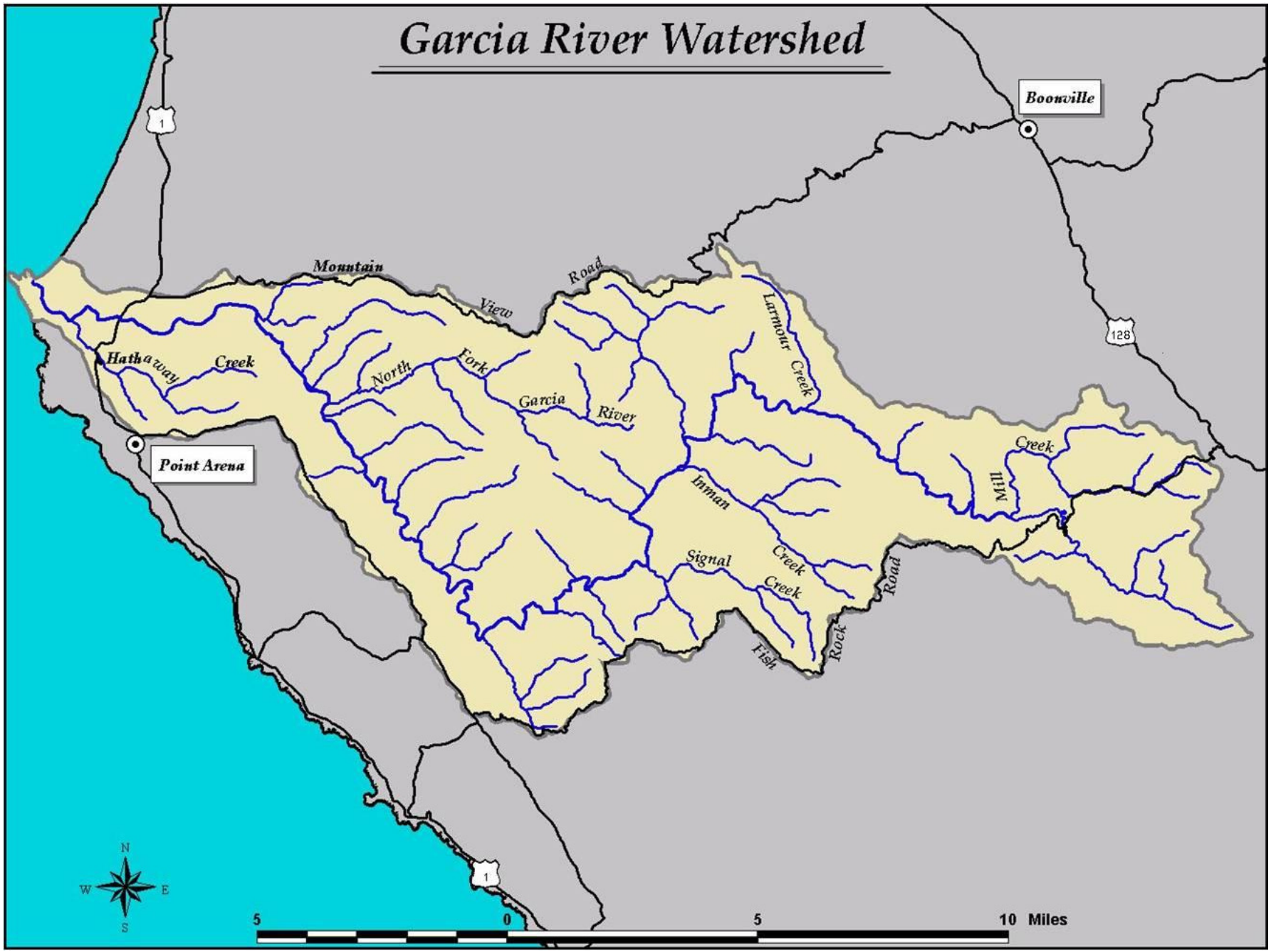
Garcia River Watershed and Sediment TMDL Action Plan

October 29, 2009

Jonathan Warmerdam
North Coast Regional Water Quality Control Board

Presentation Topics

- Garcia River History
- Garcia River Sediment TMDL Action Plan
- Other Regional Water Board Activities


Garcia River Watershed
Boonville
Point Arena
Mountain
View
Road
Hathaway
Creek
North
Fork
Garcia
River
Larmour
Creek
Mill
Creek
Inman
Creek
Signal
Creek
Rock
Road
Fish
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10 Miles

Original Settlers

Chinook Salmon

Coho Salmon

Steelhead Trout

Pink Salmon

Early Logging (1860s-1915)

The Garcia Mill (1867-1915)

- Dammed river 8 months of the year
- Oxen Teams and Steam Donkeys
- Splash Dam Logging
- 50 years of impacts

From *The Early Days of Point Arena,* Oliff and Carlstedt

Watershed Conditions
1920s-1940s

"*The river was different in those days. There was no quiet water anywhere…you could always hear it running. The riffles were steeper and it was cleaner…the river fell out into the ocean."* -Roy Bishop (Born 1919)

"The river was beautiful and clean, very natural. The river was full of fish…trout in every riffle." -Don Stuart (Born 1910)

"Up on the South Fork those creeks were so full of fish you couldn't believe it…every little riffle, every place there was a hole, there was fish spawning." -Leonard Craig (Born 1909)

Early Fish Tales
1920s-1940s

"The fishing was unbelievable. I can remember when we were jacklighting the water was so deep you couldn't see all the fish down there, so we spear blind. It wasn't unusual to get two fish at a time…go through one fish and get another." -Lando Franci (Born 1913)

"In old times it was nothing to see 60 or more Chinook, all 3 or more feet long, in this hole at one time." -Les Stornetta (Born 1916)

"There were lot of 35-40 pound Chinook, but nothing like the numbers of coho. In late November, the Steelhead would start coming in and their runs would last until April when the Spring-run of Bluebacks came." -Roy Bishop (Born 1919)

