



Groundwater Trading: Considerations for the Environment

Presentation to the California Water Commission

Sarah Heard, Director, MarketLab | September 14, 2021

90%+ of the Central Valley's GDEs have disappeared

Remaining hotspots are essential + host threatened / endangered species



Where groundwater markets arise under SGMA, careful design is essential to ensure they protect nature, disadvantaged communities + other important resources



Carefully designed markets have several key elements

Sound GSP

Open, public process

Mitigation of 3rd party impacts

Protections against market power

Accurate monitoring of pumping

Market testing + adaptation



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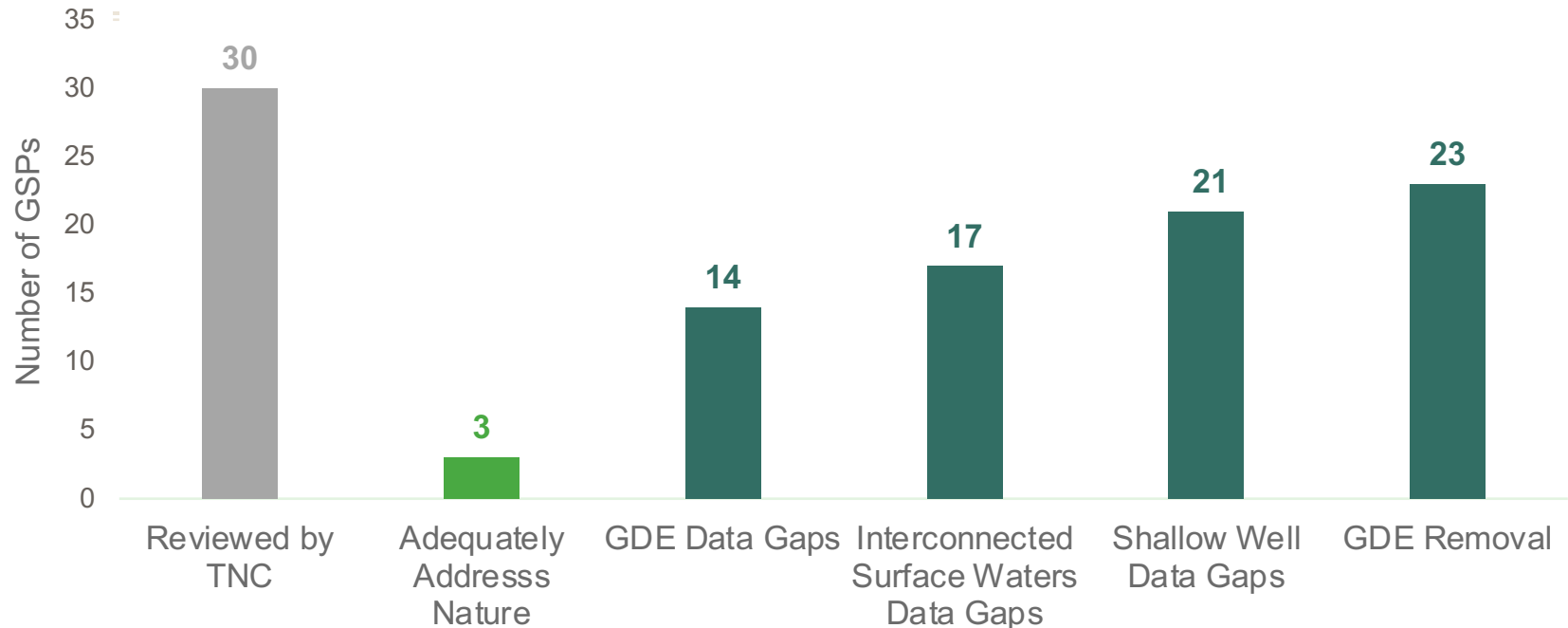
GSPs should provide
adequate water for nature

