

**Final Report by Ducks Unlimited**

**Title: Tracking landscape change in the Central Valley: Developing critical capability, strategies, and data to guide conservation and management of birds and their habitats.**

**To:**

**California Landscape Conservation Cooperative**

**U. S. Fish and Wildlife Service**

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**From:**

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**Partners:**

Ducks Unlimited Inc., Western Regional Office (DU)

U.S. Geological Survey, Western Ecological Research Center (USGS)

Central Valley Joint Venture (CVJV)

## Introduction

In addition to working with the USGS Western Ecological Research Center team led by Joe Fleskes on defining the feasibility and strategies for tracking a variety of key avian habitats in the Central Valley. Ducks Unlimited focused on mapping Central Valley rice habitats that provide large bioenergetic inputs to overwintering waterfowl and shorebirds in the region. The first year of the project characterized rice fields and their winter-flooded state in the Sacramento Valley. This report summarizes our findings and reviews our future plans to quantify foraging habitats in the Central Valley.

## Rice Mapping

Rice acreage in the Sacramento Valley has changed significantly in the past three decades with a high near 600,000 acres and a low near 300,000 acres. This change in acreage coupled with changing post-harvest crop management techniques has substantially affected the available habitat to migratory birds. The Central Valley Joint Venture 2006 Implementation Plan used the assumption that over 480,000 acres of rice is grown in the Sacramento Valley (CVJV, 2006). These numbers were based on a relatively stable rice acreage base grown in the late 1990's in the region. Over the past decade, the rice acreage has increased substantially with 2009 being one of the peak rice years in the last three decades as shown in Figure 1.

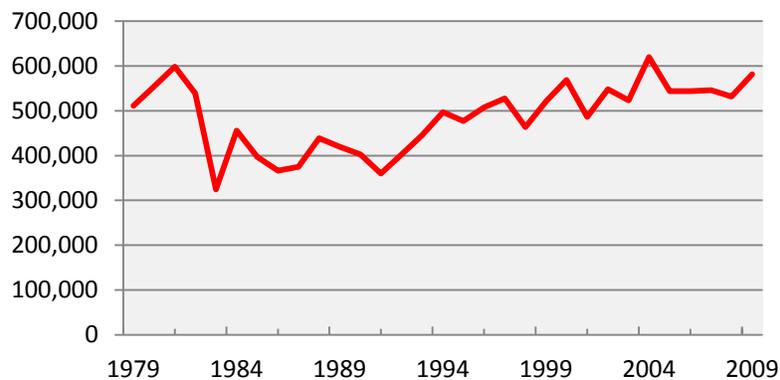


Figure 1. Rice acreage in the past 30 years, USDA

This project helped fund the completion of the 2009 rice mapping layer, the most accurate effort to date to map the spatial extent of planted rice. This effort involved classifying the flooded rice fields in multiple LANDSAT scenes during the spring season and then using a combination of existing Common Land Unit field polygons from USDA and additional heads-up digitizing of new fields to yield accurate field boundaries that cut out farm roads and other water bodies to accurately depict individual fields. The mapped summary acreages were compared to the reported USDA figures for 2009. The overall acreage difference between the USDA reported acres and the mapped acres was 1% with individual county-level differences within 5%. Placer County was an exception where the mapping effort reported 8% more rice than the USDA reported acres.