The Interior

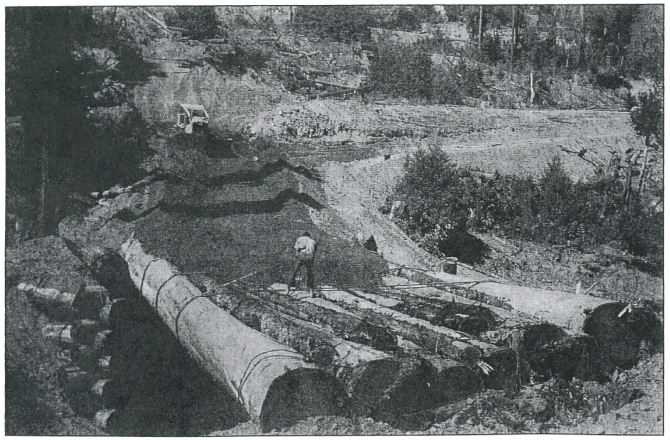
- Generally inaccessible to early logging
- Dominated by late seral forests
- Largely untouched until 1950s

Mailliard Ranch Cathedral Grove

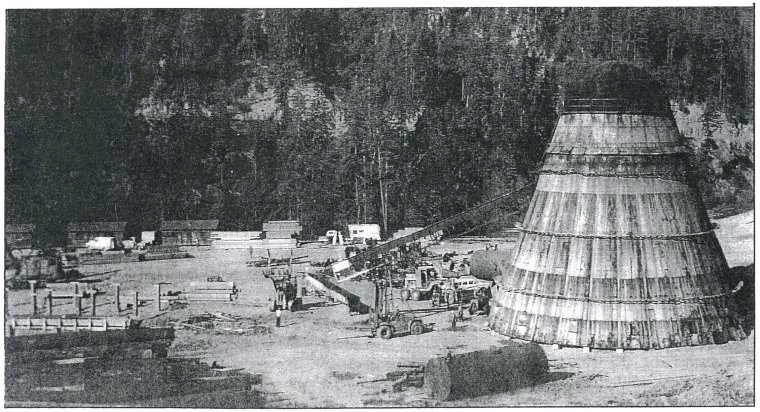
Post WWII Logging
1950s-1960s

- Housing boom demands wood products
- Improved heavy equipment
- Construction of roads/skid trail network
- River no longer used for transport
- No environmental regulations

Hollow Tree Lumber Co. 1962-1973

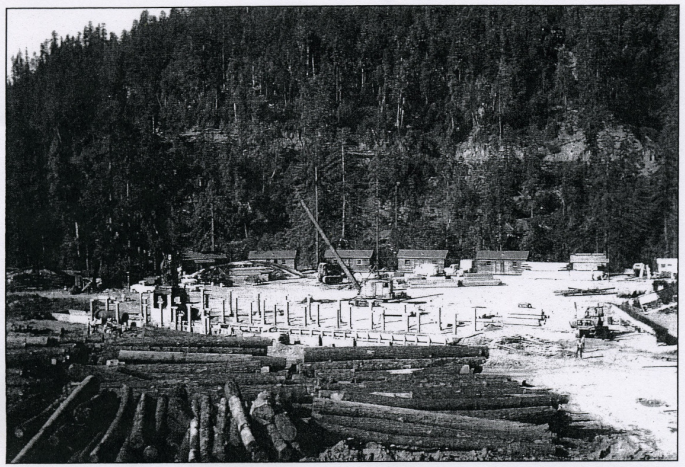


Access to the sawmill site necessitated a major bridge crossing over the Garcia River. After completing the bulkheads and cabling the bridge stringers together, a Cat prepares the approaches to the new bridge. The main bridge stringers were 80 feet long and were 20 feet above the summer water level of the Garcia. Nov. 1962.



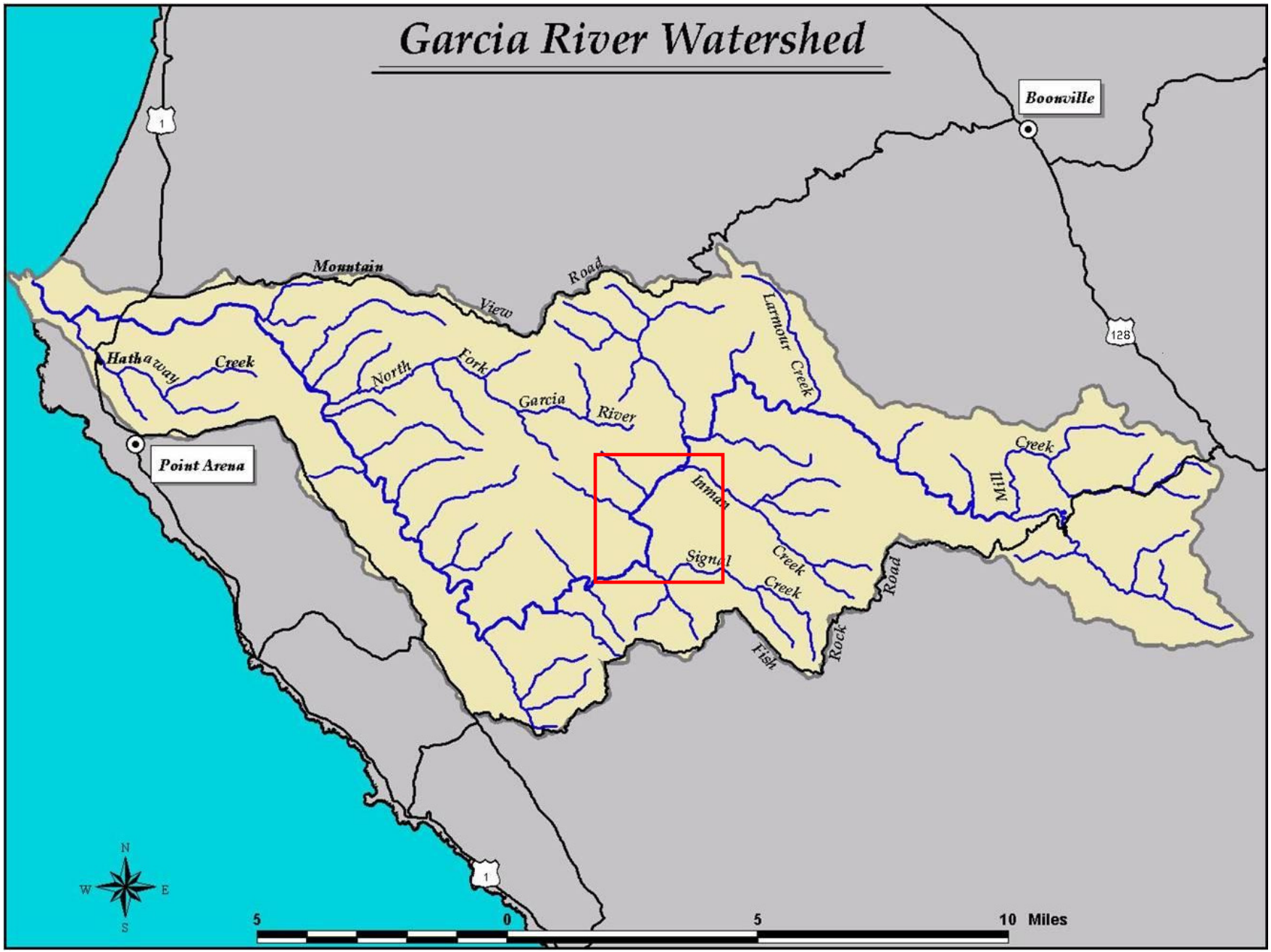
The completed teepee burner appears out of place as the rest of the sawmill is still in the early stages of construction, although most of the below surface concrete foundation work is done.

