

Discussion of Section 303(d) of the Clean Water Act Listing and De-Listing Recommendations

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North Coast RWQCB

January 23, 2001

Purposes of Meeting

- To provide an overview of the federal CWA Section 303(d)
- To present the Regional Water Board staff's approach to evaluating condition of waterbody
- To discuss the process for updating the 303(d) List
- To present the rationale for the specific List update recommendations
- To provide opportunity for public comment
- To provide an opportunity for Board input

Outline

I. Overview of CWA Section 303(d)	RWB staff
II. Approach to evaluating waterbody	RWB staff
III. List update process	RWB staff, SWB, US EPA
IV. Rationale for specific recommendations	RWB staff
V. Public comment	Public
VI. Board discussion and direction	Board

Requirements of CWA Section 303(d)

- Language of Federal CWA Section 303(d)
- Language of Code of Federal Regulations
Part 130 of Title 40
- Summary of the law

Federal CWA Section 303(d)

Each State shall identify those waters within its boundaries for which the effluent limitations required by section 1311(b)(1)(A) and section 1311 (b)(1)(B) of this title are not stringent enough to implement any water quality standard applicable to such waters. The State shall establish a priority ranking for such waters, taking into account the severity of the pollution and the uses to be made of such waters.

Each State shall identify those waters or parts thereof within its boundaries for which controls on thermal discharges under section 1311 of this title are not stringent enough to assure protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife.

Each State shall establish for the waters identified in paragraph (1)(A) of this subsection, and in accordance with the priority ranking, the total maximum daily load, for those pollutants which the Administrator identifies under section 1314(a)(2) of this title as suitable for such calculation. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality.

Code of Federal Regulations Part 130 of Title 40

Each State shall:

- Identify the waterbodies within its boundaries that are water quality-limited;
- Develop a priority ranking of these water quality-limited waterbodies; and
- Submit to US EPA a list of these waterbodies requiring a pollution control plan (Total Maximum Daily Load).

“Water quality-limited” means the quality of the water does not meet the applicable water quality standards, even after the application of the existing water quality controls for that waterbody.

Code of Federal Regulations
Part 130 of Title 40

§130.7

- (b) (1) Each State shall identify those water quality-limited segments still requiring TMDLs within its boundaries for which:
- (I) Technology-based effluent limitations required by sections 301(b), 306, 307, or other sections of the Act;
 - (II) More stringent effluent limitations (including prohibitions) required by either State or local authority preserved by section 510 of the Act, or Federal authority (law, regulation, or treaty); and
 - (III) Other pollution control requirements (e.g., best management practices) required by local, State, or Federal authority are not stringent enough to implement any water quality standards (WQS) applicable to such waters.

§130.7 (cont.)

- (b) (3) For purposes of listing waters under §130.7 (b), the term "water quality standard applicable to such waters" and "applicable water quality standards" refer to those water quality standards established under section 303 of the Act, including numeric criteria, narrative criteria, waterbody uses, and antidegradation requirements.

§130.2

- (j) *Water quality limited segment.* Any segment where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards, even after the application of the technology-based effluent limitations required by sections 301(b) and 306 of the Act.

§130.10

- (b) The Act also requires that each State initially submit to EPA and revise as necessary the following:
- (2) Identification of water quality-limited waters still requiring TMDLs (section 303(d)), pollutants, and the priority ranking including waters targeted for TMDL development within the next two years as required under §130.7(b) in accordance with the schedule set for in §130.7(d)(1).

Summary of the Law

Section 303(d) requires states to:

- Identify those waterbodies (or segments thereof) that are impaired, even after the application of all existing water quality controls;
- Submit to EPA a list of these waterbodies;
- Develop a pollution control plan (Total Maximum Daily Load) to attain and maintain water quality standards.

Definitions

“Impaired” means water quality standards are not being met.

“Standards” refer to water quality objectives (either narrative or numeric), beneficial uses, and nondegradation requirements.

So, the task is to identify waterbodies for which water quality objectives (both numeric and narrative) are not being met and/or the designated beneficial uses of that waterbody are not being supported.

What is included on the 303(d) List?

- Name of impaired waterbody
- Pollutant or stressor causing impairment
- Source of pollutant/stressor
- Priority and schedule for developing Total Maximum Daily Load (TMDL)

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“Weight of Evidence” Approach to Evaluating Condition of Waterbody

Weigh readily available data and information as to its ability to demonstrate a credible line of reasoning leading to a conclusion about the condition of the waterbody.

- (1) The water body is meeting standards;**
- (2) The water body is not meeting standards; or**
- (3) Based on the available information, standards attainment cannot be determined.**

Data / Information Sources

40 CFR §130.7: “Each State shall assemble and evaluate all existing and readily available water quality-related data and information to develop the list”

- **Data/information received from public solicitation of water quality information:**
 - **Government agencies: USGS, DFG, USFS, BLM, National and State Parks**
 - **Municipalities and Water Districts**
 - **Land owners**
 - **Volunteer monitoring groups**
 - **Academic/research institutions**
 - **Interested parties**

Data / Information Sources (cont.)

- **In-house:**
 - (1) **Regional and State Board monitoring and assessment data, including Surface Water Ambient Monitoring Program, North Coast Watershed Assessment Program, State Mussel Watch, Toxic Substances Monitoring Program, Bay Protection and Toxic Cleanup Program**
 - (2) **Data from regulated/unregulated dischargers**
 - (3) **Peer-reviewed literature**
 - (4) **Staff knowledge and experience**

Data/Information categories

- (1) Water column chemistry,
- (2) Physical condition of the water body,
- (3) Aquatic habitat surveys,
- (4) Fisheries information,
- (5) Land use history, and
- (6) Historical conditions

Hierarchy for Data/Information Evaluation

Water quality data and information evaluated relative to:

- (1) Basin Plan water quality objectives,
- (2) Other:
 - Criteria developed by the US EPA,
 - Water quality standards, such as the California and National Toxics Rules,
 - Guidance or guidelines developed by California Department of Health Services or other agencies,
 - Criteria/guidance developed by other States, regions or countries, and/or
 - Findings in peer-reviewed literature.

State and Federal Guidance on Listing and De-Listing

- 40 CFR §130
- State Water Board: “1998 Clean Water Act Section 303(d) Listing Guidelines for California”
- US EPA:
 - 1994 and 1998 clarifying documents.
 - May 15, 2001 letter from US EPA to State Water Board recommends State consider the 1998 guidelines as a starting point for the 2002 listing process.

Listing Factors per 1998 State Guidance

- Existing controls not stringent enough to assure protection of beneficial uses and attainment of water quality objectives.
- Fishing, drinking water, or swimming advisory currently in effect.
- Evaluation of chemical, physical, or biological integrity indicates that beneficial uses are impaired or are expected to be impaired within the listing cycle.
- The water body is on the previous 303(d) List and assessment continues to demonstrate impairment, or no assessment has not been performed.
- Tissue concentrations in consumable body parts of fish or shellfish exceed applicable tissue criteria or guidelines.
- Regional Water Board determines the water body needs to be afforded a level of protection offered by a 303(d) Listing.

De-Listing Factors per 1998 State Guidance

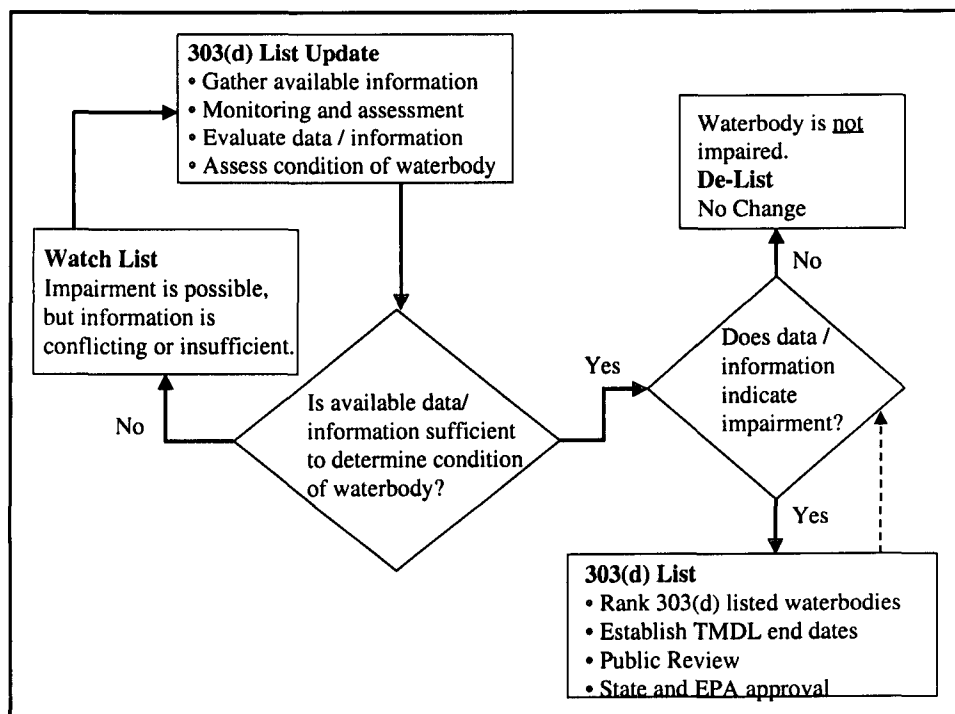
- Objectives are revised.
- A beneficial use is de-designated.
- Faulty data led to the initial listing.
- Assessment indicates objectives are being met and beneficial uses are not impaired.
- A TMDL has been approved by the US EPA.
- There are control measures in place which will result in protection of beneficial uses.

Summary of Regional Water Board Staff's Approach

- Considered Federal and State guidance
- Reviewed data/information readily available to TMDL staff
- Evaluated data/information using Basin Plan WQOs, other relevant criteria and guidance, peer-reviewed literature, and best professional judgement
- Data quality
- Recommendations apply to entire watershed, unless sufficient data available to make reach-specific determination.

Watch List

- Based on Ntl. Academy of Science's Ntl. Research Council TMDL evaluation report "Preliminary List" concept
- Conflicting or insufficient information to determine condition of waterbody
- No regulatory implications
- Identifies the need for more information
- To be used by Regional Board staff in prioritizing monitoring/assessment when resources are available.



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2002 303(d) List Update Process

January 2001 State Water Board released "CWA Section 303(d) Proposed Listing Process for 2002" to Regional Boards

February 1, 2001 Regional Water Board EO Mr. Michlin informed staff plan to hold hearings on 303(d) List in April, May, June, and July 2001

February 13, 2001 State Water Board suggested Regional Boards could convey list update in form of recommendations, without Regional Board action

March 9, 2001 Regional Water Board EO Mr. Michlin informed staff of Board's wish not to hold Workshops on 303(d) List

March 12, 2001 Notice of public solicitation of water quality information

May 15, 2001 Close of 60-day public solicitation

2002 303(d) List Update Process (cont.)

July 5, 2001 State Board directed Regional Board staff to submit their 303(d) lists to State Board by the end of October

September 10, 2001 Release of Regional Water Board staff's Public Review Draft 303(d) List Update Recommendations report

- Draft report sent to all Interested Parties including Board members
- Draft report available on Regional Water Board web page

October 8, 2001 Close of public review period

- Comments received after this date were considered

November 16, 2001 Regional Water Board staff's final 303(d) List Update Recommendations report forwarded to State Water Board

November 19, 2001 Notice for December 6, 2001 Regional Water Board Workshop on 303(d) List sent to Regional Board and interested parties

- Final report available on web page

2002 303(d) List Update Process (cont.)

November 27, 2001 Agenda Package including final report sent to Board

December 6, 2001 Regional Water Board Workshop on 303(d) List

January 23, 2001 Regional Water Board Meeting on 303(d) List

Prior to October 1, 2002 State Water Board required to:

- Hold Public Workshop on statewide 303(d) List
- Hold Board Meeting to adopt statewide List
- Forward adopted List to US EPA

By November 1, 2002 US EPA to adopt statewide list

State Water Board Perspective

- Legal issues - Sheryl Freeman

US EPA Perspective

Dave Smith
TMDL Team Leader
Region 9

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Proposed Additions to 303(d) List

Pathogens:

Russian River, Santa Rosa Creek

Sediment:

Stemple Creek, Jacoby Creek, (Redwood Creek)

Temperature:

**Russian , Gualala, Big, Ten Mile, Mad River,
and Redwood Creek**

DO & Nutrients:

Laguna de Santa Rosa

pH:

Tule Lake and Lower Klamath Lake

Approach to Evaluating Pathogen Impairment

1. Where sufficient data, compared data to Basin Plan objective for bacteria:

“In waters designated for contact recreation, the median fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed 50 MPN/100 mL...”.

- If there were frequent exceedances of WQO during multiple years, then recommend listing.

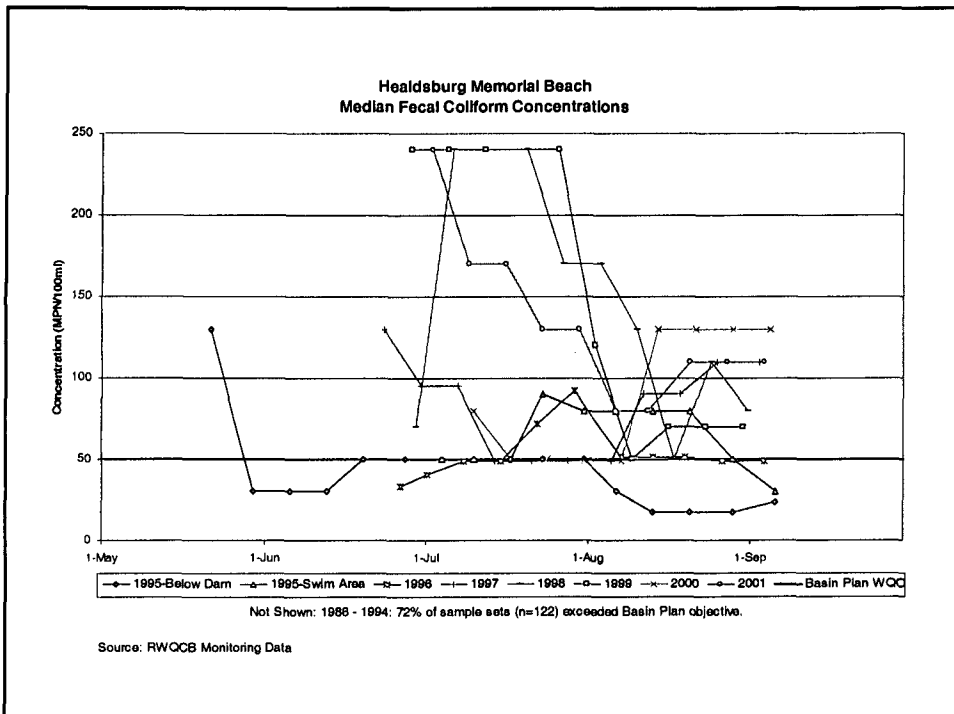
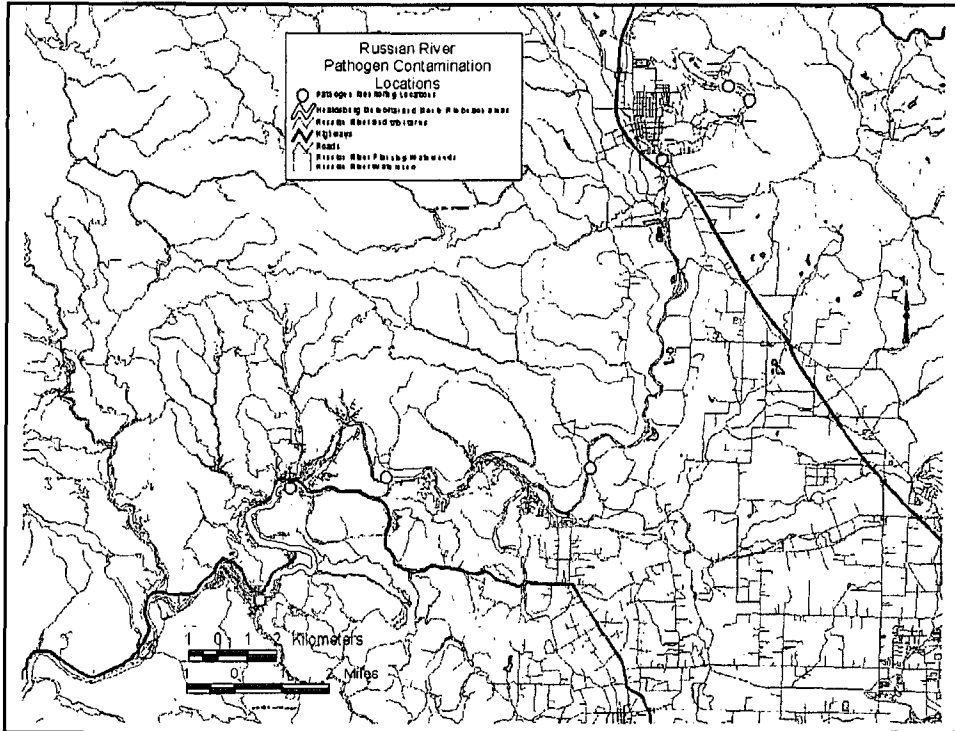
Pathogen Approach (cont.)

