



*Puttiding Creek Watershed*

Area	Hydrologic Units	Calwater Subbasins ---	(Planning Watersheds)
11,271 Acres	18010108	1113200501	Little Valley Creek (3643 Acres)
4,561 Hectares	4th Field HUC	1113200508	Puttiding Creek (7628 Acres)
18 Square Miles			
<hr/>			
<b>Location</b>	1113		
Mendocino County	4th Field Calwater		

Species Potential	Miles of Streams with Species Present
Northern California <b>Steelhead</b> North-Central Coastal Diversity Stratum - Potentially Independent Population	<u>Steelhead</u> 18 NOAA Fisheries, Critical Habitat Redesignation, 2005
Central California Coast <b>Coho</b> Lost Coast-Navarro Point Diversity Stratum - Dependent Population	<u>Coho</u> 11 CDFG, Coho Distribution, May 2007
California Coastal <b>Chinook</b> North-Central Coastal Diversity Stratum - Dependent Independent Population	<u>Chinook</u> 0 NOAA Fisheries, Critical Habitat Redesignation, 2005

Critical Habitat	Miles of Stream
Northern California Steelhead	18 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	0 Miles of Stream

Miles of Waterway <sup>A</sup>	Miles	Number of Dams <sup>C</sup>
Naturally Occurring Waterways		2
Intermittent Stream	29	1 - Partial Barrier
Perennial Stream	10	1 - Unknow Barrier Status
Artificial Path	1	

<sup>C</sup>Passage Assessment Database, Pacific States Marine Fisheries Commission, 2005

<sup>A</sup>USGS National Hydrography Dataset, High Resolution, 2004. 1:24,000

USGS Gaging Stations <sup>B</sup>	Number of Barriers <sup>C</sup>
11468540	4
Puttiding Creek near Fort Bragg	2 Dams 1 Diversion (Unknown Barrier Status) 1 Fish Passage Facility (Partial Barrier)

<sup>C</sup>Passage Assessment Database, Pacific States Marine Fisheries Commission, 2006

Average Annual Precipitation <sup>E</sup>	Average Annual Precipitation Range <sup>E</sup>
46"	40 - 55"

<sup>E</sup>California Mean Annual Precipitation Zones, 1900-1960, CA Department of Forestry, 1990



<b>Roads<sup>A</sup></b>	<b>(US Census Bureau (TIGER))</b>	Miles
Roads in Watershed		
Primary Road / Highway		1
Secondary and connecting road, state highways		0
Local, neighborhood, and rural road, city street, unseparated		55
Vehicular trail, 4WD		0
Driveway or service road		0
Total Miles		

<b>Road Density</b>	<b>(US Census Bureau (TIGER))</b>	
Miles of Roads per SqMi of Watershed		3.1
Miles of Roads per SqMi of 100m Riparian Buffer*		3.7

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

<sup>A</sup>U.S. Census Bureau - Tiger 2000, 2002. 1:24,000

<b>Roads<sup>A1</sup></b>	<b>(Timber Harvest Plans)</b>	Miles
Roads in Watershed		
Abandoned Seasonal		0
Bridge		
Existing Permanent (rocked)		37
Existing Seasonal		98
Existing Temporary & 4WD		1
Proposed Permanent (rocked)		1
Proposed Seasonal		4
Proposed Temporary & 4WD		0
Reconstructed Seasonal		
Secondary Road (2-3 lanes)		13

<b>Road Density</b>	<b>(Timber Harvest Plans)</b>	
Miles of Roads per SqMi of Watershed		8.6
Miles of Roads per SqMi of 100m Riparian Buffer*		7.9

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

<sup>A1</sup>California Department of Forestry, Timber Harvest Plans for Noyo Watershed, 2006

<b>Slope<sup>D</sup></b>	Acres	Percent of watershed
Lands of 0-2 percent slope	891	8%
Lands of 2-4 percent slope	534	5%
Lands of 4-10 percent slope	1,044	9%
Lands of 10-15 percent slope	776	7%
Lands of 15-30 percent slope	2,810	25%
Lands of 30-60 percent slope	4,447	39%
Lands of 60-100 percent slope	750	7%
Lands of > 100 percent slope	21	0%

<b>Elevation Range</b>	0 - 1647 ft.	0 - 502 m

<sup>D</sup>Slope derived from USGS 10 meter Digital Elevation Models (DEM's)



<b>Vegetation<sup>G</sup></b>	<b>Acres</b>	<b>Percent of watershed</b>
Annual grassland	744	7%
Conifer Forest		
Closed Cone-Pine-Cypress	222	2%
Montane Hardwood-Conifer	32	0%
Redwood	8,305	74%
Hardwood Forest		
Montane Hardwood	432	4%
Montane Riparian	47	0%
Hardwood Woodland		
Eucalyptus	22	0%
Shrub	1,018	9%
Urban	423	4%

<sup>G</sup>Multi-source Land Cover Data (2002 v2), CA Department of Forestry, 2002. 100 meter Grid

<b>Erodability of Watershed<sup>F</sup></b>	<b>Acres</b>	<b>Percent of watershed</b>
All of watershed is ranked as 3	11,271	100%

<sup>F</sup>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]

<b>Land Ownership<sup>H</sup></b>	<b>Acres</b>	<b>Percent of watershed</b>
Private	12,208	100%

<sup>H</sup>Management Landscape, CA Department of Forestry, 2002

<b>Area Under a Timber Harvest Plan<sup>A</sup> past 10 years</b>		<b>Area Under a Timber Harvest Plan<sup>A</sup> past 20 years</b>	
4,216	37% of watershed	6,899	61% of watershed

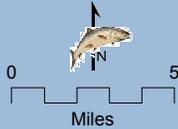
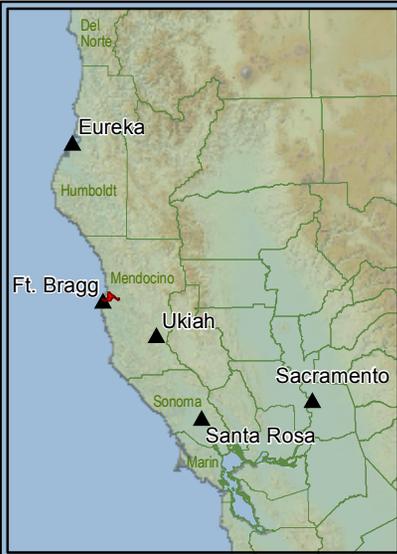
<sup>A</sup>California Department of Forestry, Timber Harvest Plans for Noyo Watershed, 2006

<b>Population<sup>I</sup></b>	<b>Housing<sup>I</sup></b>
Total Population within the watershed -- 2,307 People	Total Housing Units within the watershed -- 894 Houses
	Housing Density
	0 to Less than 1 Housing Unit / 160 Acres 51%
	1 Unit / 160 Acres to 1 Unit / 20 Acres 17%
	1 Unit / 20 Acres to 1 Unit / 5 Acres 26%
	1 Unit / 5 Acres to 2 Units / Acre 6%
	2 Units / Acres to Greater than or Equal to 5 Units / Acre 1%

