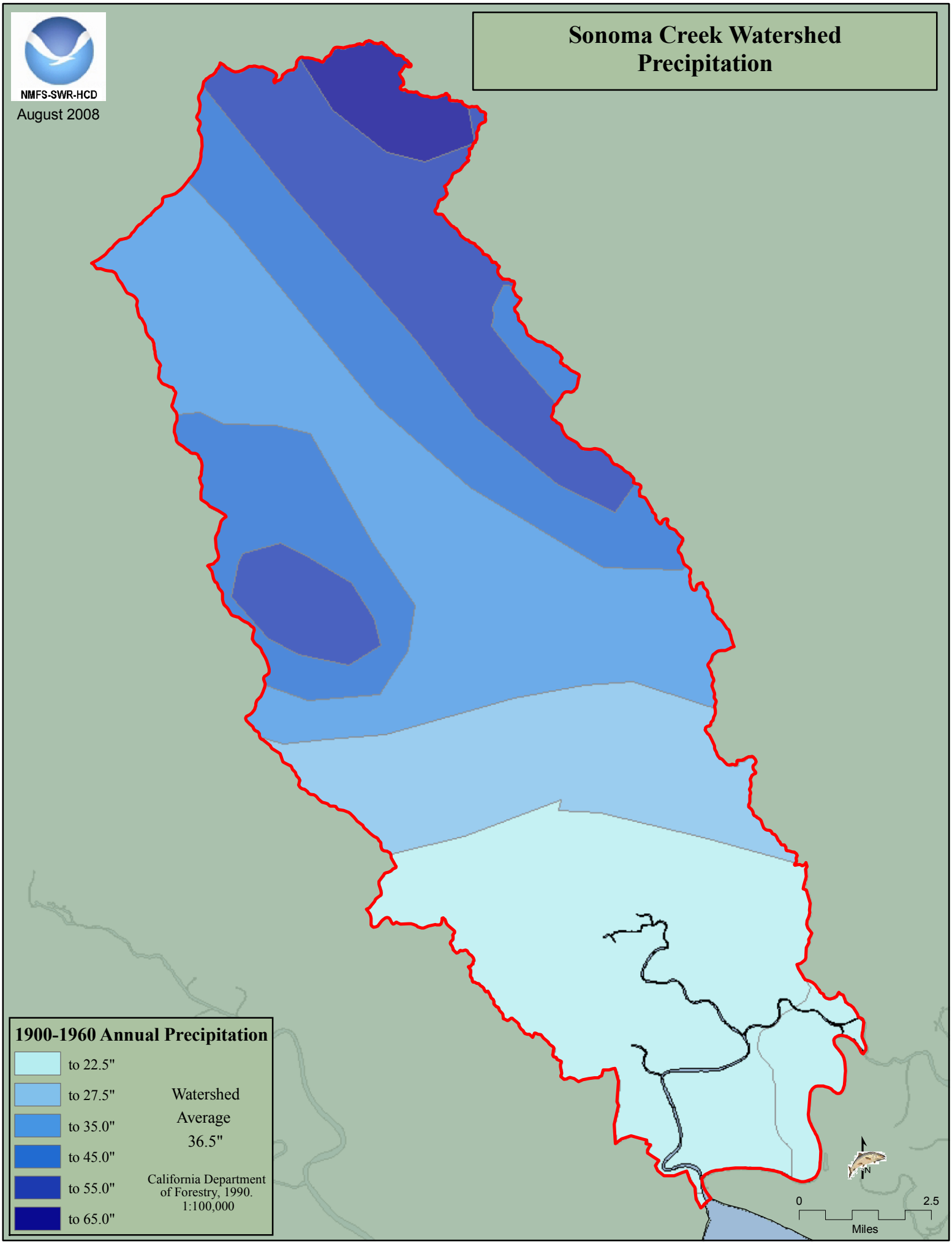
August 2008



WHR13 Vegetation Classification

California Department of Forestry, 2002.100 meter Grid

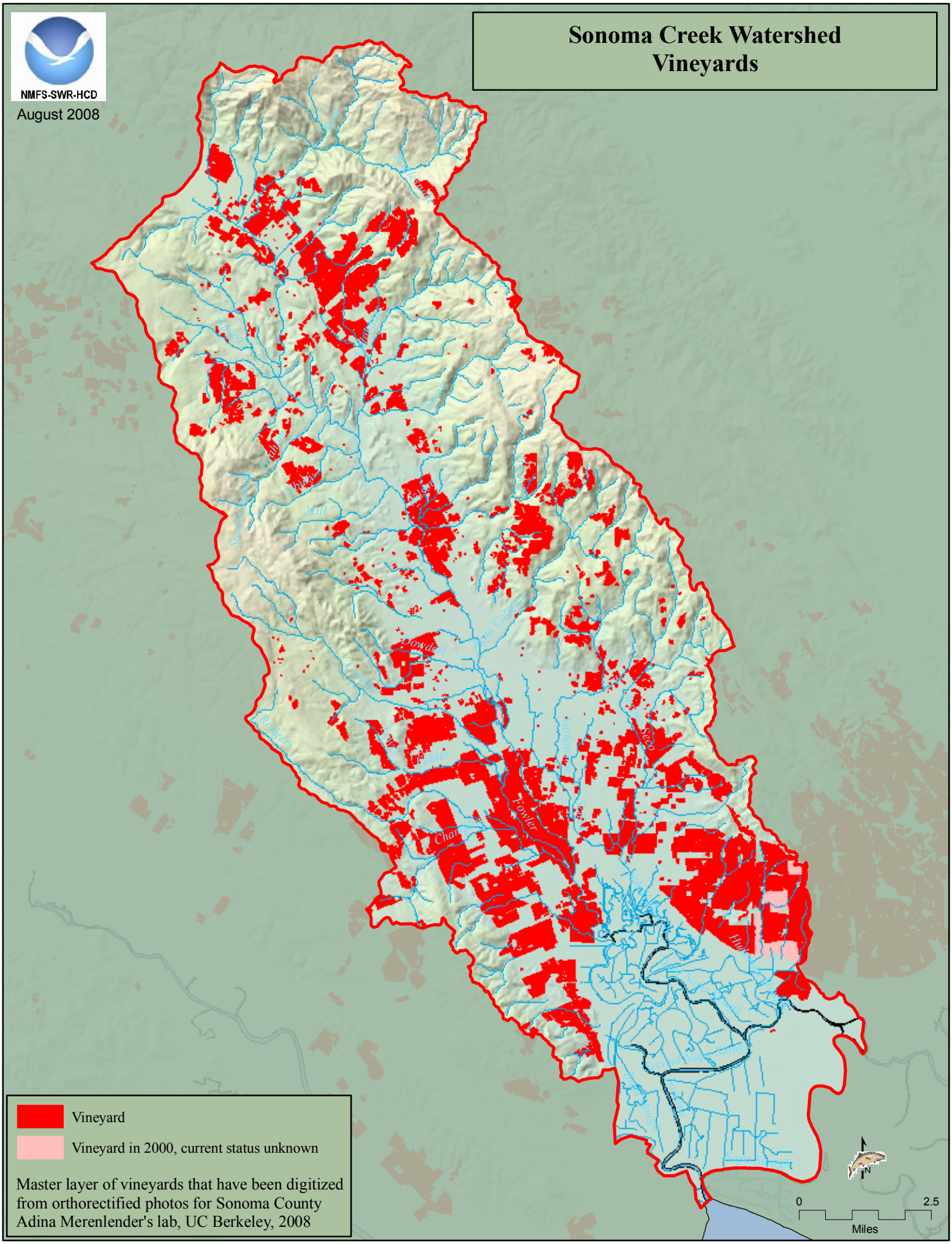
- Agriculture - 30%
- Barren/Other
- Conifer Forest - 3%
- Hardwood Forest - 27%
- Hardwood Woodland - 2%
- Herbaceous - 17%
- Shrub - 10%
- Urban - 9%
- Water
- Wetland - 1%

