Recommendation Lead

DRIP Member name and any partners (DRIP members or external) in development of proposed recommendation.

- **Redgie Collins, California Trout Inc. (CalTrout)**

Recommendation Title

Provide a concise title for your recommendation in fewer than ten words.

Instream Flows: Best Practices for Landowner Cooperative Solutions

Description

In one or two paragraphs, please provide a brief overview of the recommendation. Supporting documentation to include an overview of existing trends, the reasons for urgent action, and people currently impacted.

This recommendation proposes the development of a best practices guidance document to support voluntary, cooperative landowner solutions that enhance instream flows and drought resilience. California's ecosystems are under increasing stress from more frequent and severe droughts, climate change, and competing water demands. Landowners often lack clear, practical resources to navigate existing legal tools or participate in cooperative approaches to instream flow protections. The guidance would draw from lived experiences by landowners, Tribes, and local partners who have engaged in cooperative solutions during past droughts, ensuring it is grounded in real-world challenges and opportunities. By compiling and framing proven strategies, tools, and case studies, the guidance would provide a practical and accessible roadmap for landowners, Tribes, agencies, and local partners who want to work together to protect ecological flows while maintaining water security.

The guidance would build on the 2016 *Practitioner's Guide to Instream Flow Transactions in California* with a broader scope to include a wider suite of adaptive water rights tools (e.g., instream flow leases, forbearance agreements, storage flexibility) and natural-based solutions (e.g., beaver reintroduction) that provide multi-benefit resilience. It would also address the practical requirements that make cooperative agreements successful and replicable across watersheds, including funding and incentives, monitoring and data needs, permitting, technical support, enforcement, Tribal and community engagement, and trust-building. An outline of the best practices document is included in the Appendix.

To ensure credibility and broad support, the document would be drafted by a multi-party team of nongovernment organizations (NGOs), academic partners, and local agencies, and then undergo review by state agencies, including the State Water Resources Control Board (SWB) and California Department of Fish and Wildlife (CDFW), to confirm consistency with state practices. Relevant funding entities (e.g., the Wildlife Conservation Board (WCB)) would be consulted to ensure funding opportunities are accurately represented. A public comment period, combined with intentional outreach to Tribes, landowners, and local partners, would confirm the document's feasibility and usefulness.

Focus Area

Bold the focus area(s) that this recommendation is meant to address.

- **Reducing Ecosystem Impacts of Drought**
- Land Use Planning for Drought Resiliency
- Water Infrastructure & Planning

Desired Outcomes

What are the expected outcomes or benefits of this recommendation, and how will it specifically enhance drought resiliency in California?

- Improve ecological flow conditions in vulnerable streams during drought, while delivering meaningful incentives for landowners to prepare for or avoid curtailment.
- Reduce reliance on emergency curtailments by supporting proactive, cooperative drought strategies that maintain instream flows when they are most at risk.
- Provide a trusted and user-friendly resource for landowners, agencies, and partners interested in voluntary instream flow agreements.
    - Clarify the process.
    - Build trust through intentional drafting team and highlighting case studies and practical requirements for success.
    - Center community-lived experiences so the guidance is grounded in real-world challenges, informed by the complexity of drought, and reflective of how landowners, Tribes, and local partners have navigated past water shortages.
- Raise awareness of existing resources.

To what extent does this fully address the Focus Area problem statement?

This recommendation directly addresses several core challenges identified in the problem statement, particularly under Environmental Flow Protections, Habitat Restoration, and Existing Tools & Regulations. By developing a best practices guidance document, it responds to the lack of clarity and consistency in how cooperative instream flow solutions are pursued, offering a practical and accessible resource for landowners and agencies. The guidance would build on existing tools and legal authorities without requiring new legislation, and help to operationalize them in ways that are transparent, replicable, and trusted.

The recommendation enhances drought resilience by:

- Strengthening environmental flow protections through voluntary, incentive-based approaches that can be adapted to local watershed conditions and are particularly valuable during drought, when low-flow events place ecosystems and communities at the greatest risk.
- Supporting habitat restoration and nature-based solutions by showing case studies (e.g., riparian projects, beaver reintroduction) that deliver ecological and drought resilience benefits.
- Promoting integrated planning by clarifying how landowners, Tribes, local governments, and state agencies can work together using cooperative agreements and funding opportunities.
- Leveraging existing tools and regulations (e.g., instream leases, forbearance, Safe Harbor Agreements) to make them more accessible and usable.

