

Staggering water drawdown in winter-flooded rice increases habitat for waterbirds

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California's Central Valley has lost over 90% of its natural wetlands. However, this area still supports almost five million waterfowl and half a million shorebirds each year. Currently over 50% of waterbird habitat in the Central Valley is provided by flooded agricultural land, primarily rice (*Oryza sativa*).

Habitat for migrating and wintering waterbirds is dynamic, decreasing in early February as post-harvest flooded rice fields are drained to prepare for the next crop. This change in flooding results in habitat limitation for waterbirds. Recently, farmers have implemented a management practice, supported by the Natural Resources Conservation Service (NRCS), called 'variable drawdown' which delays the removal of water from rice fields by one to three weeks to extend the availability of flooded habitat later into February and March. We studied waterbird response to variable drawdown in 2012 and 2013 at twenty rice farms throughout the northern Central Valley.

The staggered timing of drawdown created a mosaic of water depths throughout February and the first half of March. This mosaic provides habitat for a diversity of waterbirds, which prefer different water depths depending on the species. Overall, the 3-week delay in drawdown supported the most waterbirds when compared to shorter delays. Dabbling ducks were most abundant in early February while shorebirds and long-legged wading birds peaked in late February and early March.

Despite the presence of appropriate water depths for shorebirds across variable drawdown fields during the entire study period, shorebird densities were highest in late February and early March when the 3-week-delayed drawdown was providing the majority of flooded rice habitat in the northern Central Valley. This suggests that shorebirds concentrated in our study fields due to decreasing availability of shallow water habitat elsewhere.

The practice of variable drawdown successfully extended the availability of waterbird habitat provided by post-harvest flooded rice fields later into winter.

Main Points

Variable drawdown created a mosaic of water depths and extended the duration of habitat availability across each farm.

Delaying the drawdown of rice fields in winter by three weeks resulted in the greatest response by waterbirds.

This practice, part of NRCS programs for six years, has become a viable strategy in ricelands for farmers who flood their fields.

Sesser, KA, Iglecia M, Reiter ME, Strum KM, Hickey CM, Kelsey R, Skalos DA. 2018. [Waterbird response to variable-timing of drawdown in rice fields after winter-flooding](#). PLoS ONE 13(10): e0204800.