Buying water should not be
essential for their survival



GSPs must identify environmental beneficial users

GSPs in critical basins removed 56% (76K acres) of GDEs

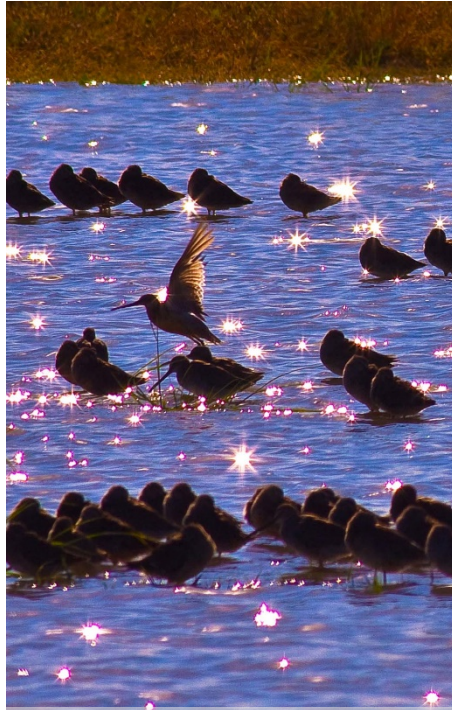


A fair, functioning market
requires an open process

Environmental stakeholders should
be included in market design



Federal Wetlands Require Special Consideration



Atwell Island | BLM



Pixley NWR | USFWS



Merced NWR |
USFWS



Kern wetlands | NRCS

Trading can concentrate
pumping + impact sensitive
resources

Special Management Areas
are a tool to mitigate this risk

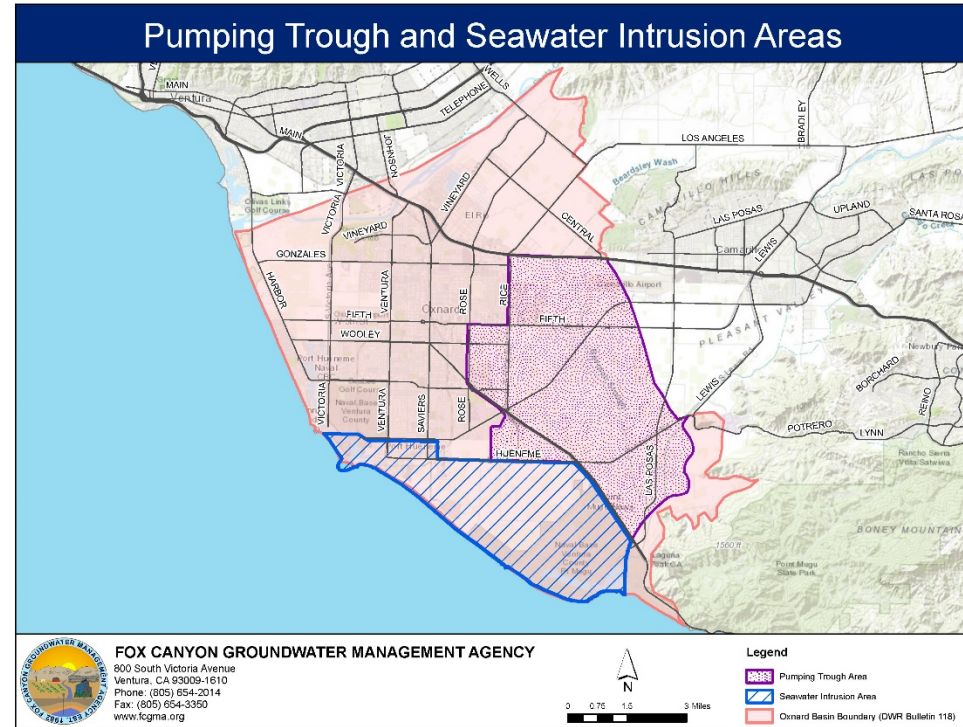


Example: Fox Canyon Groundwater Market

2 SMAs delineated in GSP + included in the market

Directional trading rules: no net pumping within SMAs

198 AF transferred out of pumping trough + seawater intrusion SMAs in 1st year



Example: Hypothetical Groundwater Market

GDEs not identified in GSP



Environmental stakeholders excluded



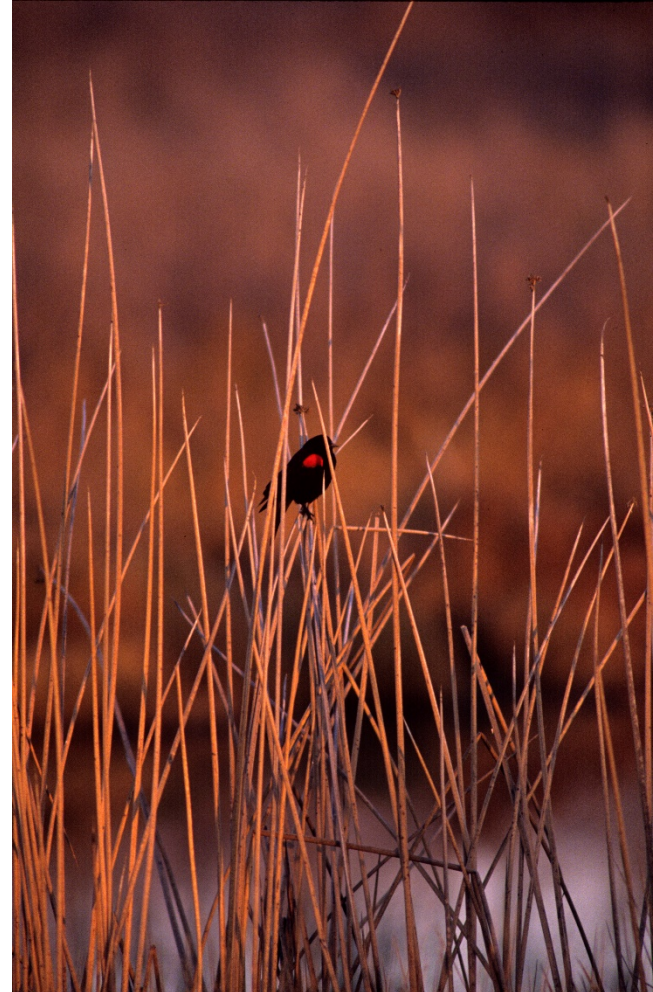
No SMAs / trading safeguards created



Concentrated pumping impacts GDEs



Stakeholder must buy water / are shut out of the market



The first SGMA groundwater market is trading: The importance of good design and the risks of getting it wrong

Groundwater markets are a promising tool for basins implementing SGMA, but they are complex, and good design is essential.

Sarah Heard, Director, MarketLab, The Nature Conservancy

Matthew Fienup, Executive Director, Center for Economic Research and Forecasting, and Assistant Professor, California Lutheran University

E. J. Remson, Senior Project Director, California Water Program, The Nature Conservancy

Online: <https://doi.org/10.3733/ca.2021a0010>

More detail on well-designed groundwater markets in Cal Ag

<http://calag.ucanr.edu/archive/?type=pdf&article=ca.2021a0010>