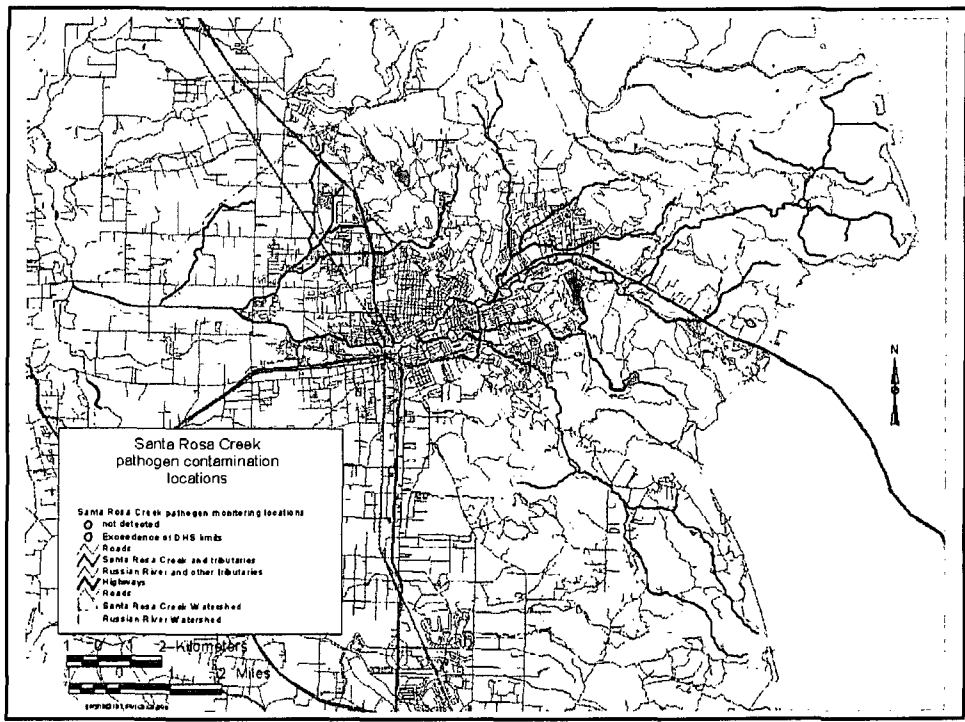
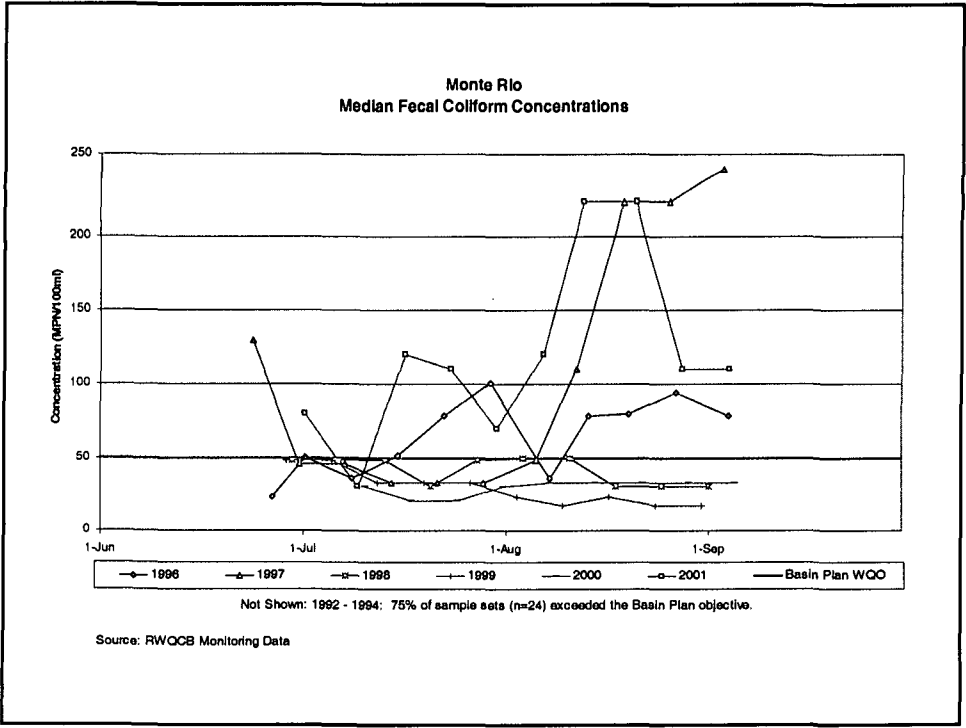
2. Compared data to CA Dept. of Health Services “Draft Guidance for Fresh Water Beaches”:

Beach posting recommended when indicator organisms exceed any of following levels:

- Single sample values:
 - Total coliforms: 10,000 per 100 mL
 - Fecal coliforms: 400 per 100 mL
 - Either Enterococcus: 61 or E. coli 235 per 100 mL
- 30-day average values:
 - Total coliforms: 1,000 per 100 mL
 - Fecal coliforms: 200 per 100 mL
 - Either Enterococcus: 33 or E. coli 126 per 100 mL

If multiple exceedances, we recommended listing.





Santa Rosa Creek - Pathogens

1979-1980: 30% of fecal coliform samples exceeded DHS limit

Summer/Fall 2001: City monitored 21 sites

- 11 monitoring dates
- Exceedance of DHS limits for one or more indicator organism at one or more site during all monitoring dates

July 10: City posted warning signs along Prince Memorial Greenway

City actions:

- Septic investigations
- Public outreach
- Homeless encampment cleaning

Approach to Evaluation of Temperature Data

North Coast Regional Water Quality
Control Board Workshop

January 23, 2002

Basin Plan Water Quality Objectives for Temperature

- The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses.
- At no time or place shall the temperature of any COLD water be increased by more than 5°F above natural receiving water temperature.
- At no time or place shall the temperature of WARM intrastate waters be increased more than 5°F above natural receiving water temperature.

Approach to Evaluating Temperature Data

Characterize species life stage requirements

Assess historical & current salmonid distribution

Compare current temperatures to estimated historical temperatures based on historical distribution of salmonids

Are current temperatures in the historic range supportive of sensitive life stages?

No

Propose for Addition to the 303(d) List

Don't Know

Place on Watch List

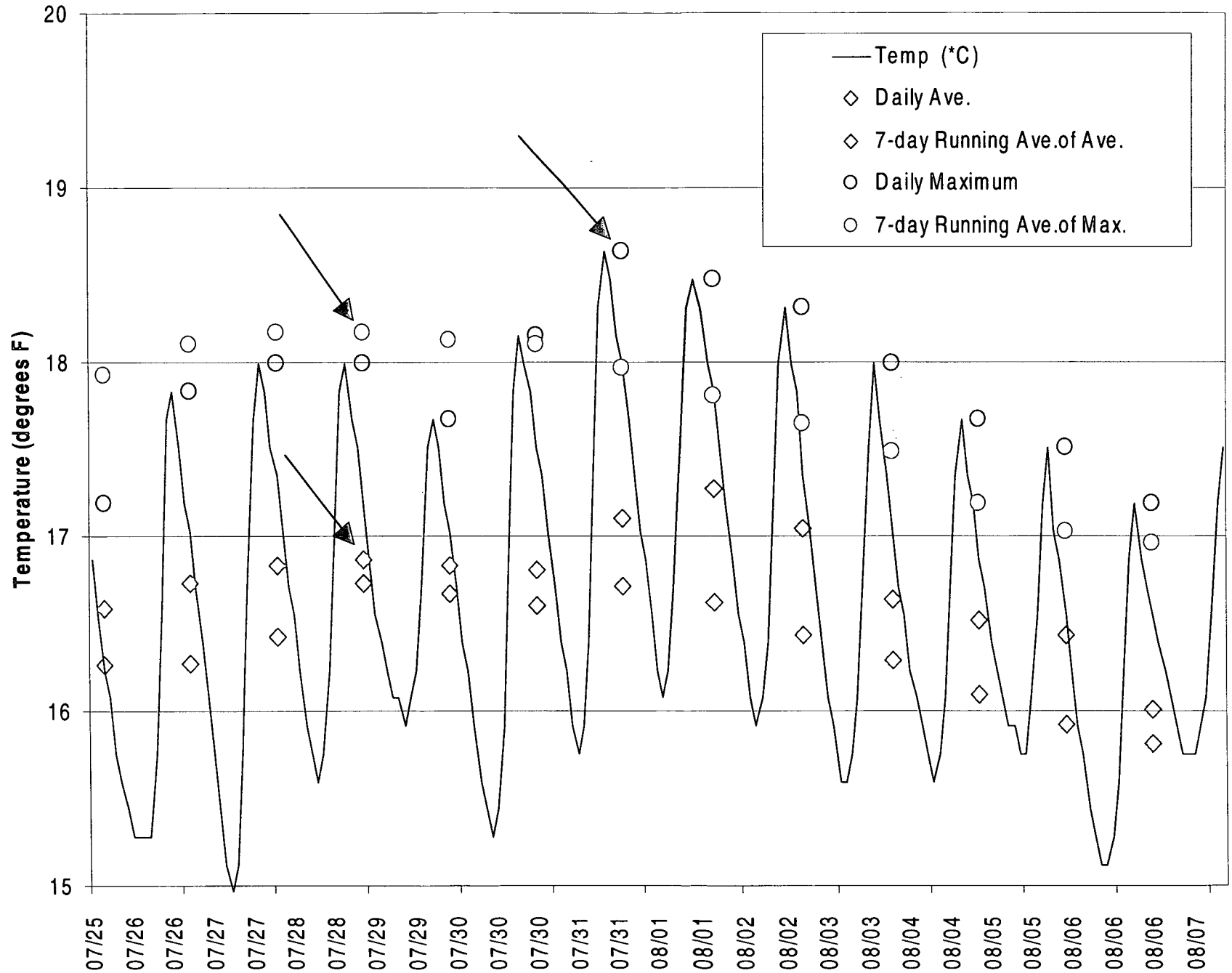
Yes

Not Impaired

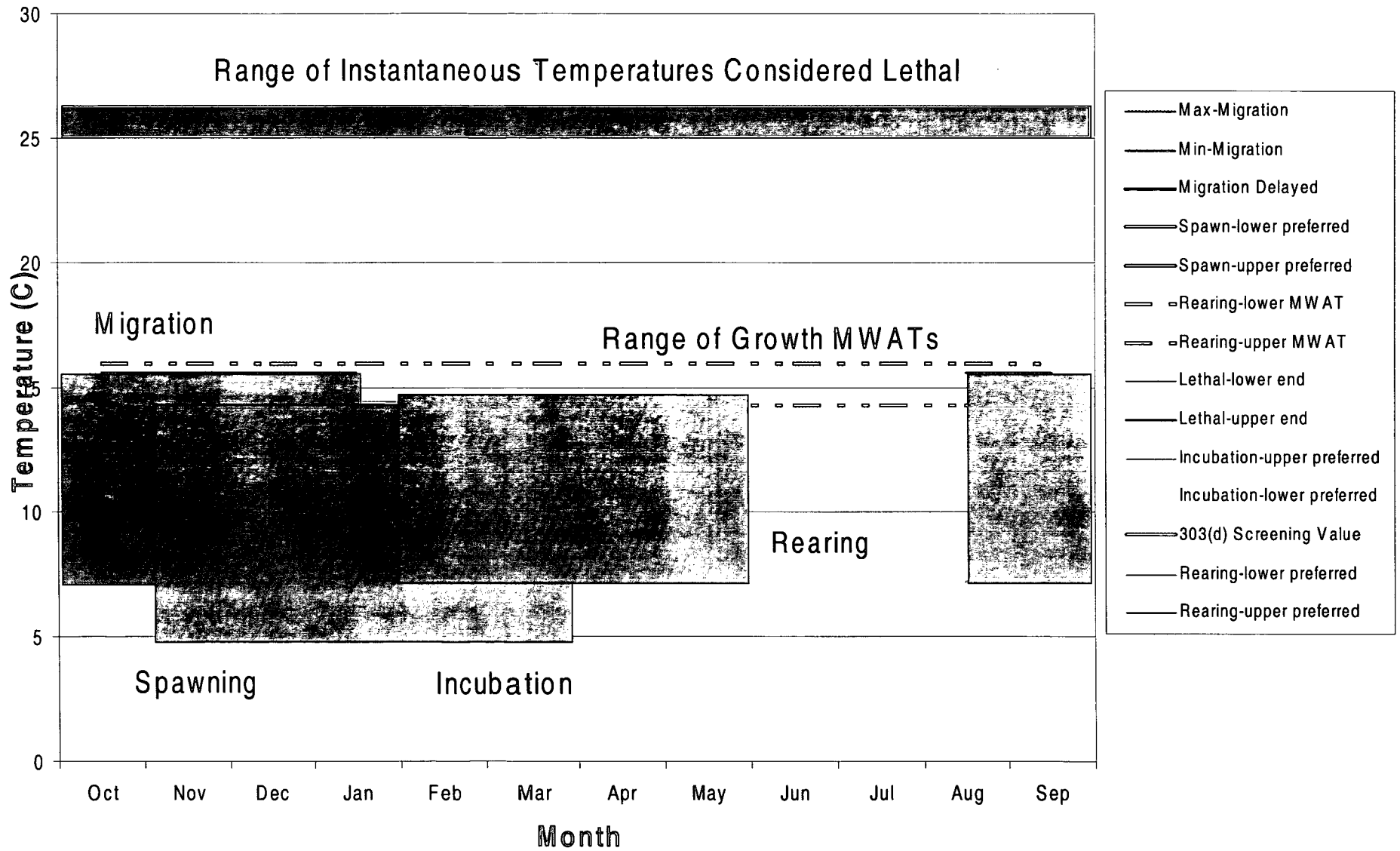
Chronic (Sub-lethal) Temperature Metrics

- Instantaneous maximum: highest individual value in a season
- Maximum Weekly Average Temperature (MWAT): maximum value in a season of 7-day moving average of daily average
- Maximum Weekly Maximum Temperature (MWMt): maximum value in a season of 7-day moving average of daily maximums