The recommendation aims to provide a roadmap for implementing voluntary, cooperative solutions, filling a gap between the tools that exist, and the practical steps needed to apply them.

Alignment with Other Initiatives

How does the recommendation align with and/or leverage existing state efforts, concurrent public or private initiatives?

- This recommendation builds upon existing landowner cooperative solutions documented through case studies and explained in the 2016 *Practitioner's Guide to Instream Flow Transactions in California*. It complements the California Environmental Flows Framework and aligns with ongoing work at SWB and CDFW to protect and enhance instream flows. The guidance would leverage water rights and habitat protection tools already within these agencies' authorities. It also connects to funding opportunities through Proposition 4, particularly the WCB Stream Flow Enhancement Program. In addition, it would build on the science, restoration, and landowner engagement work already underway by NGOs and academic partners.

Implementing Parties and Partners

Who would be the likely implementing agency or entity (potentially multiple)? Why?

- Likely Leads: nonprofit partners with expertise in cooperative flow agreements (e.g., CalTrout, Trout Unlimited, The Nature Conservancy, River Partners) in partnership with academic institutions.
- Key Reviewers: SWB, CDFW, and local governments.

Which existing entities (e.g., departments or other agencies, private or nonprofit groups, community-based organizations) will the implementing agency or entity need to partner with for successful implementation of this recommendation?

- Landowners, Local Farm Bureaus, Resource Conservation Districts (RCDs), and irrigation districts.
- Tribal partners, watershed councils, and community-based organizations with local knowledge and relationships.
- Coordination with the WCB to align with funding opportunities.

Describe the coordination required by federal, state, local and tribal governments to successfully implement this recommendation.

Developing and implementing the best practices guidance will require broad coordination across federal, state, local, and Tribal entities. Federal partners (e.g., NOAA Fisheries, US Fish & Wildlife Service) can provide scientific expertise and ensure alignment with species recovery and habitat protection programs. State agencies, including the SWB, CDFW, and WCB, will be central to reviewing and validating the guidance, aligning it with existing legal authorities, and connecting it to funding opportunities, such as Proposition 4.

At the local level, counties, RCDs, and water management entities will be important conduits for outreach and for tailoring guidance to watershed-specific conditions. Early engagement with Tribes will be critical, both to incorporate traditional ecological knowledge and to ensure that

Tribal water and cultural resource priorities are reflected in cooperative approaches. Ongoing Tribal involvement can also strengthen stewardship models and build trust with local landowners. The DWR Tribal Affairs Office should be included in this process to ensure alignment with state consultation practices, and to help identify the most appropriate engagement pathways.

Implementation Time Frame

Approximately how quickly could the proposed recommendation be implemented? Factor time needed to develop, design, permit, construct (if applicable). Bold the one timeframe you believe is most likely:

Short term (1-2 yrs.) Medium term (2-4 yrs.) Long term (4-5+ yrs.)

Necessary Steps & Measuring Success

What are the key steps to adopt and implement action?

- Assemble a drafting team (non-government organizations (NGOs), academia, local partners).
- Develop an outline that includes framing adaptive tools, case studies, practical requirements, and lessons learned. An example outline is included in the Appendix.
    - The introduction should explain the role of instream flows in drought resilience and define the legal bounds/limitations for implementing and enforcing instream flow criteria.
    - Water rights tools to include: instream leases, forbearance agreements, storage flexibility.
    - Other project types that slow stream flows and provide drought resilience benefits: riparian restoration and beaver reintroduction.
    - Practical requirements to include: funding, monitoring, permitting, technical support, enforcement, Tribal and community engagement, trust building. Also list the suggested steps to implement and metrics to monitor success.
    - Funding opportunities to highlight: WCB's Stream Flow Enhancement Program.
    - Case studies to include: Scott and Shasta Rivers, Sonoma County, Santa Rosa, adjudicated basins, the San Mateo Resource Conservation District, and Soquel Creek.
- Conduct state agency review (SWB, CDFW, WCB) for alignment with existing practice and funding opportunities.
- Release draft guidance for public comment and local review to confirm feasibility.
- Finalize and disseminate through NGO networks, state-hosted webinar series, and local partners.

To help monitor progress and success, what thresholds and reporting can be identified to reflect successful implementation?

