Anadromous Salmonid Protection Rule Package— OVERVIEW PRESENTATION

Training Workshops

January 26-28, 2010*

*Revised following development of the final ASP Q&A Document dated April 2, 2010

Outline

1. Background information.
2. Application of the ASP Rules.
3. Geographic scope.
4. Class I watercourse protection, including FPAs and CMZs.
5. Class II-L determination.
6. Class III changes.
7. Miscellaneous road-related considerations.
8. Site specific proposals.
9. Final Thoughts.

1. Background Information

Purpose of ASP Guidance Document and PPT

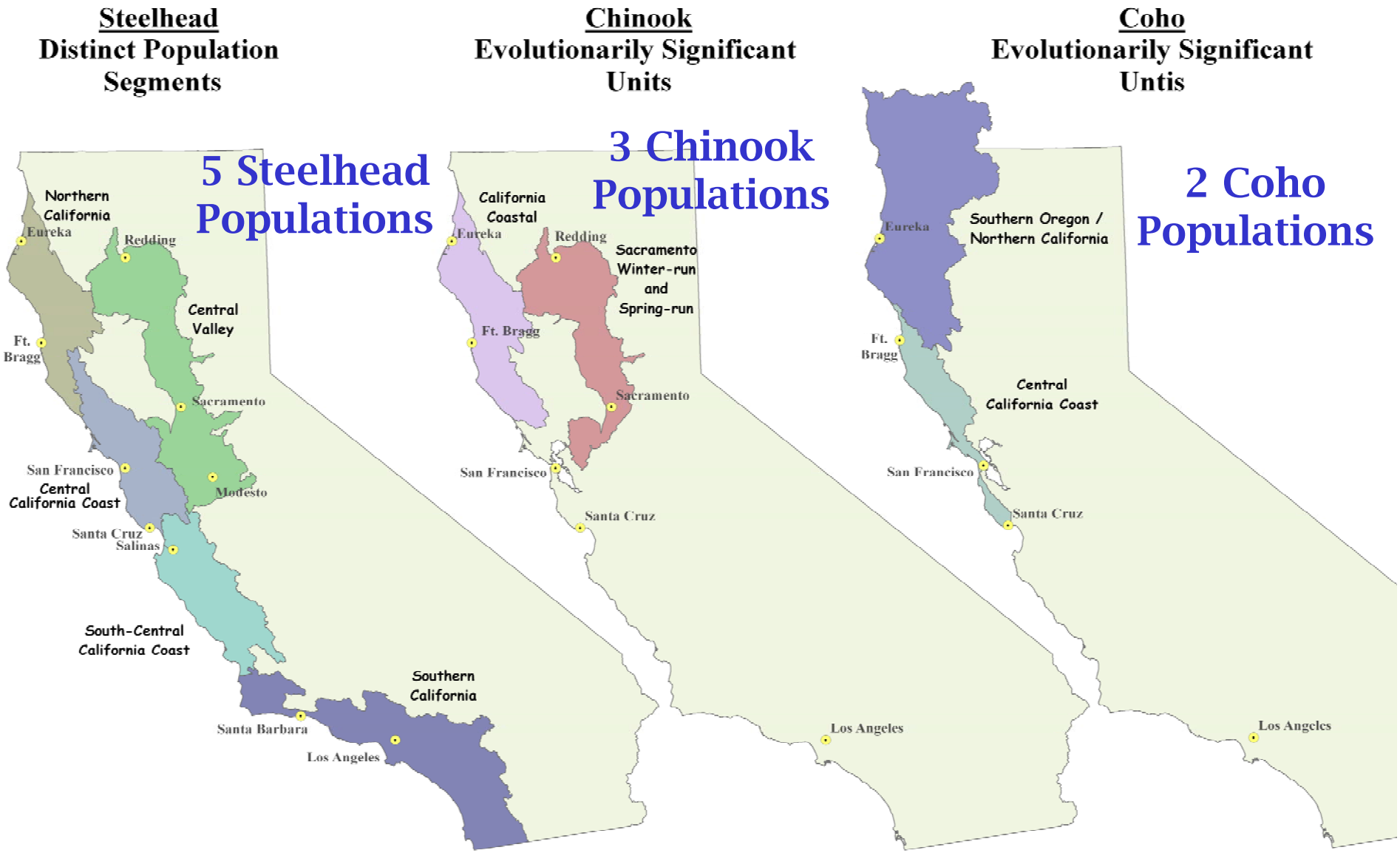
- To provide RPFs and landowners with answers to ***interpretive questions*** regarding the ASP rules that were generated by both RPFs and agency personnel.
- It is **NOT** intended to establish policies outside of those adopted by the Board.
- The **ASP rules themselves are the standards**; this PPT and associated guidance document only attempt to provide insight into the application of these rules.

ASP Rules Goal

- The ASP rules are intended to protect, maintain, and improve riparian habitats for state and federally listed anadromous salmonid species.
- These rules are permanent regulations.
- They replace the interim Threatened or Impaired Watershed Rules (T/I rules).

Coho Salmon—

Federally Listed in California since 1996



In California there are 10 Populations of Salmon and Steelhead Listed as Federally Threatened or Endangered with Extinction

Image: NOAA Fisheries

Very Short History of T/I Rules and ASP Rules Regulatory Process

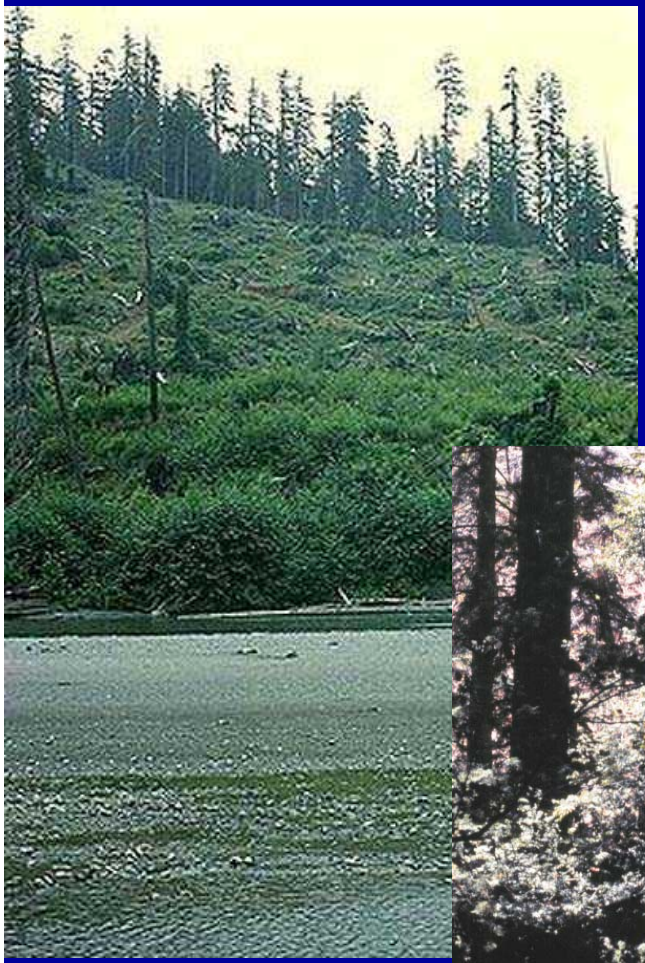
- Interim T or I Rules adopted by BOF in July 2000.
- Interim T or I Rules readopted 6 times.
- 2006—stakeholder agreement to undertake science-based revision of T or I Rules.
- BOF forms TAC in Fall 2006 for oversight of a contract to review literature on riparian buffers and functions. 5 primers written by TAC on key riparian functions.
- SWC finishes Riparian Function literature review Sept 2008; BOF expert forum Oct 2008.
- BOF FPC agrees to have CAL FIRE team begin process of transferring science review to revised rules (Nov 2008).
- BOF's FPC refines tentative ASP rule language several times (Dec 2008—June 2009).
- 2112 coho incidental take rules [14 CCR § 916.9.2 and 923.9.2] removed by court—Sept 2009 [no longer apply--but still in Forest Practice rulebook]
- BOF adopts re-noticed ASP rules at Sept 2009 meeting.

Key Changes with the ASP Rules

- New **geographic scope** element.
- Refinement of **Class I WLPZ width** and protection requirements.
- Protection for **Class I flood prone areas and CMZs**.
- Added protection for **large Class II** watercourses connected to Class I's ("biological hotspot").
- Added protection for **small headwater streams** to ensure bank stability and wood to slow sediment movement downstream.
- Incorporation of a **site-specific approach**.

Example of Changes in FPRs—
Class I Fish-Bearing Buffer Strips

Redwood Creek in the 1960's



Big River--late 1970's

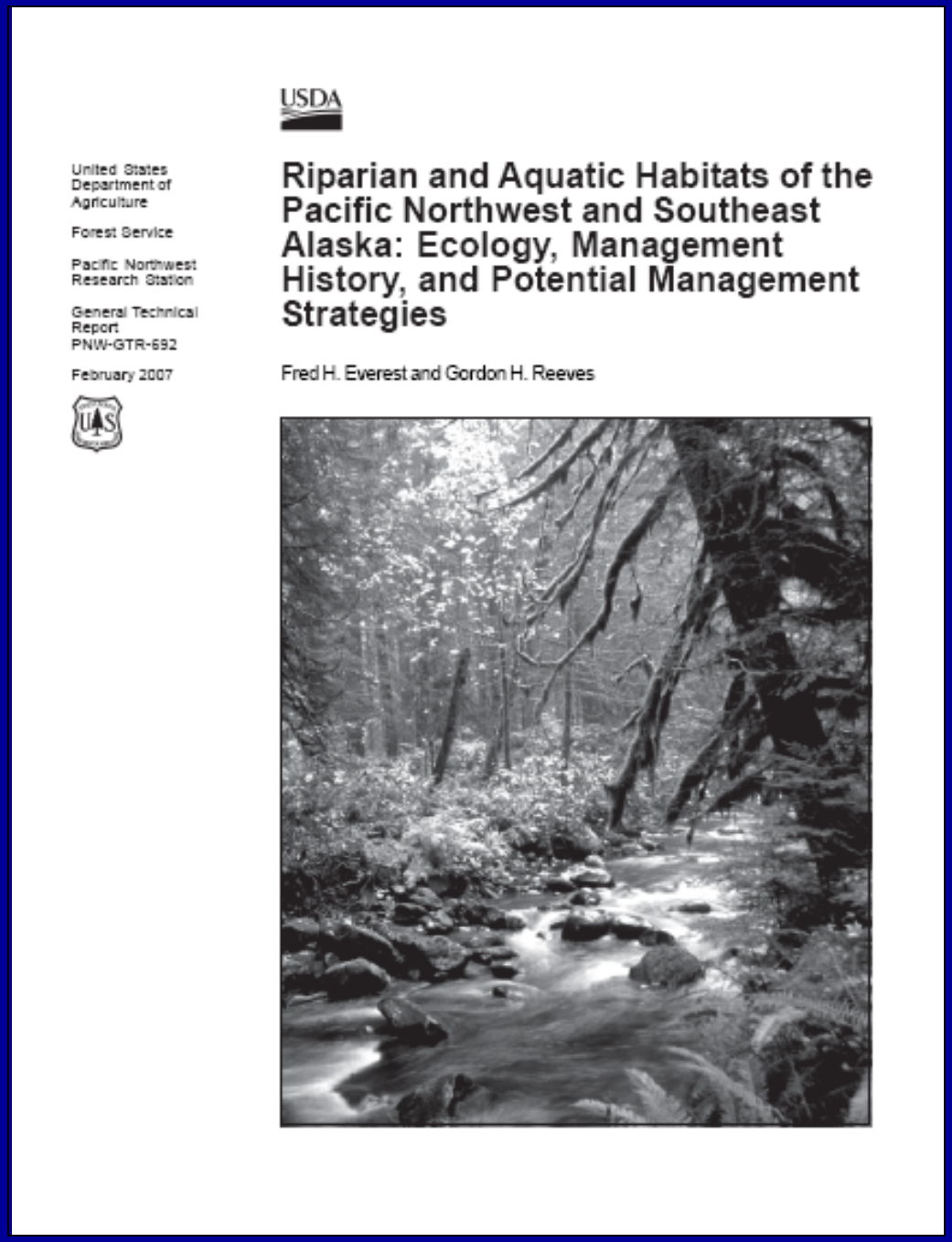
Big River in 2005

Changes in FPRs—Class I Fish-Bearing Buffer Strips

Year	Buffer Strip Width (ft)
Before 1974	0 (no protection)
1974-1983	100 ft (50% canopy)
1983-1991	50-200 ft (50% canopy), depending on side slope, yarding system
1991-2000	75-150 ft (50% canopy), depending on side slope, yarding system
July 2000 to December 2009 (watersheds with listed anadromous fish species)	150 ft (first 75 ft—85% overstory canopy cover; second 75 ft—65% canopy cover)
January 2010 (Coastal Anadromy Zone)	100-150 ft (0-30 ft no-cut, 30-100 ft—80/70% overstory canopy, 100-150 ft 50% canopy if even-aged mgt contiguous to WLPZ)

Why have these Riparian WLPZ/ Buffer Strip Requirements Changed over Time?

- **The goal over the past 35 years--find the minimum width of buffer strips that would adequately protect riparian and aquatic habitats.**
- **The several revisions have provided progressively more protection over time.**
- **Changes made due to improved understanding over time that the existing Forest Practice Rules require upgrading to meet stated goals for riparian protection based on current science.**
- **A similar rule revision/rule upgrading process has occurred in OR, WA, AK, and on federal timberlands.**



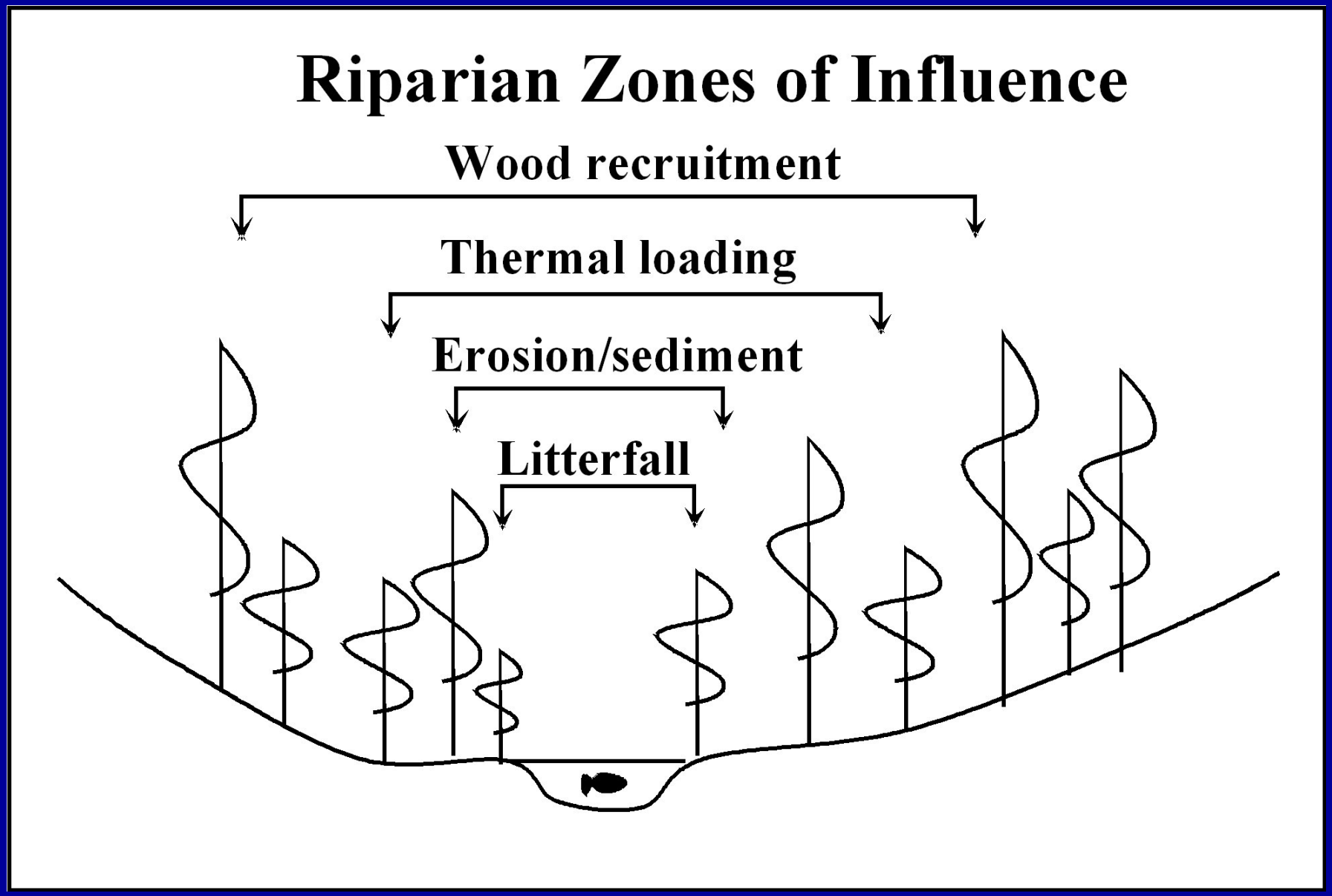
Excellent Summary of the Scientific Literature Regarding Riparian Ecosystems

Everest and Reeves 2007

Riparian Ecosystem Functions

ASP Rules Designed to Maintain/Restore these Functions:

- Large wood input into fish-bearing and larger non fish-bearing streams.
- Wood input into headwater streams for sediment retention and metering.
- Watercourse shading.
- Sediment filtration.
- Nutrient input.
- Maintenance of streambank and streambed stability.
- Maintenance of favorable microclimates for riparian-dependent species.
- Habitat for many terrestrial wildlife species.
- Floodplain function.



Source Distance Concept

Image: Dr. Lee Benda

Example of Large Wood in a Stream Channel

California-all Regions Combined, Older Forests (Average)

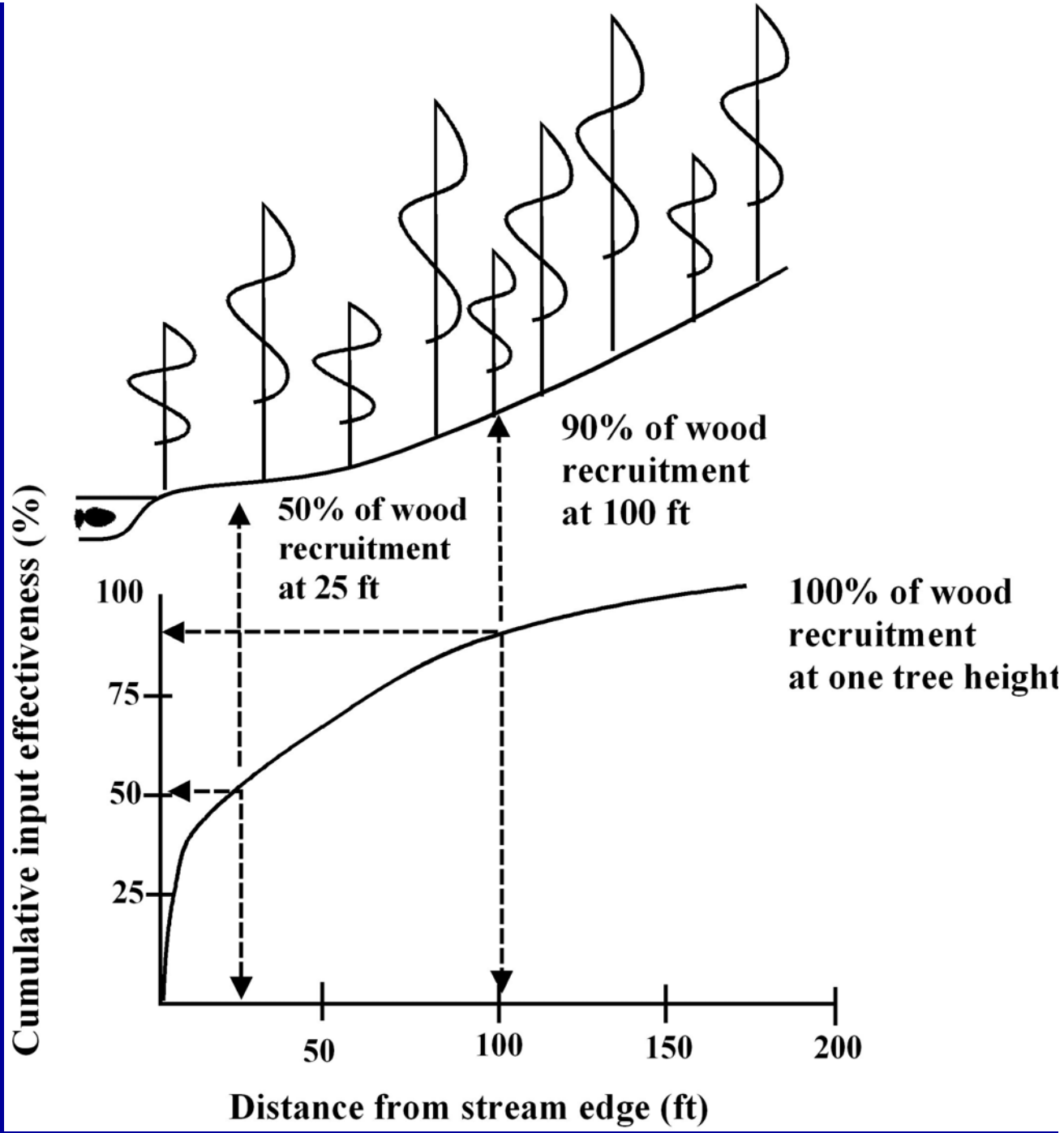


Image: Dr. Lee Benda

Images: Dr. Lee Benda

“Key pieces” Primarily Recruited by Bank Erosion – Selective Harvest can Threaten that Source

Why Do We Need Enhanced Buffers for Non-Fish Bearing Headwater Channels?

- Wood input (large and small) for sediment retention and metering in headwater channels.
- Bank stability.
- In systems with landslide processes, wood input down into fish-bearing waters.
- Thermal loading into fish-bearing waters.
- Nutrient input for the aquatic food chain.
- Litter fall and soil cover in buffer strips to prevent hillslope erosion and sediment delivery.

2. Application of the ASP Rules

Old Plans Submitted in 2009, Accepted for Filing and Currently under Review—Need to be Brought into Conformance with ASP Rules Prior to Approval?

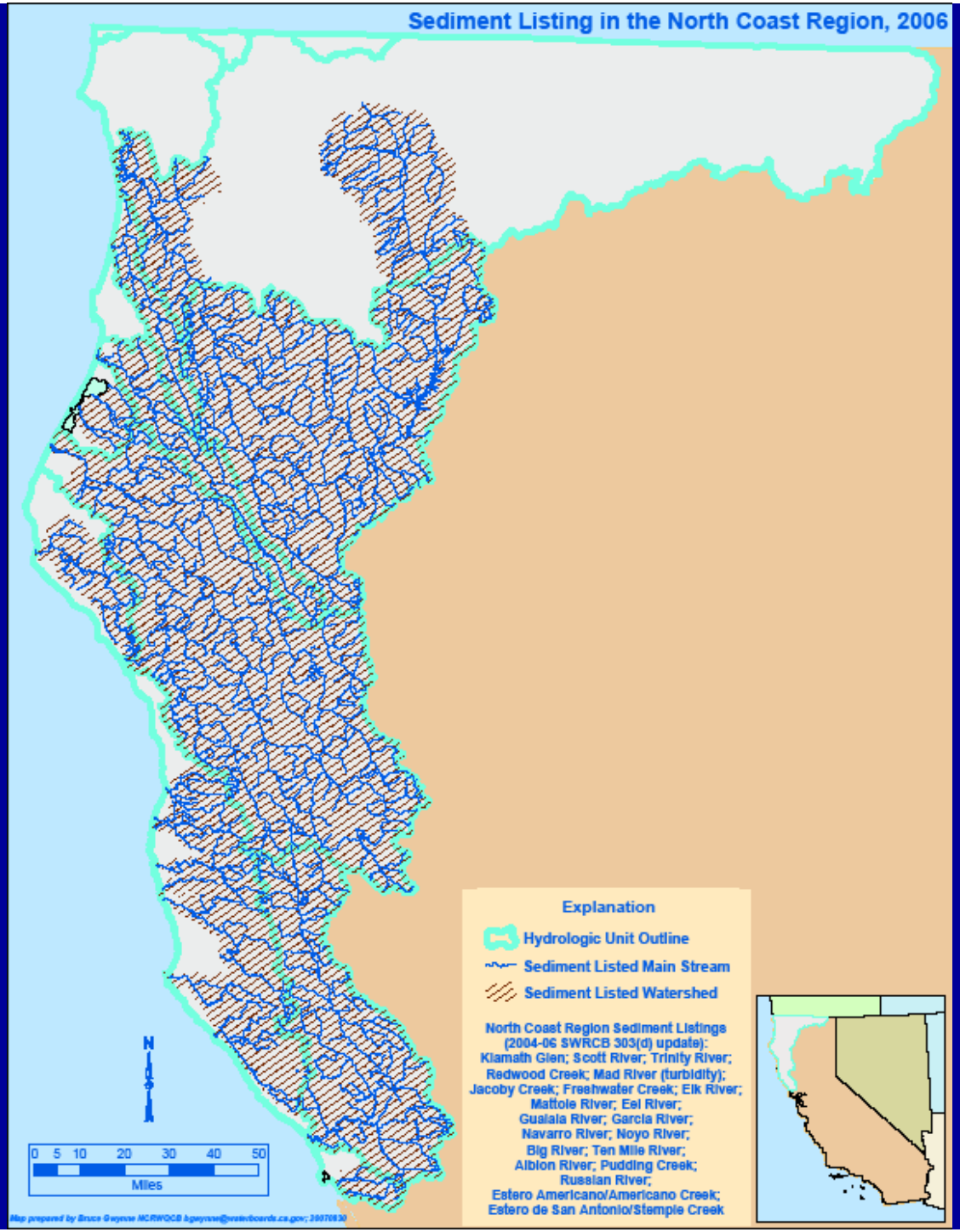
- Yes.
- Plans must be in conformance with all current rules at time of approval.
- See PRC § 4583.

Do the ASP Rules Apply to Existing NTMPs? NTMPs have to be Amended?

- If NTMP is in a watershed with listed fish and does not address listed status of fish, then NTMP must be amended to address current status.
- RPF will not automatically have to amend existing NTMP *if* it has already incorporated adequate protection for listed salmonids.
- See 14 CCR § 1090.7(l)(1) and (2).

ASP Rules Still Require Protection of Impaired 303(d) Listed Waterbodies?

- Yes.
- Same as T/I Rules—ASP Rules require RPFs to comply with standards in mandated by Basin Plans approved by various RWQCBs.
- Language in 14 CCR § 898 (Feasibility Alternatives) not changed.



