WATERBIRD HABITAT ENHANCEMENT PROGRAM

BIRD-FRIENDLY FARMING IN CALIFORNIA RICE FIELDS

A Model of Collaboration Benefitting Birds and People

PREPARED FOR

California Rice
California Rice Commission
www.calrice.org
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The United States Department of Agriculture’s Natural Resources Conservation Service (NRCS) created the Waterbird Habitat Enhancement Program (WHEP), which provided $10 million of federal Farm Bill funds to enhance habitat on 100,000 acres of California rice lands. This program helps to sustain production agriculture in the Central Valley while simultaneously providing wildlife with surrogate wetland habitat to help offset substantial loss of wetland habitat over the past 150 years. WHEP has proven to be a high-impact investment of Farm Bill funding and has become a model for enhancing waterbird habitat in California’s agricultural landscape.

This program emerged from a cooperative effort between the NRCS, California Rice Commission, rice growers, Audubon California, Point Blue Conservation Science and The Nature Conservancy to find ways to both grow rice and improve the habitat for birds. Collaborative research that documented the benefits of on-farm management for birds led to the adoption of on-farm conservation management practices included in WHEP.

Innovative and collaborative efforts, such as WHEP, to meet pressing financial and conservation challenges need continued investment for long-term benefit to farmers, birds and our environment. This report assesses WHEP’s outcomes and provides an overview of the management practices developed and installed as part of this unique program.
Sacramento Valley Ricelands are Home to Farms and Wildlife

HOME TO MILLIONS
To millions of migratory birds, the Central Valley of California is a lynchpin of the Pacific Flyway, a crucial place to rest and refuel during annual journeys from, for example, Alaska to South America. To farmers, it is among the most fertile land in the nation, the home of their families for generations, and the origin of billions of dollars in agricultural products each year. To millions of Californians, it is a source of water, food, and recreation.

The migratory ducks, geese, shorebirds and other species that depend on California’s rich wetlands have lost more than 90 percent of their habitat in the Central Valley. What remains is highly degraded and fragmented. The result has been significant population declines for many waterbirds. Birds are sentinels of nature’s health and they reveal how some environmental changes can threaten us all – wildlife and humans alike.

CRUCIAL CONNECTION
Today, the connection between agricultural and wetland habitats in the Central Valley is crucial to helping waterbirds survive. Ricelands can be an integral part of the solution to supplement lost wetlands, especially when managed with birds in mind. In California, the current annual cultivation of some 550,000 acres of rice supports nearly 230 wildlife species including 50 species of waterbirds. In fact, the ricelands and wetlands of the Sacramento Valley have been designated as internationally important for shorebirds by the Western Hemisphere Shorebird Reserve Network and the National Audubon Society.

Despite the significant habitat contribution provided by ricelands and other farmland, there are more opportunities to manage agricultural fields in ways that can enhance their ability to support a greater diversity of wildlife. Working together, the rice industry, conservation scientists and the NRCS developed a program that aligns this shared goal for the future. WHEP is an excellent example of the success that can be achieved through strong partnerships and collaboration.

California ricelands provide habitat for nine species of dabbling ducks, eight species of long-legged waders and thirteen species of shorebirds, including five species of special concern in the state of California: Black Tern, Burrowing Owl, Lesser Sandhill Crane, Least Bittern, and Northern Harrier; one California threatened species: the Greater Sandhill Crane; and two species of federal conservation concern: the Long-billed Curlew and the Whimbrel.
Waterbirds live on or around water and include ducks, shorebirds, herons, egrets, cranes, terns, rails and ibis.

**WHAT IS A WATERBIRD?**

**WATERFOWL**

Waterfowl include ducks, geese and swans, many of which are important game species. Waterfowl have flat bills and webbed feet, making them strong swimmers. They require wetland habitats such as rivers, lakes, wetlands, or the ocean to survive. As many as seven million wintering waterfowl rely on the Central Valley, and rice fields provide nearly 60 percent of all of their food resources in the Central Valley.

Located at the heart of the Pacific Flyway, California ricelands are filled with birds year-round.

**SHOREBIRDS**

Shorebirds live in other areas besides the shore. They generally inhabit open areas of beaches, mudflats, grasslands, and wetlands. They often have long, thin bills, and long legs and range from sparrow to chicken size. Central Valley ricelands and wetlands have been recognized as being internationally important to this group.

