

**Project Co-Leaders/Agency/Contact Information:** Dr. Joseph P. Fleskes / USGS-Western Ecological Research Center / Dixon Field Station, 6924 Tremont Road, Dixon CA 95620; 707-678-0682 ext. 628; 707-678-5039 fax; [joe\\_fleskes@usgs.gov](mailto:joe_fleskes@usgs.gov) and Daniel Fehring, GIS-Remote Sensing Manager/ Ducks Unlimited-Western Regional Office/3074 Gold Canal Drive, Rancho Cordova, CA 95670/ 916-851-5322/ 916-852-2200 fax; [dfehring@ducks.org](mailto:dfehring@ducks.org)

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

**Project Goals:** Tracking gains and losses of habitats at a landscape scale are key to conservation planning for wildlife species. The Central Valley Joint Venture (CVJV) currently lacks this capability and has identified that tracking net landscape change is one of the primary issues that affect its ability to effectively monitor and evaluate habitats essential for healthy populations of the bird species upon which their conservation program focuses. This project will identify types and timing of key bird habitats, identify and determine cost and feasibility of potential methods to track change in those habitats, and collect new data on availability of habitats critical for wintering waterfowl, breeding waterfowl, shorebirds, other waterbirds, and riparian songbirds in the Central Valley. Specific project goals are to:

- Determine types and timing of key habitats for which tracking data are required
- Identify existing data and types of new data that are necessary to track key habitats
- Develop cost estimates for the collection and interpretation of each data source
- Develop a feasible strategy to track key habitats on an operational basis
- Collect and analyze new data to track changes in the availability of key bird habitats

**Partners:**

Ducks Unlimited Inc., Western Regional Office (DU)  
U.S. Geological Survey, Western Ecological Research Center (USGS)  
Central Valley Joint Venture (CVJV)

**How project will advance LCC goals:** This project will:

- Help assess vulnerability of wetlands and other bird habitats
- Develop inventory and monitoring protocols for wildlife habitats
- Assess the landscape over time to help predict changes in key bird habitats
- Provide updated maps for several landcover types within the Central Valley of California

**Methods:** The project team will work with the CVJV science coordinator and the CVJV Waterfowl Working Group, Shorebird and Waterbird Working Group, and Riparian Songbird Working Group members to identify types and timing of key habitats needed to be tracked for each bird group. We will identify the availability of retrospective data and describe new data that can be used to determine recent changes in key habitats and establish baseline data to detect future change. To develop a landscape change tracking plan to meet the needs of the CVJV, we will investigate data gathering methods including cost estimates and logistical feasibility for each, and summarize the pros and cons of each option. To demonstrate the feasibility of this approach and to begin the task of tracking landscape change, we will build upon accomplishments of our past analysis of wintering habitat. We will use a set of existing digital

spatial data layers and a combination of satellite imagery and recently released 2009 aerial photography to produce an updated spatial representation and tabular database of wintering waterfowl habitat for the Central Valley. We will produce a current digital dataset showing the spatial distribution of the key habitat types used by the JV to track its progress towards and revise its strategies for accomplishing its goals. We will also update habitat acreage tables (circa 2003) from the 2006 JV Implementation Plan with current estimates for 2009 and produce tables presenting the acreage gains and losses of these habitat types based on the 2003 and 2009 estimates. In addition to providing essential habitat information for wintering waterfowl, the maps produced by this project will also provide a large portion of the information required by the JV to monitor and evaluate key habitats for breeding waterfowl and shorebirds within the Central Valley. This work is an essential foundation to future modeling work on how climate change may affect habitat availability. The next phase of this work would be to accomplish landscape tracking of all key bird habitats with a summary of methods and costs detailed during this study.

