



NMFIS-SWR-HCD

Walker Creek Watershed

Area	Hydrologic Units	Calwater Subbasins ---	(Planning Watersheds)
47,935 Acres	18050005	2201120101	Salmon Creek (3,299 Acres)
19,399 Hectares	4th Field HUC	2201120102	Arroyo (4,701 Acres)
75 Square Miles		2201120103	Upper Walker Creek (8,511 Acres)
	2201	2201120104	Sausal (7,669 Acres)
Location	4th Field Calwater	2201120201	Chileno Creek (6,048 Acres)
Marin County		2201120202	Lower Walker Creek (6,554 Acres)
		2201120203	Laguna Lake (6,889 Acres)
		2201120303	Keys Creek (4,265 Acres)

Species Potential	Miles of Streams with Species Present
Central California Coast Steelhead North Coastal Diversity Stratum - Potentially Independent Population	<u>Steelhead</u> 17 NOAA Fisheries, Critical Habitat Redesignation, 2005
Central California Coast Coho Coastal Diversity Stratum - Potentially Independent Population	<u>Coho</u> 16 CDFG, Coho Distribution, May 2007

Critical Habitat	Miles of Stream
Central California Coast Steelhead	17 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	Miles
Km of Historical Coho IP (21.5 C mask)	104
% of IP (21.5 C Mask) with Current Coho Distribution	19%

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		3
Canal / Ditch		1 - Impassable
Intermittent Stream	92	2 - Unknown
Perennial Stream	29	
Artificial Path	8	

^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
11460800 Walker Creek near Tomales	46
	3 Dams
	39 Water Rights Diversions (Unknown Passage Status)
	4 Road Crossings (1 Impassable)

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

EPA Total Maximum Daily Load Classification (**TMDL**)^I
Medium Priority - Mercury, Nutrients, Sediment (lower 16 miles)

Sources: Surface Mining, Mine Tailings, Agriculture

^IState Water Resources Control Board, 2003

Appropriated Waterways^J
Unmed Stream (SW 1/4, SW 1/4, Sec 32, T5N, R9W) from confluence of Walker Creek and Keyes Creek upstream is Fully Appropriated

^JCalifornia State Water Resources Control Board, 1998.



Average Annual Precipitation^E	Average Annual Precipitation Range^E
34"	27.5-35"

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

Roads^A	Miles
Roads in Watershed	
Secondary and connecting road, state highways	3
Local, neighborhood, and rural road, city street, unseparated	97
Vehicular trail, 4WD	3
Driveway or service road	13
Total Miles	

Road Density	
Miles of Roads per SqMi of Watershed	1.5
Miles of Roads per SqMi of 100m Riparian Buffer*	3.6

*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	1,848	4%
Lands of 2-4 percent slope	1,591	3%
Lands of 4-10 percent slope	5,697	12%
Lands of 10-15 percent slope	4,838	10%
Lands of 15-30 percent slope	13,791	29%
Lands of 30-60 percent slope	17,219	36%
Lands of 60-100 percent slope	2,945	6%
Lands of > 100 percent slope	7	0%

Elevation Range	3-1522 ft.	1-464 m
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^DSlope derived from USGS 10 meter Digital Elevation Models (DEM's)

Vegetation^G	Acres	Percent of watershed
Agriculture	1,893	4%
Annual grassland	29,129	61%
Barren / Other	37	0%
Conifer Forest		
Closed-Cone Pine- Cypress	86	0%
Douglas Fir	74	0%
Montane Hardwood-Conifer	2	0%
Hardwood Forest		
Montane Hardwood	8,271	17%
Montane Riparian	22	0%
Hardwood Woodland		
Coastal Oak Woodland	2,718	6%
Eucalytus	166	0%
Valley Foothill Riparian	507	1%
Shrub	4,028	8%
Urban	316	1%
Water	665	1%
Wetland	40	0%

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

Erodability of Watershed^F	Acres	Percent of watershed
Ranking = 3	4,266	9%
Ranking = 4	19,342	40%
Ranking = 5	24,179	50%
Unranked	149	0%

^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	46,242	96%
Local (Water District)	1,108	2%
State	580	1%

^HManagement Landscape, CA Department of Forestry, 2002

Population^I	Housing^I	
Total Population within the watershed -- 752 People	Total Housing Units within the watershed -- 307 Houses	
	Housing Density	
	0 to Less than 1 Housing Unit / 160 Acres	79%
	1 Unit / 160 Acres to 1 Unit / 20 Acres	20%
	1 Unit / 20 Acres to 1 Unit / 5 Acres	1%
	1 Unit / 5 Acres to 2 Units / Acre	0%
	2 Units / Acres to Greater than or Equal to 5 Units / Acre	0%

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



Walker 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	1905	37			17	29099		316	662	37		
	S					30							
	P					7							
	M					22	198						
	D												
Total		1905	37			22	252	29099	316	662	37	32330	
Seedling	S												
	P												
	M												
	D												
	Total												0
Sapling	S					5	5						
	P			7		12	7						
	M					541	25						
	D					554	462						
	Total			7		1112	499						1618
Pole	S						10						
	P				25		15						
	M					195	30						
	D				5	1315	694						
	Total				30	1510	749						2289
Small Tree	S					25							
	P				20	5	54						
	M					432	116						
	D				72	5199	1710		4033				
	Total				92	5661	1880		4033				11666
Medium/Large Tree	S												
	P												
	M												
	D				35								
	Total				35								35
Multi Layered	S												
	P												
	M												
	D												
	Total												0
Grand Total by Species Type		1905	37	164	8305	3380	29099	4033	316	662	37	47938	

