

CASE STUDY

Colusa County | Managed Aquifer Recharge: benefitting aquifers, farmers, and migratory birds.



Summary: In partnership with growers and the Colusa Groundwater Authority (CGA), The Nature Conservancy (TNC) is implementing a pilot multiple-benefit managed aquifer recharge (MAR) program on farmland in California's Central Valley, Colusa County. This program will benefit local groundwater users by replenishing critical domestic and agricultural groundwater supplies in a Severely Disadvantaged Community (SDAC). Participating farmers will benefit economically through incentive payments, and migratory shorebirds will benefit through the creation of critical winter habitat on farms through our specific field and water depth specifications. MAR sites will be selected where and when it is appropriate and cost-effective to do so based on farming practices, soil suitability, water availability, basin water balances, and migratory/shorebird habitat requirements. The relevance and success of this program for Groundwater Sustainability Agencies (GSAs), Severely Disadvantaged Communities (SDACs), and Groundwater Sustainability Plans (GSPs) will require all of these stakeholders and project participants to collaborate on its design. Thus, TNC will engage growers, water managers, and other stakeholders in a variety of formal and informal ways to ensure that this program will meet the needs of all parties involved in GSP development. This program serves as a model for other GSAs and stakeholders seeking to deliver multiple benefits through on-farm recharge in the Central Valley where such a program is appropriate.

Program:

TNC's BirdReturns program works with Central Valley farmers to create temporary "pop-up" wetlands for migratory birds on Central Valley farmland. TNC uses computer models and big data to track conditions in real time, and determine when, where and how much habitat is needed as conditions change (often dramatically) from year to year. Since 2014, more than 100 farmers have created over 50,000 acres of wetland habitat through BirdReturns.



For many of California's water management challenges, the variable nature of ecological and socio-economic conditions can dramatically alter the availability and cost of water. A dynamic solution like BirdReturns, in which investment and management decisions are intentionally flexible in order to better match the

changing availability of water and land for habitat and other benefits, could greatly improve conservation outcomes and water management.

In this multi-benefit replenishment program, TNC is building on the success of the Migratory Bird Conservation Partnership in designing and implementing wildlife-friendly agricultural practices. The Partnership – a collaboration of Audubon California, Point Blue Conservation Science, and the Nature Conservancy – is engaging with GSAs throughout the Central Valley to ensure that historic, current, and future groundwater needs of managed wetlands are reflected in SGMA implementation. Partnership expertise in determining where and how much habitat is needed for migratory shorebirds will be combined with UC Davis's Soil and Agricultural Groundwater Banking Index ([SAGBI](#)) to target farm fields that could provide the greatest habitat and recharge benefits. The final benefit to be derived from this project will be its focus on improving groundwater supplies in a [Severely Disadvantaged Community](#).

In consultation with CGA, TNC will seek out growers to enroll in this multi-benefit program and will pay them a set rate (e.g., per acre) for program participation depending upon duration of flooding, location, and species targeted, among other factors. Program enrollees will be asked to flood their fields, approximately 4 inches deep, at specific times during the winter migration season to provide targeted migratory shorebird habitat in row crop fields. The field flooding will use existing surface water delivery infrastructure thereby creating pop-up recharge facilities with minimal infrastructure and operational changes. TNC will monitor the groundwater infiltration resulting from the field flooding to generate an estimate of how much water is infiltrating the ground in the enrolled fields which will be critical for the GSA when calculating its water budget. Lastly, TNC will monitor bird usage, such as which species and how many of each species are using the flooded fields.

TNC will work with CGA to include the program protocols in their GSP in order for the CGA to be able to carry out the program on their own in the future. This effort will include describing program protocols for grower enrollment, determining compensation rates for enrollment, how to identify suitable fields for flooding and the timing of flooding, and how to monitor both bird usage and water infiltration rates.

Status: Program implementation will begin fall 2018 and will be completed in spring 2020.

Additional Resources:

Migratory Bird Conservation Partnership: <http://www.camigratorybirds.org/>

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