DRAFT POLICY FOR MAINTAINING INSTREAM FLOWS IN NORTHERN CALIFORNIA COASTAL STREAMS

Technical Staff Workshop

February 6, 2008

Workshop Goals

- Presentation of technical aspects of draft policy
- Opportunity for public to ask clarifying questions
- Comments will be received in accordance with Notice of Availability and Notice of Extension

Agenda

- 1:00 – 1:10 Background
- 1:10 – 1:20 Summary of draft policy
- 1:20 – 1:40 Development of proposed criteria for minimum bypass flow, maximum cumulative diversion
- 1:40 – 2:00 Water Availability Methodology
- 2:00 – 2:10 Water Cost Analysis
- 2:10 – 2:20 Examples
- 2:20 – 2:30 Summary
- 2:30 Questions

Background

- ESA and CESA listings of steelhead, coho, and chinook
- 1997 Division of Water Rights Staff Report
- 2002 NMFS-DFG Draft Guidelines
- 2004 Water Code section 1259.4 (Assembly Bill 2121)
- May 2006 - R2 Resource Consultants and Stetson Engineers contract
- Draft Policy released December 28, 2007
- Original end of public comment period was February 19, 2008
- Extension requests received from a consortium of consultants, the Farm Bureau, and Rudolph Light
- Public comment period now ends May 1, 2008

Geographic Area

- Water diversions in five counties – Marin, Sonoma, parts of Napa, Mendocino, Humboldt counties
- Streams from the mouth of the Mattole River south to San Francisco, and streams and tributaries discharging to northern San Pablo Bay
- Eel River is not in the policy area

Draft Policy Principles

- Water diversions shall be seasonally limited to periods in which instream flows are naturally high to prevent adverse effects to fish and fish habitat.
- Water shall be diverted only when stream flows are higher than the minimum flows needed for fish spawning and passage.
- The maximum rate at which water is diverted in a watershed shall not adversely affect the natural flow variability needed for maintaining adequate channel structure and habitat for fish.
- Construction or permitting of new onstream dams shall be restricted. When allowed, onstream dams shall be constructed and permitted in a manner that does not adversely affect fish and their habitat.
- The cumulative effects of water diversions on instream flows needed for the protection of fish and their habitat shall be considered and minimized.

Flow-related Criteria

- Diversion season: October 1 – March 31
- Minimum bypass flow:
  - Watersheds ≤ 290 sq. mi - calculate based on watershed area, mean annual unimpaired stream flow, anadromy
  - Watersheds > 290 sq. mi – calculate based on percentage of mean annual unimpaired stream flow
- Maximum cumulative diversion: five percent of the 1.5-year instantaneous peak flow

Minimum Bypass Flow

- Watershed drainage areas less than or equal to 290 square miles

  $Q_{MBF} = 8.7\ Q_m\ (DA)^{-0.47}$, where

  Q_{MBF} = minimum bypass flow

  Q_m = mean annual unimpaired flow

  DA = watershed drainage area. When using this equation at the point of diversion, if the upper limit of anadromy is downstream of the point of diversion, the drainage area at the upper limit of anadromy may be used.

- Watershed drainage areas greater than 290 square miles

  Q_{MBF} = 0.6 Qm, where

  Q_{MBF} = minimum bypass flow

  Q_m = mean annual unimpaired flow

Onstream Dam Criteria

- Built prior to July 19, 2006: may remain onstream with implementation of the following:

  Class I streams – fish passage, fish screens, stream flow bypass, mitigation plans

  Class II and III streams – stream flow bypass, mitigation plans

- Built after July 19, 2006:
  - Not allowed on Class I streams
  - Generally not allowed on Class II streams
  - Allowed on Class III streams with stream flow bypass and mitigation plans

Bypass Requirements

- Passive bypass of the minimum bypass flow
- Passive bypass of flows above the maximum rate of diversion if permit contains maximum rate of diversion limitation
- Automated bypass allowed if passive bypass not physically feasible
- No monitoring required for passive bypass systems
- Monitoring required for automated bypasses

Implementation of Flow-Related Criteria

- New Water Rights
  - Water Availability Analysis
    - Water Supply Report
    - Instream Flow Analysis
  - Fish Screening for Class I Diversions
  - Onstream Dam Criteria
- Petitions
  - Instream Flow Analysis for petitions resulting in reduced flow in a stream reach
  - Onstream Dam Criteria
  - Exceptions
- Small Domestics and Livestock Registrations
  - Season of Diversion
  - Onstream Dams not allowed on Class I and II streams if built after July 19, 2006
  - Requirements also apply to renewals

Watershed Approach

- Project charter requirements
- Submittal of technical information for completing environmental documents
- Watershed management plan to coordinate operation of diversions
- Periodic biological assessments to monitor performance of watershed management plan
- State Water Board may retract watershed group approvals under specified conditions

Flexibility Provided

- Water Availability
  - Alternative methods for estimating upper limit of anadromy for calculating the minimum bypass flow
  - Streamlined instream flow analysis may show water available without daily flow study, either with or without modification of project
  - Daily Flow Study allows use of alternative calculation methods, modifications to projects, use of site specific criteria
  - Broad guidance for developing site-specific criteria
- Onstream Dams
  - Alternative methods for determining stream class
  - DFG certification of fish passage requirements for Class I onstream dams
  - Broad guidance for mitigation plans
- Watershed Approach
- Case-by-Case Exceptions – with State Water Board approval

Development of Proposed Criteria for Minimum Bypass Flow and Maximum Cumulative Diversion

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Basis for Minimum Bypass Flow (MBF)

- Flow that must occur at a Point of Diversion (POD) before water can be diverted
- Flow that provides favorable spawning, passage, and rearing conditions
- Flow that provide favorable spawning will also protect passage and rearing
- Steelhead selected as indicator species

Bypass Flow Alternatives

- February median flow (DFG-NMFS)
- 10 percent exceedance flow (MTTU)
- Upper MBF (Staff generated)
- Lower MBF (Staff generated)

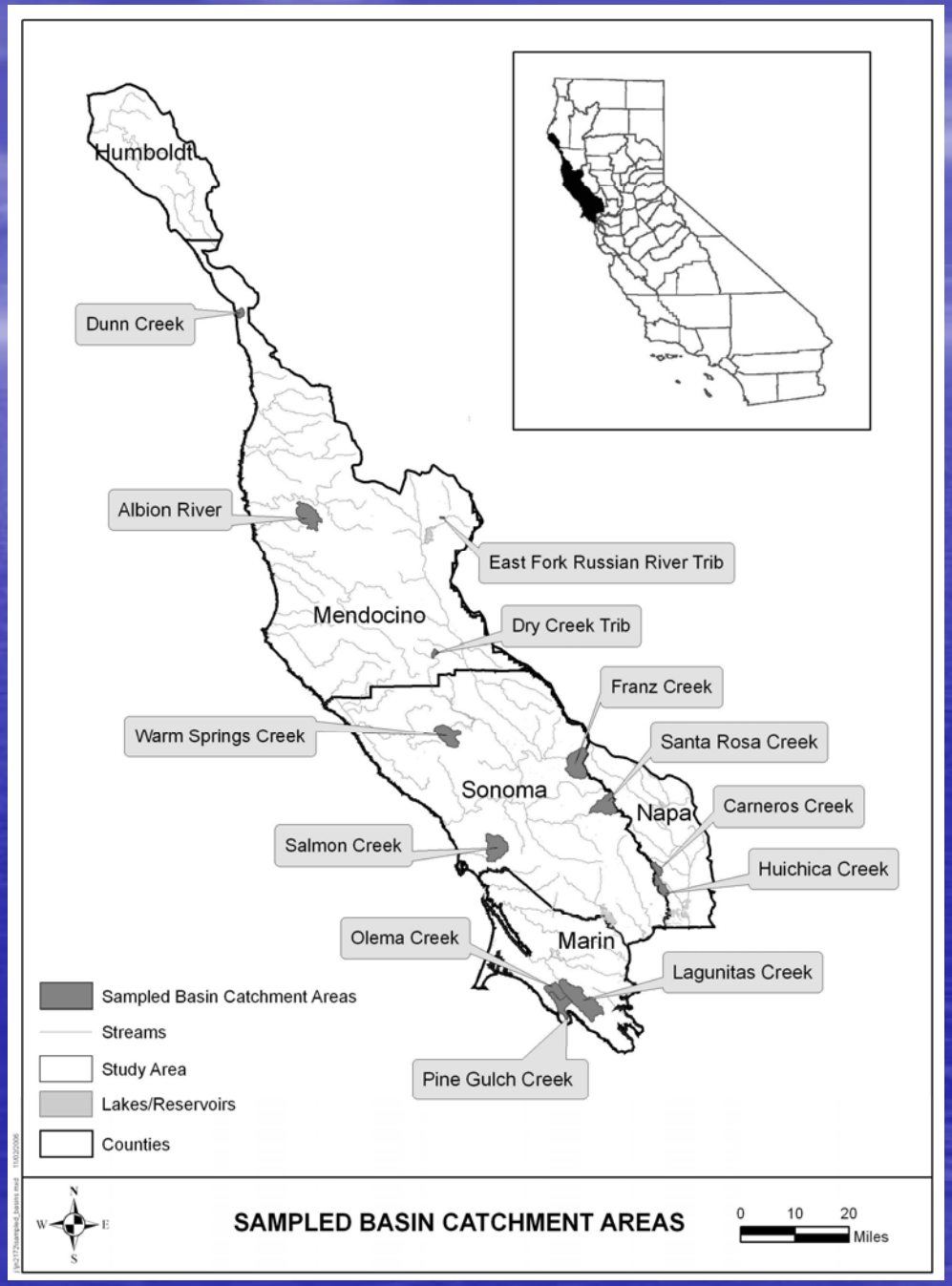
Upper MBF (proposed bypass)

