

# Identification and Mapping Groundwater Dependent Ecosystems Workgroup Meeting Summary

Date/Time: Tuesday, July 7, 2020 | 1:00 p.m. - 3:00 p.m.

Location: <https://csus.zoom.us/j/99011901938>

Contact: Sam Magill, Practitioner Work Group Facilitator

Email: [s.magill@csus.edu](mailto:s.magill@csus.edu) | Phone: (831) 251-4127

## MEETING SUMMARY

### Welcome and Introductions / Agenda and Meeting Schedule Review

Sam Magill, Work Group Facilitator walked through the agenda for the day and reminded the participants of the focus of the workgroup:

- a. Description of existing datasets, model tools and preliminary mapping efforts
- b. Discuss process for integration of datasets for developing Potential GDE Maps
- c. Discussion of data gaps

Marcus Trotta, Hydrogeologist, welcomed the group and conveyed his appreciation for the attendees participating in the work group. He mentioned the input from this group will feed into the second Ecosystems work group.

Sam Magill then suggested a round of introductions.

### Sustainable Groundwater Management Act (SGMA) Update and Need for Identification of Groundwater Dependent Ecosystems

*Objective: Provide brief overview of SGMA requirements, update on GSP development, and need for GDE identification*

Marcus Trotta started with a high-level overview of SGMA and mentioned the three steps of compliance:

1. Form GSA by June 30, 2017
2. Develop GSP by January 31, 2022
3. Achieve sustainability 20 years after adoption of plan

Failure to meet any of the deadlines, triggers intervention by the State Water Resources Control Board.

There is one Groundwater Sustainability Plan in development for each of the three basins, Petaluma Valley, Santa Rosa Plain, and Sonoma Valley. The three agencies were formed in June 2017 and have been working on their GSP since then. Sonoma Water is leading the technical work on each of the plans with support from different consultants, the Advisory Committee, and the Board.

Trotta gave an overview of the main points for GDE Mapping:

- Focus on ecosystems that can be affected by groundwater conditions and management are within jurisdiction of the GSAs
- Utilize available statewide and local datasets to develop best available information
- Consider using “indicator” species and/or grouping of GDWs with similar characteristics/habitat needs
- Prioritize GDEs for consideration in developing SMCS for surface water depletion (separate workgroup)

### *Questions/Discussion*

Dusterhoff – Is there a state defined definition for GDE that basins are following to determine what we consider GDEs or is it basin dependent and the scientists in the basin define what GDEs are?

Trotta – The Definition under SGMA is that GDEs are ecological communities of species that depend on groundwater emerging from aquifers or groundwater occurring near the surface (i.e. areas of shallow groundwater, could be roots of vegetation are able to tap into groundwater to support their growth). The state through its partnership with the Nature Conservancy has developed initial indicators of groundwater dependent ecosystems. They encourage GSAs to use that information as well as local information. So, there are state guidance and suggestions, but how they are mapped out within each basin is up to the local GSA.

Magill – That would include low lying wetlands not directly connected to existing surface water sources?

Trotta – It could, provided there is a connection with groundwater for those wetlands.

Trowbridge – For this discussion, are we narrowing our focus to groundwater dependent ecosystems but can be impacted by the GSA? The SRP GSA only covers groundwater in the Santa Rosa Plain, but if the water is coming from the Mayacamas, no amount of management change in the Santa Rosa Plain is going to change that. Also, vernal pools, they fill through rainwater but could become groundwater. How does that fit in?

Trotta – Vernal pools that are primarily perched features, rainwater that perches on low permeability layer, they do eventually contribute to groundwater. In terms of their dependency on groundwater, I wouldn't categorize them as being dependent on groundwater. We would want to focus on groundwater dependent ecosystems connected with aquifers that the GSA would have control over managing. For areas that are outside the basins, the GSA's jurisdiction is limited to those basin areas. They are required to demonstrate their Groundwater Sustainability Plan will not affect neighboring groundwater basins. In terms of upstream areas, we have been including information from those up lying adjoining areas in the contributing watershed in the basin. The GSA

could support projects that enhance conditions in those areas but that don't have direct control of groundwater use or anything that would affect groundwater conditions in those areas.