- Completion and dissemination of the guidance document.
- Number of agencies, NGOs, or landowners referencing or applying the guidance.
- Feedback from landowners and partners on clarity, usability, and trustworthiness.
- Uptake of cooperative solutions documented in pilot watersheds. For these projects, track:
    - Number of landowners participating in voluntary agreements, and the stream miles or acreage covered by those agreements.
    - Volume of water conserved or shifted during critical drought periods.

- Number of days where low-flow thresholds were avoided, i.e., days when surface water flows were maintained above ecological benchmarks due to intervention.
- Reduction in emergency curtailments in pilot watersheds compared to similar basins or prior droughts.
- Documented ecological benefits (e.g., fish habitat or temperature metrics).

Potential Challenges

What issues or challenges might arise during implementation (e.g. authority or need for additional authority, funding or revenue streams, public awareness and perception, technical, interagency coordination)? List these hurdles and offer a brief description of how to address/mitigate them.

Challenges

- Legal complexity and overlap of agency authorities
- Variation in trust across different audiences (farmers, counties, environmental groups)
- Funding availability and timely disbursement
- State agency staff capacity
- Data gaps for setting instream flow criteria recommendations

Mitigation Strategies

- Engage trusted local intermediaries early (RCDs, farm bureaus, watershed groups)
- Provide clear framing: highlight flexibility and benefits rather than restrictions
- Build credibility through multi-party drafting and transparent review
- Ensure outreach is audience-specific and paired with technical assistance
- Addressing funding and staffing hurdles by aligning costs with existing programs (e.g., WCB Stream Flow Enhancement Program, CDFW restoration funds, SWB drought preparedness programs). These sources can support outreach, landowner engagement, and technical analysis needed to implement cooperative agreements. See Funding for more detail.

Are there foreseeable potential negative consequences or unintended impacts associated with implementing this recommendation?

Because this recommendation focuses on producing guidance rather than mandating new requirements, the risks are relatively limited. However, several unintended impacts are possible:

- Perception of redundancy: If the guidance is not clearly differentiated from the 2016 *Practitioner's Guide* and other resources, some may view it as duplicative rather than additive.
- Fragmentation: if multiple entities produce similar documents without coordination, it could create confusion rather than clarity.

To mitigate these risks, the document should:

- Clearly define the unique value and scope of the guidance
- Ensure agency and partner alignment during drafting to avoid duplication and maintain consistency

Funding

What are the possible cost considerations to implement the recommendation?

- The primary costs will be associated with drafting, reviewing, and disseminating the guidance. This includes staffing time for the drafting team to prepare content, as well as state agency staff time to review and validate the document. Additional costs may arise from facilitating outreach and engagement (e.g., webinars, workshops, translation) to ensure guidance is accessible and widely adopted. These activities will require sufficient staff capacity and coordination across state and local partners.

What potential existing and/or future funding sources or mechanisms are available (e.g., grants, general fund, bond funds, rate payers, philanthropic foundations, etc.)? Does the recommendation require funding from the state and potentially matching funds?

- Potential sources include Proposition 4-supported grant programs, including the WCB Stream Flow Enhancement Program, CDFW restoration funds, SWB drought preparedness programs, and NGO contributions. While private landowners are not eligible to apply directly for WCD or other bond-funded programs, they can partner with eligible entities such as Tribes, local governments, or non-profit organizations (land trusts, RCDs, etc.) These partners can apply for and manage the funding, while landowners participate in the project implementation. Aligning with existing state funding streams will be essential to ensure landowner incentives are available.

Equity and Outreach

How might the recommendation address any specific equity or justice concerns, as defined by the DWR Racial Equity Vision, during its implementation?

- This recommendation advances equity by making voluntary cooperative solutions more accessible and understandable to a wide range of landowners, including smaller and historically underserved diverters in rural and coastal watersheds. By compiling clear examples, practical requirements, and available incentives, the guidance can help reduce barriers for participants who may not have technical or legal expertise. Partnering with Tribes and community-based organizations during drafting and review will ensure the guidance reflects culturally significant perspectives, stewardship practices, and Tribal water priorities, while also promoting trust and inclusivity.

What sort of outreach/education is necessary for the successful implementation and scaling up of the recommendation? Describe the target audience and the methods of outreach needed (e.g., communication, technical or financial assistance, partnering assistance).