- Developed using data collected from 12 validation sites and published data from western Washington (Swift)
- Set at the lowest flow at which maximum spawning habitat occurs

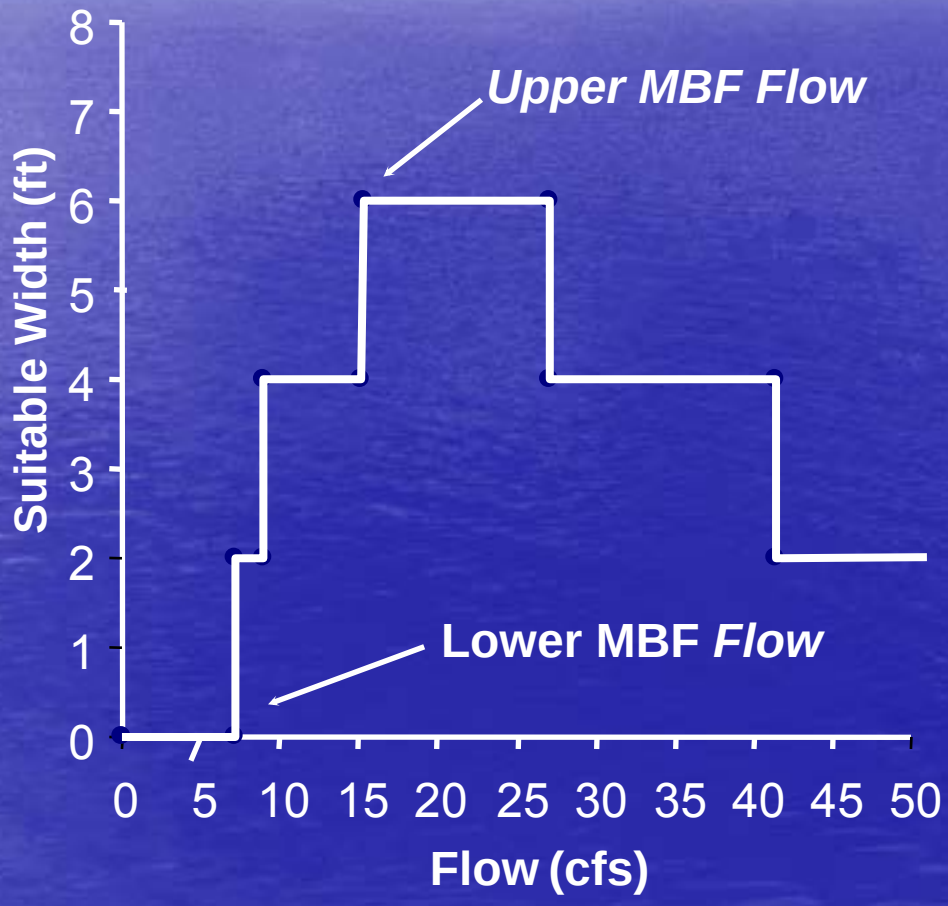
Lower MBF

- Developed using data collected from 12 validation sites and data from negotiated instream flow requirements in the policy area
- Represents marginally usable spawning habitat conditions