A groundwater market, which caps total pumping within one or more basins, allocates portions of the total to individual users and allows users to buy and sell groundwater under the total cap, is a promising tool for basins implementing California's Sustainable Groundwater Management Act (SGMA). While the benefits of a cap-and-trade system for both groundwater users and regulators are potentially very large, so too are the risks. An electronic bulletin board that introduces buyers and sellers, like craiglist.org, is not a market. Nor is a sophisticated financial application that matches participants and executes financial transactions. A water market is a complex interaction of individuals and institutions — the product of a large number of people, structures, operational mechanisms and rules. Without careful design, a water market can do harm.

Creating a functioning market is not easy. There is no off-the-shelf solution, and there is a lot to get right. The most important — and difficult — elements to get right are the rules and structure, which must be tailored to local conditions. Capping and monitoring pumping, generating buy-in from diverse stakeholders and guarding against cheating and adverse impacts, such as the drying of shallow drinking water wells or of groundwater-dependent ecosystems (GDEs), are also essential. Even with careful design, markets can fall short or cause adverse impacts. And, as the new reality of pumping restrictions sets in, powerful pumpers, largely unregulated before SGMA, will attempt to bend market rules in their favor.

We have lived this experience. Since 2016, we have been in the trenches, developing the Fox Canyon groundwater market for three coastal basins, an area known as Fox Canyon, in Ventura County. The

The Fox Canyon groundwater market operates in a large area of Ventura County that includes over 55,000 acres of high-value agricultural land and 500 active agricultural wells. A primary driver of the market is the scarcity of water.