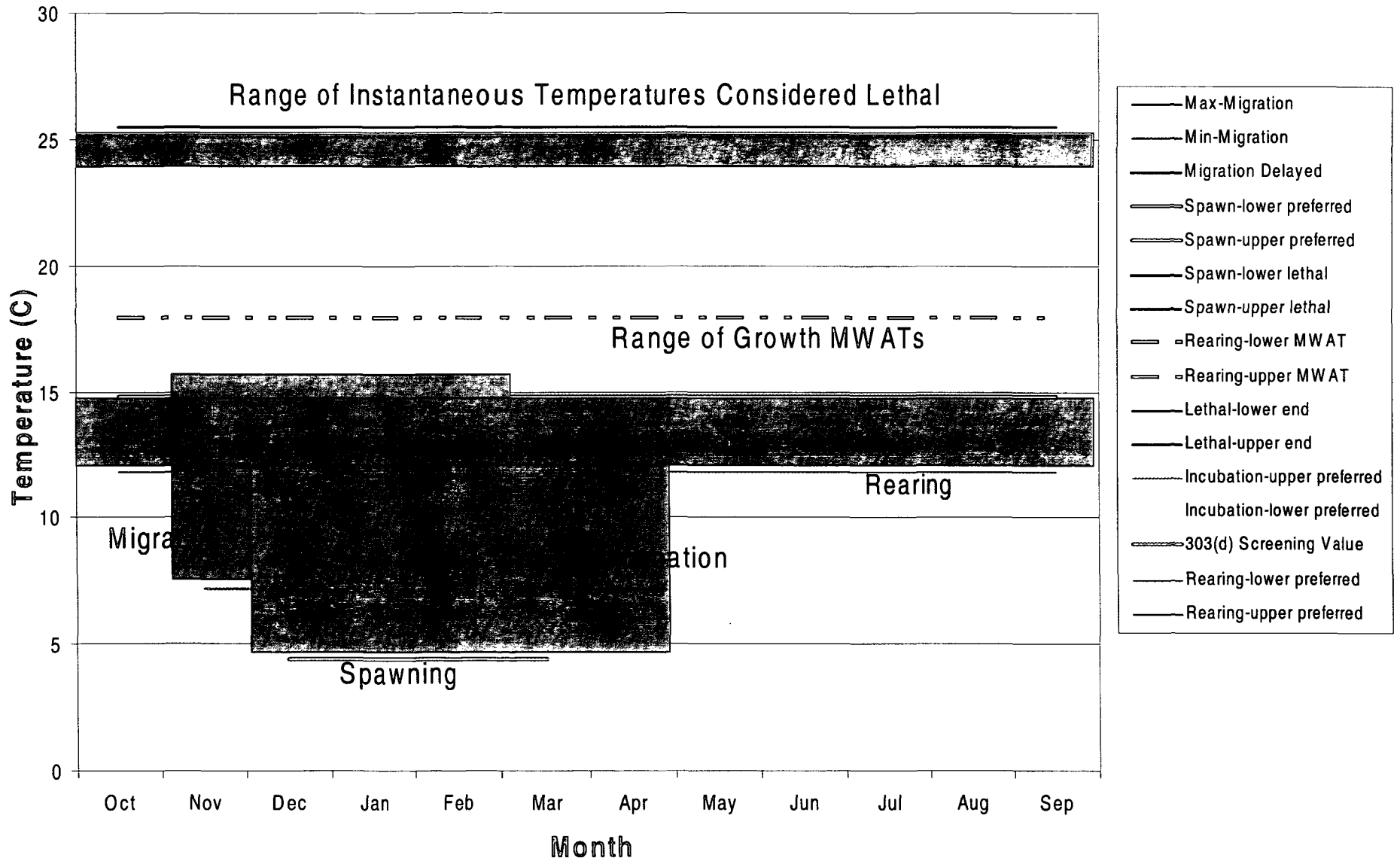
1995 Water Temperatures in Flynn Creek Near Highway 128 (SWRCB-15)



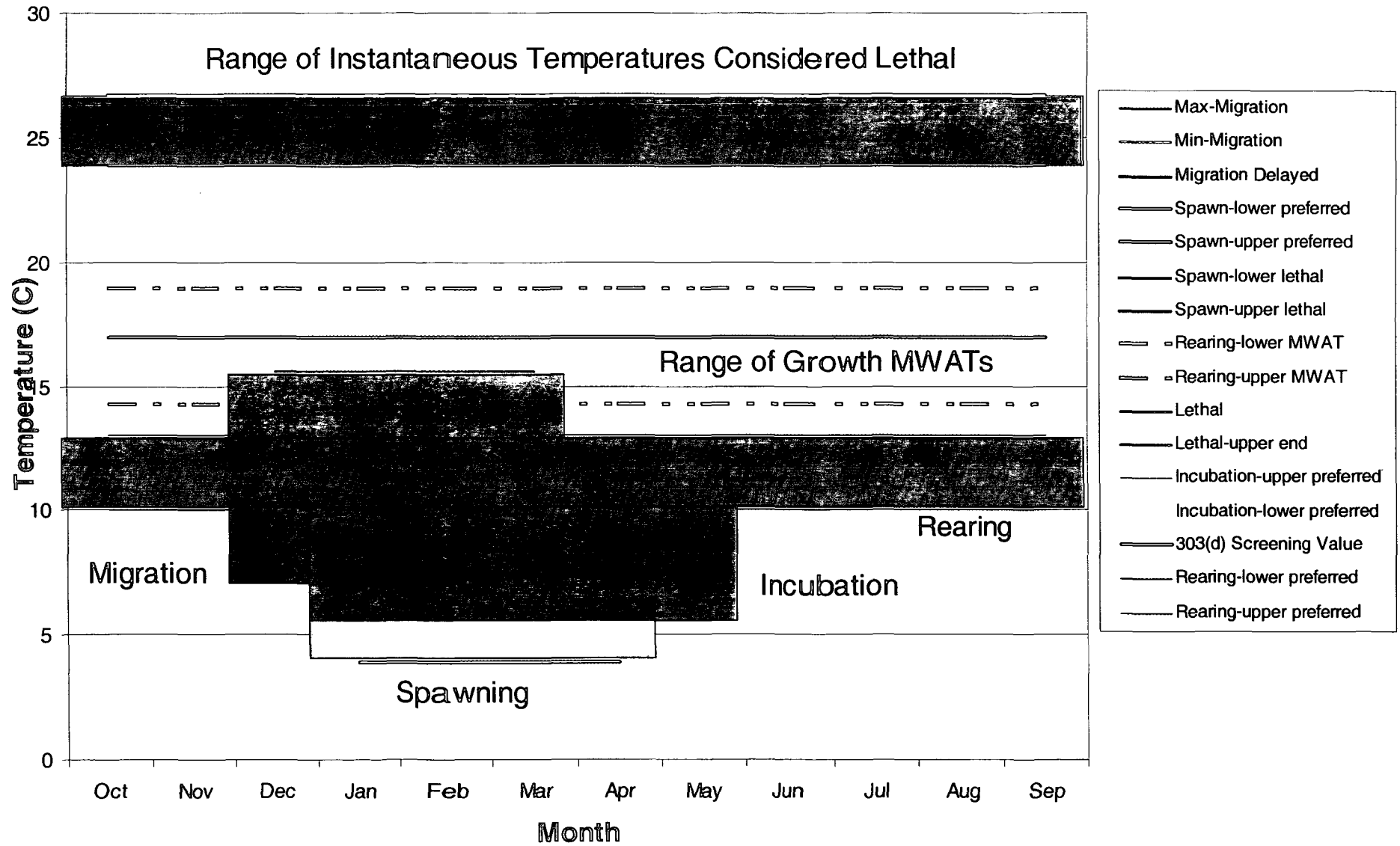
Chinook Temperature Criteria



Coho Temperature Criteria



Steelhead Temperature Criteria



MWAT Thresholds and Standards

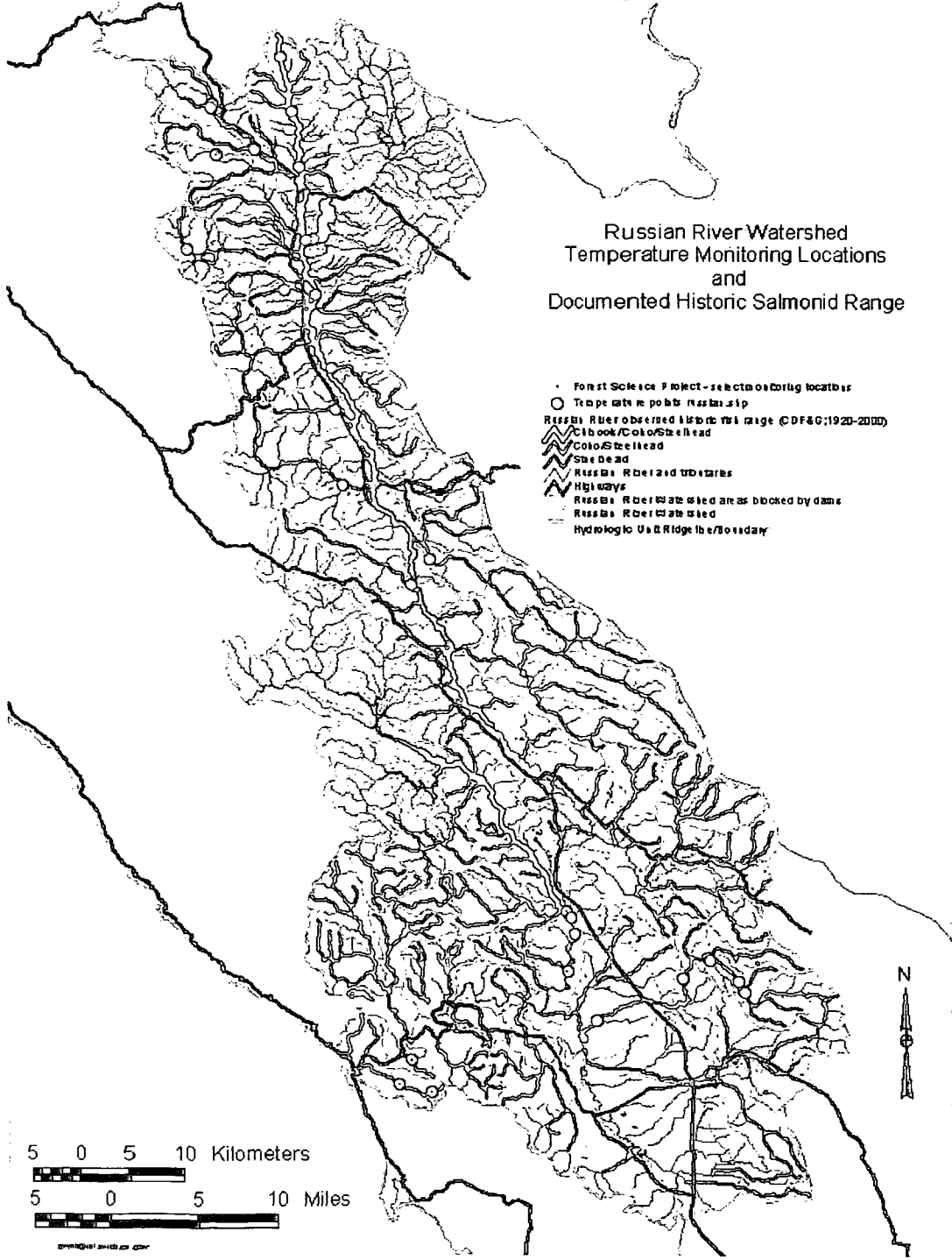
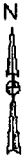
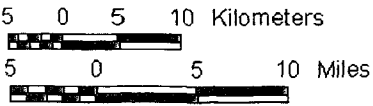
Temperature (C)	Description	Temperature (F)
26	Upper end of range of acute thresholds (considered lethal to salmonids).	78.8
25		77.0
24	Lower end of range of acute thresholds (considered lethal to salmonids).	75.2
23		73.4
22		71.6
21		69.8
20		68.0
19	Steelhead and coho growth reduced 20% from maximum (Sullivan and others, 2000). MWAT metric. USEPA (1977) growth MWAT for rainbow trout.	66.2
18	USEPA (1977) growth MWAT for coho	64.4
17	Steelhead growth reduced 10% from maximum (Sullivan and others, 2000). MWAT metric	62.6
16.7	Welsh and others MWAT threshold for coho presence/absence in the Mattole	62.1
16	Oregon Dept. of Environmental Quality Standard for salmonids (equivalent MWAT calculated from 7-day max.)	60.8
15	EPA Region 10 Recommended MWAT Threshold for Coldwater Salmonid Rearing	59.0
14.8	Coho growth reduced 10% from maximum (Sullivan and others, 2000), MWAT metric	58.6
14.6	Upper end of preferred rearing range for coho	58.3
14.3	Washington Dept. of Ecology standard (equivalent MWAT calculated from annual max.)	57.7
14		57.2
13	Upper end of preferred rearing range for steelhead	55.4

Comparison of Temperature Monitoring Data to Salmonid Thresholds

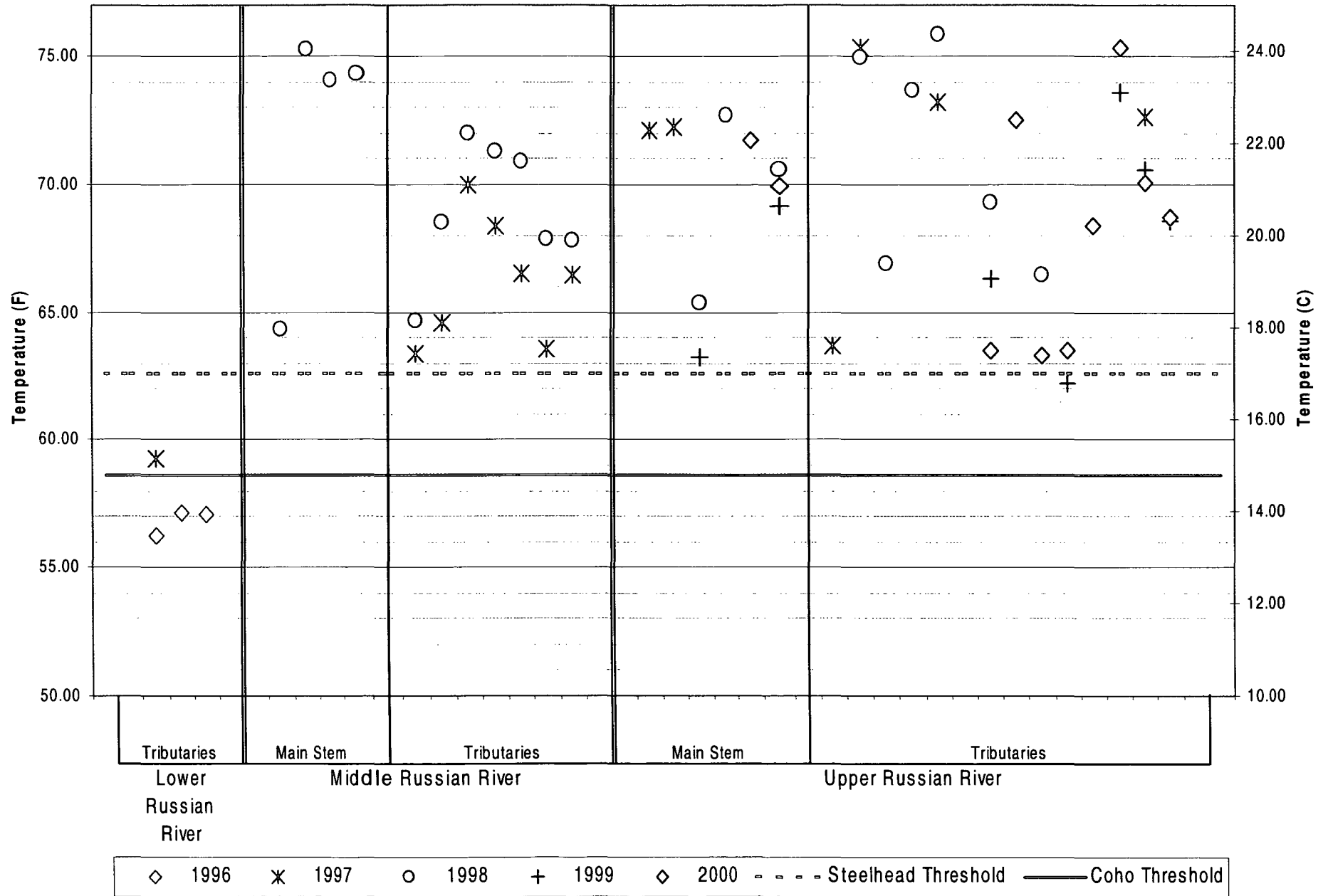
Watershed	Locations	MW AT>14.8C		MW AT>17C	
		Coho growth reduced 10%.		Steelhead growth reduced 10%.	
Russian	34	32	94%	31	91%
Gualala	65	54	83%	38	58%
Big	33	29	88%	19	58%
Ten Mile	33	26	79%	11	33%
Mad	35	31	89%	22	63%
Redwood	34	22	65%	10	29%
Navarro	57	54	95%	45	79%

Russian River Watershed Temperature Monitoring Locations and Documented Historic Salmonid Range

- Forest Science Project - select monitoring locations
- Temperature point monitoring
- ▾ Russian River observed historic range (CDF&G; 1920-2000)
- ▾ Clifton/Colo/Steelhead
- ▾ Colo/Steelhead
- ▾ Sheelad
- ▾ Russian River and tributaries
- ▾ Highways
- ▾ Russian River Watershed areas blocked by dams
- ▾ Russian River Watershed
- ▾ Hydrologic Unit Ridge Line/Boundary

