Watershed Characterization

July 2008

NMFS-SWR-HCD

Gazos Creek Watershed

Area	Hydrologic Units	Calwater Subbasins ---	(Planning Watersheds)
7,468 Acres	18060001	3304200004	Gazos Creek (7468 Acres)
3022 Hectares	4th Field **HUC**		
12 Square Miles			
	3304		
Location	4th Field **Calwater**		
San Mateo County			
Santa Cruz County			

Species Potential	Miles of Streams with Species Present
Central California Coast **Steelhead**	Steelhead
Santa Cruz Mountains Diversity Stratum - Dependent Population	10 NOAA Fisheries, Critical Habitat Redesignation, 2005
Central California Coast **Coho**	Coho
Santa Cruz Mountains Diversity Stratum - Dependent Population	5 CDFG, Coho Distribution, May 2007

Critical Habitat

Central California Coast Steelhead	10 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

Km of Historical Coho IP (21.5 C mask)	8
% of IP (21.5 C Mask) with Current Coho Distribution	83%

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		2
Intermittent Stream	11	1 - Impassable
Perennial Stream	15	1 - Unknown status

[C]Passage Assessment Database, Pacific States Marine Fisheries Commission, 2008

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

USGS **Gaging Stations**[B]	Number of **Barriers**[C]
	15
	2 Dams
	4 Road Crossings (1 Impassable)
	8 Natural Barriers (Chutes, Falls, Log Jams, etc. (5 Impassable))

[C]Passage Assessment Database, Pacific States Marine Fisheries Commission, 2008

Average Annual **Precipitation**[E]	Average Annual **Precipitation Range**[E]
33.2"	22.5 - 45"

[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	1
Local, neighborhood, and rural road, city street, unseparated	28
Vehicular trail, 4WD	0
Total Miles	29

Road Density	
Miles of Roads per SqMi of Watershed	2.5
Miles of Roads per SqMi of 100m Riparian Buffer*	3.2

*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	38	1%
Lands of 2-4 percent slope	43	1%
Lands of 4-10 percent slope	330	4%
Lands of 10-15 percent slope	398	5%
Lands of 15-30 percent slope	1,827	24%
Lands of 30-60 percent slope	3,524	47%
Lands of 60-100 percent slope	1,253	17%
Lands of 100-117 percent slope	46	1%
Elevation Range	3 - 2333 ft.	1 - 711 m

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

Vegetation[G]	Acres	Percent of watershed
Agriculture	10	0%
Annual grassland	126	2%
Conifer Forest		
Douglas Fir	472	6%
Redwood	4,888	65%
Unknown Conifer	156	2%
Shrub	1,801	24%
Urban	27	0%

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

Erodability of Watershed[F]	Acres	Percent of watershed
All watershed ranked 5		

[F]Department 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**]

Area Under a **Timber Harvest Plan**[A] past **10** years		Area Under a **Timber Harvest Plan**[A] past **13** years (1994-2006)	
330	4% of watershed	831	11% of watershed

[A]California Department of Forestry, Timber Harvest Plans for Gazos Watershed, 2006

Land Ownership[H]	Acres	Percent of watershed
Private	5,910	79%
State (Parks & Recreation)	1,549	21%
State (Other))	7	0%

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

Population[I]	Housing[I]
Total Population within the watershed -- 24 People	Total Housing Units within the watershed -- 9 Houses
	Housing Density
	0 to Less than 1 Housing Unit / 160 Acres (91%)
	1 Unit / 160 Acres to 1 Unit / 20 Acres (9%)
	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

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

Gazos 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	10						131	571	27			
	S												
	P			7									
	M			467									
	D			4937									
	Total	10		5411				131	571	27			6150
Seedling													
	S												
	P												
	M												
	D												
	Total												0
Sapling													
	S												
	P												
	M												
	D												
	Total												0
Pole													
	S												
	P												
	M												
	D												
	Total												0
Small Tree													
	S												
	P												
	M												
	D			119					1201				
	Total			119					1201				1320
Medium/Large Tree													
	S												
	P												
	M												
	D												
	Total												0
Multi Layered													
	D												
	Total												0
Grand Total by Species Type		10	0	5530	0	0	0	131	1772	27	0	0	7470

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	0%						2%	8%	0%			
	S												
	P			0%									
	M			6%									
	D			66%									
	Total	0%		72%				2%	8%	0%			82%
Seedling													
	S												
	P												
	M												
	D												
	Total												0%
Sapling													
	S												
	P												
	M												
	D												
	Total												0%
Pole													
	S												
	P												
	M												
	D												
	Total												0%
Small Tree													
	S												
	P												
	M												
	D			2%					16%				
	Total			2%					16%				18%
Medium/Large Tree													
	S												
	P												
	M												
	D												
	Total												0%
Multi Layered													
	D												
	Total												0%
Grand Total by Species Type		0%		74%				2%	24%	0%			100%

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
Not Determined	N/A
Seedling Shrub	Seedlings or sprouts < 3 years
Young Shrub	None
Mature Shrub	1 - 25%
Decadent Shrub	> 25%

DENSITY	Description
	None
S	10 to 24%
P	25 to 39%
M	40 to 59%
D	60 to 100%

Gazos 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							20.0	86.0	2.0			
	S												
	P			2.5									
	M			158.0									
	D			1426.0									
	Total			1586.5				20.0	86.0	2.0			1694
Seedling													
	S												
	P												
	M												
	D												
	Total												0
Sapling													
	S												
	P												
	M												
	D												
	Total												0
Pole													
	S												
	P												
	M												
	D												
	Total												0
Small Tree													
	S												
	P												
	M												
	D			27.0					272.0				
	Total			27.0					272.0				299
Medium/Large Tree													
	S												
	P												
	M												
	D												
	Total												0
Multi Layered													
	D												
	Total												0
Grand Total by Species Type		0	0	1613	0	0	0	20	358	2	0	0	1993

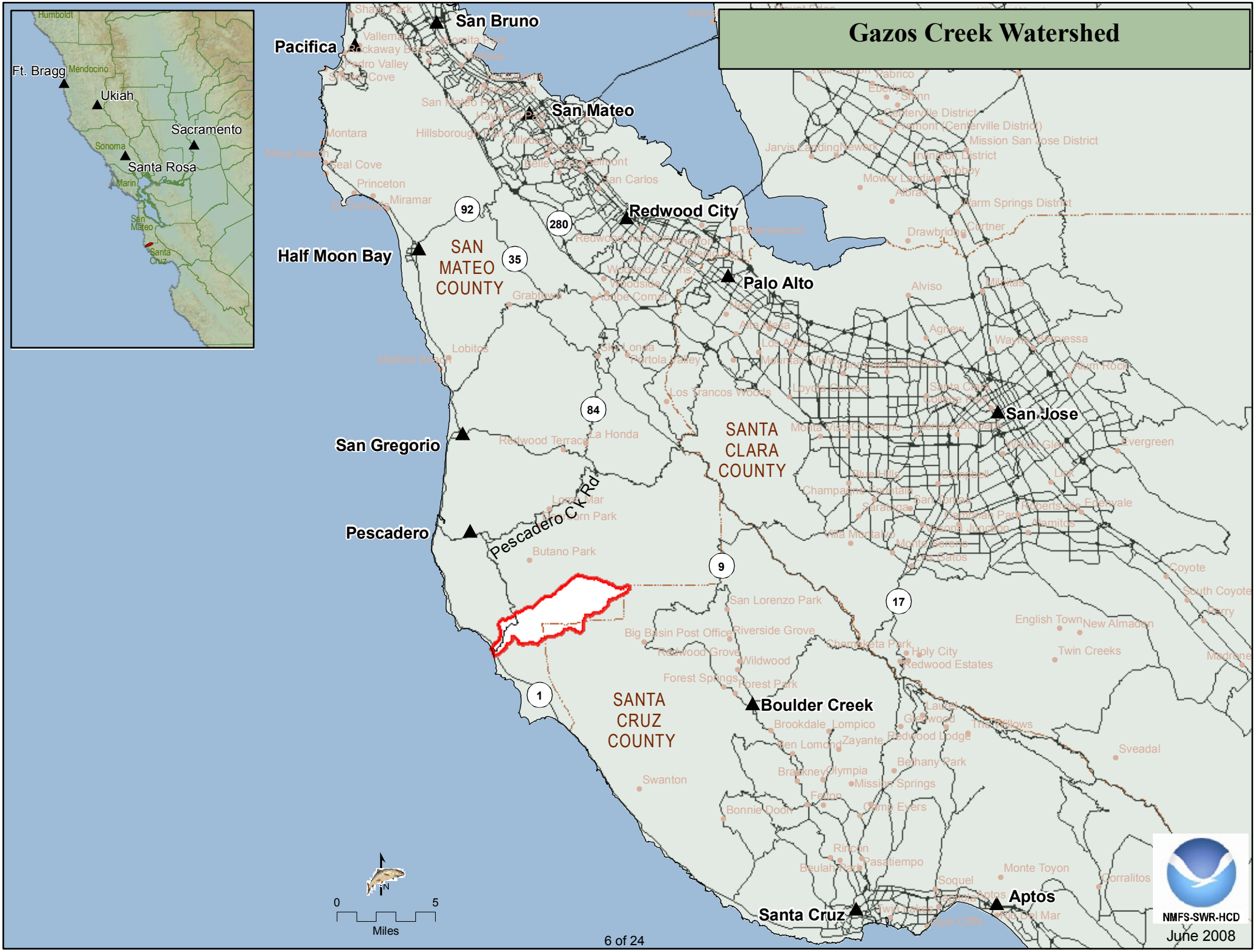
Percent

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%	4%	0%			
	S												
	P			0%									
	M			8%									
	D			72%									
	Total			80%			0%	1%	4%	0%			85%
Seedling													
	S												
	P												
	M												
	D												
	Total												0%
Sapling													
	S												
	P												
	M												
	D												
	Total												0%
Pole													
	S												
	P												
	M												
	D												
	Total												0%
Small Tree													
	S												
	P												
	M												
	D			1%					14%				
	Total			1%					14%				15%
Medium/Large Tree													
	S												
	P												
	M												
	D												
	Total												0%
Multi Layered													
	D												
	Total												0%
Grand Total by Species Type		0%	0%	81%	0%	0%	0%	1%	18%	0%	0%	0%	100%