The contruction camp is beginning to take shape at the Mill "D" site, more construction equipment is evident, and the piles of sawmill equipment continue to grow.



The log deck begins to grow in anticipation of the completion of the sawmill. The bandmill headrig stands on its foundation, main clean-out conveyor is complete, and the uprights to the mill floor are nearly complete.

Roots of Motive Power, Inc. 2001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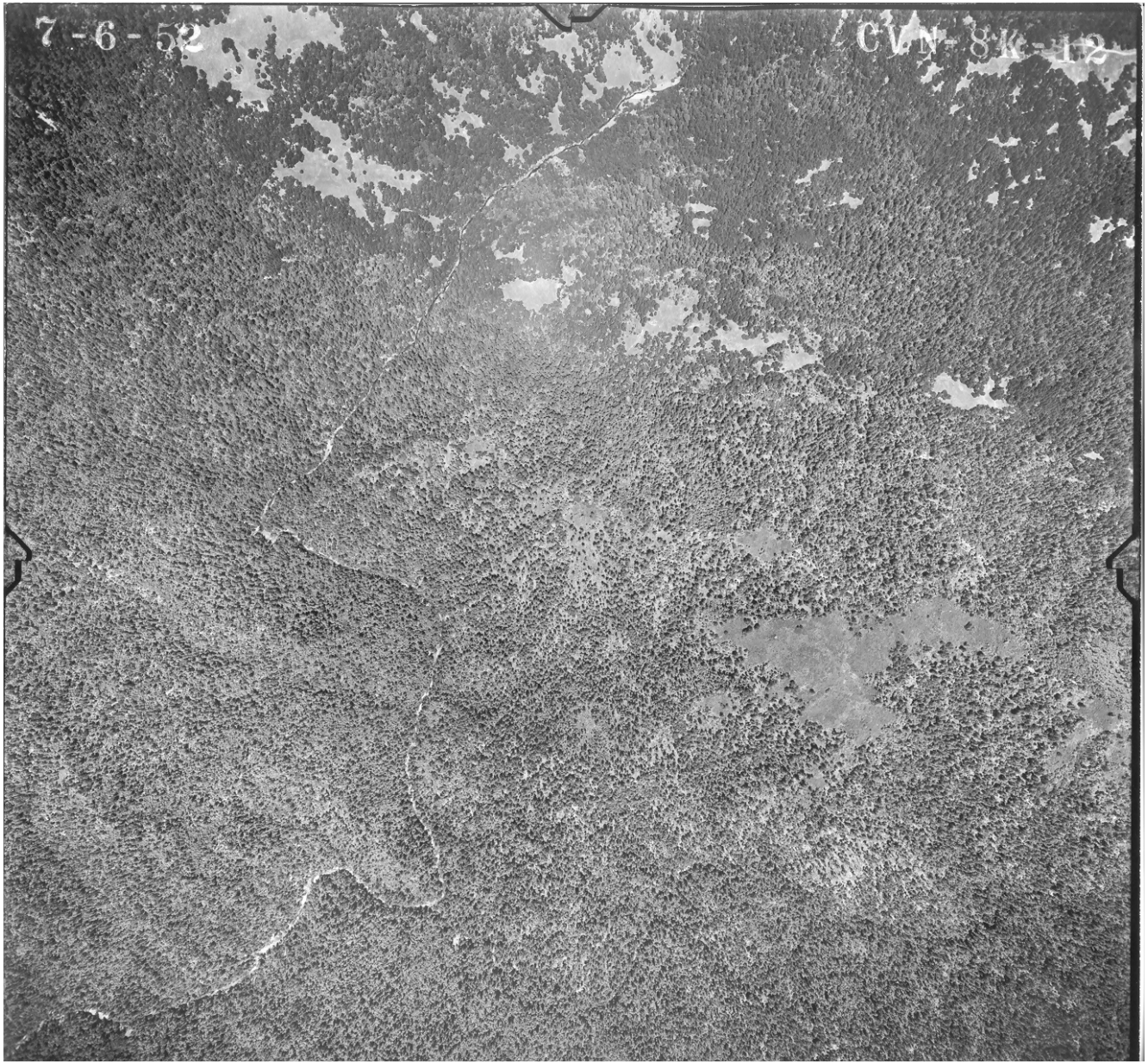
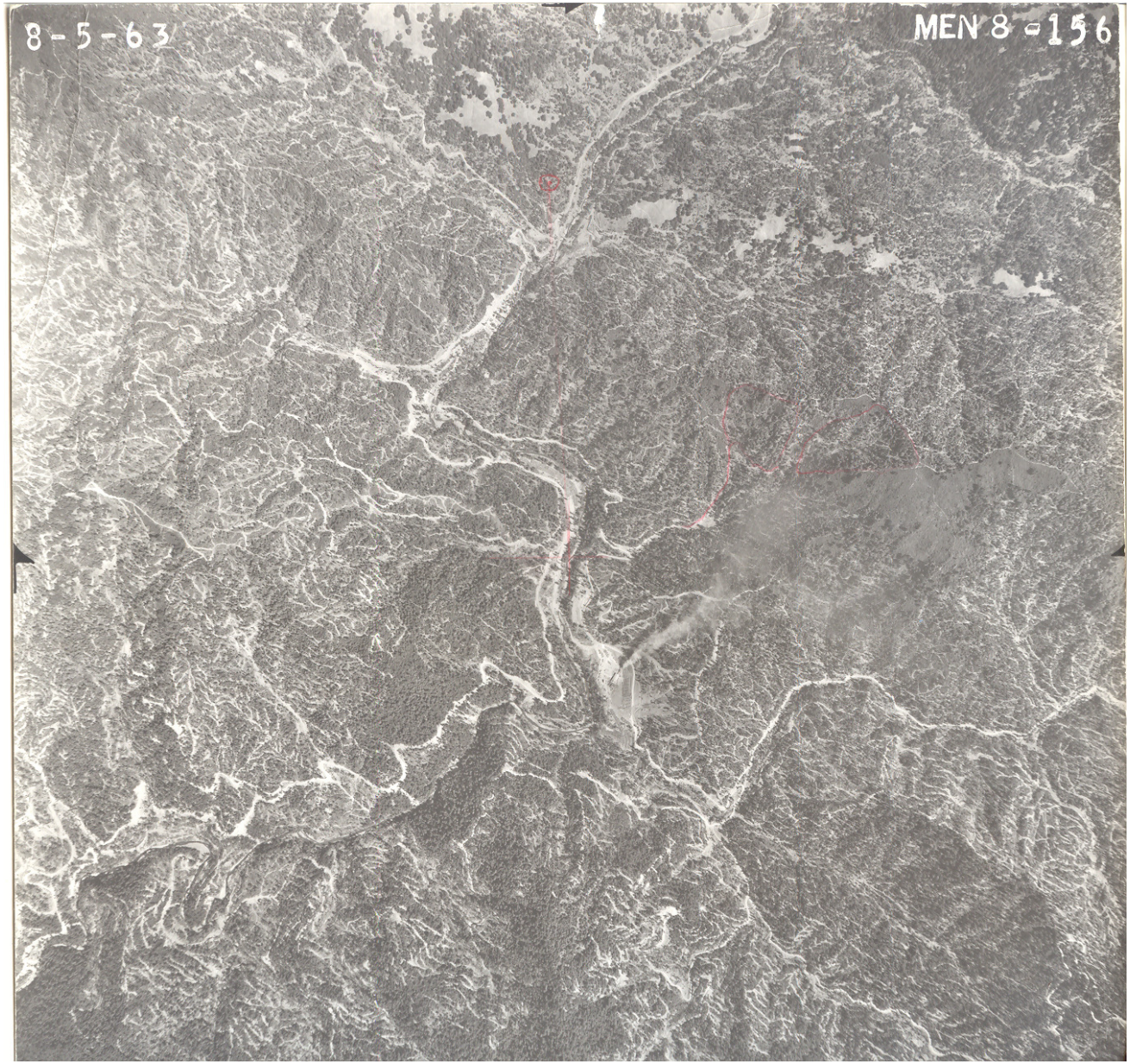
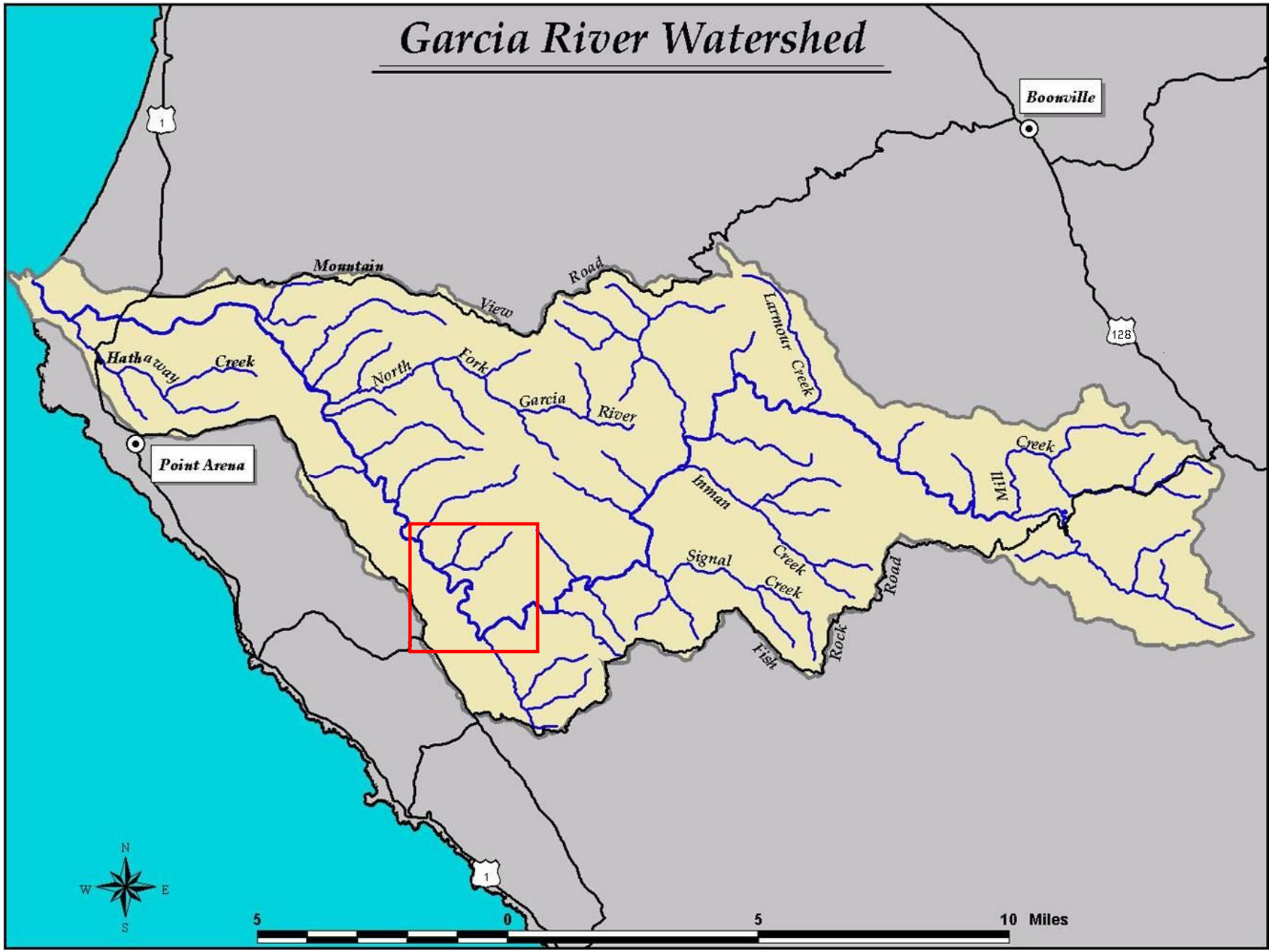
Garcia to Inman 1952



