

## Watershed Characterization

January 2009



NMFS-SWR-HCD

### Usal Creek Watershed

Area	Hydrologic Units	Calwater Subbasins ---	(Planning Watersheds)
17,612 Acres	18010108	1113110101	Lower Usal Creek (7008 Acres)
7,127 Hectares	4th Field HUC	1113110102	Upper Usal Creek (10604 Acres)
28 Square Miles			

<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 Diversity Stratum - Dependent Population	<u>Coho</u> 4 CDFG, Coho Distribution, May 2007

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)

Miles of Waterway <sup>A</sup>	Miles	Number of Dams <sup>C</sup>
Naturally Occurring Waterways		0
Intermittent Stream	36	
Perennial Stream	21	

<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>
None	6
	3 Road Crossings (Partially Impassable)
	3 Natural Barriers (Chutes, Falls, Log Jams, etc. (3 Impassable))

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

EPA Total Maximum Daily Load Classification ( **TMDL** )<sup>I</sup>  
None

<sup>I</sup>State Water Resources Control Board, 2003

Average Annual Precipitation <sup>E</sup>	Average Annual Precipitation Range <sup>E</sup>
66.6"	45 - 75"

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

Roads <sup>A</sup>	Miles
Roads in Watershed	
Secondary and connecting road, state highways	1
Local, neighborhood, and rural road, city street, unseparated	98

Road Density	Miles
Miles of Roads per SqMi of Watershed	3.5
Miles of Roads per SqMi of 100m Riparian Buffer*	4.3

\*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>Slope<sup>D</sup></b>	Acres	Percent of watershed
Lands of 0-2 percent slope	57	0%
Lands of 2-4 percent slope	90	1%
Lands of 4-10 percent slope	331	2%
Lands of 10-15 percent slope	357	2%
Lands of 15-30 percent slope	2,618	15%
Lands of 30-60 percent slope	11,370	65%
Lands of 60-100 percent slope	2,722	15%
Lands of 100-117 percent slope	68	0%

<b>Elevation Range</b>	3 - 2021 ft.	1 - 616 m
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<sup>D</sup>Slope derived from USGS 10 meter Digital Elevation Models (DEM's)

<b>Vegetation<sup>G</sup></b>	Acres	Percent of watershed
Annual grassland	10	0%
Barren	12	0%
Conifer Forest		
Douglas Fir	1,006	6%
Montane Hardwood-Conifer	578	3%
Redwood	12,266	70%
Hardwood Forest		
Montane Hardwood	3,341	19%
Montane Riparian	171	1%
Shrub	215	1%

<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>	Acres	Percent of watershed
All of watershed is ranked as 8	17,612	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>	Acres	Percent of watershed
Private	17,344	98%
State (Parks & Recreation)	268	2%

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

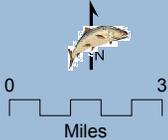
Area Under a <b>Timber Harvest Plan<sup>A</sup></b> past 10 years	Area Under a <b>Timber Harvest Plan<sup>A</sup></b> past 15 years (1991-2006)
1,841 10% of watershed	3,088 18% of watershed

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

<b>Population<sup>I</sup></b>	<b>Housing<sup>I</sup></b>
Total Population within the watershed -- 3 People	Total Housing Units within the watershed -- 2 Houses
	Housing Density
	0 to Less than 1 Housing Unit / 160 Acres
	1 Unit / 160 Acres to 1 Unit / 20 Acres
	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
	100%

