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Potential Environmental Beneficial Users of Surface Water in Groundwater Basins

We recommend these freshwater species lists as a starting point for addressing environmental beneficial users of surface water, as required under the Sustainable Groundwater Management Act (SGMA).

SGMA seeks to achieve sustainability, which is defined as the absence of several undesirable results, including "depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial users of surface water" (Water Code §10721).

As a first step in addressing when depletions might have an adverse impact, The Nature Conservancy recommends identifying the beneficial users of surface water, which include environmental users. This is a critical step, as it is impossible to define "significant and unreasonable adverse impacts" without knowing what is being impacted. To make this easy, we are providing this letter and the accompanying documents as the best available science on the freshwater species within the boundary of each groundwater subbasin. Our hope is that this information will help groundwater sustainability agencies (GSAs) and environmental stakeholders better evaluate the impacts of groundwater management on environmental beneficial users of surface water.

To help the GSA take this first step, we are providing the following references:

- **Freshwater Species List.** The excel file named for each groundwater subbasin is a spreadsheet that includes a list of freshwater species found within the groundwater subbasin. The list includes fish, amphibians, reptiles, birds, plants, macroinvertebrates and mammals, and provides both the scientific (column C) and common (column D) names for each.

  The freshwater species list includes the conservation status for each species, indicating whether federal (column E) and/or state (column F) endangered species laws may apply to management of the species. The list also includes the sources of the data. Historical observations (pre-1980) and observations of extirpated species were excluded from the analysis.

  To produce the freshwater species list, we used ArcGIS to select features within the California Freshwater Species Database version 2.0.9 within the groundwater subbasin's boundary. This database contains information on ~4,000 vertebrates, macroinvertebrates and vascular plants that depend on fresh water for at least one stage of their life cycle. The spatial database contains locality observations and/or distribution information

from ~400 data sources. The database is housed in the California Department of Fish and Wildlife's BIOS as well as on The Nature Conservancy's science website.

Please contact us if you would like the freshwater species list for a GSA.

- **Metadata (Data Sources & Field/Column definitions).** This document provides a definition for the column headings in the excel freshwater species list and describes the data sources for each species in the freshwater species list. The document provides the name of each source, citation and a link to the data source, if available. The title of this file is "Freshwater_Species_Lists_MetaData_Data_Sources.xls".

- **PLoSONE Publication.** As evidence that the California Freshwater Species Database is the best available science, we are attaching a peer-reviewed publication, which was the basis of the California Freshwater Species Database. The paper, which is attached as "Freshwater_PLoSONE", appeared in PLoSONE, an online scientific journal. This paper describes the methods used to compile the freshwater species database, and patterns of species richness (the density and diversity of species), endemism (species found only in a particular region) and vulnerability of freshwater species in California.

As next steps, we suggest three actions. First, please share these materials with the GSA, the GSA consultants and environmental stakeholders, and use these materials as a starting point to identify environmental beneficial users of surface water. Second, contact staff at the Department of Fish and Wildlife (DFW), United States Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Services (NMFS) to obtain their input on the groundwater and surface water needs of the organisms on the GSA's freshwater species list. Third, please visit the Groundwater Resource Hub, when we will be releasing a Freshwater Species Guidebook later in 2019, which is under development by a collaboration of agencies and nonprofits, including TNC, CDFW, USFWS and NMFS. The Guidebook will provide a summary of information on each individual freshwater species, which should be useful in determining surface water needs and the habitat conditions needed to sustain these important resources.

Given all that must be accomplished to meet SGMA deadlines, The Nature Conservancy is working hard to provide resources to make addressing environmental beneficial users of groundwater and surface water as simple and inexpensive as possible. With this freshwater species list tailored to the GSA, as

well as the Indicators of Groundwater Dependent Ecosystems Database (also known by the Department of Water Resources as the Natural Communities Dataset), we hope to make the first, critical step in managing groundwater resources, which includes identifying environmental users, an easy SGMA requirement to satisfy.

If you have any questions about these materials, please contact Sandi Matsumoto or Jeanette Howard.

Sincerely,

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The Nature Conservancy (TNC) is a science-based, nonprofit organization with a mission to conserve the lands and waters on which all life depends. Like humans, plants and animals often rely on groundwater for survival, which is why TNC helped develop, and is now helping to implement, SGMA. Please visit the Groundwater Resource Hub, an online resource intended to help make it easier and cheaper to address environmental requirements under SGMA.

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