- Successful implementation will require broad and tailored outreach so that the guidance reaches the audiences most likely to use it: farmers, landowners, Tribes, local governments, water suppliers, and environmental groups. Reaching Tribes and underserved communities will be especially challenging and will require dedicated funding, staff capacity, and partnerships to ensure meaningful engagement. Effective methods may include:
    - Community meetings and workshops in priority watersheds.
    - Engagement through trusted local partners such as RCDs, farm bureaus, watershed groups, NGOs, and Tribal organizations.

        - Dedicated Tribal engagement will be necessary throughout drafting and review, with intentional space for Tribes to shape the guidance. The DWR Tribal Affairs Office should be a key partner, as they bring deep expertise on how to best engage with Tribes and ensure state efforts are consistent with Tribal consultation practices.
    - Dissemination through state and NGO platforms (e.g., regular webinar series like the California Natural Resource Agency's *Cutting the Green Tape* and the Department of Water Resources' *California County Café* series).
    - Clear, plain language guidance materials (including translation where needed) that highlight options and pathways.
    - Pairing outreach with technical assistance and capacity support so landowners can take advantage of the tools and incentives described in the guidance.

Appendix: Draft Outline

1. Introduction and Purpose
    a. Why instream flows matter for drought resilience
    b. Role of voluntary, cooperative agreements as a complement to regulatory tools
    c. Intended audience (farmers, landowners, Tribes counties, water suppliers, environmental groups, agencies).
    d. How this document build on the 2016 *Practitioner's Guide* while expanding scope
2. Framing, Guiding Principles, and Vision
    a. Framing:
        i. Flexibility on private property; voluntary participation
        ii. Legal context: clarifying complexity and bounds
    b. Guiding Principles:
        i. Equity and inclusion (small diverters, underserved communities, Tribes)
        ii. Importance of trust, transparency, and collaboration
    c. Vision/Desired Outcomes:
        i. Provide a trusted and user-friendly resource for landowners, agencies, and partners interested in voluntary instream flow agreements.
        ii. Improve ecological flow conditions in vulnerable streams during drought, while delivering meaningful incentives for landowners to prepare for or avoid curtailment.
        iii. Reduce reliance on emergency curtailments by supporting proactive, cooperative drought strategies that maintain instream flows when they are most at risk
3. Current Process & Initiatives
    a. Flow chart/visual storyboard of the current process (e.g., petitions, permitting, agency coordination)
    b. Connections to Healthy Rivers and Landscapes program and other state initiatives
4. Adaptive Water Rights Tools and Other Mechanisms
    a. Instream leases, forbearance agreements, storage flexibility
        i. Include a visual/table that concisely clarifies how these mechanisms work and their similarities and differences from each other.
    b. Curtailment relief, Safe Harbor Agreements
    c. Nature-Based and Restoration Strategies: Projects that improve ecosystem resilience beyond direct flow dedication. Examples: beaver reintroduction, riparian restoration, wetland enhancement
5. Practical Requirements for Success
    a. Requirements to highlight:
        i. Funding and incentives

            1. Available state programs (e.g., WCB Stream Flow Enhancement Program, CDFW restoration funds, SWB drought resilience programs)
            2. Clarify eligibility and partnership pathways for landowners
        ii. Monitoring and data collection
        iii. Permitting and technical support
        iv. Enforcement and agency coordination
        v. Tribal and community engagement and trust building
    b. Case studies to highlight throughout section: Scott and Shasta Rivers, Sonoma County, Santa Rosa, Adjudicated basins, San Mateo Conservation District, Soquel Creek, Natural infrastructure (e.g., beaver reintroduction).
        i. Incorporate lived experiences from landowners, Tribes, and local partners who have implemented cooperative agreements, especially during drought.
    c. Necessary Steps & Measuring Success: detail the concrete steps and metrics to measure success.
6. Lessons Learned and Replicability
    a. Rehash the successes and challenges highlighted in case studies
    b. Guidance on how cooperative solutions can be replicated in other watersheds

Recommendation Lead

DRIP Member name and any partners (DRIP members or external) in development of proposed recommendation.

- **Sierra Ryan, Santa Cruz County**
- **Natalie Kuffel (with Lawrence Grodeska), Governor's Office of Land Use & Climate Innovation (LCI)**

Recommendation Title

Provide a concise title for your recommendation in fewer than ten words

Aligning Communication and Planning Timelines for Housing and Water

Description

In one or two paragraphs, please provide a brief overview of the recommendation. Supporting documentation to include an overview of existing trends, the reasons for urgent action, and people currently impacted.