**LONG-LEGGED WADERS**

This group includes a wide range of species, most with very long legs and long bills such as herons, egrets, ibis and cranes. They find their food in a variety of habitats.

Enhancement is the physical manipulation of an area to repair, improve, or mimic natural and historic functions for the benefit of wildlife. Through the NRCS Waterbird Habitat Enhancement Program, rice farmers in California are enhancing their farm fields to support greater numbers of migratory birds.
Testing of three alternative management practices begins on rice farms in the Sacramento Valley.

Rice and Waterbirds Workshops held to identify additional alternative management practices in rice.

NRCS launches a two-county pilot program that successfully enrolls 27,000 acres of riceland enrolled in bird-friendly practices.

NRCS expands program availability to eight counties in the Sacramento Valley and Sacramento–San Joaquin Delta.

Program continues and cumulatively, more than 100,000 acres enrolled.

Program applications have been submitted, awaiting contracted acreage.

“We strive to make conservation a key part of our farm operations. This new NRCS program has been the most effective and user-friendly I’ve seen so far. We appreciate using this great NRCS program to elevate the level of waterbird benefits we provide on our farm.”

— Nicole Van Vleck, Rice Grower, Montna Farms
WHEP Program can only be achieved through Strong Partnerships and Collaboration

**LONG-TERM SUSTAINABILITY**

WHEP’s long-term sustainability appears to be limited. WHEP supports a number of annual management practices and is currently funded primarily through the Environmental Quality Incentives Program (EQIP) which limits the duration of contracts and re-enrollment of the same acres in the same practice is restricted.

**BASELINE HABITAT**

WHEP successfully increased the baseline habitat provided by ricelands but the short-term contracts begin to expire in 2014, creating a downward trajectory of acres enrolled in these waterbird-friendly practices. In 2015, approximately 28,000 acres will cycle out of the program, followed by about another 59,000 acres phasing out in 2016 (Figure 3).

**ESSENTIAL PARTNERSHIPS**

Because these practices are not essential to maintain agricultural productivity, they are unlikely to continue being implemented without the continuation of the program. To address this issue, the California Rice Commission, Audubon California, Point Blue Conservation Science and The Nature Conservancy would welcome the opportunity to work closely with NRCS in a joint effort to develop alternate conservation program mechanisms that would continue to incentivize the types of bird-friendly farming practices that have been supported by WHEP thus far.

**DECLINING ACRES IN WHEP**

- **Figure 3.** Current acres of riceland contracted in bird-friendly management of winter rice fields in the NRCS Waterbird Habitat Enhancement Program during each year until 2016. Enrolled acreage decreases each year as contracted acres phase out of the program and are unable to re-enroll. This figure does not account for the additional acres that may enroll in the program in future years, although for rice, this is thought to be minimal given the high number of acres already enrolled and limitations to re-enrollment.

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**WHEP: COST-EFFECTIVE BIRD CONSERVATION**

The USDA’s roughly $10 million investment in WHEP thus far has resulted in great enhancements to on-farm habitats that benefit migratory birds in California and across the Pacific Flyway. The estimated cost to acquire 100,000 acres of similar habitat in the Sacramento Valley ranges from around $650 million to $1 billion.1

Estimates suggest that, at current costs, an annual payment program similar to WHEP could conceivably be run for hundreds of years and still cost less than permanently acquiring and restoring the same amount of land. Such a permanent restoration strategy requires that the capital be invested at the onset, whereas WHEP requires a relatively small amount of funding each year.1

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1 For a full description of the costs, see the NRCS report on WHEP: “Cost-Effective Bird Conservation,” available at [NRCS Website](https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/birds/waterbirdenhancement/).
SPECIFIC MANAGEMENT PRACTICES

SYNCHING RICE MANAGEMENT & ANNUAL WATERBIRD CYCLES
There is a great opportunity to sync rice management practices with the annual life cycle needs of waterbirds. The Waterbird Habitat Enhancement Program offers a suite of management practices that provides habitat for waterbirds and other wildlife. In figure 4 we present details for a selection of those practices, spanning the calendar year.