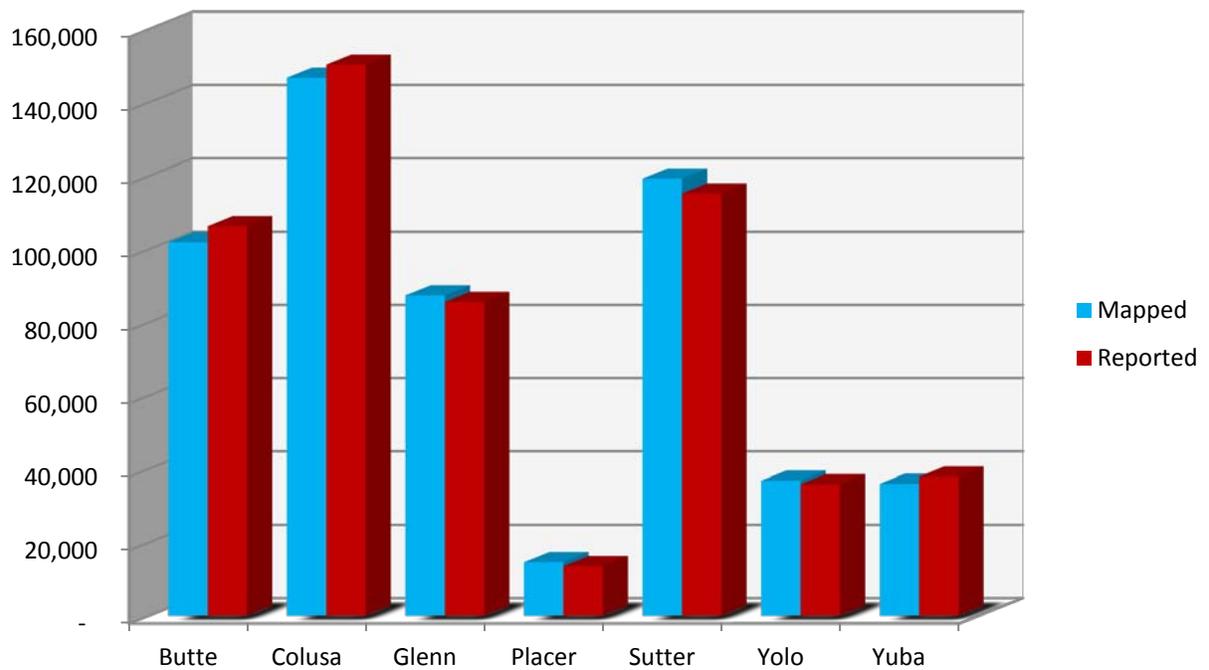


Figure 2. Comparison of 2009 Mapped Rice Acres to USDA Reported Rice Acres

The mapped ricelands were summarized in a research poster and the GIS data layers are available upon request from the Central Valley Joint Venture. This information will be used by the joint venture as they update their bioenergetic models and habitat objectives. In addition, this layer can be used in water modeling in the Sacramento Valley and help contribute to the understanding of how resilient or vulnerable rice areas are to issues of water availability and potential consequences of climate change.

County	2009		
	Mapped	Reported*	Difference
Butte	102,004	106,400	-4%
Colusa	146,775	150,400	-2%
Glenn	87,948	85,700	+3%
Placer	14,667	13,600	+8%
Sacramento	3,537	Unreported	
Sutter	121,433	115,300	+5%
Tehama	1,308	Unreported	
Yolo	36,743	35,900	+2%
Yuba	36,031	38,000	-5%
Total	550,446	545,300	+1%

Table 1. Percent differences of mapped versus USDA reported rice acreage by county

### Rice Winter-Flooding

In many of the basins of the Sacramento Valley rice provides the majority of the energetic needs of waterfowl in the winter (CVJV, 2006). This food resource is available to dabbling ducks and other waterbirds when it is flooded in the fall, winter or spring. This project mapped the managed-flooding of rice fields by growers in December of 2009. This work showed that different parts of the valley have large differences in the percentage of rice fields that are flooded for winter decomposition. In Figure 4 the difference by county are shown with Yuba County having the highest percentage of rice flooding and Placer County with the lowest percentage.

### Wetland Mapping

At the close of the first year of this study, work began on the mapping of managed wetland resources throughout the Central Valley. In this first stage, LANDSAT TM images were selected for the peak of the winter season and for the brood rearing time of late May or June. The second year of this study was not funded by the LCC. Future efforts will focus on securing funding to continue to characterize the available managed wetlands in the select satellite images.