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
Not Determined	N/A
Seedling Shrub	Seedlings or sprouts < 3 years
Young Shrub	None
Mature Shrub	1 - 25%
Decadent Shrub	> 25%

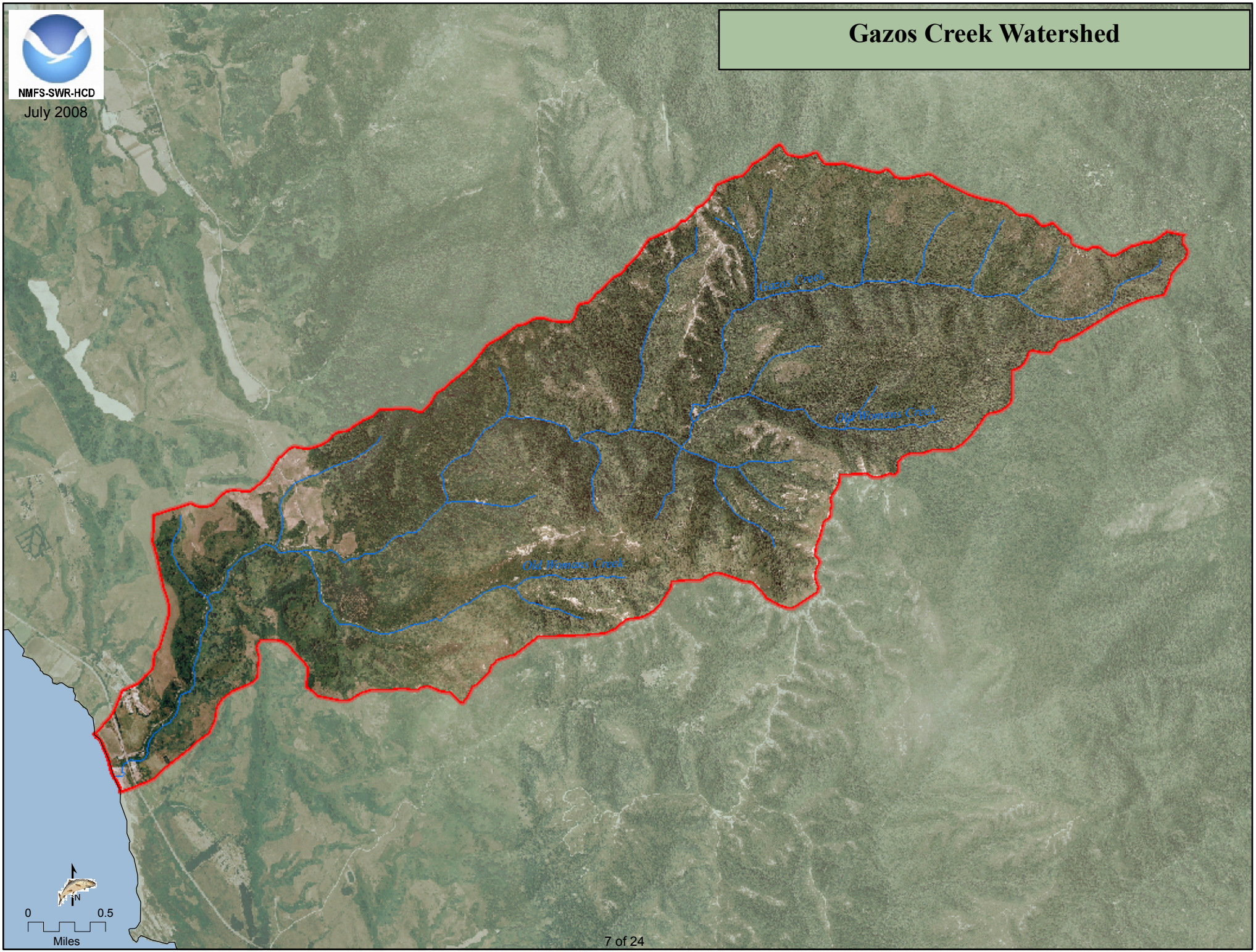
DENSITY	Description
	None
S	10 to 24%
P	25 to 39%
M	40 to 59%
D	60 to 100%


Gazos Creek Watershed
Humboldt
Ft. Bragg
Mendocino
Ukiah
Sacramento
Sonoma
Santa Rosa
Marin
San Mateo
Santa Cruz
San Bruno
Pacifica
San Mateo
Redwood City
Half Moon Bay
SAN MATEO COUNTY
Palo Alto
San Jose
SANTA CLARA COUNTY
San Gregorio
Pescadero
Pescadero C K Rd
SANTA CRUZ COUNTY
Boulder Creek
Santa Cruz
Aptos
92
280
35
84
9
17
1
0
5
Miles
N
NMFS-SWR-HCD
June 2008