Garcia to Inman 1963

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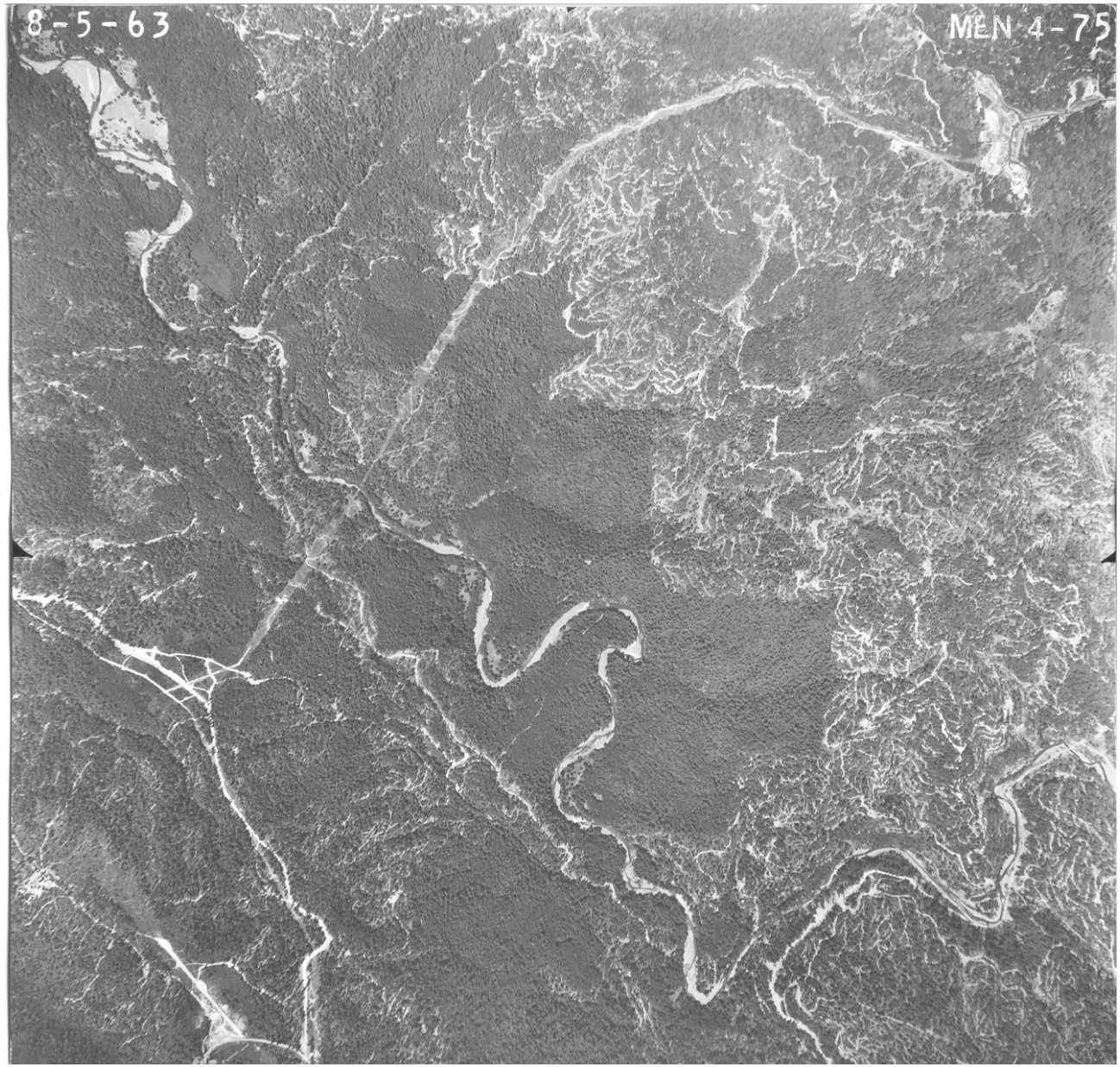
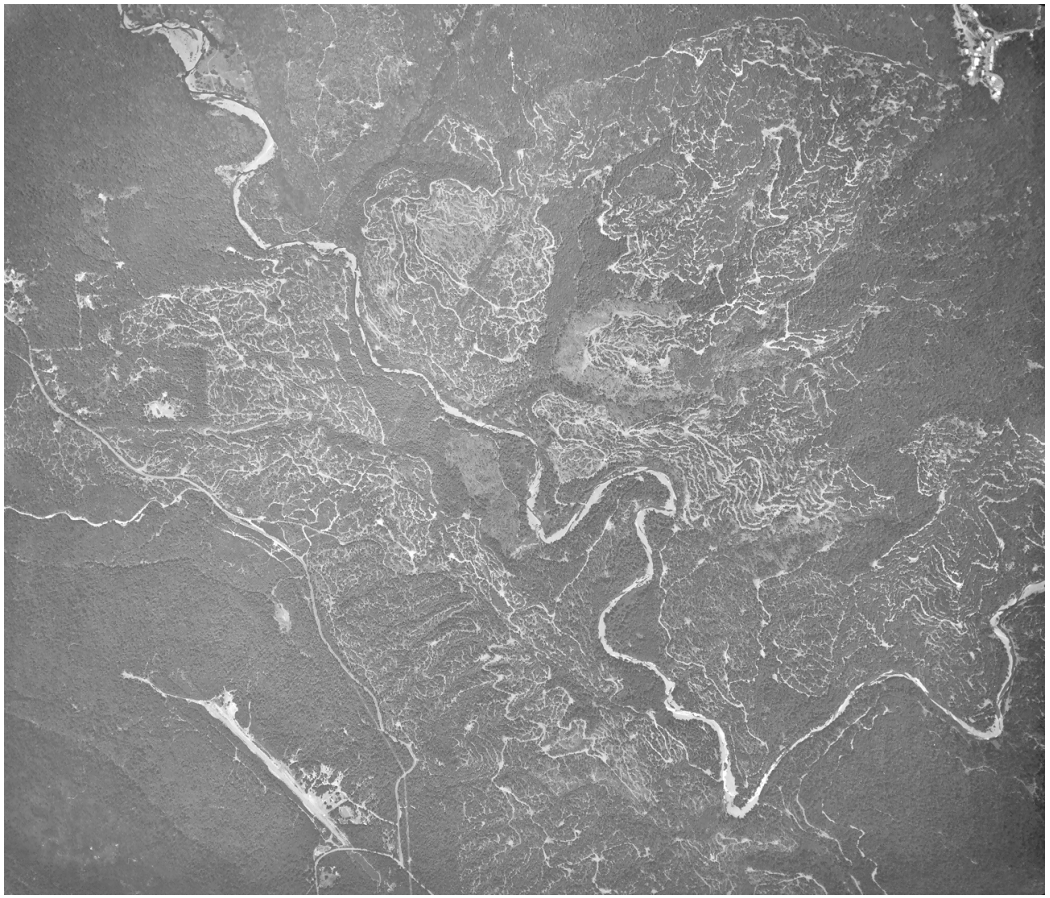
Garcia to South Fork 1952

