



Sustainable Conservation

December 8, 2017

Jennifer Marr
Statewide Infrastructure Investigations Branch
Division of Statewide Integrated Water Management
California Department of Water Resources
901 P Street, Room 231A
Sacramento, CA 95814

Dear Ms. Marr:

Sustainable Conservation appreciates the opportunity to comment on discussion draft of the White Paper on Flood-MAR: Using Flood Water for Managed Aquifer Recharge to Support Sustainable Water Resources. We have dedicated many years to pioneering the use of flood flows for groundwater recharge, primarily through diversion onto active farmland with suitable soils and crop types. We are therefore extremely pleased to see DWR actively engaging in development of managed recharge with flood flows as a tool for enhancing the state's groundwater supply and flood protection.

Our comments follow the section headings in the draft White Paper, and for the most part respond to your request for focus on completeness of information. We believe that the proposed Plan of Study must be based on as comprehensive an understanding as possible in order to most effectively develop the Flood-MAR strategy. In order for help ensure that this occurs, the full range of current information and research about the use of flood flows for groundwater recharge should be referred to in the final version of the White Paper.

Benefits of Using High-Flow Events for Managed Aquifer Recharge

In order to state the strongest case for the benefits of using high flow events for recharge, the descriptions of the public benefits should be expanded through reference to the findings made in research carried on by a range of organizations and experts. One such source is a memorandum titled *Identifying Benefits and Beneficiaries of Groundwater Recharge from Floodwater Diversion*, funded by Sustainable Conservation and prepared by the economics consulting firm M.Cubed. This memo identifies and describes a range of benefits and associated beneficiaries that could expand and complement the existing White Paper text. Other such sources should be sought out and employed as well.

Description of Flood-MAR

Figure 4 on Page 15 (Factors for Implementing Flood-MAR) should be reordered and expanded in order to present the most effective and comprehensive overview of what needs to be done when to successfully implement Flood-MAR. We suggest ordering and adding to the boxes from left to right as follows:

- Governance and coordination

- *Funding/Incentives*
- Source water
- Conveyance
- Site suitability
- Recharge method
- Groundwater use

We strongly believe that the questions specified under the heading of Governance and Coordination need to be answered first in order to establish the foundation upon which all the other elements will be built. As is stated in the draft White Paper on p. 20, "Cooperation of many entities is required for this resources management strategy to be successful. Cooperation among the owners, operators, and maintainers of pertinent water management facilities; potential beneficiaries; and the land owners bearing impacts, is required for this resource management strategy to be successful. This may require new governance structures, decision-making processes, and operations agreements to support cooperation." Creating the necessary relationships to allow for this sort of cooperation is not something that can be done instantaneously when high flows occur. They need to be in place at the beginning of the implementation of Flood-MAR to the greatest possible extent.

We suggest adding a separate box for funding and incentives in Figure 4. While determination of costs is referred to in the questions under the Governance and Coordination heading, it seems not only logical but essential to proceed directly from that to identifying sources of funding, as well as what incentives might be offered to encourage participation in Flood-MAR. Identifying funding and incentives early in the process will have a significant effect on determining the approach and outcome of all the subsequent subject areas. These sources could be both local (as determined through the GSA development of GSPs) and provided at a statewide scale through agency policy and funding programs.

Determining Suitability of Potential Recharge Areas

Suitability of Soils

The information about recharge suitability indices is incomplete as it focuses on soil characteristics without adequate consideration of underlying geology and depth to groundwater. Other methods for assessing recharge suitability have been developed that are not mentioned in the White Paper. For example, Stanford and Lawrence Berkeley National Lab have each developed suitability assessment methods that have been field tested but that are not yet available statewide. In order to present a more complete picture of the current state of research and development, and provide guidance for the upcoming Plan of Study, the list of recharge suitability methodologies should be expanded. We also recommend that the Plan of Study process include convening a technical group comprised of academic researchers, private consultants, USGS and DWR specialists, and GSA representatives to guide selection, weighting, and integration of appropriate data layers from the full range of indices.

Water Quality

Suitability of Soils is currently the only subsection under this general heading that makes reference to specific sources of information that could be used to determine the recharge suitability of an area. We recommend that the Water Quality subsection also include such a



specific reference. An important factor in determining the suitability of a site is the impacts, positive and negative, that recharge would have on nitrates and salts in the receiving aquifer. These potential impacts should be considered in any evaluation of a site's suitability. Philip Bachand has recently concluded a CDFA-funded study on this subject, *Nitrate Leaching Risk from Specialty Crop Fields during On-farm Managed Floodwater Recharge in the Kings River Basin*. We recommend that this study be referred to in this subsection and included in the References section of the White Paper. We also recommend that the Plan of Study include support for academic researchers and consultants to collect more data in order to improve the calibration of this model.