Marcus Trotta gave a high-level introduction overview of existing datasets for preliminary mapping of potential groundwater dependent ecosystems. Andy Rich talked about their work in identifying interconnected surface water in the basins. Definition in the GSP Regulations as 'surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted.' Our approach to identifying the interconnect surface water is dependent on the information we have for the basins Santa Rosa Plain and Sonoma Valley. For Sonoma Valley, we have a lot of observed data using seepage run monitoring results. For Santa Rosa Plain, we are much more dependent on model results from the USGS flow model developed for the SRP in 2014. We are currently updating the model, but the results presented here are from 2014.

### Questions

Rogers – Just for clarification on interconnected definition: SGMA defines 'interconnected surface water' as 'surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted.'

Rogers – It seems like some of the graphs, figures and analyses in the presentation, focus on the percent of time when stream reach is gaining, but losing streams are interconnected surface water also, based on the definition.

Rich – Good point, we need to reconsider a little more.

Rohde – Are there shallow groundwater data prior to 2016? Using groundwater data from 2016 to characterize groundwater conditions in the basin is technically past the SGMA date. Also, it's important to understand inter-annual groundwater fluctuations across multiple water year types (i.e., dry, wet, average).

Trotta – Yes, we have initially contoured 2016, as it represented the largest dataset of observed groundwater levels at the time. We can evaluate earlier years as well. Additionally, each point (well) on those maps has a time series of groundwater levels that can be examined if certain areas are of interest.

Rohde - Fantastic! The depth-to-groundwater maps look very nice. The lidar ground elevation data makes a difference and is much better than interpolating depth to groundwater measurements between wells.

Dusterhoff – Would you see a different story in a dry period versus a wet period?

Rich – Certainly, as the groundwater system dries during a dry period. Based on observed data, you should see a decrease amount of interconnected surface water. The point raises the question of when is the best time to do the analysis?

Dusterhoff – You are doing the best you have with the funding you have to collect the data. Story can be skewed by the time data is retrieved. How do you plan on acknowledging drier periods versus wetter periods?

Rich – For the simulated data from Santa Rosa Plain, which is focused from 2000 to 2010, I don't think we are capturing too biased climate period. With the observed data, much of it is from the last five years which is a drier period. But, given the difficulty in replicating some of the observed data, it is hard to have data that reflects not so dry conditions.

Gaffney – Will the data be available once peer reviewed and completed? Will the recording of the meeting and presentation be available too?

Magill – Yes, we will make the presentations available. The meeting is also being recorded and there will be a meeting summary that can be shared.

Trotta – We can provide you all copies of the figures that we are presenting either as a packet or through a file share site, I know some of these can be hard to view on Zoom. We also have draft write-ups for how we developed the Interconnected Surface Water maps.

Gaffney - I am wondering about underlying "raw" data, specifically GIS data.

Rich – As there are a lot of GIS data, I think it would be better to have an offline discussion, we are happy to share the information.

Marcus Trotta then showed Santa Rosa Plain, Petaluma Valley and Sonoma Valley preliminary maps from the Nature Conservancy of groundwater dependent ecosystems, draft Steelhead streams maps and draft vegetation-related potential groundwater dependent ecosystem maps before handing over to Melissa Rohde, from the Nature Conservancy for comment, and to David Cook and Patrick Lei, both from Sonoma Water.

Melissa Rohde mentioned the map is basically a starting point and much of the map features are taken from aerial imagery, there been lots of expert review and ground truthing, maps of springs and other hydrologic features. In order to know the ecosystems are related to groundwater, it is important to look at the depth of groundwater. In most parts of the state there often isn't good data of shallow groundwater. Absence of evidence isn't evidence of absence! It is important to ensure that our groundwater data network is dense enough to pick up what the conditions are in the eco systems and to validate if they are groundwater dependent. These species are typically known to use groundwater, but the species are opportunistic and can use other sources of water, so it is important to make sure there is groundwater there.