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	4%	0%				0%	61%		1%	1%	0%	
	S												
	P												
	M												
	D												
Total		4%	0%			0%	1%	61%		1%	1%	0%	67%
Seedling	S												
	P												
	M												
	D												
	Total												0%
Sapling	S					0%	0%						
	P			0%		0%	0%						
	M					1%	0%						
	D					1%	1%						
	Total			0%		2%	1%						3%
Pole	S						0%						
	P			0%			0%						
	M					0%	0%						
	D			0%		3%	1%						
	Total			0%		3%	2%						5%
Small Tree	S					0%							
	P				0%	0%	0%						
	M					1%	0%						
	D				0%	11%	4%		8%				
	Total				0%	12%	4%		8%				24%
Medium/Large Tree	S												
	P												
	M												
	D												
	Total												0%
Multi Layered	S												
	P												
	M												
	D												
	Total												0%
Grand Total by Species Type		4%	0%	0%		17%	7%	61%	8%	1%	1%	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%

Walker 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	739.0	15.0				17.0	4925.0		151.0	467.0	30.0	
	S												
	P						30.0						
	M						7.0						
	D					2.0	193.0						
	Total	739.0	15.0			2.0	247.0	4925.0		151.0	467.0	30.0	6576
Seedling	S												
	P												
	M												
	D												
	Total												0
Sapling	S												
	P												
	M						2.0						
	D					59.0	15.0						
	Total				0.0	136.0	281.0						417
Pole	S												
	P						5.0						
	M												
	D					25.0	20.0						
	Total				0.0	146.0	346.0						492
Small Tree	S												
	P				10.0		2.0						
	M					64.0	35.0						
	D				7.0	581.0	867.0		759.0				
	Total				17.0	645.0	904.0		759.0				2325
Medium/Large Tree	S												
	P												
	M				5.0								
	D												
	Total				5.0								5
Multi Layered	S												
	P												
	M												
	D												
	Total												0
Grand Total by Species Type		739	15	22	0	929	1778	4925	759	151	467	30	9815

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	8%	0%				0%	50%		2%	5%	0%	
	S												
	P						0%						
	M						0%						
	D					0%	2%						
	Total	8%	0%			0%	3%	50%		2%	5%	0%	67%
Seedling	S												
	P												
	M												
	D												
	Total												0%
Sapling	S												
	P												
	M												
	D												
	Total				0%		1%	3%					4%
Pole	S												
	P												
	M												
	D												
	Total				0%		1%	4%					5%
Small Tree	S												
	P												
	M				0%		0%						
	D				0%		1%	0%					
	Total				0%		6%	9%		8%			24%
Medium/Large Tree	S												
	P												
	M												
	D												
	Total				0%								0%
Multi Layered	S												
	P												
	M												
	D												
	Total												0%
Grand Total by Species Type		8%	0%	0%	0%	9%	18%	50%	8%	2%	5%	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%

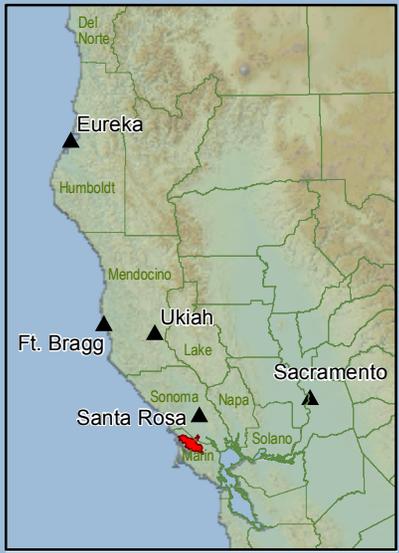
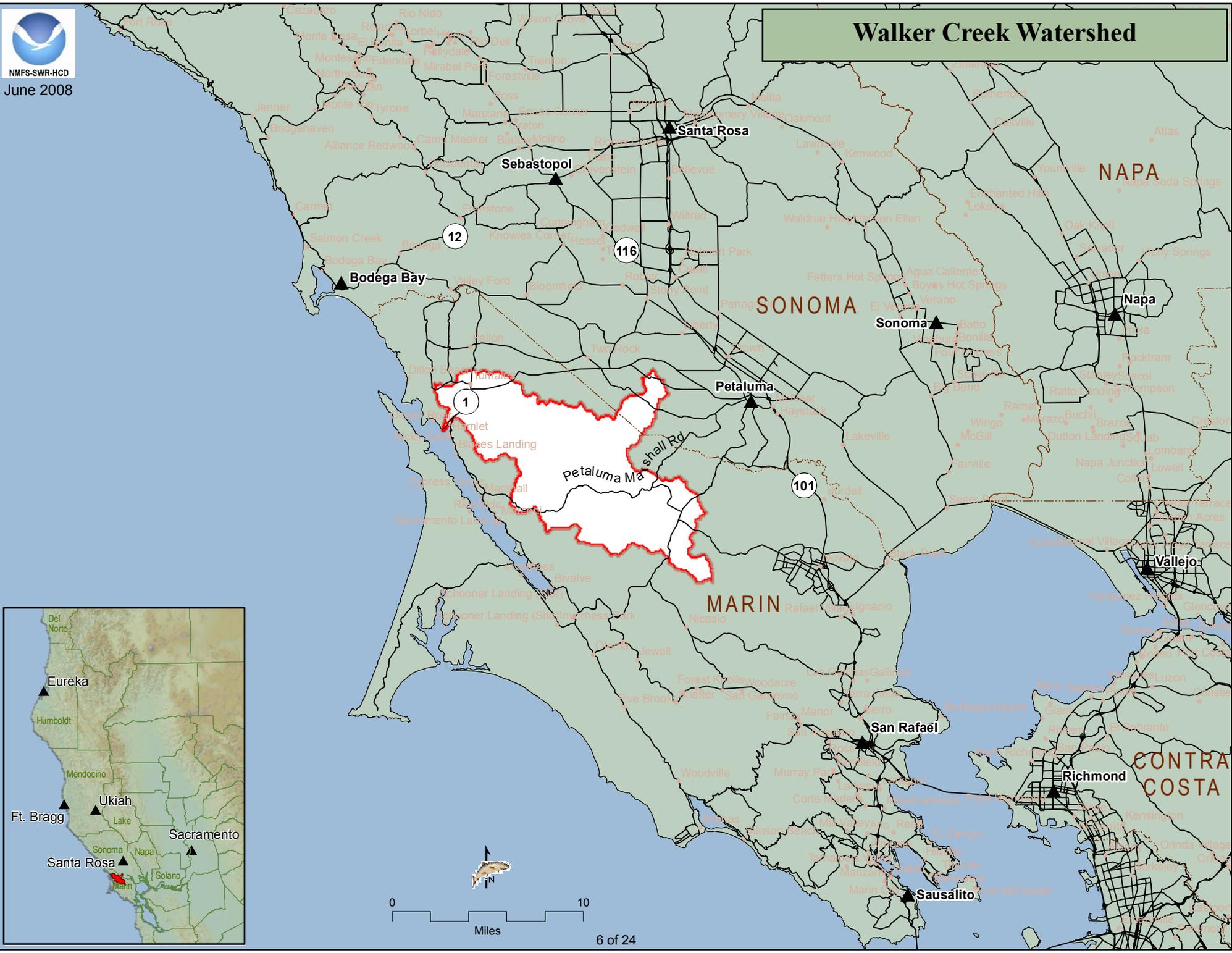
SIZE (SHRUB)	Desc.	Crown Decadence
Not Determined		N/A
Seedling Shrub		Seedlings or sprouts < 3 years
Young Shrub		None
Mature Shrub		1 - 25%
Decadent Shrub		> 25%