<sup>I</sup>Census 2000 Block Data (Migrated), CA Department of Forestry, 2003



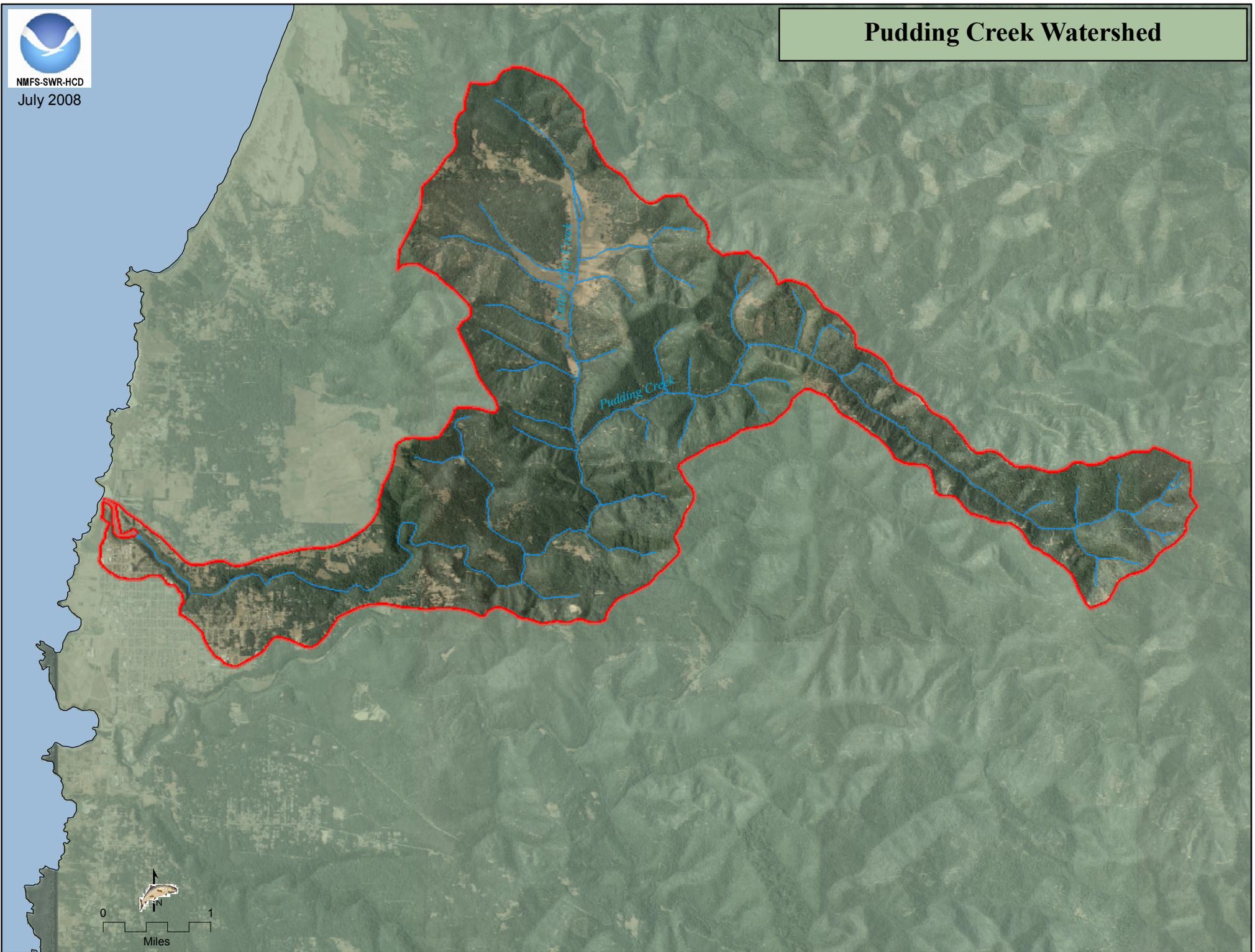
# pudding Creek Watershed





NMFS-SWR-HCD  
July 2008

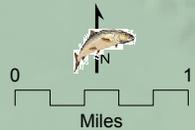
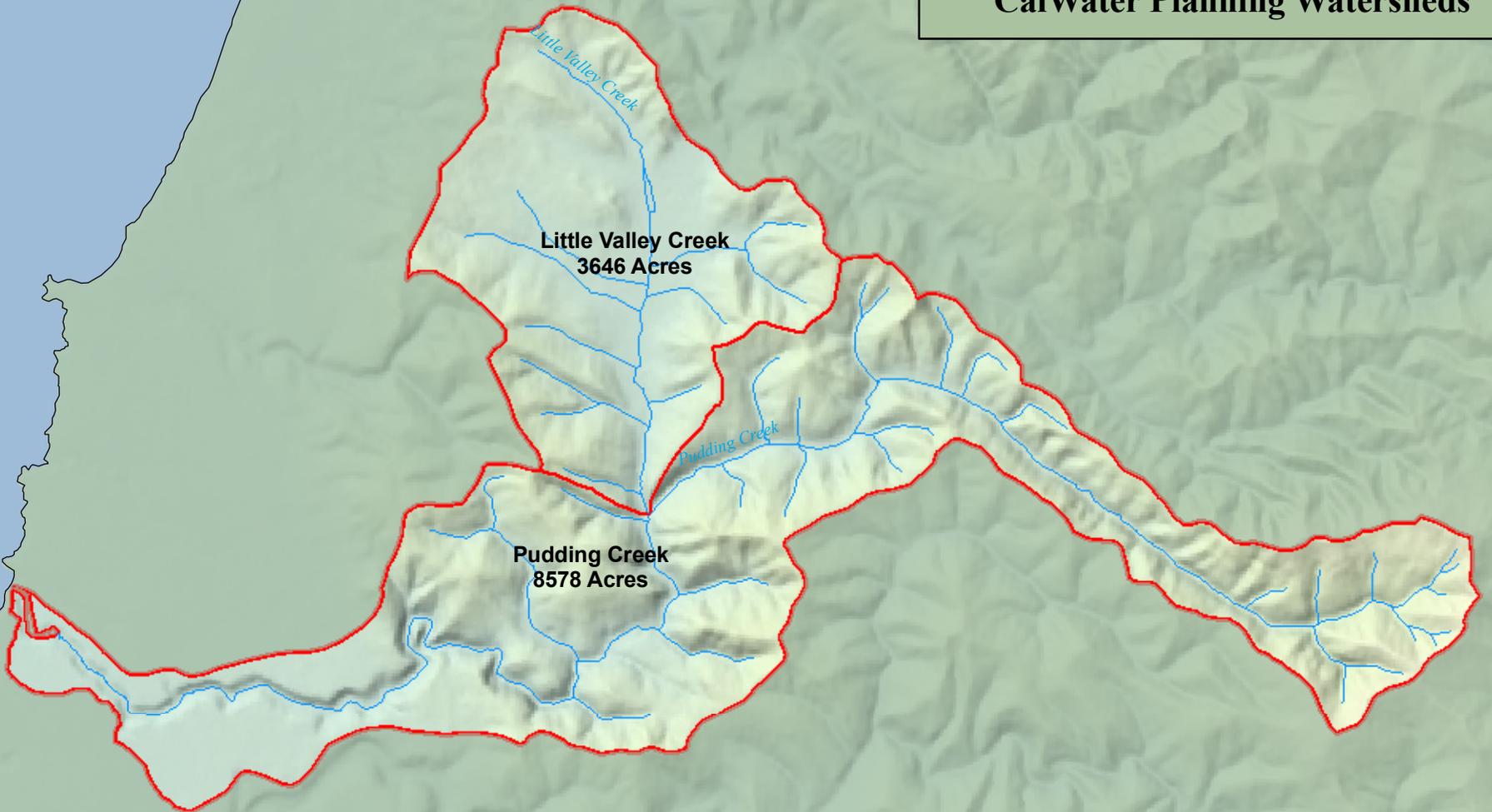
# Pudding Creek Watershed





NMFS-SWR-HCD  
July 2008

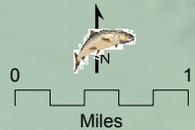
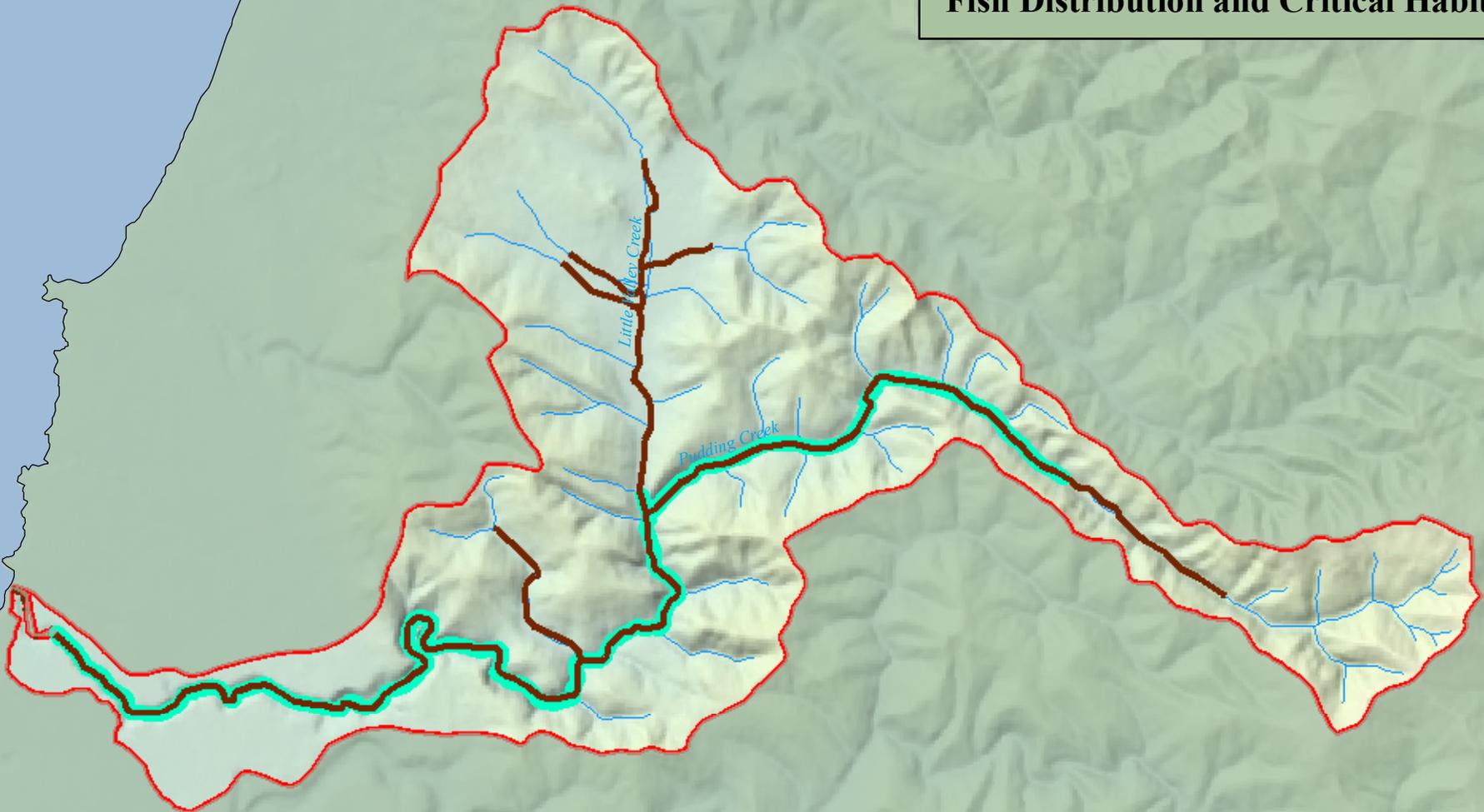
## Pudding Creek Watershed CalWater Planning Watersheds





NMFS-SWR-HCD  
July 2008

# Pudding Creek Watershed Fish Distribution and Critical Habitat

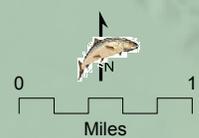


-  NC Steelhead Distribution and Critical Habitat  
National Marine Fisheries Service, August 2005. 1:100,000.
-  Coho Distribution  
CDFG - NCNCR-ISB, 2007. 1:100,000.
-  1:24,000 Streams  
USGS National Hydrography Dataset, 2004. 1:24,000
-  Pudding Creek Watershed



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# Pudding Creek Watershed Steelhead Current vs. Historical