Gazos Creek Watershed

NMFS-SWR-HCD

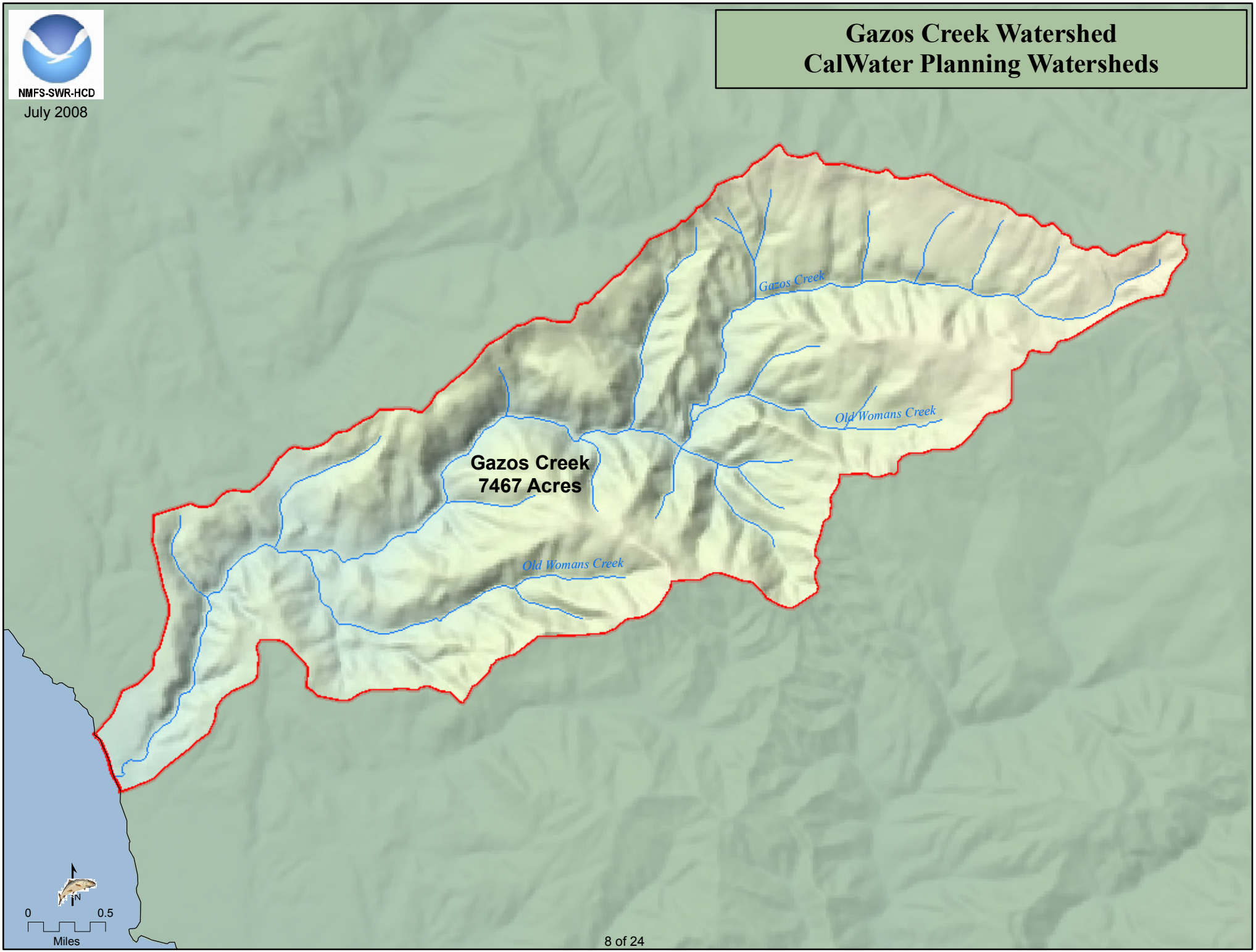
July 2008

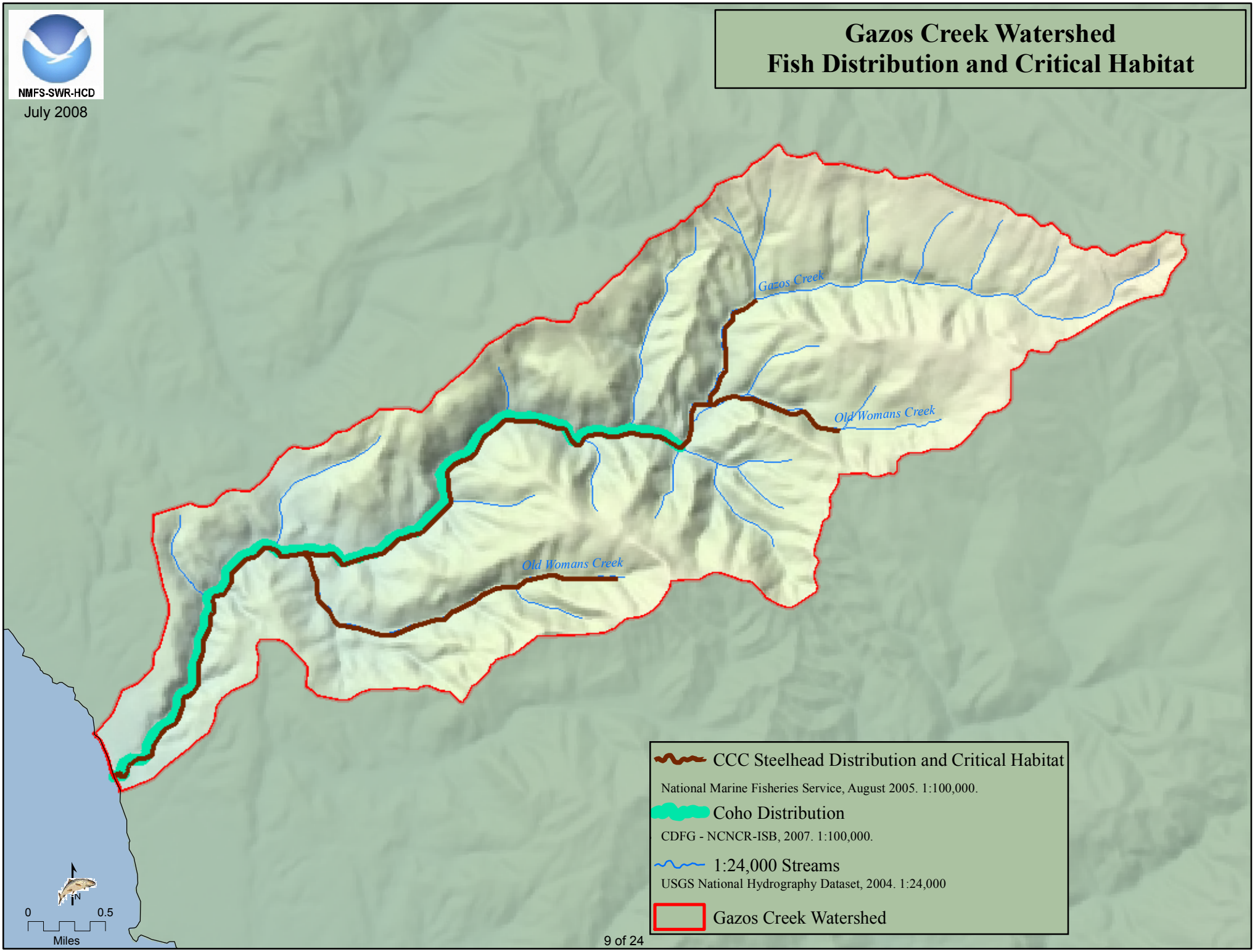


Gazos Creek Watershed
CalWater Planning Watersheds

NMFS-SWR-HCD

July 2008

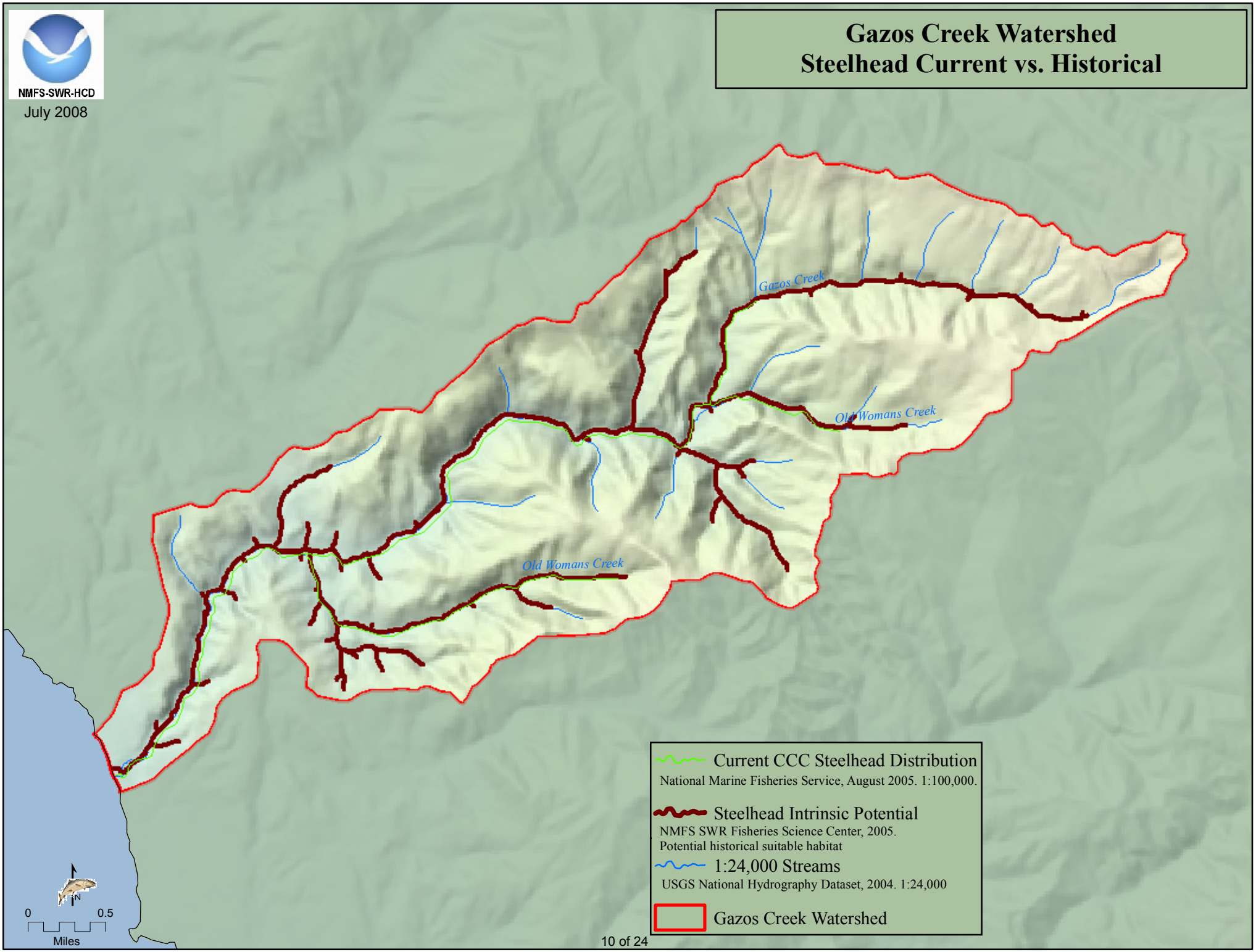



Gazos Creek Watershed
Fish Distribution and Critical Habitat
NMFS-SWR-HCD
July 2008
Gazos Creek
Old Womans Creek
Old Womans Creek
CCC Steelhead Distribution and Critical Habitat
National Marine Fisheries Service, August 2005. 1:100,000.
Coho Distribution
CDFG - NCNCR-ISB, 2007. 1:100,000.
1:24,000 Streams
USGS National Hydrography Dataset, 2004. 1:24,000
Gazos Creek Watershed
N
0
0.5
Miles