303(d) Listed Waterbodies

90% of the waterbodies in California's North Coast Region are listed as "impaired"—largely because of sediment

Image: NCRWQCB

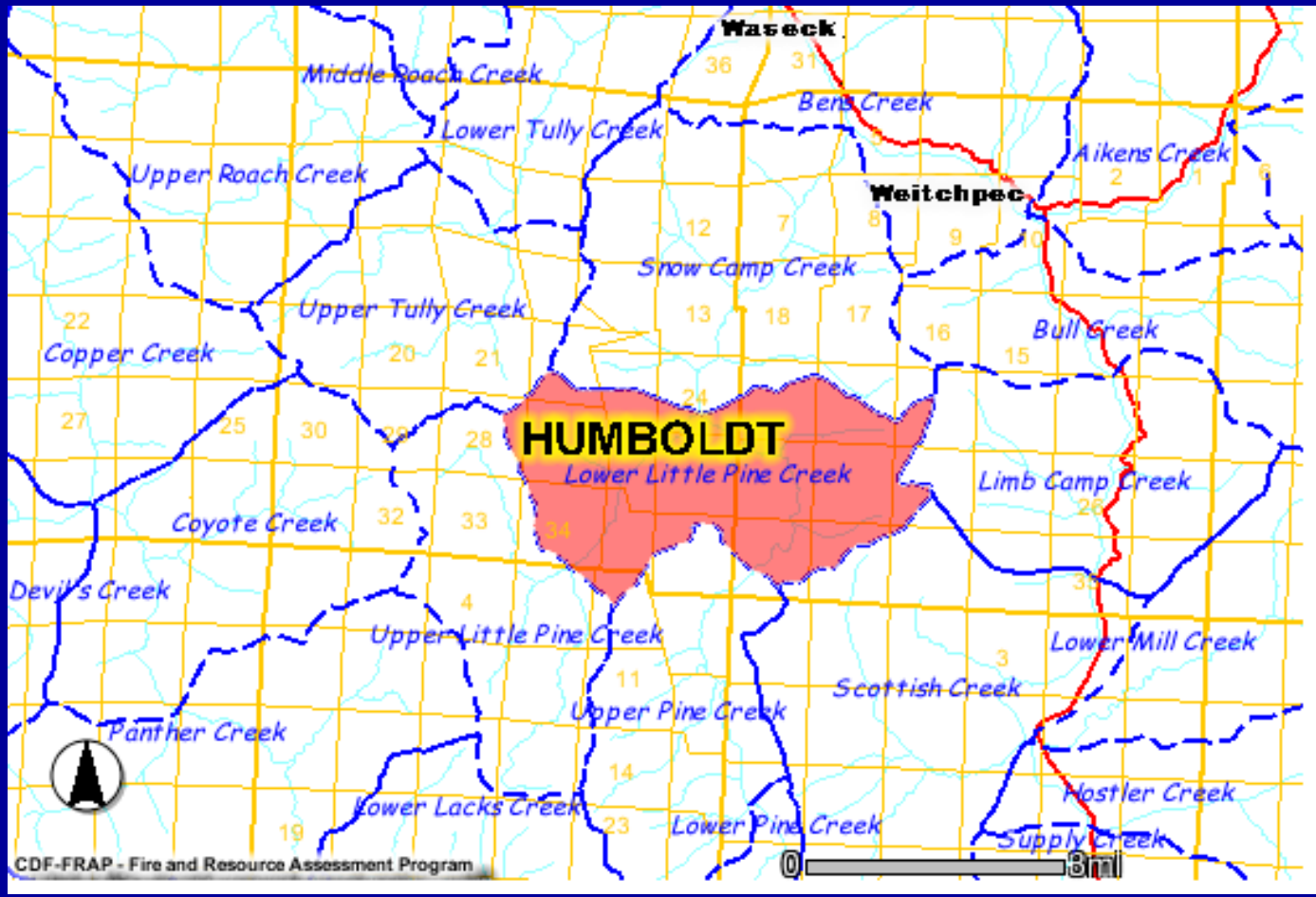
3. Geographic Scope of the ASP Rules

Geographic Area Covered by ASP Rules

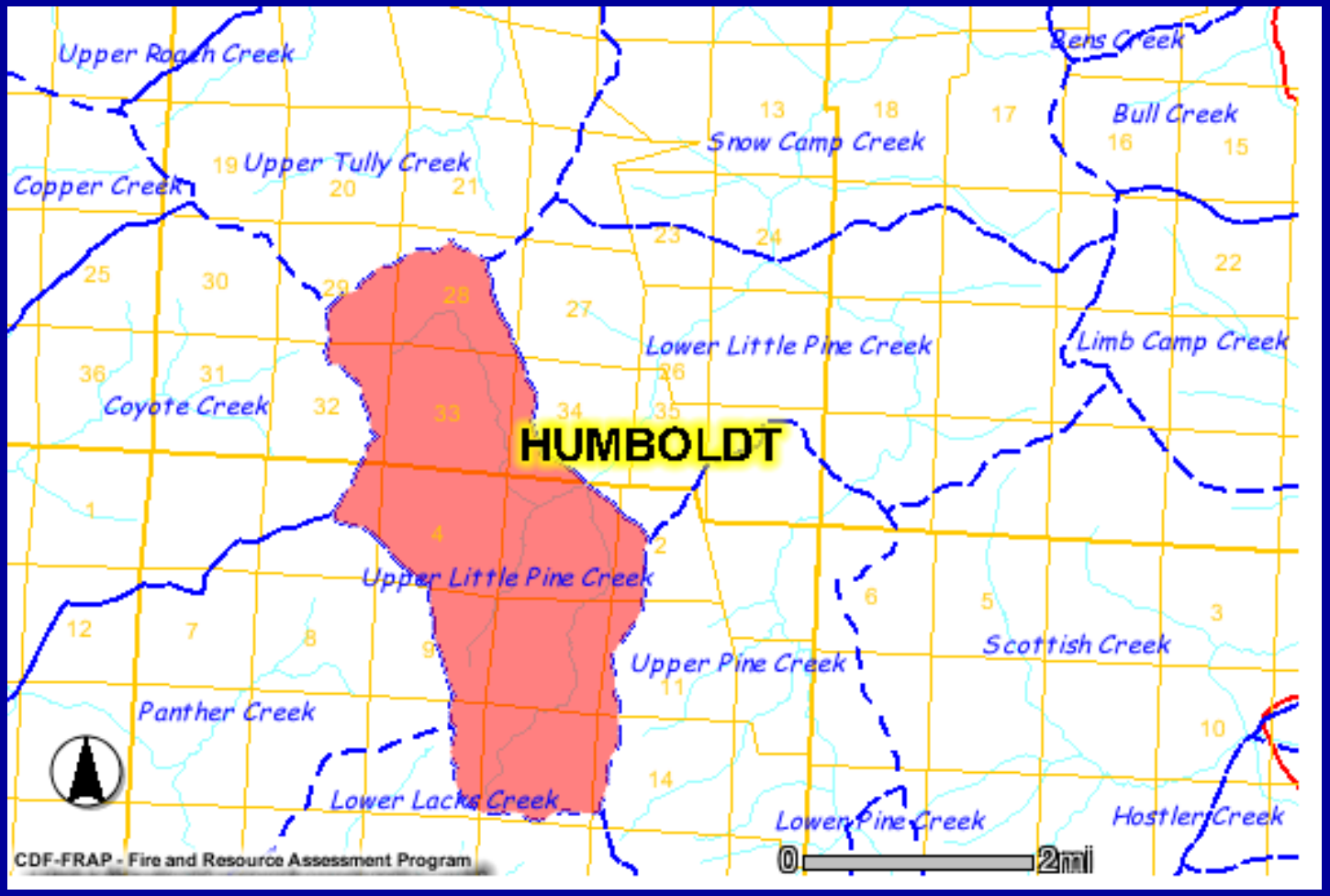
- **Mostly the same as for the T/I Rules.**
- **Add: Areas within planning watersheds immediately upstream and contiguous to watersheds with listed anadromous salmonids—subject to new road-related requirements to limit transport of fine sediment.**
- **Other watersheds further upstream may be subject based on CI analysis.**

Lower Little Pine Creek Planning Watershed

Subject to the T/I and ASP Rules Due to Listed Fish

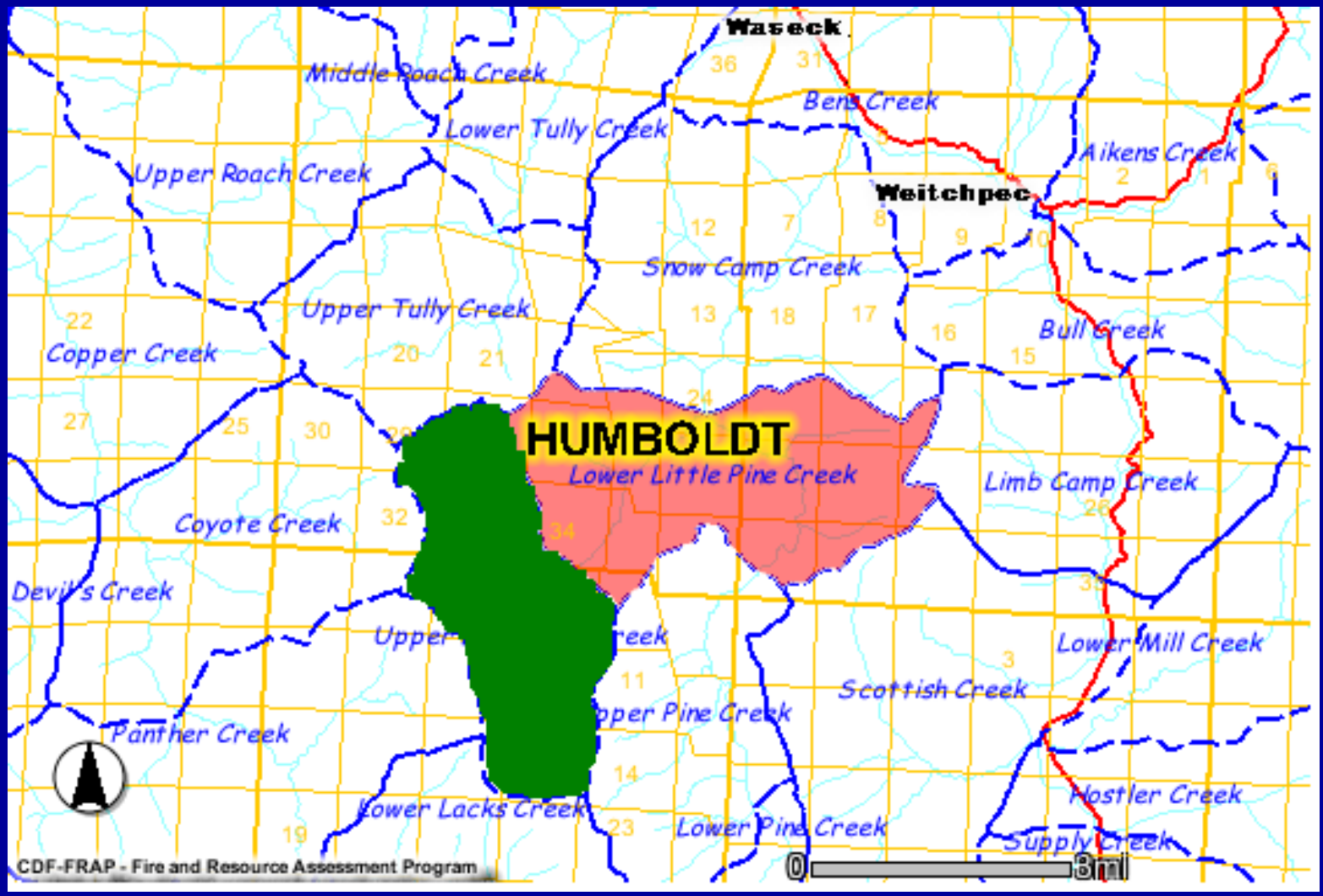


Planning Watershed Upstream:
Upper Little Pine Creek
Not Subject to Old T/I Rules

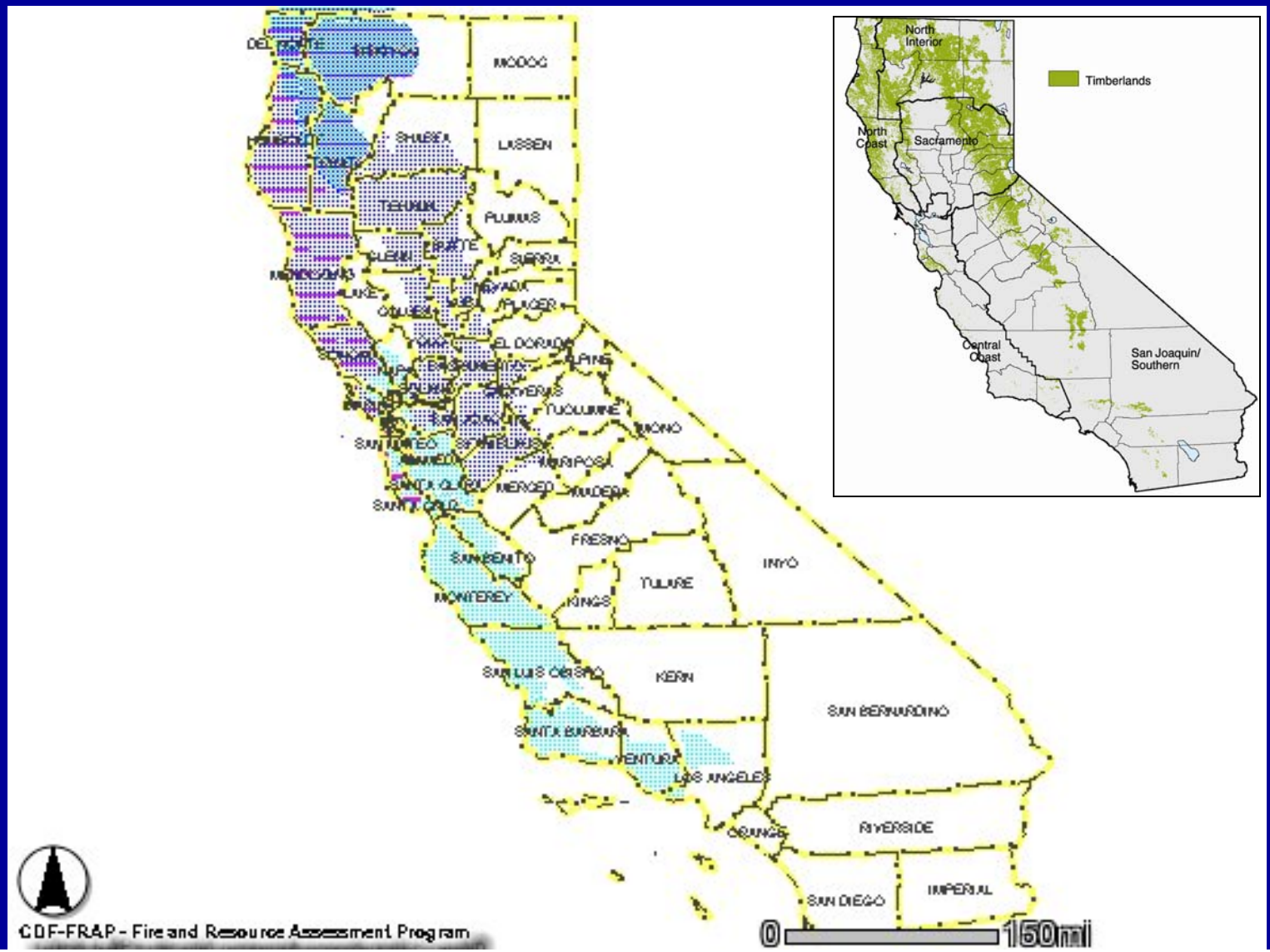


Upper Little Pine Creek NOT listed as a T/I watershed by DFG

Upper Little Pine Creek Planning Watershed:
Subject to ASP Road-Related Rules

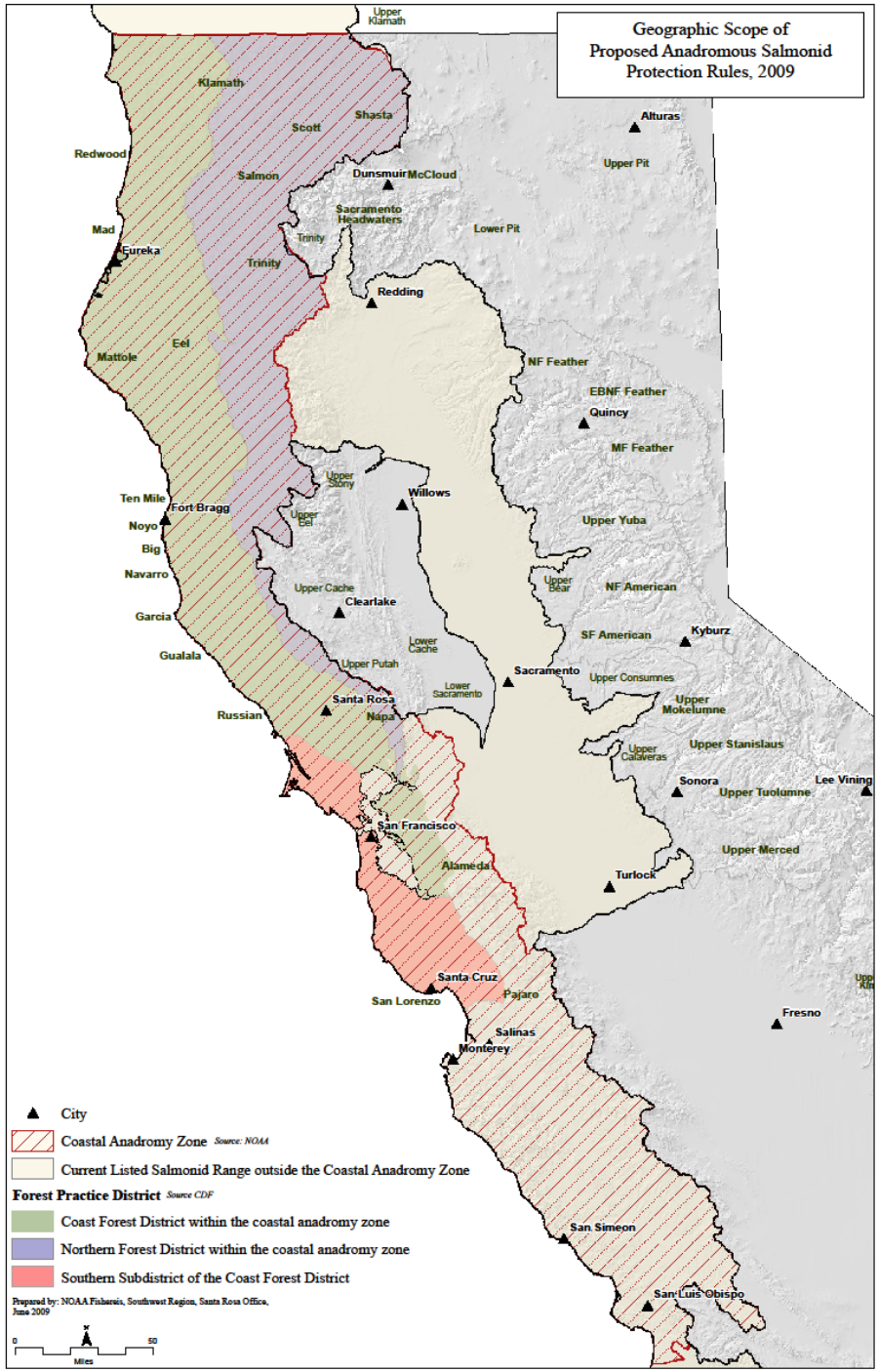


Boundaries for ASP Rules Watersheds
Coho + Chinook + Steelhead ESUs



ASP Rules Use Specific Sub-Regions

- Coastal Anadromy Zone (CAZ).
- Coast District of the CAZ.
- Northern District of the CAZ.
- Southern Sub-District (SSD) of the CAZ.



Geographic Scope of the ASP Rules

Where Do the ASP Rules NOT Apply?

Where there is:

- **An approved HCP that addresses anadromous salmonids.**
- **A valid Incidental Take Permit (ITP) issued by DFG.**
- **A valid NCCP approved by DFG.**
- **MOU or planning agreement in preparation of obtaining an NCCP addressing anadromous salmonid protection.**

Where Do the ASP Rules NOT Apply?

- ASP rules do not apply to upstream watersheds where permanent dams block anadromy and reduce transport of sediment downstream.

Lake Shasta Dam

Where Do the ASP Rules NOT Apply?

- **ASP rules do not apply to watersheds that do not support anadromy (and can't be restored) and feed directly into the ocean.**

McWay Falls, Julia Pfeiffer State Park

4. Class I Watercourse Protection, Including CMZs and Flood Prone Areas

Different Class I WLPZ Rules for:

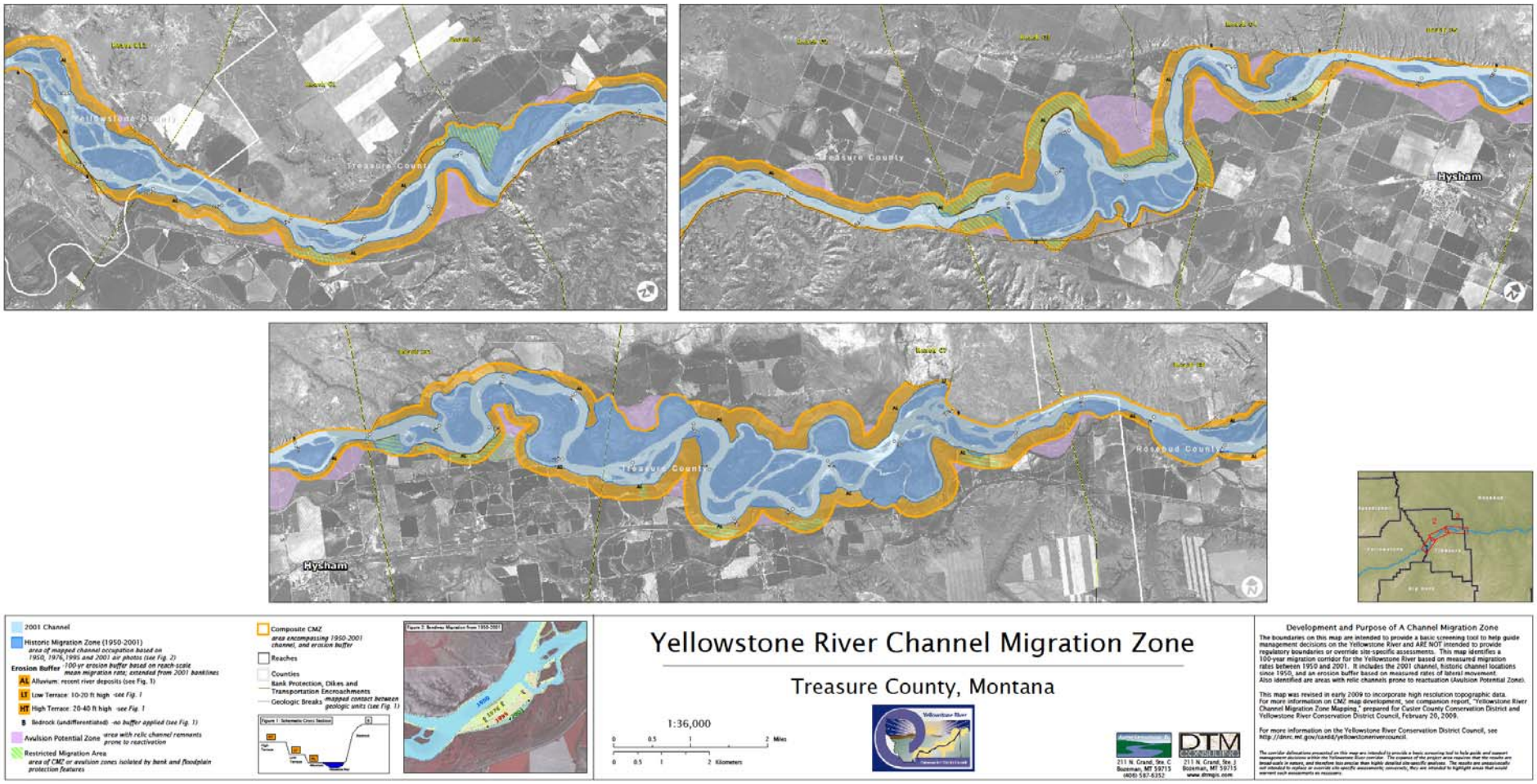
- **Confined Channels in the CAZ.**
- **Class I Channels with Flood Prone Areas or CMZs.**
- **Confined Channels outside the CAZ.**

Confined Channel

Channel with a Flood Prone Area

Images: WFPB 2004

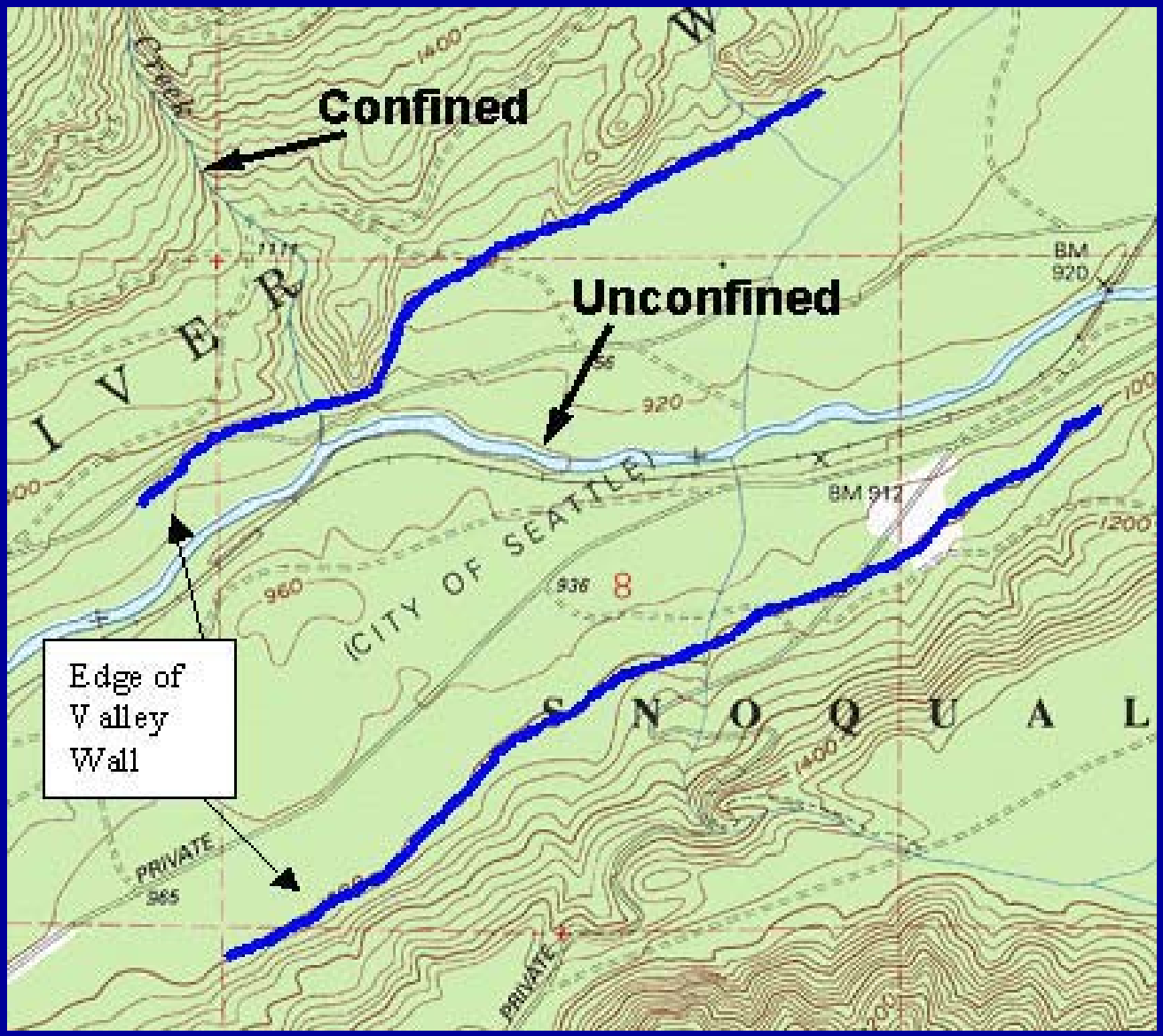
Channel Migration Zone



Area Delineated: Channel Location Between 1950 and 2001

How Does an RPF Determine if a Class I Watercourse has a Confined Channel Present?

- Incised channel that does not shift position on a floodplain,
- Channel with no contiguous flat, flood prone areas, and
- Width of the valley floor is less than 2 times the channel width at bankfull stage.

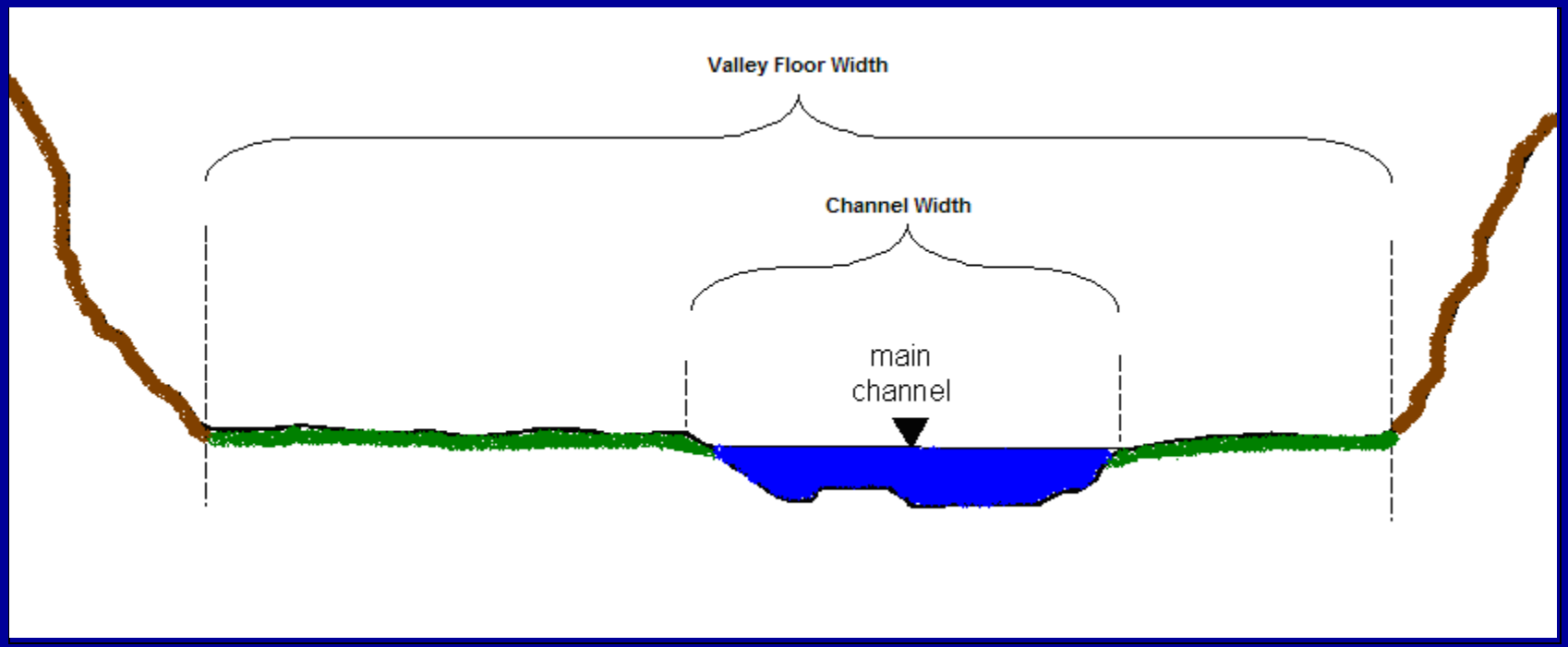


Determine Valley Floor Width Using a Topographic Map

Measure the width between contour lines that define the valley walls

Image: WFPB 2004

Valley Floor Width to Bankfull Channel Width Ratio

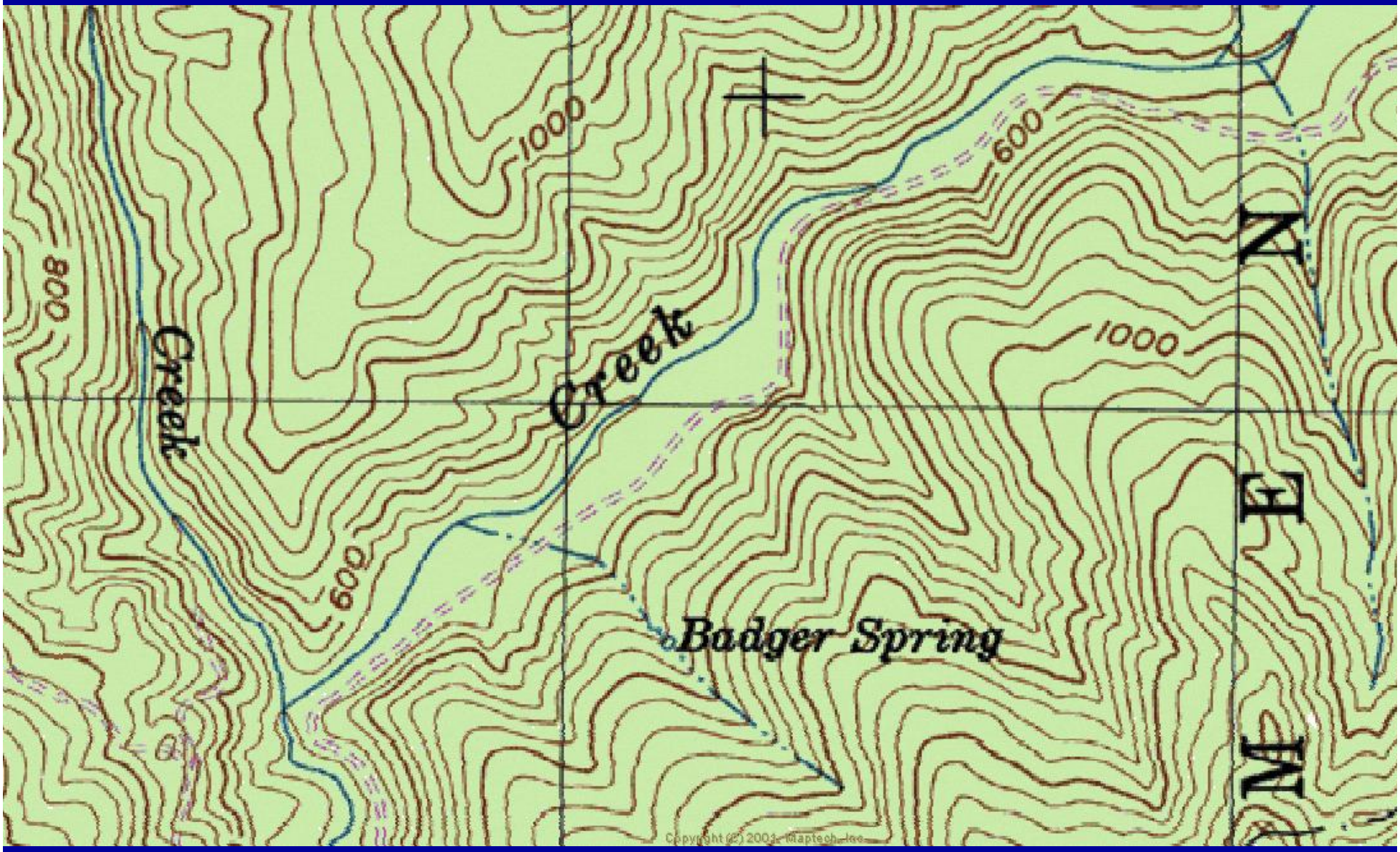


Ratio of valley floor width to bankfull channel width = 2.8; channel is classified as NOT CONFINED and has a Flood Prone Area

Example of an Unconfined Channel with a Flood Prone Area—East Branch of Soquel Creek

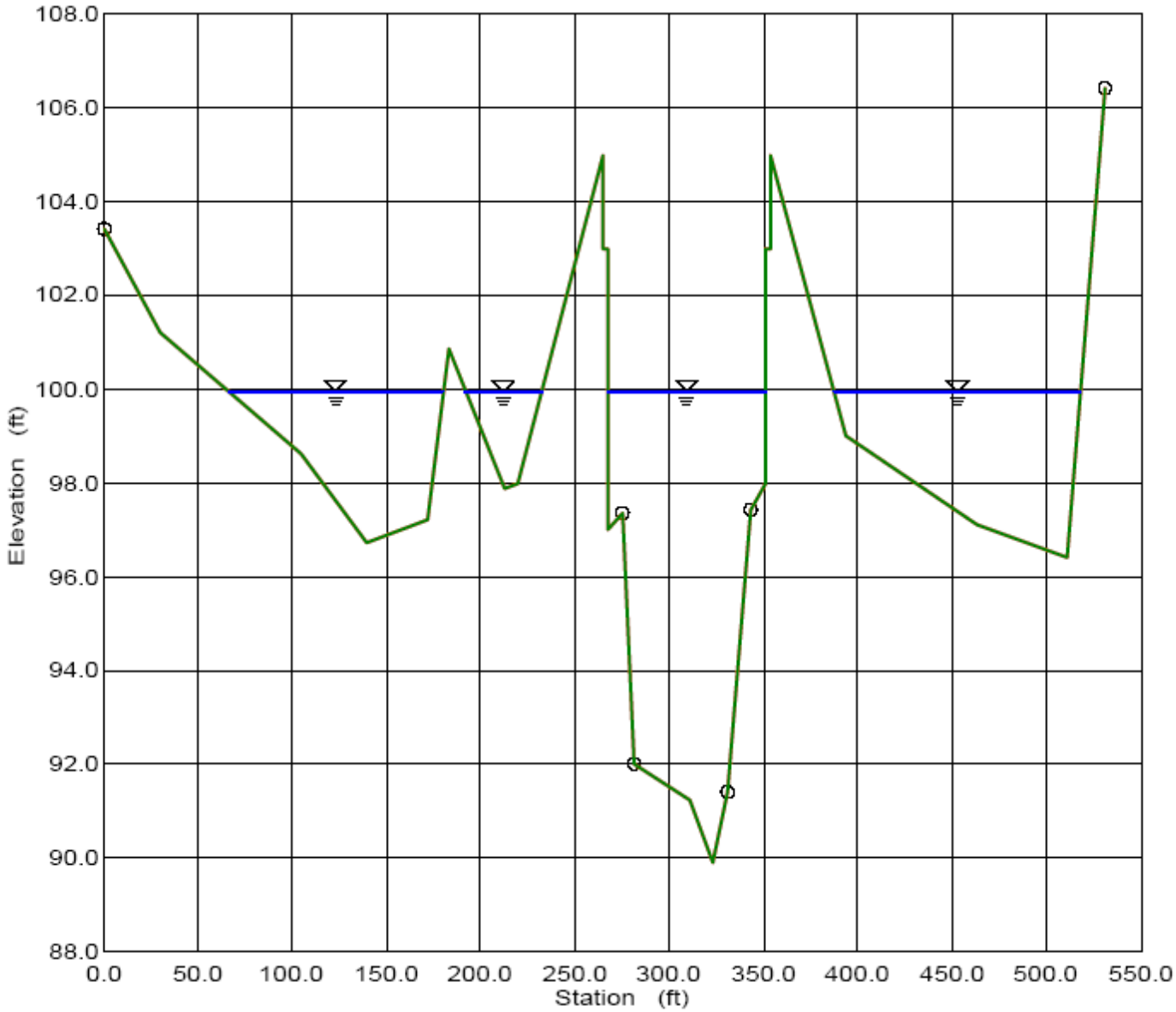
East Branch of Soquel Creek—Flood Prone Area

East Branch of Soquel Creek



Measured Valley Floor Widths: 374 ft; 581 ft; 445 ft; 535 ft; 483 ft.