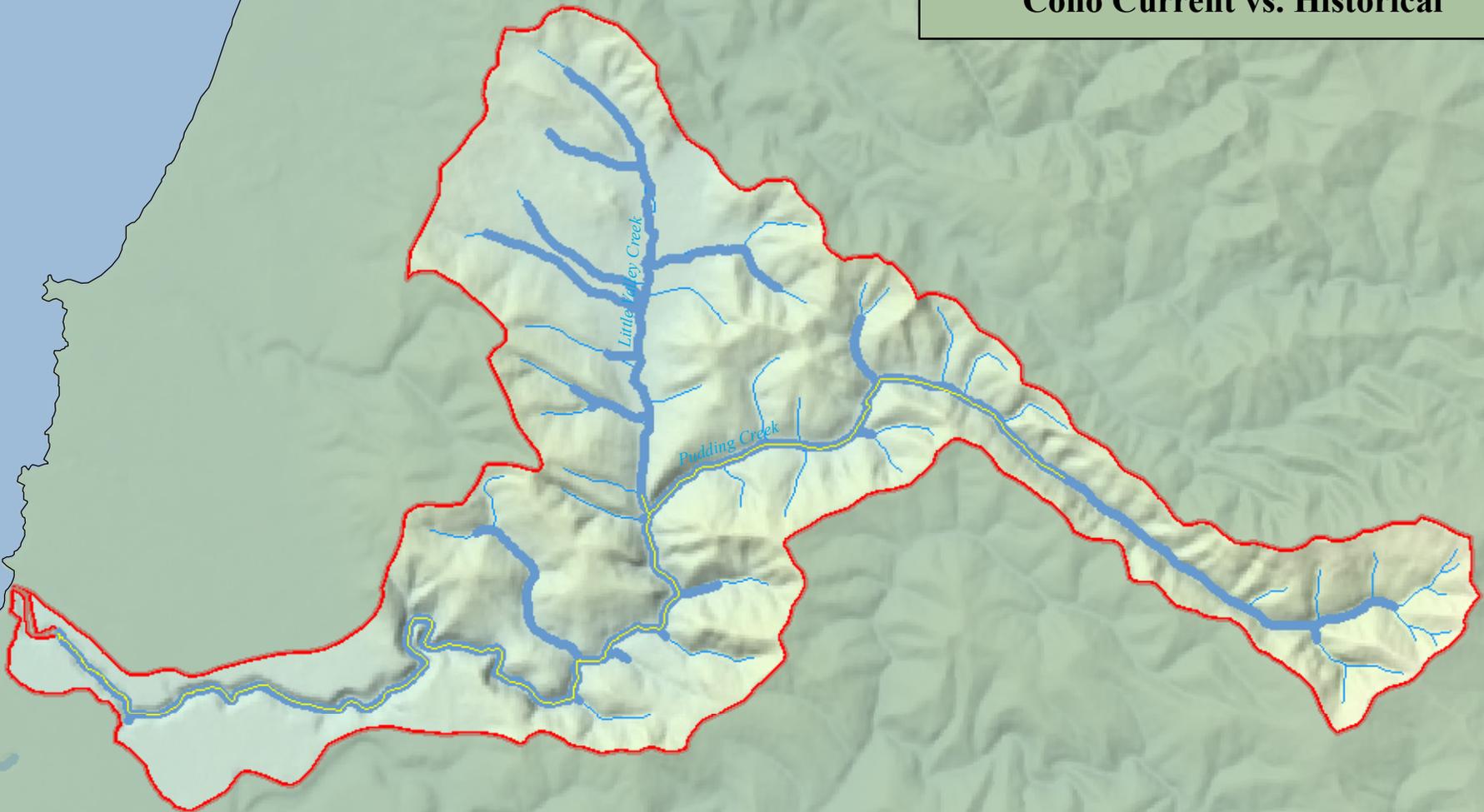


-  Current NC Steelhead Distribution  
National Marine Fisheries Service,  
August 2005. 1:100,000.
-  Steelhead Intrinsic Potential  
CDFG - NCNCR-ISB, 2007. 1:100,000.
-  1:24,000 Streams  
USGS National Hydrography Dataset, 2004. 1:24,000
-  Pudding Creek Watershed



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July 2008

## Pudding Creek Watershed Coho Current vs. Historical

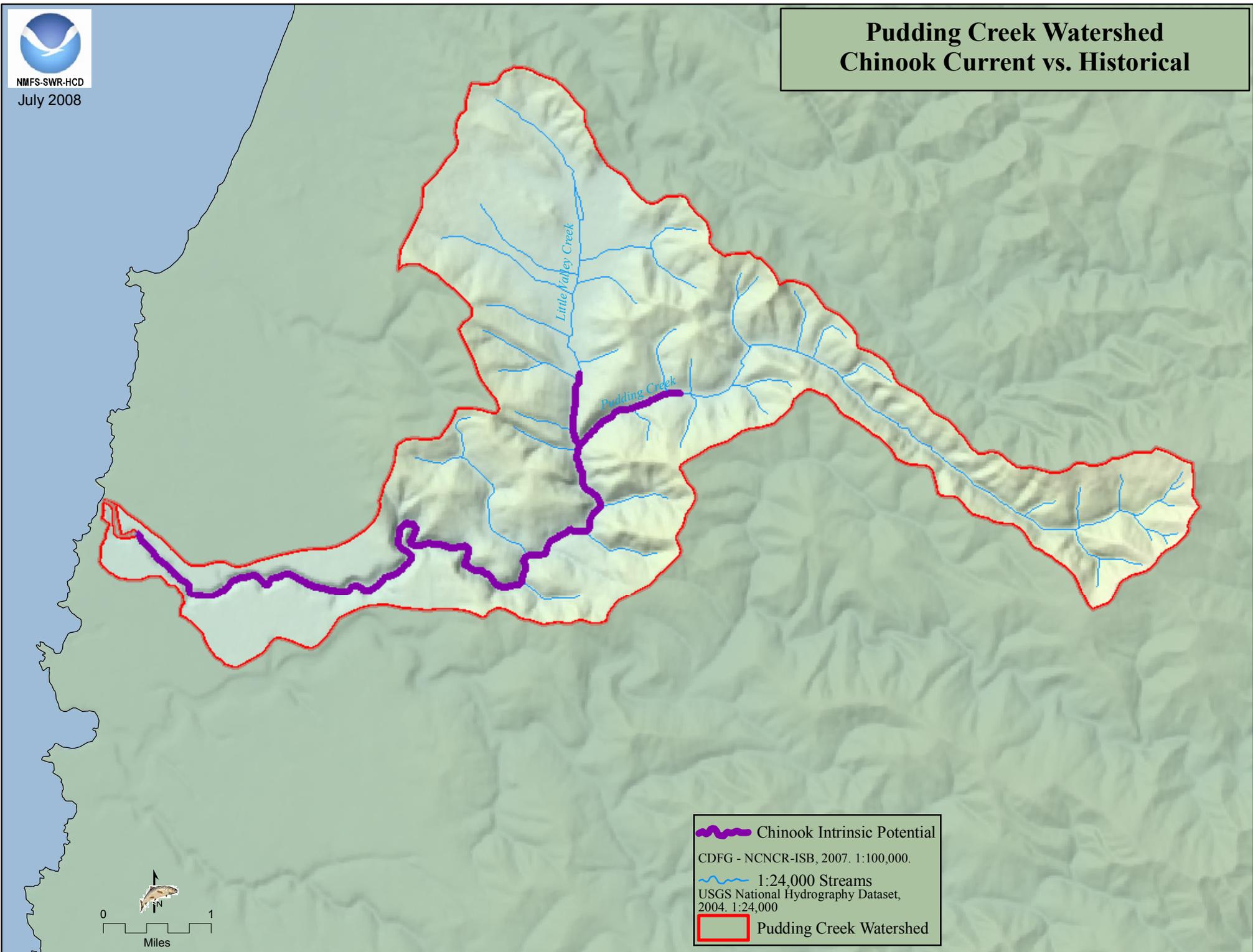


-  Current Coho Distribution  
National Marine Fisheries Service,  
August 2005. 1:100,000.
-  Coho Intrinsic Potential  
CDFG - NCNCR-ISB, 2007. 1:100,000.
-  1:24,000 Streams  
USGS National Hydrography Dataset,  
2004. 1:24,000
-  Pudding Creek Watershed



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## Pudding Creek Watershed Chinook Current vs. Historical

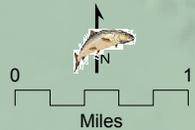


-  Chinook Intrinsic Potential
- CDFG - NCNCR-ISB, 2007. 1:100,000.
-  1:24,000 Streams
- USGS National Hydrography Dataset, 2004. 1:24,000
-  Pudding Creek Watershed

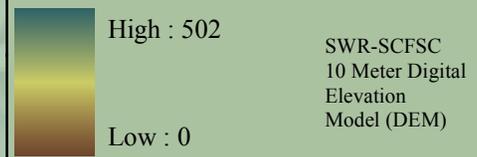


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## Pudding Creek Watershed Elevation



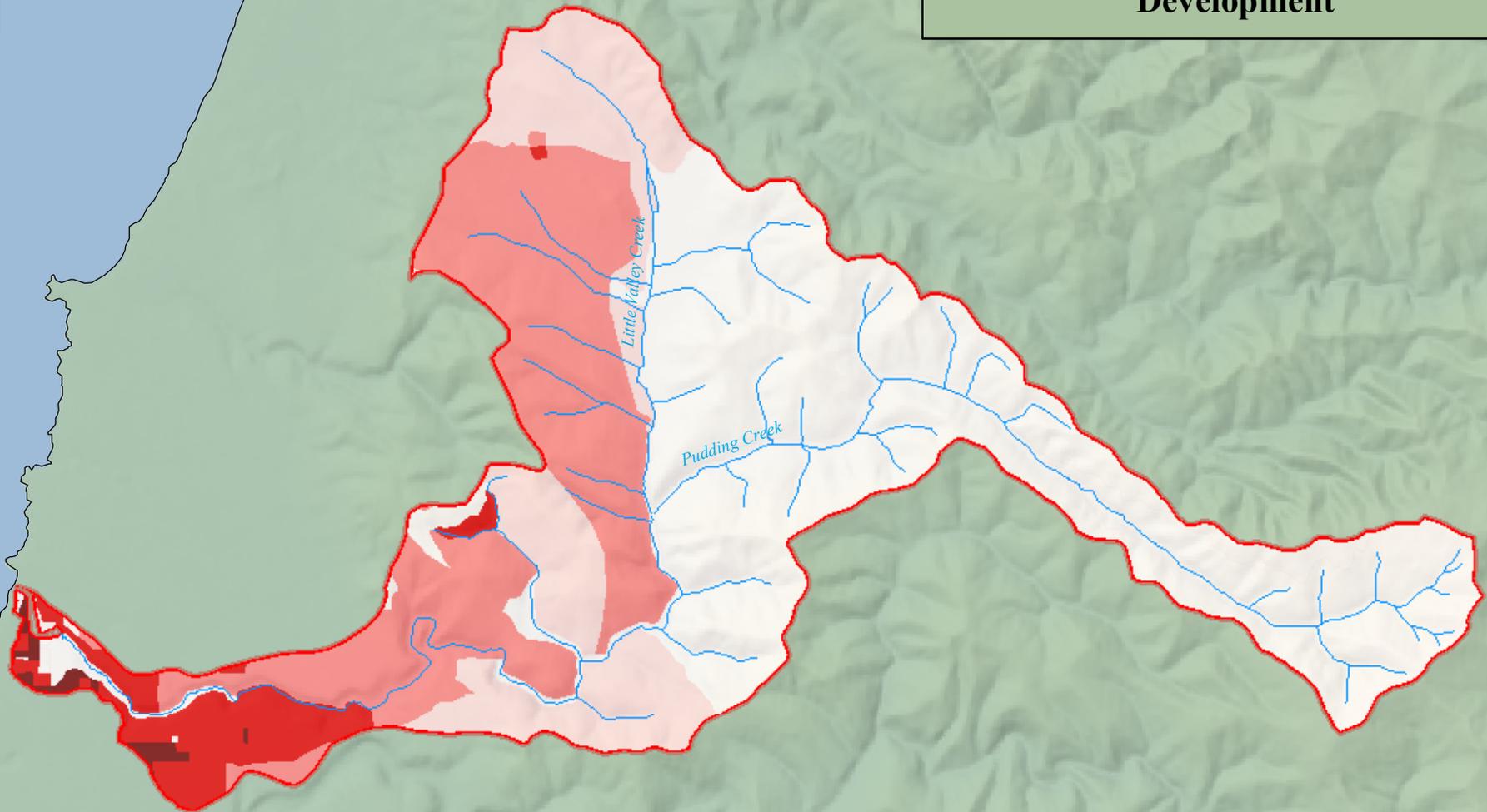
### Pudding Creek Elevation (Meters)