Gazos Creek Watershed
Steelhead Current vs. Historical

NMFS-SWR-HCD

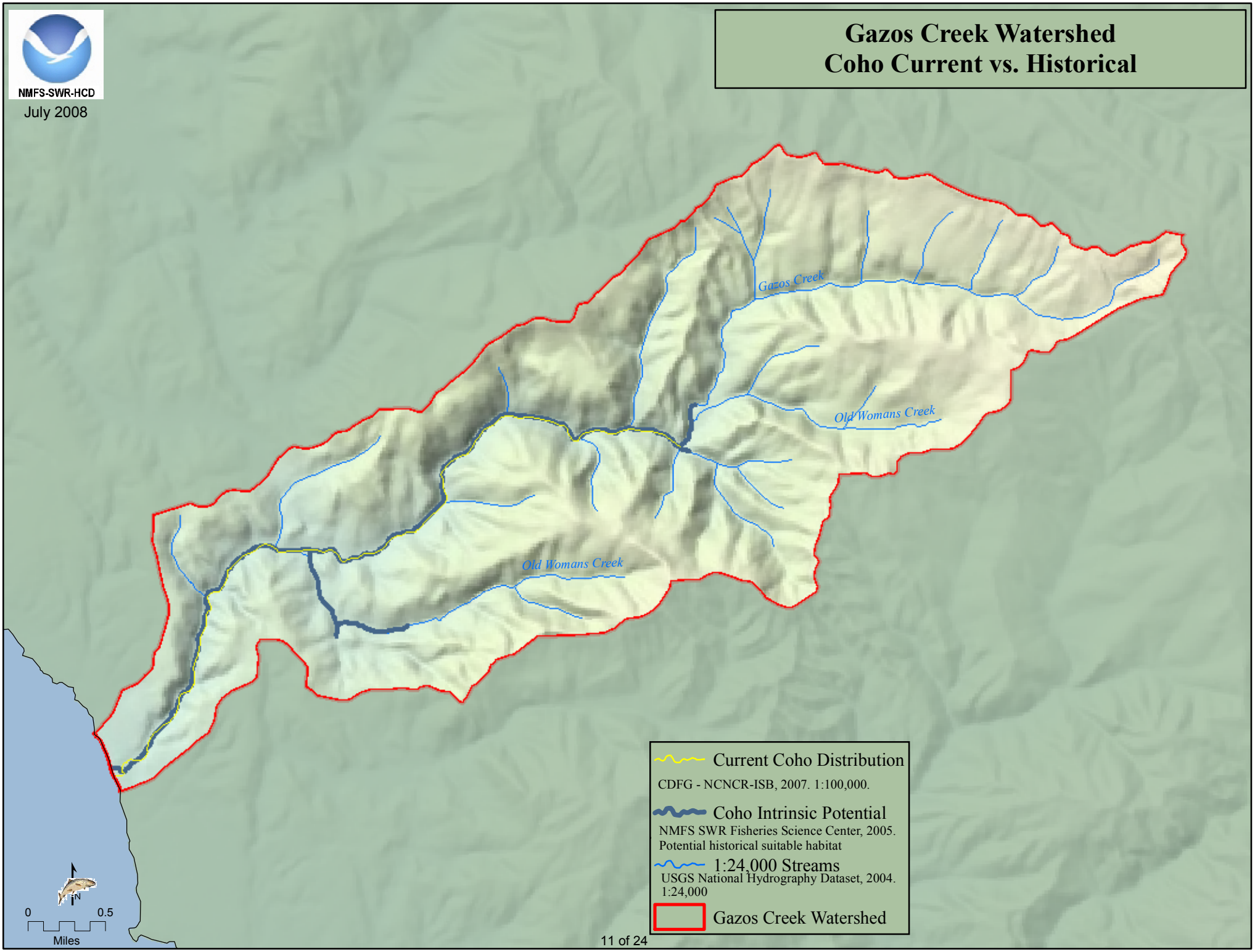
July 2008

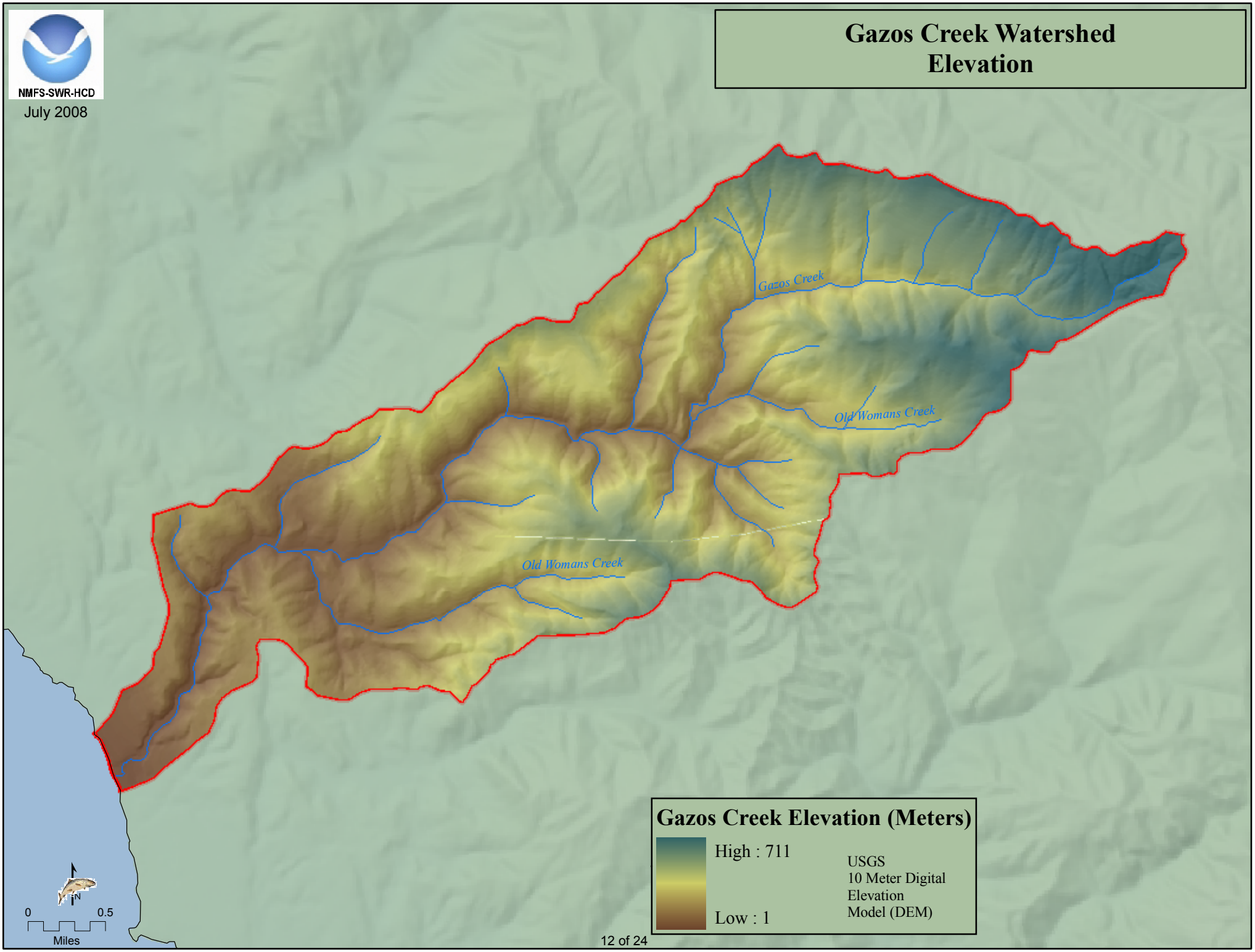


Gazos Creek Watershed
Coho Current vs. Historical

NMFS-SWR-HCD

July 2008

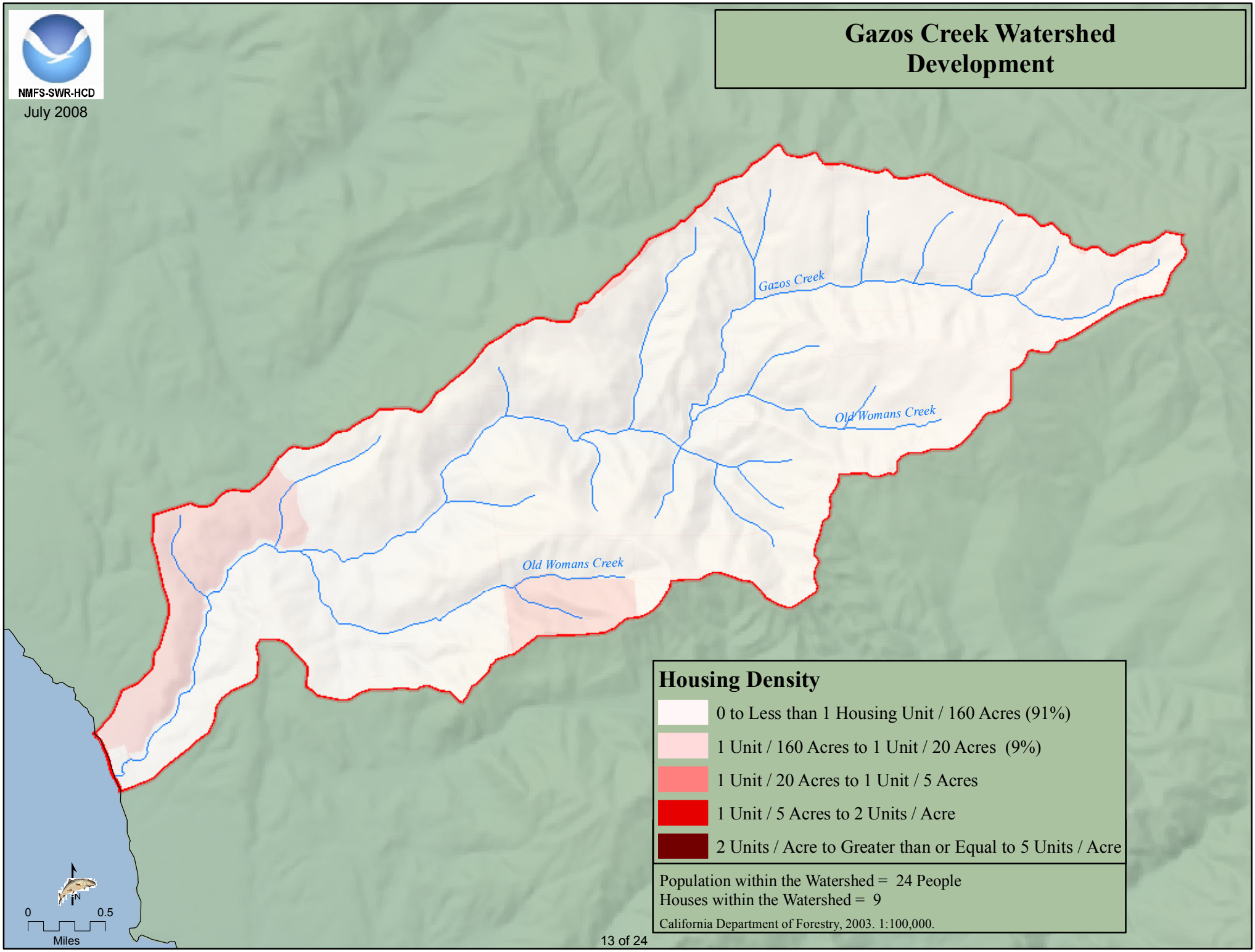



Gazos Creek Watershed
Elevation
NMFS-SWR-HCD
July 2008
Gazos Creek
Old Womans Creek
Old Womans Creek
Gazos Creek Elevation (Meters)
High : 711
Low : 1
USGS
10 Meter Digital
Elevation
Model (DEM)
N
0
0.5
Miles