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



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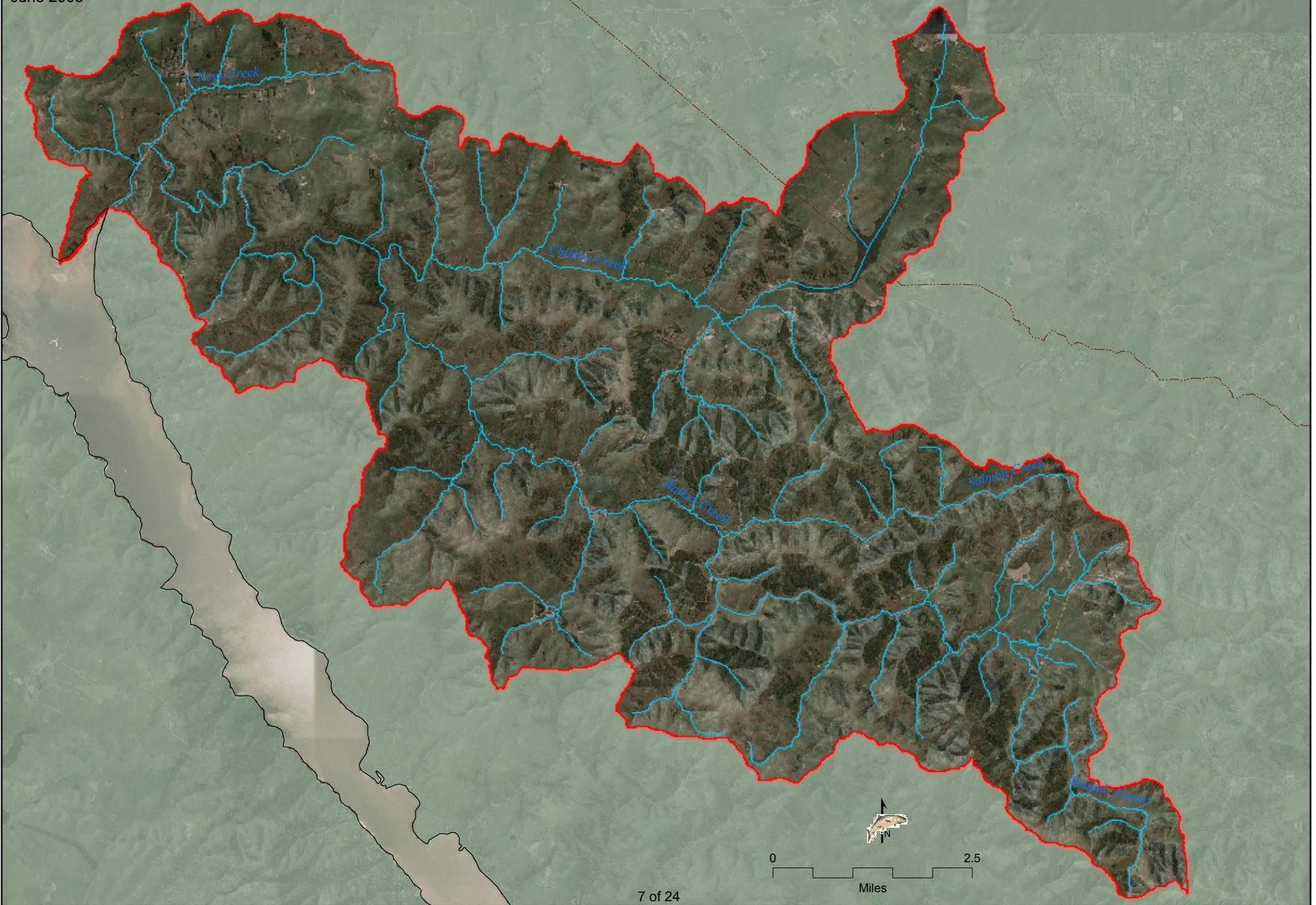
Walker Creek Watershed