California's housing and water planning processes operate on different timelines, under different mandates, and with limited coordination. This misalignment leads to water supply considerations often surfacing late in the development process, resulting in inefficiencies, higher costs, delayed projects, and missed opportunities to ensure equitable, sustainable growth.

This recommendation proposes a comprehensive study to analyze the timelines, processes, and coordination gaps and opportunities between housing and water planning, with the goal of improving alignment and ensuring that water supply considerations are integrated earlier in the housing development process. Additional guidance and best management practices could be tailored from this study's findings to directly assist local and regional planners.

Study Components

The study would be conducted in three major parts:

1. **Landscape Analysis of Timelines and Processes**
   - Map out timelines for housing and water planning processes, including general plans and housing elements, RHNA cycles, urban water management plans, groundwater sustainability plans, and key steps in the private development timeline (e.g., land acquisition, entitlements).
   - Develop a map of interested parties, along with a process flow chart to identify roles of different parties, along with where misalignments can occur and clarify opportunities for earlier engagement by water agencies.
   - Highlight strategies and potential incentives to encourage earlier, more effective coordination.

2. **Case Studies of Planning Misalignment**
   - Analyze a selection of local cases across varying geographies (urban vs rural; forest, agriculture, desert, etc.) where poor coordination led to significant challenges such as delayed projects, lost funding opportunities, or impacts to vulnerable communities (e.g., domestic well users).

- Document the real-world consequences of these misalignments, including zoning variances and informal development patterns through a series of anonymized case studies.
- Use findings to recommend the most critical points in the planning process for improved coordination between water planners, land use planners, and developers.

3. **Case Studies of Successful Coordination**
   - Highlight exemplary regions where collaboration between planners, water agencies, and developers produced strong outcomes.
   - Develop a best practices flow chart based on examples of success.
   - Document how this coordination was achieved, the benefits (cost savings, equitable outcomes, more resilient water planning), and lessons learned that can be scaled or adapted statewide.

Equity and Affordability Lens
The study would emphasize equity considerations by specifically analyzing the implications of misalignment for small water systems, domestic well communities, and disadvantaged communities to avoid perpetuating inequities.

Focus Area

Bold the focus area(s) that this recommendation is meant to address.

- Reducing Ecosystem Impacts of Drought
- **Land Use Planning for Drought Resiliency (primary)**
- **Water Infrastructure & Planning (secondary, related)**

Desired Outcomes

What are the expected outcomes or benefits of this recommendation, and how will it specifically enhance drought resiliency in California?

- The final deliverables could be targeted toward regional, county, and city-level decision-makers where coordination can be most immediately actionable while also offering insights that could inform state-level guidance and updates to planning requirements.
- This assessment would provide a launchpad from which further informed decisions and guidance may be developed to improve coordination between housing and water.
- Enhanced drought resiliency by ensuring water availability is considered in housing plans to avoid new housing built with risk of water shortages.
- Improved coordination between housing and water planning, leading to more sustainable development.
- Earlier identification or more coordinated planning of water supply issues, allowing for timely solutions.

To what extent does this fully address the Focus Area problem statement?

- Housing development accounting for water supplies and timing of expanding water supplies is key to improving the connections between land use planning and water resources, however it is only one aspect that needs improvement. This recommendation addresses a first step to understand needs and opportunities for improving alignment between the two sectors.

Alignment with Other Initiatives

How does the recommendation align with and/or leverage existing state efforts, concurrent public or private initiatives?

- This assessment contributes to the long-needed alignment of housing and water planning, through which legislation has been used to support the integration water and land use planning, such as SB 610 and SB 221 (2001) that require water supply assessments and written verifications of sufficient water supplies. This law was amended through SB 1262 (2016) to require that water supply assessments and written verifications include information related to groundwater basin conditions and SGMA (so groundwater limits are included when assessing a project's water adequacy).
- This assessment supports initiatives aimed at improving housing affordability and supply while ensuring sustainable water use.
- This assessment would also serve as an important input to LCI's Planning Guidelines Update which includes a comprehensive revision of the State's General Plan Guidelines.

Implementing Parties and Partners

Who would be the likely implementing agency or entity (potentially multiple)? Why?

- Academic partners such as UCLA's Luskin Center could provide analytical support, with practitioner input ensuring that findings are grounded in real-world needs.

Which existing entities (e.g., departments or other agencies, private or nonprofit groups, community-based organizations) will the implementing agency or entity need to partner with for successful implementation of this recommendation?

