Water Supply and Demand Assessment Program
Watershed Selection

State Water Board Staff

CALIFORNIA
Water Boards

Division of Water Rights

May 14, Eureka | May 21, Salinas | June 3, Sacramento

Meeting Agenda

- Water Rights Introduction
- Division of Water Rights Drought Response
- Water Supply & Demand Assessment Program Overview
- Watershed Selection Process and Pilot Watersheds
- Preliminary Watershed Selections
- Comments and Questions

State Water Board's Mission

To preserve, enhance, and restore the quality of California's **water** resources and **drinking water** for the **protection of the environment, public health, and all beneficial uses,** and to ensure **proper** water resource **allocation and efficient use**, for the benefit of present and future generations.

Board Members from left to right: Nichole Morgan, Laurel Firestone, Board Chair Joaquin Esquivel, Vice Chair Dorene D'Adamo, and Sean Maguire

Division of Water Rights

- Permits diversions and storage of water from streams and rivers
- May set instream flows
- Helps manage water during drought

Lake Oroville, April 2024. CA DWR

What are Water Rights?

- Water Rights
  - Legal permission to use a reasonable amount of water for a beneficial purpose such as domestic use, irrigation, recreation, fish and wildlife protection, etc.
  - Water right holders do not own the water, but have a “usufructuary right” to use it for beneficial use
- Most Common Types of Water Rights
  - Riparian
  - Appropriative (pre-1914 or post-1914)

What are Water Rights?

Riparian Rights

- Associated with the land contiguous to a river, stream, or lake
  - Water must be used on the riparian land
  - No seasonal storage of water
  - Only applies to natural flow
- Priority System: “Correlative Sharing”
  - Generally senior to appropriative rights

Appropriative Rights

- Associated with both riparian and non-riparian land
  - Allows for water to be exported, seasonal storage, and extends to all flows (natural + foreign)
- Pre-1914: do not need a water right permit
- Post-1914: permits, licenses, registrations
- Priority System: "First in Time, First in Right”
  - Priority dates are assigned based on when they were applied for

Water Right Reporting

- Water Use Reporting
  - Annually, water rights holders (or agents) required to report amount of water diverted, stored, and used during each month
- Self-reported data that often contains errors related to missing or duplicate reporting, unit conversions, or multiple owners
- Cleaned up data can be used to represent water demand for a watershed

