

Waterbird response to practices that may reduce greenhouse gas emissions from rice fields

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There are many benefits of agricultural landscapes for wildlife. In California, some practices of rice agriculture clearly benefit both farmers and wildlife. Flooding, 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 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 flooding, however, contributes to greenhouse gas (GHG) emissions, which are the primary driver of global climate change.

Recent efforts to develop practices that reduce GHG emissions within rice production identified several approaches that may be effective, 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 and food availability. During spring 2012 and 2013 we compared waterbird use between drill-seeded and the more traditional fly-on seeded fields.

We found higher densities of dabbling ducks and shorebirds in flooded fields than non-flooded fields. We also found higher use in non-baled flooded fields than 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 also found that food availability (waste rice) was lower in fields after harvest when the straw was baled and removed compared to when it was left in the field.

We found no difference in average density of dabbling ducks and shorebirds in drill-seeded vs. fly-on seeded fields, although we recognize that there are potential impacts to nesting birds from drill seeding that we have not yet studied.

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

Main Points

Baling of rice straw reduces use of fields by shorebirds and dabbling ducks and provides fewer food resources.

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

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

K. Sesser, M. Reiter, D. Skalos, K. Strum, C. Hickey. 2014. Waterbird response to practices aimed at reducing greenhouse gas emissions from rice fields in the Sacramento Valley. Unpublished report to Environmental Defense Fund.