- A steering or advisory group (including DWR, the State Water Board, LAFCOs, GSAs, local governments, and practitioner stakeholders) could guide study design, case study selection, and review of findings.
- Community-based organizations and private developers should also be consulted as part of this study.

Describe the coordination required by federal, state, local and tribal governments to successfully implement this recommendation.

- This recommendation involves state and local governments to successfully implement this recommendation.

Implementation Time Frame

Approximately how quickly could the proposed recommendation be implemented? Factor time needed to develop, design, permit, construct (if applicable). Bold the one timeframe you believe is most likely:

Short term (1-2 yrs.) Medium term (2-4 yrs.) Long term (4-5+ yrs.)

Necessary Steps & Measuring Success

What are the key steps to adopt and implement action?

- This recommendation is an assessment, therefore the key steps to implement it are securing a group to conduct the study and then implement it. If a non-state agency conducts this work, it would be beneficial if the recommendation co-leads provide an advisory role to support the research entity's study.
- Outputs of a successful study would include:
    - Development of a process flow chart for engagement points, such as through process maps that clarify roles and opportunities for coordination across agencies and timelines.
    - Propose incentives and best practices for early involvement of LAFCOs and GSAs.
    - Provide training and guidance to relevant agencies, developers, and land use authorities including best management practices, planning considerations, and a template for improved collaboration that can be adapted regionally or locally.

To help monitor progress and success, what thresholds and reporting can be identified to reflect successful implementation?

Several metrics of progress and success could be tracked to understand its implementation. The following provides optional ideas.

For process and engagement metrics, both interested party participation and transparency of methods are important:

- At least one representative from each key group (DWR, HCD, SWRCB, GSAs, council of governments, LAFCOs, local planners, domestic well advocates) actively involved through an advisory group or workshops.
- Evidence of meaningful input (e.g., number of meetings, comments incorporated, interested party satisfaction surveys).
- Study methods, data sources, and draft results publicly posted.
- At least one round of public review with feedback documented and addressed.

Technical quality metrics:

- Minimum of 3–5 misalignment case studies and 2–3 success case studies included, with lessons learned and transferability analysis.
- Evidence that case studies reflect real-world community impacts, including equity considerations (domestic wells, small systems).

Outcomes and impact metrics (of recommendations made through the study findings):

- Development of recommendations that are actionable and specific.
- Recommendations cited in state or regional planning guidance (HCD updates, DWR Water Plan chapters).
- Regional agencies or COGs pilot new collaboration approaches within 1–2 RHNA cycles.
- Recommendations explicitly address small systems, disadvantaged communities, and affordability impacts. (demonstrating equity).

Potential Challenges

What issues or challenges might arise during implementation (e.g. authority or need for additional authority, funding or revenue streams, public awareness and perception, technical, interagency coordination)? List these hurdles and offer a brief description of how to address/mitigate them.

- Challenges to implementing this recommendation (conducting a study) is insufficient research capacity to conduct the study.

Are there foreseeable potential negative consequences or unintended impacts associated with implementing this recommendation?

- No, but may be a challenge to identify resources to support this work.

Funding

What are the possible cost considerations to implement the recommendation?

- Resources would be needed to support this recommendation for researchers, supporting a local engagement process, as well as any guidance or best practices documents developed.

What potential existing and/or future funding sources or mechanisms are available (e.g., grants, general fund, bond funds, rate payers, philanthropic foundations, etc.)? Does the recommendation require funding from the state and potentially matching funds?

- This study and resources created if this recommendation is implemented could have important benefits for California's future. Therefore, research grants on climate adaptation, water, housing, and land use planning may be good candidates for funding the research component of this work. That could be paired with philanthropic foundation funding or other policy organizations supportive of developing solutions to the age-old challenge of ensuring sufficient water for housing growth in California.

Equity and Outreach

How might the recommendation address any specific equity or justice concerns, as defined by the DWR Racial Equity Vision, during its implementation?

- Ensuring that all communities, including disadvantaged ones, have access to sustainable water supplies.
- Engaging with community-based organizations to ensure inclusive planning processes.

What sort of outreach/education is necessary for the successful implementation and scaling up of the recommendation? Describe the target audience and the methods of outreach needed (e.g., communication, technical or financial assistance, partnering assistance).

- Local and regional engagement is key to successfully conducting this multi-part assessment.

Recommendation Lead

DRIP Member name and any partners (DRIP members or external) in development of proposed recommendation.