South Yuba River, June 2023. CA DWR

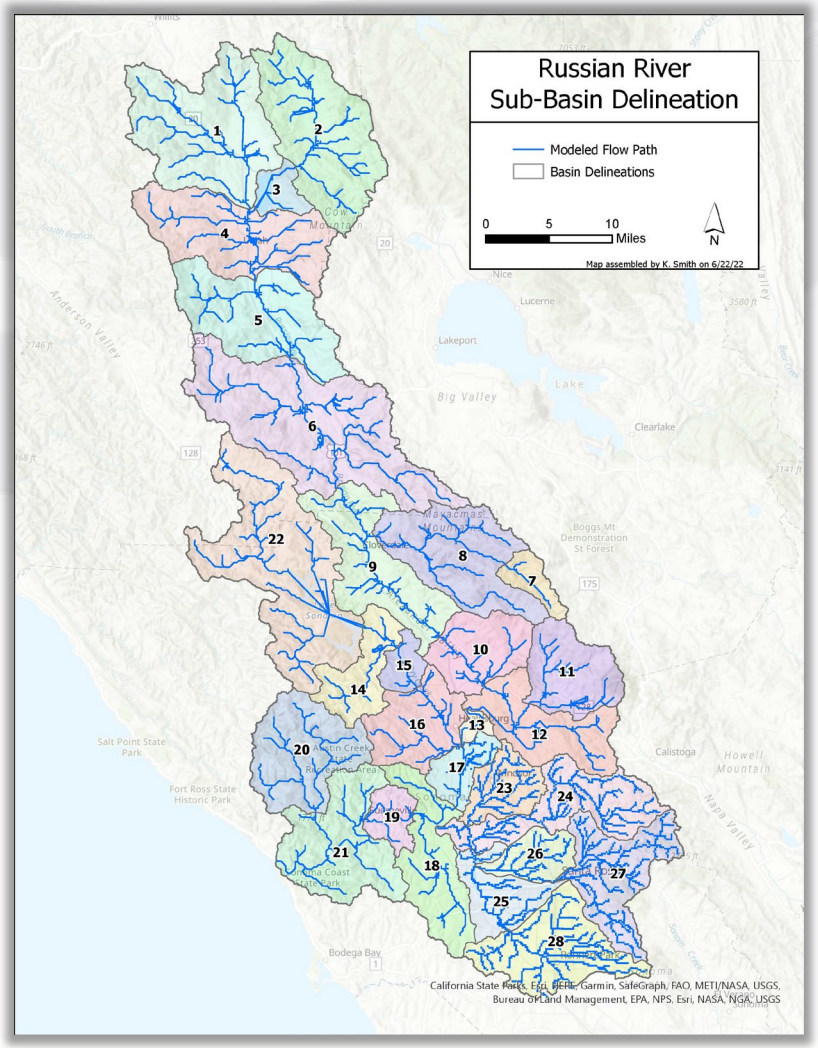
Russian River Drought Response

- 2021 & 2022 Emergency Regulations
  - Board adopted emergency regulations to prevent the unreasonable use of water and to require curtailments to protect senior water rights
  - Set specific exceptions to curtailment (Human Health & Safety Needs, Non-Consumptive Uses, etc.)
  - Established a methodology for determining the extent to which water was available for diverters in the Russian River Watershed, at their priority of right.
- Curtailment
  - Month-by-month curtailment based on forecast models and water right priority
  - Voluntary Water Sharing Program was developed with local stakeholders as an alternative to curtailment

Russian River Drought Response

Curtailments using a water allocation tool

- Observed and forecasted climate data are used to run hydrologic models that represent the “water supply” in watershed
- Division staff clean and process the diversion data (from annual water use reports) to develop a dataset that represents “water demand”
- The tool allocates available supply to water right holders based on the water right priority date, demand, and forecasted flow data on a monthly basis



