

**Final Report of Fall 2003 Migration Bird Banding Activities at Cibola and Pratt  
Restoration Sites**

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## Introduction

In the fall of 2002, the Wildlife Resources Team, Resources Management Office, Lower Colorado Region, U. S. Bureau of Reclamation (Reclamation) initiated a fall migration bird banding operation at two vegetation restoration sites along the lower Colorado River. The restoration sites, located in Cibola, AZ and Yuma, AZ, were developed in accordance to the 1997 Biological Conference Opinion (BO) on Routine Operations and Maintenance of the Lower Colorado River. In this BO, U.S. Fish and Wildlife Service (USFWS) established Reasonable and Prudent Alternative 14 (RPA 14), which states that Reclamation conduct demonstration projects to study ecological restoration techniques along the lower Colorado River (LCR), (USFWS 1997). Reclamation developed the migration bird banding project in conjunction with other vegetation and bird monitoring programs to gather baseline data at the restoration sites.

Riparian areas in the Southwest support a disproportionately high bird diversity and abundance; yet form less than 0.5% of all the land area (Powell and Stiedl 2000). Much of this habitat has decreased due to climate change, habitat destruction, agricultural land conversion, urban development, mining, overgrazing, and river regulation (U. S. Bureau of Reclamation 1996; Powell and Stiedl 2000). A search of the literature finds very little data concerning year-round bird use in xeroriparian areas of the southwest, especially in restoration sites. Fall migration data will be used, in conjunction with data collected from other times of the year, in future restoration projects as a guide to habitat requirements for specific species, particularly those listed as endangered and threatened. Bird species diversity and richness numbers collected from this project will be used as an indicator of what bird use may be expected in future restoration projects conducted along the LCR.

## Study Areas

Cibola National Wildlife Refuge is located along the LCR south of Interstate 10 and west of Blythe, California in Cibola, Arizona. Established in 1964 to offset wildlife and habitat losses due to channelization of the Colorado River, the refuge attracts more than 200 bird species (USFWS 2003). The restoration plot contains 3 distinct habitats: a 5.5 ha mixture of honey mesquite (*Prosopis glandulosa*) and screwbean mesquite (*P. pubescens*), 2.6 ha of Goodding willow (*Salix gooddingii*), and 1 ha of Fremont cottonwood (*Populus fremonti*), (fig. 1.). A total of 1,500 honey mesquite, 1,500 screwbean mesquite, 10,000 Goodding willow, and 2,600 Fremont cottonwoods were planted in 1999 (USBR 2003).

Pratt Agricultural site is located north of Interstate 8, near Yuma, AZ on land administered by the Bureau of Land Management. A leaseholder farmed the 23 ha site since 1949. In 1999 Reclamation began to restore the site with the planting of native Goodding willow, coyote willow (*S. exigua*) and Fremont cottonwood trees. It was planted with pole plantings, potted trees, and seeds, and since has been regularly irrigated and left to grow. Some plant material has been harvested from this site since spring 2000; otherwise, no manipulation of the trees has occurred. A total of 712 Fremont

cottonwoods and 699 Goodding willows were planted at the site. Fremont cottonwood and Goodding willow seeds were scattered over two areas measuring 11m x 213 m and 28m x 213 m (U. S. Bureau of Reclamation 2003) (fig 2.).

### **Permits**

Banding was conducted under the USFWS Banding Permit #22994, with Barbara Raulston as the Master Bander. Joe Kahl, Greg Clune, Matthew Voisine, Beth Sabin and Chris Dodge are listed as subpermitees. At least one of the sub-permit holders was present during the banding effort.

### **Methods**

Both sites operated with standard nylon mist nets sized: mesh 30m/m, height 2.6m, and length 12 or 6m.

At the Cibola site, nine, 12m net lanes and two, 6m net lanes were used. Six 12m nets are located in the Goodding willows, three, 12m nets in the Fremont cottonwoods and two, 6m nets in the mesquite habitat (fig 1.). Each net lane was chosen in order to sample the three distinct habitats, and produce the maximum amount of captured birds. Reclamation conducted banding over four days from 27-29 Aug. 2003.

For the Pratt site, ten, 12m nets were used and scattered throughout the site in order to sample all areas and capture the maximum amount of birds (fig 2.). Banding was conducted over four days from 9-12 Sept. 2003

The Institute for Bird Populations has established protocol for Monitoring Avian Productivity and Survivorship (MAPS) station operations, which Reclamation used at all times (DeSante *et al.* 2002). Nets were set up 1/2 hour before sunrise, and closed 5 hours later, or when the temperature exceeded 37.8° C. The nets were checked every 30 to 50 minutes depending on the temperature. All data were recorded on a standardized data sheet (DeSante *et al.* 2002), (fig. 3.). A metal, numbered USFWS leg band was placed on all captured birds, with the exception of game species and hummingbirds. Each bird was identified to species, aged, sexed, measured for wing chord and body fat, weighed and released. Time, date, and net location were recorded for each captured bird as well as total hours of net operations. Birds were identified to species using Pyle (1997) and National Geographic (1999). Birds were aged and sexed using Pyle (1997).

### **Results**

Because some birds escaped during removal from the nets or in the hand while banding, not all data were collected from those escaped birds. Birds with missing data were omitted for relative analysis.