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June 2008

Walker Creek Watershed





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June 2008

Walker Creek Watershed CalWater Planning Watersheds





NMFS-SWR-HCD
June 2008

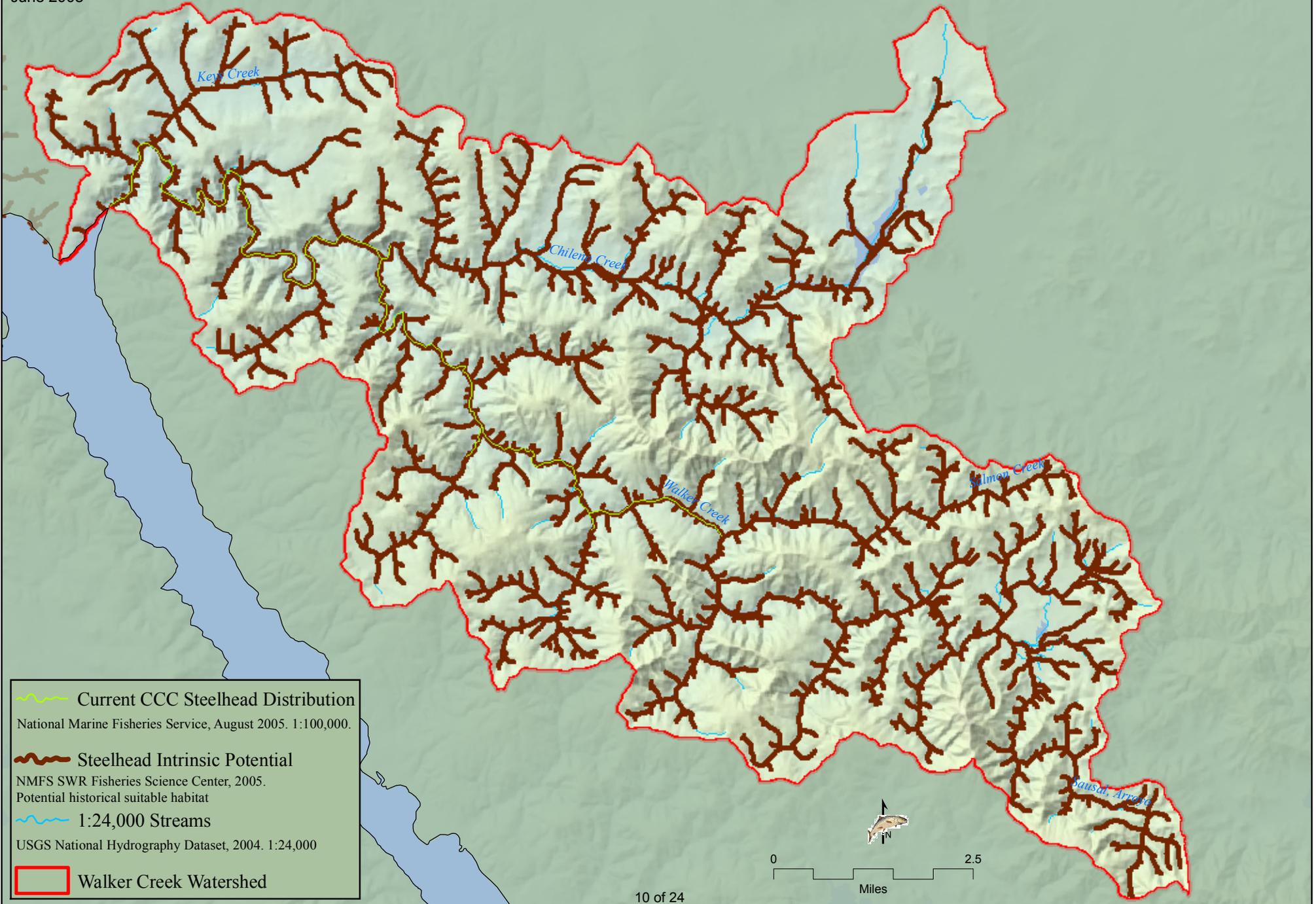
Walker Creek Watershed Fish Distribution and Critical Habitat





