

# **DRAFTING SGMA GROUNDWATER PLANS WITH FISHERIES IN MIND**

2019 WLS Panel on Interconnected Groundwater & Surface Water



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# AUGUST 2018 RELEASE OF CUEL GUIDEBOOK ON SGMA & FISHERIES



# A HIDDEN CONNECTION – GROUNDWATER PUMPING, SURFACE FLOWS & FISHERIES



## *The Groundwater-Fisheries Connection*

- › Historically, Groundwater Extractions in California Have **Not** Been Regulated to Take Into Account **Adverse Impacts on Interconnected Surface Flows**
- › Yet Many Rivers in California that Support Fisheries Such as Salmon and Trout are **Hydrologically Dependent on Tributary Groundwater to Maintain Instream Flow**
- › When There is Intensive Pumping of Tributary Groundwater the Result Can Be Reductions in Instream Flow and **Damage to Fisheries**

# 'BENEFICIAL USES' OF WATER IN CALIFORNIA



SGMA Statute: The objective of SGMA is to avoid six specified “undesirable results” including (No. 6) the “**depletion of interconnected surface waters** that have significant and unreasonable impacts on **beneficial uses** of surface waters”

## State Water Board Bulletin No. 116

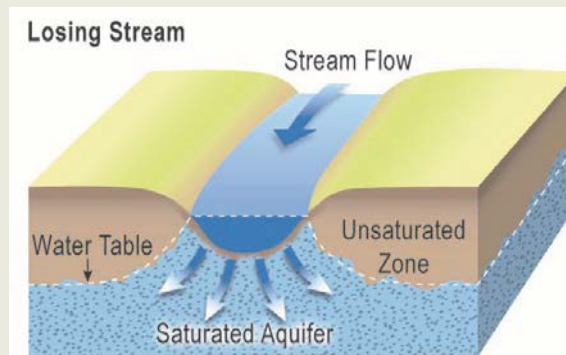
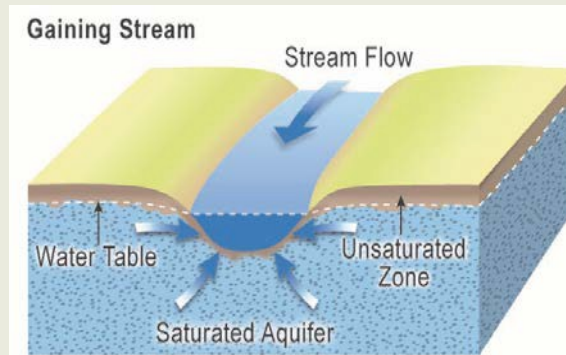
Designated “**Beneficial Uses**” of Water Include:

- › Supporting “cold water **ecosystems** including but not limited to preservation or enhancement of...**fish**”
- › Supporting “high quality **aquatic habitats** suitable for reproduction and early development of **fish**”
- › Supporting “**habitats necessary** for migration or other temporary activities by aquatic organisms, such as **anadromous fish**”

