

Can we reduce greenhouse gas emissions from rice and still maintain waterbird habitat?

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There are many benefits of agricultural landscapes for wildlife. In California, some rice agriculture practices are known to benefit both farmers and wildlife. Flooding after harvest, in particular, increases the decomposition of rice stubble while providing habitat for over 50 species of waterbirds. Because California has lost over 90% of its historic wetlands, flooded rice is now critical wildlife habitat, providing 85% of the total flooded habitat in the Sacramento Valley during winter. Rice is also flooded during planting, providing habitat for spring migrants and locally breeding birds. Rice production, however, produces greenhouse gases (GHG) as organic matter decomposes in flooded conditions, and GHG emissions are the primary driver of climate change.

Recent efforts have identified several practices that may reduce GHG emissions associated with rice production, including reduced winter flooding, removal of rice straw via baling, and drill seeding to plant the rice. Ideally, any

practices adopted to reduce GHG emissions will not negatively impact bird populations.

During the winters of 2011-2013 we examined the effects of reduced winter flooding and baling on waterbird use. During spring 2012 and 2013 we compared waterbird use between drill-seeded and the more traditional flooded fly-on seeded fields.

We found higher densities of ducks and shorebirds in flooded fields than in non-flooded fields. We also found more birds in non-baled flooded fields than in baled flooded fields, although the difference in use between these practices was small for ducks. We did not find a difference between the combinations of baled and flooded practices for geese. We found no difference in average density of ducks and shorebirds in drill-seeded versus fly-on seeded fields, although we recognize that there may be impacts to nesting birds from drill seeding that were not studied.

Our results can be used to assess the trade-offs between various GHG emissions reduction approaches and their effects on waterbirds.

Main Points

Baling of rice straw reduces use of fields by shorebirds and ducks.

Flooding rice fields after harvest and during planting is important for use by ducks and shorebirds.

Drill-seeded fields and fly-on seeded fields have similar numbers of waterbirds.

While reducing GHGs is necessary, doing so in an area of critical importance for wildlife should be done with caution.

K.A. Sesser, M.E. Reiter, D.A. Skalos, K.M. Strum, C.M. Hickey. 2016. [Waterbird response to management practices in rice fields intended to reduce greenhouse gas emissions](#). *Biological Conservation* 197: 69-79.