NMFS-SWR-HCD
June 2008

Walker 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



NMFS-SWR-HCD

June 2008

Walker Creek Watershed Coho Current vs. Historical



 Current Coho Distribution

CDFG - NCNCR-ISB, 2007. 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

 Walker Creek Watershed



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June 2008

Walker Creek Watershed Elevation





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June 2008

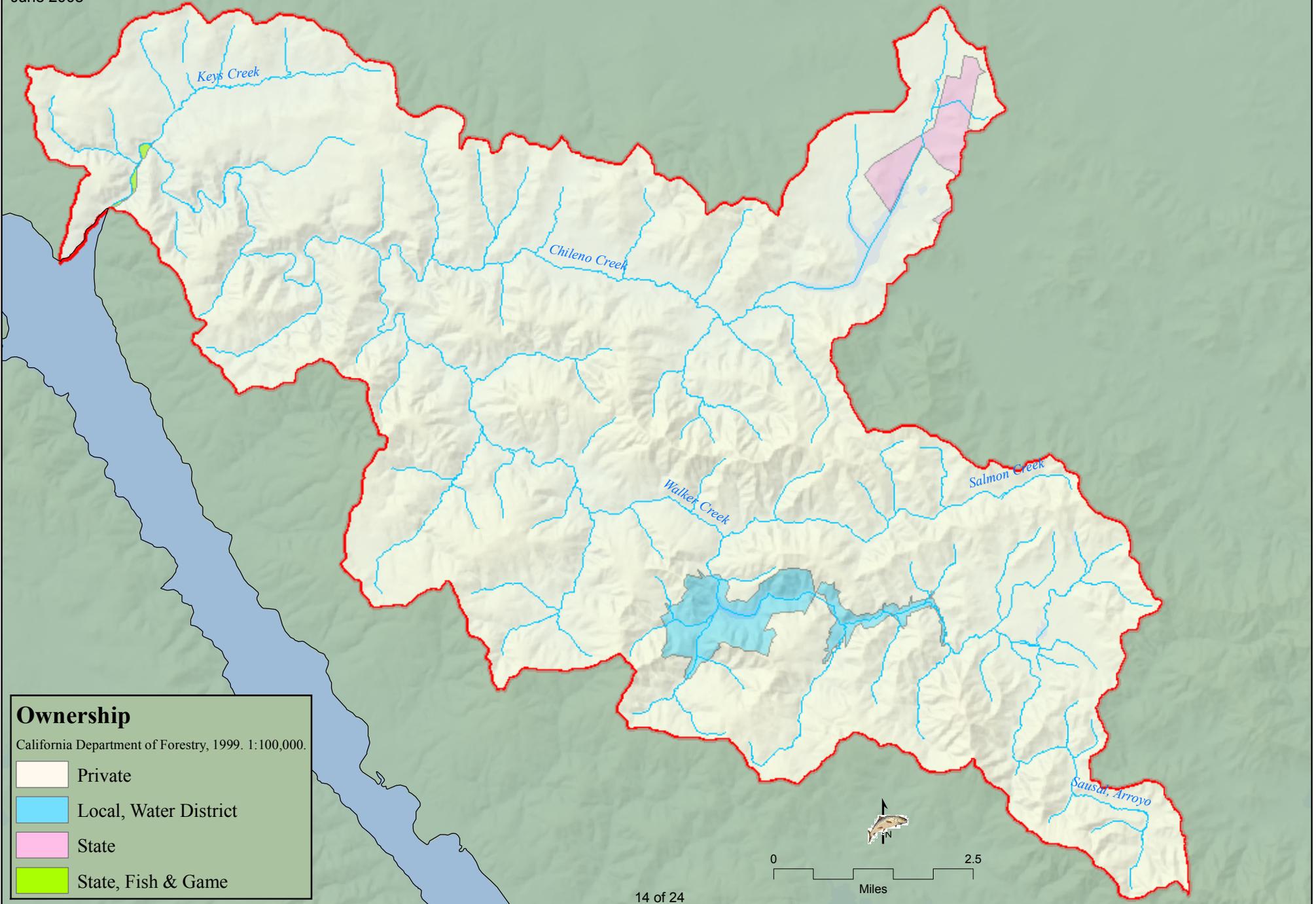
Walker Creek Watershed Development





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June 2008

Walker Creek Watershed Ownership



Ownership