**Products:** Products from this project will include: 1) listing and description of key habitats for which tracking data are required; 2) listing and description of available data or describe new data sources necessary to track key habitats; 3) detailed cost estimates for use, development, and interpretation of each data source; 4) development of a feasible strategy to track key habitats on an operational basis; and 5) an updated spatial representation and tabular database of wintering waterfowl habitat for the Central Valley. The updated information on wintering waterfowl habitat will specifically include:

- A current digital dataset showing the spatial distribution of the key habitat types used by the JV to track its progress towards and revise its strategies for accomplishing its goals. The digital map products will be based primarily on FSA NAIP imagery acquired in 2009, depicting spatial distributions of the following habitat classes throughout the Central Valley: Seasonal/Managed Wetlands, Permanent/Semi-Permanent Wetlands, Rice, Other Agriculture, and Urban
- Updated habitat acreage tables (circa 2003) from the 2006 JV Implementation Plan with current estimates for 2009 and tables presenting the acreage gains and losses of these habitat types based on the 2003 and 2009 estimates
- Digital map based upon multi-temporal Landsat imagery of winter flooding in rice and other agricultural fields.

To facilitate data sharing and communication, all products resulting from this project will be made available for download from the USGS or CVJV websites.

**Experience:**

The DU-USGS partnership uniquely provides both the biological and GIS expertise necessary to accomplish project goals. DU and USGS are both highly active within the California JVs, we are actively involved in the JV working groups for the various bird groups, and we are committed to the communication and collaboration required to produce a comprehensive plan for tracking habitat trends within JV/LCC boundaries. Additionally, DU and USGS are well experienced in GIS and remote sensing techniques required for tracking these trends. DU created the first comprehensive maps of wetland and riparian landcover throughout the Central Valley in the mid-1990s and DU/USGS produced updated maps on rice and water distribution for the Sacramento Valley in 1998. These datasets have been utilized extensively by the California JVs for habitat information needs. We understand the strengths and weaknesses of

these historic datasets, and are knowledgeable of the availability of new imagery, ancillary datasets and processing techniques that could provide improved and updated map products.

**Is the Project on-going? If so, describe: 1. what has been completed to date, 2. who has supported it, both fiscally and in-kind, 3. what will this proposal add to the project. A report of the accomplishments and outcomes to date is encouraged.**

This is new proposed work but does build upon previous analysis conducted by Ducks Unlimited and USGS.

**Timetable for Completion (identified by each deliverable):**

**1 Oct 2010** – Report summarizing the types and timing of key habitats (including post-harvest treatment types for agricultural habitats) for which tracking data are needed for wintering waterfowl, breeding waterfowl, shorebirds, other waterbirds, and riparian shorebirds.

Set of current maps showing the extent of Rice and Urban classes for 2009.

**1 Apr 2011**– Report describing available and new data sources necessary to track key habitats for each JV bird group.

**1 Oct 2011** –Report comparing costs and logistical feasibility of options that could be used to track change in key habitats for each JV bird group.

Complete digital map of habitat types for wintering waterfowl for the Central Valley.

Report that includes updated spatial representation and tabular database of wintering waterfowl habitat for the Central Valley.

**Performance Metrics with Timeline for each:** See above for products and timeline.

**Conservation Outcomes:**

- a) Development of a feasible strategy to track key bird habitats
  - used for improvements and updates for JV monitoring and evaluation plans for all bird groups
  - used for updating the CVJV Implementation Plan
  - addresses *Species and Habitat* area of emphasis from LCC proposal guidelines.
- b) Tracking change in availability of winter waterfowl habitats
  - used for updating spatial and tabular data in the CVJV Implementation Plan
  - used for monitoring progress towards CVJV Implementation Plan goals.
  - addresses *Landcover* and *Species and Habitat* area of emphasis from LCC proposal guidelines.

**Budget- (by outcomes):****FY2010***Outcome:      <sup>a</sup>Development of a feasible strategy to track key bird habitats**<sup>b</sup>Tracking change in availability of winter waterfowl habitats*