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## Pudding Creek Watershed Development



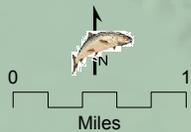
### Housing Density

- 0 to Less than 1 Housing Unit / 160 Acres (51%)
- 1 Unit / 160 Acres to 1 Unit / 20 Acres (17%)
- 1 Unit / 20 Acres to 1 Unit / 5 Acres (26%)
- 1 Unit / 5 Acres to 2 Units / Acre (6%)
- 2 Units / Acre to Greater than or Equal to 5 Units / Acre (1%)

Population within the Watershed = 2,307 People

Houses within the Watershed = 894

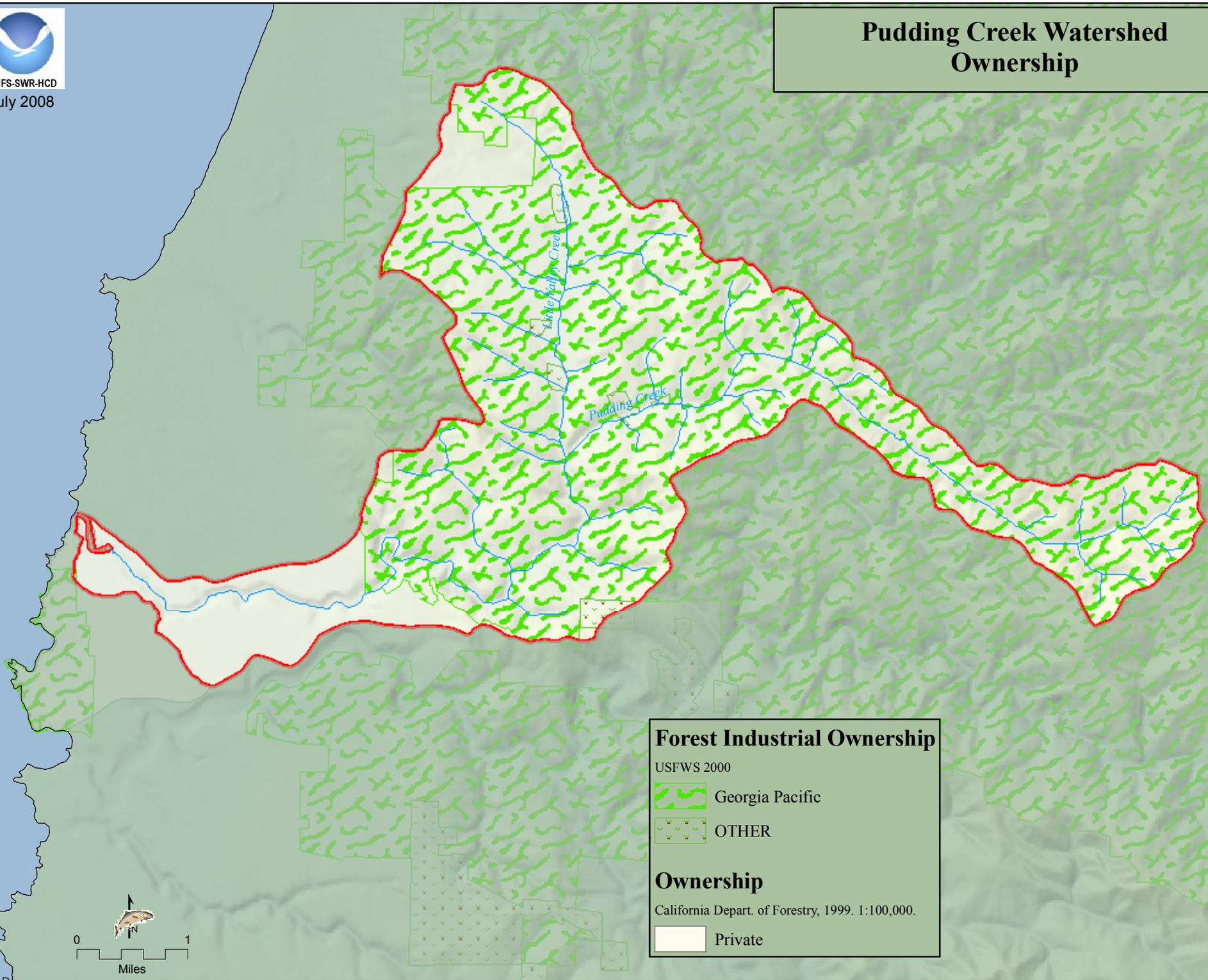
California Department of Forestry, 2003. 1:100,000.





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# Pudding Creek Watershed Ownership



## Forest Industrial Ownership

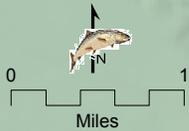
USFWS 2000

-  Georgia Pacific
-  OTHER

## Ownership

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

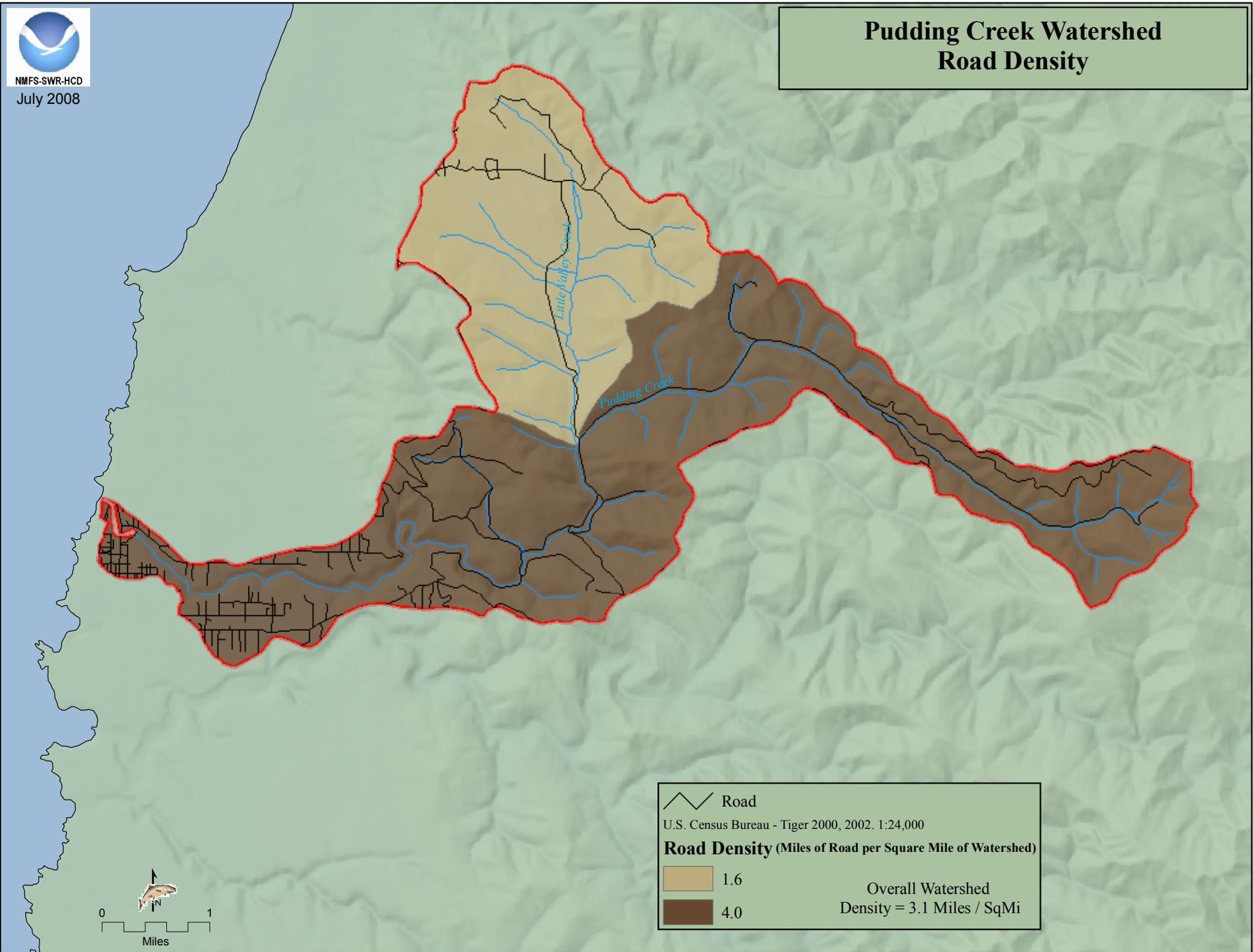
-  Private





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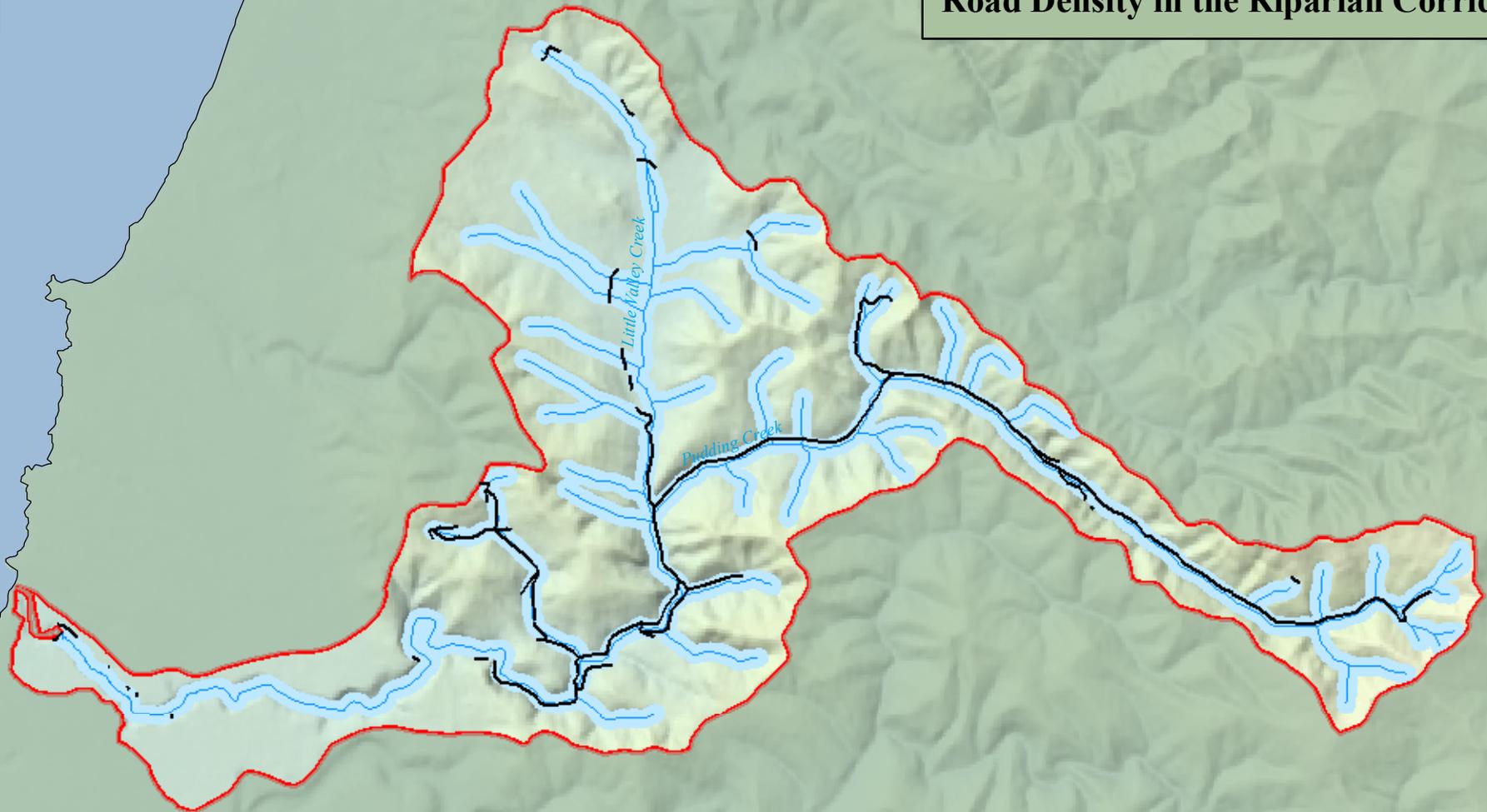
# Pudding Creek Watershed Road Density