Gazos Creek Watershed Development

NMFS-SWR-HCD

July 2008

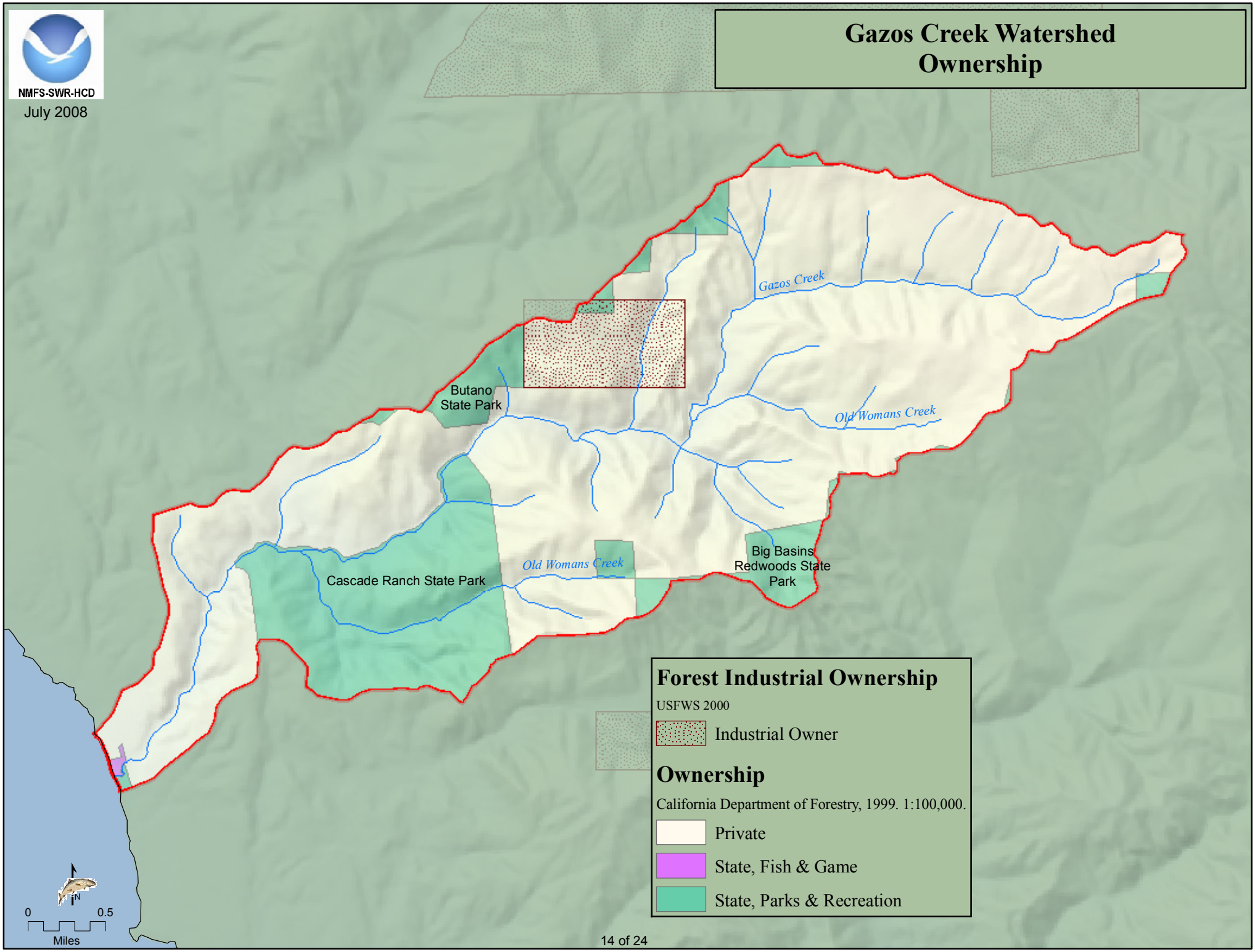


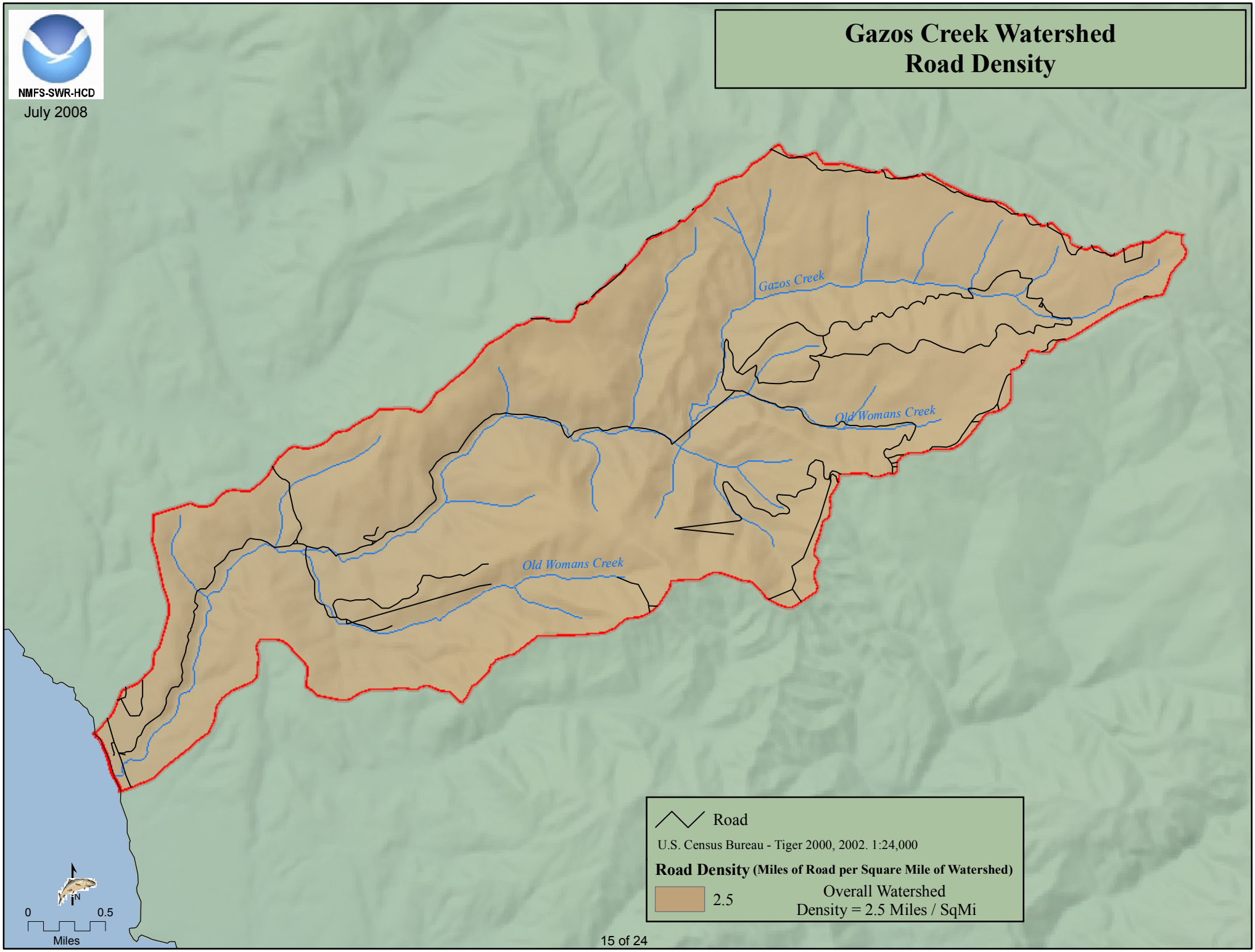
Housing Density

- 0 to Less than 1 Housing Unit / 160 Acres (91%)
- 1 Unit / 160 Acres to 1 Unit / 20 Acres (9%)
- 1 Unit / 20 Acres to 1 Unit / 5 Acres
- 1 Unit / 5 Acres to 2 Units / Acre
- 2 Units / Acre to Greater than or Equal to 5 Units / Acre