Garcia to South Fork 1963



Renewed Logging 1980s-1990s



1985

- Approximately 43% of watershed experienced new logging and road reconstruction between mid-1980s and mid-1990s (EPA, TMDL)

Signal Creek - 1955

CDFG, 1955

Signal Creek - 1955

CDFG, 1955

Instream Effects

- The California Department of Fish and Game assessed the main stem of the Garcia for fisheries habitat in 1966. They found that 37 of 104 miles were classified as severely damaged with no streamside canopy, no in-stream shelter or pools, as well as 75-100% siltation of the gravel substrate (CDFG, 1966).

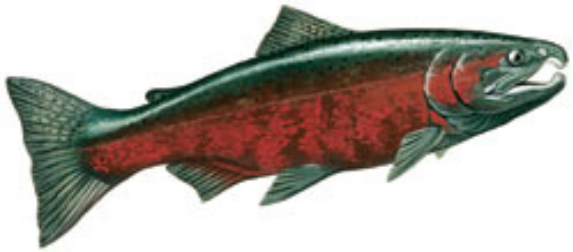
Other Land Use Impacts

- Agricultural Activities
  - Early conversion of forests for grazing
  - Grazing within river and tributaries
  - Crop production on Garcia floodplain (ongoing)
  - Water diversion for crops

- Gravel Mining (1960s - 1990s)
  - Extraction averaged 67,078 tons/year (1966-1993)
  - Caused channel simplification
  - Affects on salmonid spawning and rearing sites
  - Affects on riparian vegetation
  - Changes in hydrology

Garcia River Salmonids

Chinook Salmon

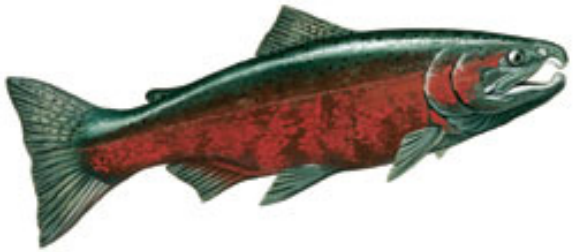


Coho Salmon

Steelhead Trout

Pink Salmon

Garcia River Salmonids



Coho Salmon
ENDANGERED

Steelhead Trout
THREATENED

Pink Salmon
ENDANGERED

New Rules / New Listings

- 1972 - Clean Water Act
- 1973 - Forest Practice Act
- 1976 - Forest Practice Rules
- 1993 - 303d Listing for Sediment and Temperature
- 2000 – Threatened and Impaired Rules (FPR)
- 2002 - Garcia River Watershed Sediment TMDL and Implementation Strategy