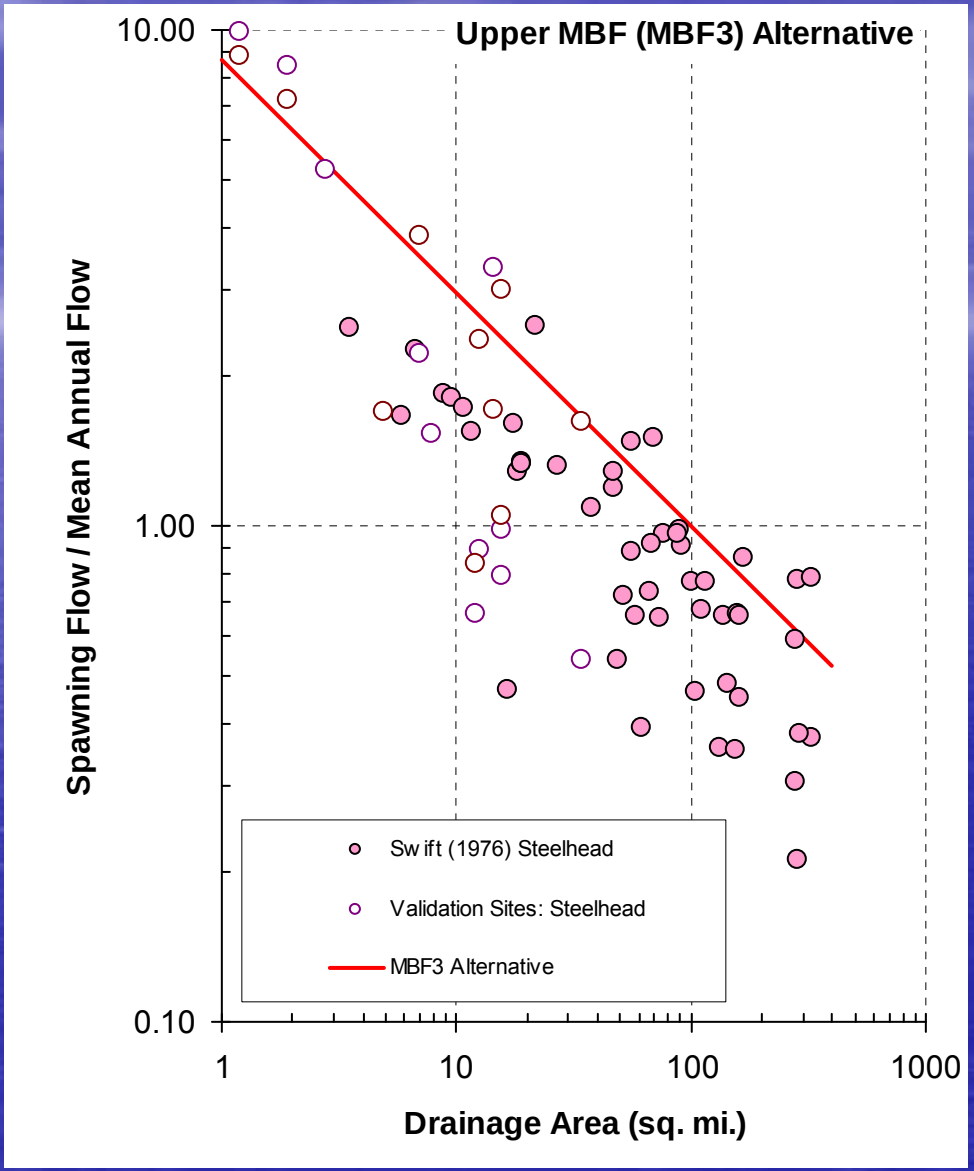
Validation Sites



Depiction of flows used in the development of the Upper and Lower MBF



Upper MBF



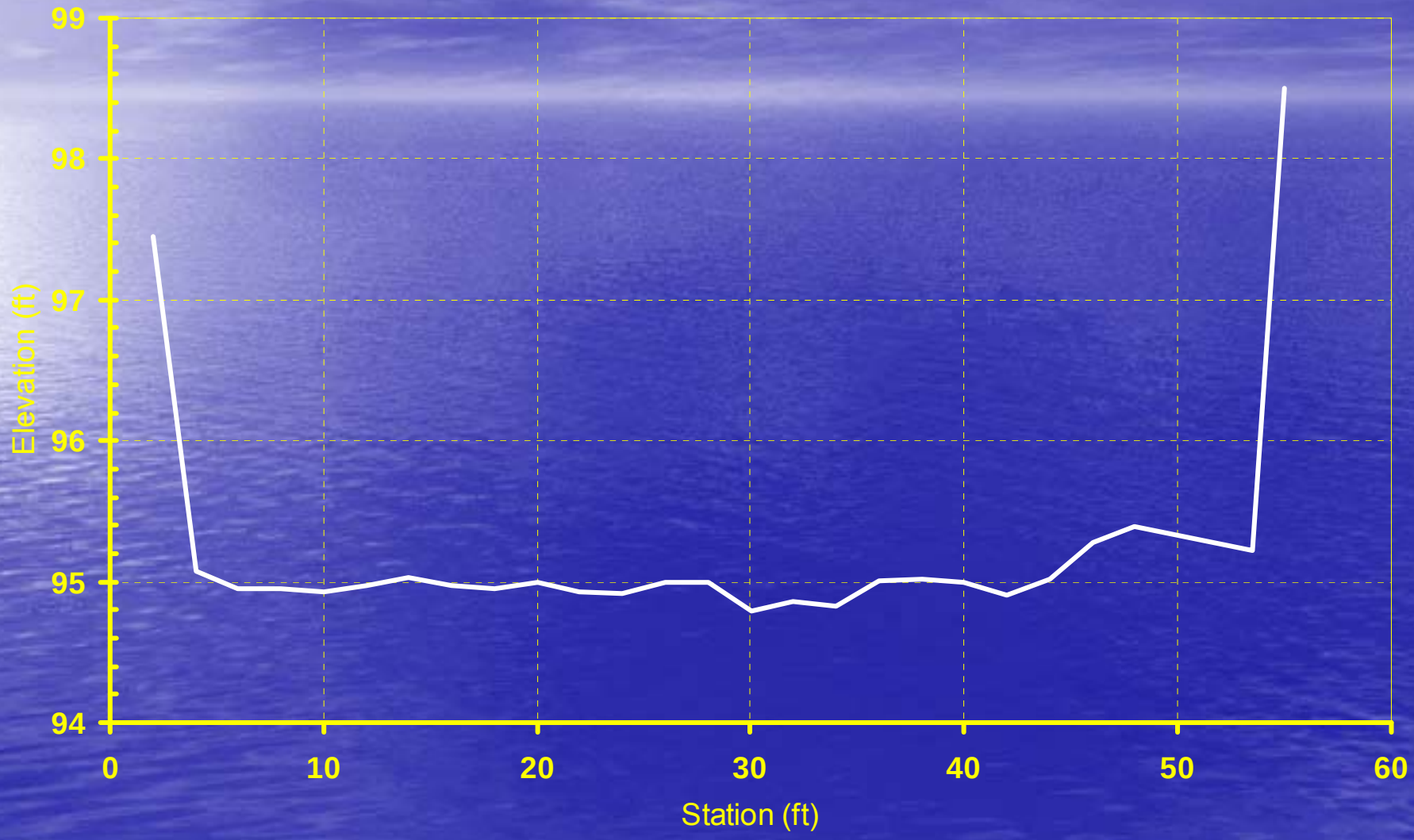
Upper MBF = $8.7*Qm*DA^{-0.47}$

Comparison of Bypass Flows

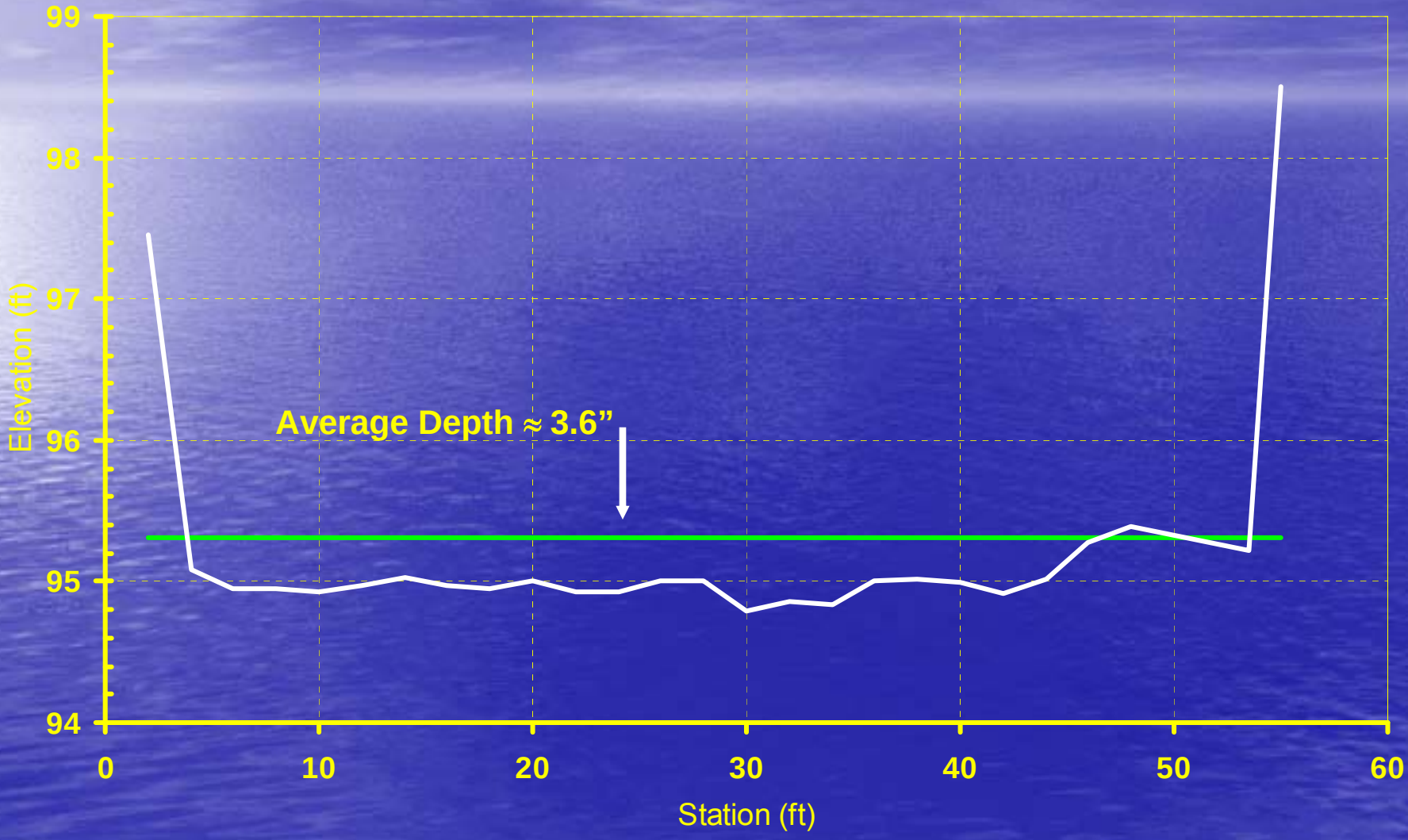
Site	Upper MBF	Lower MBF	February Median	10% Exceedance
Dry Creek Trib (1.2 mi^2)	18	10	6.8	5.6
Huichica Creek (4.9 mi^2)	37	15	7.4	17
Pine Gulch Creek (7.8 mi^2)	40	14	19	25
Franz Creek (15.7 mi^2)	57	17	15	55