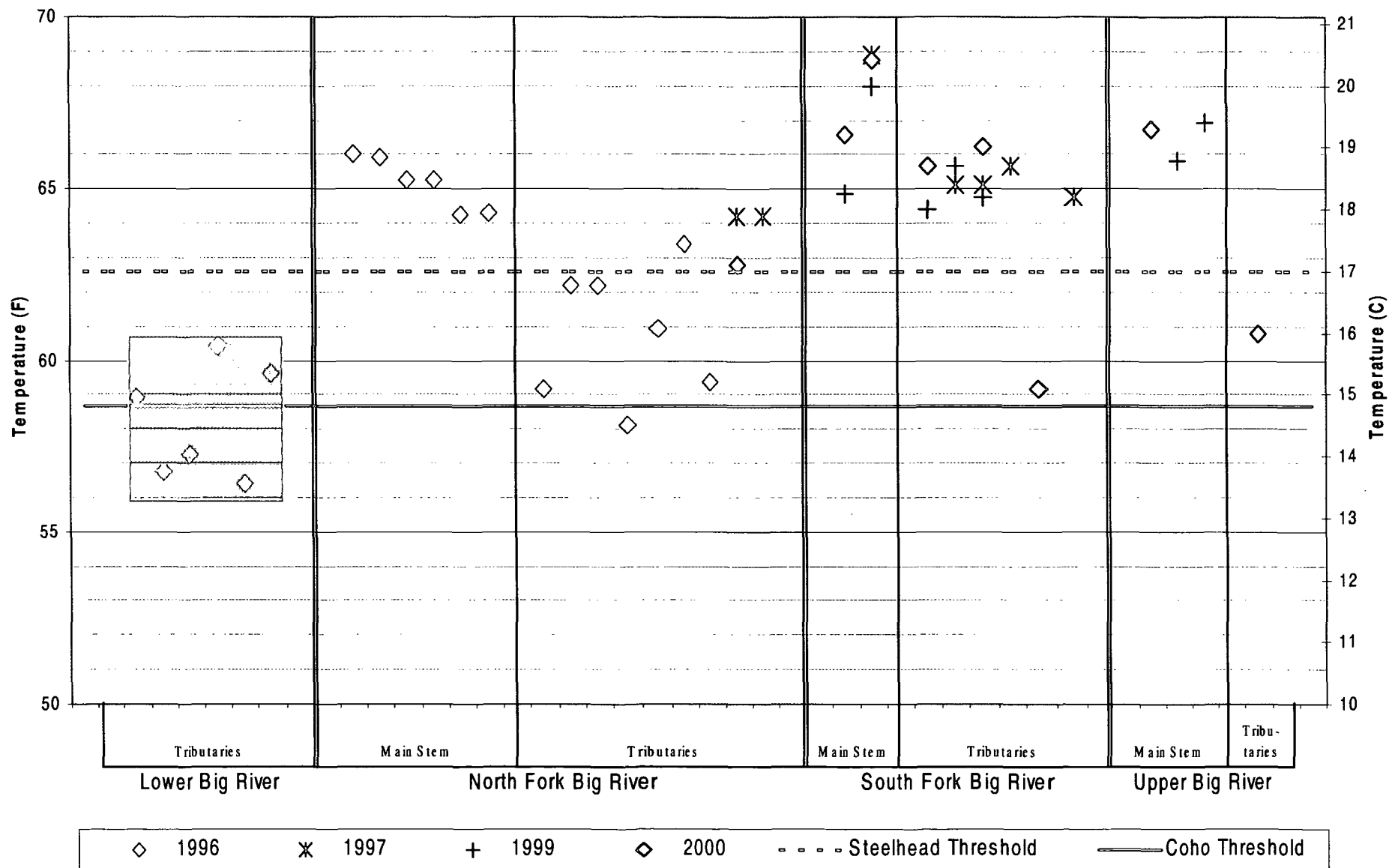


Russian River MWATs



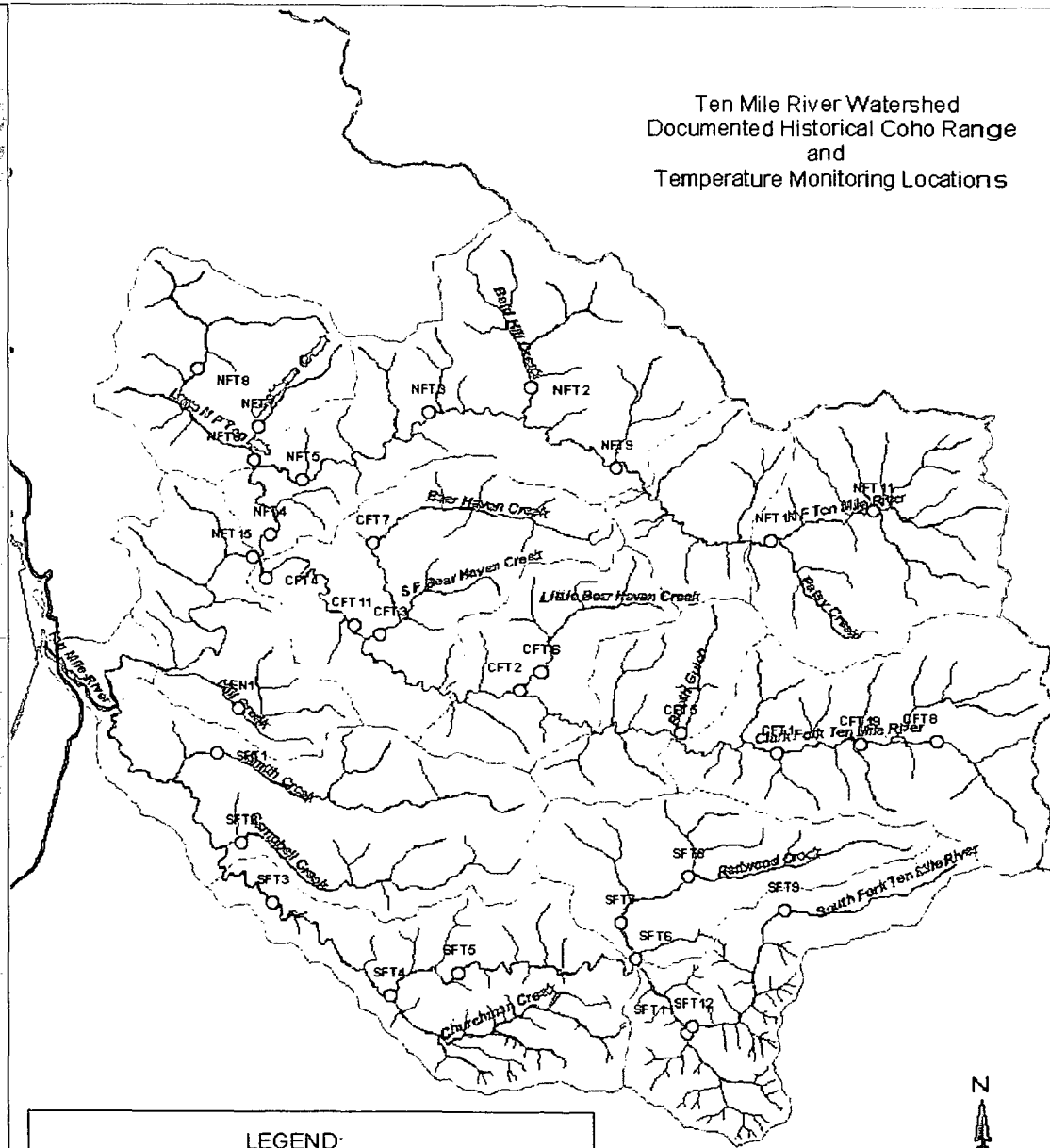
Sources: Forest Science Project, Sonoma County Water Agency, and Mendocino County Water Agency

Big River MWATs



Sources: California Department of Forestry, Mendocino Redwood Company, and Mendocino County Water Agency

Ten Mile River Watershed
 Documented Historical Coho Range
 and
 Temperature Monitoring Locations



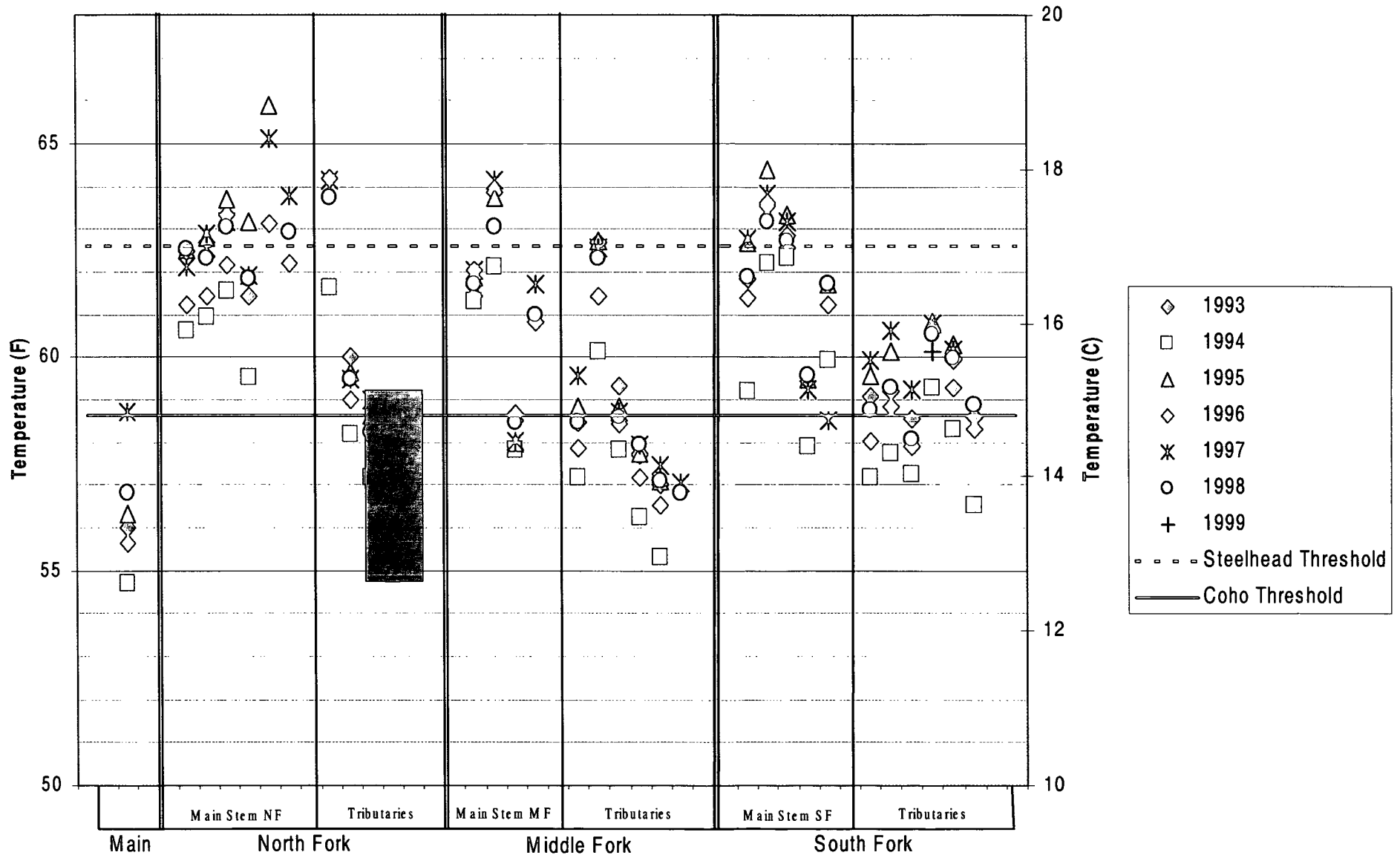
LEGEND:
 Historical Coho Presence documented
 ○ Temperature Monitoring Locations: 1993-1999