Mean = 485 ft



Valley Width = Approximately 450 feet

Channel Cross-Section by Tim Best, CEG

East Branch of Soquel Creek near Fern Gulch: Confined or Unconfined?

- Valley Floor Width = 485 feet
- Bankfull Channel Width = 80 feet
- Ratio of Valley Floor Width to Bankfull Channel Width: 485/80 = 6.1
- Unconfined Channel with a Flood Prone Area


Example of a Confined Channel:
Amaya Creek, Santa Cruz County

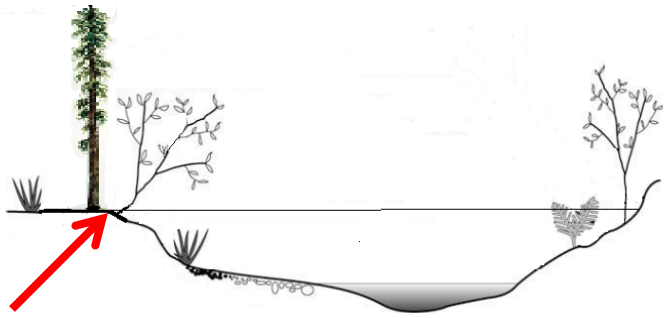

Amaya
Creek
Bankfull Channel Width = 20 ft
Valley Floor Width = <40 ft
Ratio = <2.0

Class I WLPZ Rules for Confined Channels in the CAZ

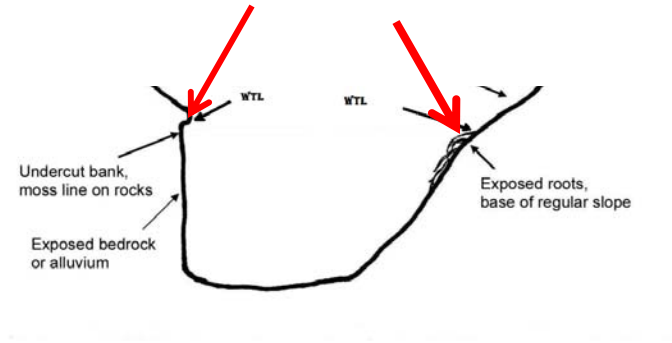
- **Core Zone** = first 30 feet from stream channel (timber harvest largely prohibited).
  - Large wood, canopy, bank stability
- **Inner Zone** = next 70 feet (timber harvest limited by overstory canopy (80%/70%), 13 largest trees in core and inner zone, etc.
  - Large wood, canopy, nutrient input, etc.
- **Outer Zone** = next 50 feet (only applies when the WLPZ is adjacent to even-aged mgt). 50% overstory canopy.
  - Buffer for windthrow, microclimate control, terrestrial wildlife habitat, additional wood recruitment and shading, sediment filtration.

Watercourse Transition Line (WTL)

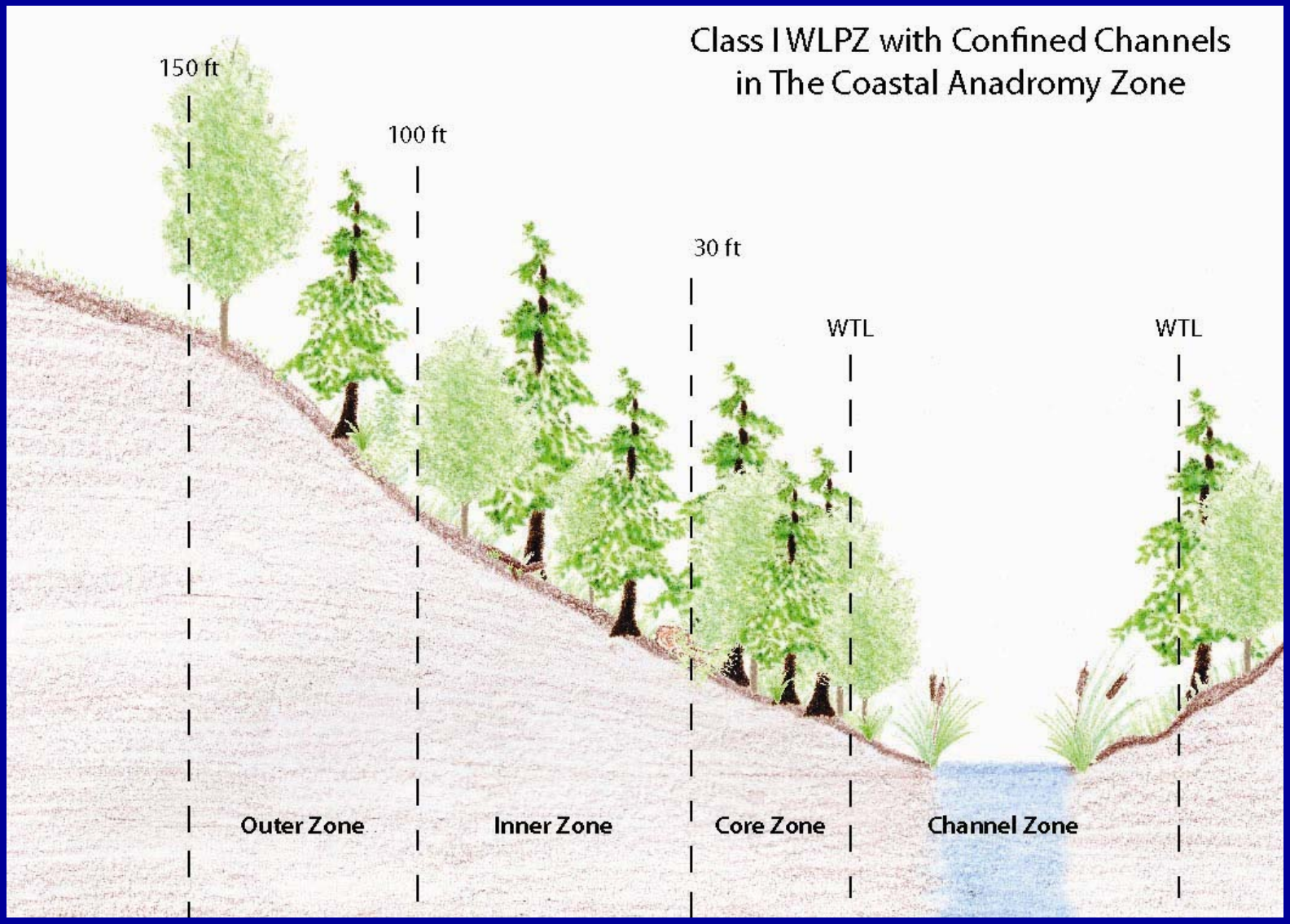
- Change in vegetation from annual water tolerant plants to upland species at least 25 yrs old.
- Just above physical indicators of scour such as undercut banks.
- Change in the size distribution of sediment from gravel to fine sand.



Large Channel with Flood Prone Area



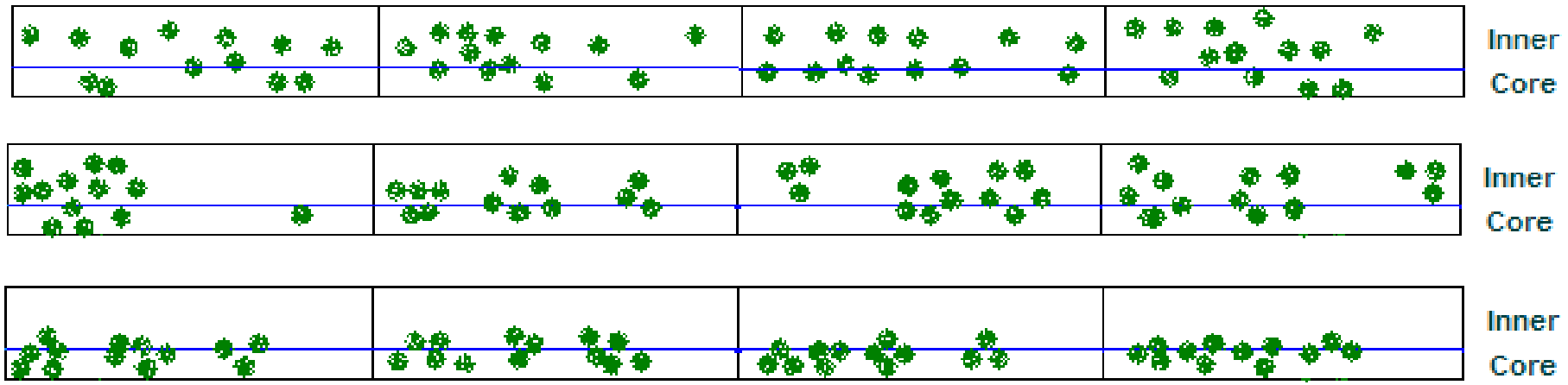
Small Incised Headwater Channel


Class I WLPZ with Confined Channels
in The Coastal Anadromy Zone
150 ft
100 ft
30 ft
WTL
WTL
Outer Zone
Inner Zone
Core Zone
Channel Zone

How do you Retain the 13 Largest Trees Per Acre in the Core and Inner Zones?

- RPF is to evaluate each acre of WLPZ covering the Core and Inner Zones (i.e., 100 x 435 feet).
- Ensure that the 13 largest trees are not marked for harvest (don't have to mark 13 trees for retention).
- Can count both live and dead trees.
- Consider each acre individually.
- Retention can be focused on the core zone and can utilize "clumps" of large redwoods.

Three Scenarios for Retaining the 13 Largest Trees Per Acre in the Core and Inner Zones

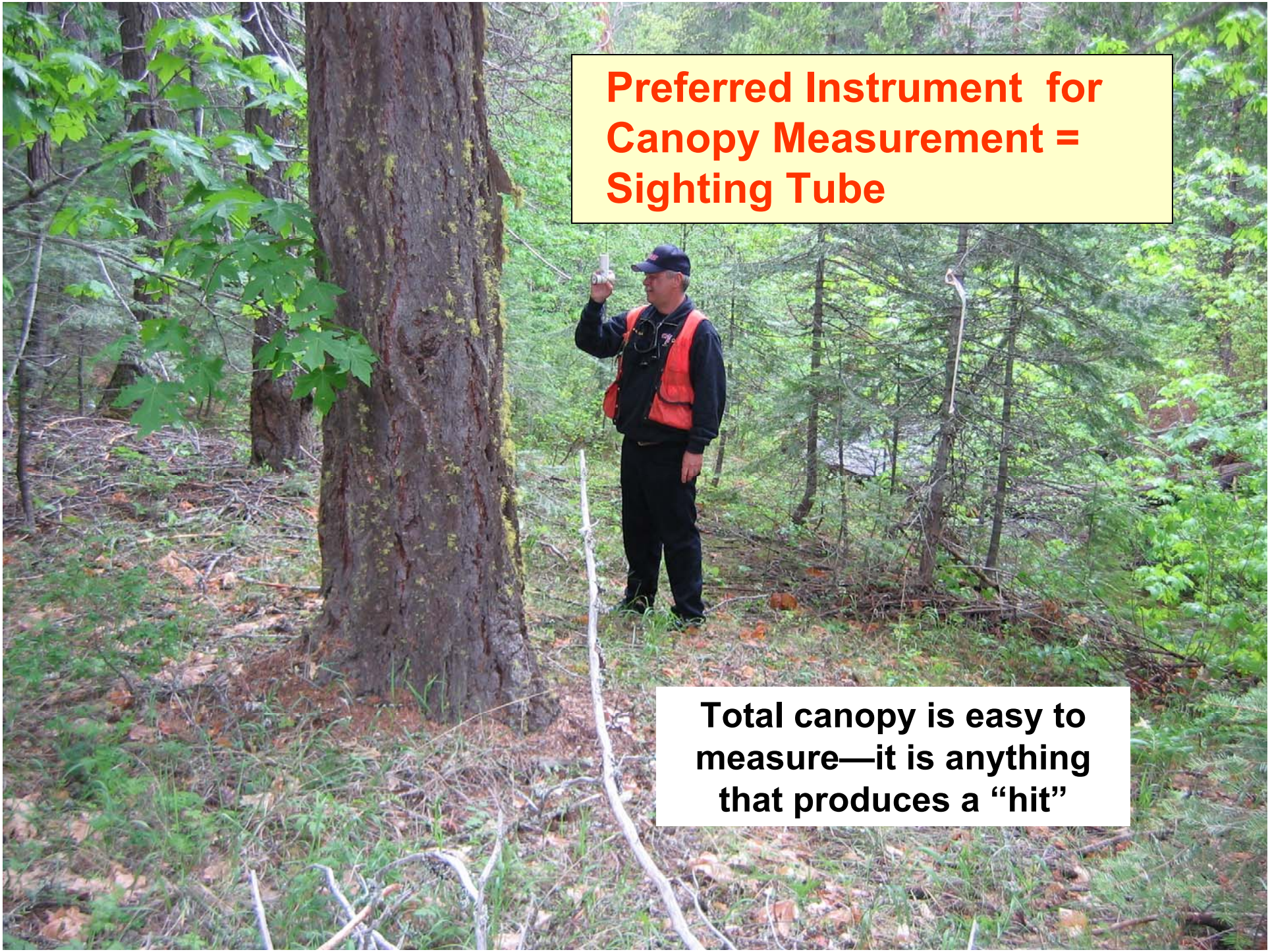


CAL FIRE may choose different beginning and ending locations for acreage determination

How is Overstory Canopy to be Measured?

- Overstory canopy defined in the FPRs as "the portion of the trees, in a forest of more than one story, forming the upper canopy layers."

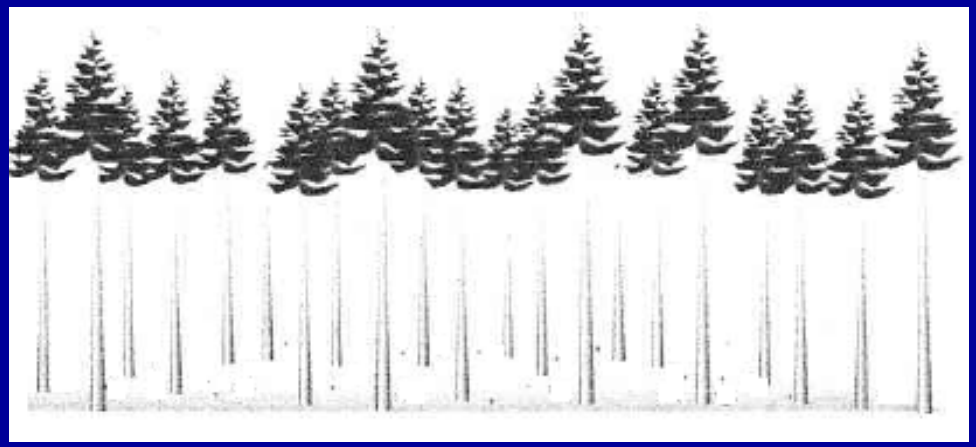
- Defining and measuring just overstory can be difficult in California--with multi-aged stands, many harvest entries, many types of conifer and hardwood species, etc.


Preferred Instrument for Canopy Measurement = Sighting Tube
Total canopy is easy to measure—it is anything that produces a “hit”

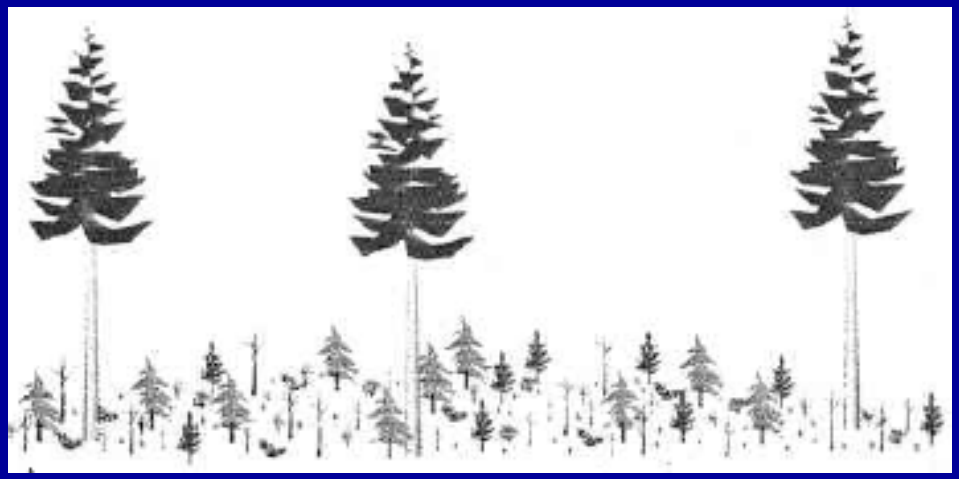
View Through a Sighting Tube

Image: Dr. Cajun James, SPI

Canopy Measurement Issues



Overstory canopy = Total canopy



Overstory canopy ≠ Total canopy


Overstory canopy =
Total canopy
11/29/04
2-04EM-0023-4-SHA
1

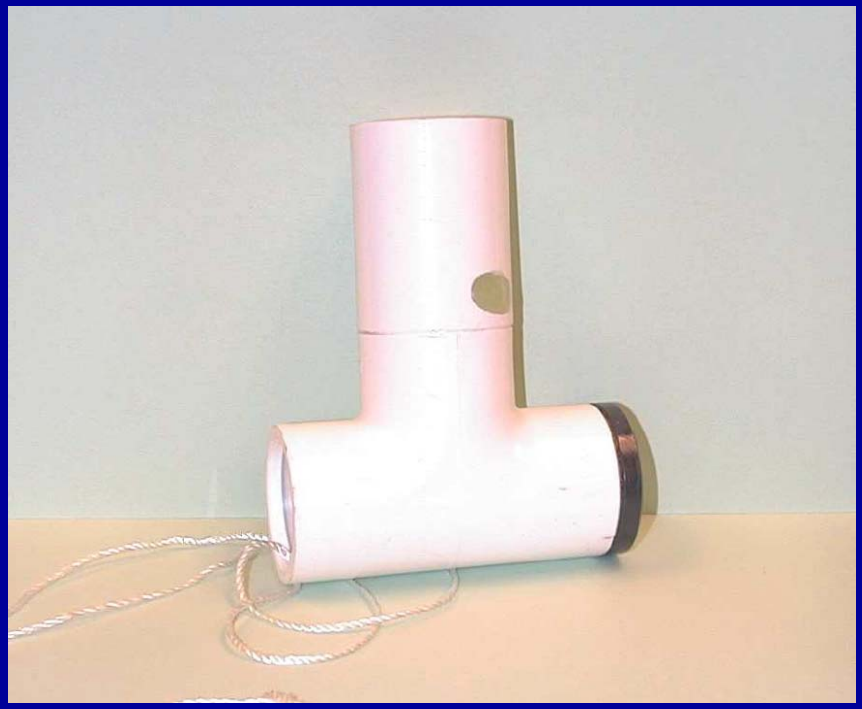

Overstory canopy =
Total canopy

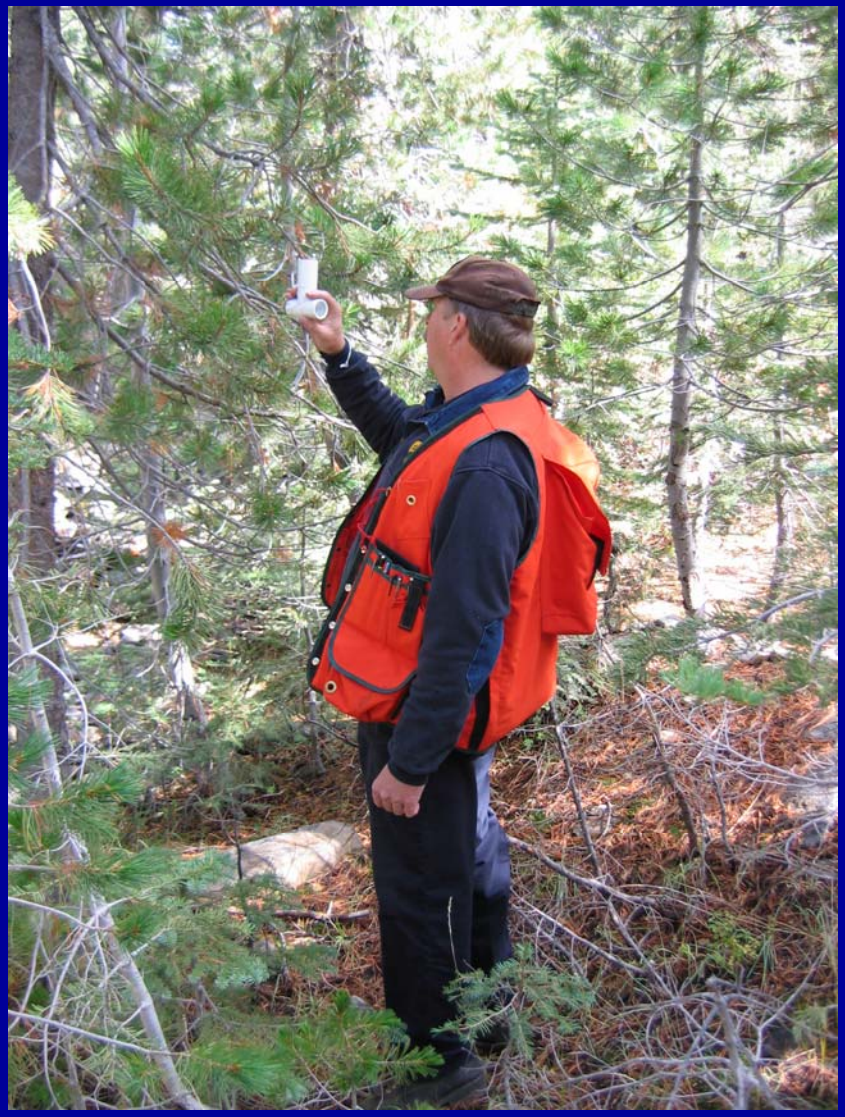

Overstory canopy ≠
Total canopy
11/29/04
19

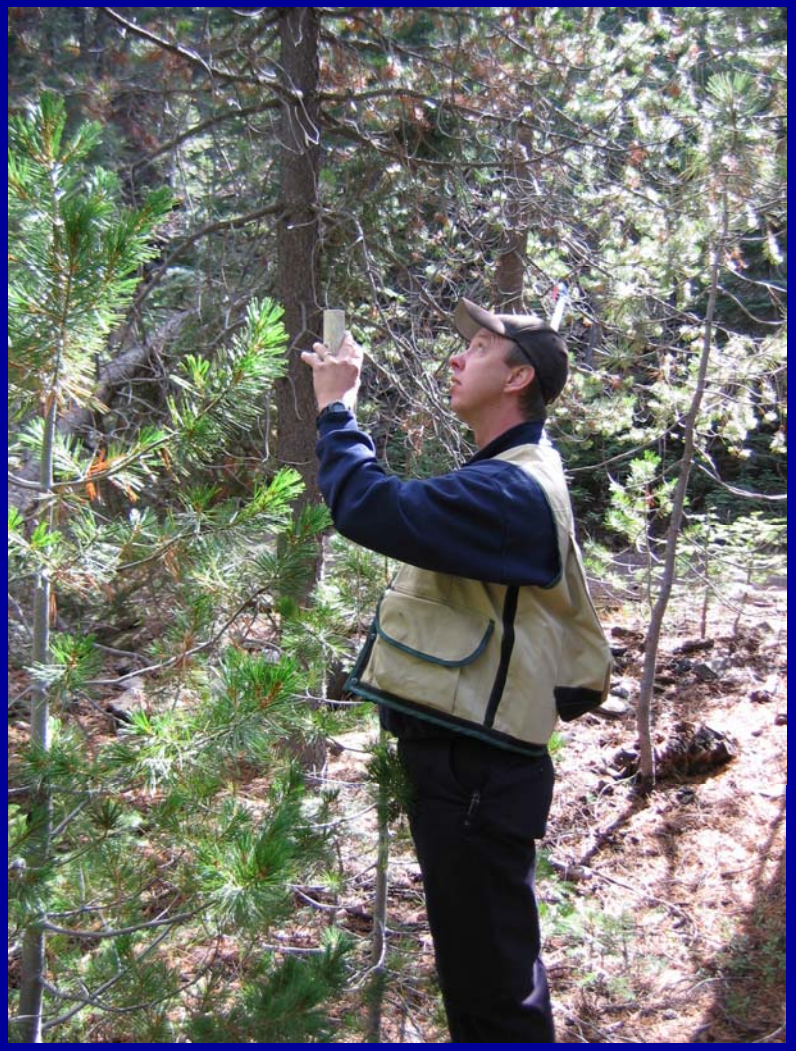

Overstory canopy ≠
Total canopy

Sighting Tube and Field Use

- Overlap among canopy layers impedes ability to determine overstory canopy.
- Observer to determine if overstory tree above short tree/brush.
- If present, assume sighting tube will record a “hit.”
- Record data separately for overstory canopy.







Look up when you “hit” understory vegetation! Is there an overstory tree?

What are the Class I (and II) WLPZ Flagging Requirements? Do you Have to Flag the Core and Inner Zone Boundaries?

What are the Flagging Requirements?

- Class I and II WLPZ boundary must be identified on the ground (paint, flagging, etc.).
- No requirement to flag core and inner zone boundaries (unless outer edge of the inner zone is the WLPZ boundary).
- Flagging of the core/inner zone may be helpful to the LTO.