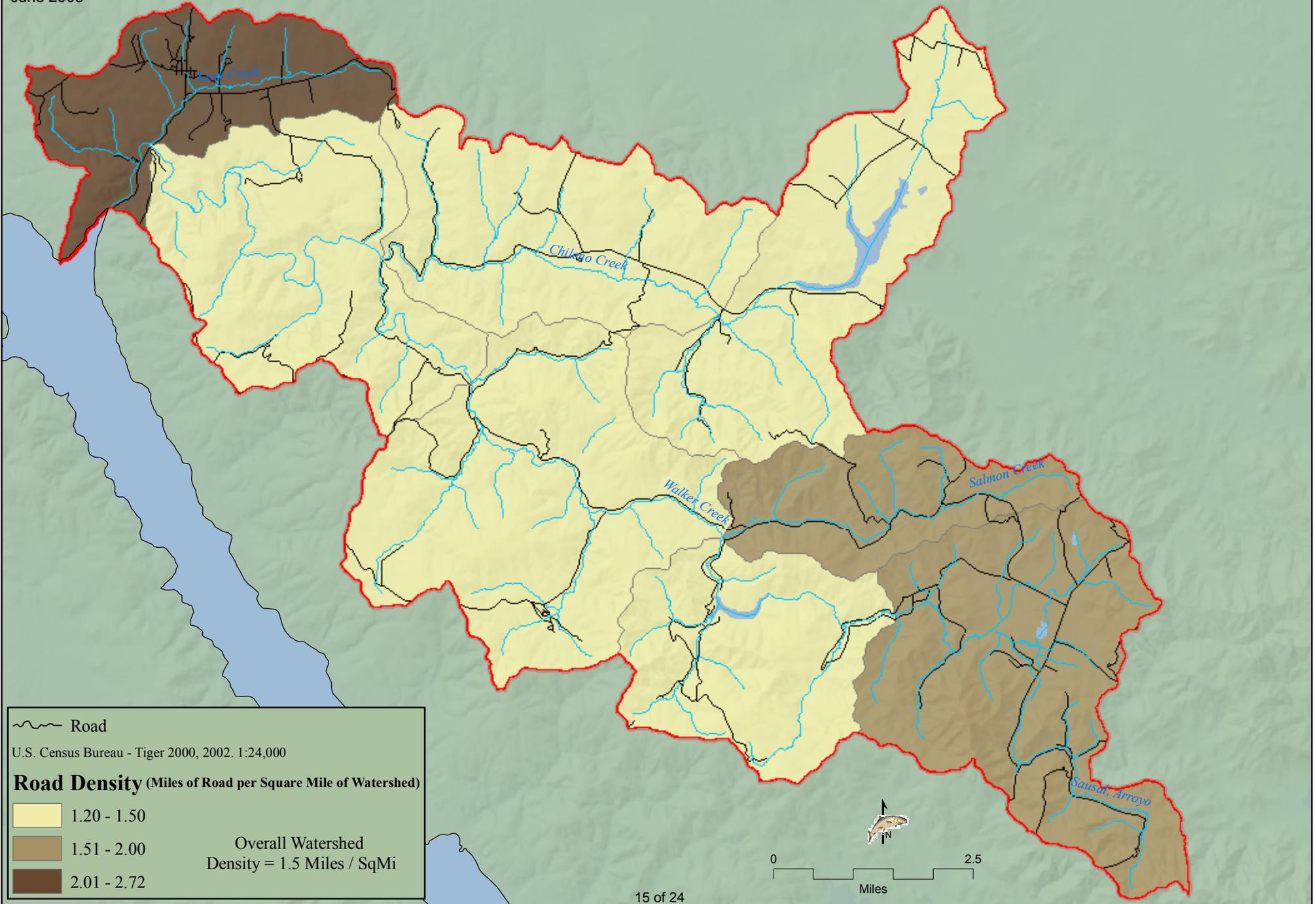
California Department of Forestry, 1999. 1:100,000.

- Private
- Local, Water District
- State
- State, Fish & Game



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Walker Creek Watershed Road Density





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Walker Creek Watershed Road Density in the Riparian Corridor



~ Road Segments within the 200 meter Riparian Corridor

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

~ 1:24,000 Stream

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

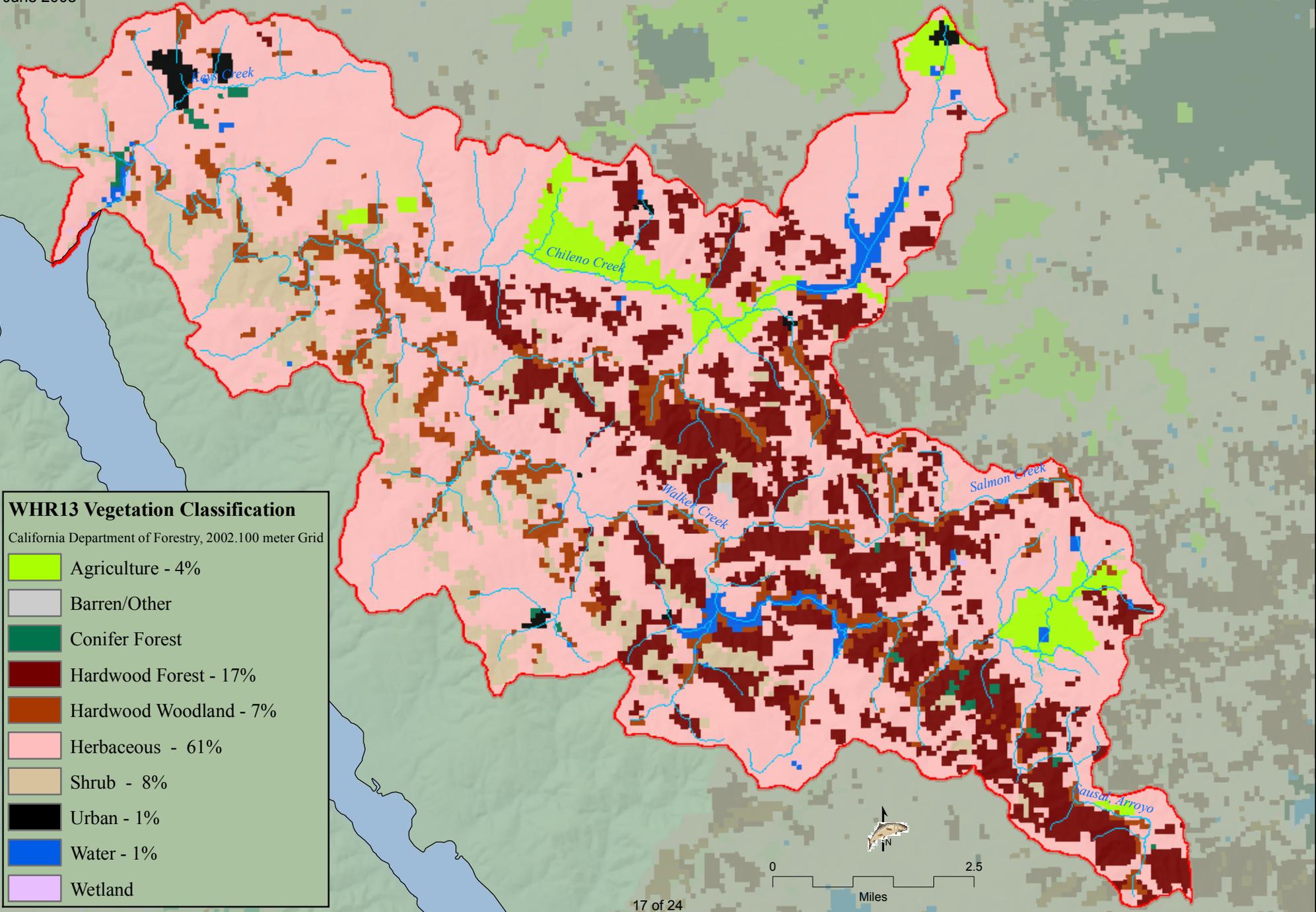
200 Meter Riparian Buffer (100 m on either side of stream centerline)

