

## Landbird Monitoring in the Southern Plains, Sonoran Desert, and Chihuahuan Desert Networks

### PROTOCOL SUMMARY

#### Importance

Landbirds are a conspicuous component of many ecosystems. Because they have high body temperatures, rapid metabolisms, occupy high trophic levels, and can respond quickly to changes in resource conditions, landbirds are considered good indicators of ecosystem health. In addition, landbirds are highly detectable relative to other vertebrates, and they can be efficiently surveyed with the use of several standardized methods. Landbirds are also protected under the legal mandates of the Endangered Species Act (1973) and Migratory Bird Treaty Act. Monitoring changes in landbird population and community parameters can be an important component of any comprehensive, long-term monitoring program.

For these reasons and because they are specifically identified in the management objectives of many network parks, the National Park Service's Southern Plains, Sonoran Desert, and Chihuahuan Desert networks have chosen landbirds as a focus for long-term natural resources monitoring. To gain operational efficiencies and improve the spatial and thematic scope of our results, the three networks conduct monitoring in an integrated, collaborative fashion, in partnership with the Rocky Mountain Bird Observatory.

#### Monitoring Objectives

Specific, measurable objectives for landbirds monitoring are:

1. To estimate the proportion of points occupied for most species in most parks. Occupancy is a measure of presence or absence of a species in space. This measure, when evaluated across time, indicates changes in the distribution of a species.
2. To estimate parameters related to community dynamics—particularly species richness and composition, which are essential to understanding the effects of changing landscapes and management practices on native biodiversity. Using community-level estimators is an efficient means of obtaining meaningful landbird data within our operational constraints.



Great horned owl.

NATIONAL PARK SERVICE

3. To estimate density of the most common species using the point-transect distance-sampling method at fixed points. Where assumptions are met, density estimates can provide a robust and widely accepted method for estimating bird abundance. For larger parks, we will likely be able to estimate density for only the most common species, due to time and other constraints on field efforts.

#### Methods

Our sampling approach is based on distance-based “point transects,” with some minor refinements to facilitate better estimation of community-level parameters. In general, we sample from all areas that are accessible and present no significant safety concerns. All areas of the target habitats are included in the sampling frame. For larger parks, samples are randomly allocated using a spatially-balanced algorithm to ensure good coverage of these more extensive units. For smaller parks, where most of the available habitat is sampled, a systematic grid is used to assign locations.

#### Products, Scope, and Schedule

Network-scale status and trends reports and park-specific landbird resource briefs are produced annually. Appropriate assessments of potential trends requires several years of data, so early reports focus on current status and species composition. The scale of inference of each report is the individual park.

Information on bird communities and natural history is also communicated through live presentations, updated bird checklists and other written summaries, and podcasts and other media produced and distributed through the network websites and the Learning Center of the American Southwest ([www.southwestlearning.org](http://www.southwestlearning.org)).

## Protocol Status

The protocol and standard operating procedures (SOPs) for the Sonoran Desert Network were approved in December 2008. The protocol is currently being revised to incorporate Southern Plains and Chihuahuan Desert Network parks. A database and supporting documentation that meet NPS and FGDC standards are complete and available. Final data from 2007–2008 are available from the NPS DataStore. Data from 2009 are available from the Rocky Mountain Bird Observatory (<http://www.rmbo.org/public/monitoring/dataQueries.aspx>).

## Protocol Implementation

The implementation schedule for this protocol is shown in the table at right.

## Project Contact

Robert E. Bennetts, Southern Plains Network  
[robert\\_bennetts@nps.gov](mailto:robert_bennetts@nps.gov), (719) 846-4663

### Parks where landbirds monitoring will be implemented.

Year	Park	Network
2010	Amistad NRA	Chihuahuan Desert
	Big Bend NP	Chihuahuan Desert
	Carlsbad Caverns NP	Chihuahuan Desert
	Fort Davis NHS	Chihuahuan Desert
	Guadalupe Mountains NP	Chihuahuan Desert
	White Sands NM	Chihuahuan Desert
2009	Alibates Flint Quarries NM	Southern Plains
	Bent's Old Fort NHS	Southern Plains
	Capulin Volcano NM	Southern Plains
	Chickasaw NRA	Southern Plains
	Chiricahua NM	Sonoran Desert
	Coronado NMem	Sonoran Desert
	Fort Union NM	Southern Plains
	Fort Larned NHS	Southern Plains
	Gila Cliff Dwellings NM	Sonoran Desert
	Lake Meredith NRA	Southern Plains
	Lyndon B. Johnson NHP	Southern Plains
	Pecos NHP	Southern Plains
	Sand Creek Massacre NHS	Southern Plains
Washita Battlefield NHS	Southern Plains	
2008	Tonto NM	Sonoran Desert
2007	Casa Grande Ruins NM	Sonoran Desert
	Fort Bowie NHS	Sonoran Desert
	Organ Pipe Cactus NM	Sonoran Desert
	Montezuma Castle NM	Sonoran Desert
	Saguaro NP	Sonoran Desert
	Tuzigoot NM	Sonoran Desert

NHP = National Historical Park; NHS = National Historic Site;  
 NM = National Monument; NMem = National Memorial;  
 NP = National Park; NRA = National Recreation Area

## Avian Species that Occur in Network Parks



Yellow-billed cuckoo



Cactus wren



Red-tailed hawk



Harris's hawk



Curved-billed thrasher