Population within the Watershed = 24 People
Houses within the Watershed = 9

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

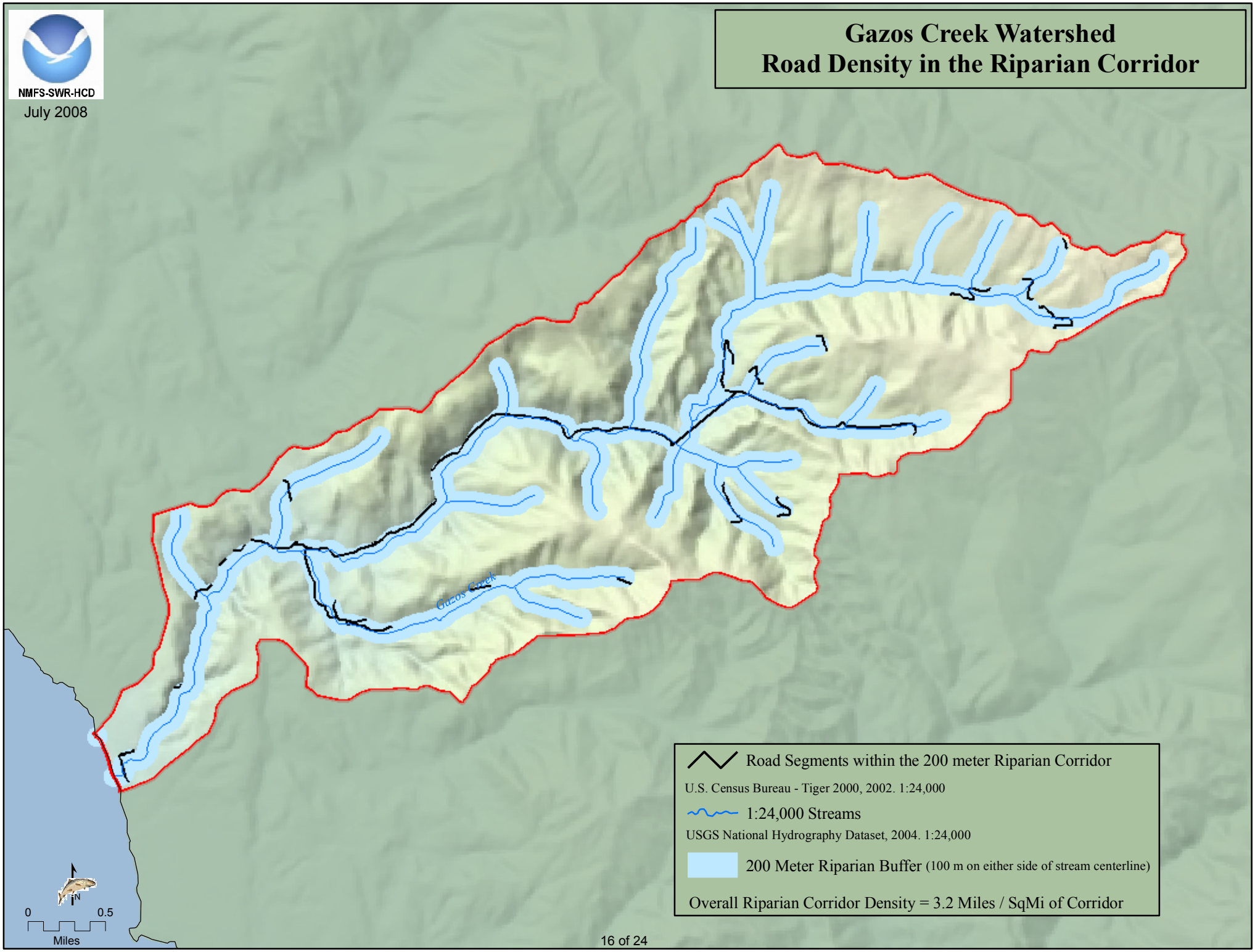

Gazos Creek Watershed
Ownership
NMFS-SWR-HCD
July 2008
Gazos Creek
Butano
State Park
Old Womans Creek
Old Womans Creek
Cascade Ranch State Park
Big Basins
Redwoods State
Park
Forest Industrial Ownership
USFWS 2000
Industrial Owner
Ownership
California Department of Forestry, 1999. 1:100,000.
Private
State, Fish & Game
State, Parks & Recreation
N
0
0.5
Miles


Gazos Creek Watershed
Road Density
NMFS-SWR-HCD
July 2008
Gazos Creek
Old Womans Creek
Old Womans Creek
Road
U.S. Census Bureau - Tiger 2000, 2002. 1:24,000
Road Density (Miles of Road per Square Mile of Watershed)
2.5
Overall Watershed
Density = 2.5 Miles / SqMi
N
0
0.5
Miles

Gazos Creek Watershed
Road Density in the Riparian Corridor

NMFS-SWR-HCD

July 2008



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

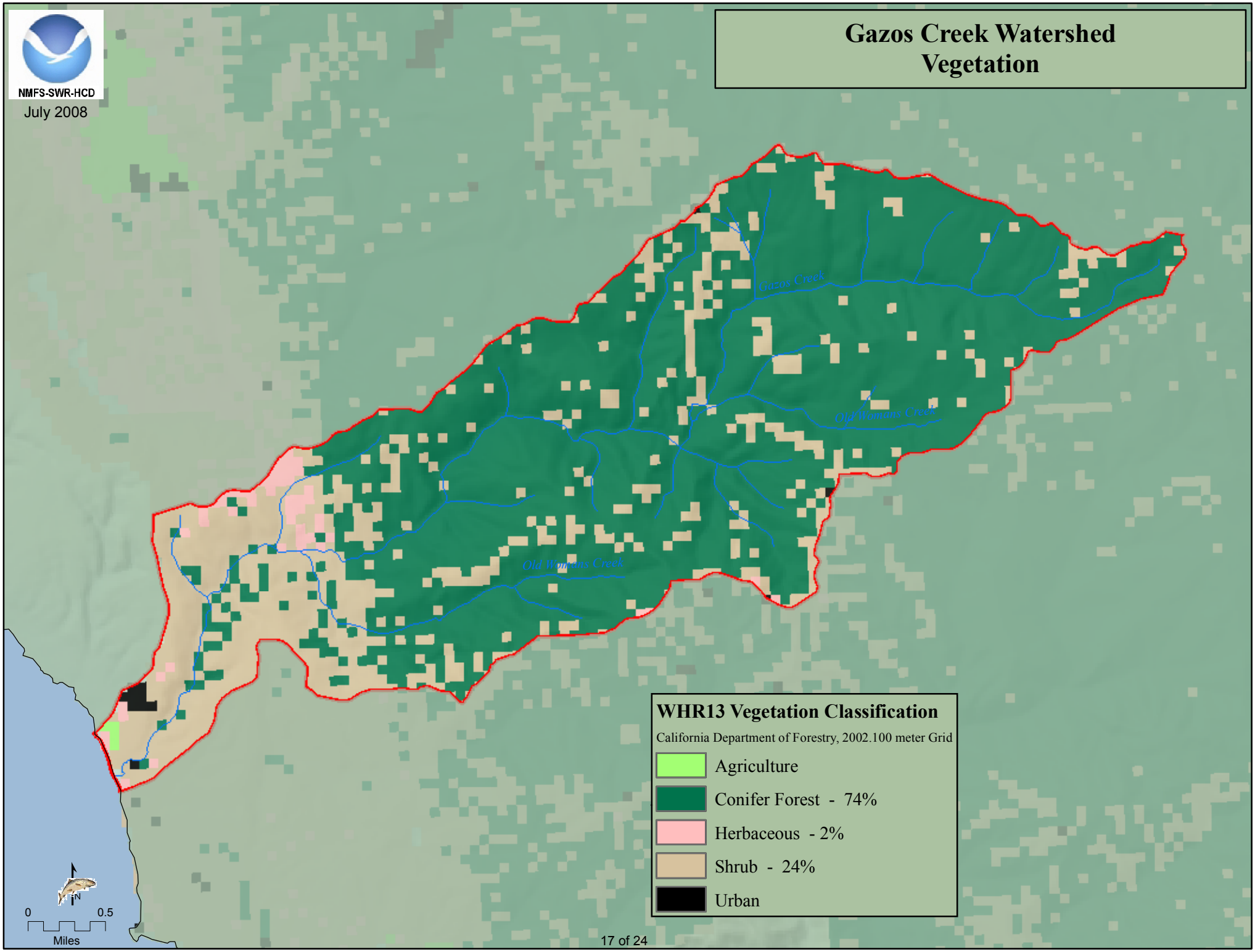
200 Meter Riparian Buffer (100 m on either side of stream centerline)

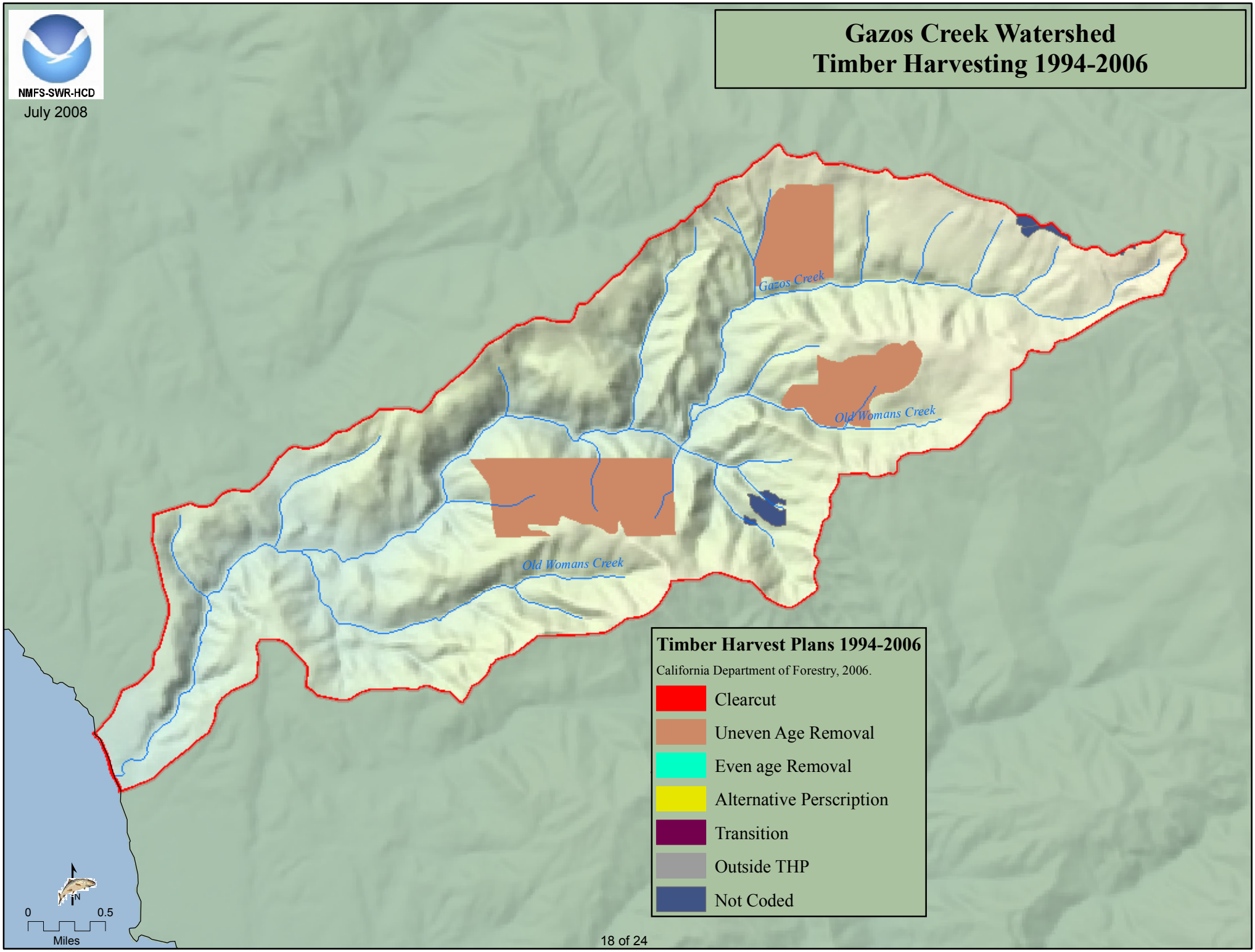
Overall Riparian Corridor Density = 3.2 Miles / SqMi of Corridor