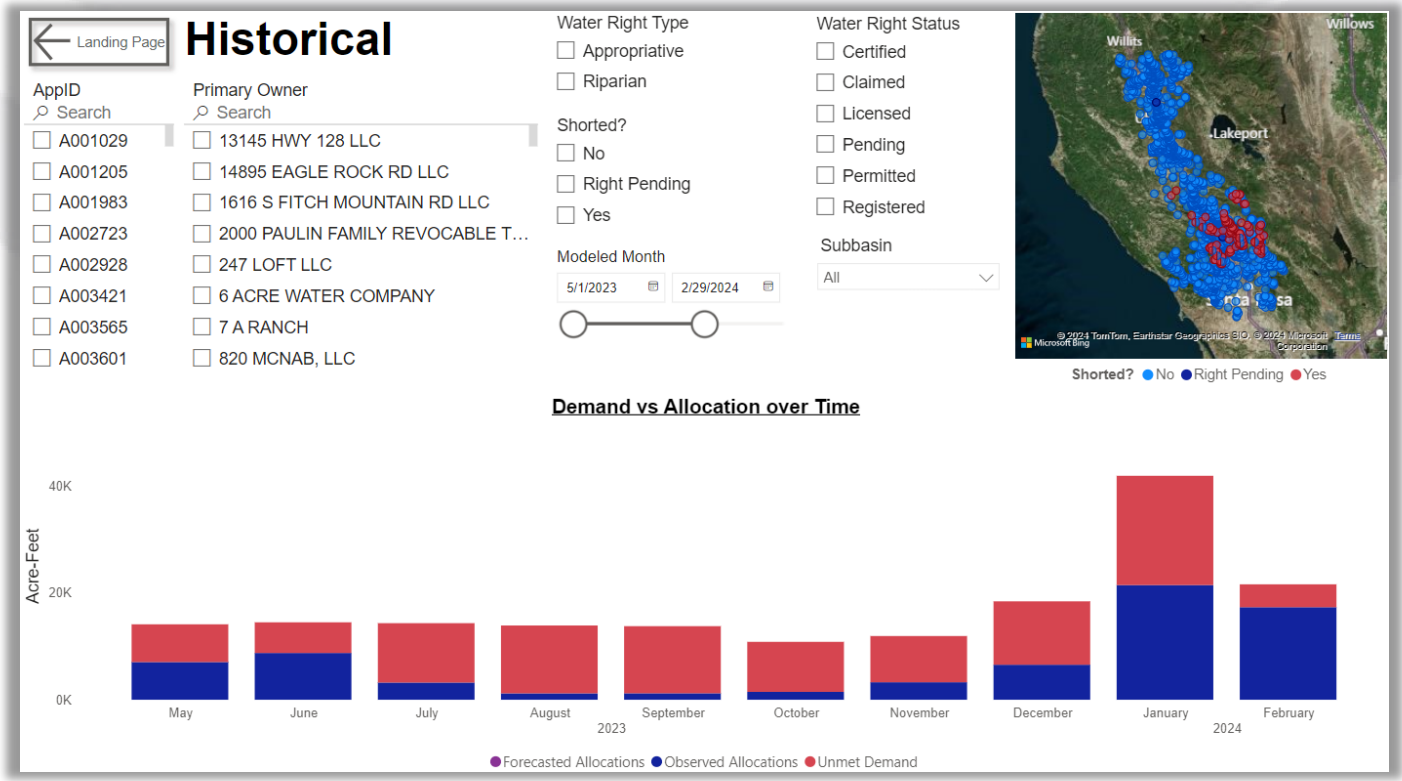
Supply & Demand Assessment Program

- Authorized in 2022, includes 9 positions building upon Russian River drought response
- $15M Modeling Contract with Paradigm Environmental, Inc.
- **Goal:** Provide data and tools to inform better planning and decision-making during times of water shortage

Lake Mendocino, October 2021. CA DWR

Supply & Demand Assessment Program

- Objective is to develop hydrologic models and tools to assess supply and demand in select watersheds throughout California
- Continued work on models and tools developed to monitor conditions in Russian River watershed
- Intend to develop these tools (supply models, demand datasets, and water allocation tools) for additional watersheds and plan to make all tools open source and accessible to public to support local and Board efforts



Power BI Data Visualization tool for the Russian River watershed
Available on the SDA Webpage: www.waterboards.ca.gov/sda

Supply & Demand Assessment Program

Future Applications:

- Provide water availability forecasts for upcoming month as well as water year
- Evaluate environmental flow scenarios
- Assess water availability to inform actions for addressing future water shortages
- Incorporate climate change modeling to predict how watersheds will react to future climate scenarios

Priorities for Watershed Selection

- Driven by **surface water demand** (regions where analysis would likely be successful)
- Contain regions of **salmonid habitat** or other important fisheries with known flow concerns
- Targeting watersheds in the **North Coast**, **San Francisco Bay**, and **Central Coast** Regions, but not a formal requirement
- Be a region where the Division is **not already engaged** in other drought or flow assessment efforts unless modeling work at a sub watershed level would accelerate efforts

Pilot Watersheds (work underway)

- Navarro River
- Napa River
- Butte Creek

Lake Berryessa, August 2022. CA DWR

Navarro River

Characterization

- Coastal watershed with drainage area of 315 sq. mi
- Characterized by many small diversions for agricultural, commercial, and residential use
- Degraded coho salmon and steelhead trout habitat

Status

- Paradigm is building the supply model and has delineated the watershed subbasins
- Staff is working on data quality control to finalize the demand dataset

Napa River

Characterization

- Drainage area of 283 sq. mi
- Significant surface water - groundwater interactions
- Large amount of groundwater pumping
- Heavy agriculture use
  - Irrigation Watering
  - Frost Protection
- Critical flow issues (stream drying)
- San Francisco Estuary Institute (SFEI) Model of the Bay Area used to assist in model development