Overall Riparian Corridor Density = 3.6 Miles / SqMi of Corridor



NMFS-SWR-HCD
June 2008

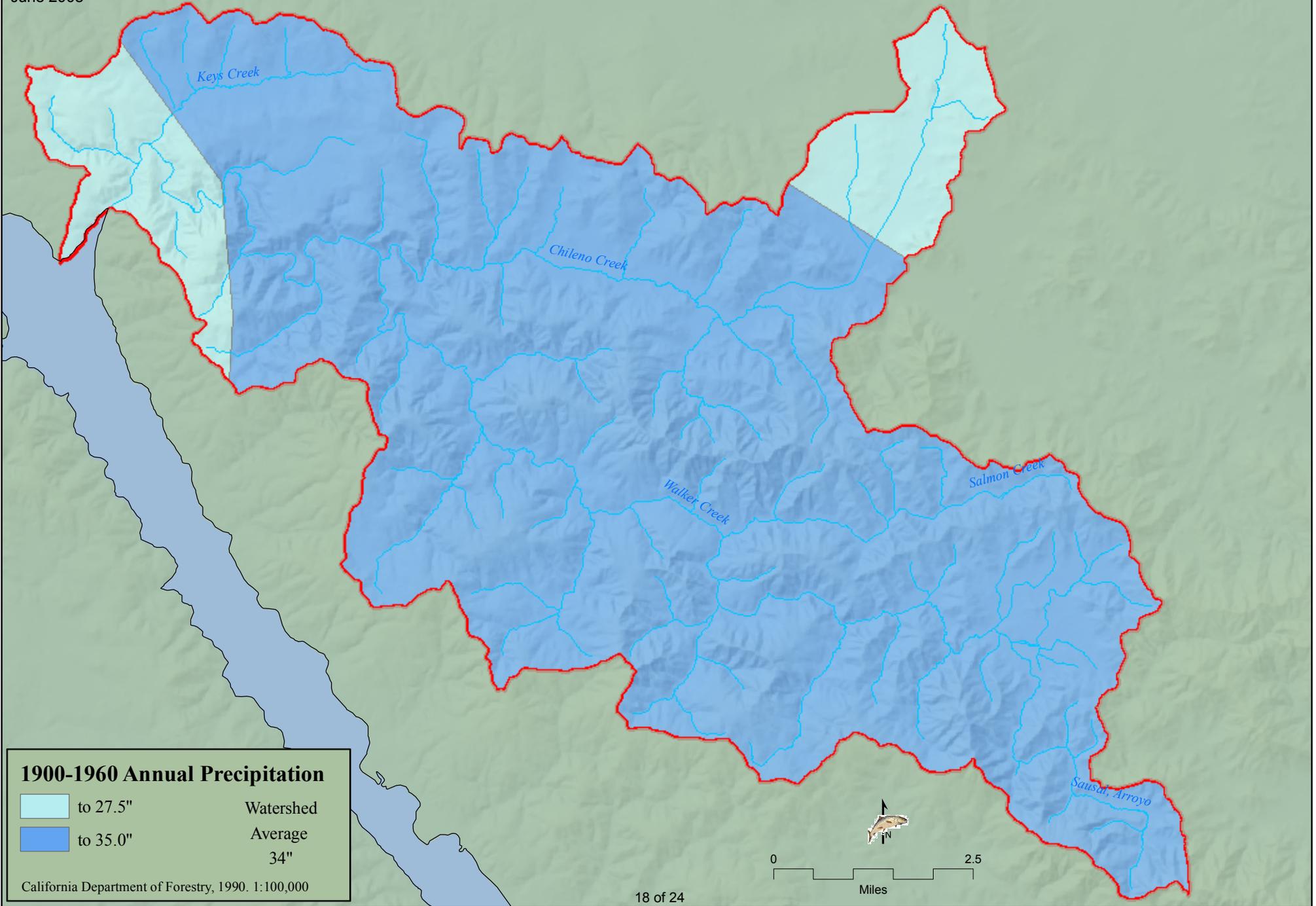
Walker Creek Watershed Vegetation





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Walker Creek Watershed Precipitation