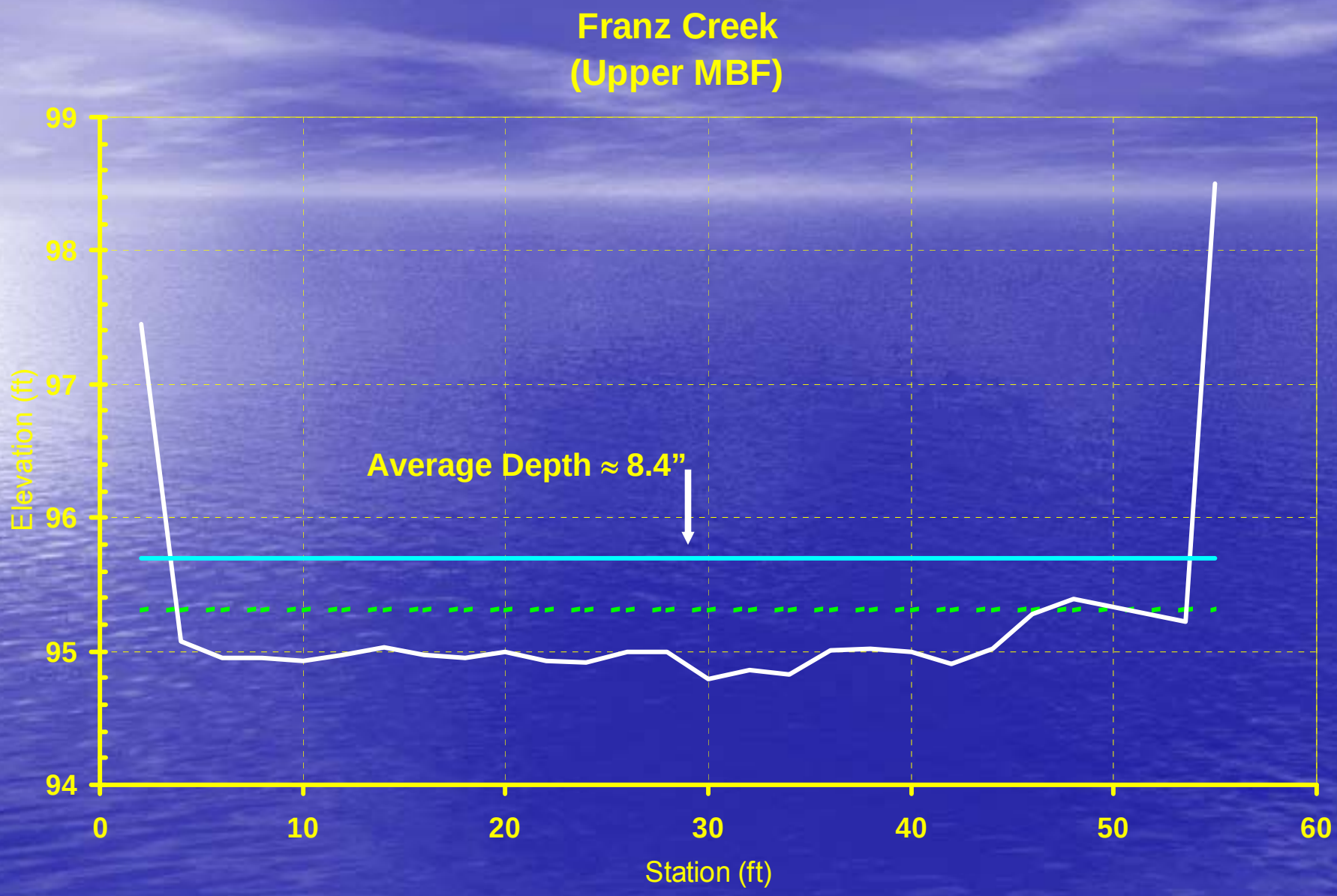
Flows in cfs

Franz Creek
Channel Cross-section



Franz Creek
(February Median Flow)




Franz Creek
(Upper MBF)
Average Depth ≈ 8.4”
Elevation (ft)
99
98
97
96
95
94
0
10
20
30
40
50
60
Station (ft)

Basis for Maximum Cumulative Diversion (MCD)

- Maximum cumulative amount of water that can be diverted at a point of interest
- Flow that protects channel maintenance by preserving flow variability and peak flows
- Channel maintenance is a long-term process that forms basic channel habitat structure
- Diversion during high flow can reduce flow magnitude and variability
- Changes in flow magnitude can result to changes in channel width, depth, and/or substrate size

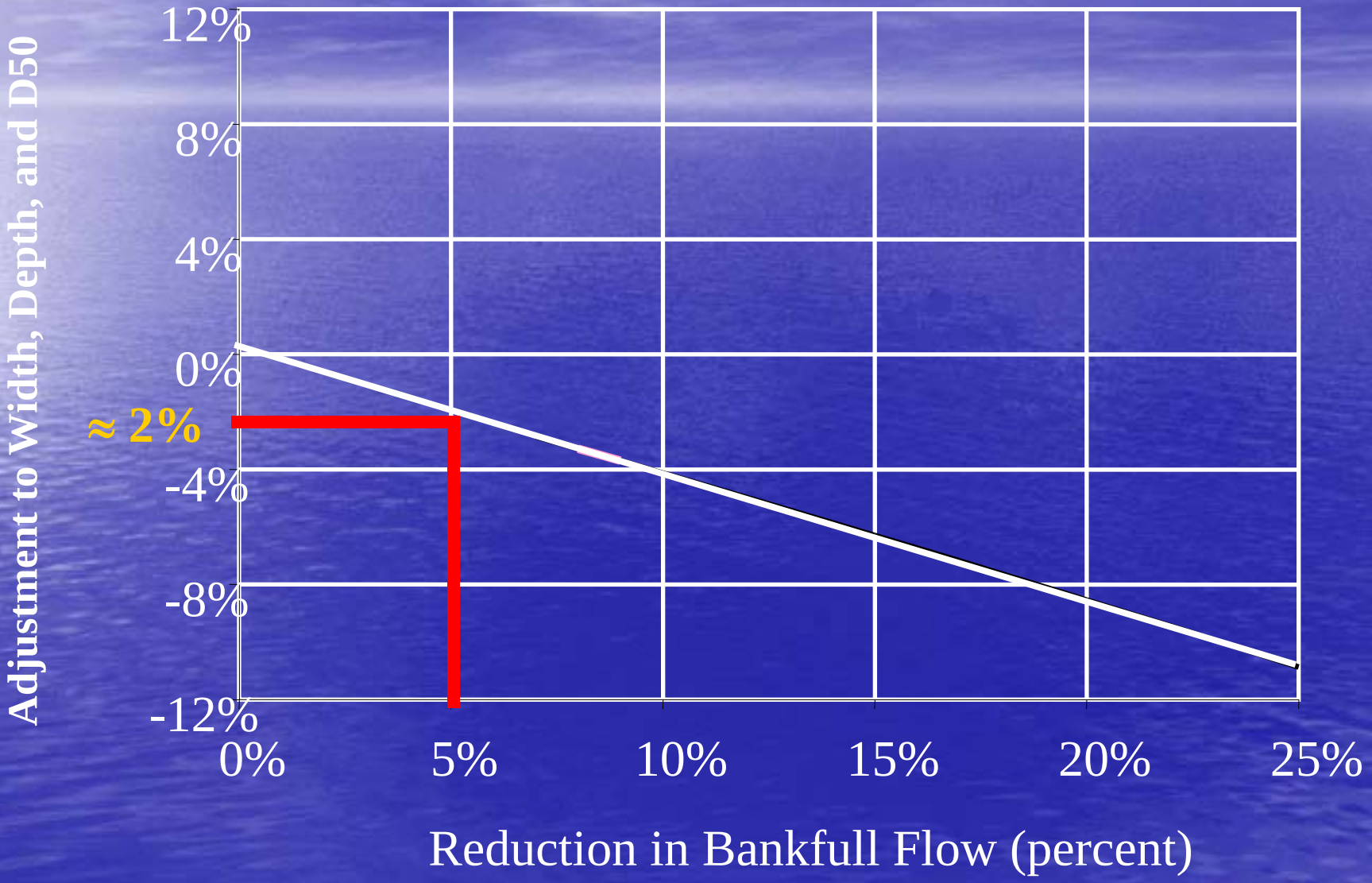
MCD Alternatives

- 5% of the 1.5 year return flow
- 15% of the 20% winter exceedance flow
- 10% of unimpaired winter flow (CFII)
- 1/2 day reduction peak flow recession

How Much Water Can be Diverted Without Adversly Affecting Fish Habitat?