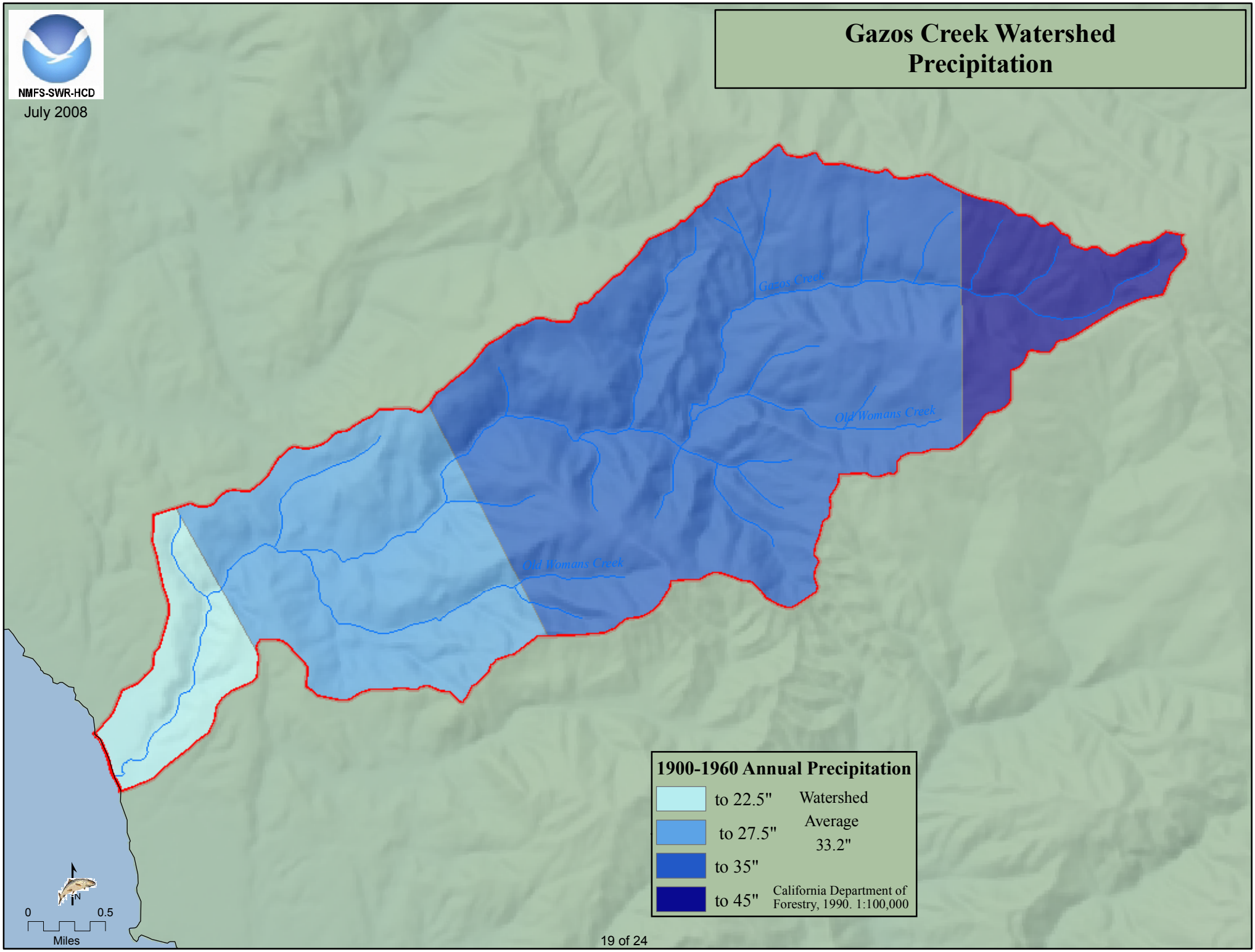
Gazos Creek Watershed Vegetation

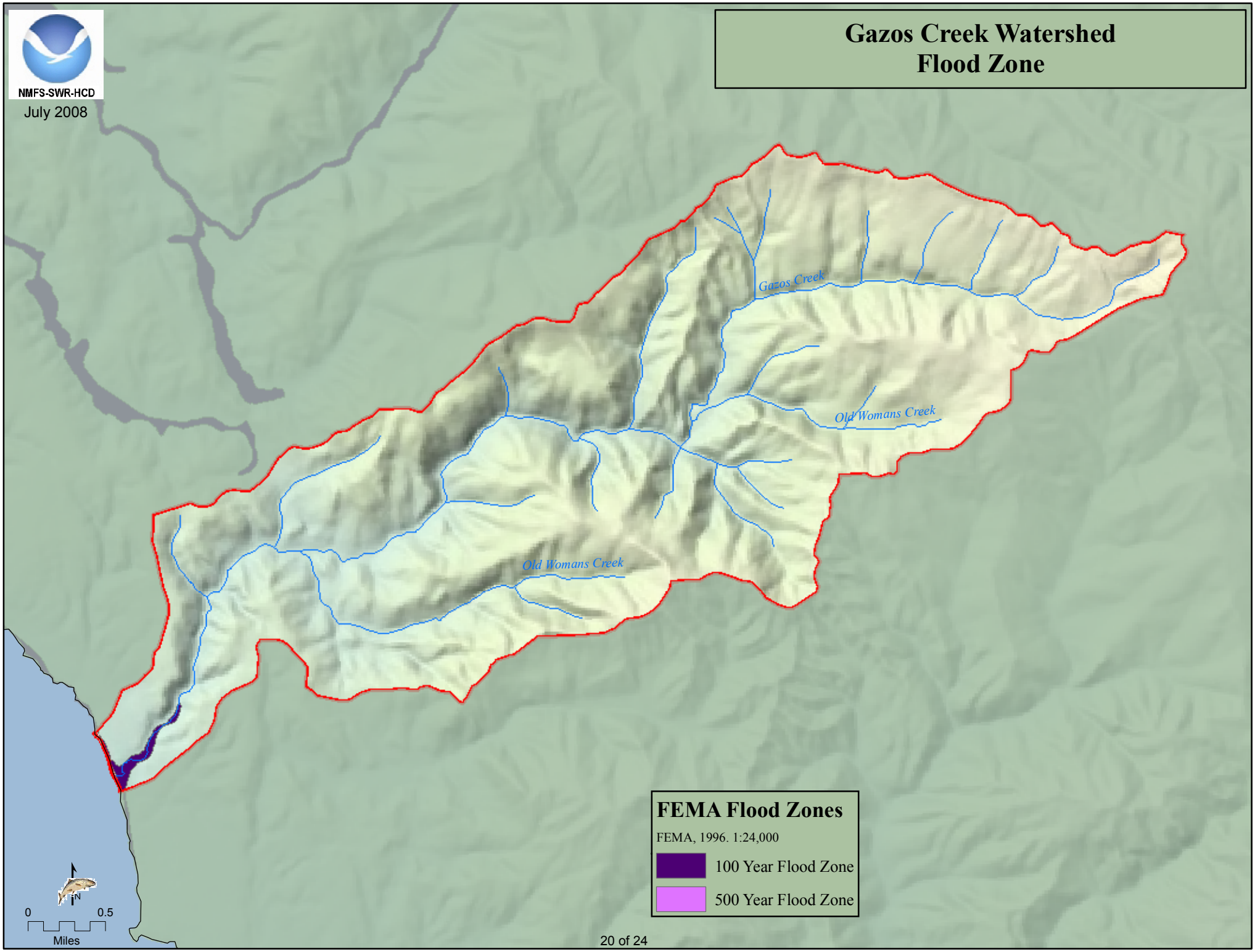
NMFS-SWR-HCD

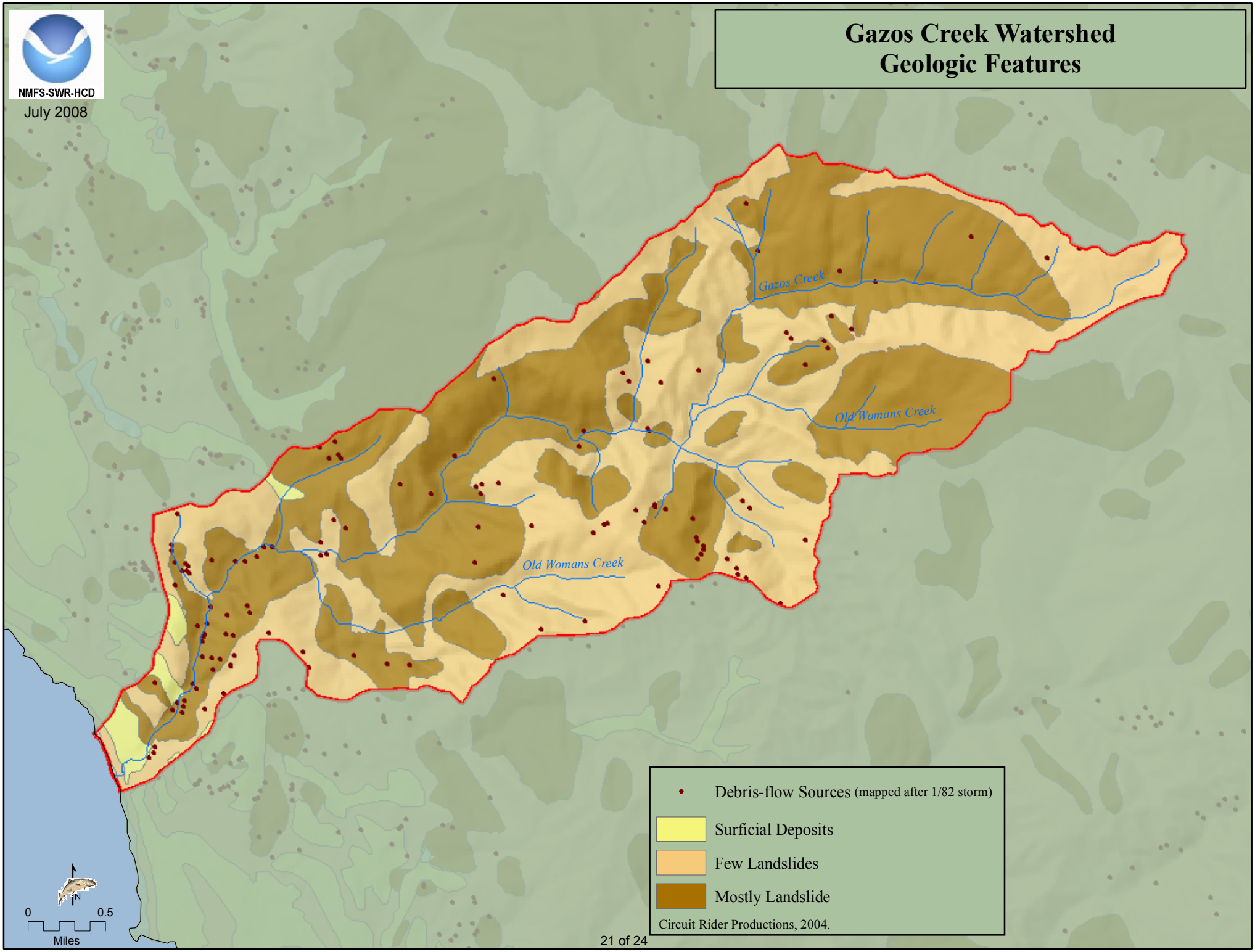
July 2008

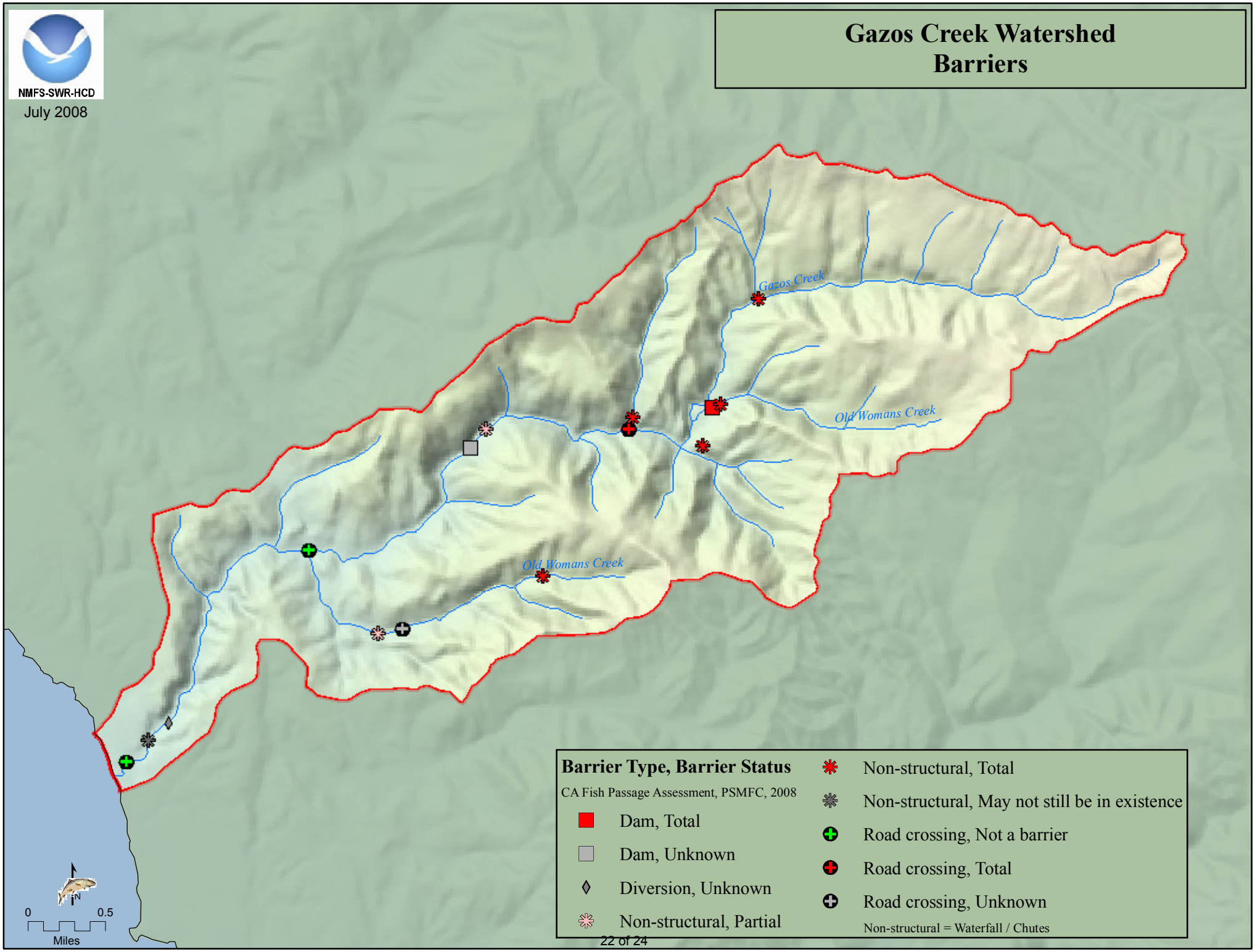



NMFS-SWR-HCD
July 2008
Gazos Creek Watershed
Timber Harvesting 1994-2006
Gazos Creek
Old Womans Creek
Old Womans Creek
Timber Harvest Plans 1994-2006
California Department of Forestry, 2006.
Clearcut
Uneven Age Removal
Even age Removal
Alternative Perscription
Transition
Outside THP
Not Coded
N
0
0.5
Miles


Gazos Creek Watershed
Precipitation
NMFS-SWR-HCD
July 2008
Gazos Creek
Old Womans Creek
Old Womans Creek
1900-1960 Annual Precipitation
to 22.5"
to 27.5"
to 35"
to 45"
Watershed
Average
33.2"
California Department of
Forestry, 1990. 1:100,000
N
0
0.5
Miles


Gazos Creek Watershed
Flood Zone
NMFS-SWR-HCD
July 2008
Gazos Creek
Old Womans Creek
Old Womans Creek
FEMA Flood Zones
FEMA, 1996. 1:24,000
100 Year Flood Zone
500 Year Flood Zone
N
0
0.5
Miles


Gazos Creek Watershed
Geologic Features
NMFS-SWR-HCD
July 2008
Gazos Creek
Old Womans Creek
Old Womans Creek
Debris-flow Sources (mapped after 1/82 storm)
Surficial Deposits
Few Landslides
Mostly Landslide
Circuit Rider Productions, 2004.
N
0
0.5
Miles


Gazos Creek Watershed
Barriers
NMFS-SWR-HCD
July 2008
Gazos Creek
Old Womans Creek
Old Womans Creek
Barrier Type, Barrier Status
CA Fish Passage Assessment, PSMFC, 2008
Dam, Total
Dam, Unknown
Diversion, Unknown
Non-structural, Partial
Non-structural, Total
Non-structural, May not still be in existence
Road crossing, Not a barrier
Road crossing, Total
Road crossing, Unknown
Non-structural = Waterfall / Chutes
N
0
0.5
Miles

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
1806 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/

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
USGS DEM
10 Meter Digital Elevation Model (DEM)
Earth Resources and Science (EROS)
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