NMFS-SWR-HCD  
July 2008

# Pudding Creek Watershed Road Density in the Riparian Corridor

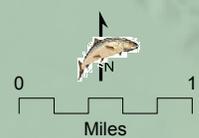


 Road Segments within the 200 meter Riparian Corridor  
U.S. Census Bureau - Tiger 2000, 2002. 1:24,000

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

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

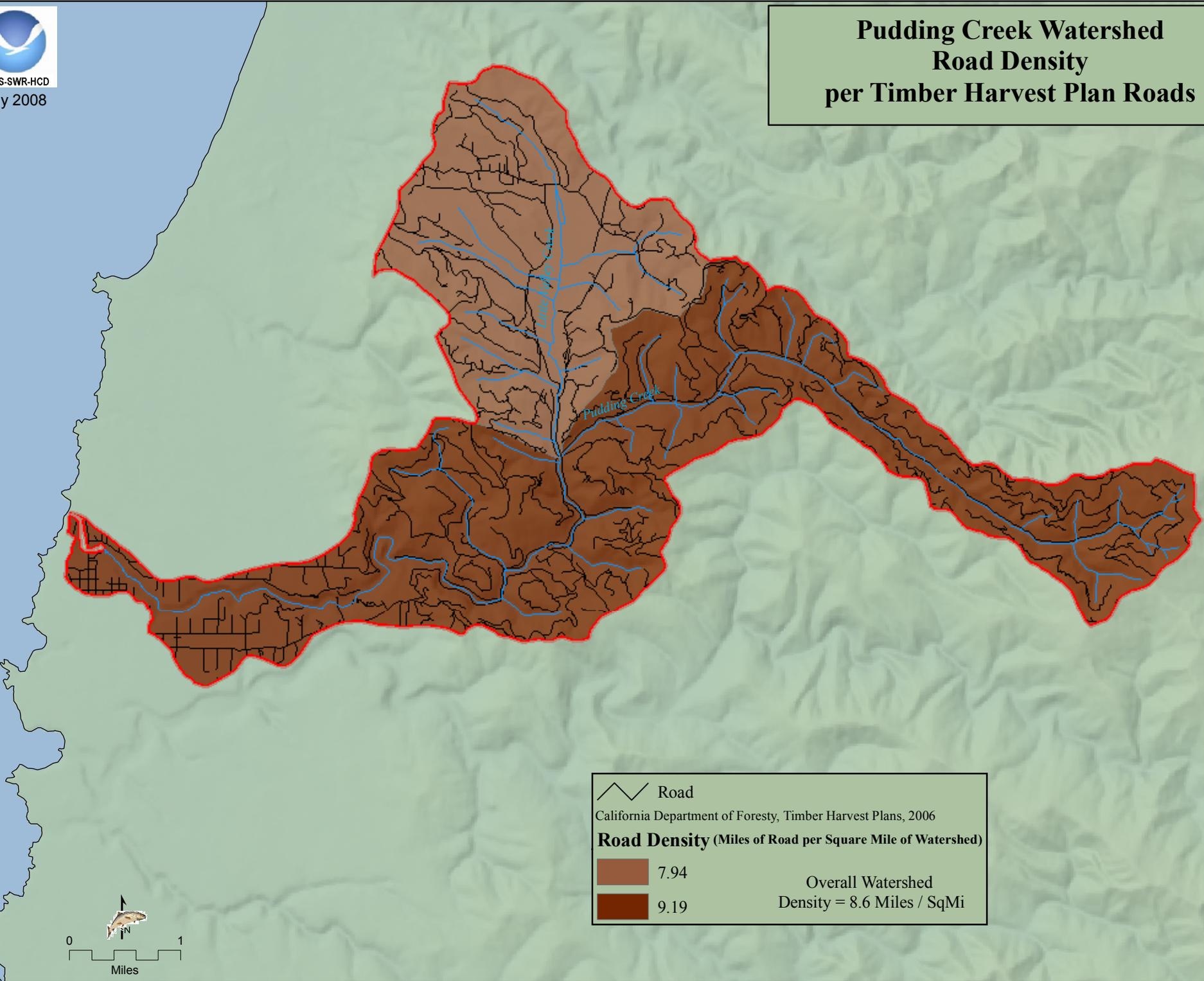
Overall Riparian Corridor Density = 3.7 Miles / SqMi of Corridor





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# Pudding Creek Watershed Road Density per Timber Harvest Plan Roads



 Road  
California Department of Forestry, Timber Harvest Plans, 2006

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

	7.94
	9.19

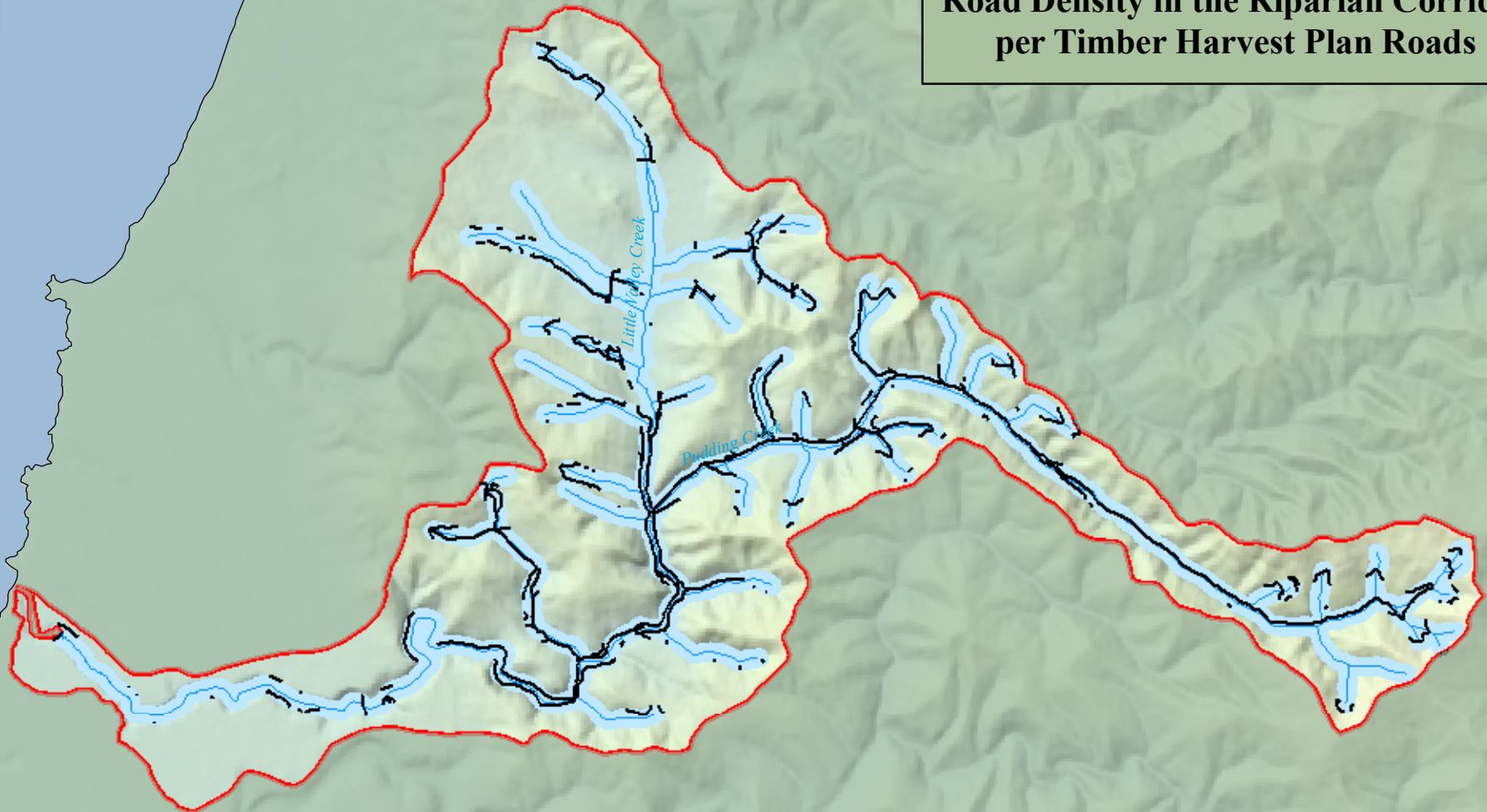
Overall Watershed  
Density = 8.6 Miles / SqMi





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# Pudding Creek Watershed Road Density in the Riparian Corridor per Timber Harvest Plan Roads

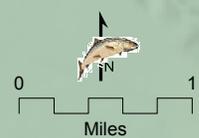


 Road Segments within the 200 meter Riparian Corridor  
California Department of Forestry, Timber Harvest Plans, 2006