Barriers and Challenges to Using Flood Flows for Managed Aquifer Recharge Cooperation and Governance

While local agencies are acknowledged in this subsection of the White Paper, we believe there should be separate recognition of the unique challenges they may present to the implementation of Flood-MAR. Local land use decisions in particular could have significant impacts. For example, a site that meets all the criteria for recharge suitability may be rezoned to allow for development and lost for purposes of Flood-MAR. Given the number of counties and cities that may be involved, the unique characteristics of each of them, and the importance they place on preserving their land use autonomy, it seems prudent to call out the particular importance of developing cooperative relationships with local governments.

Legal

Water Rights

The beneficial use issue is currently referred to in the Policy subsection, but there is a significant legal question that needs to be addressed before any policy changes are contemplated. As was very apparent at the November 8, 2017 public forum on groundwater recharge, there is significant disagreement between the State Water Board on one hand and experienced water lawyers on the other as to whether any change in current beneficial use policy is needed in order to pursue managed aquifer recharge. This is a threshold legal question that needs to be resolved.

Implementation

Land Use

In light of our previous comments on water quality, we recommend that the third bullet in this subsection be amended to read: "Will it increase the amount of nitrate and other pollutants entering the groundwater? *Will it result in net dilution of nitrates and other pollutants over time?*"

Economics

This section fails to recognize a fundamental challenge to developing any sort of incentive structure for public benefits – the need for a consistent standard for specifying how a unit of recharge is calculated. We and others are committed to developing a consistent approach for calculating a recharge unit. We recommend that this need be called out in the White Paper as a specific challenge to the economics of Flood-MAR, and that DWR play a role in developing this methodology in order to create consistency across basins implementing SGMA.

Next Steps

Engagement

Once again we want to stress the importance of coordination, collaboration, and engagement as the first, threshold elements of creating a Flood-MAR strategy. These efforts need to be firmly established before commencing the Plan of Study. We applaud the White Paper's recognition of the need to develop relationships of trust, and its acknowledgement that doing so takes time. The obvious conclusion is to start building them now.

We strongly support DWR's stated intent of collecting relevant existing literature and assessing available tools. We have tried to provide some of these resources in these comments. As you engage in this gathering of information, please keep in mind that all of us engaged in this work are in the early stages of a scientific understanding of all the elements of Flood-MAR. In many cases there simply has not been enough time to develop the data, analyses, and discussions required for peer-reviewed publication. We ask that you be willing to accept "gray" literature at this early juncture. We believe that much of it can be of great value in achieving Flood-MAR's goals. We strongly support the Plan of Study's stated goal of identifying and describing data and knowledge gaps and recommending pilot projects and studies to fill those gaps.

We strongly support pursuing the opportunity for Flood-MAR to integrate with and leverage other major water resources planning efforts. We hope that DWR will focus these efforts not only on SGMA and the Central Valley Flood Protection Plan, but also on CV-SALTS (particularly on the issue of potential dilution of aquifer contamination) and the revision of the Bay-Delta Plan (potential impact of changes in flow regimes on flood flow availability and SGMA implementation).

Plan of Study

As we stated in the Economics section above, we believe the list of specified elements of the Plan of Study is missing a key component: the development of an accurate and reliable recharge measurement and accounting methodology, which will be an essential prerequisite to developing monetization techniques and creating consistency across basins implementing SGMA. It will be vital to be able to determine with accuracy how much water is being recharged, how to credit the person/entity who did the recharge, and how the recharged water contributes to the basin achieving sustainable yield over time.

Coordination with Other Plans and Programs

This subsection is somewhat redundant and should be incorporated into the Engagement subsection, since this coordination should be a prerequisite to developing the Plan of Study. The list of entities with whom coordination and cooperation will be required should be expanded to include NGOs. NGOs are playing key roles across the state in studying and demonstrating managed aquifer recharge.

Schedule

It is unclear what role DWR sees itself playing in Year 3 and on. Is it proposing to act as a project manager? If so, we would suggest that a more suitable role might be as the compiler and coordinator of existing information, and the coordinator of efforts with other agencies to remove



regulatory/permitting barriers and promote findings and practices. We feel certain that many qualified entities will take action on recharge once adequate information and assurances are available.

In conclusion, we wish to reiterate how excited we are that DWR is engaging in this work, to which Sustainable Conservation has devoted a great deal of time and resources over a number of years. We look forward to working in close partnership with DWR as the Flood-MAR project evolves and ripens. Once again, thank you for the opportunity to provide comments on the draft White Paper.

Sincerely,

A handwritten signature in blue ink, appearing to read "J Stacey Sullivan".

J Stacey Sullivan
Policy Director