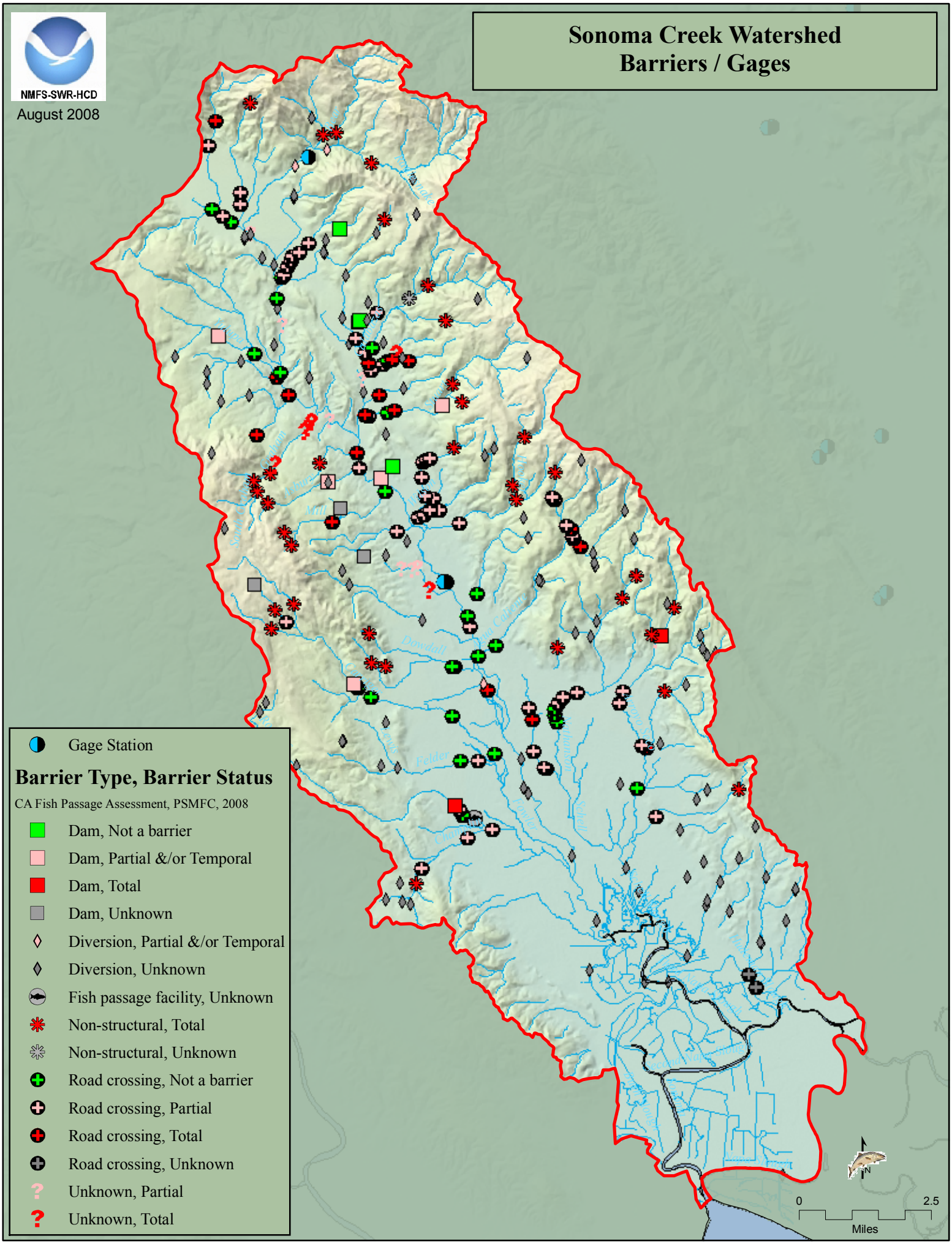

NMFS-SWR-HCD
August 2008
Sonoma Creek Watershed
Precipitation
1900-1960 Annual Precipitation
to 22.5"
to 27.5"
to 35.0"
to 45.0"
to 55.0"
to 65.0"
Watershed
Average
36.5"
California Department
of Forestry, 1990.
1:100,000
N
0
2.5
Miles