5 0 5 Kilometers

5 0 5 Miles



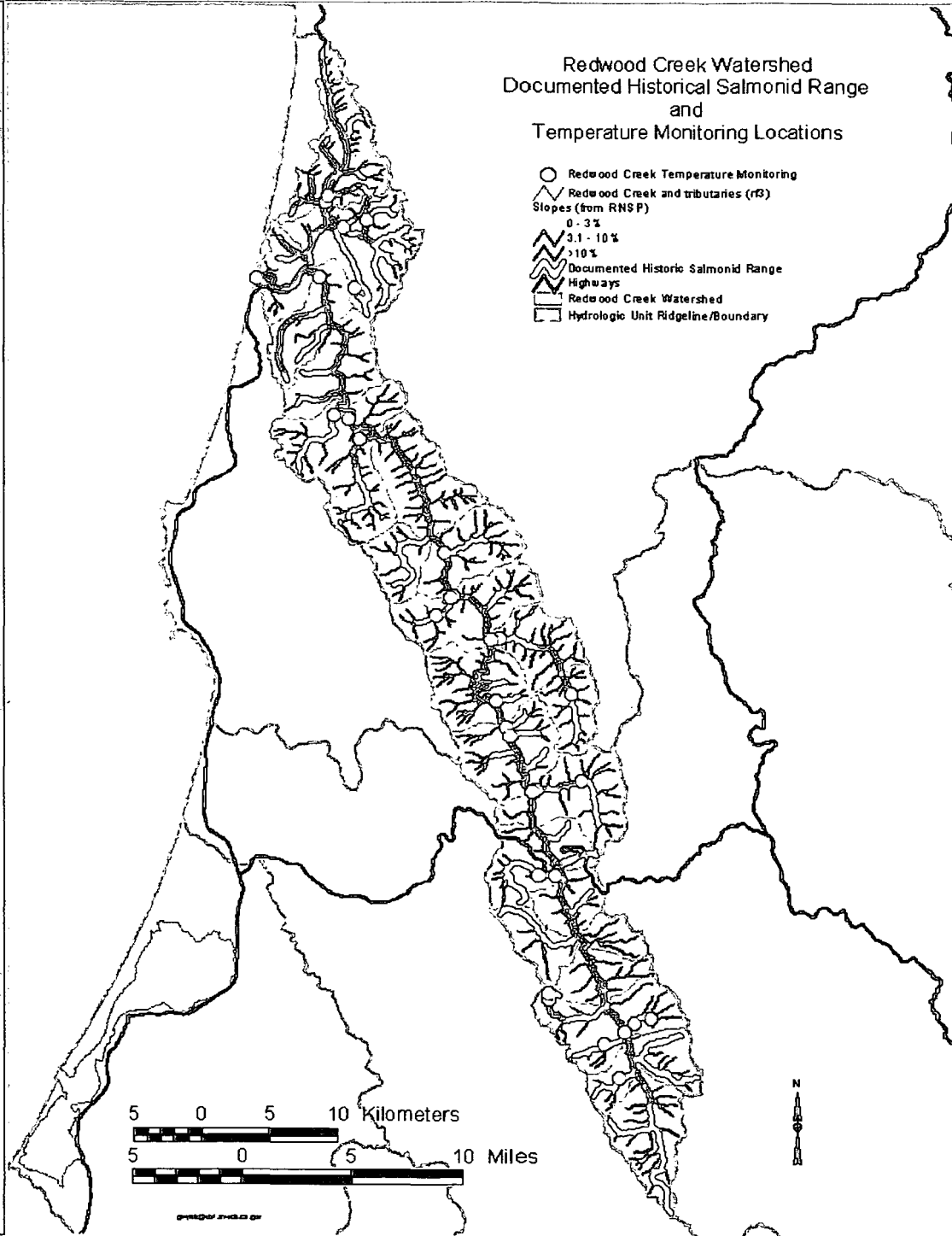
Ten Mile River MWATs



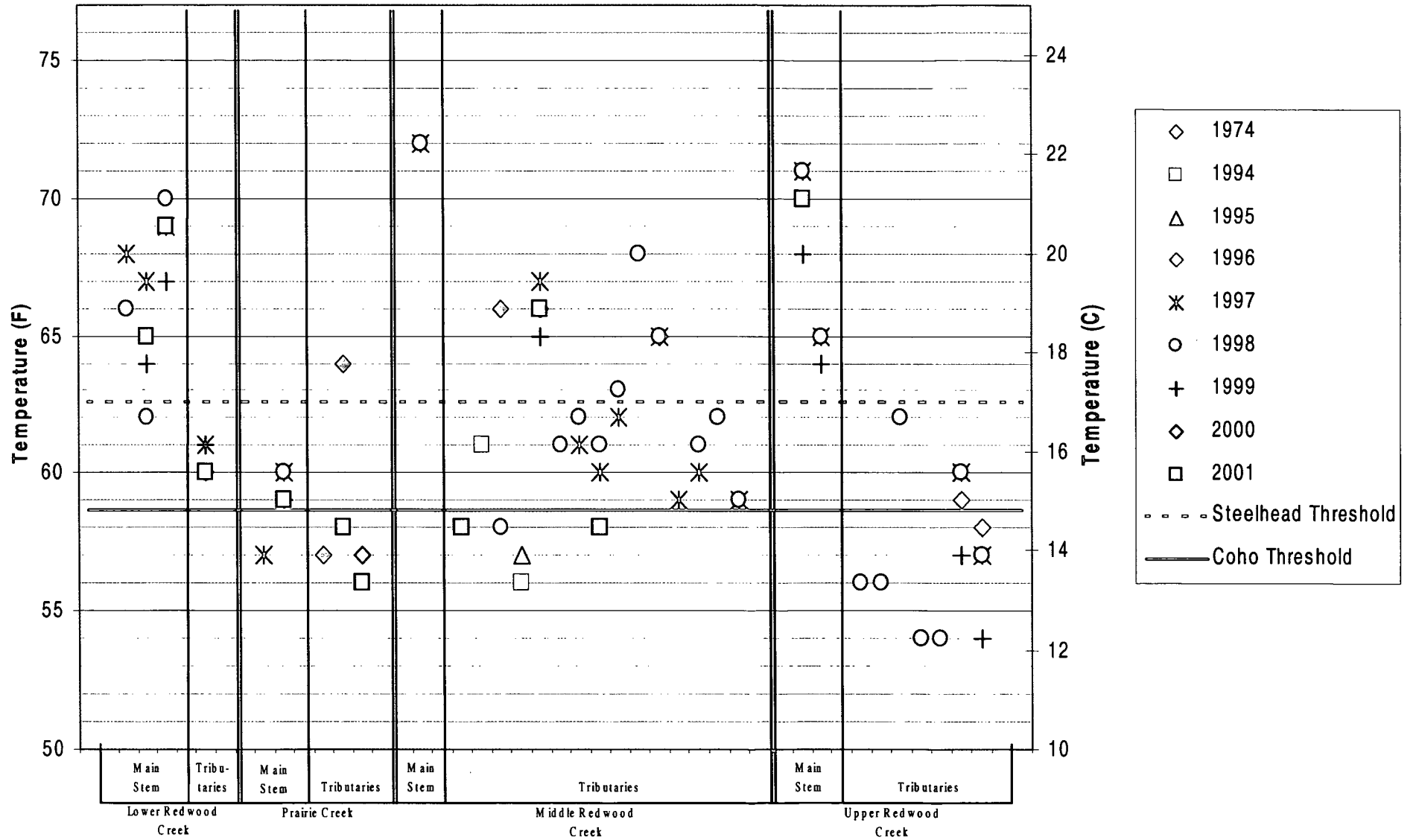
Source: Hawthorne Timber Company

Redwood Creek Watershed
Documented Historical Salmonid Range
and
Temperature Monitoring Locations

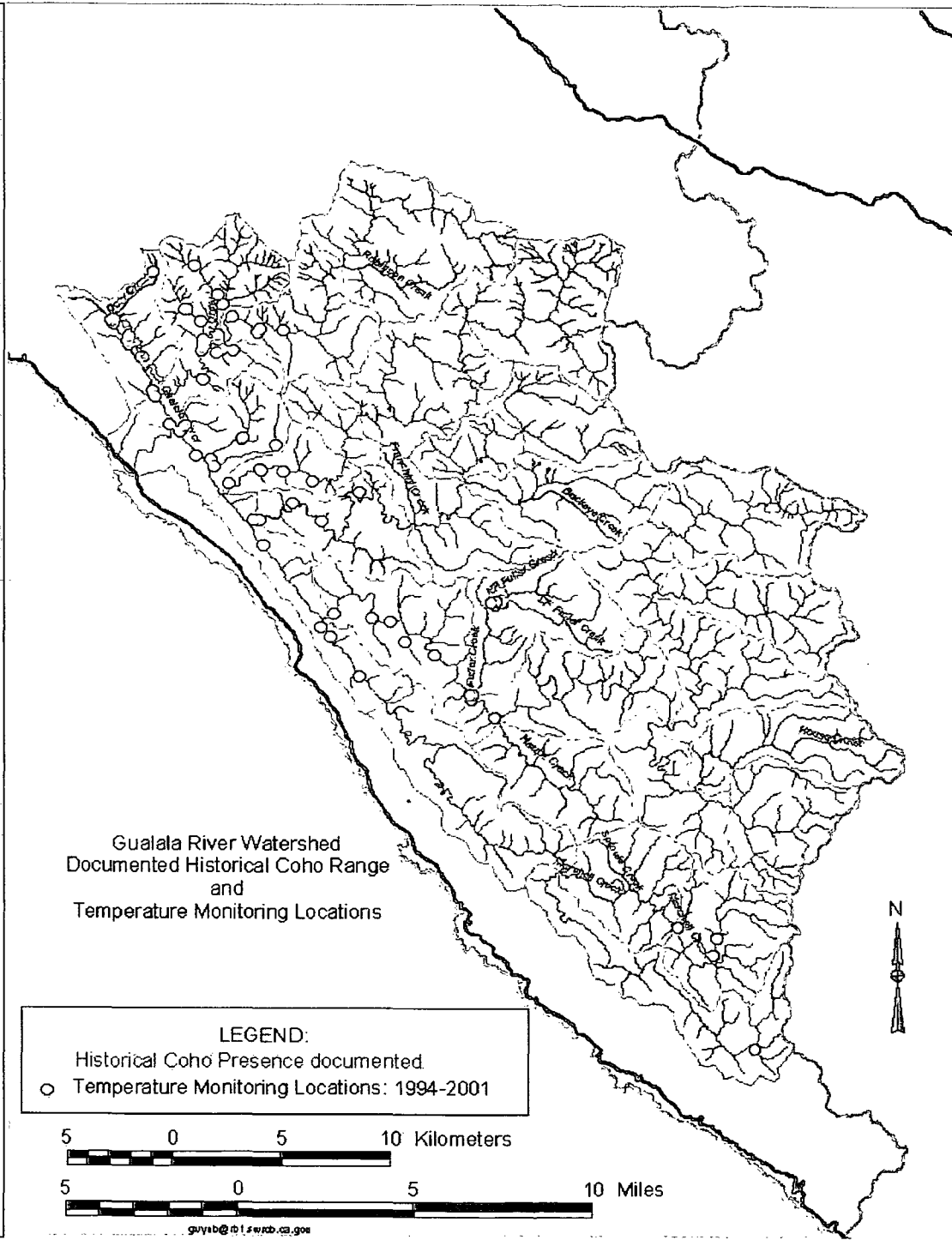
- Redwood Creek Temperature Monitoring
- △ Redwood Creek and tributaries (rR)
- Slopes (from RNSP)
 - 0 - 3%
 - 3.1 - 10%
 - >10%
- Documented Historic Salmonid Range
- Highways
- Redwood Creek Watershed
- Hydrologic Unit Ridgeline/Boundary



Redwood Creek MWATs



Sources: Simpson Timber Company and Forest Science Project



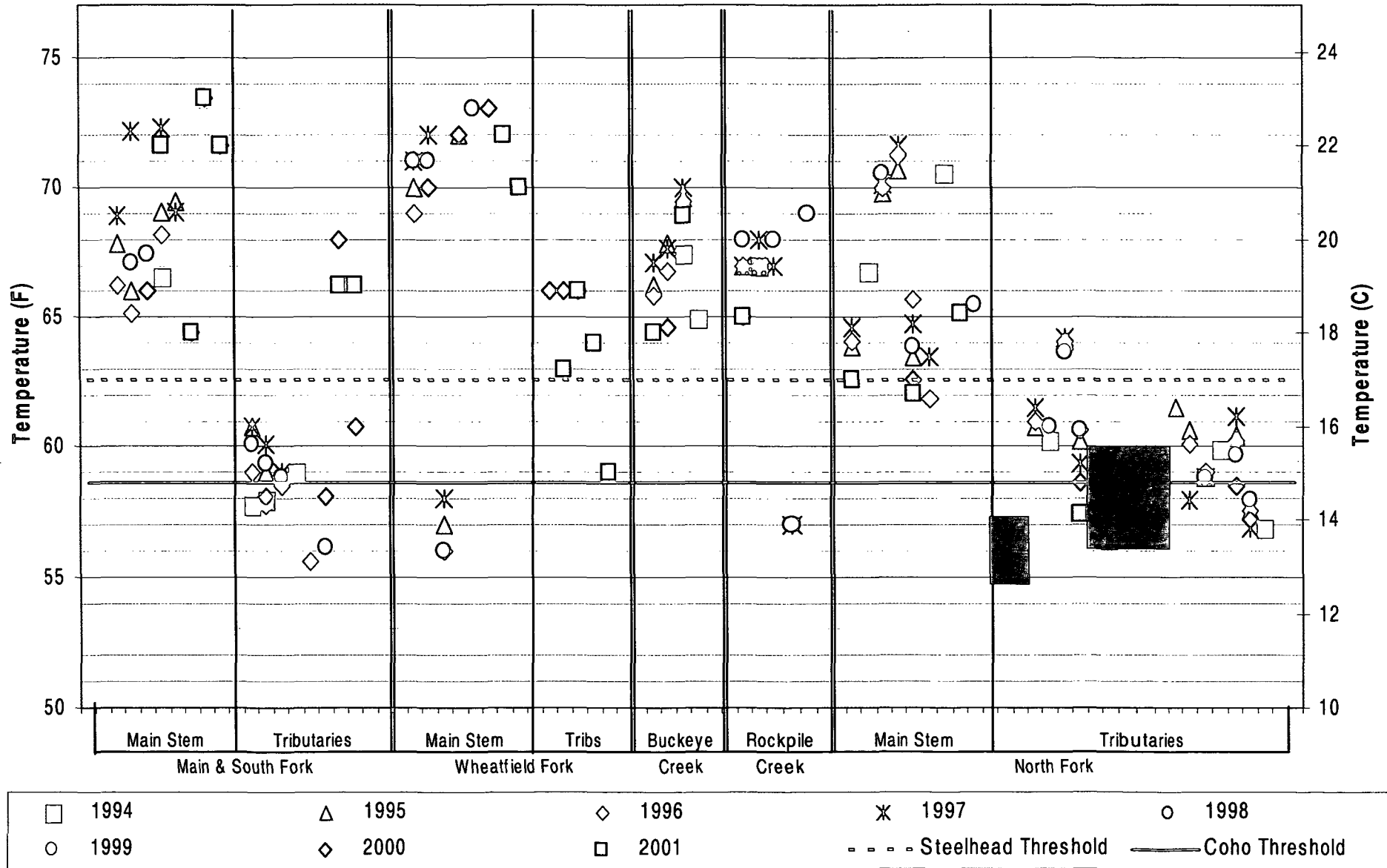
Gualala River Watershed
Documented Historical Coho Range
and
Temperature Monitoring Locations

LEGEND:
Historical Coho Presence documented
○ Temperature Monitoring Locations: 1994-2001

5 0 5 10 Kilometers

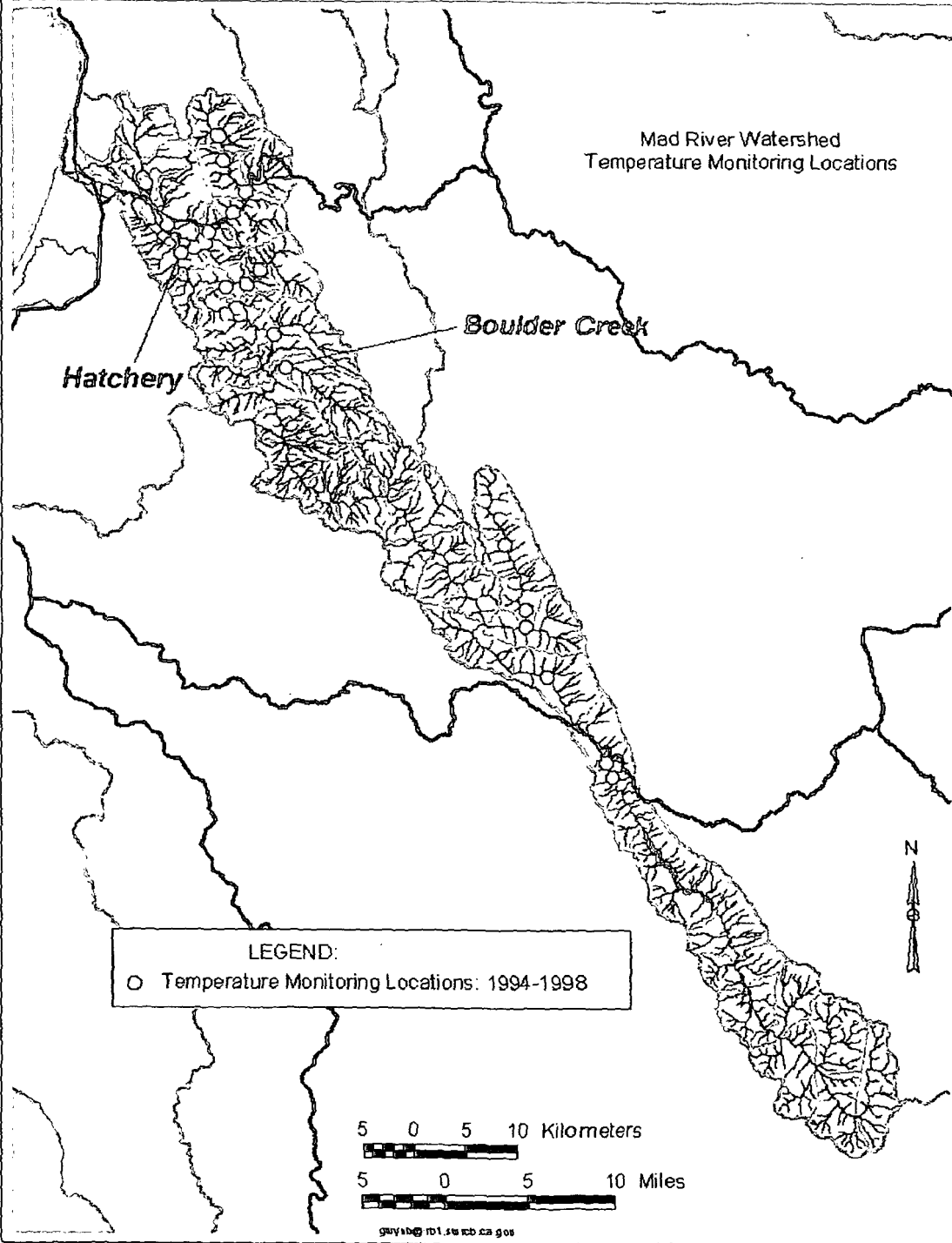
5 0 5 10 Miles

Gualala River MWATs



Sources: Gualala Redwoods Inc. and Gualala River Watershed Council

Mad River Watershed
Temperature Monitoring Locations



Hatchery

Boulder Creek

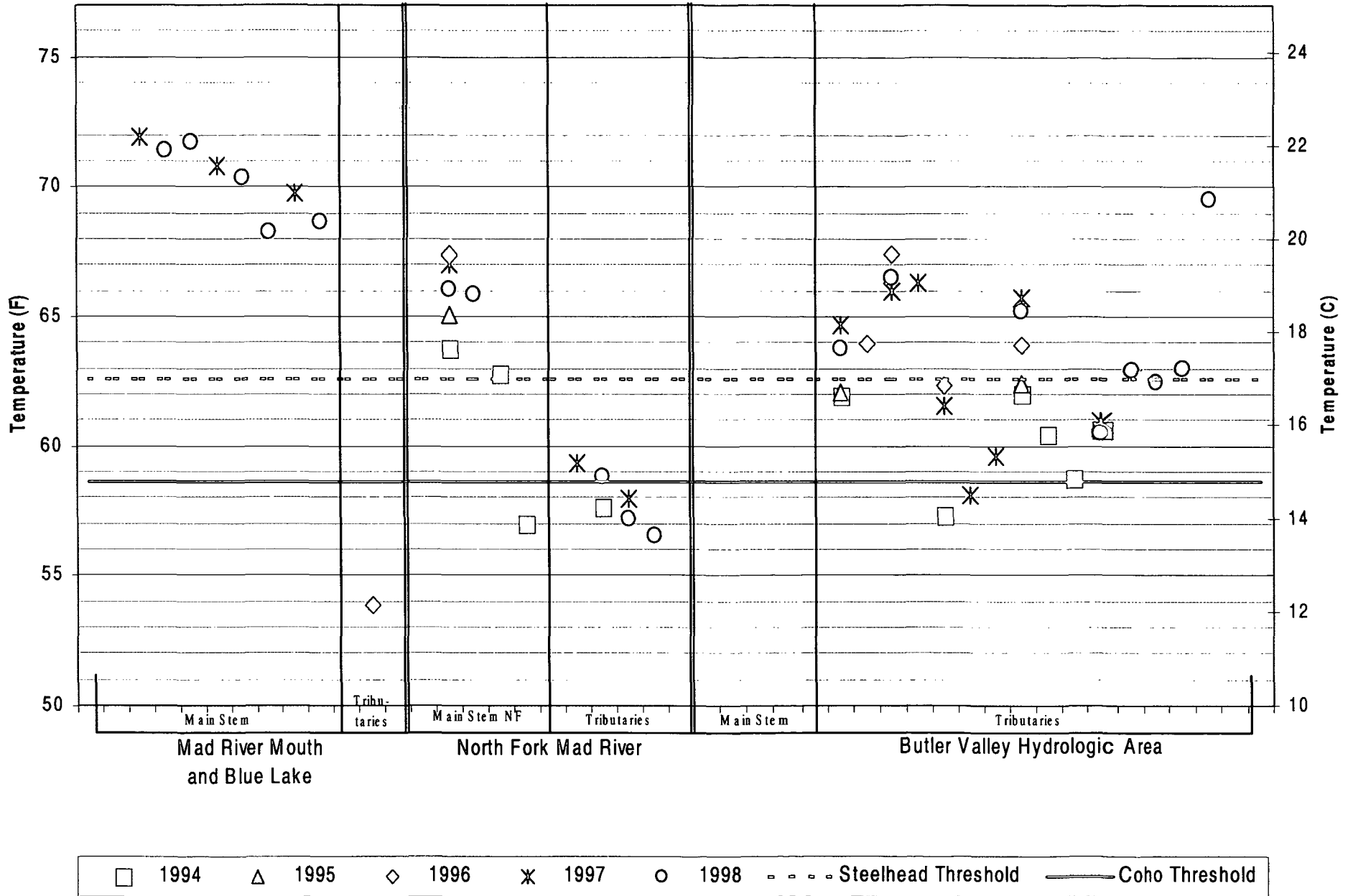
LEGEND:
○ Temperature Monitoring Locations: 1994-1998