David Cook said they wanted to find an indicator species that would represent groundwater dependent species throughout the three basins. Initially we focused on fish and amphibians and we were also looking for a solid data set. Through that process we found that steelhead are quite well distributed throughout the basins, and we had detailed data sets. Unfortunately, there wasn't one single dataset used for all three basins. For Petaluma and Sonoma Valley, we used a 2005 report from Leidy, this was supplemented with information from Sonoma Water. For Santa Rosa Plain, we had a good dataset from the Coastal Monitoring Program, along with in-house data from the Shawn Chase database. We put all the steelhead bearing streams on maps, excluded anything outside of the three basins and included any stream further downstream from a section that was identified as steelhead habitat. That is how we arrived at our process to get the steelhead layer.

Patrick Lei – We relied heavily on the Sonoma Veg Map and focused on communities with strong riparian composition such as willow and cottonwood, or species that may rely on groundwater in some parts of the year, such as oak. One limitation of maps is depth of groundwater. We probably will not include vernal pools in the final maps because we don't think there is much of a groundwater connection, but where there is, we would include it.

### Questions

Trowbridge – How are the maps of groundwater dependent ecosystems going to inform SGMA? Are we expecting the maps to change over time as groundwater management changes or are we going to monitor attributes of these communities that we would expect to change with groundwater management? It seems like what is driving the maps is development.

Trotta – The way that groundwater dependent ecosystems are written into SGMA and requirements related to them in the groundwater sustainable plan regulations that DWR has established, is related to identifying their occurrence and distribution and taking them into consideration during the development of GSP and SMC, establishing how much groundwater lowering can occur in the basin before there are impacts in the basin or how much surface depletion there is before there are impacts. I am envisioning the mapping based on our existing available data sets will be utilized by the second workgroup that would be focused on what are the minimum thresholds set for surface water depletion in the basin. Are there certain areas that should be prioritized more than others? Are there areas where there should be a focus on monitoring? Going forward, I would expect the maps to change over time as new information is developed. How does the distribution of these groundwater dependent ecosystems match up with where higher densities of groundwater pumping are occurring in the basins?

Lee – Related to that concept of previous development and how it affects this. Things about the seepage and springs around, there are lots of places in the watershed where early in the history of the area, they were found and developed where there are stock ponds in the hills now, where the original seepage would have been. Now they are characterized by ponds more than whatever vegetation we are looking for otherwise.

Lee – Another question about the Veg map, there are lots of places on the developmental property, there is spring activity under forested cover, would that be one area of data gap? I guess you can't see through the upper canopy to see the lower plants.

Lei – I agree with you, that would be one example of a data gap. We do have limitations, In the early discussion before putting the map together we talked about seepage and springs but decided to keep those out of this map.

Lee – If we want to talk about those kinds of places that are not showing up in your analyses at this point, that is where local knowledge can come in.

Trotta – Seepage and springs that may be missed by the veg mapping, could be picked up in the maps Andy Rich went through. It may not capture all of them but could give an insight. Also, maps that have been developed by USGS that include seepage and springs, that we could also incorporate.

Rohde – When you create the GDE map, it would be great to see how the Sonoma Veg data overlap with the NC dataset. It would be helpful to see which vegetation are added under the Sonoma veg database that weren't originally available in the NC dataset.

Trotta – What we see as some of the next steps is going to be integration of different data sets. We can produce various maps that highlight the differences between the maps or show where we are intersecting data. We will make sure the data is clearly shown on the next set of maps.

Sam Magill said staff would be very interested to hear if there are other existing data sources that should be included for the Groundwater Sustainability Plan, and what additional data collection is recommended for the implementation phase of the GSP.