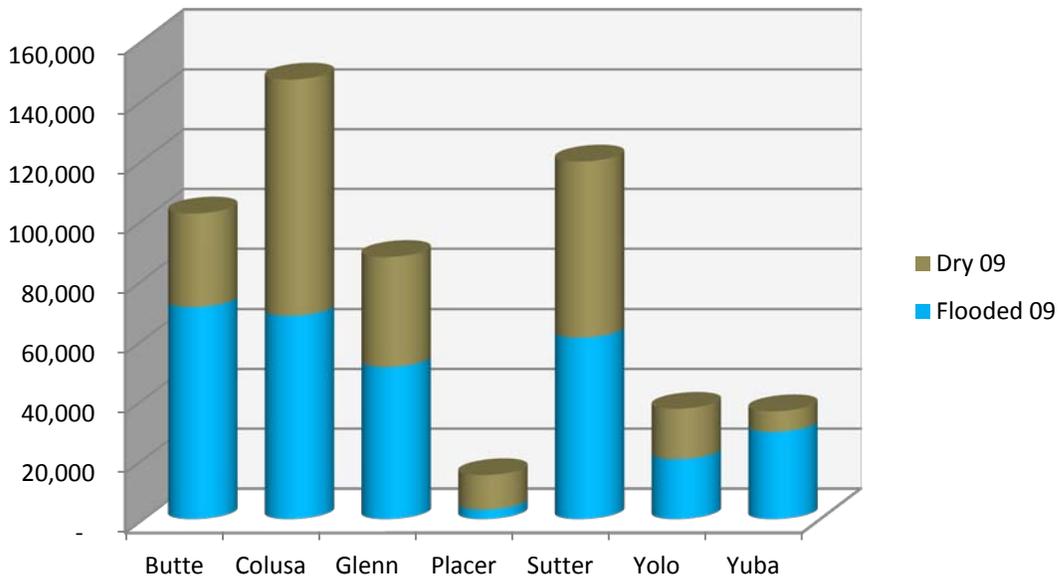


Figure 3. Winter-flooded rice by county in the Sacramento Valley, 2009

## References

Central Valley Joint Venture, 2006. Central Valley Joint Venture Implementation Plan – Conserving Bird Habitat. U.S. Fish and Wildlife Service, Sacramento, CA.

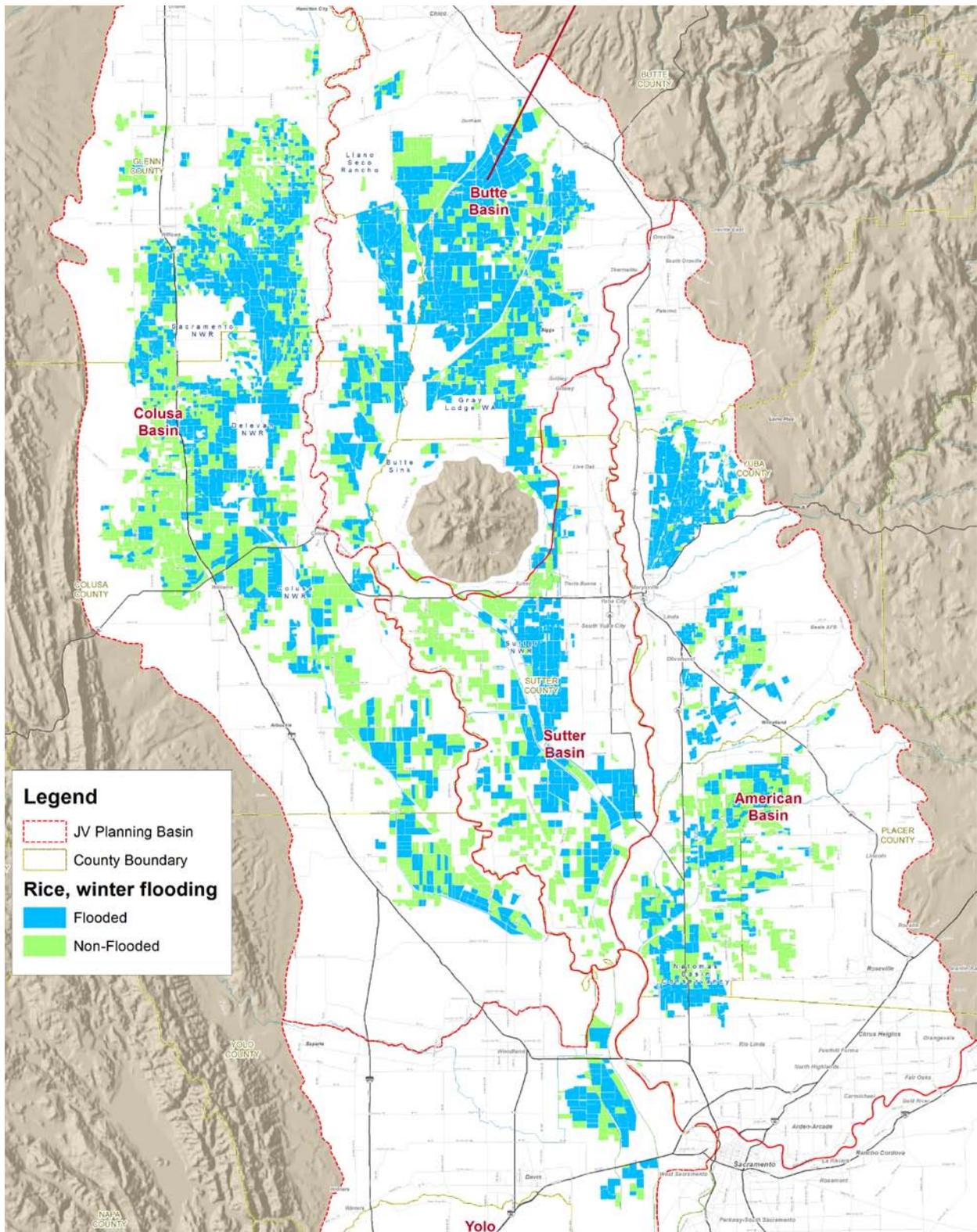


Figure 4. Map of rice fields and winter-flooding in the Sacramento Valley, 2009