Work Task C24: Avian Species Habitat Requirements

FY11 Estimate	FY11 Actual Obligations	Cumulative Expenditures Through FY11	FY12 Approved Estimate	FY13 Proposed Estimate	FY14 Proposed Estimate	FY15 Proposed Estimate
$175,000	$183,056.69	$643,095.14	$200,000	$200,000	$250,000	$250,000

Contact: Beth Sabin, (702) 293-8435, lsabin@usbr.gov

Start Date: FY08

Expected Duration: FY16

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

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

Location: LCR MSCP project area; Imperial Ponds HCA, Arizona.

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), Sonoran 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 and 1,320 acres of honey mesquite 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. Habitat models will be created for the Sonoran yellow warbler,

Arizona Bell's vireo, summer tanager, Gila woodpecker, vermilion flycatcher, gilded flicker and elf owl. Habitat associations for the southwestern willow flycatcher (D2) and the western yellow-billed cuckoo (D7) are covered under other work tasks

Previous Activities:

Restoration of Managed Marsh Units to Benefit Black Rail and other Marsh Birds. Vegetation surveys were conducted in 2009 and water depth data were downloaded from all monitoring wells. Bi-weekly marsh bird surveys were conducted at Imperial NWR in fields 16 and 18 throughout the breeding season in 2009. The locations of all black rails, clapper rail, and least bitterns were mapped in both fields. Black rails were first detected in fields 16 and 18 in April and July of 2009. Yuma clapper rails were consistently detected in Field 16 throughout the summer, with a high of 21 birds. In Field 18 clapper rails were also detected in 2009.

Yellow-billed Cuckoo Habitat Modeling. Two preliminary multivariate models of yellow-billed cuckoo breeding habitat were developed in 2009. This GIS-based model for quantifying occupied yellow-billed cuckoo breeding habitat may help in determining essential factors for landscape level habitat development.

In 2010, a draft report summarizing the results of the GIS habitat model was submitted for review. The GIS models examined the effects of landscape-scale habitat variables on cuckoo distribution and identified features that constituted high quality cuckoo habitat within the LCR MSCP planning boundaries. Existing data on cuckoo distribution and abundance within the planning area and in both the Verde River and San Pedro River watersheds were used to develop and test the model. A probability map depicting the likelihood of cuckoo habitat was created and tested with a set of known cuckoo locations from 2007. The model was then extrapolated to reaches of the Verde and San Pedro rivers and tested with additional known cuckoo locations. A vegetation type model showed a negative correlation with saltcedar, and a positive correlation with cottonwood-willow vegetation types.

Habitat Associations for Riparian Obligate Species. 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.

Territories per covered species were paired with non-use sites from the same region and habitat type. From 2008-2010, habitat data was gathered at144 use and 181 non-use sites for the Arizona Bell's vireo, Sonoran yellow warbler, summer tanager, vermilion flycatcher and the Gila woodpecker. Habitat assessments were not conducted for the gilded flicker due to lack of gilded flickers detected in the bird surveys. A preliminary habitat suitability model was created for these species from the three years of data (2008-2010).

FY11 Accomplishments:

Restoration of Managed Marsh Units to Benefit Black Rail and other Marsh Birds. A final report has been submitted to Reclamation and this marsh bird habitat study has been completed. Final results indicate that with proper water level management and marsh vegetation species present, management for black rail, clapper rail and other marsh bird species can be

accomplished in the same impoundment. The probability of black rail occupancy was positively associated with chairmaker's bulrush and southern cattail, negatively associated with river bulrush, and highest if the water depth was maintained between -44mm and 40mm. For clapper rails, positive correlations with early successional cattail and *Phragmites* were found coupled with water depths between 0-65mm. A sample wetland design based on the results of this study would include 3 components: 1) an area with shallow and stable water depths at one end of the impoundment planted with chairmaker's bulrush, 2) a gradual slope planted with a mix of 30% chairmaker's bulrush and 70% cattail, and 3) an area with deep water (250-350 mm) planted with cattail.

Wetlands can be managed simultaneously for both California black rails and Yuma clapper rails by 1) maintaining mostly shallow water depths (saturated soil to <40 mm), 2) maintaining stable water in shallow areas (where black rails are expected), and 3) promoting chairmaker's bulrush in shallow water areas (<30 mm) where black rails are most likely to occur and southern cattail in deeper water areas (>30 mm) where clapper rails are most likely to occur. Planting species other than chairmaker's bulrush or southern cattail is not recommended. In areas where water depths are likely to exceed 350 mm, California bulrush, which is tolerant of deep water and common on the lower Colorado River, can be planted instead of cattail, as cattail will likely become established voluntarily. Planting any new marsh restoration sites should occur immediately after water is added to the site to discourage the growth of *Phragmites* and other invasive plants. The use of automated irrigation procedures such as those implemented in impoundments 16 and 18 in 2010 are strongly recommended as automated irrigation stabilizes water depth, reduces the time and money necessary to maintain water delivery, and ensures proper water levels during holidays and weekends.