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

# Usal Creek Watershed

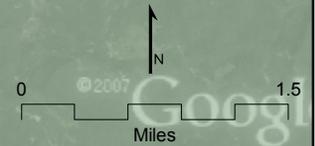




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# Usal Creek Watershed





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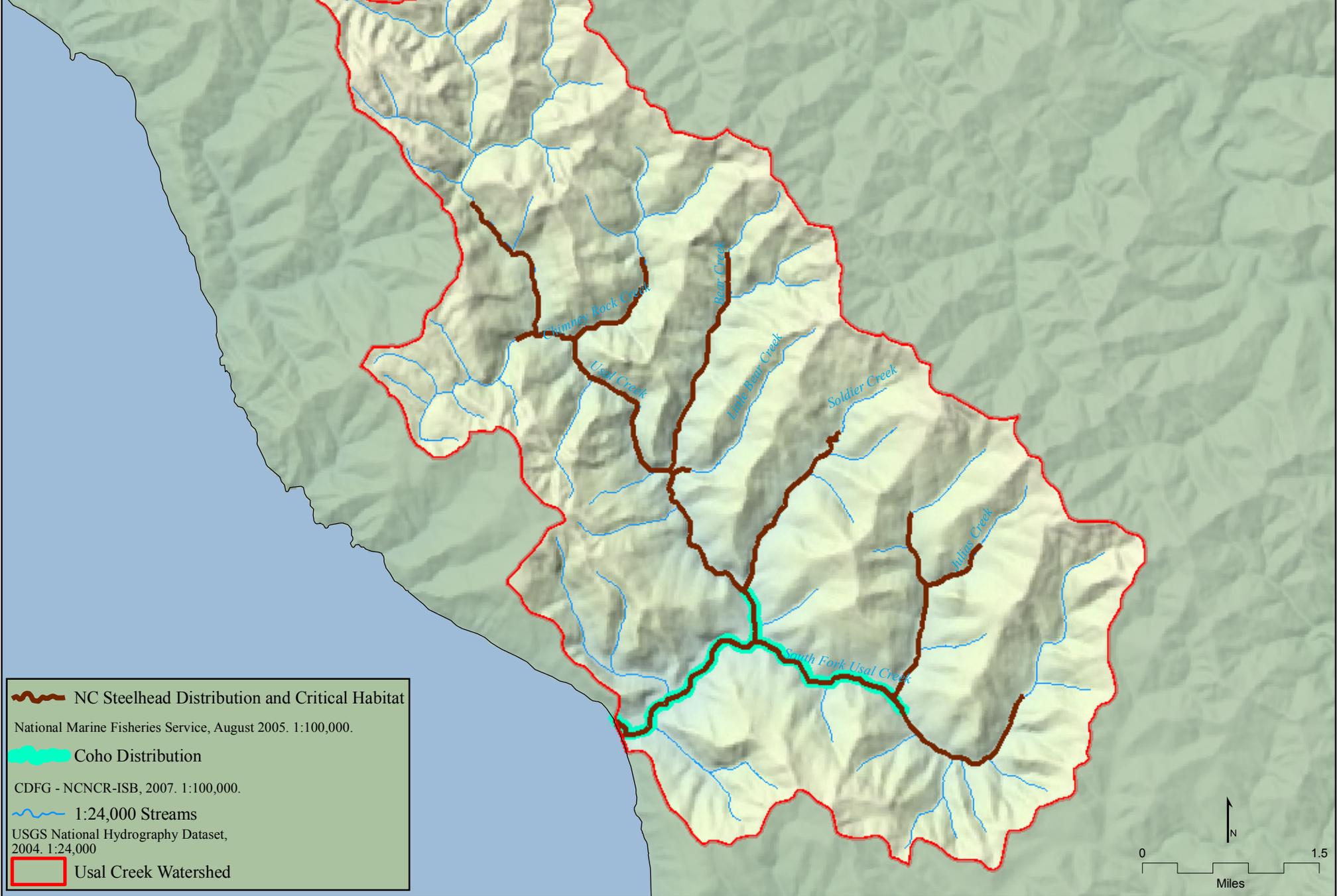




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# Usal Creek Watershed Fish Distribution and Critical Habitat

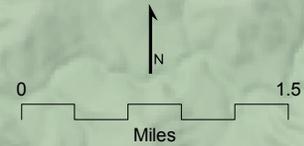


 NC Steelhead Distribution and Critical Habitat  
National Marine Fisheries Service, August 2005. 1:100,000.

 Coho Distribution  
CDFG - NCNCR-ISB, 2007. 1:100,000.