- **Sierra Ryan, Santa Cruz County**
- **Natalie Kuffel (with Lawrence Grodeska), California Governor's Office of Land Use & Climate Innovation (LCI)**

Recommendation Title

Provide a concise title for your recommendation in fewer than ten words.

Assessing Water Supply and Wastewater Capacity with Housing Needs

Description

In one or two paragraphs, please provide a brief overview of the recommendation. Supporting documentation to include an overview of existing trends, the reasons for urgent action, and people currently impacted.

This recommendation calls for a study to assess current and projected water supply and wastewater treatment capacity by region, comparing findings to regional housing growth plans and allocations, along with demands from existing housing. California's growing housing demand is placing increasing pressure on limited water resources. Yet, there is limited data on whether and where water supply and wastewater infrastructure can support this growth on a region by region basis, particularly during dry periods.

To ensure water security during both normal and dry periods, it is critical to evaluate whether existing and future water supplies and wastewater infrastructure can support projected housing development. This lack of clear, data-driven understanding fuels two competing narratives: some argue there is "plenty of water" to build everywhere, while others worry continued growth will strain already fragile systems.

Scope & Approach

- **Regional Focus:** Analysis would be conducted on a regional basis, with an initial effort to define "region" (e.g., county, Groundwater Sustainability Agency, planning region). A pilot or prototype study could be launched in a single region to test methods before scaling statewide.
- **Time Horizons:** The study would use a 50-year planning horizon to align with infrastructure lifespans and long-term water availability planning, rather than a shorter 20-year view.
- **Equity & Small Systems:** Special attention would be given to small water systems and domestic well communities, which may face shortages even when regional supply appears adequate. Lessons from historic subdivision and well-approval records would be incorporated to avoid repeating past vulnerabilities.

The study would creatively integrate multiple datasets, including Urban Water Management Plans, Water Supply Assessments, GSA groundwater modeling (from GSPs), groundwater quality data (e.g., CV-SALTS), and other regional modeling efforts. Analysis would consider:

- Longer, more frequent droughts as projected by climate change models, rather than relying on the six-year drought as the "worst case."
- Land use transitions from agriculture to housing in rural areas.
- The potential to enhance regional water capacity through sustainable practices (e.g., water recycling, water conservation measures) and water-efficient housing design (e.g., graywater systems, cisterns, rainwater harvesting), while balancing water supply needs for healthy ecosystems.

Focus Area

Bold the focus area(s) that this recommendation is meant to address.

- Reducing Ecosystem Impacts of Drought
- **Land Use Planning for Drought Resiliency (primary)**
- **Water Infrastructure & Planning (secondary, related)**

Desired Outcomes

What are the expected outcomes or benefits of this recommendation, and how will it specifically enhance drought resiliency in California?

- This recommendation would help inform future discussions about how to ensure growing housing development is water secure under future dry periods.
- The near-term output of this recommended study is that it could identify where there may be insufficient existing water infrastructure to support projected housing development.
- The study would develop repeatable analytical methods for assessing water supply capacity at a regional level and within a region.
- Enhanced drought resiliency by ensuring water availability is considered in housing plans to avoid new housing from otherwise increased risk of water shortages.
- Improved coordination between housing and water planning, leading to more sustainable development.
- Potentially this study could support early identification of water supply issues and needs for wastewater infrastructure, allowing for timely solutions.

To what extent does this fully address the Focus Area problem statement?

- Housing development accounting for water supplies and timing of expanding water supplies is key to improving the connections between land use planning and water resources; however, it is only one aspect that needs improvement within the Focus Area of Land Use Planning for Drought Resilience.

Alignment with Other Initiatives

How does the recommendation align with and/or leverage existing state efforts, concurrent public or private initiatives?

- Aligns with state policy to support drought resilience and water shortage prevention, sufficient, safe, and affordable water as part of the human right to water; to integrate water and land use planning.
- Supports initiatives aimed at improving housing affordability and supply while ensuring sustainable water use.

Implementing Parties and Partners

Who would be the likely implementing agency or entity (potentially multiple)? Why?

- A research university or other neutral, non-partisan organization would likely lead the assessment to ensure the study's technical rigor and credibility. An advisory group made up of state and regional agencies (e.g., California Department of Water Resources (DWR), State Water Board (SWB), LCI, Department of Housing and Community Development (HCD), regional council of governments), along with local water agencies, city and county planners, and other community-based organizations, would provide data access, policy context, and equity perspectives to guide the study and its outputs.

