Work Task C24: Avian Species Habitat Requirements

FY12 Estimates	FY12 Actual Obligations	Cumulative Expenditures Through FY12	FY13 Approved Estimate	FY14 Proposed Estimate	FY15 Proposed Estimate	FY16 Proposed Estimate
$200,000	$243,998.17	$851,071.96	$200,000	$300,000	$300,000	$300,000

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Start Date: FY08

Expected Duration: FY17

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

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

Location: LCR MSCP project area; Imperial Ponds Conservation Area, 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 species. 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. In 2011, a final report was prepared giving recommendations on creation and management of marshes for both clapper and black rails.

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 has been 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.

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 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).

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 that will address microclimate for the Sonoran yellow warbler,

Gila woodpecker, Arizona Bell's vireo, and the summer tanager will be created during a five-year period from 2011 to 2015. In 2011, the first year of data for these models was collected.

FY12 Accomplishments:

Yellow-billed cuckoo habitat modeling. 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 predicted that a core area of dense cottonwood/willow within a 120-m radius (4.5 ha) of a location increased the chances of cuckoo occurrence, and the likelihood of cuckoo occurrence continued to increase if the core area was surrounded by a large, native forest (480 m radius/72 ha) that contained lots of structural diversity. The odds of cuckoo occurrence decreased rapidly when too much tamarisk surrounded the site.

Habitat associations for riparian obligate species. In 2012, the second year of data was collected for habitat models for the Sonoran yellow warbler, Arizona Bell's vireo, summer tanager and Gila woodpecker. Ten use sites for each species 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). 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. Vegetation plots consisted of nested plots that measured habitat characteristics of overstory trees, the shrub and intermediate layer, canopy closure and gaps, total vegetation volume and the herbaceous layer. The data collection protocol followed the standard LCR MSCP vegetation monitoring methodology.

Temperature and humidity were also assessed at the vegetation plots. Six vegetation plots per species were randomly selected from all the use site plots and six plots were randomly selected from the non-use site plots. Data loggers were established at the center point of the vegetation plot and set to record temperature and relative humidity measurements every 15 minutes. Data were downloaded from the data loggers every three months.

FY13 Activities:

Habitat associations for riparian obligate species. Habitat assessments for the new detailed models (2011-2015) will continue to be conducted 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 as in 2011 and 2012.

Data will be downloaded from the data loggers that were established in August and September of 2012 every three months. The vegetation and microclimate data will be analyzed and included in the 2013 report.

Elf owl habitat modeling. A habitat modeling study for the elf owl will be initiated. The objective of the study is to quantify habitat preferences of elf owls in riparian habitat. The study will focus on habitat requirements within the area near the nest cavity and within the home range. The study will also gather additional information on the detectability of elf owls in dense riparian habitat.

A thorough literature review of elf owl habitat studies and preferences will be initiated. The only currently known population of elf owls within the LCR MSCP program area is located at the Bill Williams River 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. A study plan and scope of work will be drafted for the study.

Proposed FY14 Activities:

Habitat associations for riparian obligate species. Habitat assessments for the new detailed models (2011-2015) continue to be conducted in 2014. In 2014, 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 every three months. The 2014 vegetation data and 2013 microclimate data will be analyzed and included in the 2014 report. Work will begin on the habitat models.

Elf owl habitat modeling. The habitat modeling study will be implemented in 2014, and will include vegetation parameters from 10 use and 10 non-use sites to create habitat models. The data and results obtained from work task C36, Elf Owl Detectability Study, will be used to guide the data collection and the design of this modeling effort. The implementation of the elf owl habitat modeling will increase costs in FY 14.

Pertinent Reports: The following reports are on the LCR MSCP website. *Lower Colorado River Riparian Bird Surveys 2012*; *Restoration of Managed Marsh Units to Benefit California Black Rails and Other Marsh Birds: An Adaptive Management Approach, Final Report 2011*; and *Development of a GIS-based Model of Yellow-Billed Cuckoo Breeding Habitat Within the LCR MSCP Area, San Pedro River and Verde River, AZ 2012.*