Flood Prone Area and CMZ Requirements

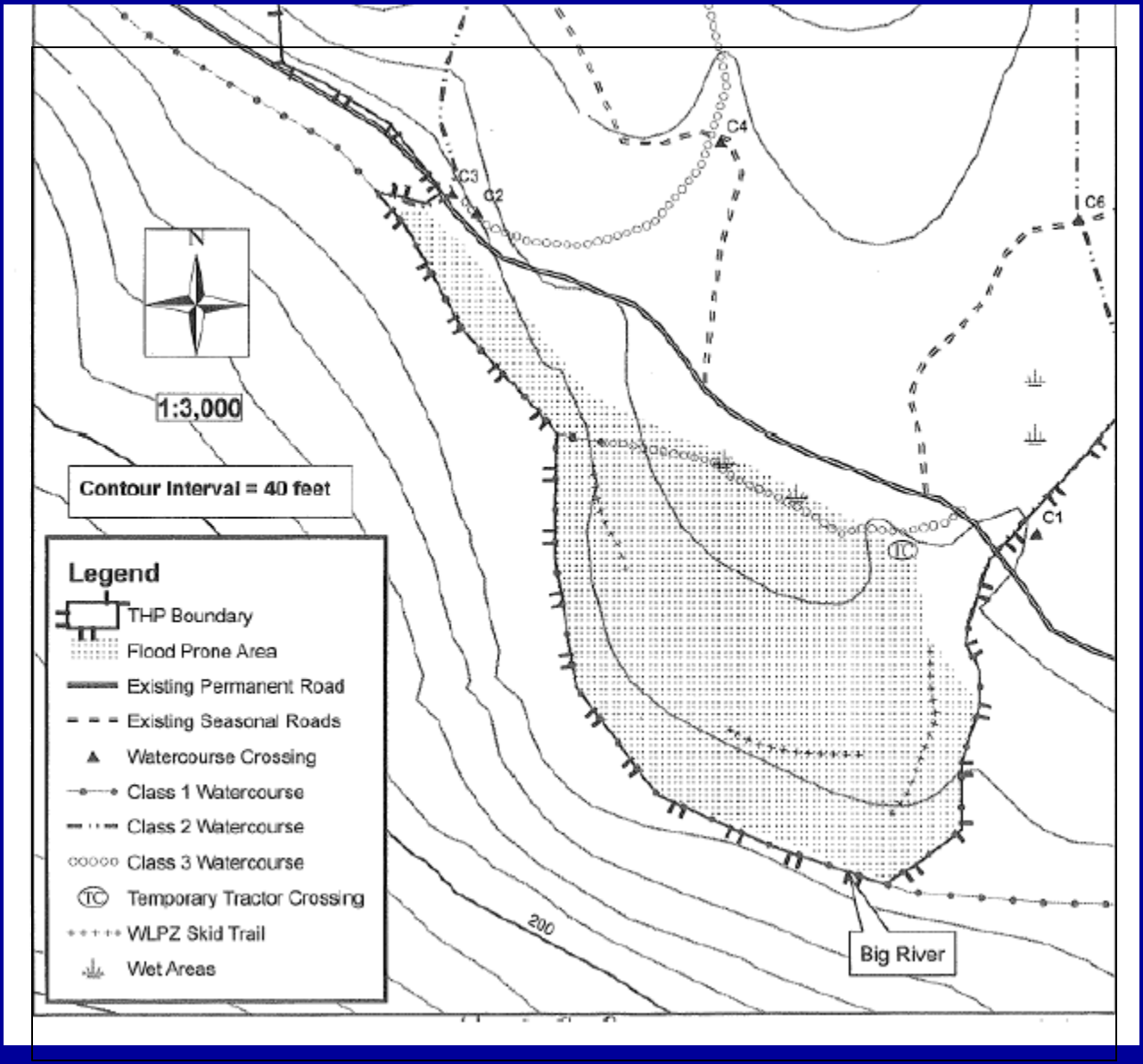
Field Indicators of Flood Prone Areas

Look for:

- **Overflow channels.**
- **Hydric (or water-loving) vegetation.**
- **Fine sediment in bark.**
- **Willow, alder, cottonwood tree species.**
- **Flotsam hanging in brush.**
- **Silt and sand immediately under the leaf layer.**

Emanuel Fritz's 'Wonder Plot"


Silt Line on Coast
Redwood Tree



Example: 5 acre Flood Prone Area—Correctly Identified and Protected as Part of Recent Big River THP

How do you Determine the Landward Edge of the Flood Prone Area?

- Field Indicators, such as distinct change in slope; distinct change in plant/tree species.
- Absence of fine sediment in tree bark, flotsam hanging in brush.
- Surveying methods determining the 20 year Return Interval flood flow, or elevation equivalent to 2X Bankfull Stage.

Determination of a Flood Prone Area Using the Two Times Bankfull Stage Method

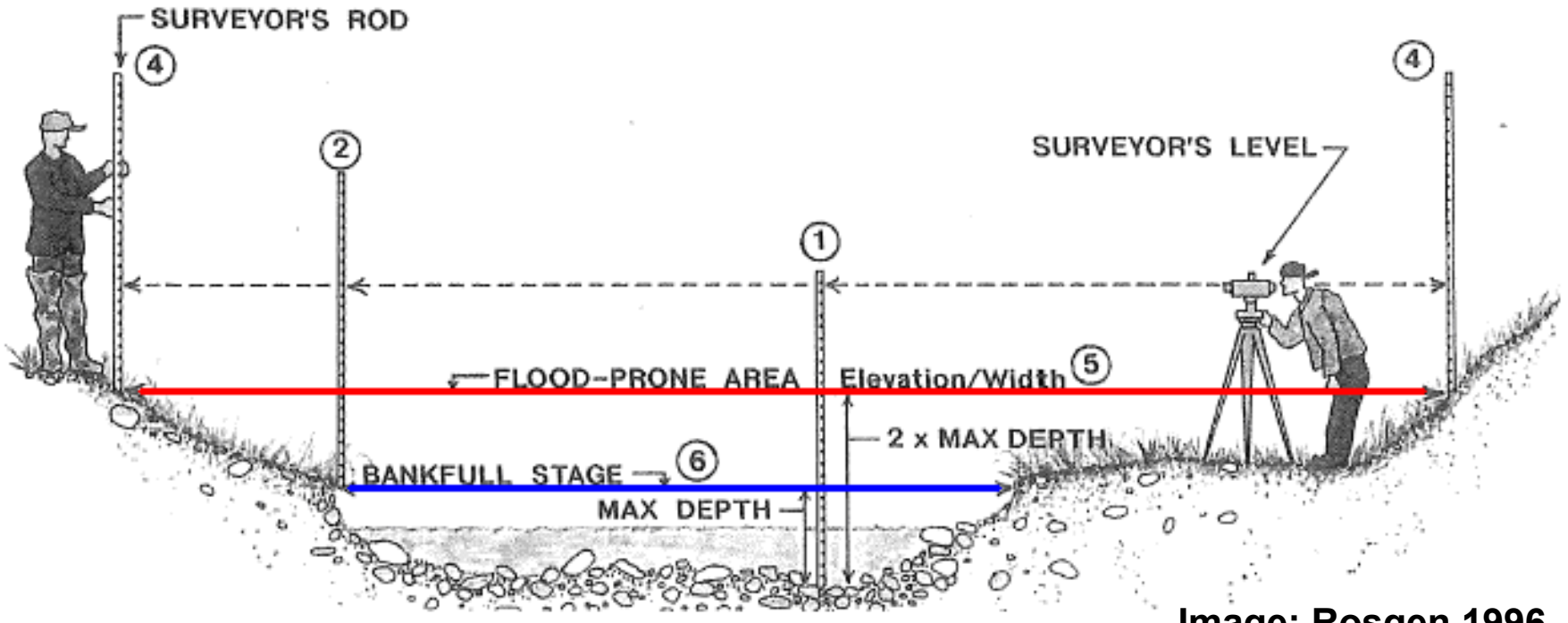
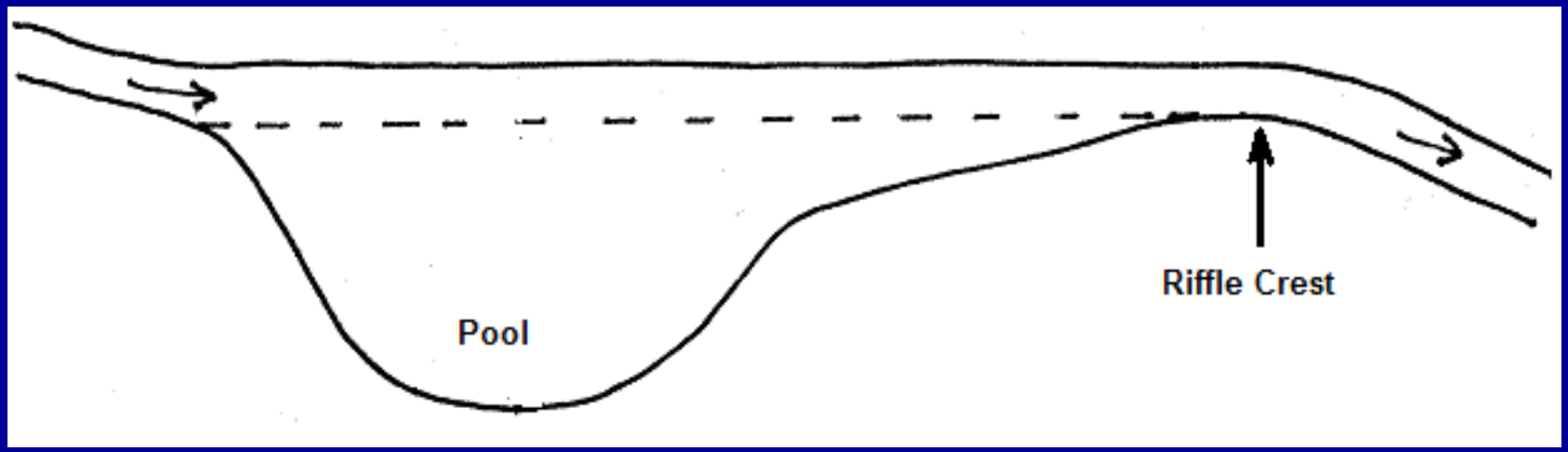


Image: Rosgen 1996

Longitudinal Channel Profile Showing a Riffle Crest

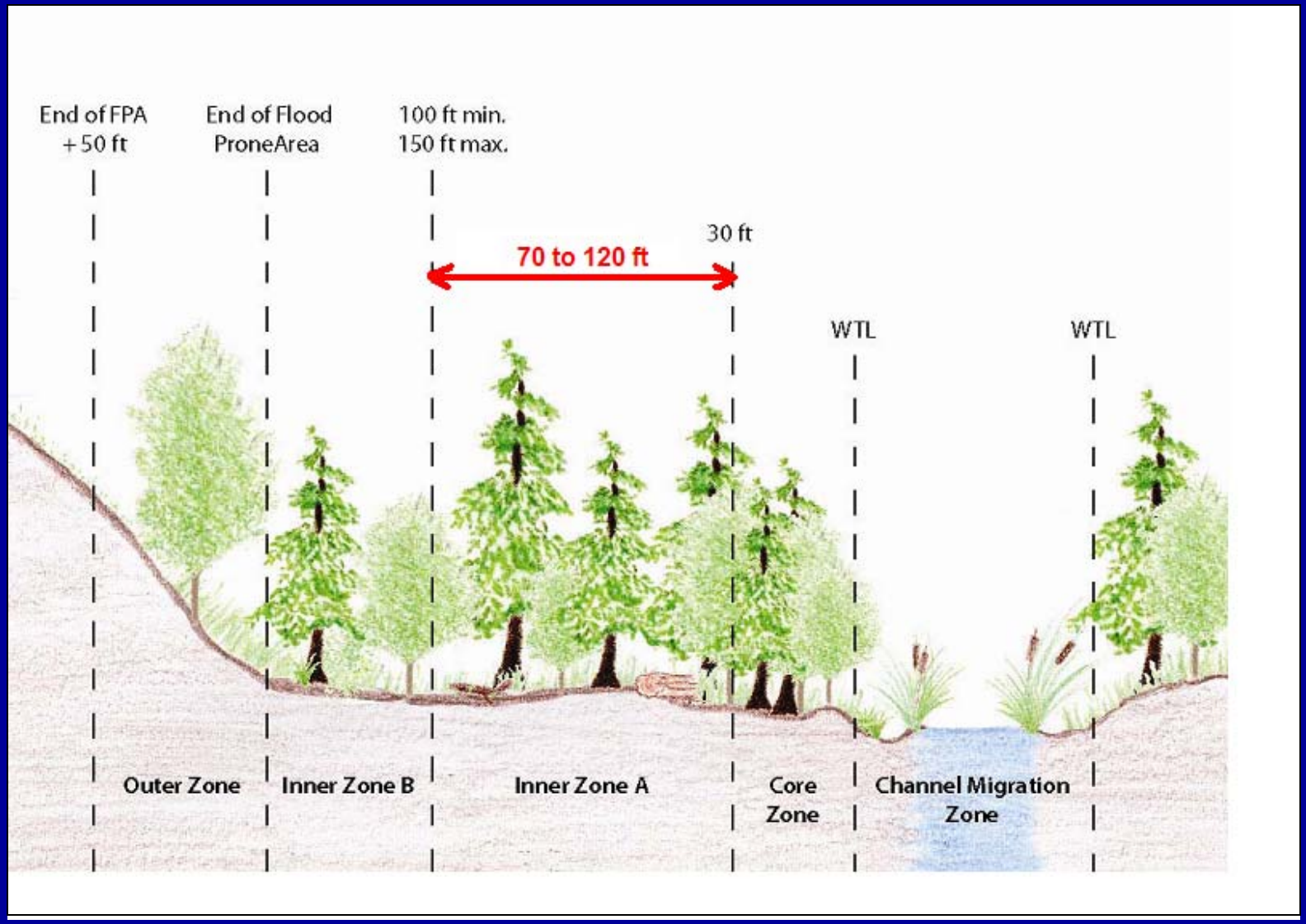


Riffle Crest = "Topographic High" Along a Longitudinal Stream Profile

Class I CMZ/ WLPZ Rules for with Channels with Flood Prone Areas or CMZs

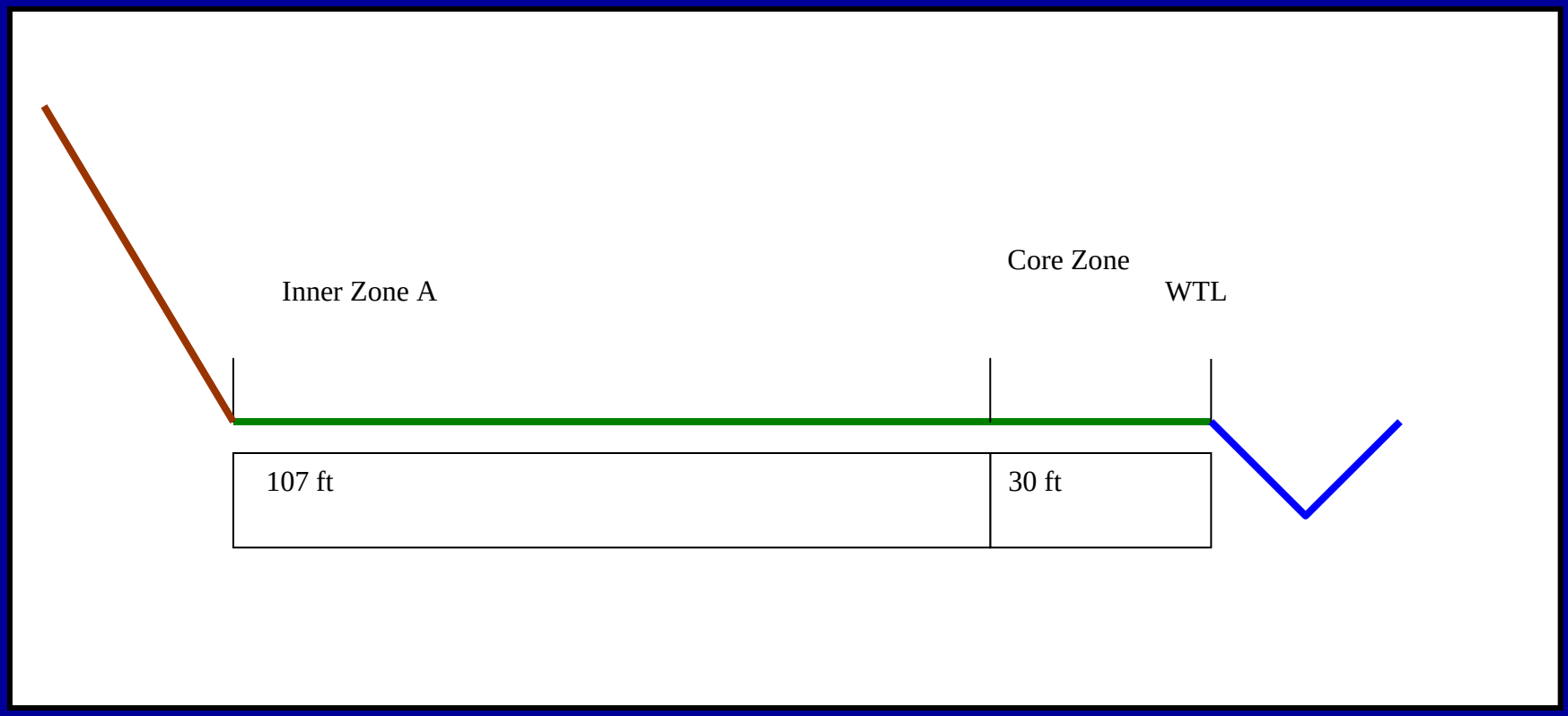
Channel Migration Zone (if present)	Variable width
Core Zone	30 feet
Inner Zone A	Minimum 70 feet; Maximum 120 feet
Inner Zone B (if needed)	Variable width—from Inner Zone A to end of FPA
Outer Zone (if needed)	50 feet (when evenaged silviculture used above WLPZ

Class I WLPZ in Flood Prone Areas and Channel Migration Zones



South Fork Gualala River Watershed Flood Prone Area

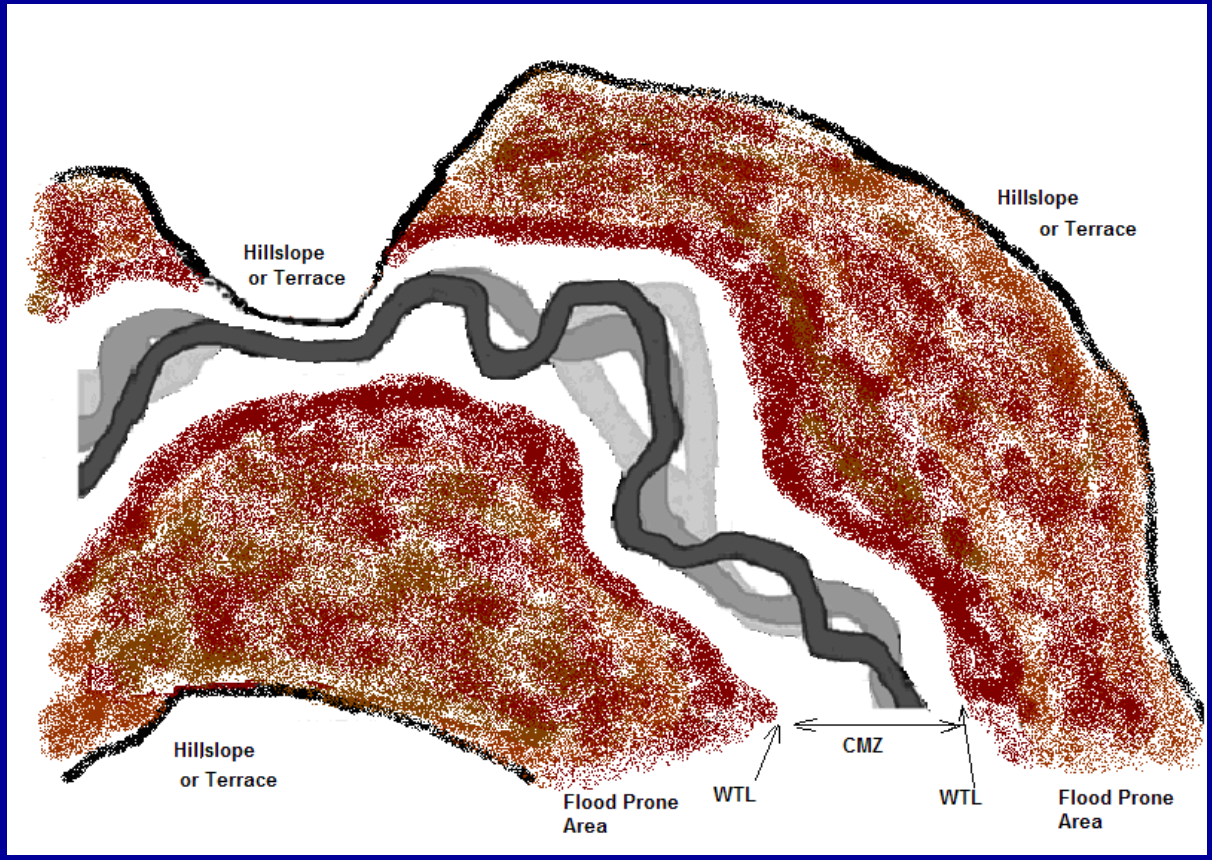
Example of an Inner Zone A with a Width of Less Than 120 feet; and No Inner Zone B



Entire Flood Prone Area is 137 feet wide

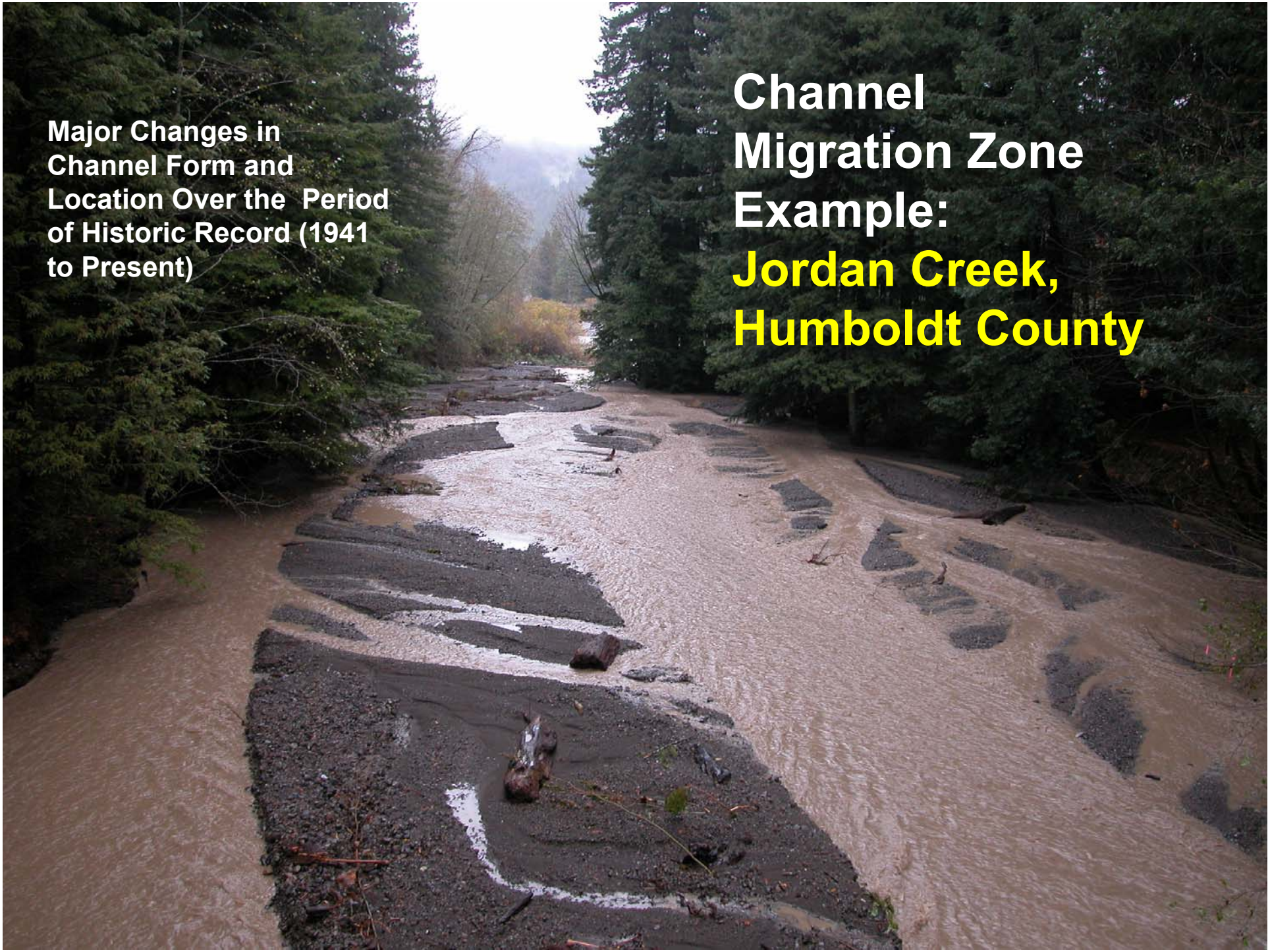
Inner Zone A width = 107ft; Core Zone width = 30 ft

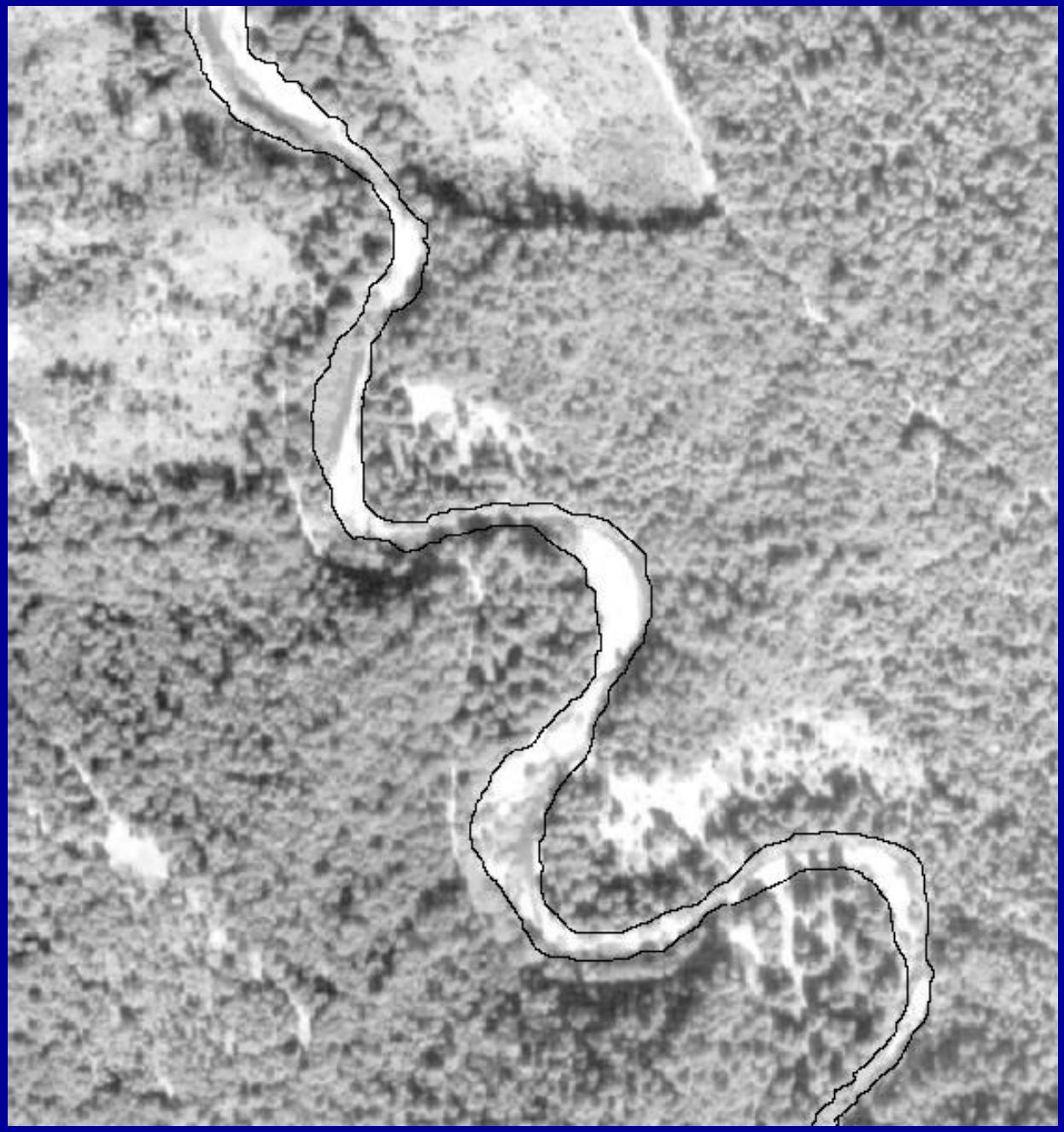
Channel Migration Zone Example



Has the Channel Moved During the Time Required to Grow Mature Conifer Trees?

- **Field Inspections Should Reveal Past Lateral Movement of the Channel**


Major Changes in Channel Form and Location Over the Period of Historic Record (1941 to Present)
Channel Migration Zone Example:
Jordan Creek, Humboldt County

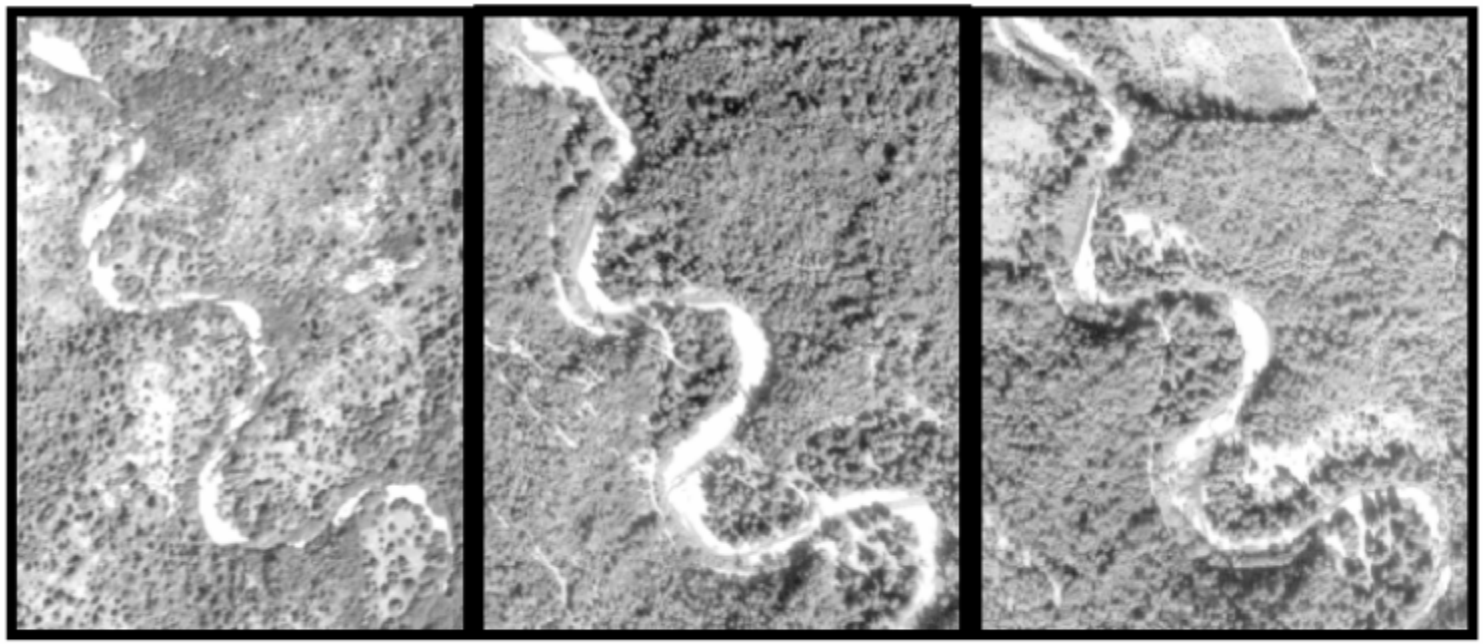


NF Gualala River CMZ

Image: T. Spittler, CGS

Channel Migration Zone Example

Use a Series of Air Photos Covering Several Decades to Determine if the Channel Has Moved



1936 Frame 172 | 1984 Frame 20-87 | 2000 Frame 3-73

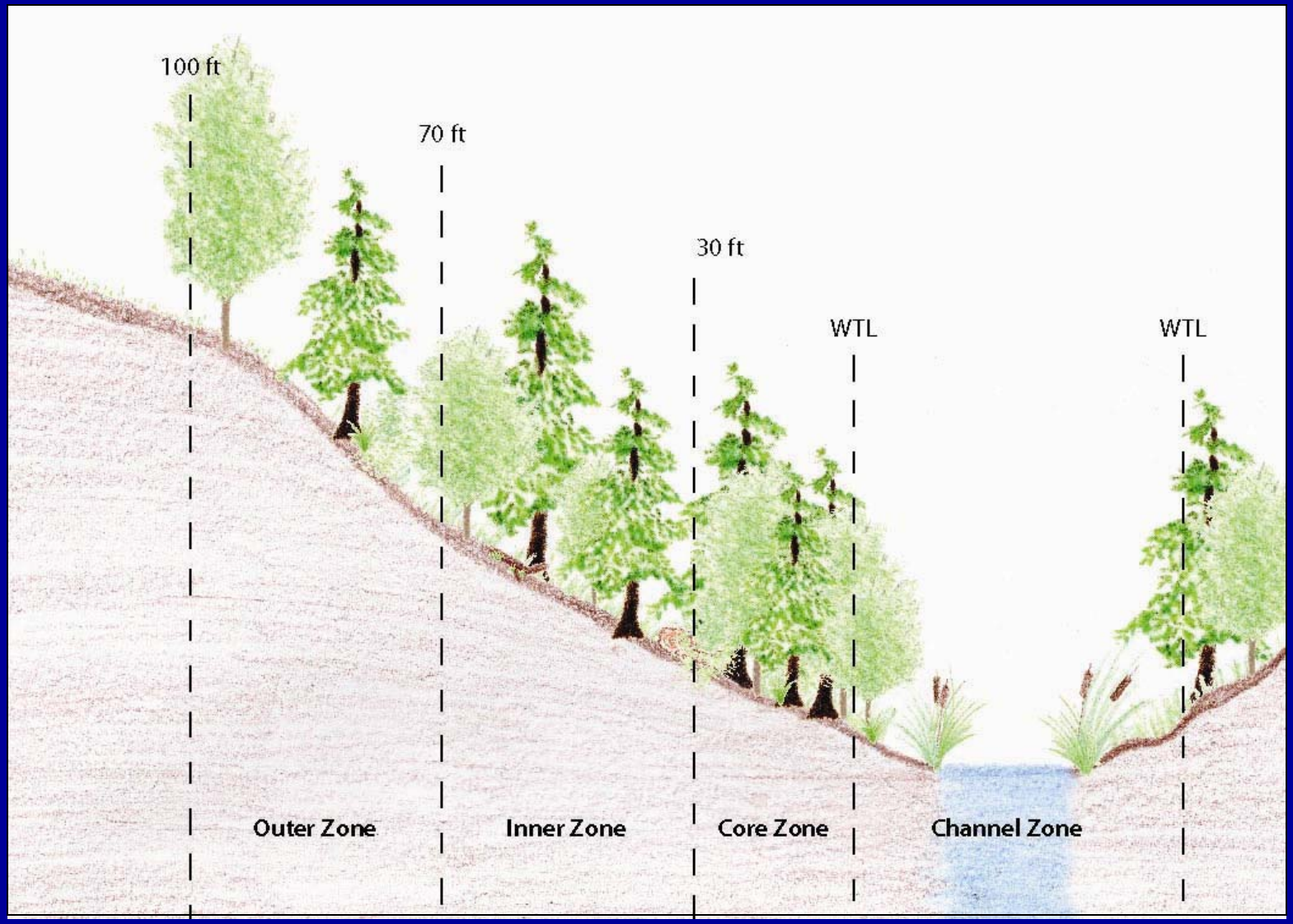
High channel stability exhibited over 60 yr along the NF Gualala River

Image: T. Spittler, CGS

Class I WLPZ Rules for Confined Channels Outside the CAZ

- **Core Zone** = first 30 feet from stream channel (timber harvest largely prohibited).
  - Large wood, canopy, bank stability
- **Inner Zone** = next 40 feet (timber harvest limited by overstory canopy (70%), 7 largest trees in core and inner zone, etc.
  - Large wood, canopy, nutrient input, etc.
- **Outer Zone** = next 30 feet (mandatory)—50% overstory canopy
  - Buffer for windthrow, microclimate control, terrestrial wildlife habitat, additional wood recruitment and shading, sediment filtration.
- **ELZ** = next 25 feet (where evenaged system used adjacent to WLPZ.