Which existing entities (e.g., departments or other agencies, private or nonprofit groups, community-based organizations) will the implementing agency or entity need to partner with for successful implementation of this recommendation?

Researchers would need close collaboration with:

- State agencies (DWR, SWB, LCI, HCD) for statewide water and housing policy guidance, data, and alignment with existing state initiatives.
- Local housing authorities and regional councils of governments for RHNA allocations, land use plans, and local growth projections.
- Water suppliers (urban agencies, mutuals, small systems), GSAs, wastewater agencies, and other water resource managers (e.g., irrigation or stormwater districts) to provide infrastructure capacity data, groundwater modeling, and information on recycling, recharge, and expansion opportunities.
- Community-based organizations and Tribes to ensure equity, community priorities, and on-the-ground knowledge are incorporated.

Describe the coordination required by federal, state, local and tribal governments to successfully implement this recommendation.

Successful implementation would require coordination across multiple levels of government:

- State agencies (DWR, SWB, LCI, HCD): provide data access, policy alignment, and technical guidance to ensure consistency with state drought resilience and housing goals.
- Local governments (counties, cities, councils of government): share housing growth projections, planning documents, and local permitting constraints.
- Tribal governments: contribute data and perspectives on water supply, ecosystem protection, and community needs that may not be captured in state or local datasets.
- Federal agencies (e.g., EPA, Bureau of Reclamation, USGS): provide relevant data on water quality, supply, and infrastructure programs.

Researchers would serve as the neutral convener, but the study's credibility and usefulness would depend on sustained collaboration among these entities to integrate data and co-develop methods.

Implementation Time Frame

Approximately how quickly could the proposed recommendation be implemented? Factor time needed to develop, design, permit, construct (if applicable). Bold the one timeframe you believe is most likely:

Short term (1-2 yrs.) Medium term (2-4 yrs.) Long term (4-5+ yrs.)

Necessary Steps & Measuring Success

What are the key steps to adopt and implement action?

- Assess actual and projected water supply and wastewater treatment capacity by region across the state.
- Compare findings with regional housing allocations.
- Document best practices where housing and water planning are well coordinated.

To help monitor progress and success, what thresholds and reporting can be identified to reflect successful implementation?

- The formation of an advisory group with representation from DWR, State Water Board, and other state and regional interested parties to guide the study, shape recommendations, and ensure outputs are useful for policy and planning.

Potential Challenges

What issues or challenges might arise during implementation (e.g. authority or need for additional authority, funding or revenue streams, public awareness and perception, technical, interagency coordination)? List these hurdles and offer a brief description of how to address/mitigate them.

- **Validity and Salience**: The main challenge to implement this recommendation is making sure that it can inform future policy discussions. Therefore, this requires methods that are valid and acceptable by different interested parties, making the advisory group a critical part of the study.

Are there foreseeable potential negative consequences or unintended impacts associated with implementing this recommendation?

- There are no negative consequences expected of conducting the recommended study are that the results could be misconstrued for a specific interest party's lobbying.

Funding

What are the possible cost considerations to implement the recommendation?

- Compensation for research staff, hosting workshops to discuss methods, and communications about the findings.

What potential existing and/or future funding sources or mechanisms are available (e.g., grants, general fund, bond funds, rate payers, philanthropic foundations, etc.)? Does the recommendation require funding from the state and potentially matching funds?

- The recommendation is to conduct a study. This could be supported by a variety of funding sources that support policy-relevant research, especially on the topic of climate change, water security, and/or housing security.

Equity and Outreach

How might the recommendation address any specific equity or justice concerns, as defined by the DWR Racial Equity Vision, during its implementation?

- Ensuring that all communities, including and especially those relying on low income, have access to sustainable, secure water supplies.
- Engaging with community-based organizations to ensure inclusive planning processes.

What sort of outreach/education is necessary for the successful implementation and scaling up of the recommendation? Describe the target audience and the methods of outreach needed (e.g., communication, technical or financial assistance, partnering assistance).

- The completion of this study could be useful to increase public awareness about the importance of integrating water and housing planning.
- If the methods developed as part of the study are repeatable and found to be useful for an analysis at the regional level, this could lead to the development of workshops, training sessions, and eventually guidance for agency staff and local government planning staff on how to account for water supplies and wastewater in housing-related planning and development processes.