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

 Usal Creek Watershed





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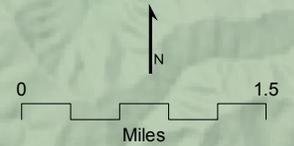
# Usal Creek Watershed Steelhead Current vs. Historical

 Current NC 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

 Usal Creek Watershed



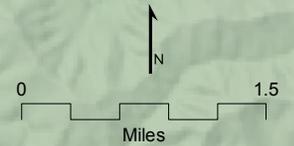


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# Usal Creek Watershed Coho Current vs. Historical

-  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
-  Usal Creek Watershed





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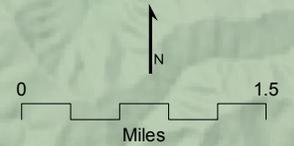
January 2009

# Usal Creek Watershed Chinook Historical

 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

 Usal Creek Watershed





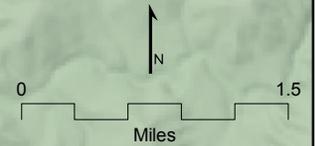
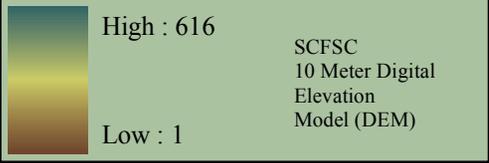
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# Usal Creek Watershed Elevation



## Usal Creek Elevation (Meters)





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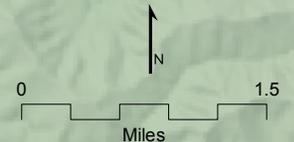
# Usal Creek Watershed Development

## Housing Density

- 0 to < 1 Housing Unit / 160 Acres (100%)
- 1 Unit / 160 Acres to 1 Unit / 20 Acres
- 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 = 3 People  
Houses within the Watershed = 2

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





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# Usal Creek Watershed Ownership

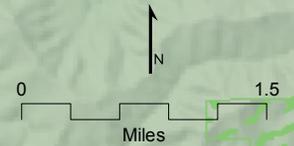
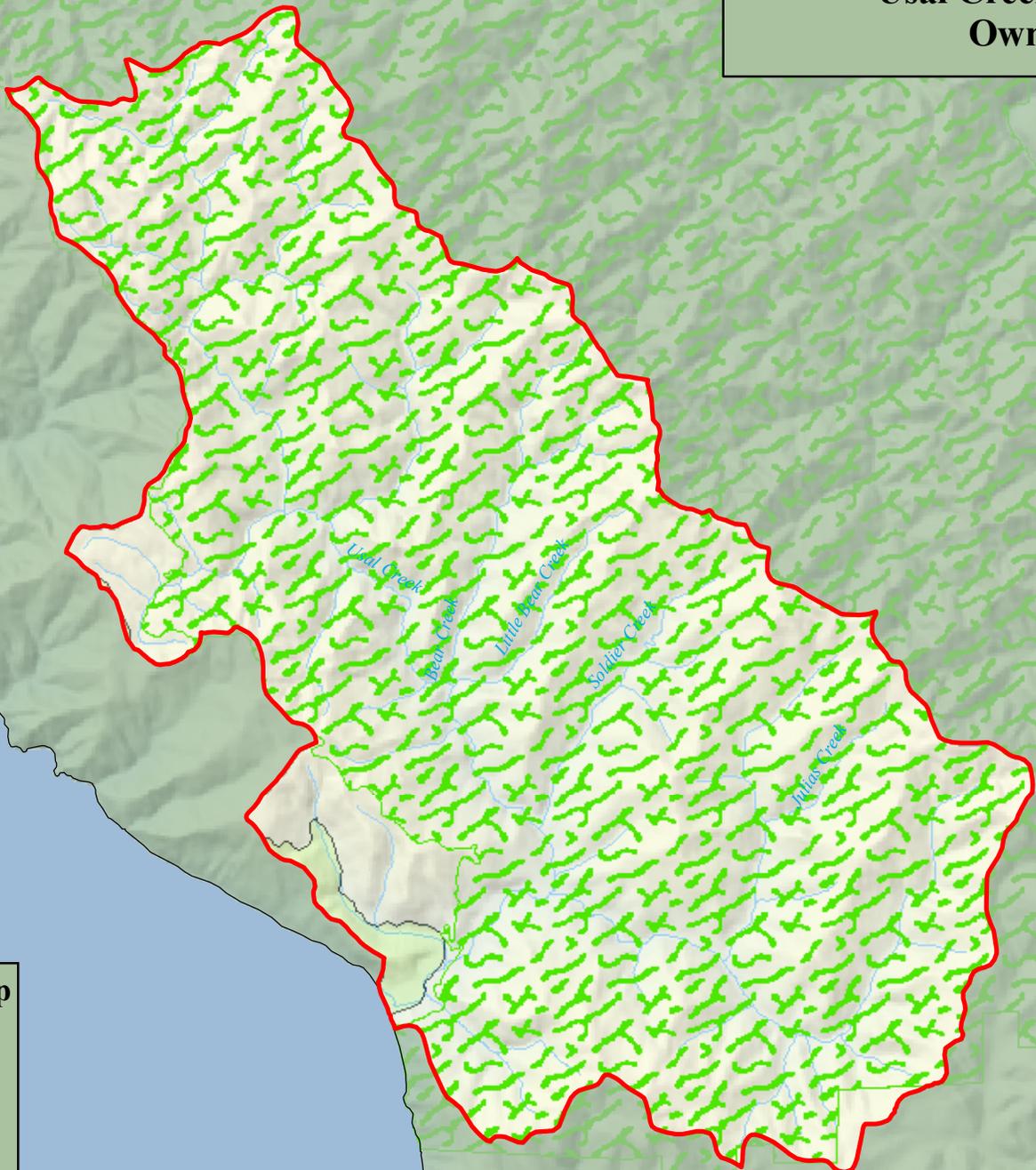
**Forest Industrial Ownership**  
USFWS 2000