5 0 5 10 Kilometers

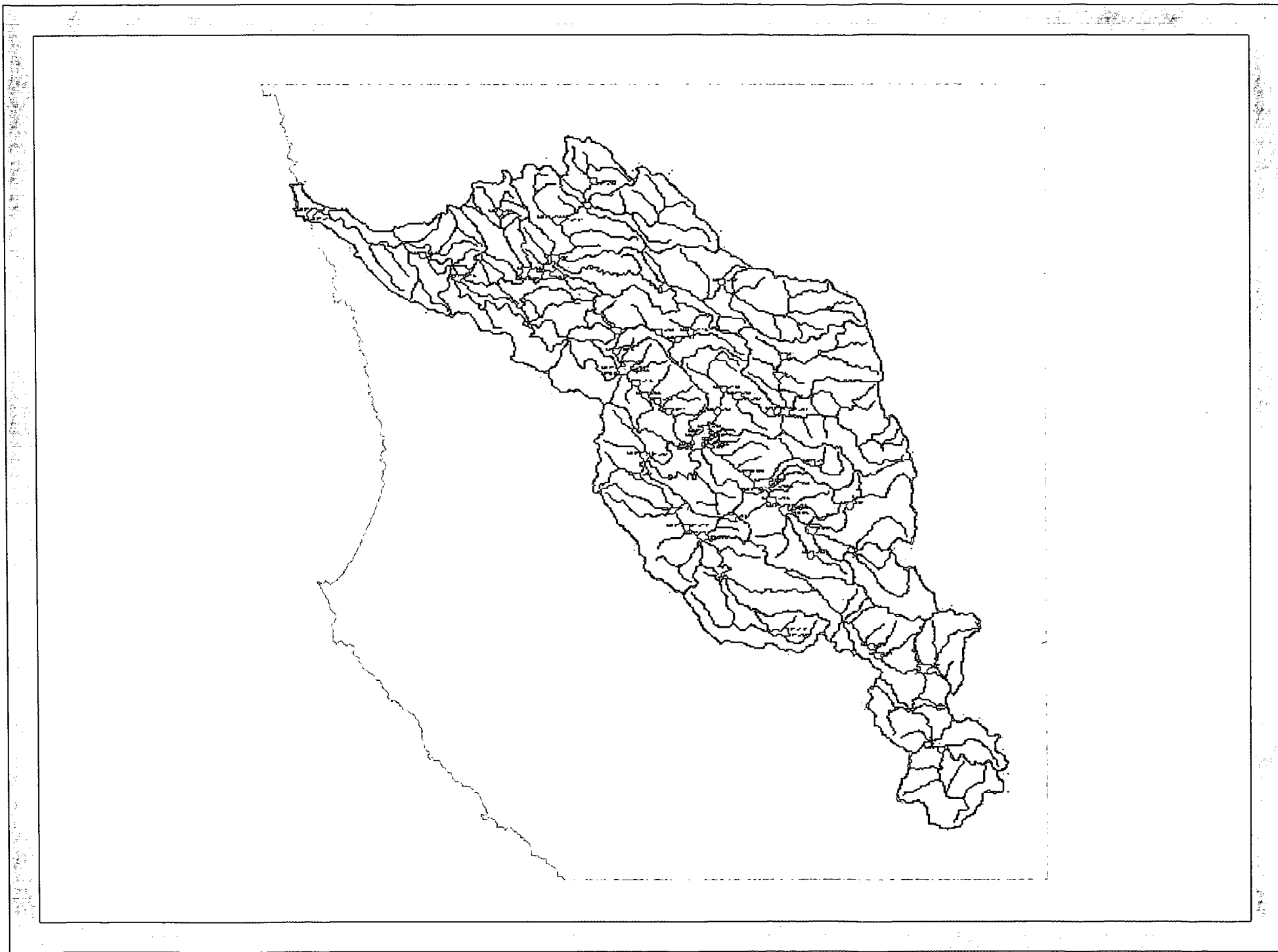
5 0 5 10 Miles

guyab@rd1.su.cb.ca.gov

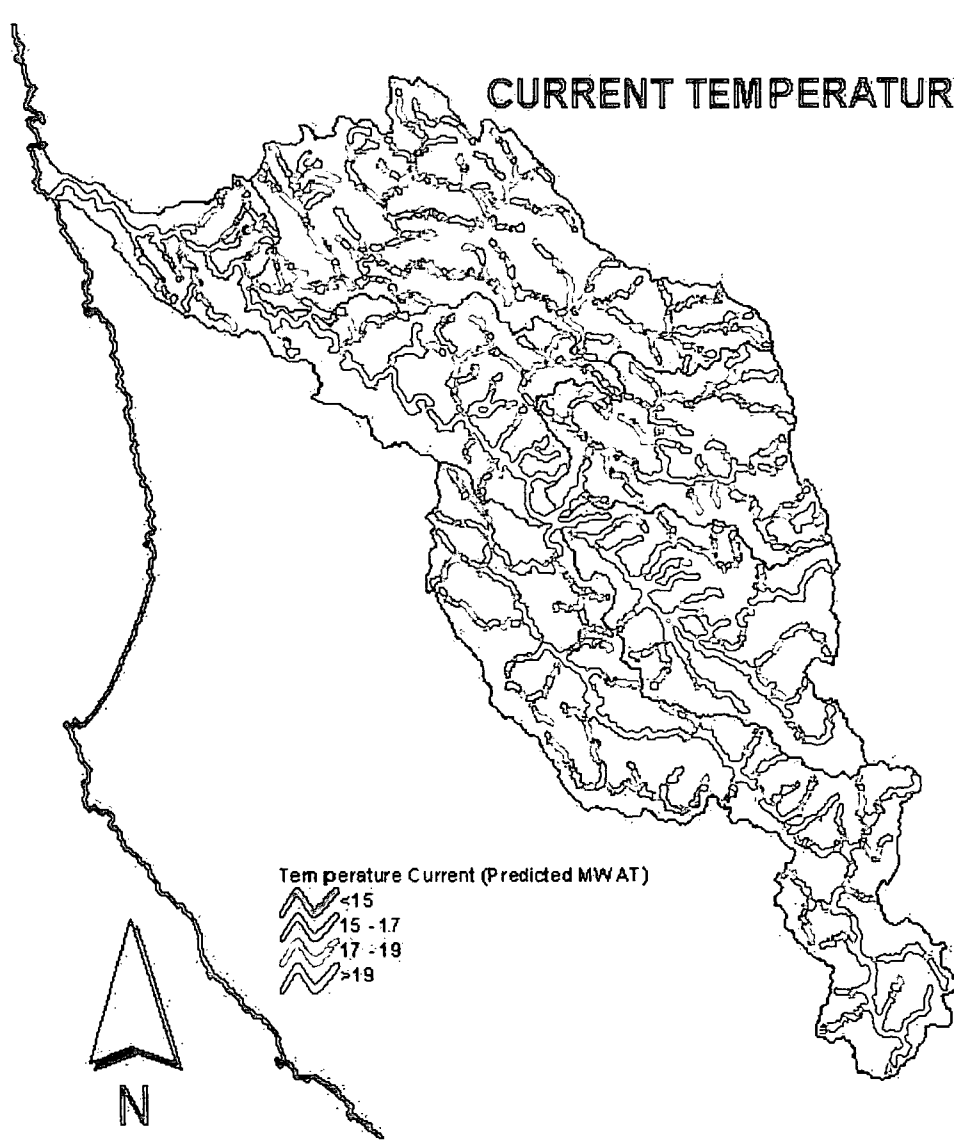
Mad River MWATs



Sources: Department of Fish and Game, Natural Resource Management, and Forest Science Project



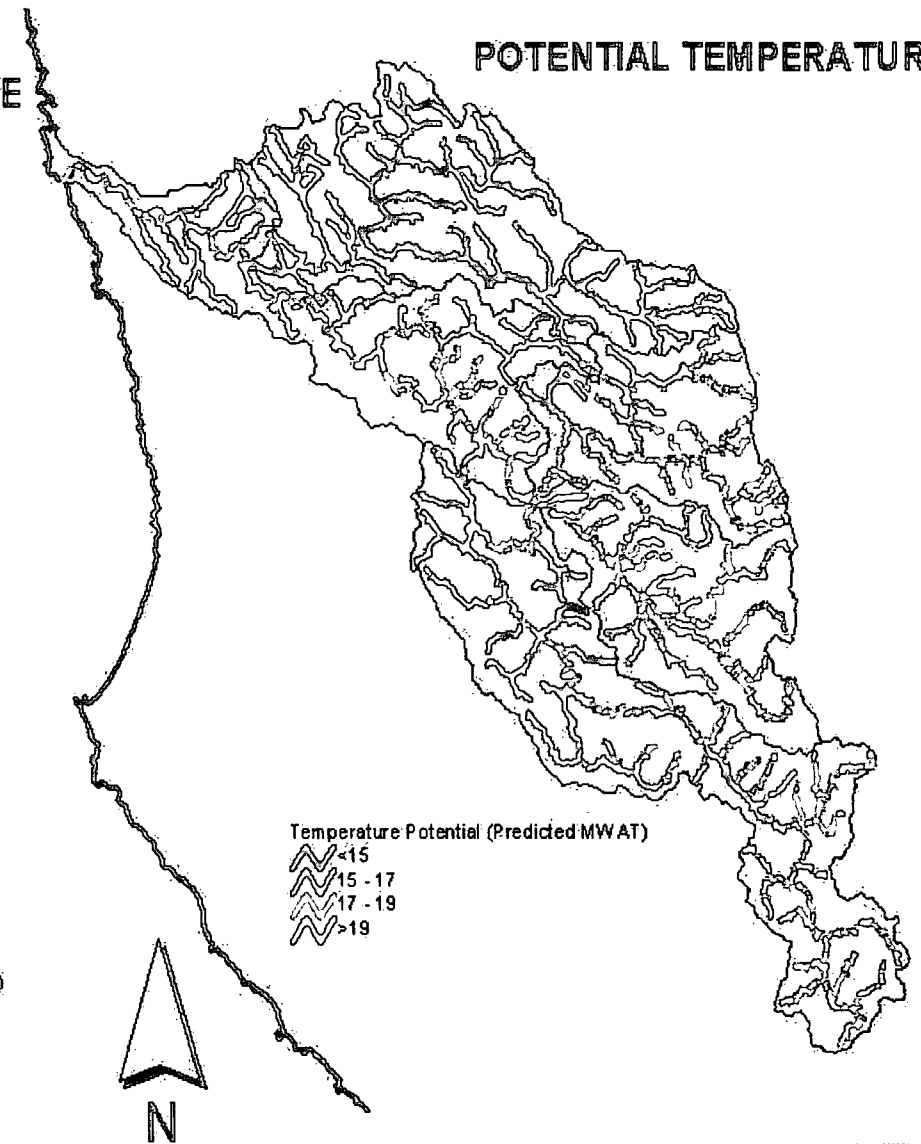
CURRENT TEMPERATURE



Temperature Current (Predicted MWAT)

- <15
- 15 - 17
- 17 - 19
- >19

POTENTIAL TEMPERATURE



Temperature Potential (Predicted MWAT)

- <15
- 15 - 17
- 17 - 19
- >19

Approach to Evaluating Sediment Impairment

1. Evaluated data with respect to Basin Plan objectives relevant to sediment:

Sediment: “The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.”

Settleable Material: “Water shall not contain substances in concentrations that result in deposition of material that causes nuisance or adversely affect beneficial uses.”

Turbidity: “Turbidity shall not be increased more than 20 percent above naturally occurring background levels.

Approach to Evaluating Sediment Impairment (cont.)

2. Evaluated data with respect to thresholds for determining properly functioning conditions for BU's
 - Standard measures for evaluating sediment conditions of streams, and measures for assessing impacts to salmonids
 - Peer-reviewed literature
 - Thresholds identified in adopted TMDLs
3. Considered anecdotal information

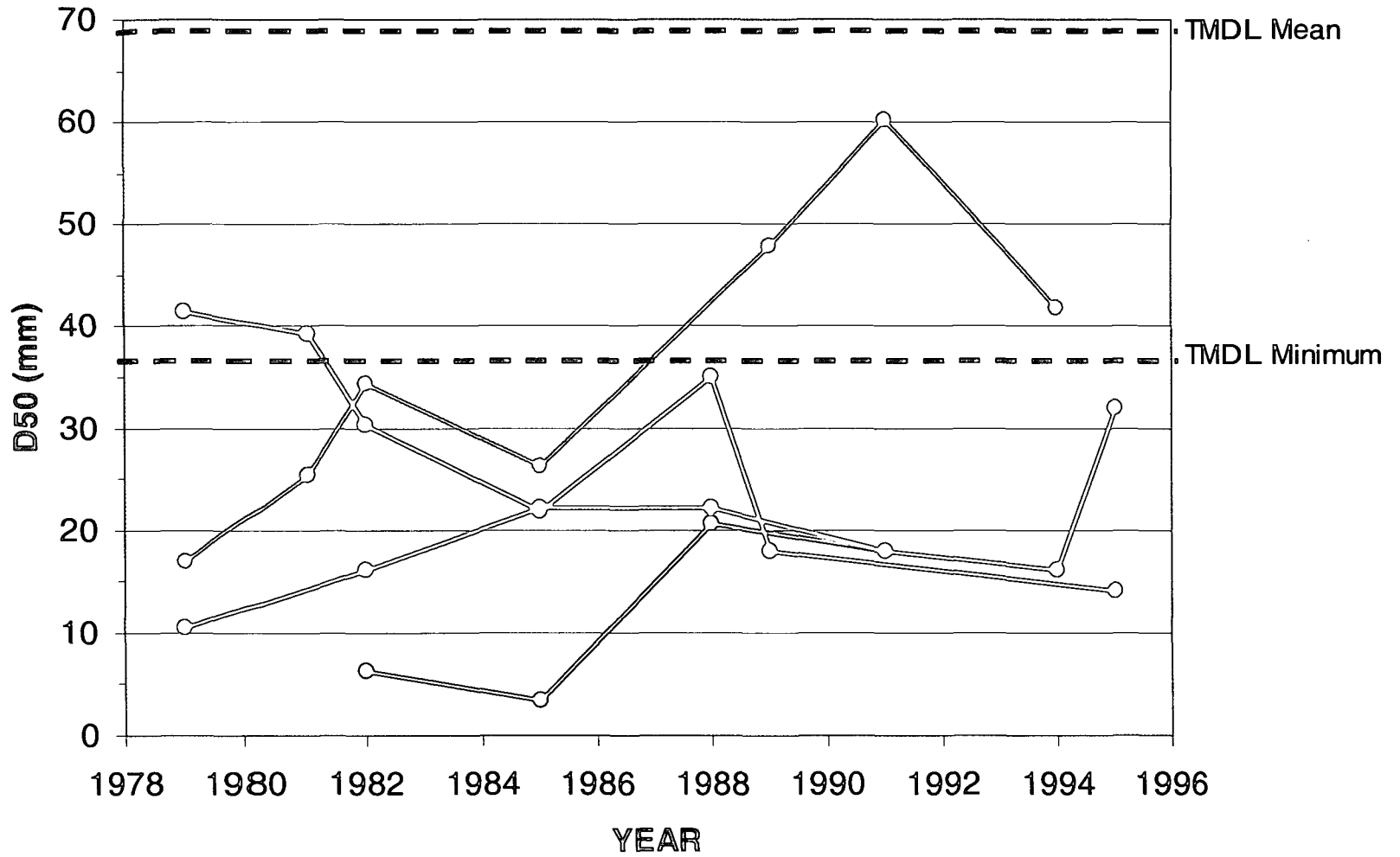
Redwood Creek

- 1992: Added to 303(d) List for sediment
- 1998: US EPA established TMDL
- 2002: Based on review of readily available data, staff concludes:
 - Continued evidence of sediment impairment, though some areas of Redwood Creek showing improvement
 - Continued threat of sedimentation
 - Staff recommends continued listing

Redwood Creek (cont.)