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

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

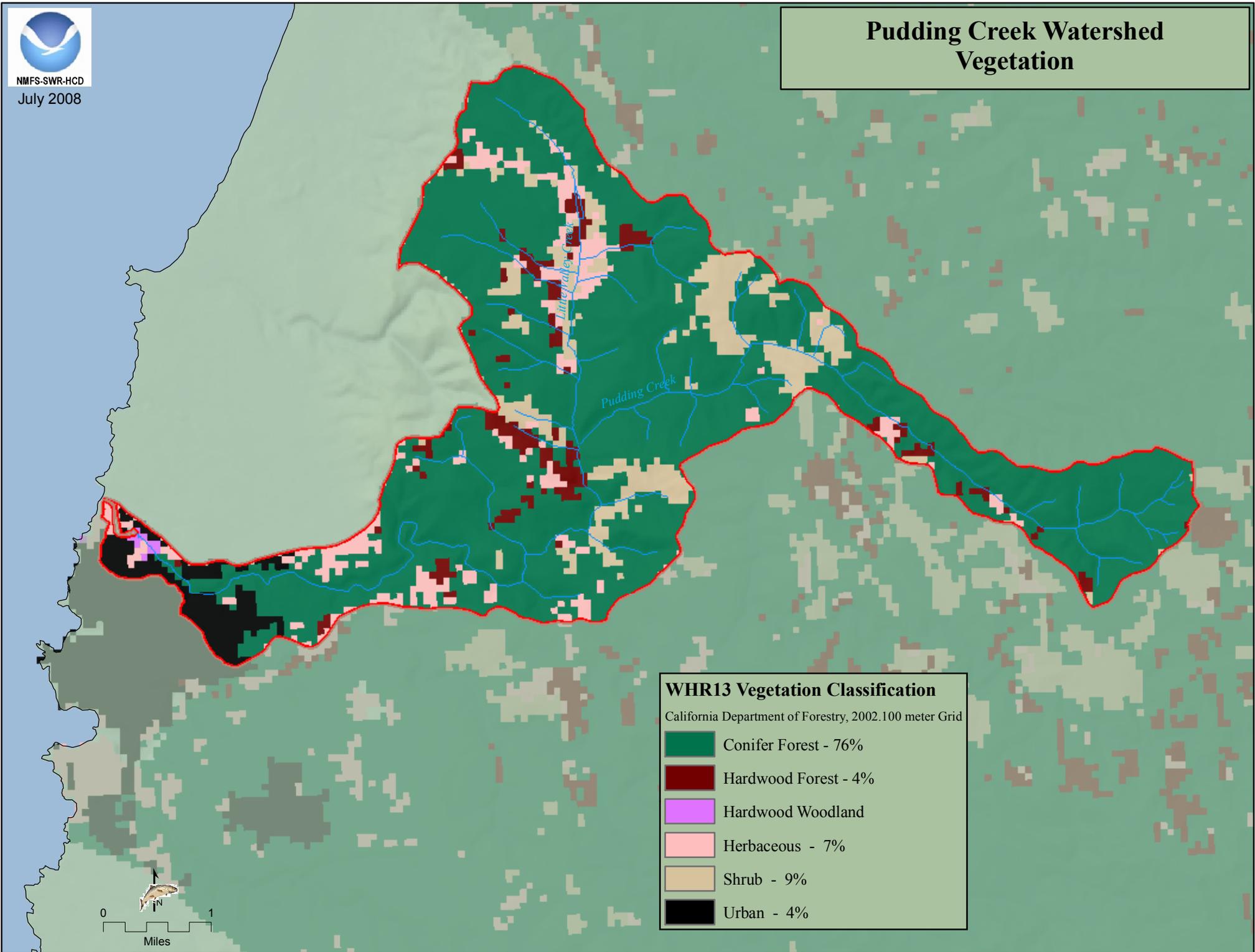
Overall Riparian Corridor Density = 7.9 Miles / SqMi of Corridor





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# Pudding Creek Watershed Vegetation



**WHR13 Vegetation Classification**  
California Department of Forestry, 2002.100 meter Grid

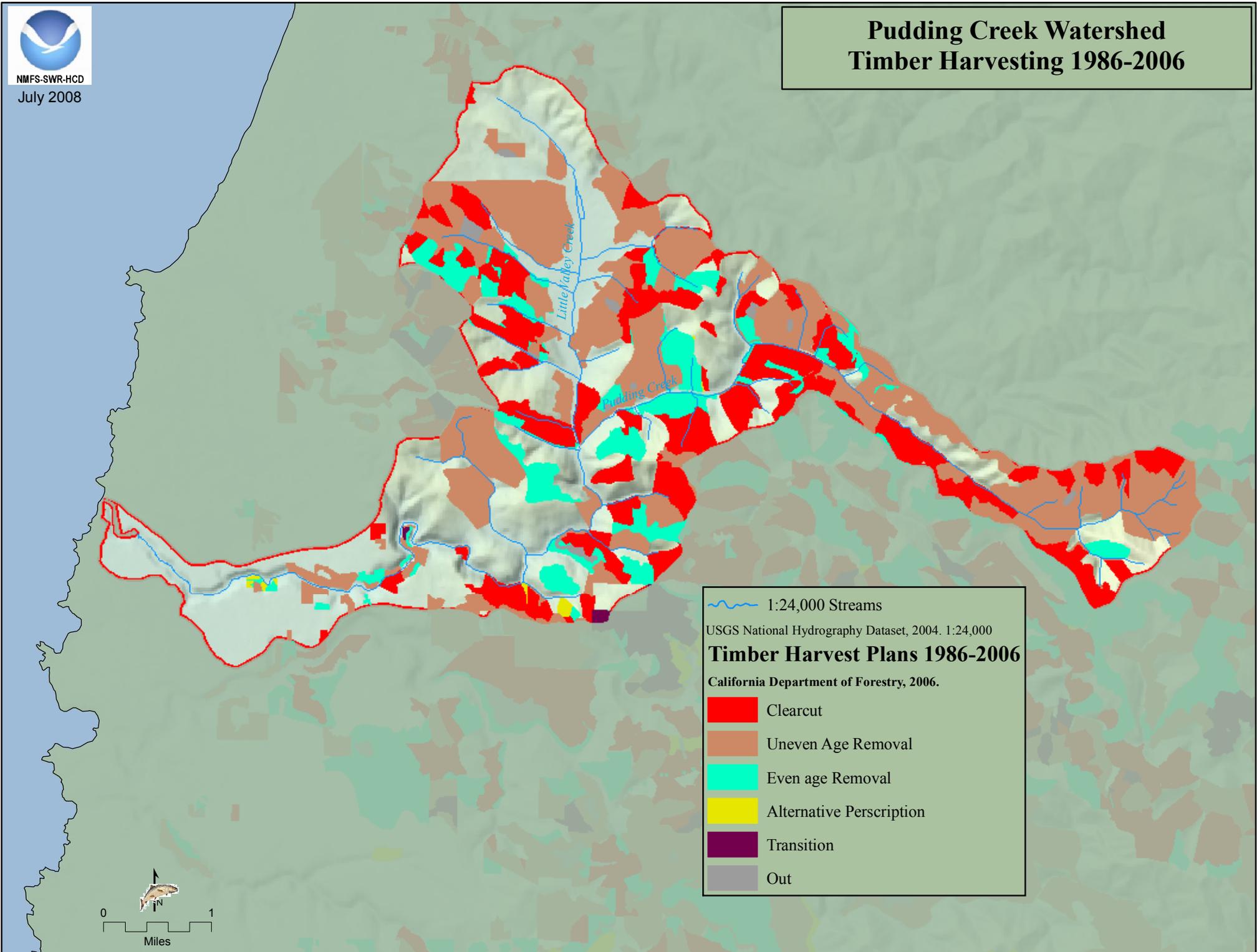
	Conifer Forest - 76%
	Hardwood Forest - 4%
	Hardwood Woodland
	Herbaceous - 7%
	Shrub - 9%
	Urban - 4%





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# Pudding Creek Watershed Timber Harvesting 1986-2006



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

### Timber Harvest Plans 1986-2006

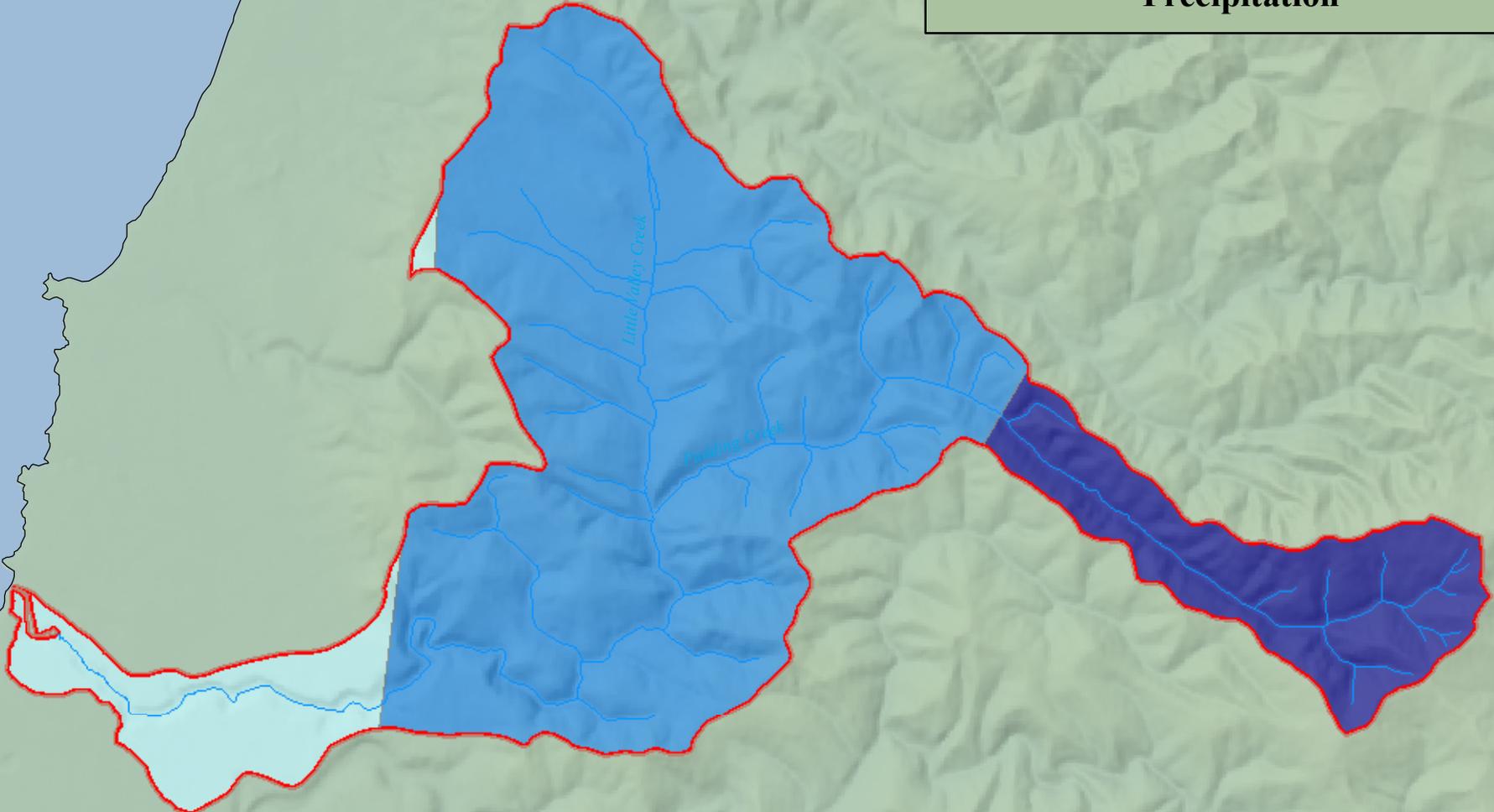
California Department of Forestry, 2006.