 Georgia Pacific

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

 Private

 State, Parks and Recreation





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# Usal Creek Watershed Road Density



Road

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

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

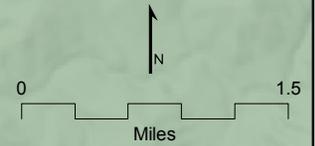


3.2



4.2

Overall Watershed  
Density = 3.5 Miles / SqMi





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# Usal Creek Watershed Road Density in the Riparian Corridor



 Road Segments within the 200 meter Riparian Corridor

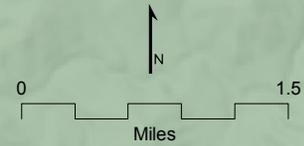
U.S. Census Bureau - Tiger 2000, 2002. 1:24,000

 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 = 4.3 Miles / SqMi of Corridor





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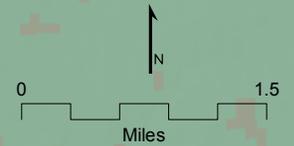
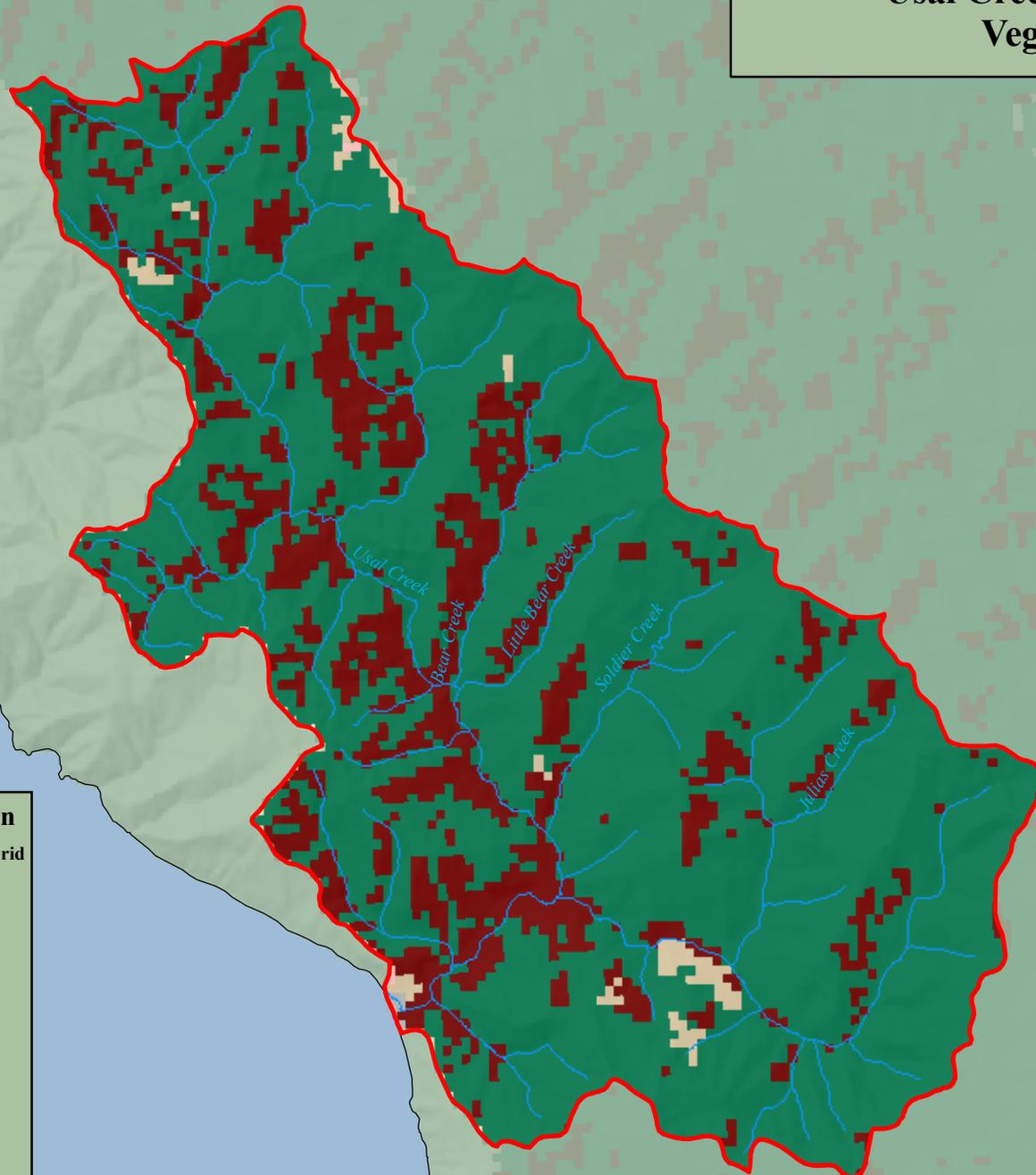
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# Usal Creek Watershed Vegetation

## WHR13 Vegetation Classification

CA Department of Forestry, 2002.100 meter Grid

- Barren/Other
- Conifer Forest - 79%
- Hardwood Forest - 20%
- Hardwood Woodland
- Herbaceous
- Shrub - 1%
- Urban
- Water
- Wetland





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# Usal Creek Watershed Timber Harvesting 1991-2004

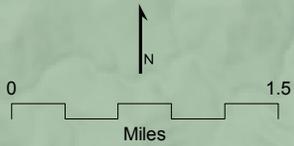


 1:24,000 Streams

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

**Timber Harvest Plans 1991-2004** California Department of Forestry, 2006.

 Harvest Plans Footprint (Silviculture method not defined)