- Recognize uncertainty
- Determine a threshold flow representative of peak flows and variability
  - Bankfull flow
  - 1.5 year return flow
- Predict affects on channel width, depth, and/or substrate size

Predicted Channel Change



Regional Protectiveness of the MCD Alternatives

5% of the 1.5 year return flow	Yes
15% of the 20% winter exceedance flow	Yes
10% of unimpaired winter flow (CFII)	Partially
1/2 day reduction peak flow recession	Yes

Components of Water Availability Analysis

Water Availability Analysis

- State Water Board Responsibilities
  - Must determine that there is “unappropriated water available to supply the applicant.” (Wat. Code, § 1375, subd. (d).)
  - “In determining the amount water available for appropriation for other beneficial uses, the [State Water Board] shall take into account, whenever it is in the public interest, the amounts of water required for recreation and the preservation and enhancement of fish and wildlife resources.” (Wat. Code, § 1243)

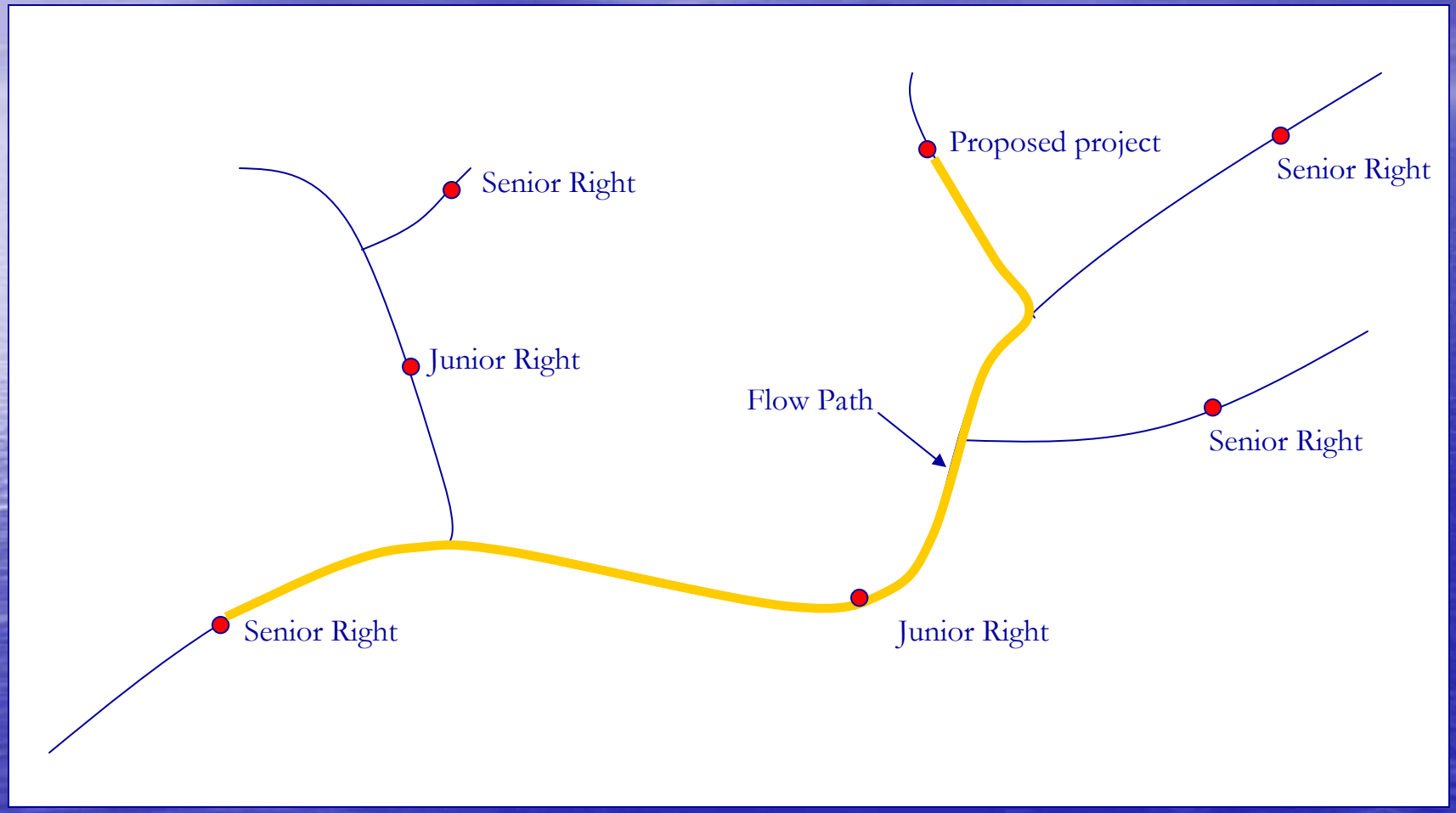
Water Availability Analysis

- The analysis outlined in the draft policy consists of two main components:
  - Water Supply Report
  - Instream Flow Analysis

Water Supply Report

- This report is necessary to demonstrate that a sufficient amount of water remains instream to supply senior rights and the proposed project.
  - Includes claims of riparian and pre-1914 appropriative rights
- Perform analysis along the identified flow path from the proposed Point(s) of Diversion to the Pacific Ocean or a regulated mainstem river

Water Supply Report



Water Supply Report

- Report shall include the following:
  - Estimate of the percentage of unappropriated water supply available at each senior POD along flow path
  - Comparison of remaining unappropriated water supply vs. the proposed project's demand at each senior POD along flow path
  - Flow frequency analysis of seasonal unimpaired flow volume
  - A map showing locations of proposed project's POD(s) and the PODs of all senior water right holders and water right claimants within the watershed of interest
  - A list of all senior water rights used in the analysis. The list shall include:
    - The ID # of each permit, license, certificate, registration, or statement
    - The season of diversion
    - The face value of each water right

Determination of the Upper Limit of Anadromy

- Definition: “the upstream end of the range of anadromous fish that currently are, or have been historically, present year-round or seasonally, which ever extends the farthest upstream”

Determination of the Upper Limit of Anadromy

- The State Water Board will presume the proposed project's POD is within the range of anadromy.
- The applicant may override this presumption using any of the three following methods:
  - Present a study previously accepted by the State Water Board, NMFS, or DFG, that identifies the location of the upper limit of anadromy downstream of the proposed POD
  - Present information that demonstrates the gradient of a segment of stream channel downstream of the POD is too steep for fish to move beyond
  - Site specific studies

Points of Interest

- Point of Interest – a location on a stream channel where the applicant shall analyze the effects of the proposed project, in combination with other water diversions on fishery resources
- The State Water Board will select the points of interest in consultation with DFG
- Points of Interest will be selected at:
  - Proposed POD(s)
  - Upper limit of anadromy, if located downstream of the POD
  - Locations where the project may adversely affect instream flows needed for the protection of fishery resources.

Instream Flow Analysis

- An instream flow analysis will be necessary for the purposes of evaluating the impacts to instream beneficial uses by the proposed project in combination with senior diverters
- Shall consist of an evaluation of the reduction in instream flows caused by the:
  - existing senior diverters
  - existing senior diverters and the proposed project
- Analysis shall be conducted at all POIs selected

Instream Flow Analysis

- Will the regional criteria for diversion season, minimum bypass flow and maximum cumulative diversion rate be used?

Instream Flow Analysis

- Draft policy outlines two approaches to obtaining a water availability determination
  - Streamlined analysis
  - Daily flow study

Streamlined Analysis

- Water availability determination without a daily flow analysis
- Accounts for existing senior diversions not regulated by the policy
- Proposed projects address impacts to instream flows for fish by
  - Modifying start of diversion season
  - Modifying minimum bypass flow

Daily Flow Analysis

- Assesses impacts of proposed project, in combination with senior diversions, to instream flows needed for fish on a daily basis.
- Spawning and passage flow protection – compare change to daily flows against the minimum bypass flow criteria
- Channel maintenance flow protection – use daily flow data to compare the change to the 1.5 year flood flow over the period of record

Site Specific Studies

- If the instream flow analysis shows the proposed project cannot meet the draft policy's regional criteria, and the project cannot be modified to meet the regional criteria, a site specific study may be performed to obtain variances from the regional criteria
- After development of site specific criteria, another daily flow analysis shall be performed
- If the proposed project cannot meet site specific criteria, water may not be available for appropriation and further environmental analysis should be undertaken if proposed project is to proceed

Water Availability Determination

- If the analysis indicates the proposed project, in combination with senior diversions, complies with the draft policy's regional criteria or site specific criteria, water is available for the proposed project

