

Work Task C24: Avian Species Habitat Requirements

FY09 Estimates	FY09 Actual	Cumulative Accomplishment Through FY09	FY10 Approved Estimate	FY11 Proposed Estimate	FY12 Proposed Estimate	FY13 Proposed Estimate
\$375,000	\$377,198.25	\$464,133.38	\$200,000	\$175,000	\$250,000	\$200,000

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Start Date: FY08

Expected Duration: FY14

Long-term Goal: Develop habitat suitability index models for covered avian species.

Conservation Measures: MRM1 (CLRA, LEBI, BLRA, WIFL, YBCU, ELOW, GIFL, GIWO, VEFL, BEVI, YWAR, SUTA)

Location: System-wide

Purpose: Determine habitat requirements for covered marsh and riparian bird species, including Yuma clapper rail (CLRA), least bittern (LEBI), California black rail (BLRA), southwestern willow flycatcher (SWFL), yellow-billed cuckoo (YBCU), elf owl (ELOW), gilded flicker (GIFL), Gila woodpecker (GIWO), vermilion flycatcher (VEFL), Arizona Bell's vireo (BEVI), yellow warbler (YWAR), and summer tanager (SUTA).

Connections with Other Work Tasks (past and future): Information gained from this work task will be used to design, create, and maintain marsh and cottonwood-willow habitat described in Section E that targets covered bird species. Information will also be used to maintain existing habitat as described in H1. Data collected in work tasks D2, D3, D5, D6, D7, and F2 will be used to help define habitat requirements.

Project Description: The HCP requires the creation of a minimum of 512 acres of marsh habitat for three covered marsh bird species. All 512 marsh acres should provide habitat for CLRA and LEBI, while 130 acres will provide habitat for BLRA. Studies will be conducted to determine habitat requirements for marsh bird surveys. Created habitats in turn will be designed in a mosaic to provide the characteristics required by each species. In addition, potential limiting factors such as water fluctuation, percent cover by plant species, minimum patch size, and selenium bio-accumulation may be determined.

The HCP also requires the creation of a minimum of 5,940 acres of cottonwood-willow habitat for nine covered riparian obligate bird species. Habitat requirements for these covered species are not fully understood. Studies will be conducted to determine habitat

requirements for riparian obligate species. Results from these studies may be utilized in created habitats.

Previous Activities: The habitat sampling methods used for this study were developed under System Monitoring for Riparian Obligate Avian Species (D6) in 2007 and 2008. Location of each territory and general bird surveys were conducted under D6, but all habitat research and data collection for each territory was conducted under this work task.

Twenty territories (depending on the species' rarity) per covered species were paired up with 20 non-use sites from the same geographic and habitat type over a two-year period. In 2008, habitat data was gathered at 46 sites for Bell's vireo and yellow warbler. A combination of landscape variable assessment, basic characterization of the vegetation cover types, and a microhabitat description with a point intercept method were used to assess habitat. This follows an earlier, rapid habitat assessment protocol implemented by USGS in 2007, for which more detailed methods are designed to provide complementary information.

FY09 Accomplishments:

System-wide and created habitat avian research. In 2009, habitat data was gathered at an additional 145 sites, for a total of 191 use and non-use sites for the two-year period (2008-2009). The sample sizes for each species were as follows: Bell's vireo (31), yellow warbler (31), Gila woodpecker (12), vermilion flycatcher (9), and summer tanager (2), with the same number of non-use sites paired with each use site. The Bell's vireo and yellow warbler were the only species abundant enough to achieve the goal of 20 use and non-use sites per species.

Gila woodpeckers were associated with the presence of large-diameter snags, anthills, and patches of upland habitat. Vermilion flycatchers were associated with cover by large trees and presence of mid-canopy mesquite and the avoidance of saltcedar. Arizona Bell's vireo were associated with the presence of large canopy cover, particularly cottonwood, and shrub-sized mesquite, but avoided large patches of upland habitat. Sonoran yellow warblers were associated with overall dense woodland covers, particularly cottonwood and willow, but largely avoided mesquite and patches of upland habitat. Gilded flickers were not detected in the LCR MSCP planning area during the last three years; therefore, no habitat assessments for this species were possible. The Great Basin Bird Observatory submitted a final report to Reclamation that included detailed results for activities under C24, D6, and F2.