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



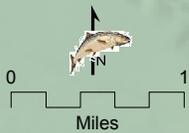
NMFS-SWR-HCD  
July 2008

# Pudding Creek Watershed Precipitation



**1900-1960 Annual Precipitation**

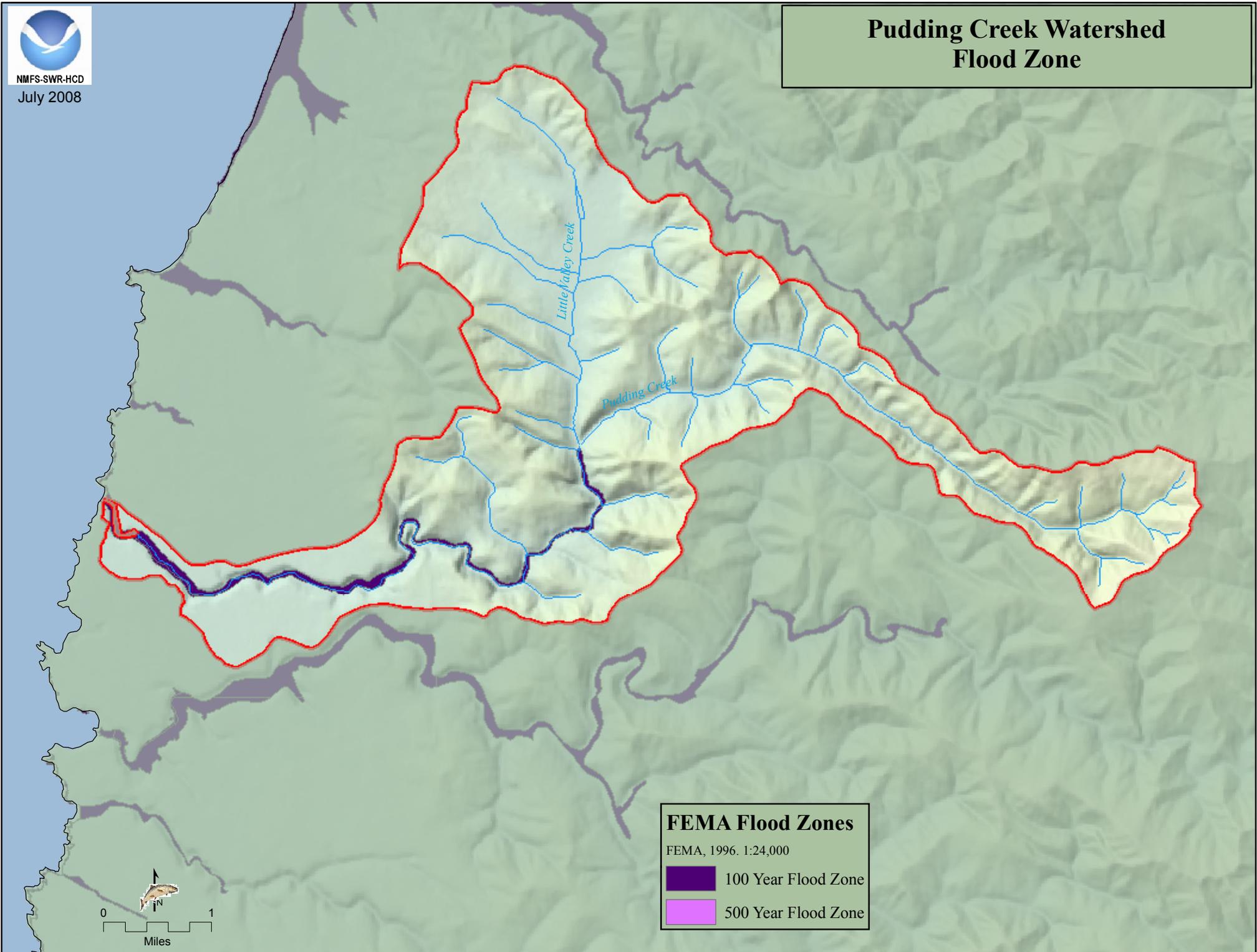
	to 40"	Watershed Average 46"
	to 45"	
	to 55"	California Department of Forestry, 1990. 1:100,000





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## Pudding Creek Watershed Flood Zone



**FEMA Flood Zones**  
FEMA, 1996. 1:24,000

	100 Year Flood Zone
	500 Year Flood Zone

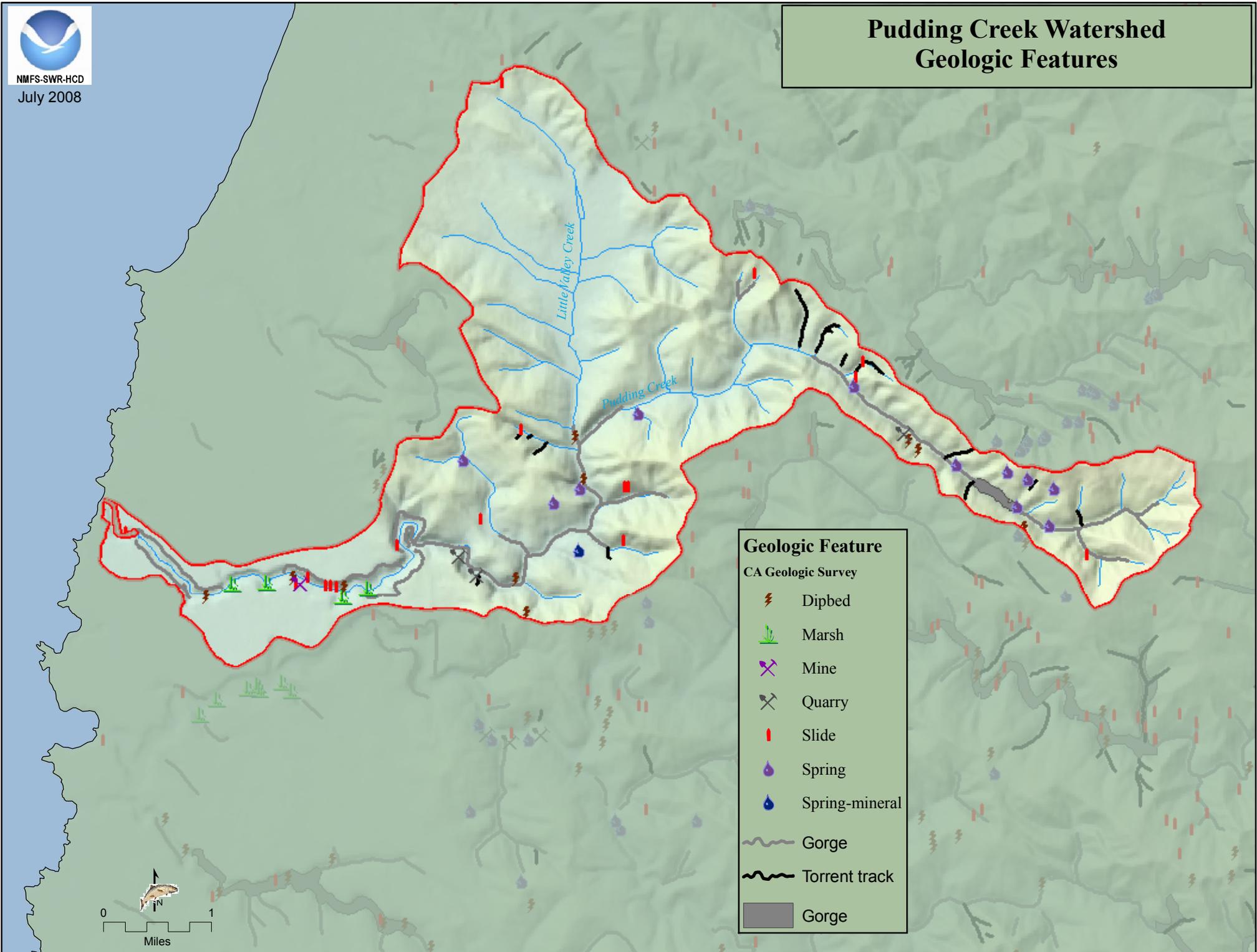
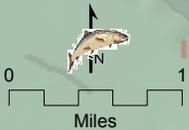