Rogers – I have a question about the steelhead distribution maps – were those generated from records current steelhead distribution or were they taken from steelhead critical habitat maps? Some areas that probably don't have steelhead, might not have steelhead because of stream flow depletion impacts. How was that dynamic factored in the map making?

Cook – It is based on current information, doesn't account for any impact on groundwater. It was the most accurate data set we could find. Something up for discussion – how do you define what steelhead stream?

Rogers – What is the data here? What is the timeline? In more recent years, steelhead have been absent due to decrease in stream flow. Since the Leidy study was completed, Yulupa creek has dried considerably and has a significant passage barrier. I wouldn't consider it a steelhead stream currently, but it could become one again. Are we looking to restore past conditions through this or maintain existing GDEs as of a certain dateline?

Trotta – Ultimately it would be a GSA Board decision. No need to correct or address issues before GSA was enacted in 2017 – it is not a requirement of SGMA. Many GSPs have held it as a baseline in their criteria. We are aware of the baseline; it will depend on the costs and priorities of the GSA in complying with SGMA. At a minimum they would support to restore conditions to improve fisheries and other ecosystems in their plans. Whether it would be built into the criteria would be up for discussion.

Gaffney – Definitely, there is an opportunity for continued collaborative data collection and local refinement. When we developed the Sonoma Veg Map program, the intention was to create a fine scale veg map for the million-acre county that aligned with the CDFW MCV standards. There is a significant opportunity to continually refine with local data via this process, as well as through I-naturalist, stream maintenance program etc. Ag & Open Space has developed additional data sets related to future potential riparian habitat based on physical attributes and processes.

There are also relatively accurate maps for the main stem Russian (alluvial reaches) that document riparian and land use cover from 1940-1942, 1990. Combined with modeled outputs for where riparian "could" exist based on fluvial-geomorphic processes, this could contribute to this initiative one more potential gap (please forgive my ignorance of the constraints of this process): multi-benefit criteria such as agricultural use (such as rangelands) that are compatible with GW sustainability, biological diversity, etc. Since Ag & Open Space is a potential tool for protecting these areas (via conservation easements)

it would be helpful to understand how you are looking at this (or if it is outside the realm of this effort).

Rich – Regarding the comment of the main stem of the Russian River, none of the three basins covers the main stem of the Russian River so, it won't be directly useful here, but it is interesting information

Trowbridge – To piggyback on Karen Gaffney's historic data, we have been working on a historical ecology map. We wouldn't want the GSA to be beholden to restoring it, we are working on a vision for restoration and it does seem like the historical ecology would be indicative of groundwater and how groundwater used to be in the basin, so it would provide valuable baseline information about groundwater even if some of the ecology has changed.

Trotta – What is the timeframe for that work?

Dusterhoff – It is a two-part project. Part 1 is developing restored landscape vision and Part 2 is using the vision to identify several restoration concepts. The vision was completed in April; we are in the process of making some updates, but it is a public document now. Restoration plan will be done by February 2021. Here is the link for Laguna de Santa Rosa Restoration Vision:

[https://www.sfei.org/sites/default/files/biblio\\_files/Restoration%20Vision%20for%20the%20Laguna%20de%20Santa%20Rosa%20SFEI%20041520%20med%20res.pdf](https://www.sfei.org/sites/default/files/biblio_files/Restoration%20Vision%20for%20the%20Laguna%20de%20Santa%20Rosa%20SFEI%20041520%20med%20res.pdf)

Gaffney – Am I mistaken that the Ukiah reach of Russian River is not a high or medium priority basin? The middle Reach looks to be involved too.

Trotta – It is a medium priority basin and there is a GSA creating a plan for that basin in Mendocino county. We aren't directly involved in the development of that plan. The data sources you mention would most likely be of interest to that GSA, I can put you in contact with consultants working with GSA in that area.

Magill to Trotta – Should meeting participants send additional information to staff between meetings?

Trotta – Yes, that would be helpful; we will discuss offline, maybe a single point of contact or file share location would be best.