Water Cost Analysis and Examples

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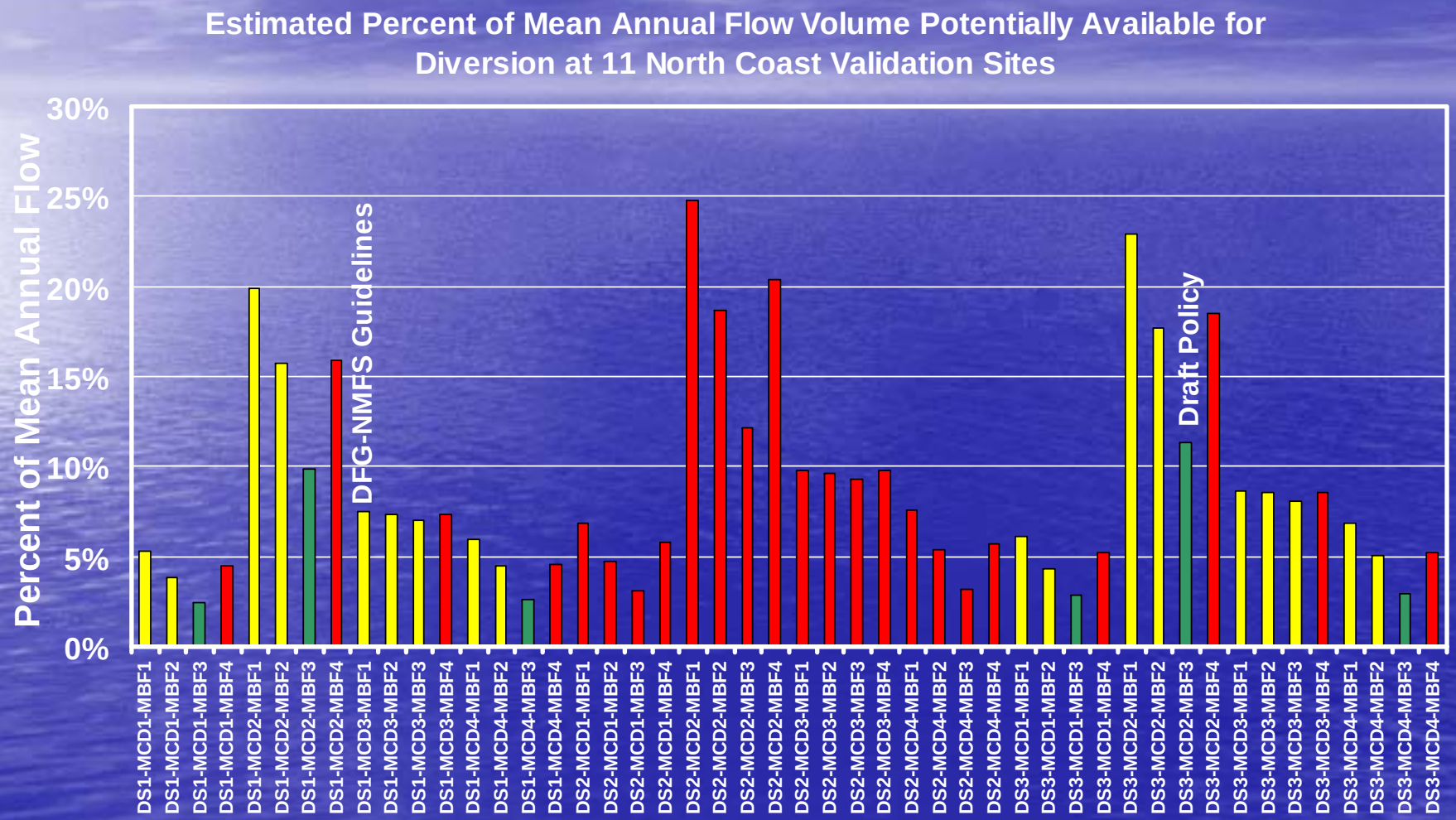
Water Cost Analysis

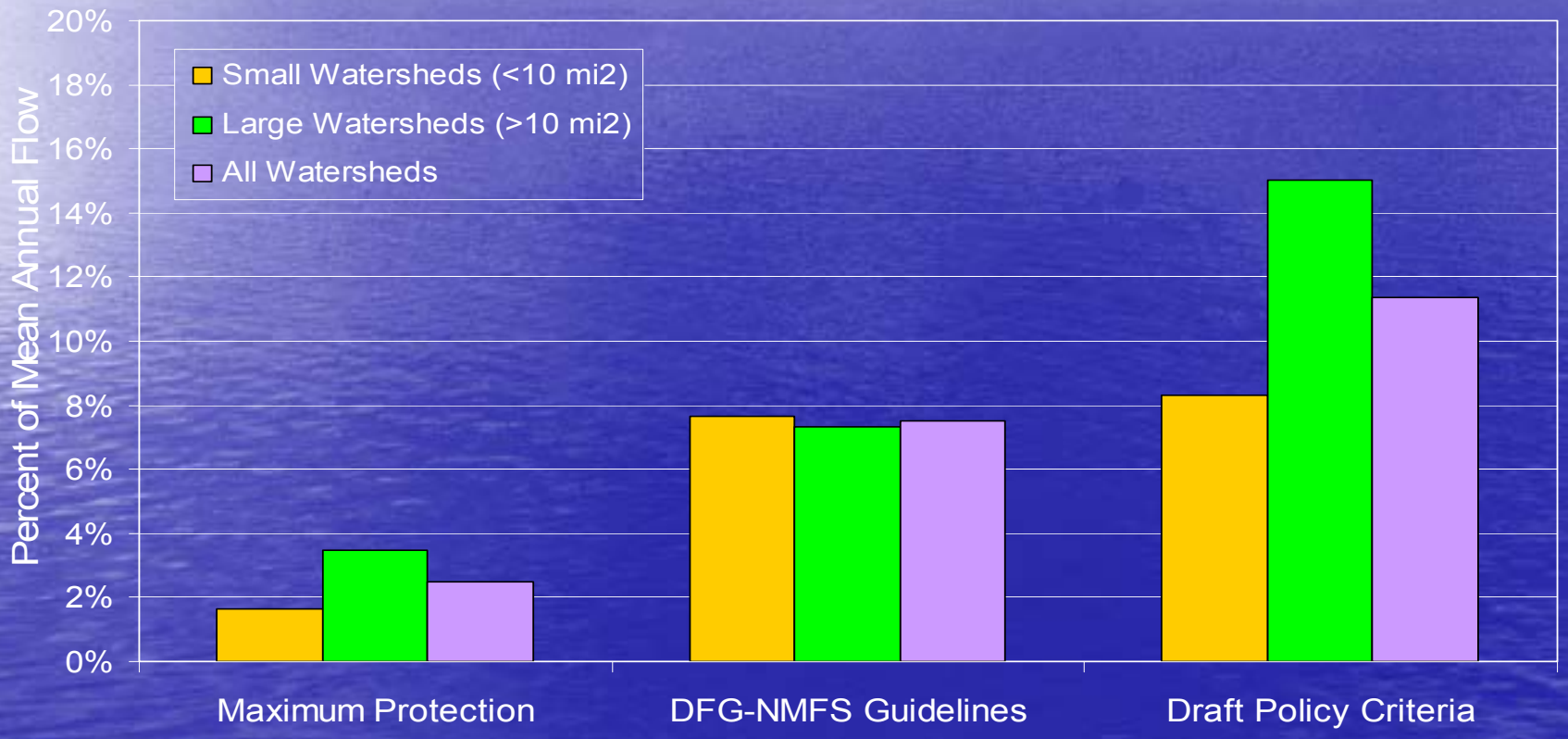
- Compares the relative amount of water that could be diverted at 11 validation sites under different scenarios
- Does not provide an absolute prediction of water availability
- Does not provide an indication of whether pending applications would be consistent with policy criteria or require site-specific studies

Water Cost Analysis



Water Cost Analysis

Estimated Percent of Mean Annual Flow Volume Potentially Available for Diversion for Policy Alternatives