<u>Budget Item</u>	<b>Request from</b>	<u>Value of in-kind Services</u>		
	<b>LCC</b>	<b>DU</b>	<b>CVJV</b>	<b>USGS</b>
<b>Salaries w/benefits</b>				
Biologist (USGS)	<b>15,000<sup>a</sup></b>	-	-	5,000 <sup>a</sup>
GIS Specialist (USGS)	<b>7,000<sup>a</sup></b>	-	-	3,000 <sup>a</sup>
GIS Specialists (DU)	<b>37,000<sup>ab</sup></b>	-	-	-
CVJV Science Coordinator (FWS)	-	-	3,000 <sup>a</sup>	-
<b>Equipment</b>				
Computing, networking (DU)	-	3,000 <sup>b</sup>	-	-
Computing, networking (USGS)	<b>1,500<sup>a</sup></b>	-	-	5,000 <sup>a</sup>
<b>Supplies</b>				
Software, miscellaneous (DU)	<b>500<sup>b</sup></b>	1,000 <sup>b</sup>	-	-
Software, miscellaneous (USGS)	<b>1,500<sup>a</sup></b>	-	-	5,000 <sup>a</sup>
<b>Travel</b>				
Partner meetings,Conferences (DU)	<b>200<sup>ab</sup></b>	-	-	-
Partner meetings,Conferences (USGS)	<b>200<sup>ab</sup></b>	-	-	-
<b>Services</b>				
Statistical support (USGS)	-	-	-	1,000 <sup>a</sup>
Printing & publication costs (DU)	<b>200<sup>ab</sup></b>	-	-	-
Printing & publication costs (USGS)	<b>200<sup>ab</sup></b>	-	-	-
Total Direct Costs	<b>63,300</b>	4,000	3,000	19,000
Indirect Costs (11.22% on DU)	<b>4,200</b>	-	-	-
Indirect Costs (18.4% on USGS)	<b>4,700</b>	-	-	-
<b><i>FY10 Subtotal</i></b>	<b><i>72,200</i></b>	<b><i>4,000</i></b>	<b><i>3,000</i></b>	<b><i>19,000</i></b>

**FY2011**

*Outcome:*     <sup>a</sup>Development of a feasible strategy to track key bird habitats  
                   <sup>b</sup>Tracking change in availability of winter waterfowl habitats

Budget Item	Request from LCC	Value of in-kind Services		
		DU	CVJV	USGS
<b>Salaries w/benefits</b>				
Biologists (USGS)	<b>15,000<sup>a</sup></b>	-	-	15,000 <sup>a</sup>
GIS Specialist (USGS)	<b>7,000<sup>ab</sup></b>	-	-	-
GIS Specialists (DU)	<b>50,000<sup>b</sup></b>	-	-	-
CVJV Science Coordinator (FWS)	-	-	5,000 <sup>a</sup>	-
<b>Equipment</b>				
Computing, networking (DU)	-	-	-	-
Computing, networking (USGS)	<b>1,000<sup>a</sup></b>	-	-	5,000 <sup>a</sup>
<b>Supplies</b>				
Software, miscellaneous (DU)	<b>1,000<sup>b</sup></b>	1,000 <sup>b</sup>	-	-
Software, miscellaneous (USGS)	<b>1,500<sup>a</sup></b>	-	-	5,000 <sup>a</sup>
<b>Travel</b>				
Partner meetings,Conferences (DU)	-	-	-	-
Partner meetings,Conferences (USGS)	<b>1,500<sup>ab</sup></b>	-	-	-
<b>Services</b>				
Statistical support (USGS)	-	-	-	10,000 <sup>a</sup>
Printing & publication costs (DU)	-	-	-	-
Printing & publication costs (USGS)	<b>1,500<sup>ab</sup></b>	-	-	-
Total Direct Costs	<b>78,500</b>	1,000	5,000	35,000
Indirect Costs (11.22% on DU)	<b>5,700</b>	-	-	-
Indirect Costs (18.4% on USGS)	<b>5,000</b>	-	-	0
<b><i>FY11 Subtotal</i></b>	<b><i>89,200</i></b>	<i>1,000</i>	<i>5,000</i>	<i>35,000</i>

**Matching Funds:** In addition to the value of in-kind support listed above, USGS provides Landsat imagery at no cost.

**Letters of Support:** See attached.



19 May 2010

California Landscape Conservation Cooperative

Dear Madam or Sir:

I am writing to express the strong endorsement of *California Waterfowl Association* for the research proposal “***Tracking landscape change in the Central Valley: Developing critical capability, strategies, and data to guide conservation and management of birds and their habitats***” that has been submitted by **Dr. Joseph Fleskes** (USGS-WERC) and **Mr. Daniel Fehringer** (Ducks Unlimited-WRO) for consideration of funding through the California Landscape Conservation Cooperative. The proposed project would provide information critical to the successful management of waterfowl populations and their habitats in California and I urge your organization to consider full funding..