Restoration of managed marsh units to benefit black rail and other marsh birds. Vegetation surveys were conducted in April, May, and June and water depth data were downloaded from all monitoring wells in April and May. Bi-weekly marsh bird surveys were conducted at Imperial NWR in fields 16 and 18 throughout the breeding season. The locations of all black rails, clapper rail, and least bitterns were mapped in both fields. Water management in the fields was coordinated with refuge personnel, based on the effect of water depth changes on rails that were detected.

Black rails were first detected in fields 16 and 18 in April. No additional black rails were detected until July, when two were detected in Field 16 and four were detected in Field 18. Yuma clapper rails were consistently detected in Field 16 throughout the summer, with a high of 21 birds on 9 April. In Field 18, one to three clapper rails were detected in all but the final July survey, including one juvenile seen with an adult in May. Between one and three least bitterns were detected in Field 16 on four occasions, and one was detected in Field 18 in July.

Equipment calibrations may have made the water depth data unreliable. Data that were collected from the data loggers are being analyzed to determine what can be used in the final analysis. Depending on the outcome of the analysis, new monitoring equipment may be installed prior to next season.

Yellow-billed cuckoo habitat modeling. The following steps have been taken toward the development of the GIS-based model for quantifying occupied yellow-billed cuckoo breeding habitat:

1. Digital (GIS) layers have been developed from the 2006 Reclamation vegetation classification.
2. Vegetation classification layers for the Bill William National Wildlife Refuge were obtained.
3. Vegetation classes have been extracted and stored in a unique grid comprising 30-m by 30-m cells.
4. GIS variables such as NDVI and proximity to features for the LCR YBCU model have been created from 2003, 2005, and 2007 TM imagery.
5. Landscape variables for the LCR YBCU model, such as amount of mesquite within a given radius, patch size, and distance to water, have been created from the Reclamation vegetation layers.
6. The LCR MSCP 2006 and 2007 YBCU locations have been attributed with GIS data.
7. Physical and biological associations with LCR MSCP YBCU occurrence are being explored using logistic regression and/or Mahalanobis distance modeling.

Two preliminary multivariate models of yellow-billed cuckoo breeding habitat have been developed based on the above steps.

FY10 Activities: Avian surveys under D6 will continue to provide data for the Avian Habitat Assessments. Habitat assessments will continue for the vermilion flycatcher, summer tanager, Gila woodpecker, and gilded flicker. Habitat assessments are complete for the yellow warbler and Bell's vireo. The habitat assessment protocol will be assessed.

The marsh bird habitat study will continue through the 2010 breeding season, with a final report due in September 2010. Depending on the outcome of the analysis of depth data obtained in 2009, new monitoring equipment may be installed prior to the FY10 field season.

Two preliminary multivariate models of yellow-billed cuckoo breeding habitat have been completed and are in the final stages of analysis and evaluation. A final report for the cuckoo modeling study is due in September 2010.

FY11 Proposed Activities: Area search surveys conducted under D6 will continue in 2011 to provide data for Avian Habitat Assessments. Species that were not detected in sufficient numbers (i.e., gilded flicker) for habitat suitability modeling will be surveyed utilizing species-specific surveys to determine specific habitat use, and to obtain sufficient data for habitat modeling.

Additional marsh bird habitat studies may include, but are not limited to, studies on seasonal movement of marsh birds, black rail habitat management implementation, or other related work to further understand habitat use for those species.

Pertinent Reports: The *Annual Report on the Lower Colorado River Riparian Bird Surveys, 2009* is posted on the LCR MSCP Web site. Final reports for Marsh Bird Habitat Monitoring and Yellow-billed Cuckoo Modeling will be posted when available.