Class I WLPZ with Confined Channels Outside the CAZ




Howard Creek
Tehama County
NOV 8 2004

Judd Creek—Southern Exposure Research Site

5. Class II-L Determination

ASP Rules—Class II Watercourses

- **Two types**: Large and Standard Class II watercourses, except in SSD.
- **Large Class II**: 100 ft width with core and inner zones. Requirements generally similar to those for Class I watercourses for these zones (see Table 4 for zone widths).
- **Standard Class II**: Widths same as Table 1 in 916.5 (no cable reduction), with a 15 foot core zone in the CAZ, 10 foot core zone for non-CAZ.* Inner zone—50% total canopy.

*** Note: No core zone for slopes < 10%**

ASP Rules—Class II-L Watercourses

- Can supply water and nutrients to a Class I watercourse at least to mid-July during a year with at least average precipitation.
- Can supply coarse and fine sediment to a Class I channel.
- May be able to supply wood of a size that can function as large wood for a Class I watercourse.

Steps to Classify, Type, and Assign Protection Measures for Class II Watercourses (see #40)

- Classify a channel as a Class I, II, III, or IV watercourse.
- "Type" the Class II as either a Class II-L or Class II-S.
- Once the determination has been made that a watercourse is a Class II-L, the entire length of the Class II watercourse will be typed as a Class II-L (typing may change based on stream order; see slide #136).
- Apply Class II-L protection measures for first (lowest) 1000 feet, or propose site-specific measures.
- After the first 1000 ft, the Class II-S protection standards shall be applied, but the watercourse is still typed as a Class II-L.
- Class II watercourses that are less than 1000 ft in length and that have been typed as a Class II-L shall have the Class II-L minimum standards applied to the entire length of the Class II watercourse.
- If the watercourse is typed as a Class II-S at the confluence, apply Class II-S protection measures for entire length.
- If Class II is in SSD, apply special protection measures.


Class II
Typing is
Done with
Both
Field and
Office
Methods

Office-Based Methods to Type a Class II-L Watercourse

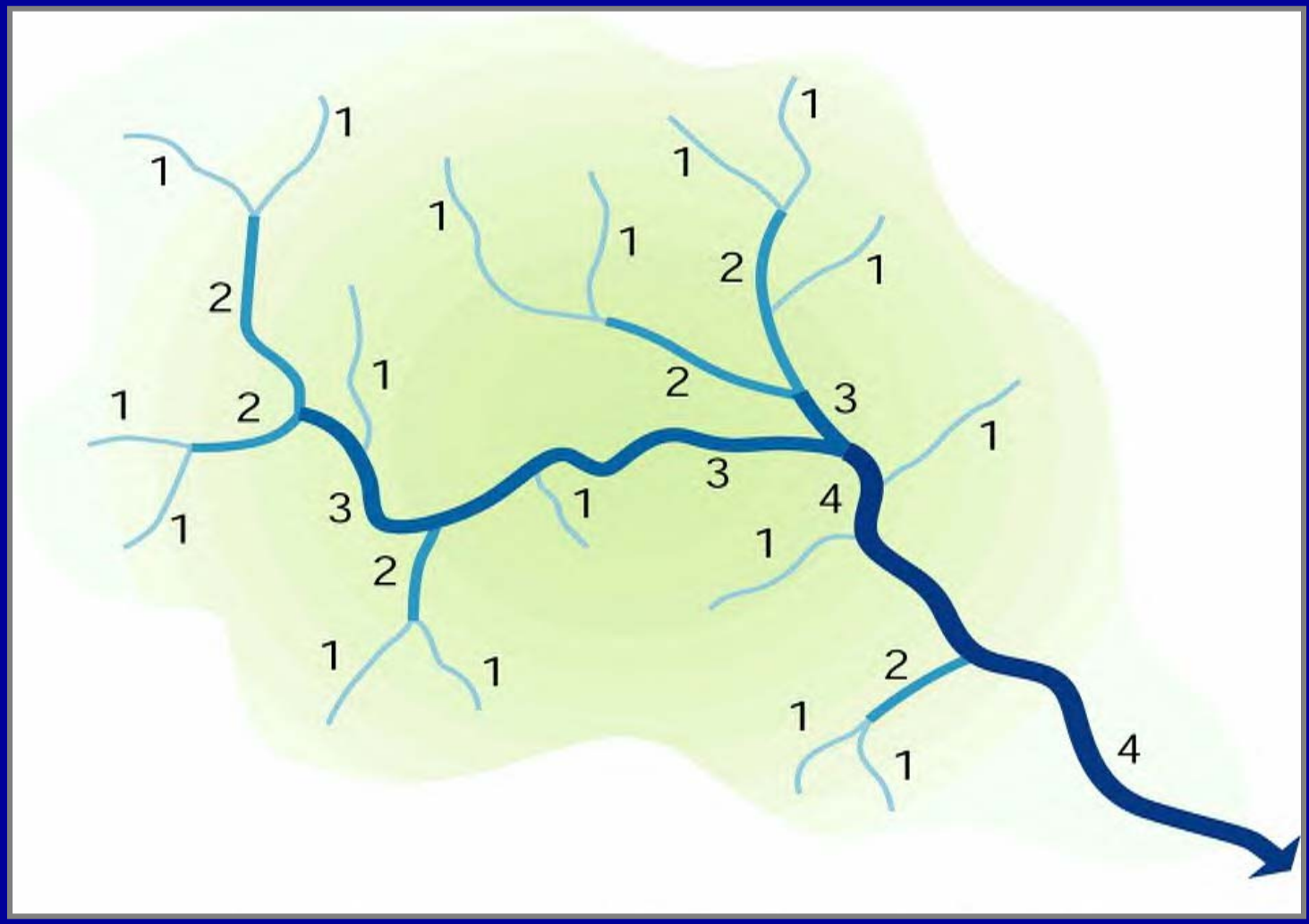
1. **Stream order — 2nd and 3rd order channels are potentially Class II-L watercourses; use field mapping, not USGS topographic maps.***

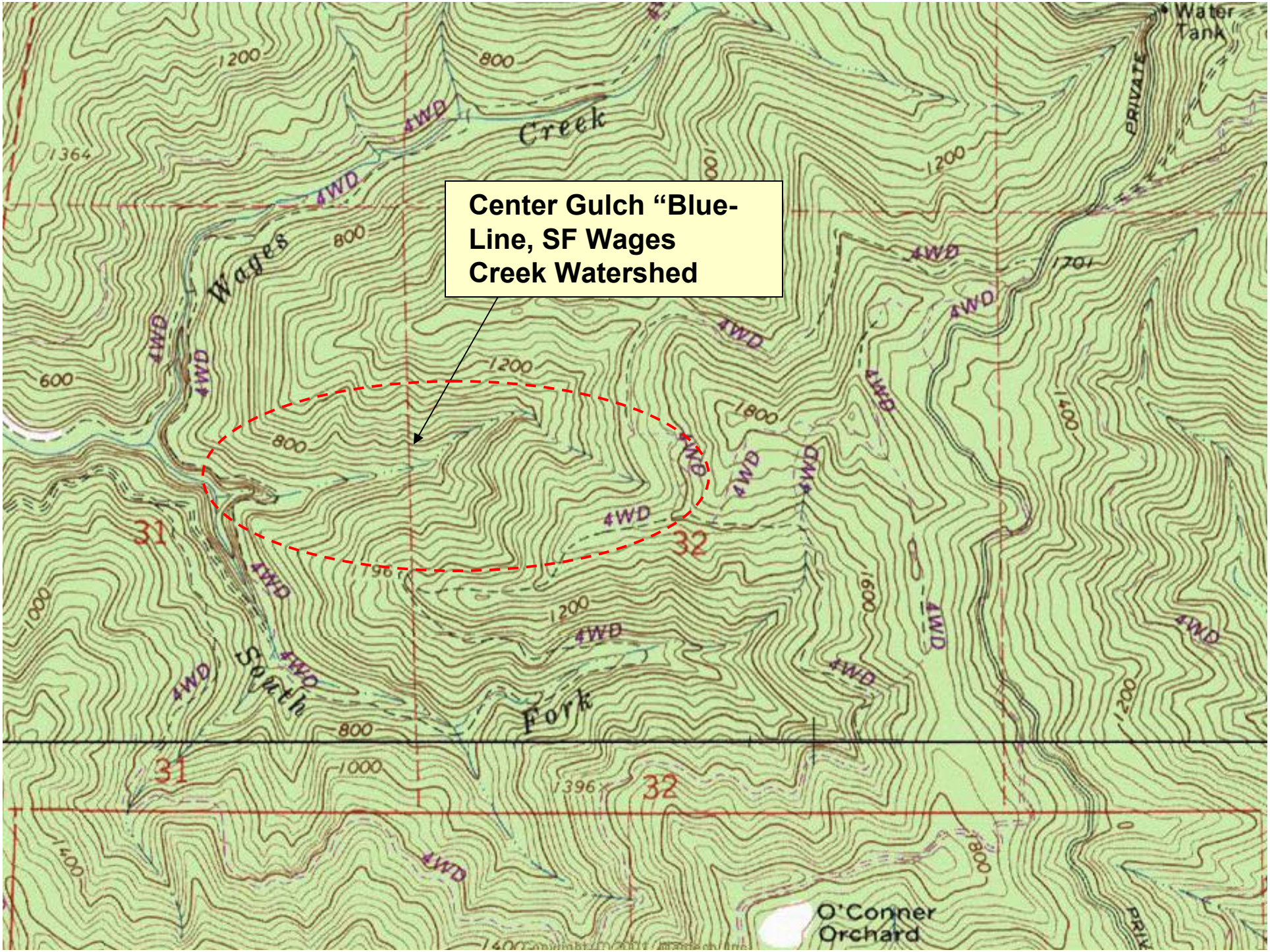
2. **"Blue-Line" Streams – Watercourses mapped with blue or black on 1:24,000 scale USGS maps that are not Class I's.**

3. **Drainage area — Area known to produce mid-summer flow based on local knowledge for an ownership/local region and extrapolated to other watersheds.**

***First Order channels can be Class II-Ls where a spring produces significant flow**

Stream Order Diagram




Center Gulch "Blue-Line, SF Wages Creek Watershed
Water Tank
PRIVATE
Creek
Wages
South
Fork
4WD
31
32
O'Conner Orchard

Regional Drainage Area Knowledge: Mendocino Redwood Company Draft HCP/NCCP

- The draft MRC HCP distinguishes between Large and Small Class II watercourses based on drainage area, not flow.
- Watershed areas of 100 acres or more qualifying as a Large Class II.
- The draft HCP allows the area threshold to be adjusted based on adaptive management.

Field-Based Methods to Type a Class II Watercourse

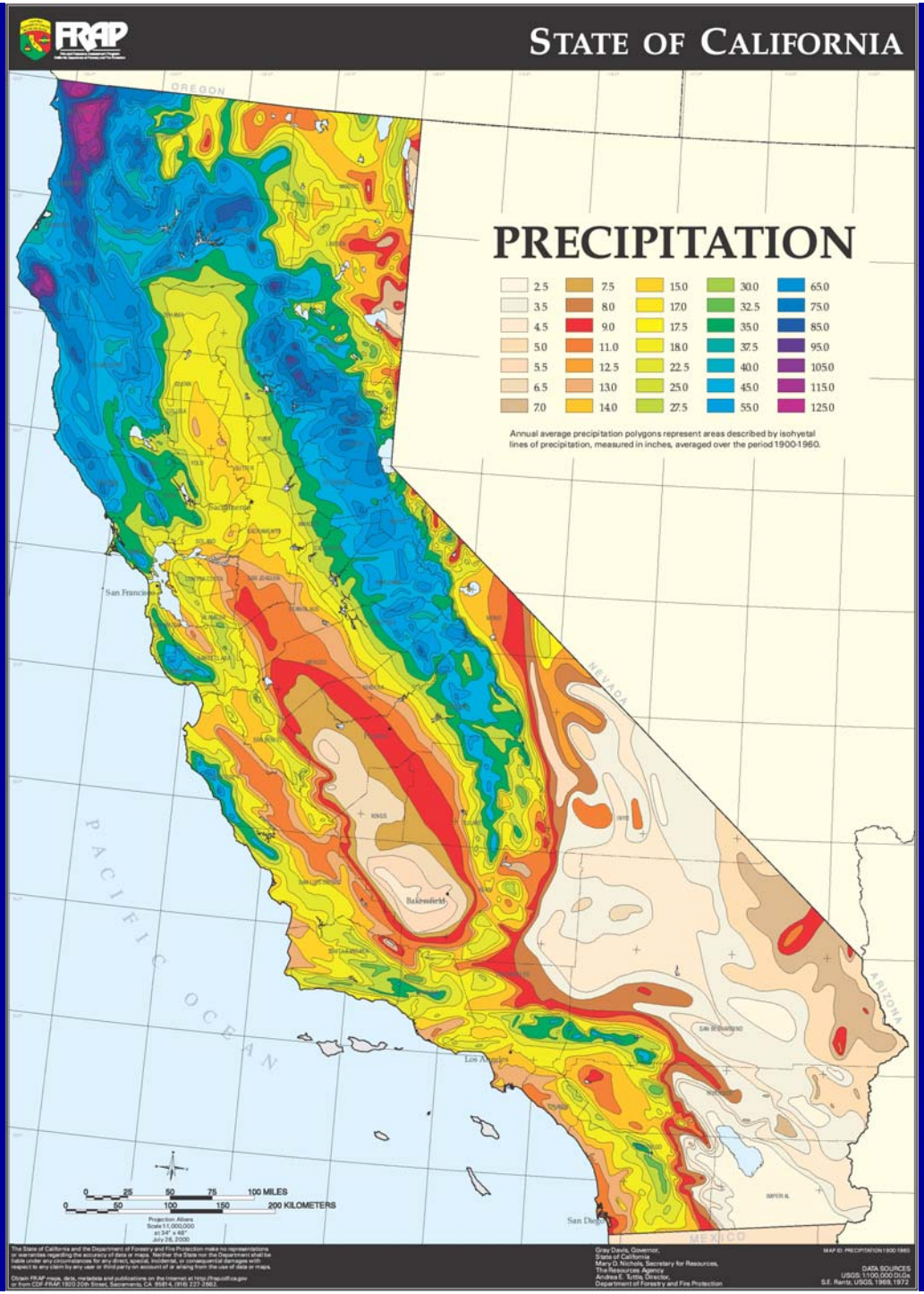
1. Determine by direct observation with field surveys after July 15th of a year with at least average precipitation; or use local knowledge of mid-summer flow conditions.
2. Observe channel characteristics.
3. Use stream monitoring data from headwater streams to determine drainage area needed to produce mid-summer flows and extrapolate to other watersheds in same local region.

Class II-L Typing Information

- Field surveys for **direct observation** of streamflow are to be completed after July 15th following a year with at least **average annual precipitation**.

Average Hydrologic Year—What is it?

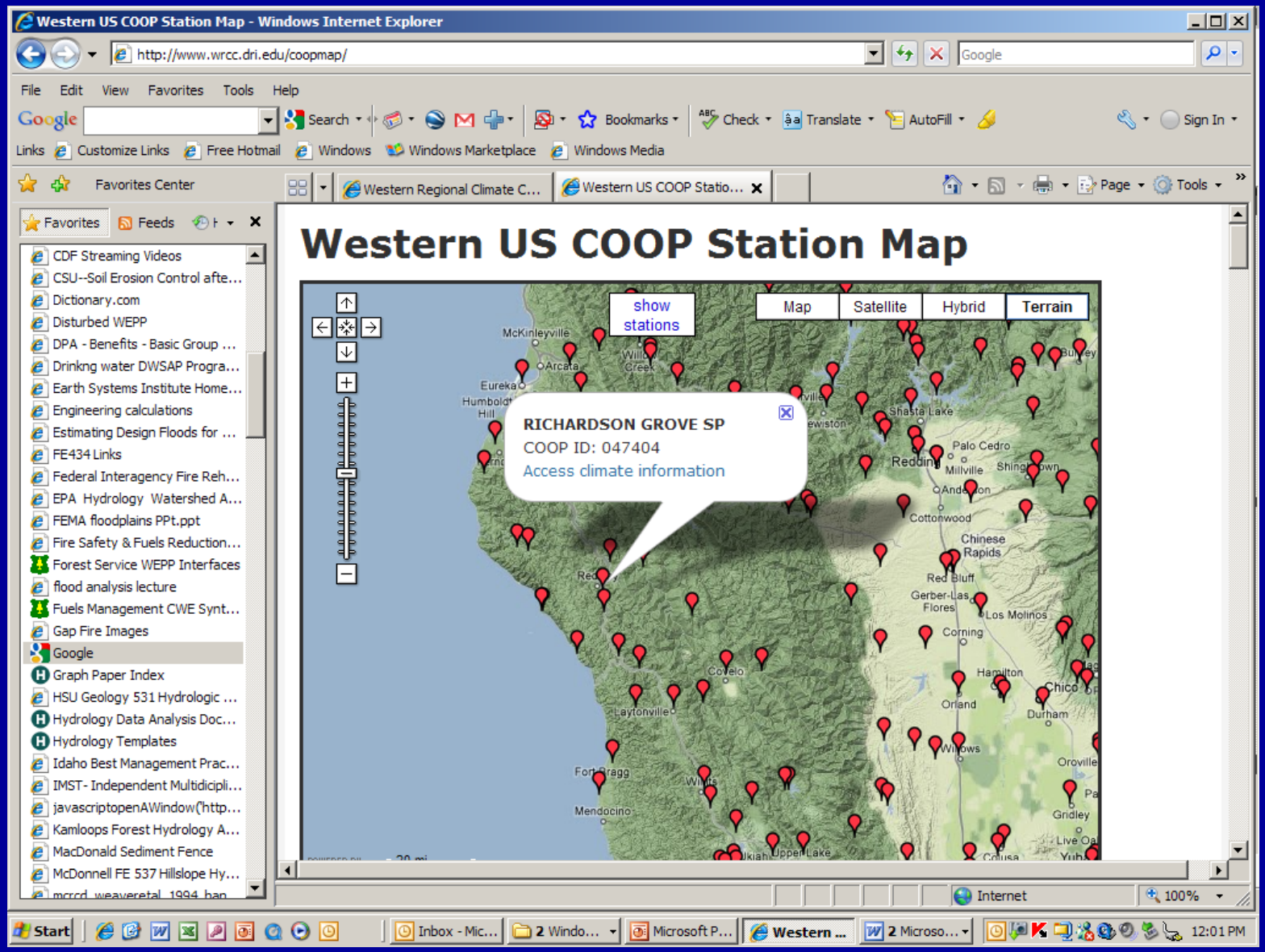
- **A year with at least average precipitation and runoff, derived from long-term data sets (at least 30 years).**
  - **Western Regional Climate Center**
  - **DWR Climate webpage**
  - **OSU PRISM data**
  - **NOAA Regional Climate Center**
  - **CAL FIRE FRAP website**
  - **US Geological Survey**