“The Waterbird Habitat Enhancement Program provides me the opportunity to invest further in habitat on my farm without incurring all the expenses on my own. I appreciate NRCS helping me to cover some of these costs while we work together to do more for waterbirds and other wildlife.”

— Charley Mathews Jr., Rice Grower

TIMING RICE PRACTICES WITH THE NEEDS OF WATERBIRDS

FIGURE 4. The annual cycle of Sacramento Valley rice production (blue) and migratory waterbirds (green) can be aligned by implementing alternative management practices on rice fields that provide enhanced habitat for waterbirds throughout the year (purple). Width of the arrows represents the relative amount of flooded habitat available for waterbirds (blue) and abundance of waterbirds in the Sacramento Valley (green).
**Winter Season**

Replace boards in water-control structures and perform light tillage during the winter. Rice fields and managed wetlands in the Central Valley host nearly half of the region’s shorebirds and two-thirds of the entire waterfowl population of the Pacific Flyway (including nearly 20 percent of North America’s ducks). One reason waterbirds use this area is because approximately 60 percent of California’s ricelands are intentionally flooded in winter to promote decomposition of plant material left after harvest. Approximately 40 percent of rice fields are not flooded each winter and most of these fields remain dry or periodically become saturated by rainfall. To increase the habitat value of rice fields that are not intentionally flooded in the winter, growers enrolled in this practice refrain from heavy-machine work after harvest. This prevents important food sources from being buried and creates field conditions that are more hospitable for birds. Growers then use their water-control structures to passively capture rainwater, thereby increasing the likelihood of providing shallowly flooded habitat that waterbirds can use.

**Late Winter / Spring Season**

Stagger field drainage using variable drawdown. Shorebirds need enough food to increase their body weight by 20-60 percent to help them make their migratory journey to their nesting area. 

**MANAGEMENT OBJECTIVE**

- Create preparedness to increase flooded winter conditions by collecting rainwater on fields through passive capture; most effective at providing habitat when heavy tillage is reduced.

- Cumulative acres enrolled: Approximately 55,000 acres over 5 years

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Rice fields are typically drained at the end of January. This means that the available flooded habitat rapidly diminishes just as shorebird abundance in the Sacramento Valley is reaching its peak in the spring (Figure 4). Many birds do not depart for their Arctic breeding areas until May, and arrive in the Central Valley to find a lack of habitat. In addition, waterbirds that have spent the winter further south rely on the Central Valley to rest and re-fuel as they pass through on their journey back to their northern breeding grounds. The rice growers who enrolled staggered the draining of their winter-flooded rice fields. This practice retains water during the month of February by draining only 25 percent of a farm’s fields each week. This practice attracted three times the numbers of shorebirds (Figure 5), ducks and long-legged waders than the typical drawdown timing thereby increasing the capacity of the landscape to support a greater abundance and diversity of waterbirds.
SHOREBIRD RESPONSE TO THE VARIABLE DRAWDOWN PRACTICE

FIGURE 5. On left, average water depth in fields where water drawdown was delayed by three weeks (solid green line) and provided flooded habitat for shorebirds later in the winter when habitat is limited compared to fields with typical drawdown timing (solid orange line). On right, average number of shorebirds per acre in fields where drawdown was delayed by three weeks (dashed green line) compared to fields with typical drawdown timing (dashed orange line) in the Sacramento Valley, California. The shaded area represents optimal water depths for shorebirds.

These results are from a study conducted by the Partnership from 2012-2013 on 12 farms enrolled in the WHEP program. Data were collected on 12 visits over 6 weeks and averages incorporate all densities recorded during that time, including when no birds were observed.

SPECIFIC MANAGEMENT PRACTICES

The Sacramento Valley’s rice fields provide wetland-like habitat for nesting Mallards, Cinnamon Teal, Black Tern, Black-necked Stilt, American Avocet, Killdeer and more. The berms that subdivide rice fields and the roads through rice farms can be important habitat for American Avocet and Killdeer, species that nest on relatively bare ground close to shallow water.

Rice farmers that enrolled in nesting season enhancement practices installed small islands into rice fields and widened the tops of the earthen berms that separate rice paddies. More than four times as many shorebirds have been found to nest on widened berms than on those that had not been altered.