*California Waterfowl Association* is a statewide nonprofit organization, whose principal objectives are the preservation, protection, and enhancement of California’s waterfowl resources, wetlands, and associated hunting heritage. We were established in 1945 and are now the largest single-state organization in the nation focused on conservation of waterfowl and their habitats. Our programs incorporate various aspects of public policy, waterfowl management, habitat enhancement, and education. *California Waterfowl* works closely with government agencies and private landowners to improve habitats and manage for healthy waterfowl populations in California. Wetland restoration and enhancement projects focus on breeding and migratory waterfowl habitat and work to increase public hunting opportunity.

*California Waterfowl Association* recognizes the importance of tracking changes in the Central Valley landscape. We feel strongly that the proposed study would provide this critical information and help guide our conservation efforts of habitats that are important for healthy populations of waterfowl and other wetland-dependent birds and wildlife.

*California Waterfowl Association* staff has worked with Dr. Fleskes and his colleagues on a variety of successful projects, many of which have resulted in publications in peer-reviewed journals. I have full confidence that, if funded, the proposed work will be accomplished and we fully endorse the proposal

Sincerely,

A handwritten signature in black ink, appearing to read "Greg Yarris". The signature is stylized and fluid.

Gregory S. Yarris  
Vice President, Policy and Communications



## CENTRAL VALLEY JOINT VENTURE

### Conserving Migratory Bird Habitat

May 19, 2010

To: California Landscape Conservation Cooperative  
From: Bob Shaffer, Joint Venture Coordinator  
Subject: Support for LCC Science Proposal: *“Tracking landscape change in the Central Valley: Developing critical capability, strategies, and data to guide conservation and management of birds and their habitats”*

Dear Madam or Sir:

I am writing to express the strong endorsement of the Central Valley Joint Venture (CVJV) for the research proposal *“Tracking landscape change in the Central Valley: Developing critical capability, strategies, and data to guide conservation and management of birds and their habitats”* that has been submitted by **Dr. Joseph Fleskes** (USGS-WERC) and **Mr. Daniel Fehringer** (Ducks Unlimited-WRO) for consideration of funding through the California Landscape Conservation Cooperative. Tracking landscape change has been identified as a top priority information need for the Central Valley Joint Venture. This project would provide information that is critical to achieving the CVJV’s conservation objectives, and I urge your organization to consider full funding for it.

The CVJV is a self-directed coalition which includes nine conservation organizations, 11 state and federal agencies and one corporation. This partnership directs its efforts toward the common goal of providing for the habitat needs of migrating and resident birds in the Central Valley of California.

The CVJV has identified a very critical need not only to track JV conservation accomplishments but also to track net change in the availability of key bird habitats in the Central Valley landscape. We feel strongly that the study proposed by Dr. Fleskes and Mr. Fehringer would address this information need and help to ensure the continued success that our program has enjoyed during its more than two decades in existence.

Our partnership has worked with Dr. Fleskes, Mr. Fehringer, and their colleagues in the past and we have full confidence that if funded the proposed work will be accomplished. I fully endorse the proposal.

Sincerely,

Robert D. Shaffer, Coordinator



United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Pacific Southwest Region  
2800 Cottage Way, Room W-2606  
Sacramento, California 95825-1846

In reply refer to:

R8/CCSA

MAY 26 2010

To Whom It May Concern:

I wish to express the support of the U.S. Fish and Wildlife Service (Service) for the proposal being submitted by Dr. Joseph Fleskes (USGS Western Ecological Research Center) and Mr. Daniel Fehringer (Ducks Unlimited) entitled "***Tracking landscape change in the Central Valley: Developing critical capability, strategies, and data to guide conservation and management of birds and their habitats***" for consideration of funding through the California Landscape Conservation Cooperative. Tracking landscape change in the Central Valley is critical for the planning and implementation of the Service's habitat conservation mission. This project would provide urgently needed information and aid of our habitat conservation programs.

The Service has worked previously with Dr. Fleskes and Mr. Fehringer on a number of important conservation issues. We have had nothing but positive experiences and look forward to the opportunity to develop even closer ties.

If you have questions, please contact the undersigned at (916) 978-6160.

Sincerely,

Richard F. Kearney  
Assistant Regional Director,  
Climate Change and Science Applications

TAKE PRIDE  
IN AMERICA