- In-stream conditions:
 - Percent fines and D_{50} data does not meet TMDL thresholds
 - Channel morphology is vulnerable due to sediment supply
 - Suspended sediment loads are not consistently meeting TMDL threshold
 - Suspended sediment concentrations at levels that impair salmonids
- Up-slope conditions:
 - Record of landslides in 1997
 - Road density

Median Particle Size at Redwood Creek Gaging Stations



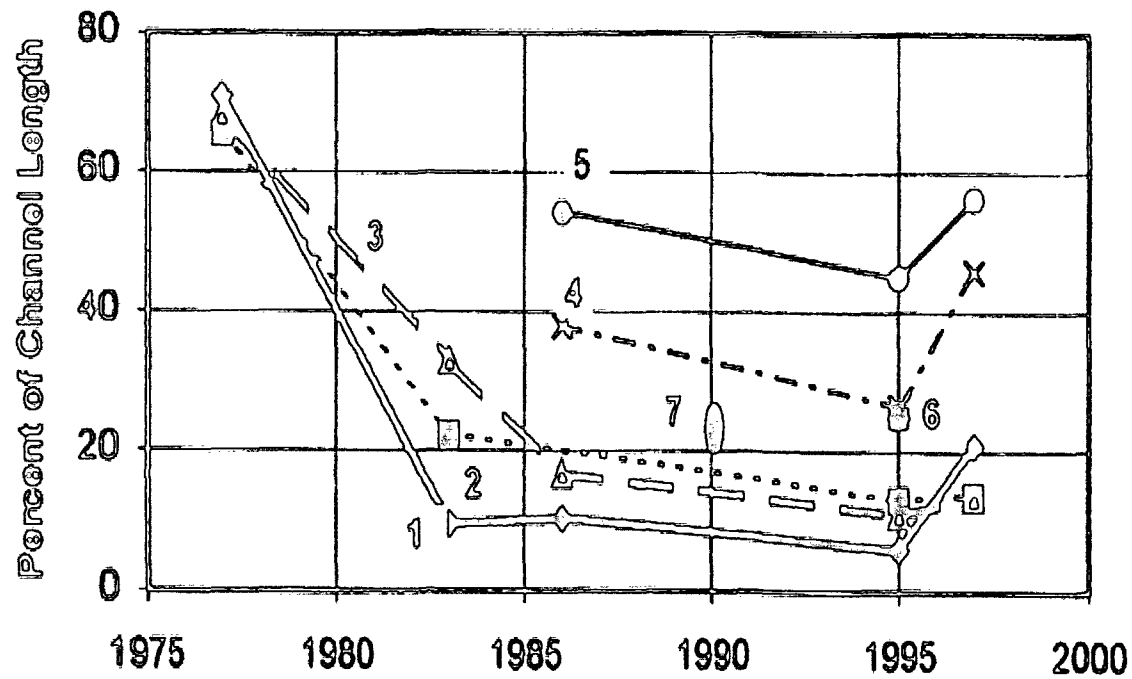
RWC at Miller Ck

 RWC at Weir Ck

 RWC at Panther Ck

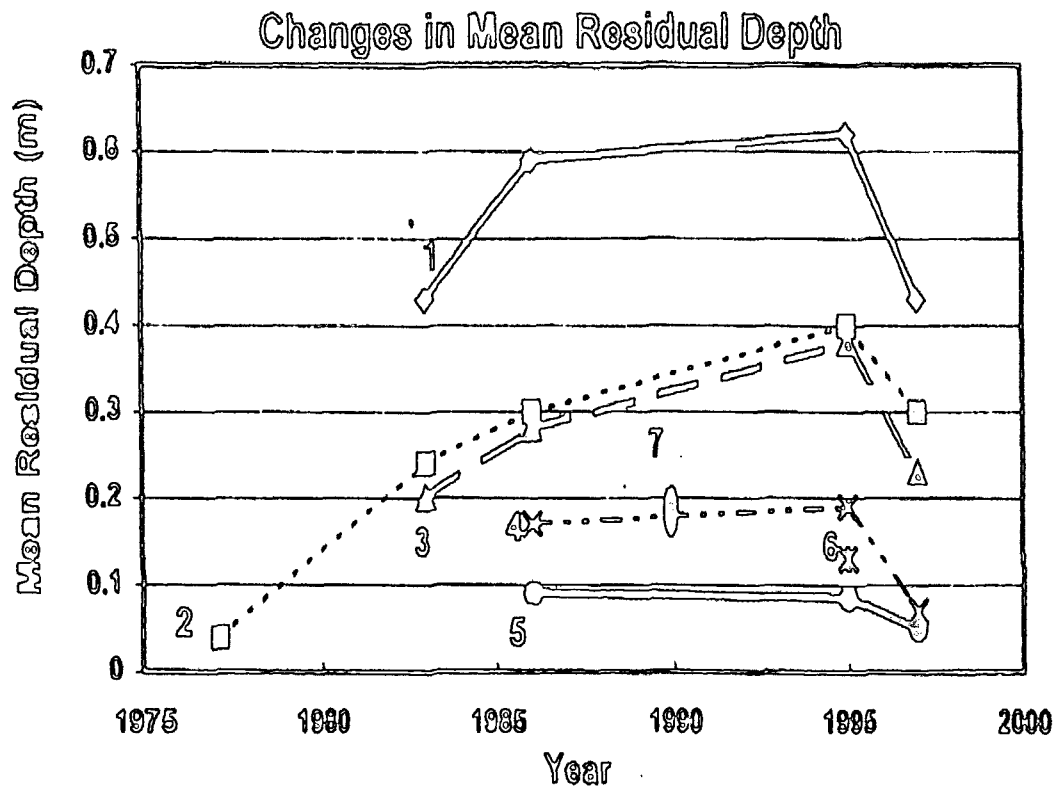
 RWC at O'Kane

Percent of Channel in Riffles



- Legend
- 1 Redwood Creek at Weir Creek
 - 2 Redwood Creek at Bond Creek
 - 3 Redwood Creek at Elam Creek
 - 4 Upper Bridge Creek
 - 5 Lower Bridge Creek
 - 6 Bridge Creek Canyon
 - 7 Lost Man Creek

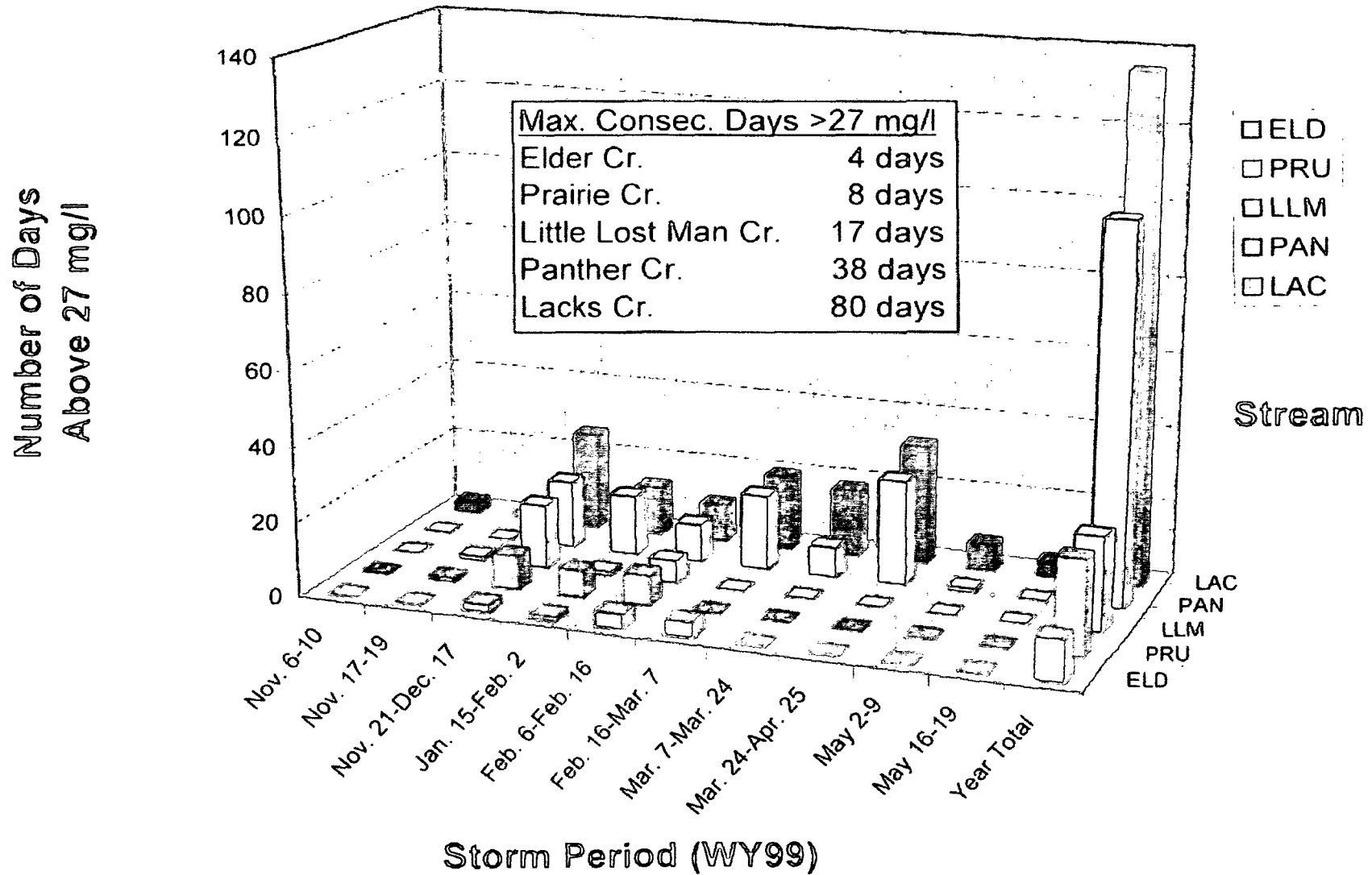
Source: USGS



- #### Legend
- 1 Redwood Creek at Weir Creek
 - 2 Redwood Creek at Bond Creek
 - 3 Redwood Creek at Elam Creek
 - 4 Upper Bridge Creek
 - 5 Lower Bridge Creek
 - 6 Bridge Creek Canyon
 - 7 Lost Man Creek