Lee – In terms of existing data sources to be included – there are local and anecdotal knowledge of data that exists out there. In terms of another data source, we at the Ecology Center, have installed 11 stream gauges in upper Sonoma creek in the last two years. Having the continuous data that can be used in an upstream and downstream fashion, is another potential data source that could be valuable and is available. Also, we recently installed a series of temperature loggers around the watershed for the dry season. In terms of additional data collection to be recommended, seeing more of the continuous stream flow data around the different watersheds beyond the USGS gauges is available, and could be valuable moving forward.

Pennington – Great work. I was thinking about other species of concern and endangered species. You chose steelhead but it does seem there are other species that are dependent on having water in the summer and into the fall, when the streams are most sensitive to groundwater depletion. I would recommend looking at species such as freshwater shrimp and where they

existed historically. Think about steelhead passed through these streams but aren't necessarily there when the groundwater dependent ecosystems are sensitive to groundwater depletion.

David Cook – We can look at other species. The reason we selected steelhead is that it encompasses species that are most sensitive in the summertime. Steelhead streams, we are really talking about juvenile steelhead and they encapsulate all the amphibians such as CA giant salamander, etc. that need perennial water. Fresh water shrimp distribution is so patchy that there are no known occurrences within the three basins. It doesn't encapsulate enough to be of value for this kind of type of analysis.

Pennington – What about the possibility of using multiple species?

David Cook – We may add additional section in the streams. In general, when you look at the basins, lots of amphibians are outside the basin.

Rohde – We also need to consider how other state and federal listed species are impacted by groundwater. Here is a document that identifies what protected status species are likely reliant on groundwater in California:

[https://groundwaterresourcehub.org/public/uploads/pdfs/Critical\\_Species\\_LookBook\\_web.pdf](https://groundwaterresourcehub.org/public/uploads/pdfs/Critical_Species_LookBook_web.pdf)

This is an effort that Rick Rogers (NOAA), Briana Seepy (DFW), Xeronimo Castaneda (Audabon), and I have put together.

### Review Meeting Action Items

Sam Magill restated the action items from the meeting:

- Data sharing – staff to discuss offline how to share additional data, meeting summary, and other meeting materials
- Discussion for staff how to share raw data
- Marcus Trotta to connect Karen Gaffney to the GSA for the Ukiah reach of the Russian River

### Next Steps and Planning for Meeting #2

*Objective: Discuss next steps for planning workgroup meeting #2.*

Marcus Trotta said he will look at file share, take input received today and make any refinements and revisions to maps. He will develop a GIS process to integrate surface water maps to species and veg maps with the goal of having the information and those maps for a second meeting.

Then we can determine if we need a third meeting or not. Would like a discussion of the importance of understanding their habitat needs including critical time periods. We are probably looking at the second or third week of August for the next meeting for this group. Sam Magill will reach out to you.

We proposed the other workgroup would meet on the tail end of this one. We will look at the overall schedule, it may make sense to have the two groups overlap a little to do some work in tandem with this workgroup.

Marcus Trotta and Andy Rich thanked the group for participating and said the comments were very helpful.

### Attendees:

Andres Ticlavilca, National Marine Fisheries Service  
Karen Gaffney, Ag & Open Space Preservation District  
Melissa Rohde, The Nature Conservancy  
Rick Rogers, National Marine Fisheries Service  
Robert Pennington, Permit Sonoma  
Scott Dusterhoff, San Francisco Estuary Institute  
Steve Lee, Sonoma Ecology Center  
Wendy Trowbridge, Santa Rosa de Laguna Foundation

### Staff/Presenters

Marcus Trotta, Sonoma Water  
Andy Rich, Sonoma Water  
David Cook, Sonoma Water  
Patrick Lei, Sonoma Water  
David Manning, Sonoma Water  
Ann DuBay, Sonoma Water  
Simone Peters, Sonoma Water (recorder of meeting notes)

### Facilitator

Sam Magill, Sacramento State University – Consensus and Collaboration Program