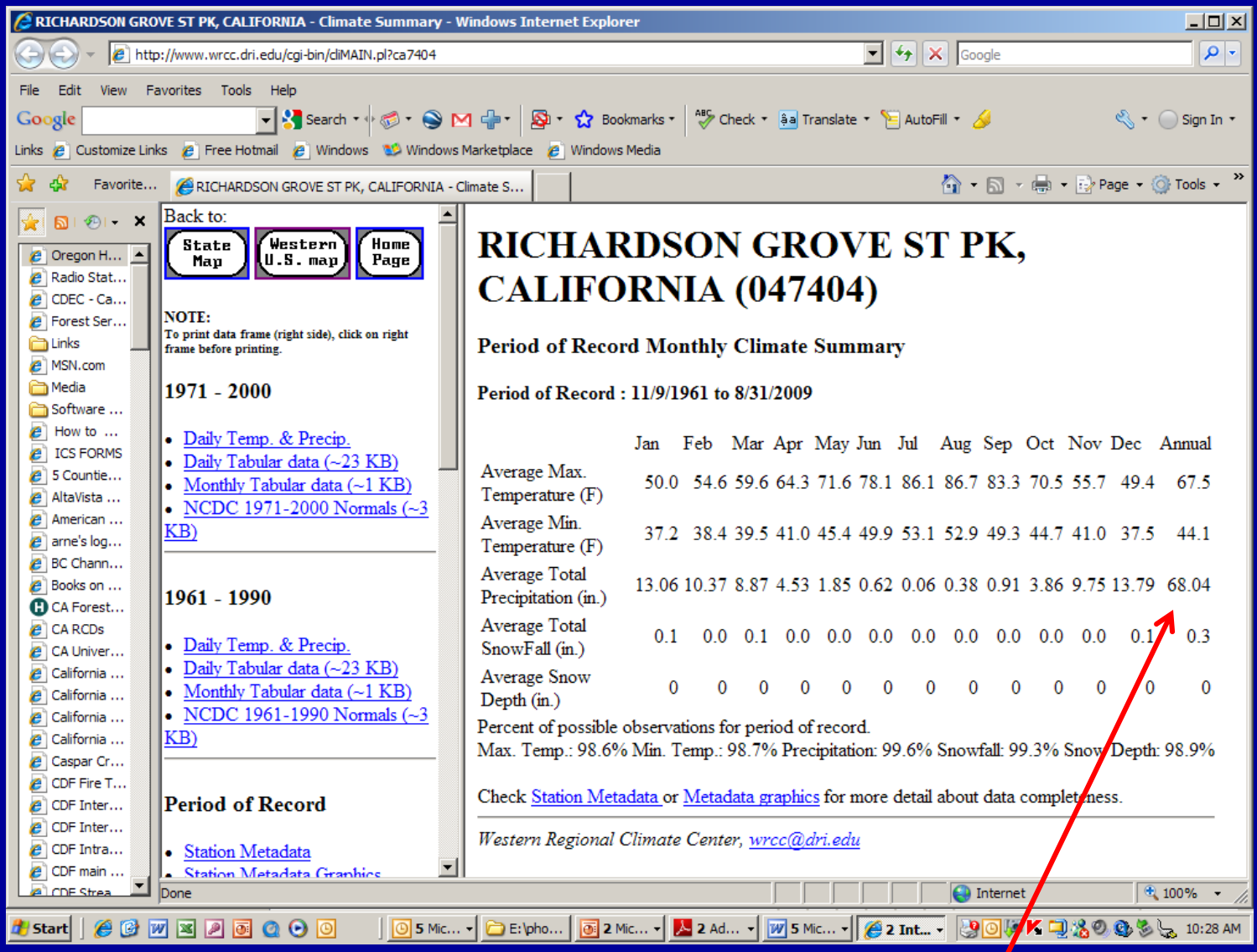


Isohyetal Map

Source:
CAL FIRE FRAP

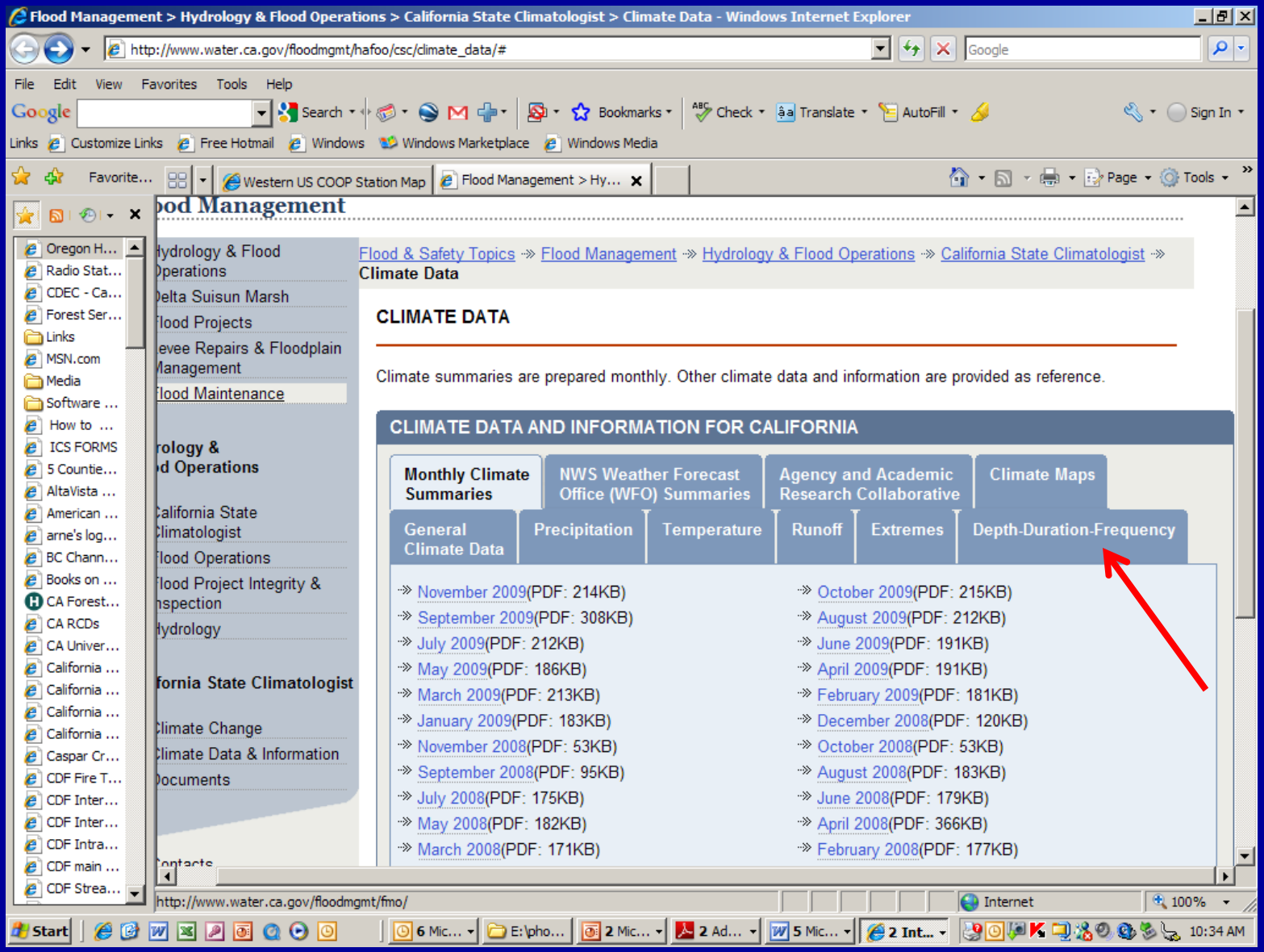
Western Regional Climate Center Webpage

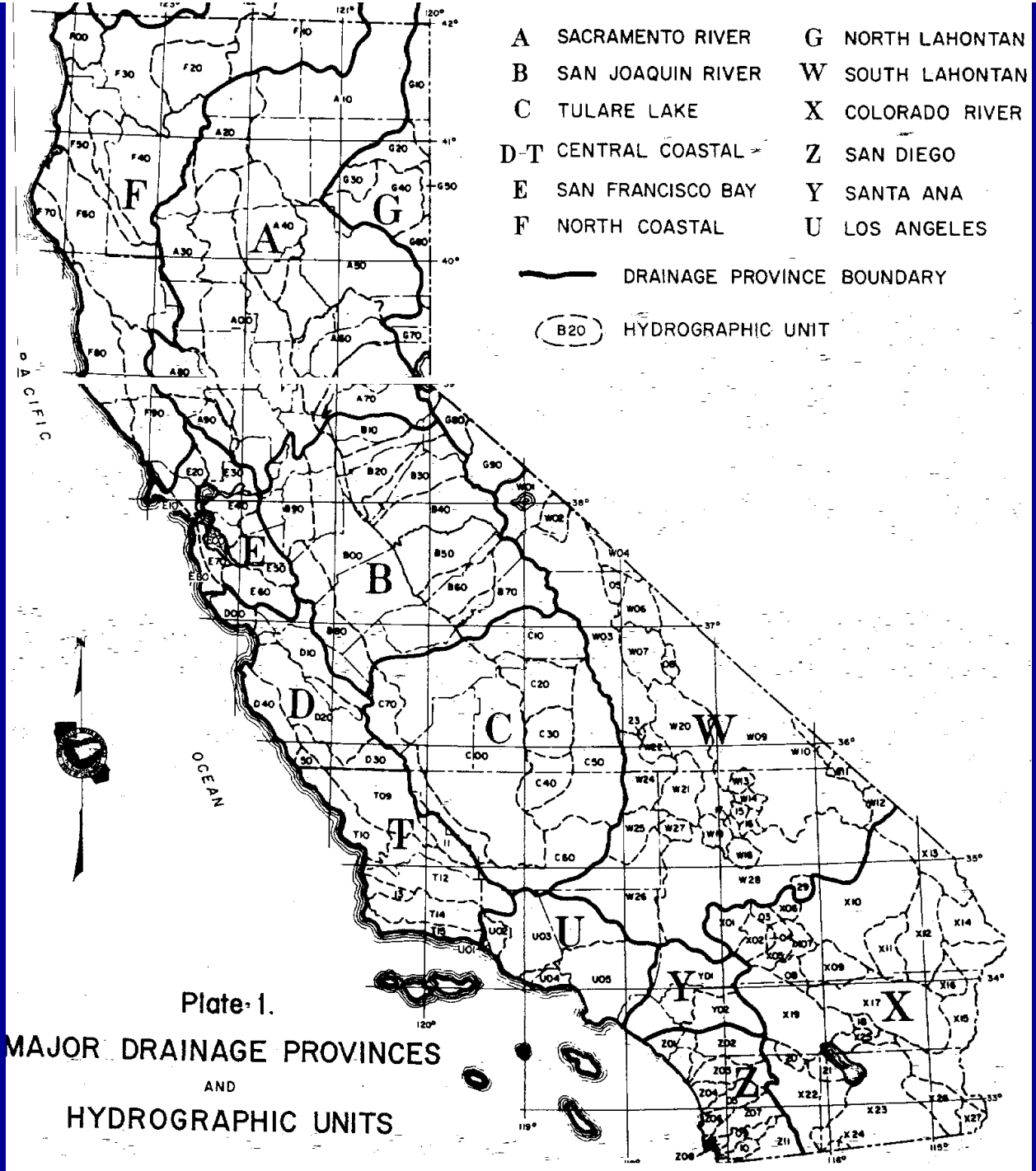




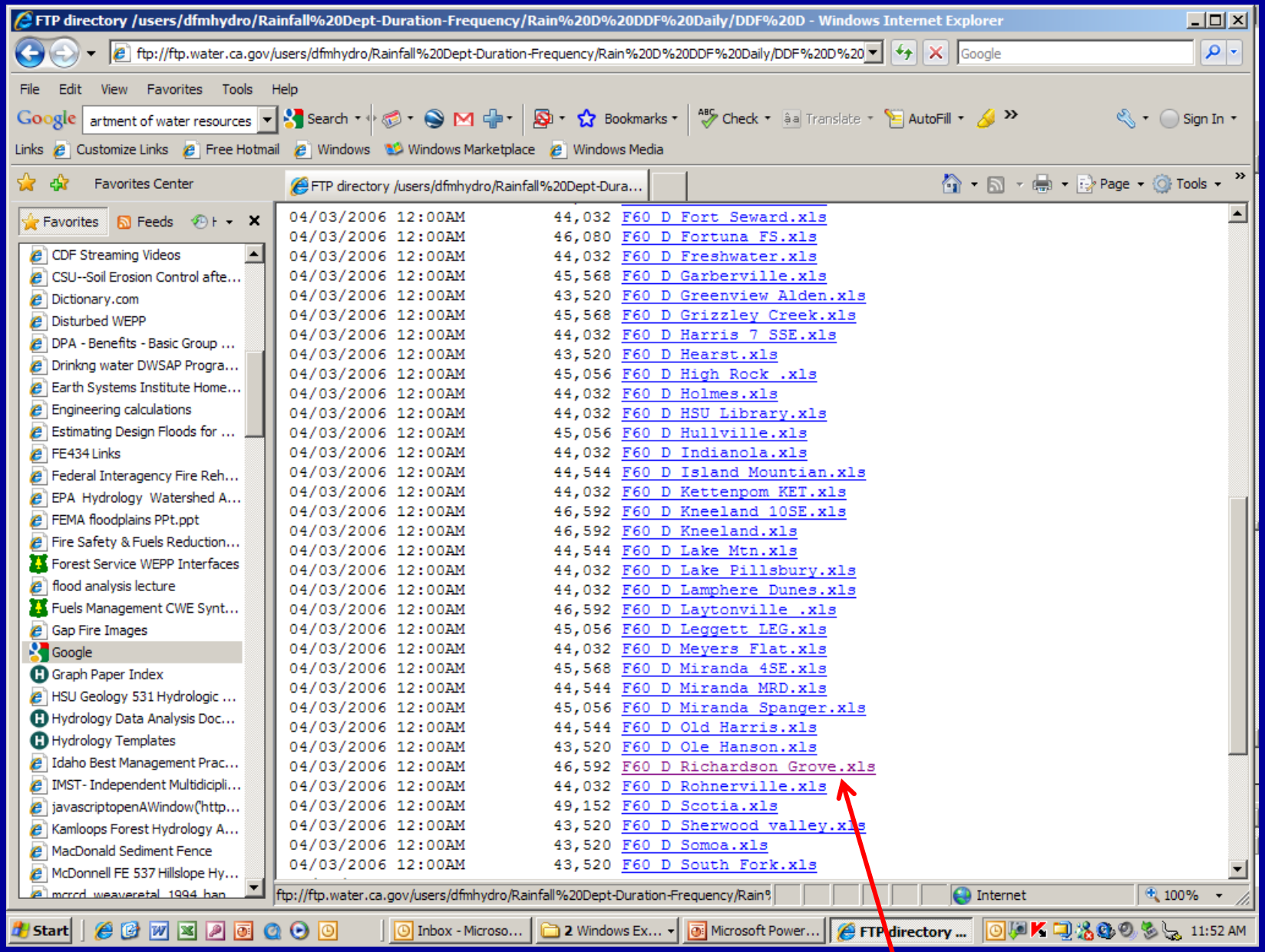
Example: Richardson Grove SP—68.04 in/yr (average from 1961 to 2009)

DWR Climate Webpage

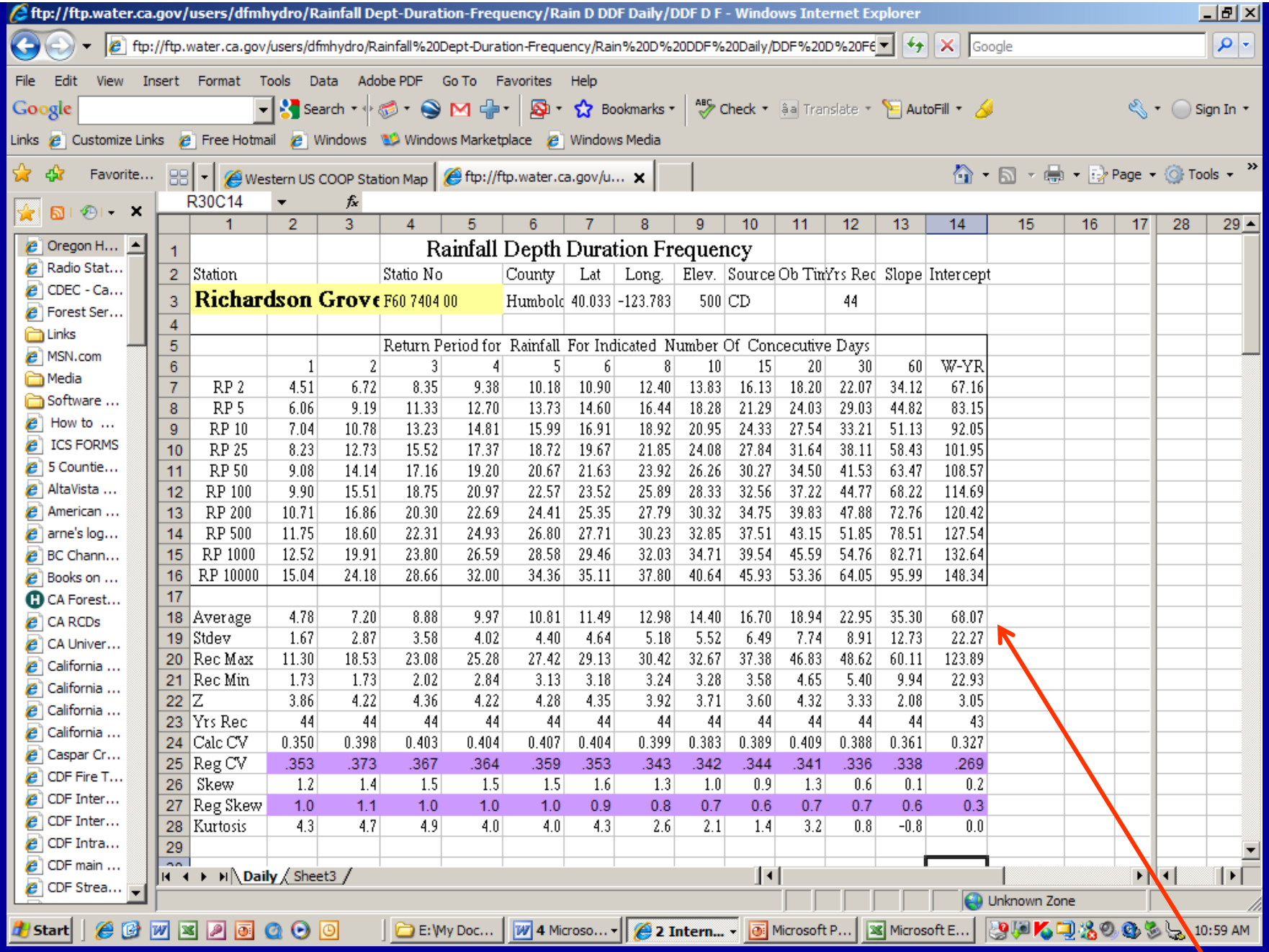




DWR Climate Data Categorized by Major Drainage Provinces



Find Excel File for Richardson Grove Station



Data from 1961-2005

Example: Richardson Grove SP – 68.07 in/yr

OSU PRISM Website Climate Data

- **Statistical approach that uses point data and a digital elevation model (DEM) to generate gridded estimates of climate parameters.**
- **Will generate a 30-yr annual precipitation estimate for anywhere in California!**
- **You provide the latitude and longitude.**

PRISM Climate Group - Windows Internet Explorer

http://www.prism.oregonstate.edu/

File Edit View Favorites Tools Help

Links Customize Links Free Hotmail Windows Windows Marketplace Windows Media

RICHARDSON GROVE ST PK,... | PRISM Climate Group

PRISM CLIMATE GROUP

HOME PRODUCTS PROJECTS DOCUMENTATION HELP | Print Friendly | A A A

TERMS OF USE

What's New!

8/17/09:A positive funding outlook has allowed us to update the 4 km monthly time series maps to the current month.

5/4/09: See PRISM maps on pg 16-17 in the May 2009 CBO report on Potential Impacts of Climate Change.

7/2/08: 1971-2000 800m Normals Query now available on Data Explorer.

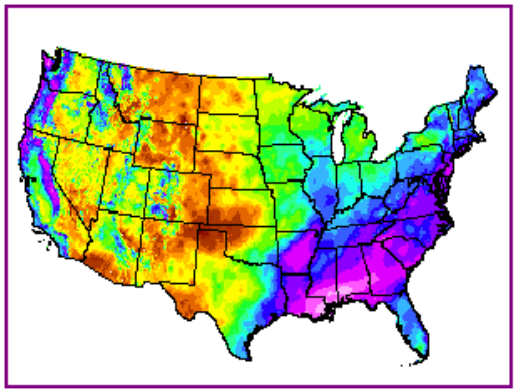
6/9/08: Updated informational presentations. See presentations

Complete History

Quick Links

Data Alerts!
Monthly Data
800m Normals (1971-2000)
Internet Map Server

Latest PRISM Data - Dec 2009



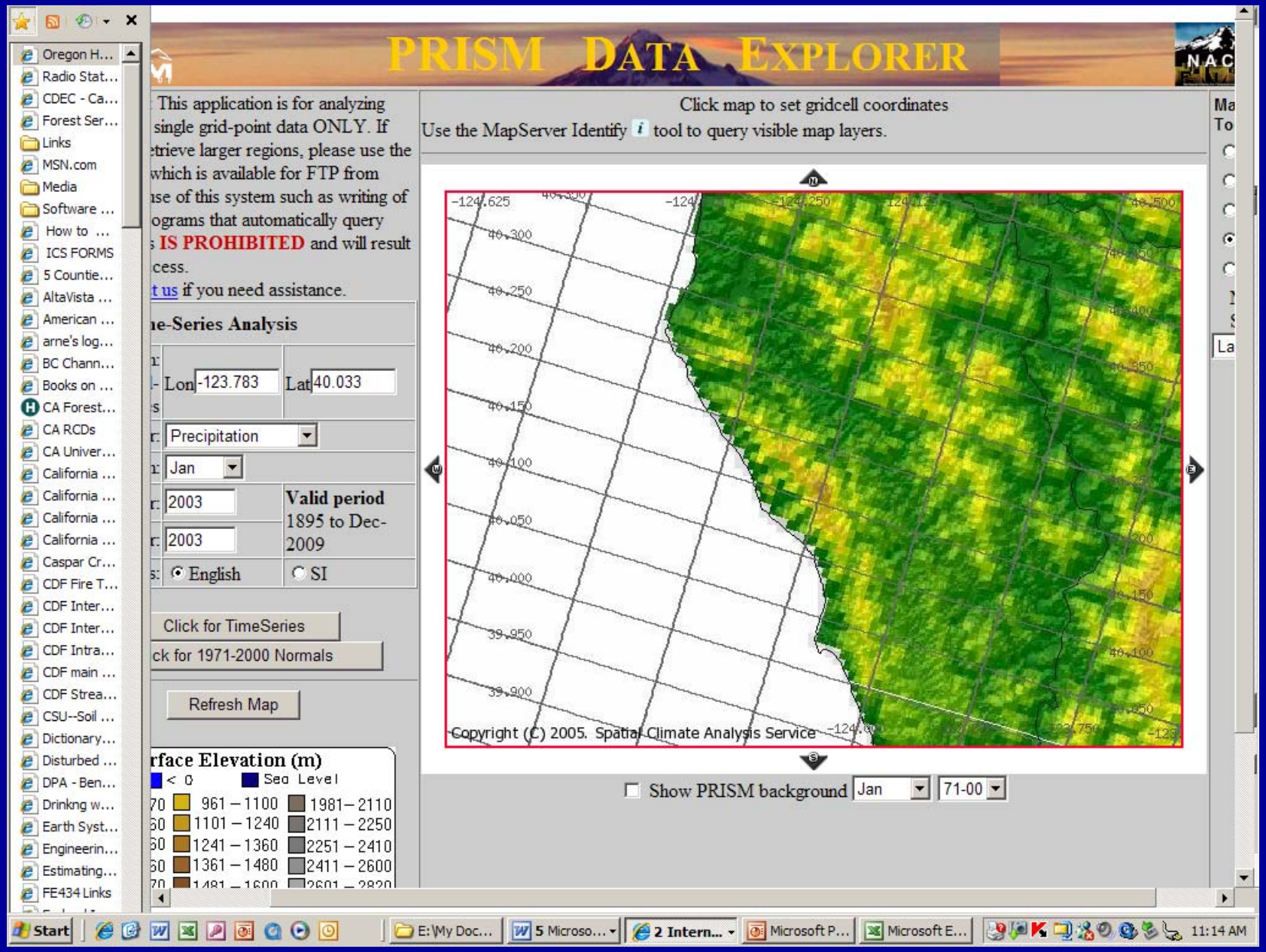
Precipitation
Max Temp
Min Temp
Dewpoint
PPT %

Click to see full-size map. More...

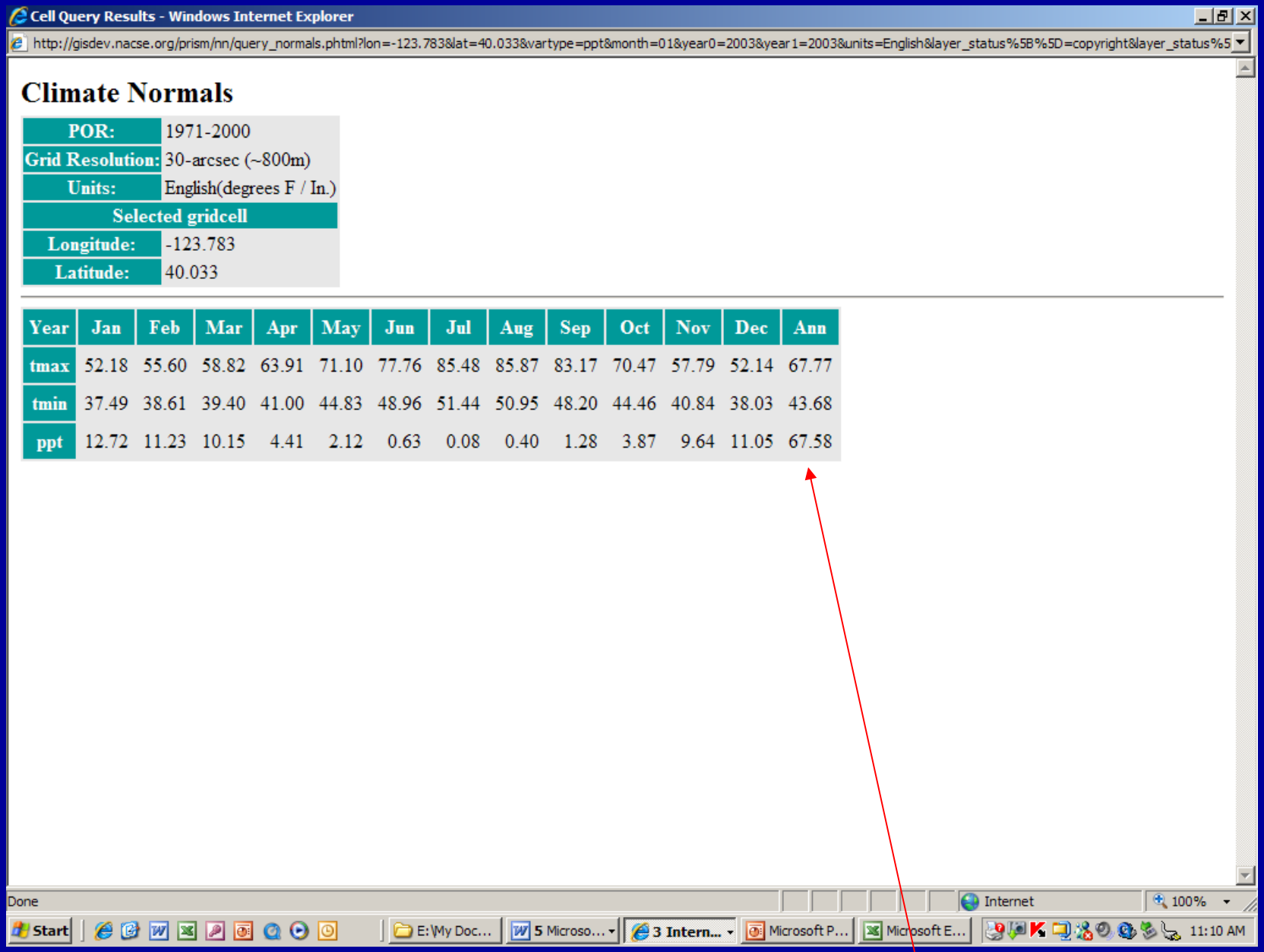
The data sets available on this web site were created using the PRISM (Parameter-elevation Regressions on Independent Slopes Model) climate mapping system, developed by Dr. Christopher Daly, PRISM Climate Group director. PRISM is a unique knowledge-based system that uses point measurements of precipitation, temperature, and other climatic factors to produce continuous, digital grid estimates of monthly, yearly, and event-based climatic parameters. Continuously

Done | Internet | 100%

Start | E:\My Doc... | 5 Microso... | 2 Intern... | Microsoft P... | Microsoft E... | 11:21 AM



Go to PRISM "Data Explorer" and specify latitude and longitude, 1971-2000

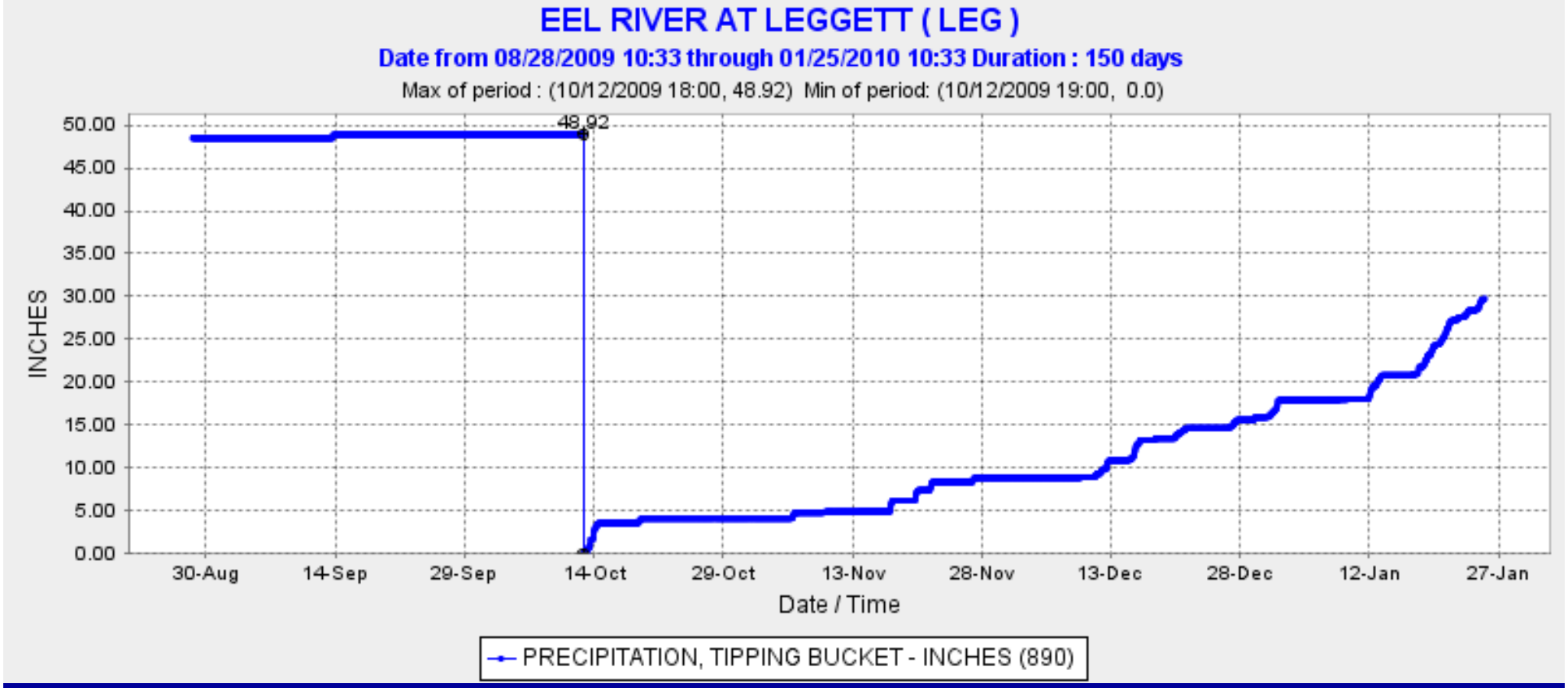


Example: Richardson Grove SP – 67.58 in/yr

Did the Past Year Have Average Precipitation?

- Local newspapers keep running totals of precipitation vs long-term normal.
- Department of Water Resources California Data Exchange Center (CDEC) website—cumulative precipitation station totals [http://cdec.water.ca.gov/
- SF Caspar Creek watershed—real time data website for cumulative precipitation: http://nrs-isa.humboldt.edu/rsl/tts_plot.html

Example of Past Year/Current Year Precipitation: Eel River at Leggett (CDEC site)

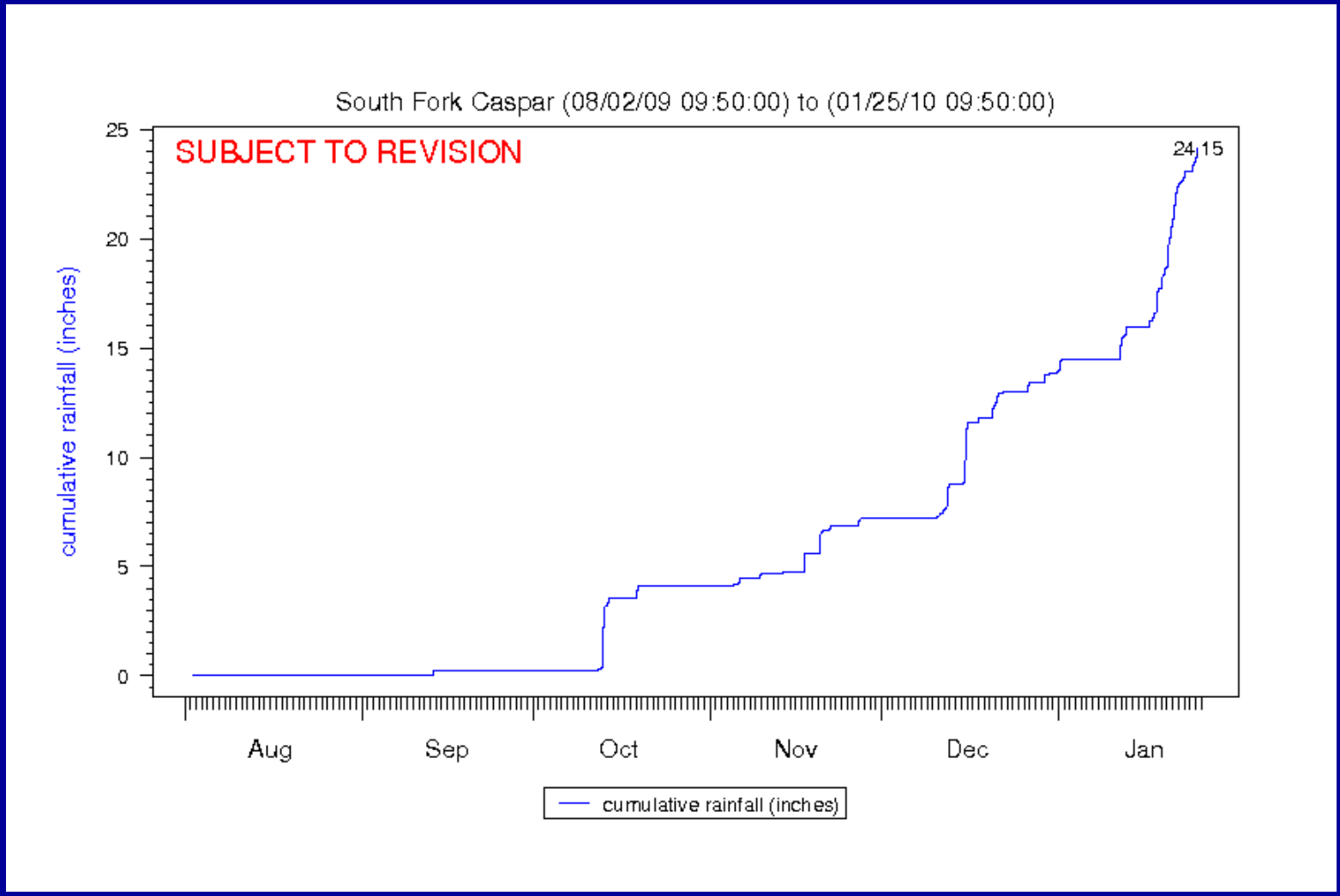


Hydrologic Year 2009: 48.02 inches

2010 Hydrologic Year (to date): 29.78 inches

Long-term average: 70.50

Example of Current Year Precipitation: SF Caspar Creek (USFS-PSW website)



Current Hydrologic Year: 24.15 inches

Long-Term Average: 46.1 inches

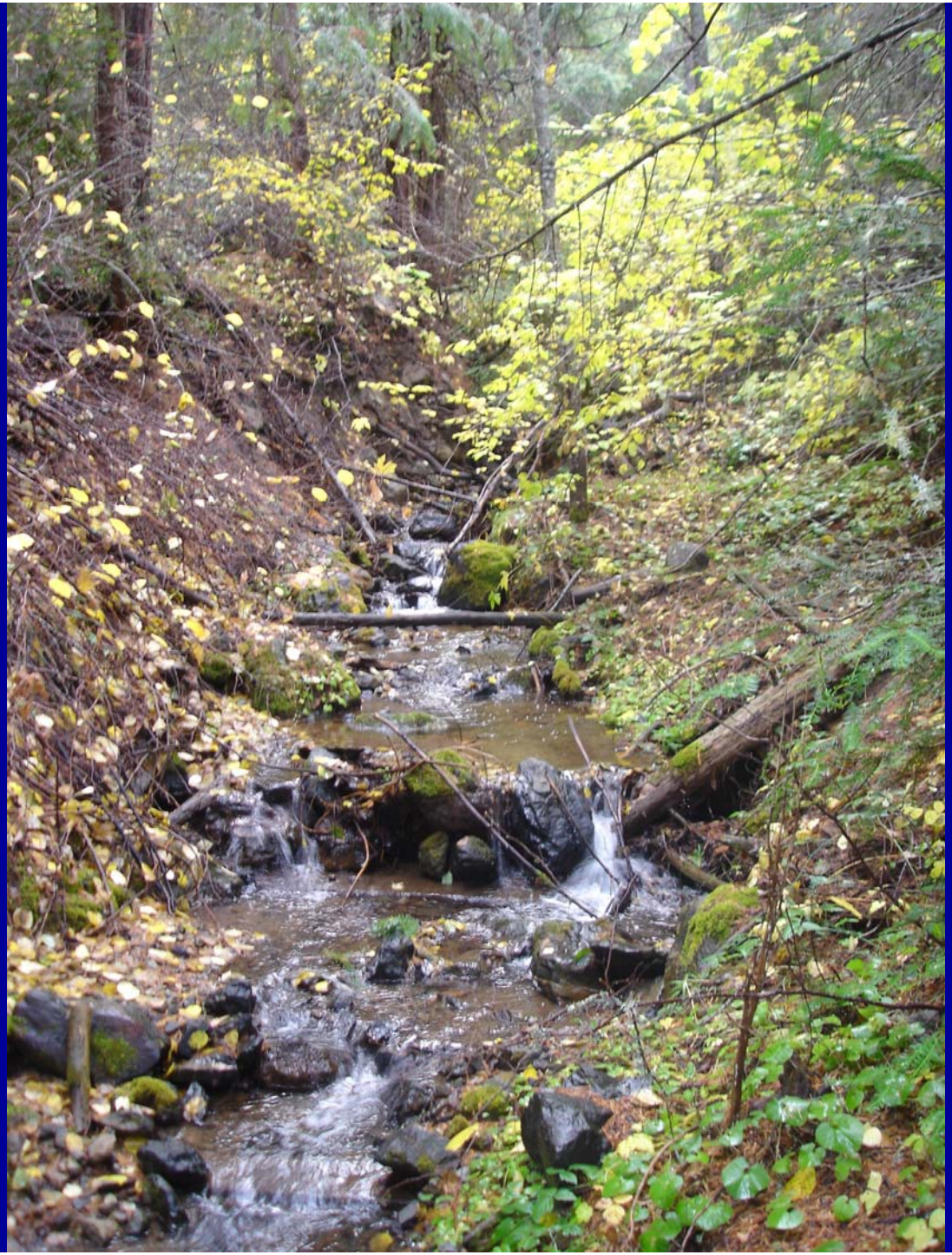

How Much Flow is Required into a Class I Watercourse to Merit Class II-L Typing?