NMFS-SWR-HCD
June 2008

Walker Creek Watershed Flood Zone



FEMA Flood Zones

FEMA, 1996. 1:24,000

 100 Year Flood Zone



NMFS-SWR-HCD
June 2008

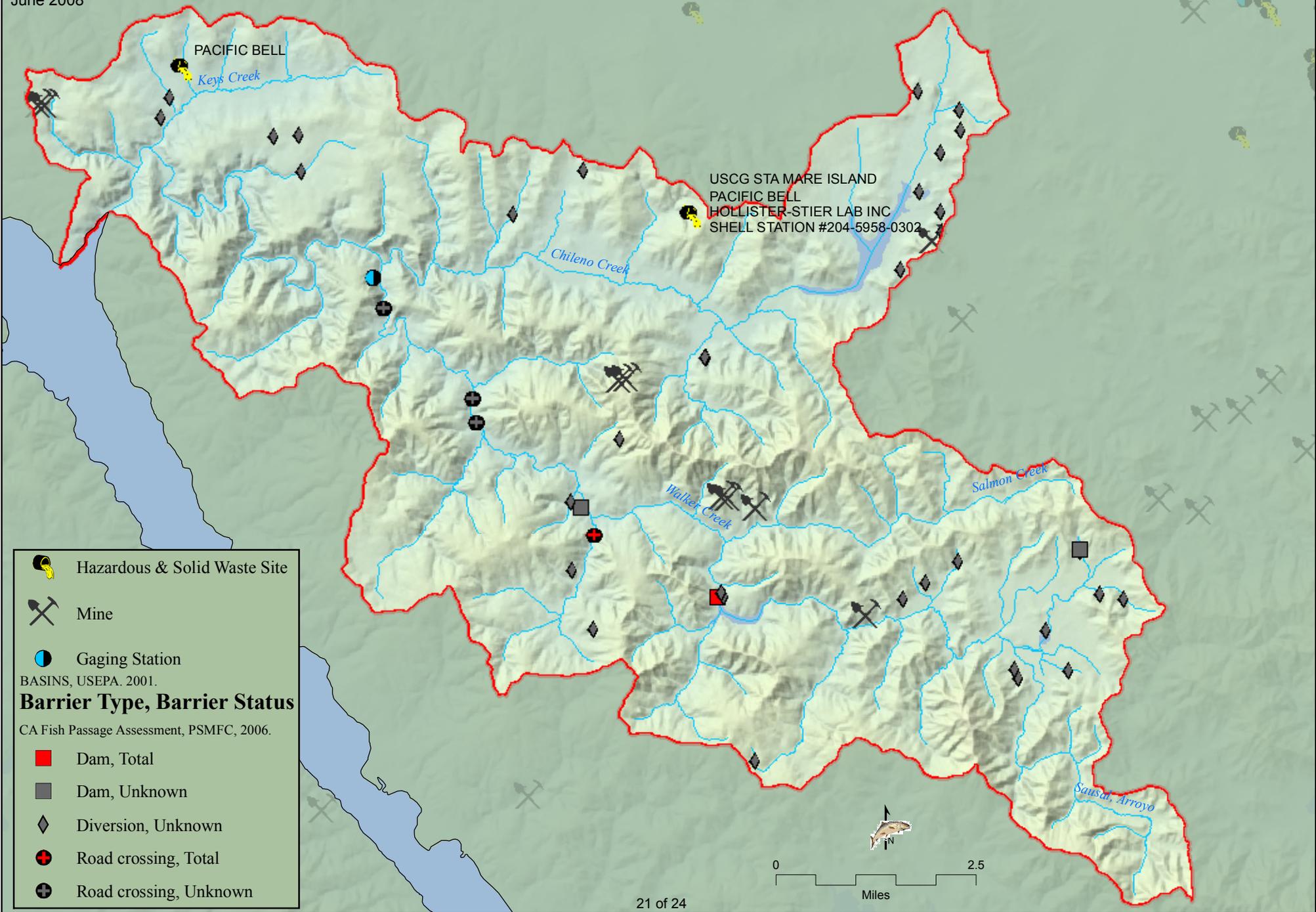
Walker Creek Watershed Erosion Potential





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June 2008

Walker Creek Watershed Barriers and Industrial Discharge



- Hazardous & Solid Waste Site
- Mine
- Gaging Station

BASINS, USEPA, 2001.

Barrier Type, Barrier Status

CA Fish Passage Assessment, PSMFC, 2006.

- Dam, Total
- Dam, Unknown
- Diversion, Unknown
- Road crossing, Total
- Road crossing, Unknown





NMFS-SWR-HCD
June 2008

Walker Creek Watershed Public Consultation Tracking System



● RMS / PCTS 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

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calwater_ver2_2
vector digital data
California Watersheds (CALWATER 2.2)
California Department of Forestry and Fire
Protection
1:24,000
1999
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Distribution

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vector digital data
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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
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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_september2006
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)

R2_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

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>

Erodability

Highly Erodible Watersheds
vector digital data
Dept. of Conservation, Division of Mines &
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/>

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_ca041_2006_2 (Marin)
remote-sensing image
raster digital data
National Agriculture Imagery Program (NAIP)
USDA-FSA Aerial Photography Field Office
Salt Lake City, Utah
2006
<http://datagateway.nrcs.usda.gov/GatewayHome.html>

Historic Suitable Habitat (Coho, 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
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vector digital data
United States Environmental Protection Agency
2001
<http://www.epa.gov/waterscience/basins/>

mines
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Records Management System (RMS)

Public Consultation Tracking System (PCTS)

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Oracle Databases
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Flood Zones

FEMA Flood Insurance Maps 1996
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Q3 Flood Data Program
1996
<http://www.fema.gov/>