Application of the Policy

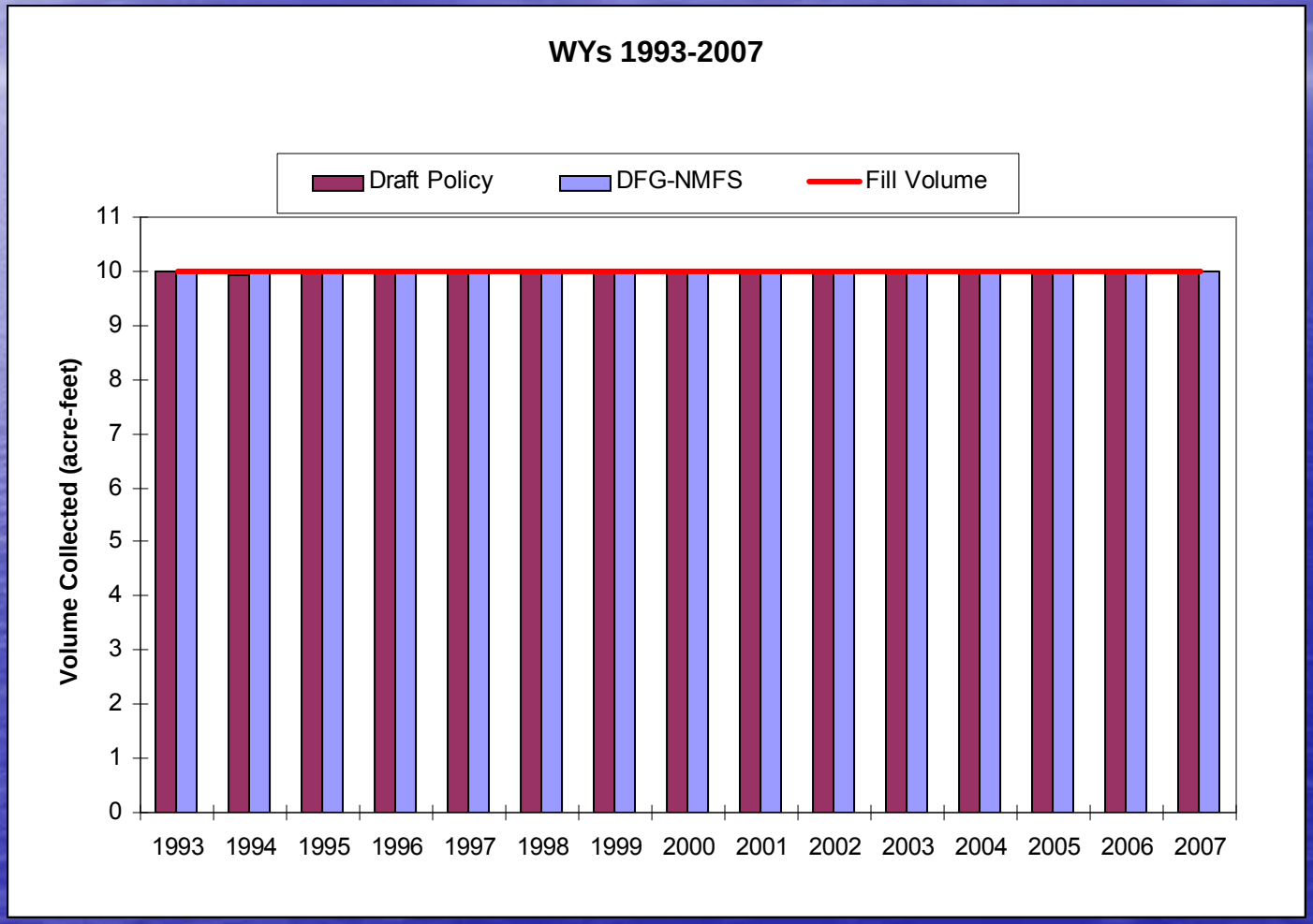
- Approximately 310 pending water right application in the policy area
- Determining the affect of the policy on each pending application is site-specific
- Major factors influencing consistency with policy criteria include:
  - Drainage area and Unimpaired flow at POD
  - Location of fish with respect to location of POD
  - Existing level of impairment

Policy Application Example 1

Source	Forsythe Cr thence Russian R
Configuration	Diversion to offstream storage
Storage Amount	10 Acre-feet
Primary Use	Vineyard Irrigation-25 acres
DA at POD	30 square miles
DA Anadromy	30 square miles
DFG-NMFS Bypass Flow	59 cfs
Policy Bypass Flow	171 cfs

DA is Drainage Area

Policy Application Example 1



Policy Application Example 1 Summary

Total period of record	55 years
Total requested volume	10 acre-feet
DFG-NMFS estimated Yield	9.8 acre-feet
Draft Policy estimated Yield	9.6 acre-feet

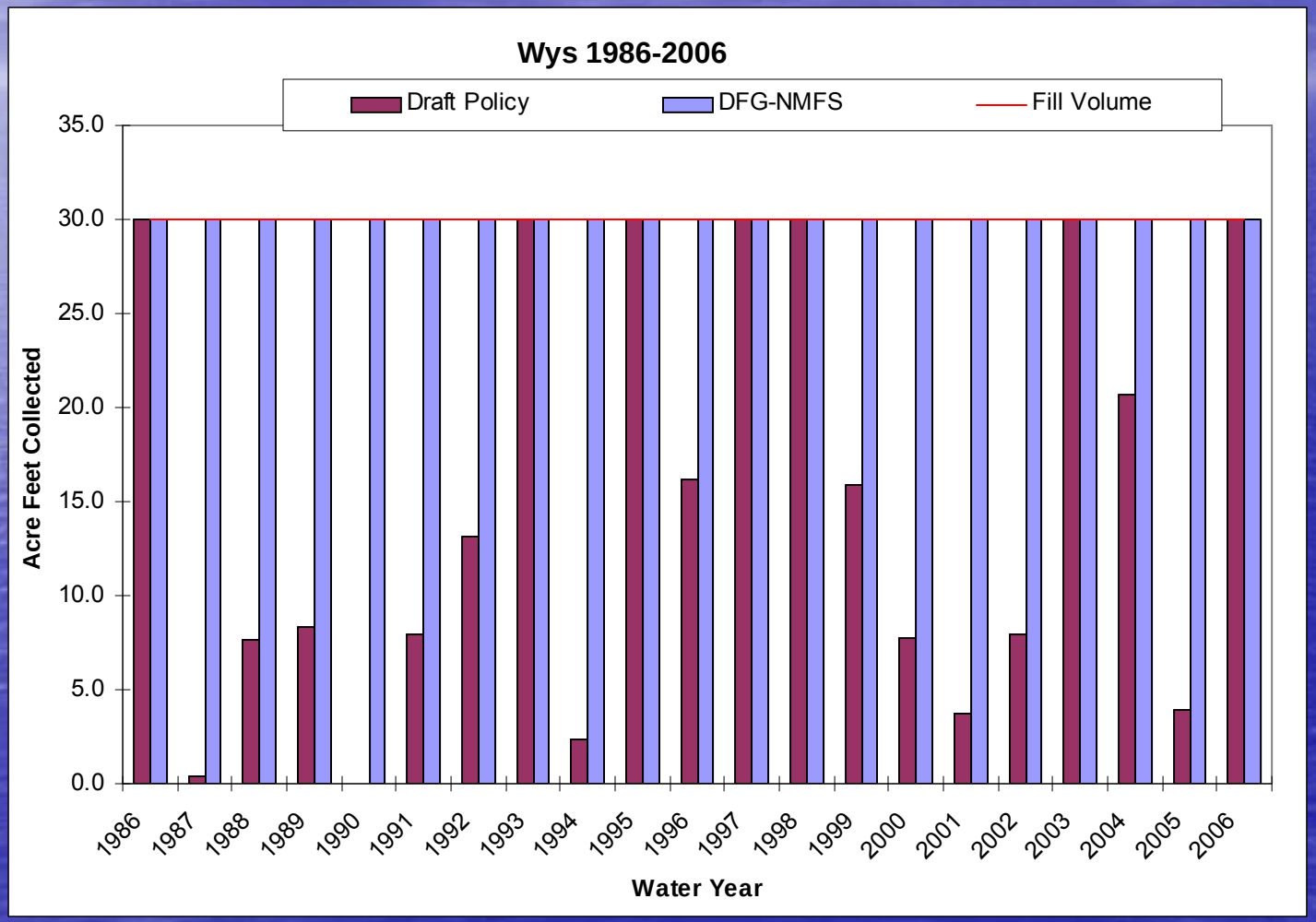
Policy Application Example 2

Source	Donnelly Cr thence Anderson Cr
Configuration	Diversion to offstream storage
Storage Amount	30 Acre-feet
Primary Use	Vineyard Irrigation-85 acres[1]
DA at POD	0.85 square miles
DA Anadromy	0.85 square miles
DFG-NMFS Bypass Flow	1.6 cfs
Policy Bypass Flow	13 cfs

[1]Place of use covered by additional application

DA is Drainage Area

Policy Application Example 2



Policy Application Example 2 Summary

Total period of record	56 years
Total requested volume	30 acre-feet
DFG-NMFS estimated Yield	30 acre-feet
Draft Policy estimated Yield	18 acre-feet