Status

- Paradigm is adjusting the supply model further to better capture low flows
- Staff is working on data quality control to finalize the demand dataset

Butte Creek

Characterization

- Drainage area of 820 sq. mi
- Receives imported water from the Feather River
- Complex diversions in valley regions
- Critical habitat for largest population of Central Valley spring run Chinook salmon
    - Very active local stakeholders working to support collaborative improvements to fisheries

Status

- Staff is working on data quality control to finalize the demand dataset

Considerations for Additional Watersheds

- Iterative Criteria-Based Evaluation Process
  - Water Right Considerations
  - Hydrologic Complexity
  - Ecological Significance
  - Land Designations
- Developed Preliminary Watershed Tiers
- Provided a Preliminary Selection of Watersheds

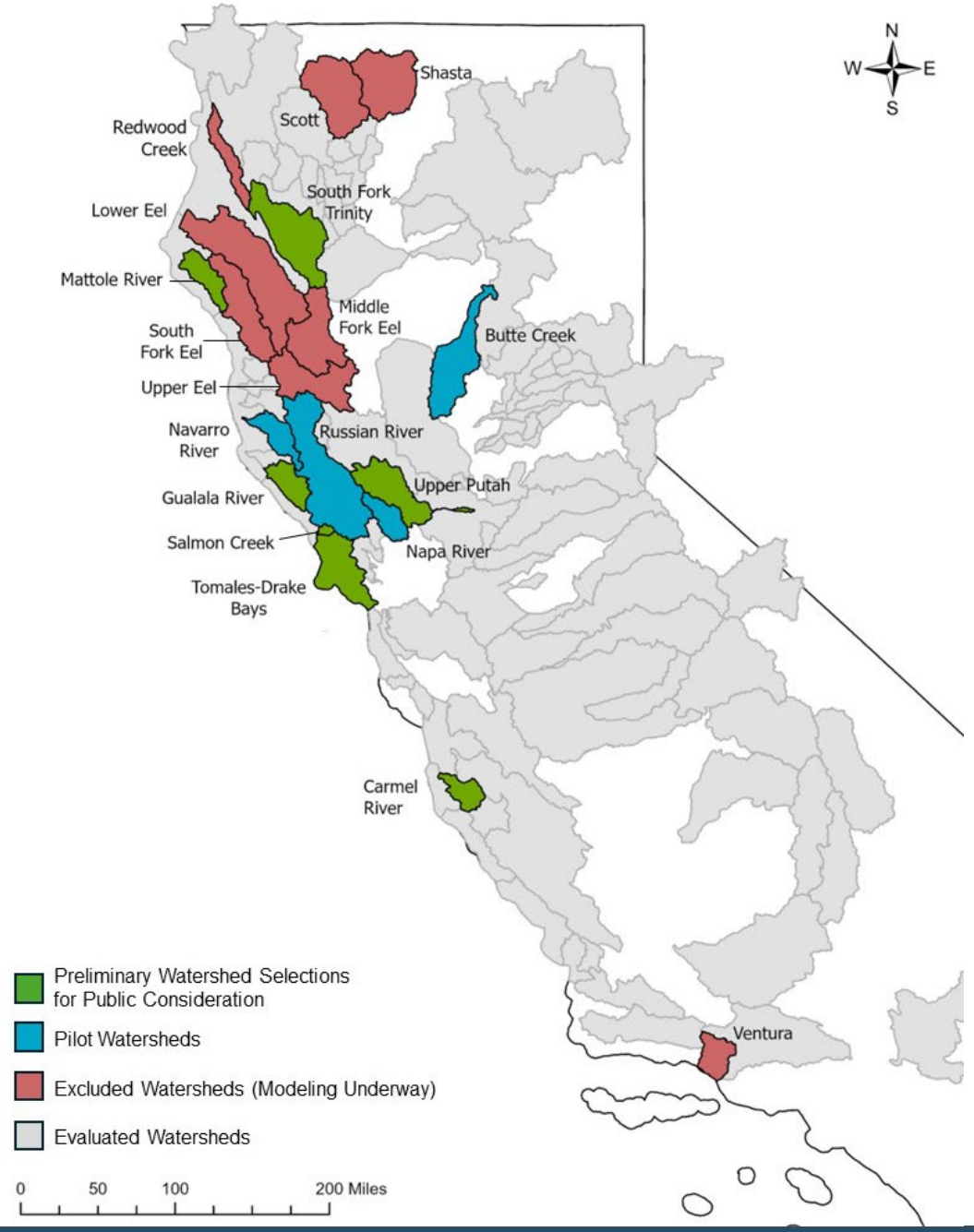
Preliminary Watershed Selections

San Francisco Bay Region
- Tomales-Drake Bays

North Coast Region
- Mattole River
- Gualala River
- Salmon Creek
- South Fork Trinity

Central Coast Region
- Carmel River

Central Valley Region
- Upper Putah



Tomales-Drake Bays

Total Annual Diversion (Thousand AF)	# Water Rights for Non-Domestic / Non-Municipal Use	POD/Well Ratio	Drought Frequency
88.8	192	1.93	49%

Characterization

- Coastal Watershed
- Contains the following sub-watersheds:
  - Lagunitas Creek
  - Walker Creek
- Received high scores for ecological criteria

Nominations

- Lagunitas Creek and Walker Creek were nominated by SF Bay Regional Board and CDFW due to concerns of streams going dry

Upper Putah

Total Annual Diversion (Thousand AF)	# Water Rights for Non-Domestic / Non-Municipal Use	POD/Well Ratio	Drought Frequency
1932	410	3.79	49%

Characterization

- Received high scores for the water rights criteria
- Upper Putah Creek has a watermaster
- Large number of appropriative rights with a high amount of annual diversion

Mattole River

Total Annual Diversion (Thousand AF)	# Water Rights for Non-Domestic / Non-Municipal Use	POD/Well Ratio	Drought Frequency