How Much Flow is Needed?

- Board's language does not provide qualification on the amount of flow required.
- If flow is "just a trickle" and likely not to impact water temperature in a Class I, an RPF may propose an alternative protection measure under 916.9, section (v).
- Brown's (1980) Mixing Equation and other accepted methodologies could be used for justification.

Class II-L Typing: Flow Information

- **Surface flow to the receiving Class I watercourse is expected to be the dominant flow source during a year with at least average precipitation.**
- **Surface flow may be interrupted by reaches with subsurface flow (i.e., surface flow is present, but may not be spatially continuous).**
- **Limited intermittent dry portions of the channel at or above the confluence with the Class I do NOT disqualify the channel from Class II-L typing.**



Siskiyou County Class II Watercourse

December Flow—

Is it a Class II-L or Class II-S?

Class II-L Typing Information

What Happens if an RPF has to Type in the Winter or During a Dry Year?

- Surveys at other times of the year can be used, if there is "local knowledge" of mid-summer flow conditions [916.9(g)(1)(B)(1)].
- Use knowledge of drainage area needed to produce mid-summer flows.
- Use channel characteristics.
- Use multiple office methods.
- Pre-consult with local agency personnel.

Class II Flow in December

What happens if the PHI occurs in a wet period in March, and all Class II channels are flowing water?

Review Team to rely on information in plan, their local knowledge of drainage area, and other office methods/ field indicators.

Comments on Using Channel Characteristics to Determine a Class II-L

- Generally insufficient for identification alone; strongly recommend multiple field methods, as well as 1 or more office methods.
- Can be used to determine if ephemeral, intermittent, or perennial watercourse.
- Greater chance of mid-summer flow: lower channel slope, wider channel width, greater depth, lower entrenchment.

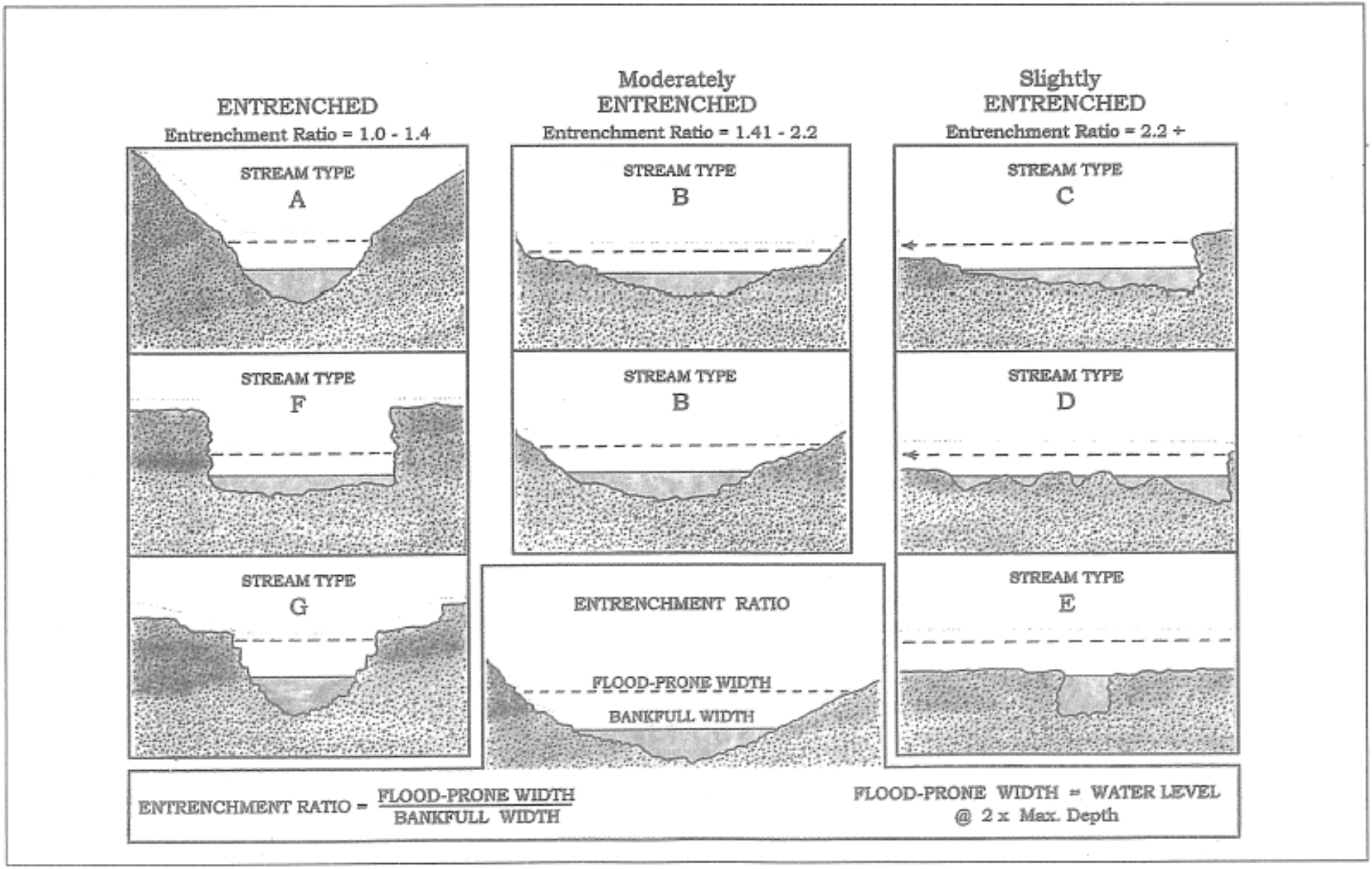


Image: Rosgen 1996

Oregon Streamflow Duration Assessment Method

Indicators of Streamflow to Distinguish Between Ephemeral, Intermittent, and Perennial Streams

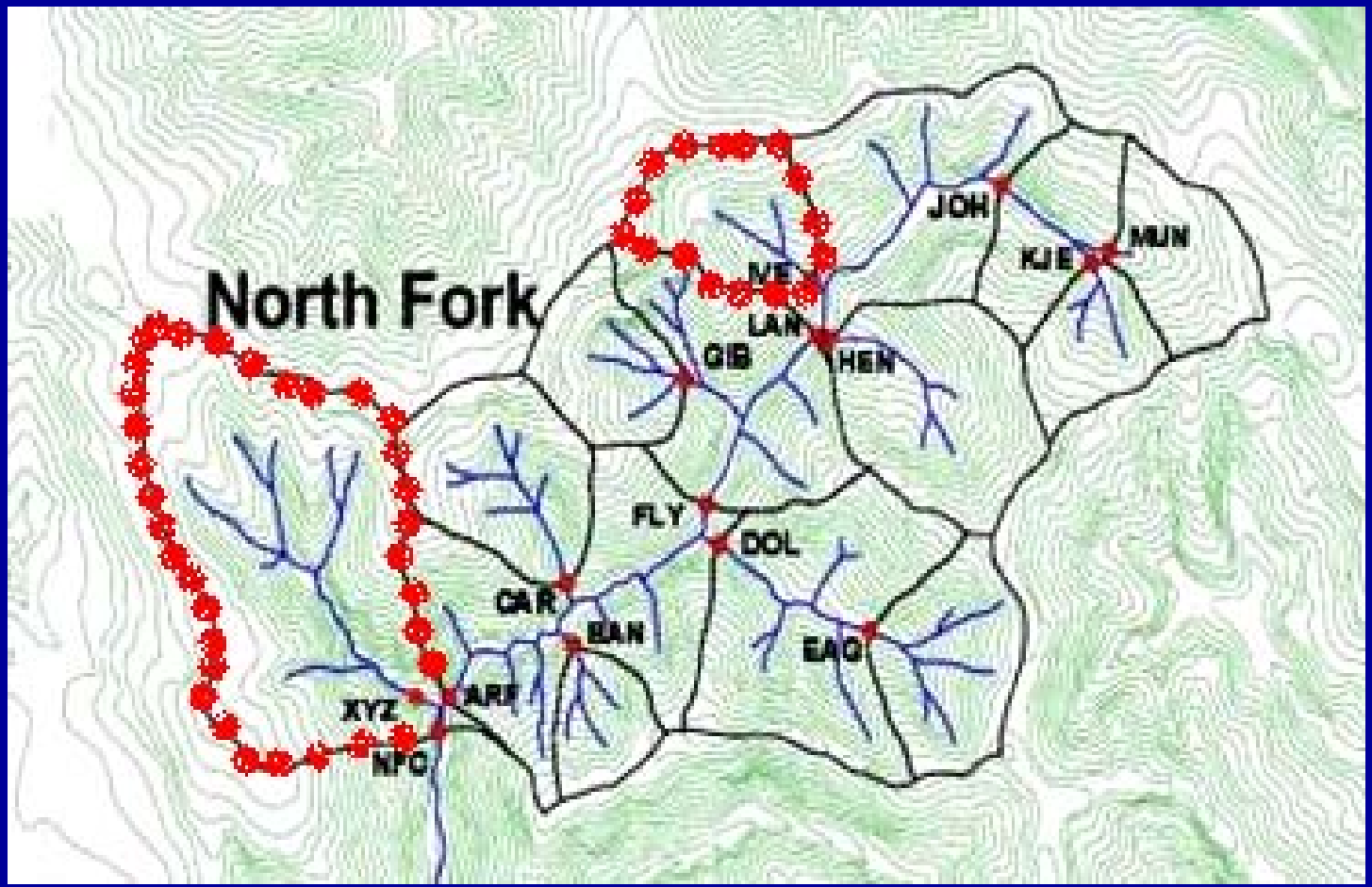
Significant particle size sorting and larger depositional areas—strong geomorphic indicator of longer streamflow duration (perenial stream)

Image: USEPA and USACE 2009

Particle sorting: gravel and cobbles tend to be localized in riffles and runs; accumulations of fine sediments settle out in slow water areas

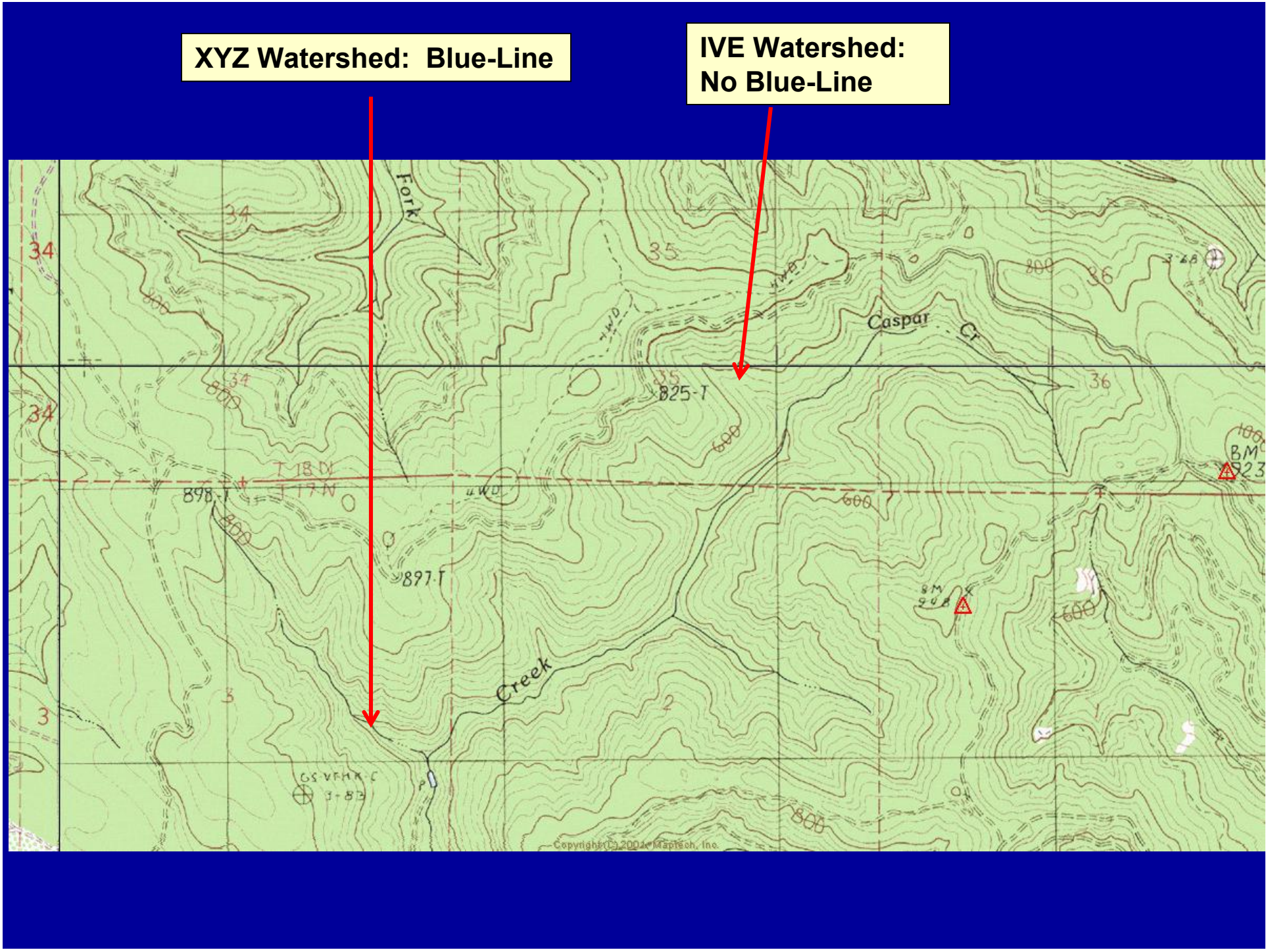
Examples of Stream Monitoring Data:

XYZ and IVE Watersheds North Fork Caspar Creek



XYZ Flume, NF Caspar Creek

Watershed IVE: 52 acres—Flow in Late July


XYZ Watershed: Blue-Line
IVE Watershed: No Blue-Line
Caspar Cr
Fork
Creek
825-T
897-T
898-T
T 18 N
R 17 W
4WD
Copyright (C) 2001 Maptech, Inc.

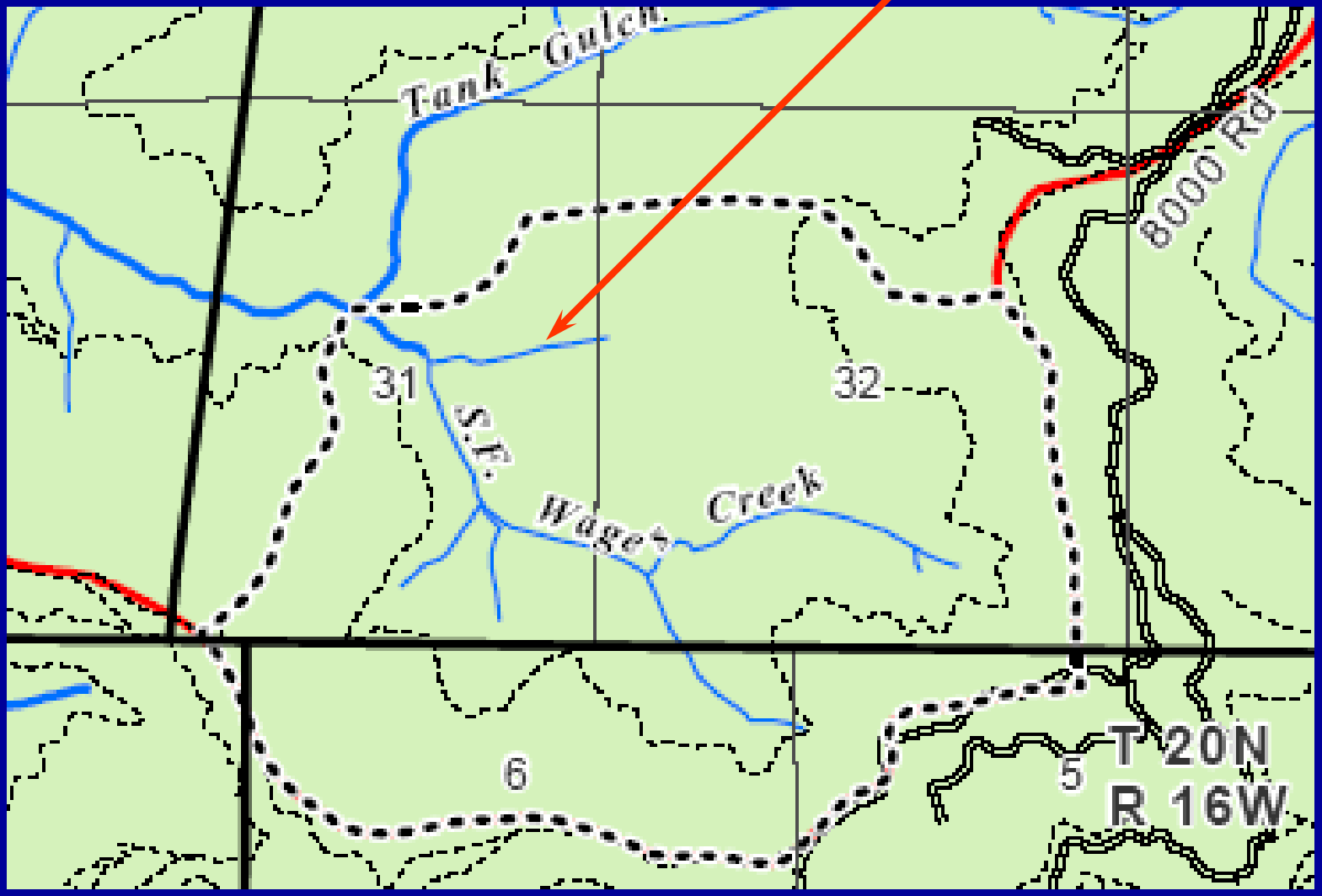
Caspar Creek Watershed Summary Information From Hydrologist Elizabeth Keppeler, USFS-PSW

- At 100 acres (~40 ha)--Class II's consistently have perennial flow, but this may be interrupted by reaches with subsurface flow.
- Some watercourses with half this drainage area also produce perennial flow.

Center Gulch above SF Wages Creek

Third Order Class II from Map Evaluation; (Blue-line); Perennial for ~100 feet upstream of its confluence with main stem SF Wages Cr

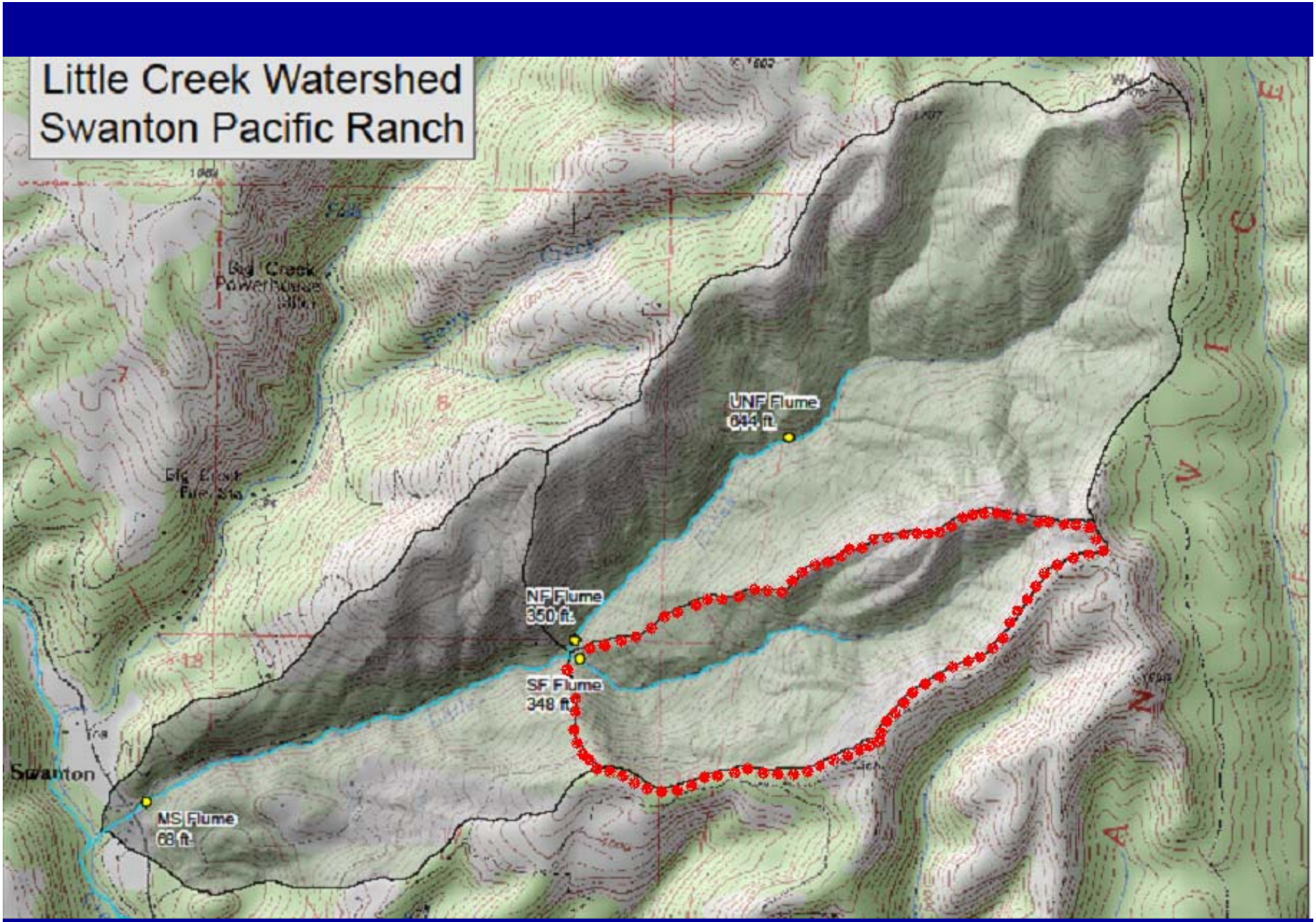
Center Gulch



Swanton Pacific Ranch

SF Little Creek Watershed

Drainage Area = ~200 acres above fish barrier



Natural rock waterfall barrier to anadromy located 400 feet up from confluence with North Fork

Headwater Stream T2 Monitored in the North Fork Little Creek Watershed, Swanton Pacific Ranch

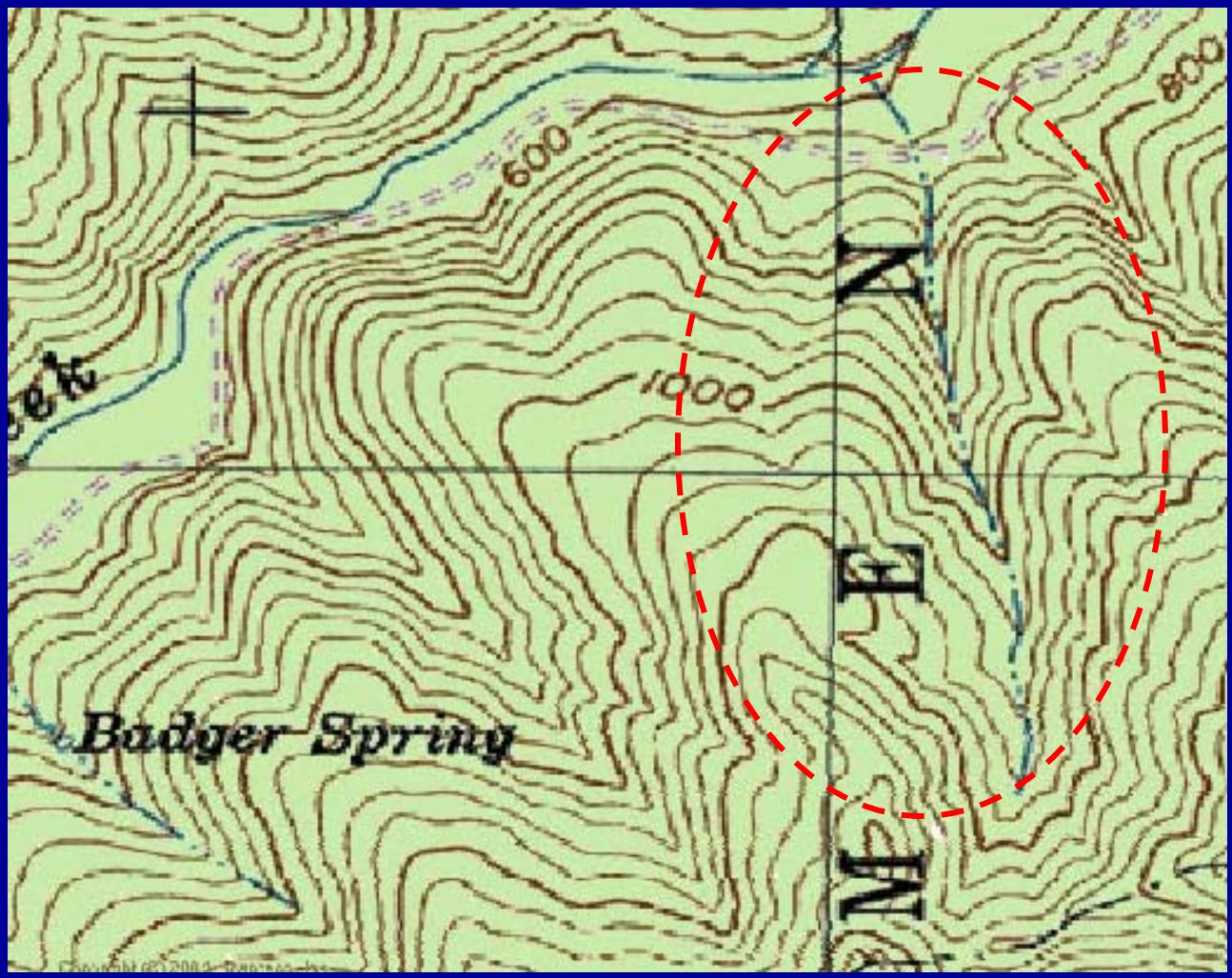
"Weir Creek" Soquel Demonstration State Forest

Drainage area = 159 acres

Flow on July 13, 2007

Winter Flow

Weir Creek: Blue-Line Stream on a USGS Topographic Map--Tributary to the East Branch of Soquel Creek



Note: There are no Class II-L and S watercourses in the SSD

Selected Gauged Watersheds by Geomorphic Region

Coast Ranges

Caspar Creek (USFS-PSW and CAL FIRE; Mendocino Co.)
SF Wages Creek (CTM and CAL FIRE; Mendocino Co.)
SF Ten Mile River (CTM; Mendocino Co.)
Elk River and Freshwater Creek (HRC, Humboldt Co.)
Redwood Creek tributaries (RNSP, Humboldt Co.)
Little River (Green Diamond Resource Co., Humboldt Co.)
Maple Creek (Green Diamond Resource Co., Humboldt Co.)
Little Creek (Cal Poly SPR, Santa Cruz Co.)
East Branch Soquel Creek Tributaries (SDSF, Brook Kraeger, Santa Cruz Co.)

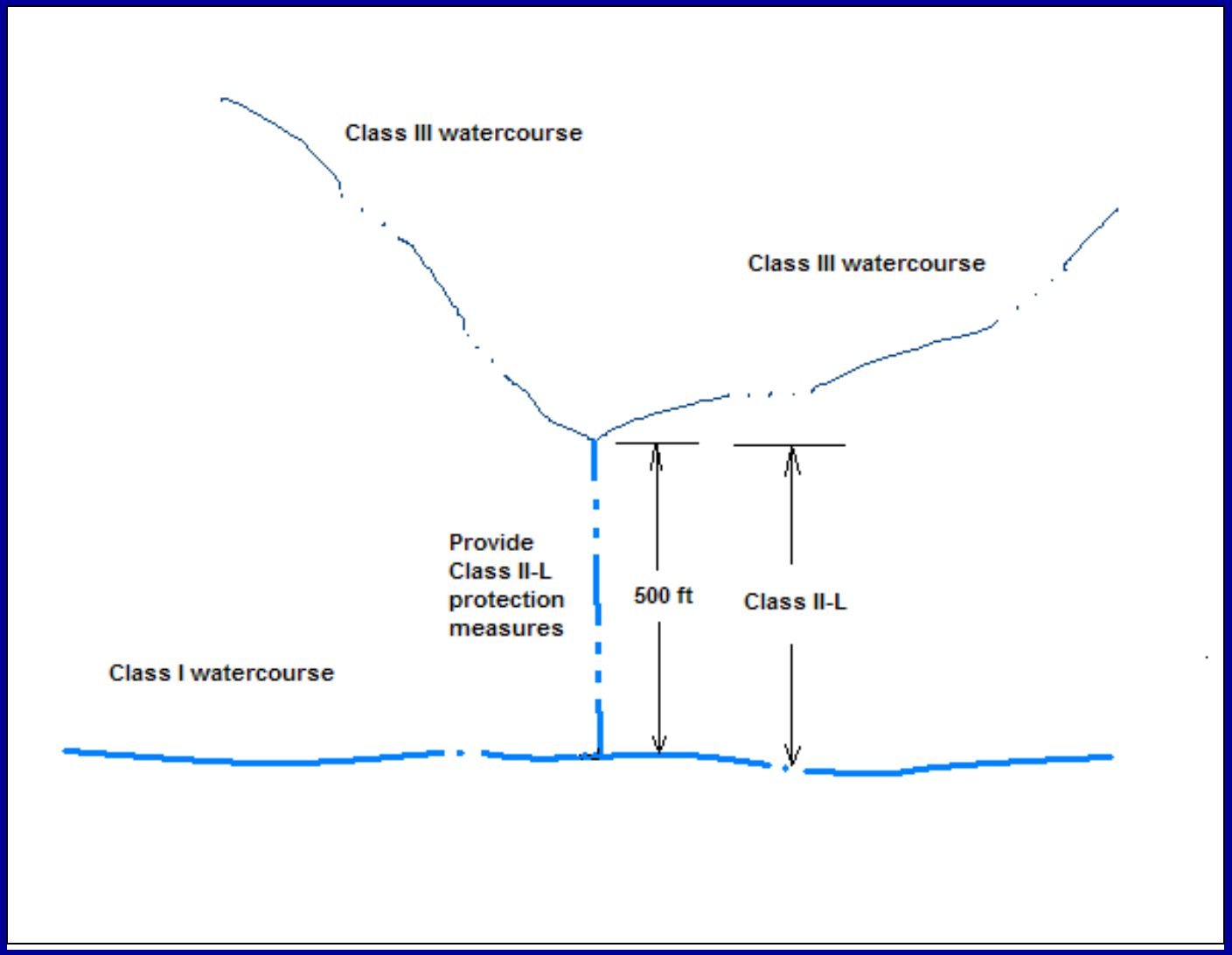
Sierra Nevada and Cascade Province

Kings River Experimental Watershed (KREW; USFS-PSW, Tulare Co.)
Frazier Creek and Bear Trap Creek (SNAMP, Madera Co.)
Big Sandy Creek and Speckerman North Creek (SNAMP, Placer Co.)
Upper San Antonio Creek (SPI, Calaveras Co.)
Judd Creek (SPI and CAL FIRE, Tehama Co.)
Millseat Creek (SPI, Shasta Co.)