Action Plan for the Garcia River Watershed Sediment Total Maximum Daily Load

- GOAL: To reduce controllable human-caused sediment delivery to the watershed in order to meet water quality objectives.
- First sediment TMDL with an Implementation Strategy
- Adopted into the Water Quality Control Plan for the North Coast Region on January 3, 2002

Garcia River Watershed Sediment TMDL: Compliance Options

- Option 1. Waste discharge prohibitions that apply in the Garcia River Watershed
- Option 2. Erosion Control Plan and an approved Site-Specific Management Plan
- Option 3. Erosion Control Plan and the Garcia River Management Plan

Option 2 and Option 3 Requirement: **Erosion Control Plan**

1. Inventory of Sediment Delivery Sites (>10 yds^3 over 40 years)

2. Sediment Reduction Schedule (10 year period)

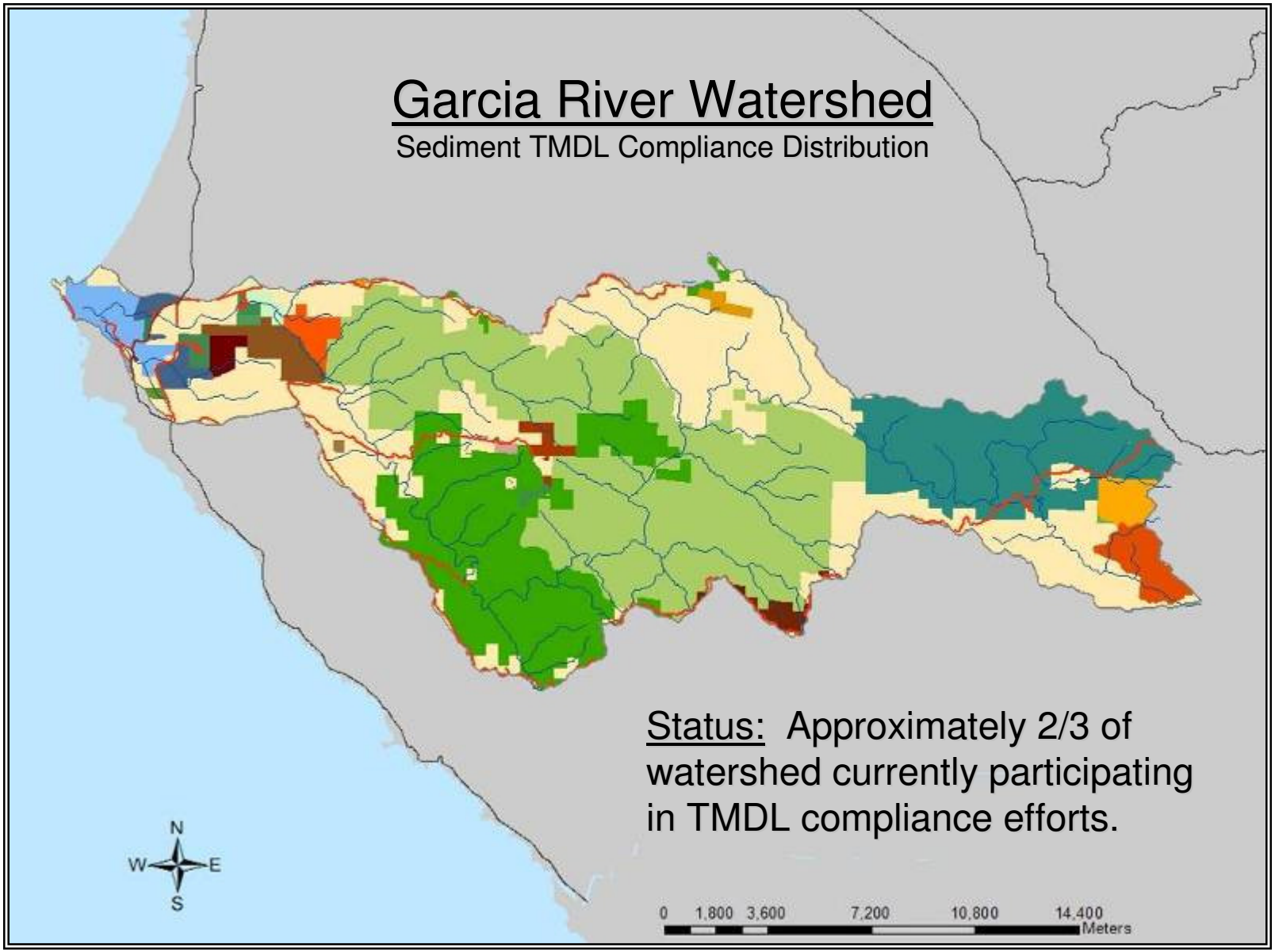
3. Assessment of Landslides and Unstable Areas

4. Effectiveness Monitoring (Annual)

Option 2 and 3 Requirements: **Land Management Plan**

- Landowners follow a set of pre-approved BMPs that are in the TMDL, or;

- Develop “roughly equivalent” BMPs to prevent future sediment discharges.


Garcia River Watershed
Sediment TMDL Compliance Distribution
Status: Approximately 2/3 of watershed currently participating in TMDL compliance efforts.
N
W
E
S
0 1,800 3,600 7,200 10,800 14,400
Meters

Changing Land Management

- Modernization of Timber Harvest Methods
  - Watercourse Protection Zones (T & I Rules)
  - Improved sediment control standards
  - Alternative yarding and silvicultural practices
- Agricultural Standards / Grazing
  - Riparian fencing
  - Animal waste management
  - Crop setbacks
  - Movement away from surface water extraction
- Commercial gravel mining has stopped
- Extensive restoration along lower Garcia

Additional NCRWQCB Activities

- Oversee Timber Harvest Planning and Operation
- Conduct Education/Outreach
- Grant Management and Coordination
- Enforcement Activities
- Instream Monitoring