NMFS-SWR-HCD  
July 2008

# Pudding Creek Watershed Geologic Features

**Geologic Feature**  
CA Geologic Survey

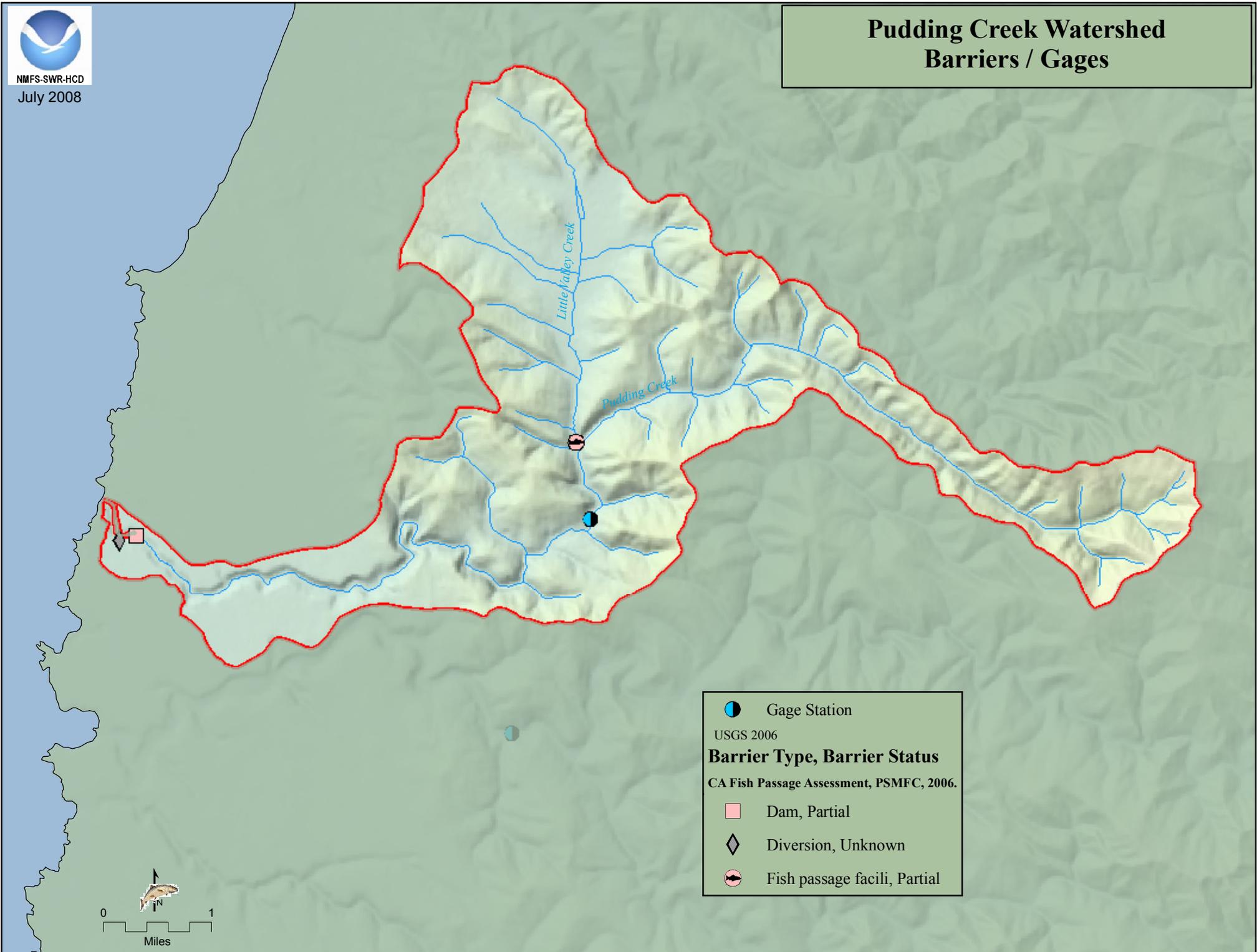
-  Dipbed
-  Marsh
-  Mine
-  Quarry
-  Slide
-  Spring
-  Spring-mineral
-  Gorge
-  Torrent track
-  Gorge





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July 2008

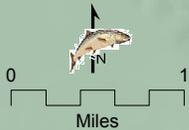
# Pudding Creek Watershed Barriers / Gages



● Gage Station  
USGS 2006

**Barrier Type, Barrier Status**  
CA Fish Passage Assessment, PSMFC, 2006.

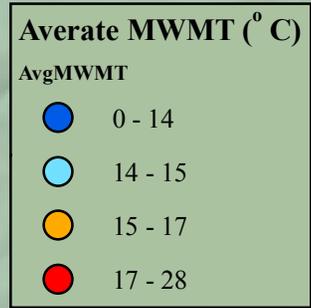
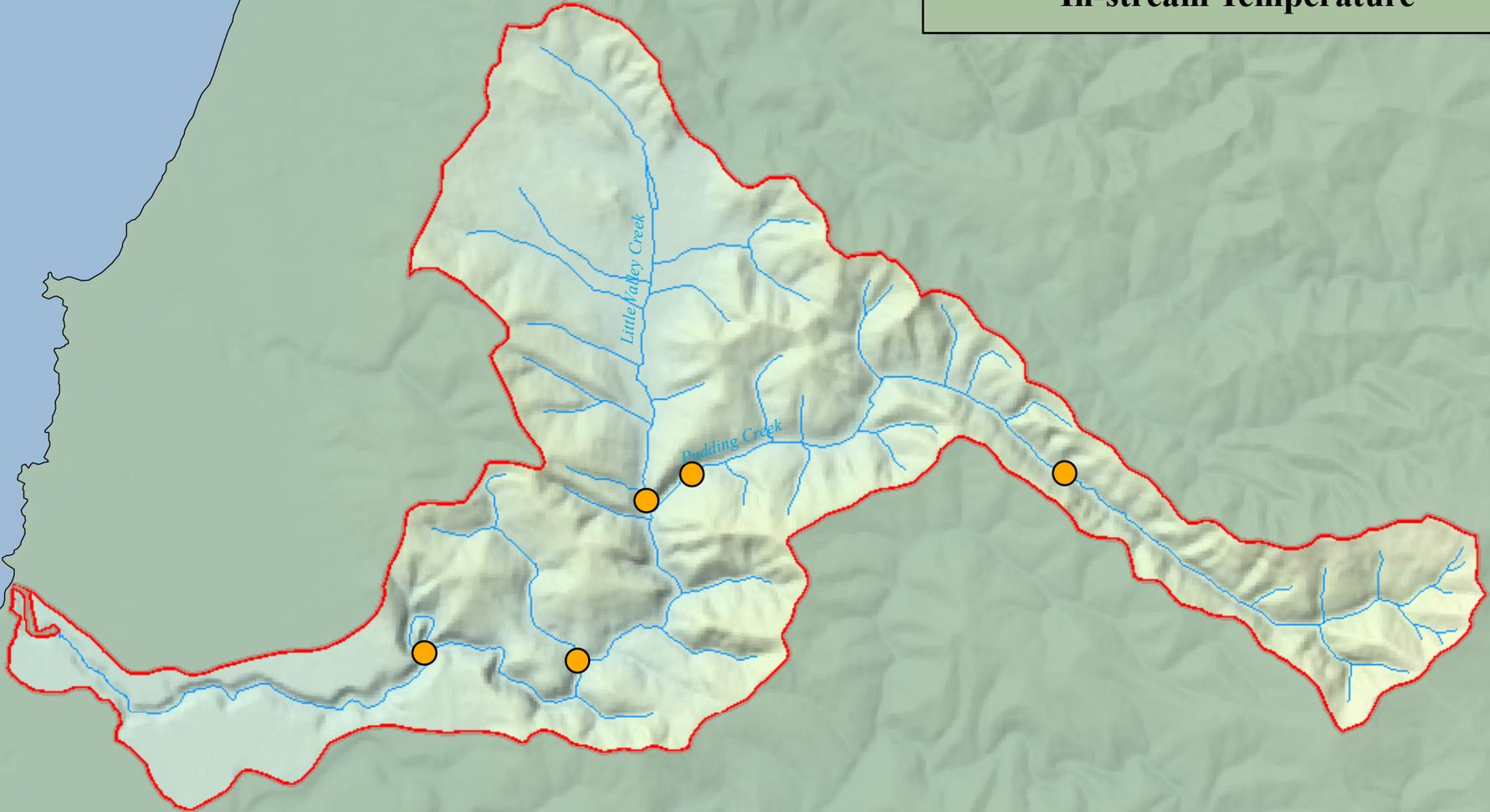
- Dam, Partial
- ◇ Diversion, Unknown
- ⊗ Fish passage facility, Partial





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July 2008

# Pudding Creek Watershed In-stream Temperature

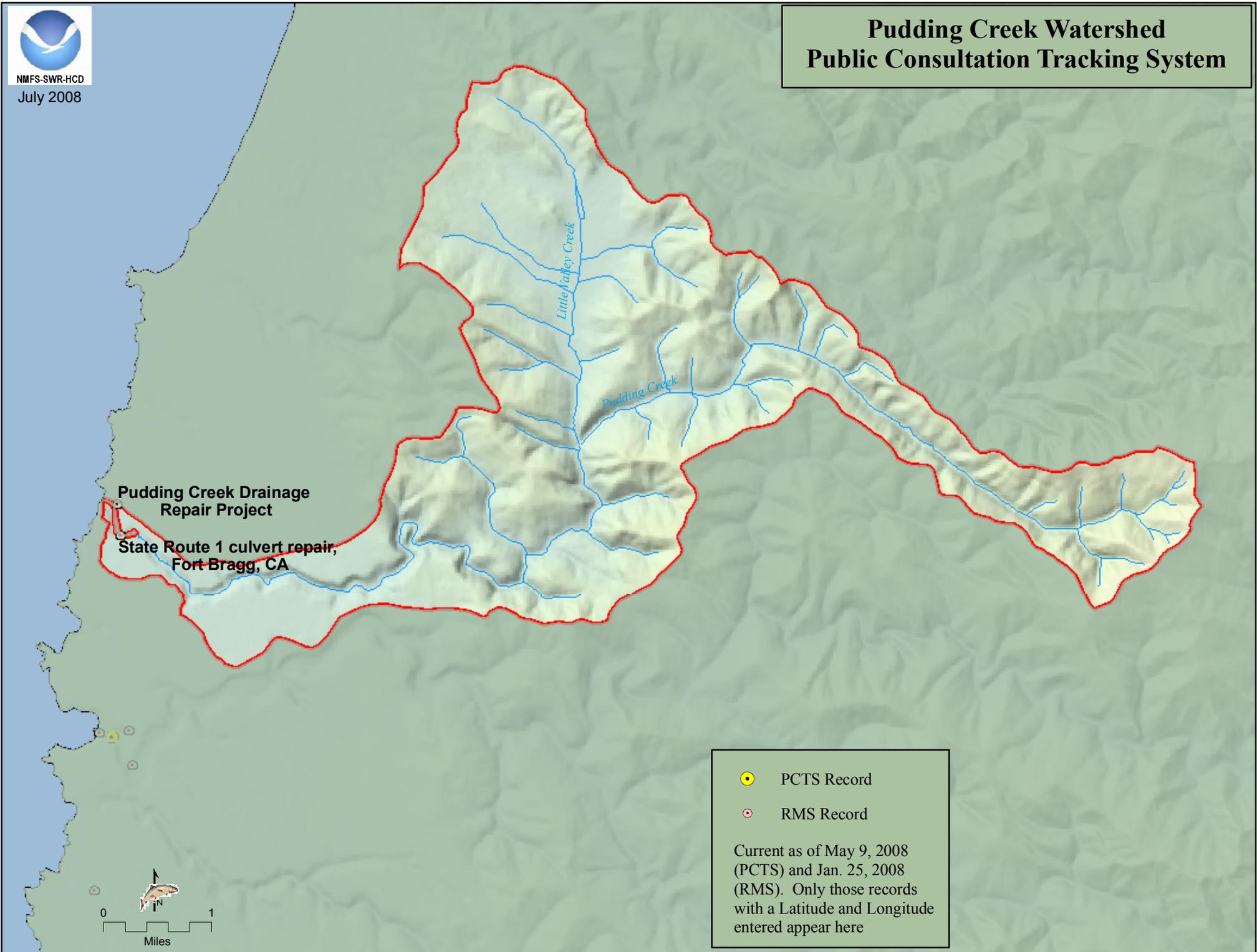


Sonoma Ecology Center, 2008.



NMFS-SWR-HCD  
July 2008

# Pudding Creek Watershed Public Consultation Tracking System



- 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\_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)**

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**

Dem\_1\_utm\_f

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

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

### **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