Nesting Islands

MANAGEMENT OBJECTIVE

- Increase nesting habitat sites by installing islands and widening berms
- Cumulative amount of installed practices: 147 islands and 760 miles of modified berms over 5 years

Spring and Summer Season

Install islands and widen berms

The Partnership from 2012-2013 on 12 farms enrolled in the WHEP program. Data were collected on 12 visits over 6 weeks and averages incorporate all densities recorded during that time, including when no birds were observed.

“I am really happy with this new habitat program. The nesting islands I’ve created are among my favorite. They create a nice protected area for the birds. Overall, I’ve seen increased numbers and variety of species using my fields. I love driving around and seeing all these birds.”

— Keith Davis, Rice Grower

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Black-necked Stilt

Black Tern (above) – a species of conservation concern in California – nests in the Central Valley almost exclusively in rice fields.
Fall Season

Flood-up early in fall

**MANAGEMENT OBJECTIVE**

- Flood available fields to create habitat for fall migrant birds
- Estimated cumulative acres enrolled: 822 acres over four years

**AFTER BREEDING FURTHER NORTH, SHOREBIRDS ARE THE FIRST TO ARRIVE IN THE SACRAMENTO VALLEY IN JULY, followed by ducks and geese in August.** At this time, habitat is scarce. The migrant birds find a limited amount of shallow flooded habitat in the wetlands and dense stands of mature rice carpets much of the valley. The dense rice can be good habitat for young ducks to hide and for herons and egrets to look for food, but do not provide significant amounts of habitat for shorebirds. In fact, it can be months after the first migratory waterbirds arrive before rice fields can help support them in large numbers.

**RICE FARMERS ENROLLED IN A PRACTICE CALLED EARLY FALL FLOOD-UP** on fields that were either harvested early or were not in production. This shallow flooding from July through September provided high-value habitat. With the limited amount of this habitat available, shorebirds literally flocked to these fields. In fact, it is estimated that just 200 acres of this habitat provided 8 to 50 percent of regional habitat objectives depending on the month.

**TABLE 1.** The annual and cumulative enrolled acreage, number of islands, and miles of bird-friendly management practices in California’s ricelands in the NRCS Waterbird Habitat Enhancement Program.
PARTNERSHIPS MAKE CONSERVATION POSSIBLE

“Improving agricultural landscapes to benefit wildlife is one of the goals of the NRCS. Rice fields are already equipped to provide precise water level management, so proposing alterations to the typical management is a cost-effective way to gain habitat while leaving the land in production. It is a very satisfying challenge to help private land owners find the balance between agricultural production and environmental conservation.”

– Jennifer Cavanaugh, State Wetlands Biologist, USDA Natural Resources Conservation Service

THE WATERBIRD HABITAT ENHANCEMENT PROGRAM was developed through a collaboration of the NRCS, California Rice Commission, rice growers, Audubon California, Point Blue Conservation Science, and The Nature Conservancy. Together, the partners developed and tested field management practices to enhance the habitat value of rice fields for migratory birds. Leveraging the expertise and capacity of the rice growing community and the nongovernmental organizations, the NRCS invested significant federal Farm Bill funding to incentivize the adoption of bird-friendly farming practices. Efforts included NRCS personnel at all levels within California, from the local field offices to state-level staff. The California Rice Commission hosted a series of educational workshops for growers, while the conservation organizations helped reach out to growers, monitored the response from the birds, and shared the science validating the program. Working across the public, private and nonprofit sectors, this partnership harnessed significant resources and expertise to make WHEP successful.

“The WHEP practices I have applied during the past three years have proven to show positive outcomes for the bird species in the working lands environment.”

– Jim LaGrande, Rice Grower

Greater Sandhill Cranes
Special Acknowledgement

Large-scale projects like WHEP require significant financial support and administrative commitment to become a reality. This success story could not have been possible without significant investment from each of the partners, especially the federal conservation funding and sustained commitment from the NRCS and the United States Department of Agriculture. Accordingly, WHEP should be recognized as one of their great contributions to waterbird habitat in the Central Valley – one of the most important waterbird habitat areas in North America and a critical stopping point along the Pacific Flyway. The California rice industry and the bird conservation community are deeply appreciative of this valuable contribution.