# PICTURING THE CONNECTION



## *Aquifers, Gaining Streams/Losing Streams and Surface Water Flows for Fisheries*

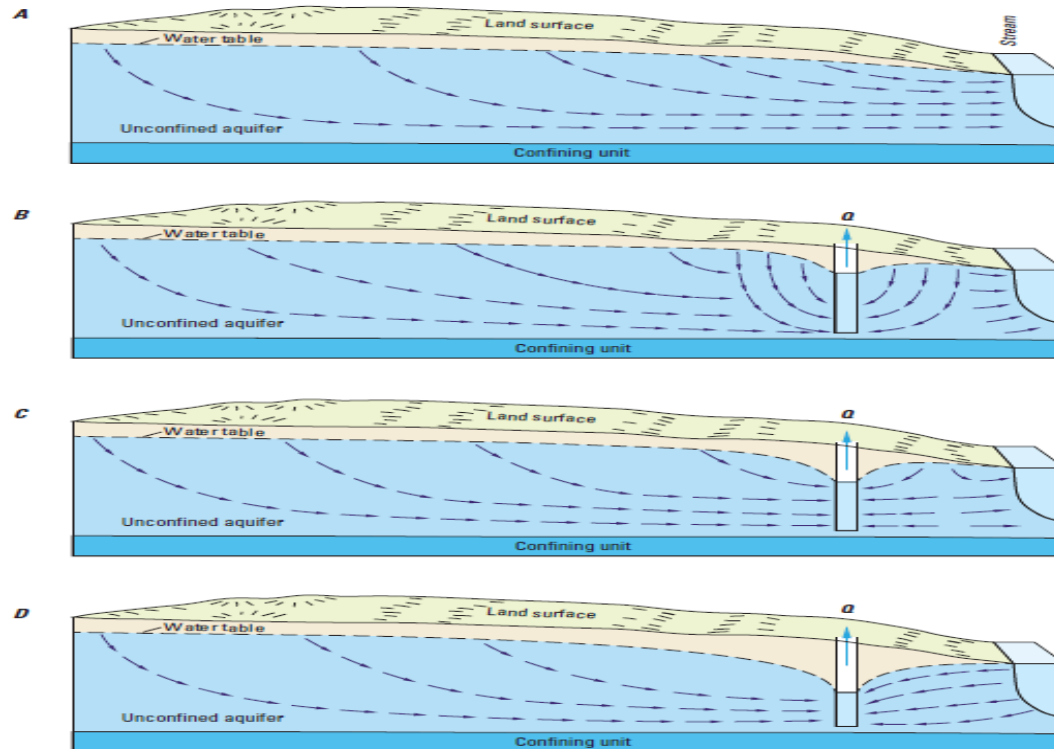


# PICTURING THE CONNECTION



## 'Cones of Depression' and the Lateral Location of Groundwater Wells

12 Streamflow Depletion by Wells—Understanding and Managing the Effects of Groundwater Pumping on Streamflow



# PICTURING THE CONNECTION



## Key Habitat Parameters for Fisheries Related to Groundwater Pumping's Effect on Interconnected Surface Water Flows

- › **Water Temperature** for Coldwater Fisheries (Salmon/Steelhead)
- › Acute **Seasonal Instream Flow Needs of Fisheries** at Times of Year When Juvenile Salmon/Steelhead Migrate Downstream
- › Maintaining **Connectivity** Between Mainstem Rivers and Tributary Creeks That Serve as **Coldwater Refuges** for Salmon/Steelhead During Summer/Early Fall

# FRAMING THE CONNECTION: MODELING & WATER BUDGETS



## *SGMA Regulations and Guidance Related to Fisheries*

- › SGMA Regulation 354.16 provides GSP **hydrogeologic conceptual models must** include “identification of **interconnected surface water systems** and an estimate of the **quantity** and **timing** of **depletions** of those systems”
- › *SGMA Best Management Practices for Modeling* (December 2016 Guide by California Department of Water Resources): “The **water budget shall quantify... inflow** to the groundwater systems by sources type, including...**surface water systems...and shall quantify...outflows** from the groundwater system, including...groundwater discharge **into surface water sources**”



## FRAMING THE CONNECTION: MINIMUM THRESHOLDS & MONITORING



### *SGMA Regulations and Guidance Related to Fisheries*

- › SGMA Regulation 354.34 and 354.28 provides that GSPs must provide “**minimum thresholds**” for “the “**rate or volume of surface water depletions** caused by groundwater use that has adverse impacts on **beneficial uses** of the surface water” and shall be supported the “**location, quantity and timing of depletions** of surface water”
- › *SGMA Best Management Practices on Monitoring Networks* (December 2016 Publication by California Department of Water Resources) provides that GSP monitoring networks for depletions of interconnected surface water must characterize “flow conditions indicating surface water discharge...identifying the **approximate date and location where ephemeral or intermittent streams and rivers cease to flow...and temporal changes** in conditions due to variations in stream discharge and regional groundwater extractions”

# SOFTWARE/MODELS TO ASSESS IMPACTS OF GROUNDWATER PUMPING ON FISHERIES IN GSPs



- › Software and models are now available to **quantitatively** evaluate the impact of groundwater pumping on interconnected surface water flows (presented in **United States Geological Survey Circular 1376** titled *Streamflow Depletion by Wells – Understanding and Managing the Effects of Groundwater Pumping on Streamflow*, 2012 publication)
- › Software and models are now available to evaluate the impacts of reduced surface water flows on fisheries and fisheries habitat, such as **SALMOD** (software developed by United States Geological Survey in 1994) and the **IOS Model** (Interactive Object-Oriented Simulation Model)
- › The availability of such software and models make it difficult for GSAs to credibly claim that it is **not feasible** or is **too speculative** to analyze the impacts of groundwater pumping on fisheries in SGMA GSPs

# CONCLUSION – FISHERIES UNDER SGMA



## *The Five Key Take-Aways in the August 2018 CUEL SGMA Fisheries Guidebook*

- › (1) **Temporal Focus** is on Times When Fisheries Need Instream Flow, Not on the Long-Term Average Maintenance of Groundwater Table
- › (2) **Lateral Location** of Groundwater Wells Can Affect Impacts on Nearby Surface Water Flows and Fisheries (**Cones of Depression**)
- › (3) Fisheries May Be Impacted by How Groundwater-Surface Water Interactions Affect Instream Surface Water **Temperatures**
- › (4) **Absence of Complete Data** is Not a Proper Basis for SGMA Groundwater Plans to Omit Provisions Addressing the Impacts of Groundwater Pumping on Surface Flows and Fisheries (**Best Science Available**)
- › (5) In Approving and Implementing SGMA Groundwater Plans, GSAs Are Subject to the Requirements of California **Public Trust Law** As Well As SGMA

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