The Nature Conservancy and NCRWQCB
Garcia River Monitoring

- In 2007, NCRWQCB staff worked with The Nature Conservancy to initiate an instream monitoring program within The Garcia River Forest
- In 2008 and 2009, NCRWQCB staff were provided access to conduct monitoring within other parts of the watershed
- Instream monitoring based upon:
  - U.S. EPA's Environmental Monitoring and Assessment Program (EMAP) – Western Pilot Study
  - SWRCB's Surface Water Ambient Monitoring Program (SWAMP) (For NCRWQCB Sites Only)

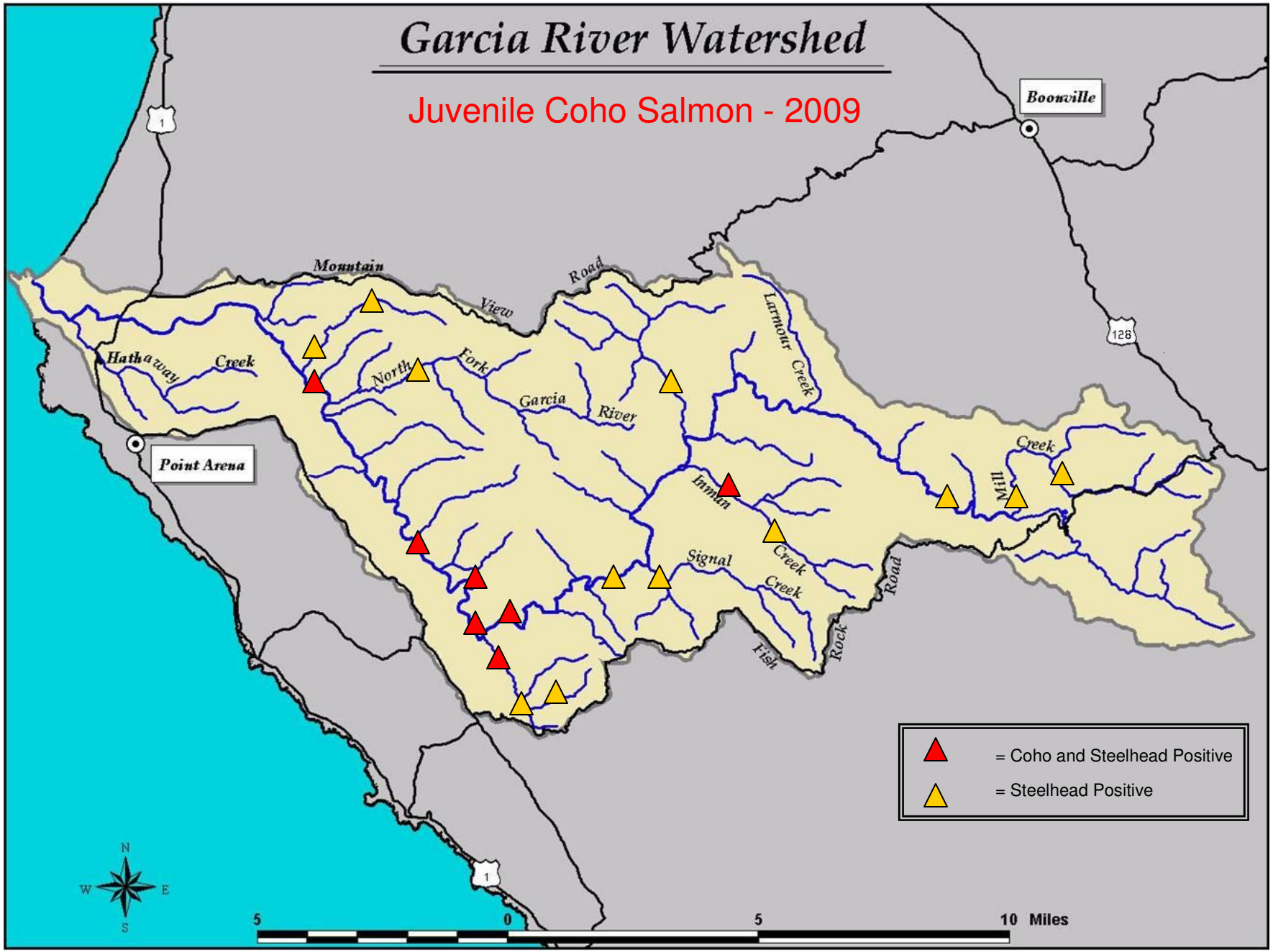
TNC and NCRWQCB

Garcia River Monitoring

- Physical Habitat Characterization
  - Channel Dimensions
  - Slope, Bearing
  - Thalweg Profile
  - Substrate Size
  - Embeddedness
  - Bank Characteristics
  - Human Influence
  - Debris Torrent
  - Channel Constraint
- Stream Discharge Measurements

TNC and NCRWQCB
Garcia River Monitoring

- Biological Measurements
  - Large Woody Debris Tally
  - Benthic Macroinvertebrates
  - Algae and Diatoms
  - Canopy Cover Measurements
  - Riparian Vegetation Structure
  - Legacy Tree Survey
  - Instream Fish Cover
  - Invasive Plant Survey
  - Aquatic Vertebrate Monitoring
- Ambient Water Quality
  - Dissolved Oxygen
  - pH
  - Temperature
  - Conductivity
  - Turbidity
  - Nutrients
  - Metals


Garcia River Watershed
Juvenile Coho Salmon - 2009
Boonville
Point Arena
Mountain View Road
Hathaway Creek
North Fork Garcia River
Larmour Creek
Mill Creek
Inman Creek
Signal Creek
Rock Fish Road
128
1
= Coho and Steelhead Positive
= Steelhead Positive
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S
5 0 5 10 Miles

Priority Recovery Actions

- Continue to Reduce sediment loading
- Improve shade canopy to reduce stream temperatures
- Increase Large Woody Debris
- Remove barriers to migration

THANK YOU!

The ongoing effort to restore the Garcia River watershed and save our pacific salmonids involves numerous landowners, consultants, agencies, NGOs, stakeholders, concerned citizens, and spans back over multiple decades.

Thank you to all who have taken part!