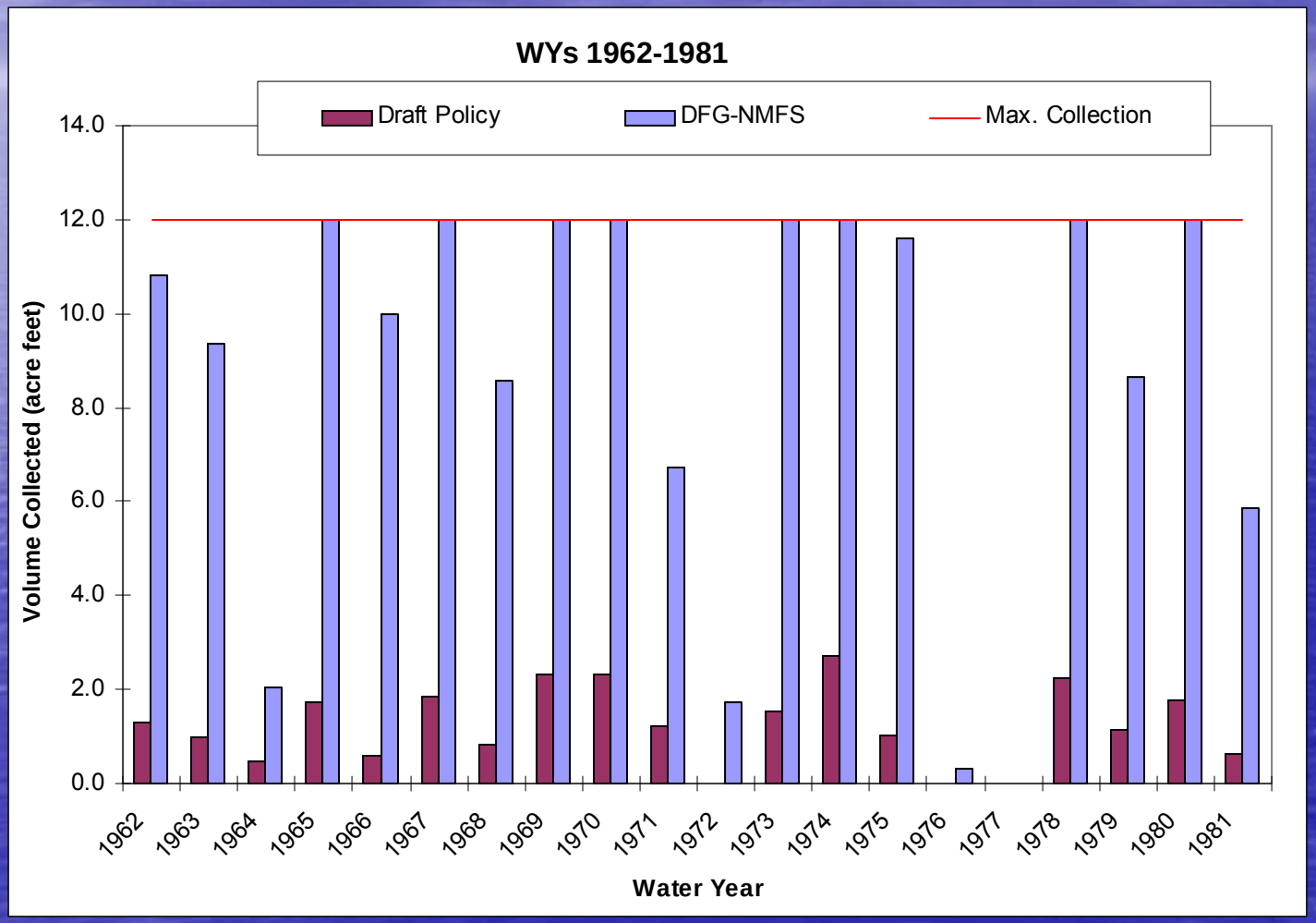
Policy Application Example 3

Source	Unnamed trib. thence Star Cr
Configuration	Onstream reservoir
Storage Amount	40 Acre-feet/12 acre feet[1]
Primary Use	Recreation
DA at POD	0.02 square miles, 13 acres
DA Anadromy	3.3 square miles
DFG-NMFS Bypass Flow	0.02 cfs
Policy Bypass Flow	0.13 cfs

[1]Non consumptive use, evaporation and seepage estimated at 12 acre-feet per year

DA is Drainage Area

Policy Application Example 3



Policy Application Example 3 Summary

Total period of record	20 years
Total requested volume	12 acre-feet
DFG-NMFS estimated Yield	8.6 acre-feet
Draft Policy estimated Yield	1.2 acre-feet

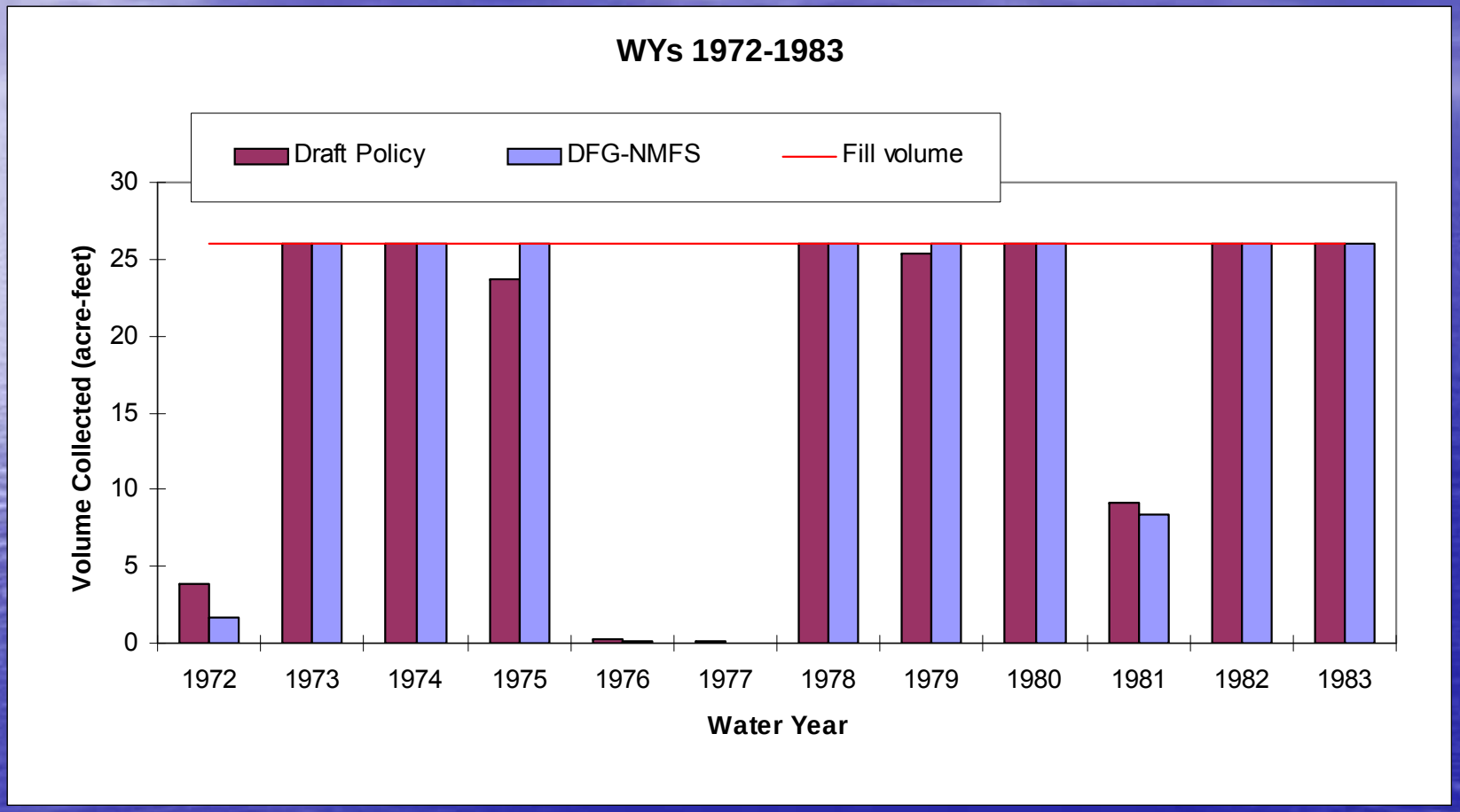
Policy Application Example 4

Source	Unnamed trib thence North SI
Configuration	Onstream reservoir
Storage Amount	26 acre-feet
Primary Use	Vineyard Irrigation-161 net acres[1]
DA at POD	0.22 square miles, 141 acres
DA Anadromy	425 square miles
DFG-NMFS Bypass Flow	0.11 cfs
Policy Bypass Flow	0.08 cfs

[1]Place of use also served by other water sources

DA is Drainage Area

Policy Application Example 4



Policy Application Example 4 Summary

Total period of record	12 years
Total requested volume	26 acre-feet
DFG-NMFS estimated Yield	18 acre-feet
Draft Policy estimated Yield	18 acre-feet

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Summary

- Draft policy was developed to protect instream flows needed for threatened and endangered fish
- Project location in watershed, location of fish, and the extent of authorized diversions in watershed contribute to water availability results using draft policy criteria
- Project modifications, site-specific studies, case-by-case exceptions and watershed approaches are alternative approaches under the draft policy

Next Steps

- Public comment period ends at noon on Thursday, May 1, 2008.

- Questions? Call:

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