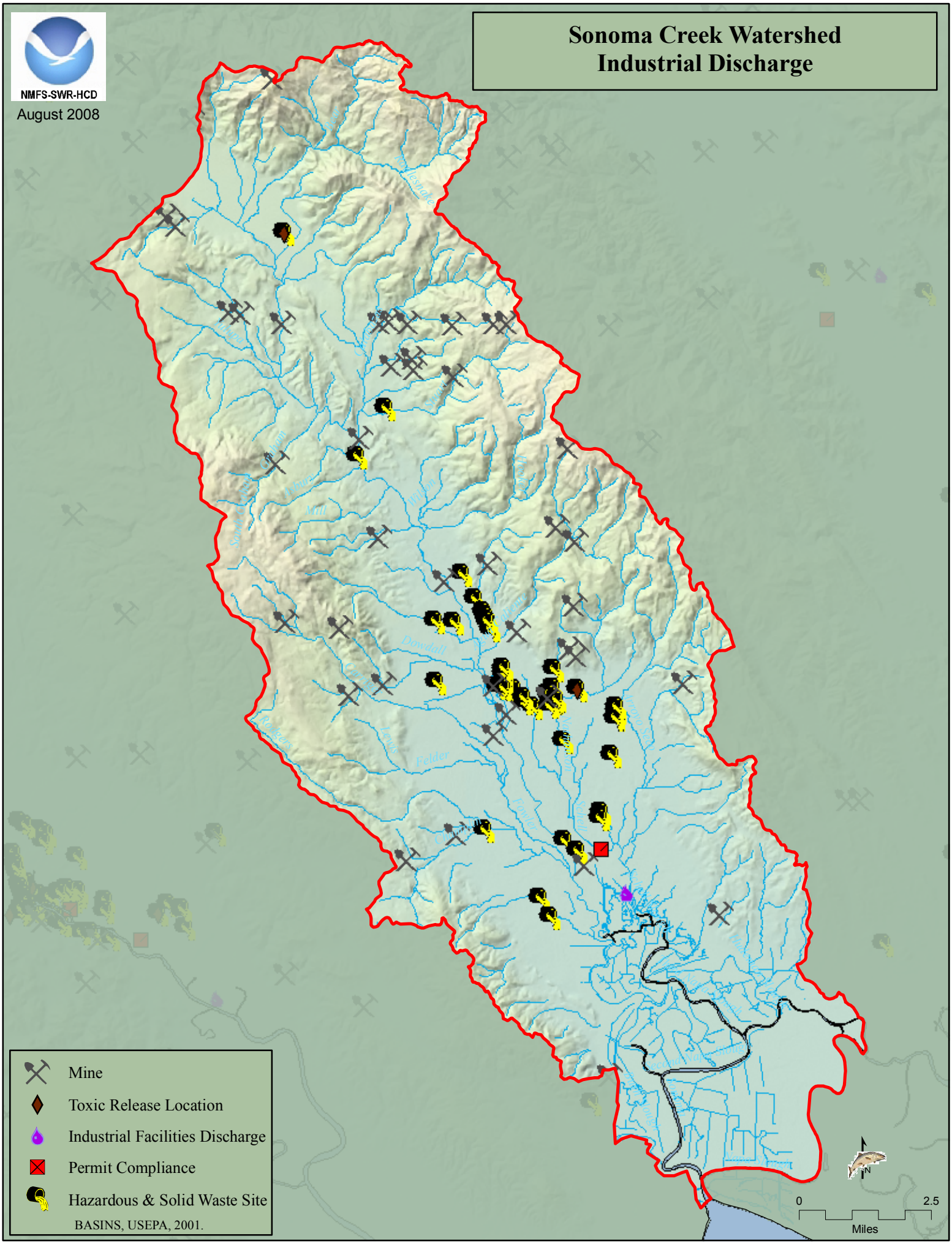
Sonoma Creek Watershed Vineyards

NMFS-SWR-HCD

August 2008




Sonoma Creek Watershed
Barriers / Gages
NMFS-SWR-HCD
August 2008
Gage Station
Barrier Type, Barrier Status
CA Fish Passage Assessment, PSMFC, 2008
Dam, Not a barrier
Dam, Partial &/or Temporal
Dam, Total
Dam, Unknown
Diversion, Partial &/or Temporal
Diversion, Unknown
Fish passage facility, Unknown
Non-structural, Total
Non-structural, Unknown
Road crossing, Not a barrier
Road crossing, Partial
Road crossing, Total
Road crossing, Unknown
Unknown, Partial
Unknown, Total
Dowdall
Felder
Schell
0
2.5
Miles
N


Sonoma Creek Watershed
Industrial Discharge
NMFS-SWR-HCD
August 2008
Mine
Toxic Release Location
Industrial Facilities Discharge
Permit Compliance
Hazardous & Solid Waste Site
BASINS, USEPA, 2001.
0
2.5
Miles
N

Sonoma Creek Watershed
Public Consultation Tracking System

NMFS-SWR-HCD

August 2008

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/

CCC_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

Critical Habitat

CCC_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
1805 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
gages
vector digital data
Better Assessment Science Integrating point and Nonpoint Sources (BASINS)
United States Environmental Protection Agency
2001
http://www.epa.gov/waterscience/basins/

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 Protection1990
1:100,000
http://frap.cdf.ca.gov/data/frapgisdata/select.asp

Roads
TGRR00
vector digital data
Roads
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
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/

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_ca097_2006_2 (Sonoma)
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/

Toxins

Hazardous_&_solid_waste_sites
Better Assessment Science Integrating point and Nonpoint Sources (BASINS)
vector digital data
United States Environmental Protection Agency
2001
http://www.epa.gov/waterscience/basins/

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/

Industrial_discharge_sites
vector digital data
Better Assessment Science Integrating point and Nonpoint Sources (BASINS)
United States Environmental Protection Agency
2001
http://www.epa.gov/waterscience/basins/

Toxic_release_inventory
vector digital data
Better Assessment Science Integrating point and Nonpoint Sources (BASINS)
United States Environmental Protection Agency
2001
http://www.epa.gov/waterscience/basins/

Permit_compliance
vector digital data
Better Assessment Science Integrating point and Nonpoint Sources (BASINS)
United States Environmental Protection Agency
2001
http://www.epa.gov/waterscience/basins/

Records Management System (RMS)
Public Consultation Tracking System (PCTS)
National Marine Fisheries Service
Oracle Databases
2008

Vineyards
Master layer of vineyards that have been digitized from orthorectified photos for Sonoma County
vector digital data
Adina Merenlender's lab, UC Berkeley
UC Berkeley/IHRMP North Coast GIS lab
2008