If Water Just Flows for the Last 250 Ft Before Entering a Class I—is it Still a Class II-L and given Class II-L Protection Measures for 1000 ft?

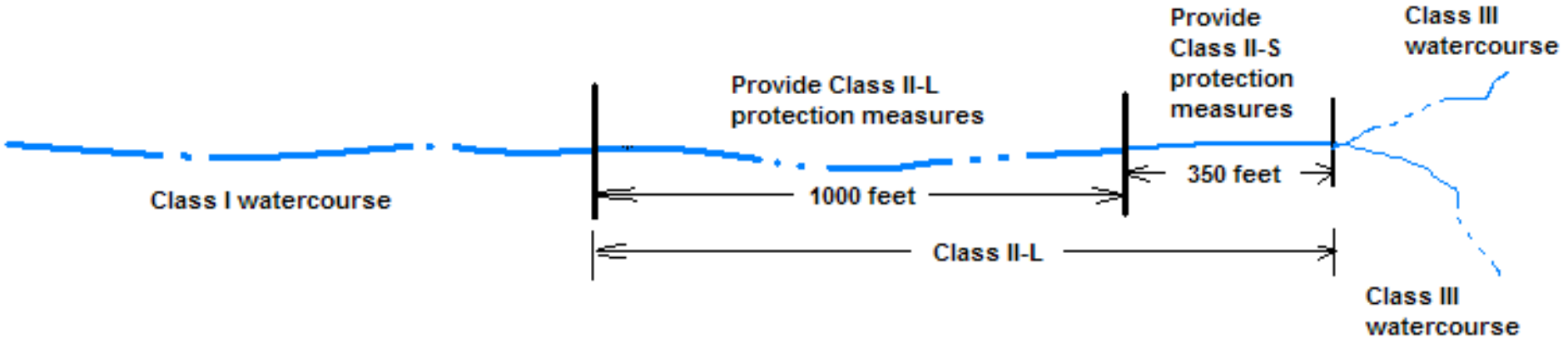
- Yes, unless it changes to a Class III prior to 1000 feet, or the stream order changes to a first order Class II watercourse.
- Why? Class II-L watercourses can significantly impact Class I's, and
- Class II-L watercourses have significant values themselves, and should be viewed as a hydrologic system (not a "limited stream reach").
  - Note that an alternative can be developed with Section 916.9, section (v).

Class II-L Watercourse where Class II-L Protection Measures are Applied for Only 500 Feet

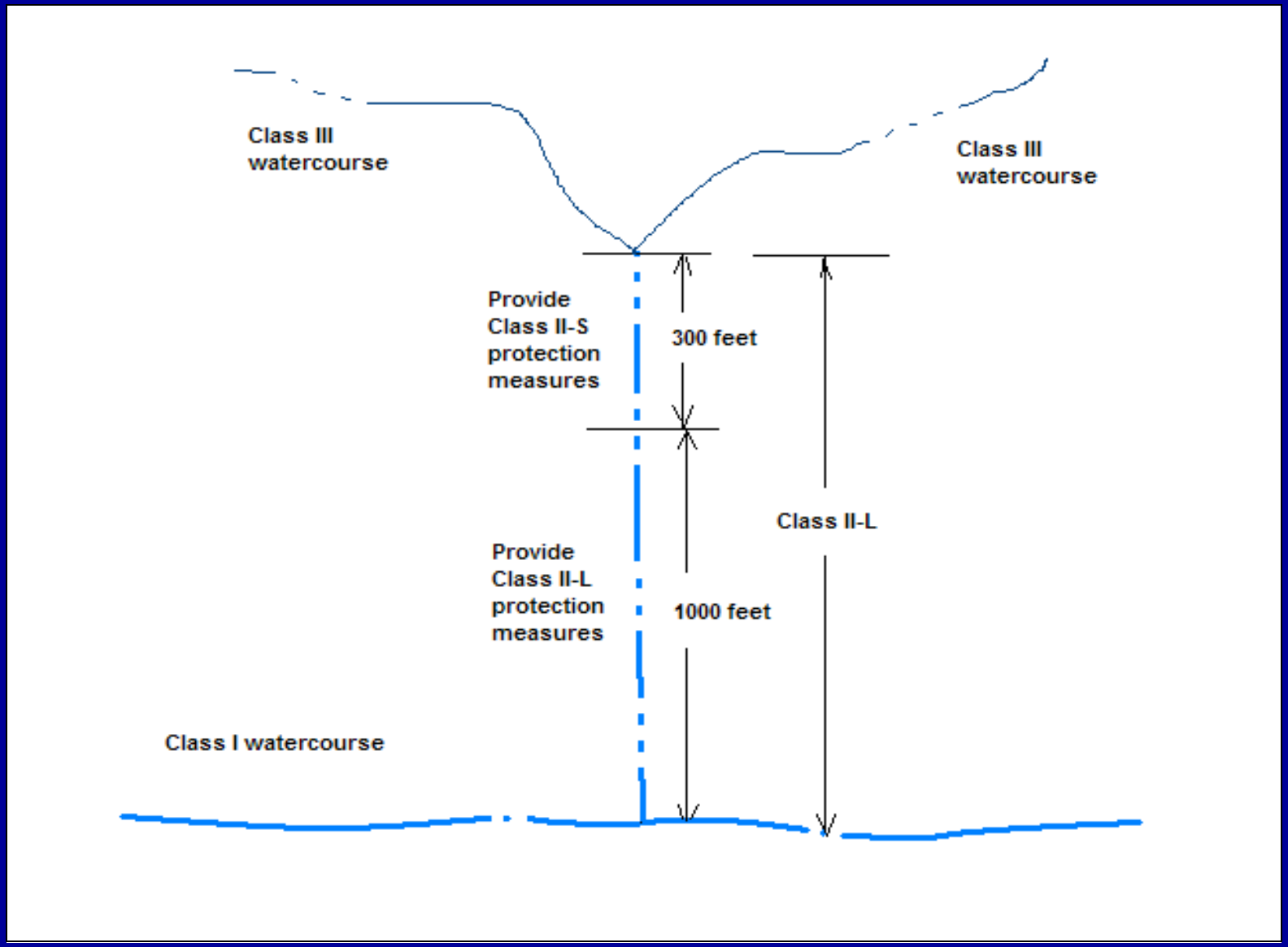


Class II-L Watercourse Where a First 1000 Feet Receive Class II-L Protection Measures

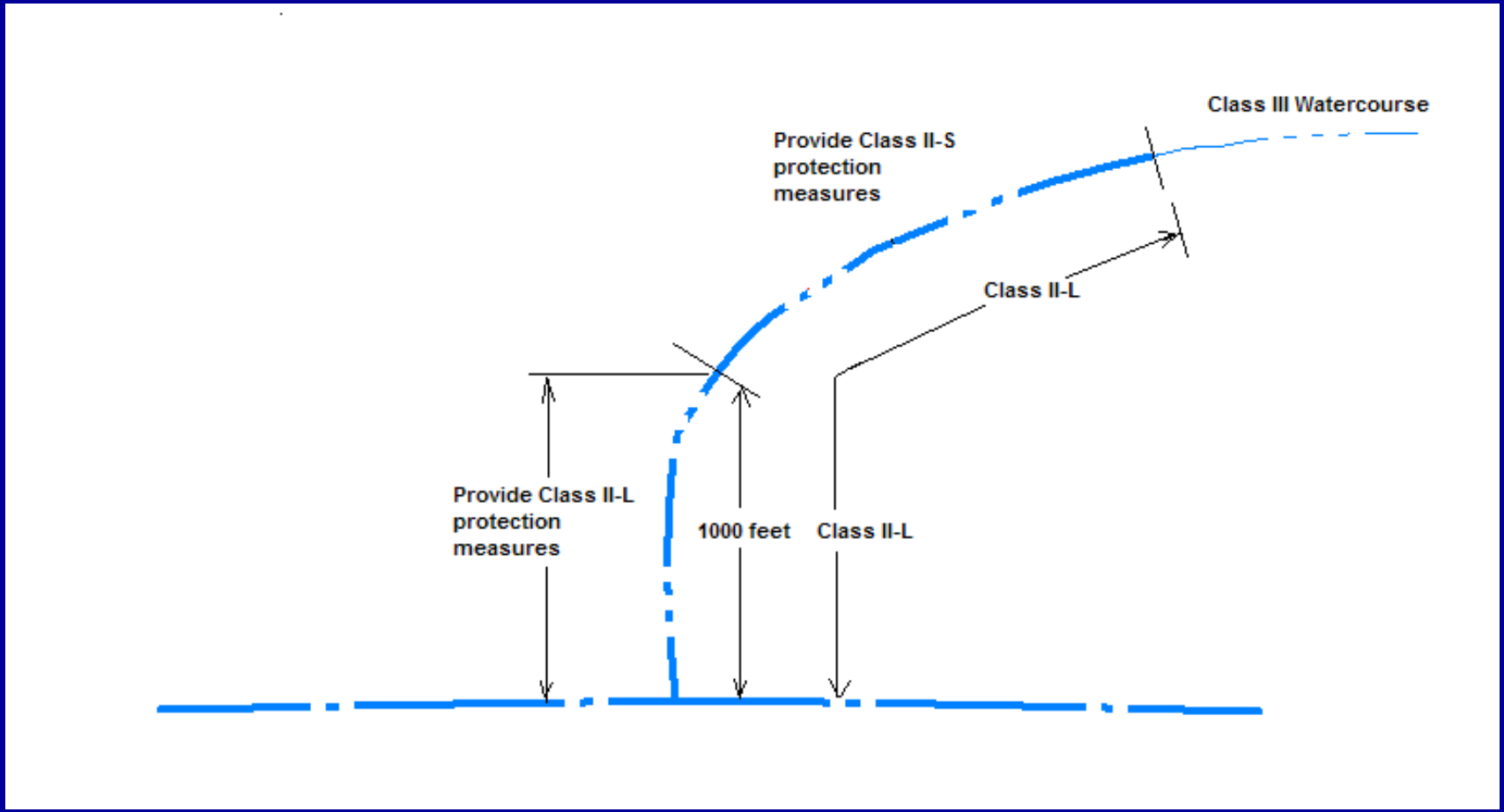
The Next 350 feet Receive Class II-S Protection Measures



Class II-L Watercourse Where First 1000 Feet Receive Class II-L Protection Measures; the Next 300 feet Receive Class II-S Protection Measures

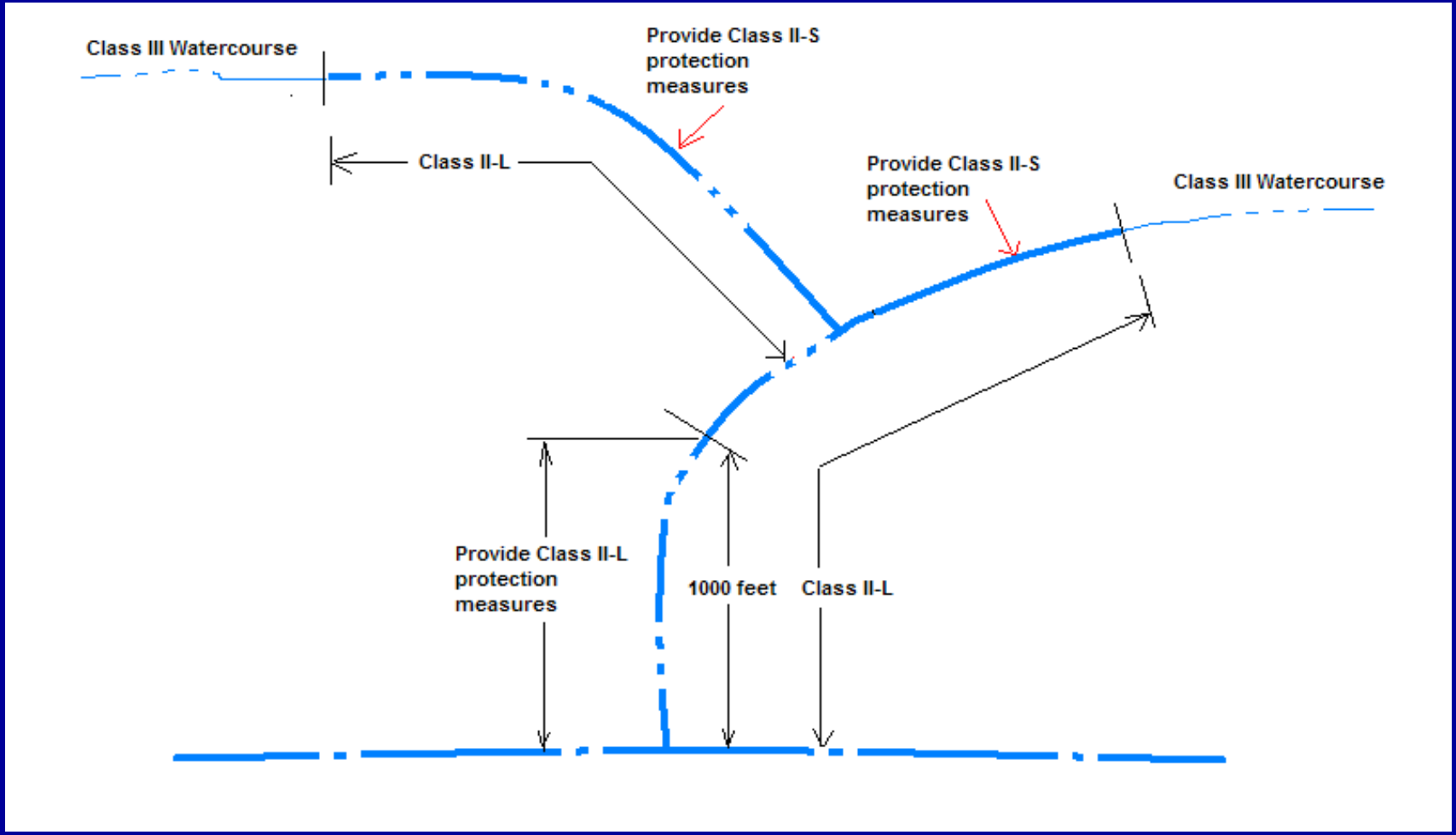


Class II-L where the First 1,000 feet Receives Class II-L Protection Measures. The Class II-L Continues to 2,500 feet, where Classification Changes to a Class III. Class II-S Protection Measures are Applied from 1,000 feet to 2,500 feet.

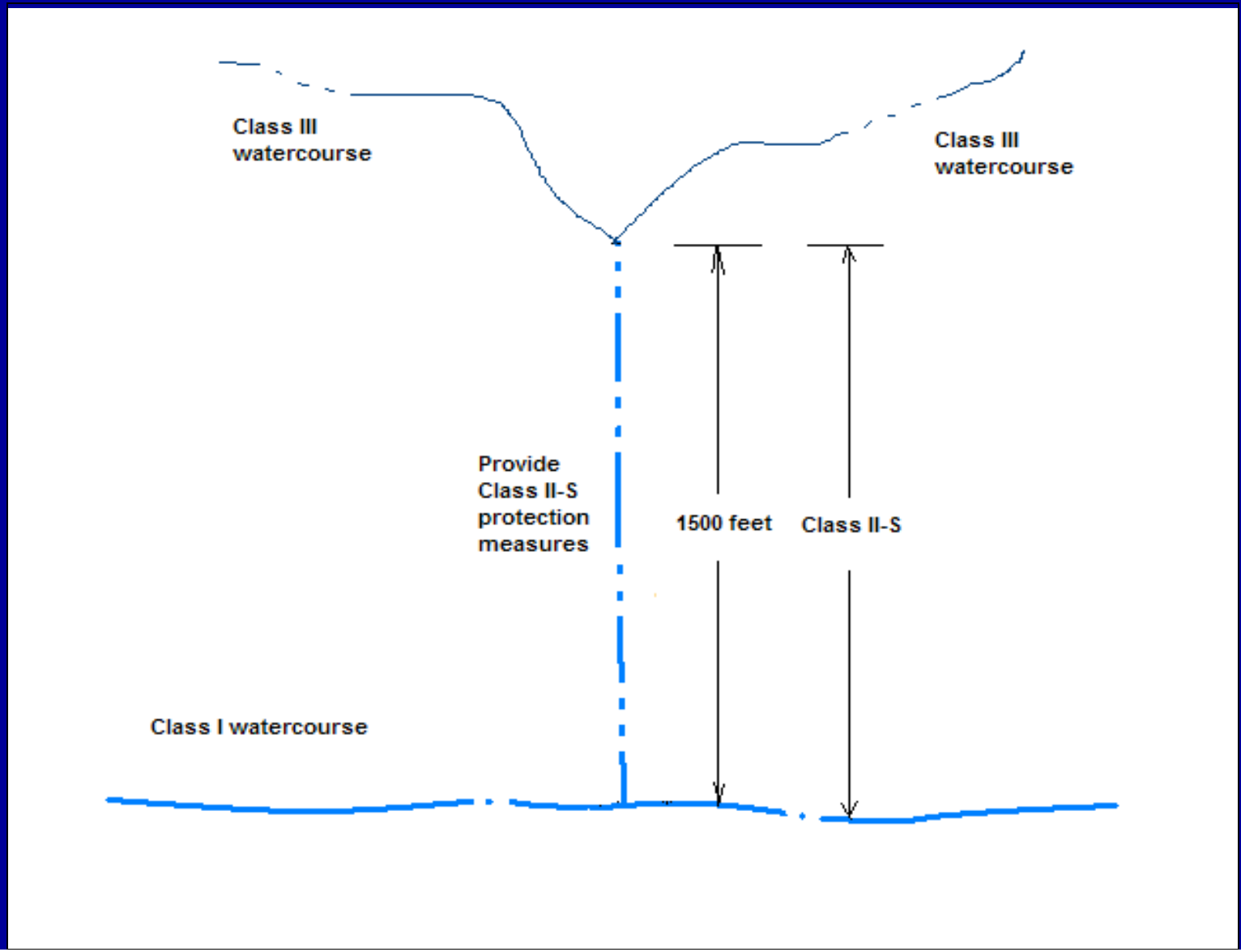


Class II-L Watercourse Where First 1000 Feet Receive Class II-L Protection Measures; the Next 1500 Feet Receive Class II-S Protection Measures.

Class II Tributary Typed as Class II-L, but Receives Class II-S Protection Measures for its Entire Length, Since it is Located more than 1000 feet from the Confluence with the Class I Watercourse.



Class II-S Watercourse Type, Since Mid-July Surface Flow at/near the Confluence with the Class I is not Present



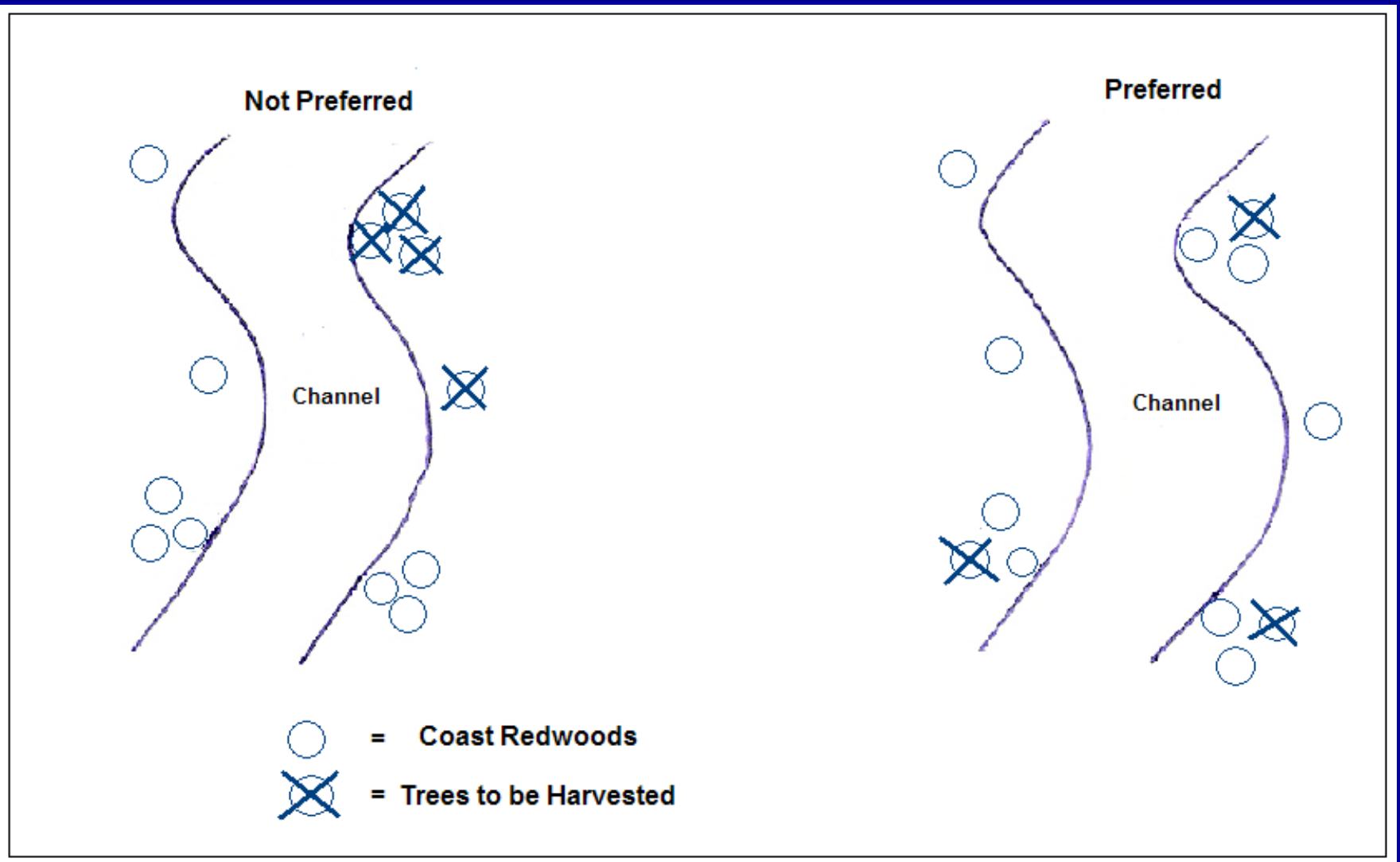
Where does an RPF Begin Measuring 1000 feet for Class II-L Protection Measures?

- The 1000 foot distance is to be measured from the edge of the active channel at bankfull stage.
- For channels without CMZs, this is approximately the WTL.
- For channels with CMZs, this will be inside the CMZ along the active channel.

How Are the Requirements Different in the Southern Subdistrict of the Coast District?

- No typing for Class II-L or Class II-S watercourses.
- RPFs must:
- Follow FPRs and Santa Cruz Co. rules.
- Not harvest more than 1/3 of the conifers 18 inches DBH or larger.
- Retained redwoods ≥12 in DBH are not be spaced >25 feet apart.
- Maintain 80% overstory canopy within channel zone.
- Retain all trees that have boles that overlap the edge of the channel.
- Retain trees with live roots permeating the bank, except for 1/3 of stems.

Diagram Illustrating how Trees may be Harvested along Class II Watercourses in the SSD



6. Class III Changes

Examples of Class III Watercourse Channels

Summary of Class III Protection Measures

1. 30 ft wide ELZ for slopes <30%; 50 ft wide ELZ for slopes >30%.
2. Retain all pre-existing large wood on the ground within the ELZ that is stabilizing sediment.
3. Retain pre-existing wood and debris in the channel zone.
4. Retain hardwoods, where feasible, in ELZ.
5. Retain all snags, except for safety, in ELZ.
6. Retain all countable trees needed to achieve resource conservation standards within the ELZ.
7. Retain all trees in ELZ and channel zone which show evidence of providing bank or bed stability, excluding sprouting conifers that do not have boles overlapping the channel zone.
8. Listed channel zone exceptions are permitted.

Class III Watercourse Protection

Require seedlings, saplings, hardwoods in ELZ so that there is:

- **Wood input for sediment storage and metering.**
- **Cover over the hillslope soil to provide sediment filtration.**
- **Channel bank stability.**

ASP Rules Helps Prevent this from Occurring!

Unit J, NF Caspar Creek, 1990

Key Class III Issue: Retaining All Countable Trees to Achieve Resource Conservation Standards

- ELZ tree retention standards are to be met immediately following harvest.
- Hardwoods can be counted to meet retention standards.

Key Class III Issue: Retaining All Countable Trees to Achieve Resource Conservation Standards

- Easily met with unevenaged management and evenaged with regeneration present (seedlings and saplings).

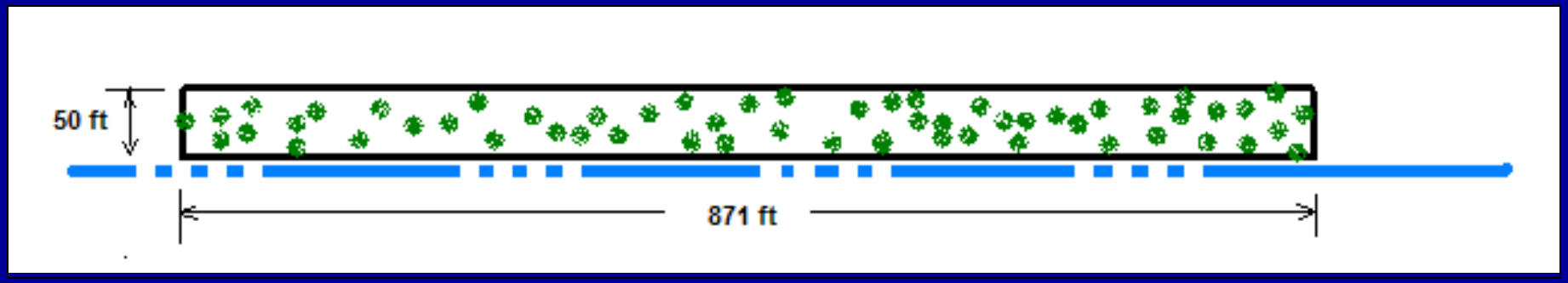
- If no small trees and seedlings present, then:
  - A) Propose an in lieu practice whereby you explain and justify why it is acceptable to harvest mature trees.
  - B) Propose a site specific plan under 916.9 (v).
  - C) Leave large mature trees.

Key Class III Issue: Retaining All Countable Trees to Achieve Resource Conservation Standards

Will a stocking survey be necessary?

- CAL FIRE will not request stocking standard reports for ELZs unless there appears to be a violation of the FPRs.
- A 100% sample could be used to determine compliance with this rule for enforcement purposes.

Illustration Showing how Class III ELZ Stocking Could be Determined



7. Miscellaneous Road-Related Considerations

Road-Related Questions

- **Low antecedent soil moisture means low soil moisture prior to precipitation inputs.**

- **The definition of saturated soils in the ASP rules supersedes the definition used in previously approved plan (unless PRC 4583 is used).**

Water Drafting Rules Changes

New 916.9 [936.9, 956.9] Section (r) Requirements

- Water drafting for timber operations must comply with F&G Code 1600 et seq.
- Describe the estimated drainage area above the point of diversion.
- Describe the methods that will be used to measure the source of streamflow.
- Barrier installation to prevent sediment transport.
- Use of drip pans to capture petroleum product leaks.

8. Site Specific Proposals

Spatially Explicit Riparian Management (SERM)—Important Part of TAC/SWC Review

- **One-size-fits-all** not always appropriate; management in riparian buffers can be beneficial.
- Riparian management established by **actual site conditions**, not rule assumptions.
- Use the best-available technical tools and empirical data.
- Can be at site level (THP) or watershed scale.
- Evaluate site or watershed conditions and design appropriate treatments.

ASP Rule 916.9(v): Site-Specific Measures or Non-Standard Operations Provisions

- Develop site specific measures in place of any of the ASP requirements.
- RPF is to ensure that the goals and standards for salmonid habitat are met.
- DFG/Review Team agencies concurrence required.
- Rules call for development of 2 pilot projects with agencies and landowners in 18 months.
- Guidance provided for site specific plans for:
  - Flood prone areas.
  - Fire hazard reduction.

ASP Q &A Example: Flood Prone Area

- **Setting**
  - Flood prone area along major North Coast river.
  - Planted with conifer seedlings 20 yrs ago; no thinning.
  - Dense stand with 400 stems per acre.
- **Proposal**
  - Thin stand to ~150 stems/ac from WLPZ to edge of flood prone area.
- **Analysis**
  - Will not meet no-harvest in Core Zone, or canopy requirement in Inner Zone.
  - Reasonable, since allows remaining trees to grow larger **faster, allowing them to provide critical riparian functions.**

Example of a Redwood Floodplain Plantation—

Humboldt Redwood Company's Plantation at Scotia

Images: Dr. Kevin O'Hara, UC Berkeley

ASP Q &A Example: Fuel Hazard Reduction

- **Setting**
  - Class I watercourse in northern Sierra Nevada; watershed burned hot 50 years ago; anadromous salmonids present.
  - Natural regeneration, producing overly dense stand (no stand treatment).
- **Proposal**
  - Prescription to reduce surface, intermediate, and co-dominant fuels in stand beyond ASP rule standards.
  - Treatment in Core, Inner, and Outer Zones, as well as on hillslopes, creating a landscape-level fire hazard reduction project.
- **Analysis**
  - Documented fire problem (fire history, fire behavior models).
  - Reasonable case made for removing trees and other vegetation beyond ASP rule standards.
  - RPF to include discussion on how riparian functions will be maintained by the fuel reduction treatment.

“Dense stands of trees in the Angora SEZ likely contributed to the rapid [fire] spread upslope to Angora Ridge…”

Murphy et al. 2007

What is the Simplest Way to Get a Site-Specific Plan Approved by the Review Team?

- For alternative measures limited to a specific site, all that is needed is:
  - RPF to pre-consult with DFG, and
  - Obtain written concurrence (based upon substantial evidence) prior to plan submittal.

- **No further documentation needed!**

9. Final Thoughts

Actual fish numbers are dependent on many factors that we have no control over. These factors include:

- **Decadal ocean conditions,**
- **Ocean fishing,**
- **Water diversions and river flow conditions below dams,**
- **Hatchery practices,**
- **Gravel mining,**
- **Predation by marine mammals,**
- **Multi-year droughts, and**
- **Climate change and its impacts on ocean temperatures and upwelling conditions.**

See: Botkin et al. 1994

9. Final Thoughts

- With the adoption of the ASP rules, CAL FIRE and DFG anticipate that salmonid habitat recovery will continue the trend initiated with the 2000 adoption of interim T/I rules by the BOF.

- Re-establishment of functioning riparian zones is critical for recovery, but it is only part of the improvements needed for widespread species recovery.

9. Final Thoughts

- **RPFs are encouraged to consult with agency personnel prior to laying out a project in a watershed with anadromous salmonids.**

- **Agency staff can help RPFs determine if key issues are present and answer questions about the ASP rules and agency expectations.**

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Thanks for Your Attention—and
Now on to Your Questions!