Yellow-billed Cuckoo Habitat Modeling. A draft final report has been reviewed by Reclamation and is in final preparation with USGS. Landscape-scale habitat variables on cuckoo distribution and the identity of features that constitute high quality cuckoo habitat within the Bill Williams River NWR and the Grand Canyon/upper Lake Mead areas were used to develop a habitat model. The model will be enhanced by including recent cuckoo habitat created under the LCR MSCP at PVER and CVCA, which is quite different from previous cuckoo nesting areas that were included in the model.

Habitat Associations for Riparian Obligate Species. In 2011, system wide surveys (D6), post-development monitoring on habitat conservation areas (F2) and habitat modeling were continued under a new contract. More detailed habitat models for the Sonoran yellow warbler, Gila woodpecker, Arizona Bell's vireo and the summer tanager are to be created during a five year period from 2011-2015. These models will add to the preliminary models developed from 2008-2010. Fifty use and fifty non-use sites will be evaluated per species over the five year period (10 per year).

In 2011, the first year of data for these models was collected from mid September to mid October. Ten use site and 10 non-use sites were evaluated per species for the four species mentioned above. Ten use sites were randomly chosen from all available territories and paired with a non-use site randomly chosen in the same habitat stratum and region. Vegetation plots were randomly placed within use sites (established territories) with one vegetation plot per two acres. There was a maximum of five vegetation plots within each territory (established

territories). Only one vegetation plot was measured per non use site regardless of the territory size of its paired use site. The random points translated to the center of each vegetation plot.

Temperature and humidity were also assessed at the vegetation plots. Six vegetation plots per species were randomly selected from all the use site vegetation plots and the non-use site vegetation plots. The data loggers were set to record temperature and relative humidity measurements every 15 minutes.

FY12 Activities:

Yellow-billed Cuckoo Habitat Modeling. The USGS habitat model and report will be reviewed and finalized, and additional LCR MSCP conservation site data will be added to enhance the model.

Habitat Associations for Riparian Obligate Species. Habitat assessments for the new detailed models (2011-2015) will continue to be conducted in 2012. Ten use sites (established territories) and ten non use sites will be evaluated per species for the Sonoran yellow warbler, Gila woodpecker, Arizona Bell's vireo and the summer tanager. The parameters measured and field protocol will be the same as in 2011.

Data will be downloaded from the data loggers that were established in August and September of 2011 every three months. In August and September of 2012 the data loggers will be moved to six new randomly selected use vegetation plots and six randomly selected non use vegetation plots.

In 2012, the 2011 and 2012 data will be entered into the BOR vegetation database. The 2011 and 2012 data will be analyzed and included in the 2012 report.

Proposed FY13 Activities:

Habitat Associations for Riparian Obligate Species. Habitat assessments for the new detailed models (2011-2015) continue to be conducted in 2013. In 2013, ten use sites (established territories) and ten non use sites will be evaluated per species for the Sonoran yellow warbler, Gila woodpecker, Arizona Bell's vireo and the summer tanager. The parameters measured and field protocol will be the same in previous years.

Data will be downloaded from the data loggers that were established in August and September of 2012 every three months. In August and September of 2013 the data loggers will be moved to six new randomly selected use vegetation plots and six randomly selected non use vegetation plots.

Habitat Associations for the Elf Owl. A habitat modeling study for the elf owl will be initiated in FY2013. The objective of the study is to quantify habitat preferences of elf owls in riparian habitat.

A thorough literature review of elf owl habitat studies and preferences will be initiated. The only known population of elf owls within the LCR MSCP program area is located at the Bill Williams NWR on the edge of mosquito flats. Additional populations of elf owls in riparian habitats similar to type of habitat in the LCR MSCP program area will be located. Preferably, some

locations will include elf owls that are nesting in cavities in riparian trees (willows, cottonwoods, etc.). Habitat factors that need to be rigorously tested in the study will be defined. A study plan and scope of work will be drafted for the study.

Pertinent Reports: Study plans are available upon request. The following reports are posted on the LCR MSCP website: *Lower Colorado River Riparian Bird Surveys 2011; Restoration of Managed Marsh Units to Benefit California Black Rails and other Marsh Birds: An Adaptive Management Approach, Final Report 2011*.