1044	73	19.22	59%

Characterization

- Coastal Watershed
- Received high scores for ecological criteria
- Demand is substantially more dependent on surface water than groundwater
- Critical low flow during summer months

Gualala River

Total Annual Diversion (Thousand AF)	# Water Rights for Non-Domestic / Non-Municipal Use	POD/Well Ratio	Drought Frequency
4.8	11	6.17	54%

Characterization

- Coastal Watershed
- Received high scores for ecological criteria
- Demand is more surface water dependent

Salmon Creek

Total Annual Diversion (Thousand AF)	# Water Rights for Non-Domestic / Non-Municipal Use	POD/Well Ratio	Drought Frequency
0.0156	19	2.32	48%

Characterization

- Coastal Watershed
- Received high scores for ecological criteria

Nominations

- Nominated by North Coast Regional Board due to chronic water supply issues

South Fork Trinity

Total Annual Diversion (Thousand AF)	# Water Rights for Non-Domestic / Non-Municipal Use	POD/Well Ratio	Drought Frequency
2952	52	1.08	58%

Characterization

- Water flows northward from South Fork Trinity to Trinity River, then to Klamath River
- Dry season flows are snowpack-dominated

Nominations

- Contains Upper and Lower Hayfork Creeks, nominated by the North Coast Regional Board due to high water demand and flow issues (streams drying)
- Regional Board has developed demand estimates for illegal cannabis diversions not enrolled in the program

Carmel River

Total Annual Diversion (Thousand AF)	# Water Rights for Non-Domestic / Non-Municipal Use	POD/Well Ratio	Drought Frequency
648	21	3.02	50%

Characterization

- Coastal Watershed
- Watershed has a high amount of diversion and high Point of Diversion (POD) density despite small watershed area
- Flow issues (streams drying) have impacted Endangered Species Act threatened steelhead
- Public interest has led to numerous habitat restoration projects

Nominations

- Nominated by Central Coast and Central Valley Regional Boards because of high water demand, impaired watershed