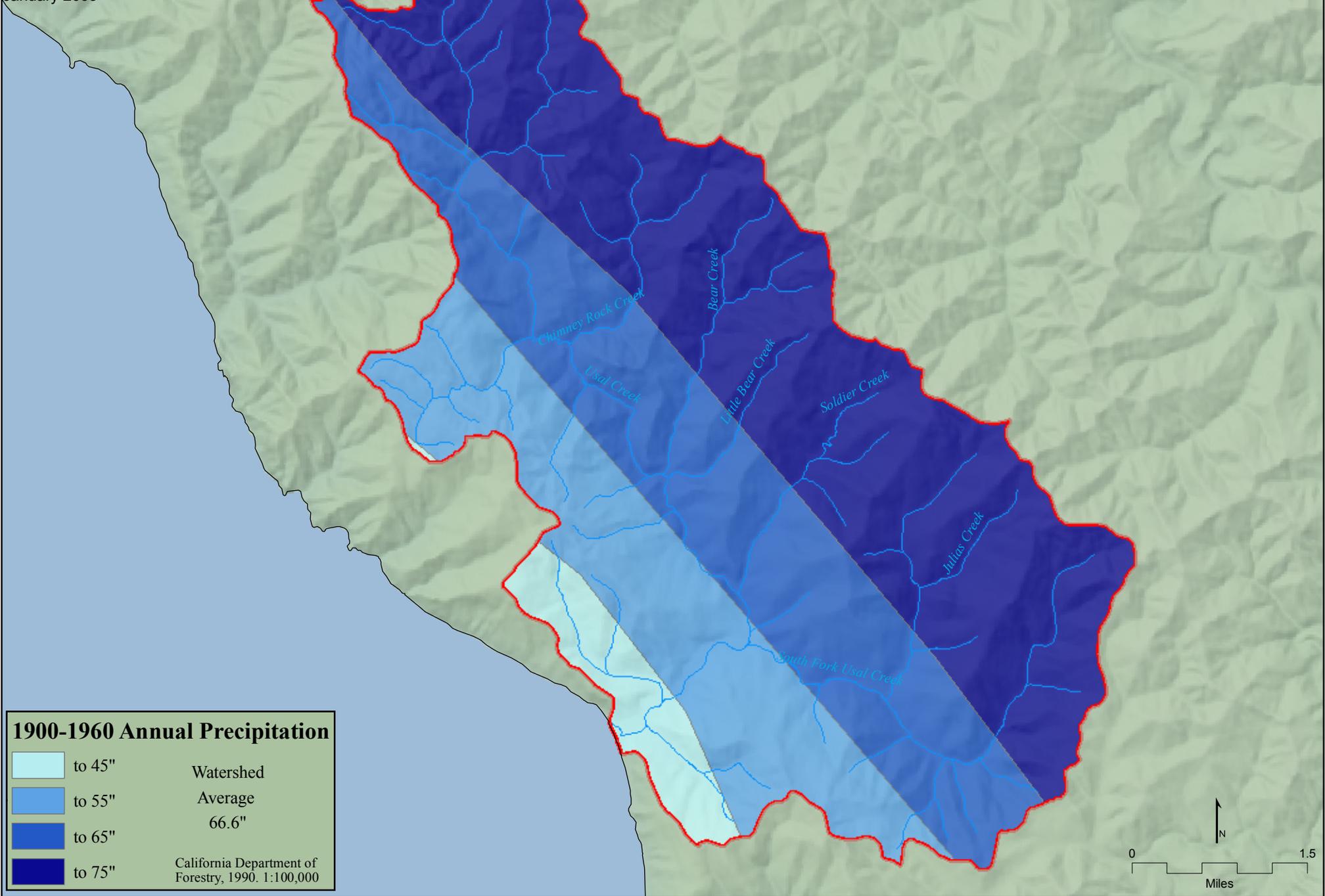




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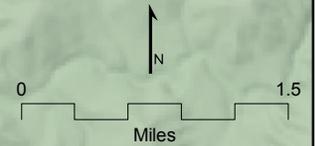
# Usal Creek Watershed Precipitation



## 1900-1960 Annual Precipitation

	to 45"	Watershed Average 66.6"
	to 55"	
	to 65"	
	to 75"	

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





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# Usal Creek Watershed Flood Zone

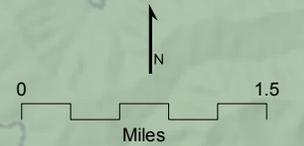


## FEMA Flood Zones

FEMA, 1996. 1:24,000

 100 Year Flood Zone

 500 Year Flood Zone





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# Usal Creek Watershed Geologic Features





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# Usal Creek Watershed Barriers / Industrial Discharge

 Mine

USGS 2006

**Barrier Type, Barrier Status**

CA Fish Passage Assessment, PSMFC, 2008

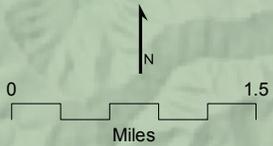
 Road crossing, Partial

 Non-structural, Total

 1:24,000 Streams

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

 Usal Creek Watershed



## 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>

### **Critical Habitat**

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](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**

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**

Google Maps  
remote-sensing image  
raster digital data  
2008

<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/>

### **Geologic Features**

Geopoint  
vector digital data  
Department of Conservation, Division of Mines and  
Geology  
Minimum Mapping Unit: Approximately 8000  
Acres (20,000 Hectares)  
1994