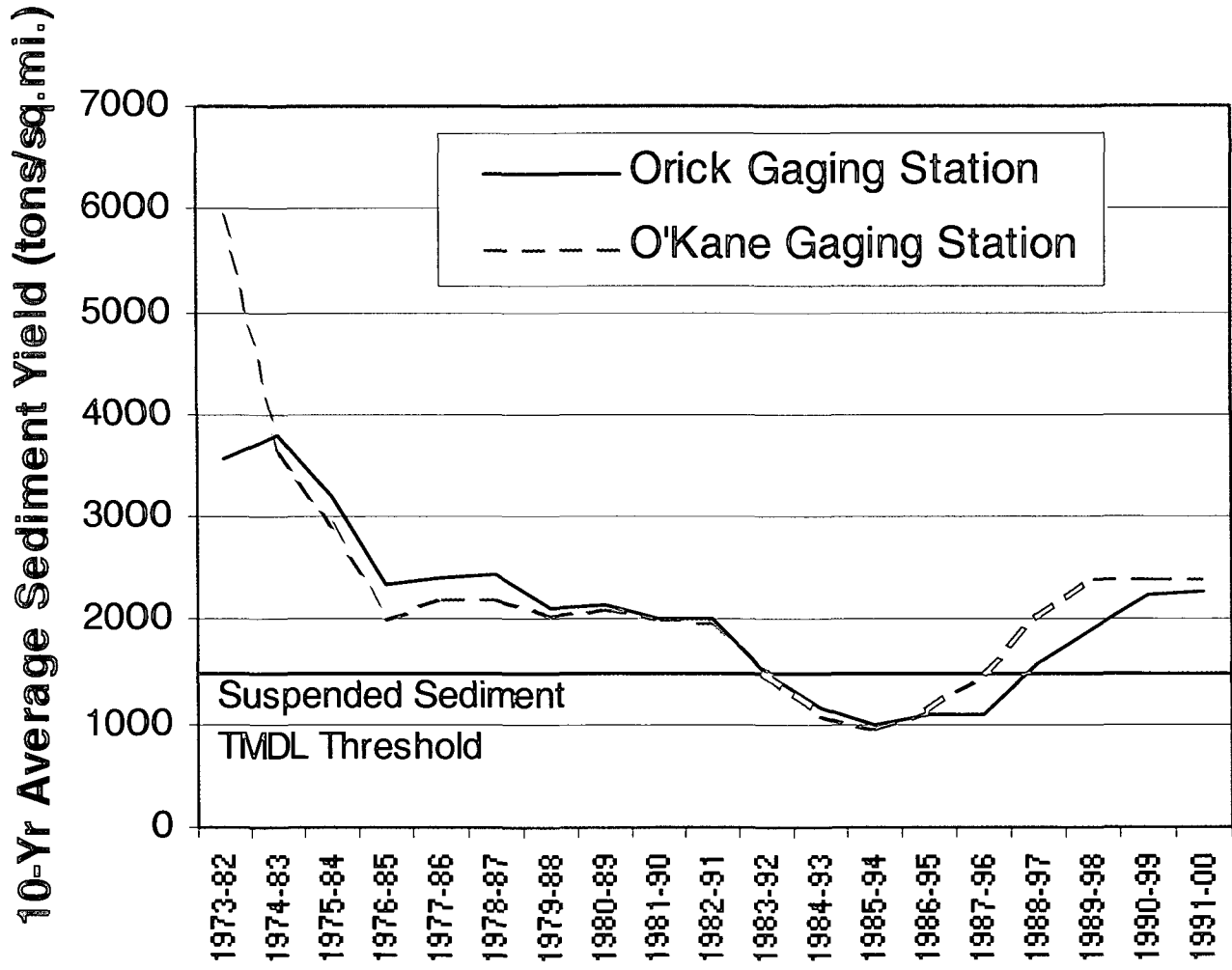
Source: USGS

Number of Days SSC Above 27 mg/l for Five Northcoast Streams, WY99

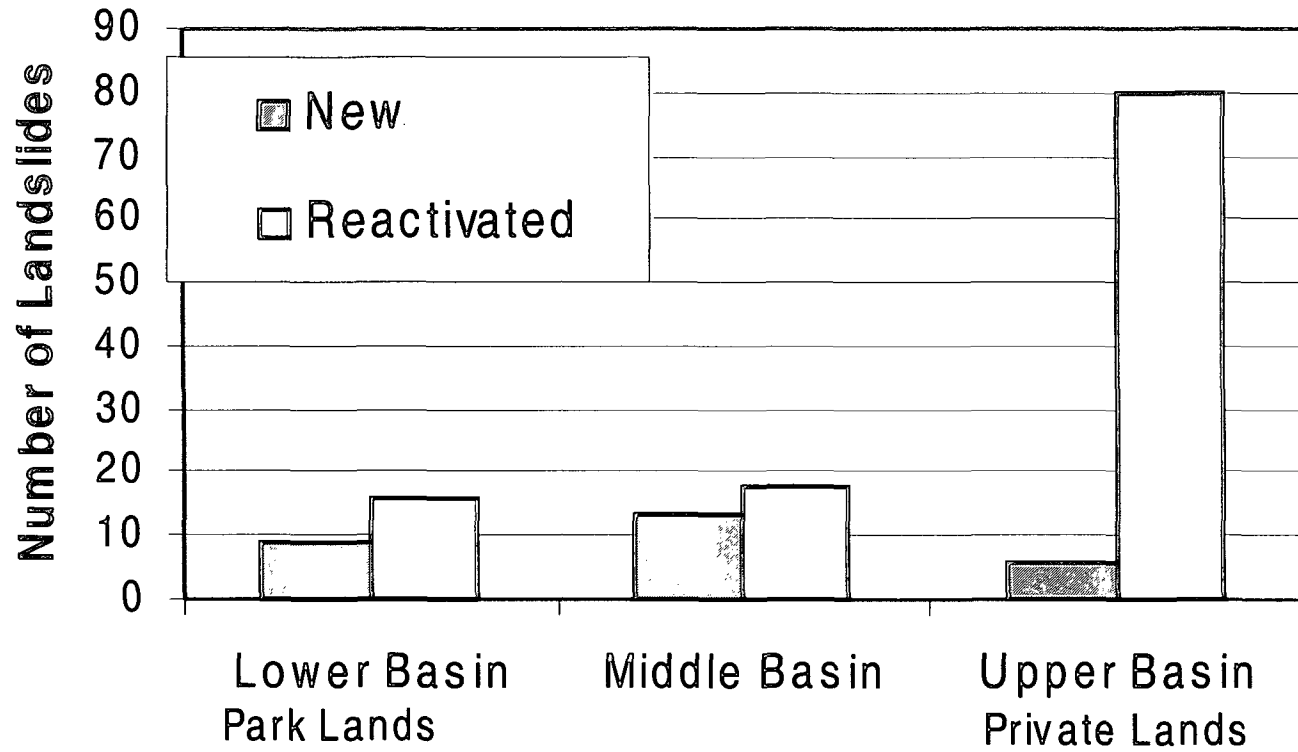


Source: RNP

Ten-Year Rolling Average for Suspended Sediment Yield Redwood Creek



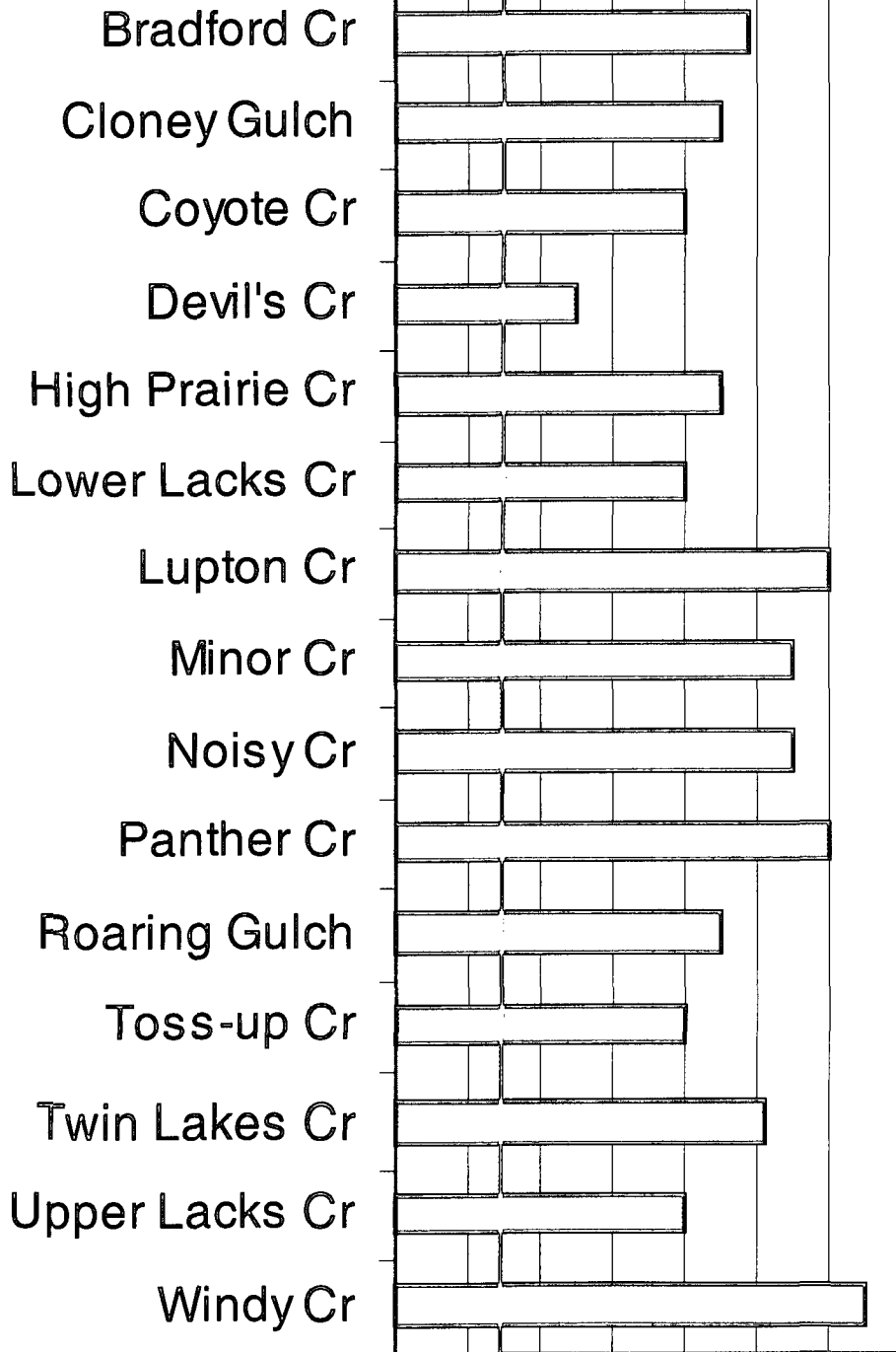
Redwood Creek Mainstem Landslides, 1997



Source: USGS

Road Density (Mi./Sq.Mi.)

0 2 4 6 8 10 12 14



Middle and Upper Redwood Creek Road Density

Status of Roads Within Redwood Creek

<u>Miles</u>	<u>Redwood Ntl. Park</u>	<u>Private Land</u>
Total	436	1200
Assessed	436	1039
Upgraded	73	27
Decommissioned	222	20

Source: Redwood Ntl. Park

Redwood Creek Landowners Assoc. Downstream Migrant Fish Trap Studies

- 2000 and 2001 studies have been completed
- The studies will be discussed in more detail at the February Board meeting
- Regional Water Board staff has reviewed 2000 data
- The 2000 results are encouraging for juvenile chinook
- One years worth of data on a single life stage is not sufficient information to warrant de-listing

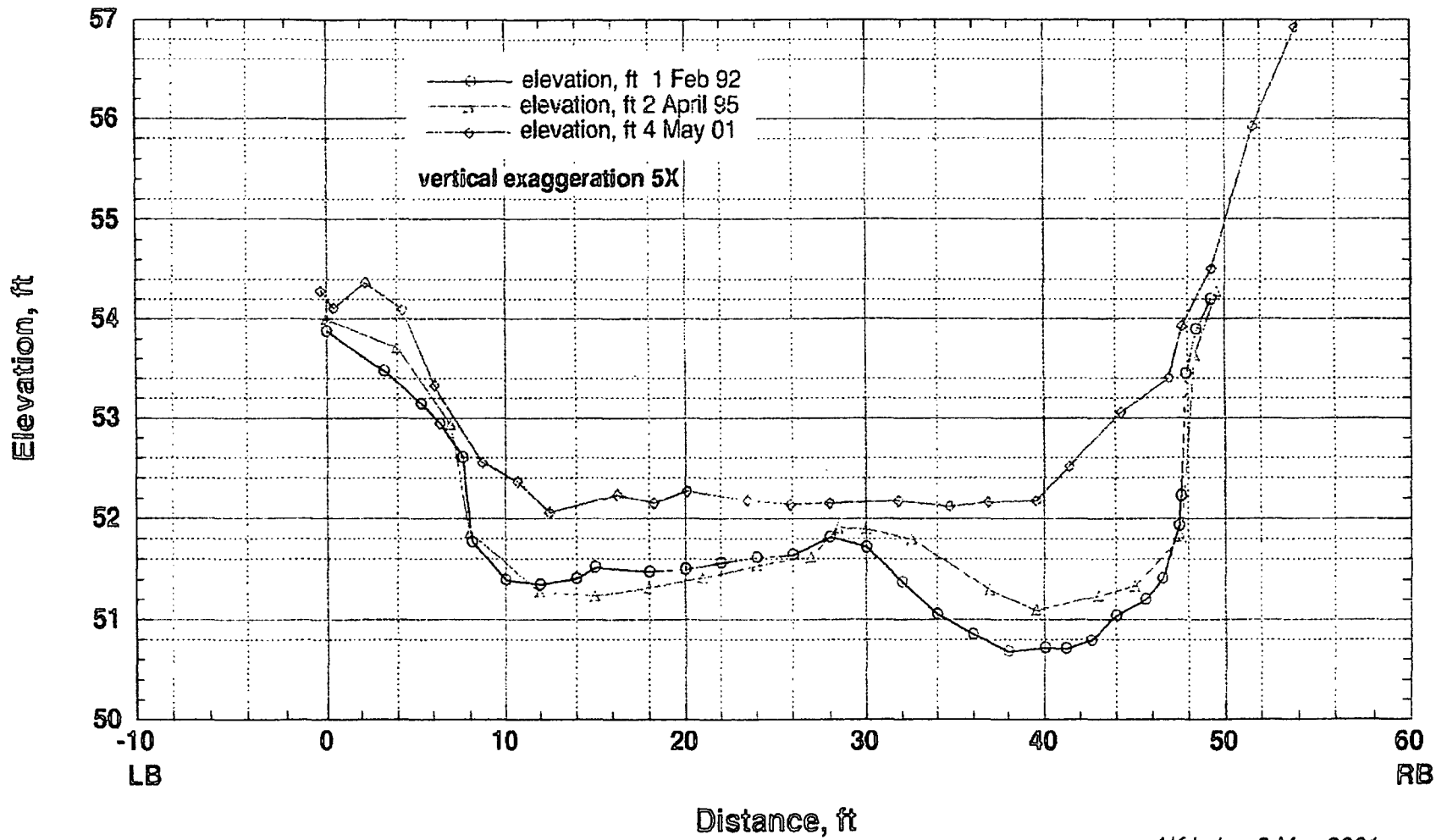
Redwood Creek - Conclusions

- TMDL thresholds for fine sediment, channel morphology, and suspended sediment load are not being met
- Channel morphology is vulnerable to sediment supply
- Upslope conditions in upper watershed present threat of sedimentation
- Beneficial uses are impaired by sediment
- Continued listing of Redwood Creek for Sediment is warranted

Jacoby Creek

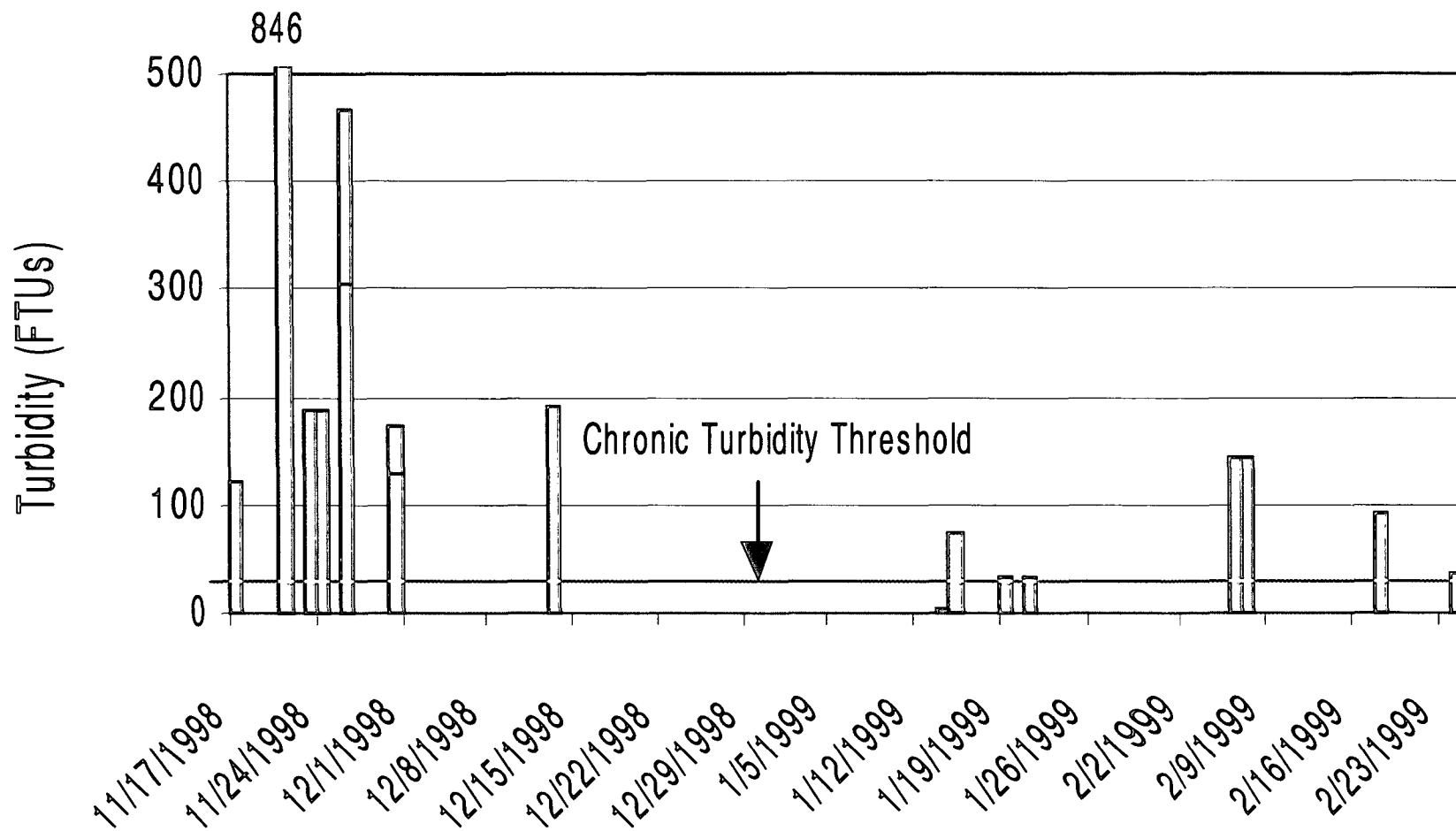
- Anecdotal information from long-time residents of watershed:
 - Creek runs brown during small/short storms, when it did not do so in past
 - Creek runs brown well after rainfall stops
 - Increased frequency of flooding
 - Pools have been filled in by sediment
 - Incidence of debris slides doubled between 1941 and 1978 (aerial photo review)
 - Sedimentation at mouth of creek causing loss of brackish marsh habitat
 - Water supply effected by turbidity levels

Jacoby Cr XS1
(approximately 75 ft upstream from covered bridge)
1992 - 2001



AK Lehre 8 May 2001

Grab Sample Turbidity Measurements of Jacoby Creek at Old Arcata Road



Stemple Creek/Estero de San Antonio

- Proposed for listing in 1990
 - Identified sedimentation, low DO, and high ammonia as cause of impairment
- 1996 specific stressors included on 303(d) List
 - Listed for Nutrients
- 1997 TMDL approved
 - Addressed nutrient and sediment impairment
- 2002: Amend List to include Sediment, to be consistent with original intent of listing

Laguna de Santa Rosa

- Listed in 1990 for Ammonia and Dissolved Oxygen
- US EPA approved TMDL in 1995
- Laguna de Santa Rosa removed from 303(d) List for Ammonia and Dissolved Oxygen by US EPA in 1998
- TMDL goals for unionized ammonia are being met
- TMDL goals for DO are consistently not being met
- Low DO attributed to organic matter and nutrients
- Staff recommends adding Laguna de Santa Rosa to 303(d) List for DO and Nutrients

Tule Lake and Lower Klamath Lake

- Attempt to make listings consistent with Oregon
- pH WQO exceedance 1992-1996
- Recommend adding to List for pH