Informational Resources

For further information and to subscribe to the Supply and Demand Assessment Email List visit:

www.waterboards.ca.gov/sda

Water Supply and Demand Assessment Fact Sheet now available!

https://www.waterboards.ca.gov/waterrights/water_issues/programs/supply-and-demand/docs/2024-sda-fact-sheet.pdf

Related Efforts

Pilot Telemetry Project 2025-2028 in Russian River watershed

Water Board research project to test automated measurement and reporting

Looking for volunteers in Russian River to participate in this Pilot Project

- Keep monitoring equipment, help simplify future reporting

Read about the Project: https://cawaterdata.org/projects/telemetered-data-project/

Contact Water Board Email: Laurel.Dodgen@waterboards.ca.gov

Subscribe/contact the Water Data Consortium: https://cawaterdata.org/contact-us/

Questions & Comments

Please email questions and comments to

DWR-SDA@waterboards.ca.gov

Comments on the preliminary watershed selections are due by **12:00 Noon, June 17, 2024**

For further information visit:

www.waterboards.ca.gov/sda

Additional Slides

Watershed Tiers

Tiers inform selections

Tier 1 Watersheds

Gualala-Salmon, Tomales-Drake Bays, Lower Bear River (HUC 10), Upper Bear, Lagunitas Creek (HUC 10), Petaluma River (HUC 10), Garcia River (HUC 10), Upper Yuba, Sonoma Creek (HUC 10)

Tier 2 Watersheds

Upper Cache, San Lorenzo River (HUC 10), Pajaro, Mattole, Pismo Creek (HUC 10), Trinity, Upper Putah, Walker Creek (HUC 10), Central Coastal

Tier 3 Watersheds*

Upper Pit, Carmel River (HUC 10), Salmon Creek (HUC 10), Weaver Creek (HUC 10), South Fork Trinity, Upper Hayfork Creek (HUC 10), Lower Hayfork Creek (HUC 10), Browns Creek (HUC 10)

**Not a comprehensive list. Only Tier 3 watersheds highlighted by CDFW or a Regional Water Board are shown.*

Watershed	# Appropriative WRs (Total, Domestic/Municipal, Non-Domestic/Non-Municipal)			# Riparian WRs	Average Monthly Diversion (Thousand Acre-Feet)	Drought Condition* (# Dry Months in the Past 20 years)	POD/Well Ratio
Tomales-Drake Bays (HUC 8)	259	67	**192 (74%)**	155	7.4	118 (49%)	1.93
Mattole River (HUC 10)	207	134	**73 (35%)**	307	**87**	**141 (59%)**	**19.22**
Gualala River (HUC 10)	25	14	11 (44%)	41	0.4	**129 (54%)**	**6.17**
Salmon Creek (HUC 12)	31	12	19 (61%)	16	0.001	116 (48%)	2.32
South Fork Trinity (HUC 8)	161	109	52 (32%)	205	**246**	**139 (58%)**	1.08
Carmel River (HUC 10)	132	111	21 (16%)	59	54	119 (50%)	3.02
Upper Putah (HUC 8)	534	124	**410 (77%)**	233	**161**	117 (49%)	**3.79**

** This metric refers to the number of months with conditions categorized as moderate/severe/extreme/exceptional drought. Data Source: U.S. Drought Monitor*

Butte

Total Annual Diversion (Thousand AF)	# Water Rights for Non-Domestic / Non-Municipal Use	POD/Well Ratio	Drought Frequency
302	50	0.46	54%

Napa

Total Annual Diversion (Thousand AF)	# Water Rights for Non-Domestic / Non-Municipal Use	POD/Well Ratio	Drought Frequency
625	56	1	48%

Navarro

Total Annual Diversion (Thousand AF)	# Water Rights for Non-Domestic / Non-Municipal Use	POD/Well Ratio	Drought Frequency
184	40	3.03	53%

Other Watersheds for Consideration

(based on scoring or agency input)

- Upper Pit
- Upper Yuba
- Upper Cache
- Garcia River
- Pajaro River
- Pismo Creek
- San Lorenzo River