### **Cibola**

Reclamation produced 120.0 net hours over the 4-day period. A total of 166 birds (1.15 birds per net hour) were captured (fig. 4.); 153 newly banded, 5 recaptured, 13 not banded. Eight families, comprising 19 species, were banded during the week. The families *Parulidae* (Wood Warblers) and *Cardinalidae* were the largest captures with 68 (44.4%) and 30 (19.6%) respectively. Wilson warblers (*Wilsonia pusilla*) were the most abundant with 32 birds captured, representing 20.9% of the banded birds. Eight willow flycatchers (*Empidonax traillii*) were banded. Due to overlap of migrating subspecies, identification to the endangered subspecies *E. t. extimus*, was not possible.

### **Pratt**

A total of 195.4 net hours were conducted over the 4-day period with 92 birds (0.71 birds per net hour) captured (fig 4.); 83 newly banded, 3 recaptures, and 6 not banded. Nine families, comprising 24 species were banded during the week. Like Cibola, the family *Parulidae*, contained the largest amount of banded birds with 40 (48.2%). The family *Thraupidae* (Tanagers) totaled 11 (13.3%) of the banded birds. Wilson Warblers (*Wilsonia pusilla*) were the species captured the most with 16 birds banded, representing 19.3% of the banded birds. Four willow flycatchers were banded, and once again, Reclamation was unable to determine if they were the endangered *extimus* subspecies.

### **Discussion**

Restoring the habitat that has been lost along the lower Colorado River is important to the survival of migrants. More than 80% of migratory birds use riparian habitats during breeding season or migration in the western United States. (Skagen 1998) Our fall migration monitoring has shown to be a valuable component in efforts to measure the success of each restored site. Although it is only in its second year of monitoring, a total of 456 migrants were captured in 2002 and 258 captured in 2003 at both sites. This shows the utilization of each site as stopover habitat for migrating birds. However, this statistic also shows a decline in birds captured at both sites between 2002 and 2003. Since this is only the second year of this study, reasons for this decline are hard to determine and may be due to another year of drought. The Pratt site bird captures dropped from 239 in 2002 to 86 (64%) in 2003 and the Cibola site dropped from 217 in 2002 to 167 (24%) in 2003. It is possible that the drastic drop at Pratt is because of the decrease in irrigation. During each Pratt site visit observations were made that there was no visual sign that irrigation was taking place with consistency.

Although there has been no breeding of the endangered southwestern willow flycatcher (*E. t. extimus*) detected at the restored sites, it appears to be successful migration habitat for willow flycatchers. Over the past two years, there have been a total of 10 migrants at Pratt and 11 at Cibola. Reclamation was unable to determine if they were the endangered Southwestern subspecies. Once again it must be noted that the Pratt site has not been irrigated consistently. In the future, it is hopeful that the southwestern willow flycatcher will utilize these restored areas as breeding sites.

Riparian habitat has suffered because of the diversion of stream flows for irrigation and development (Skagen 1997). Therefore future restoration of riparian habitats along the LCR is important. The information collected by monitoring these restored sites can be a useful guide to determine if a restoration project is successful. This information can then be used to aid in the development of future restoration projects along the LCR.

Figure 1. Aerial Photo of the Cibola Restoration Site, with Net Lanes in Red

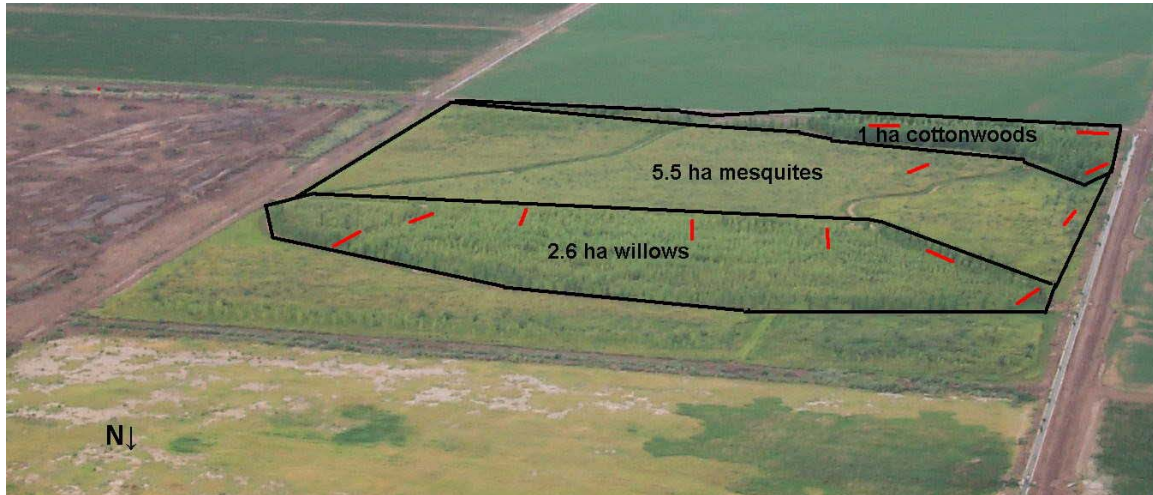


Figure 2. Pratt Restoration Site with Net Lanes in Red

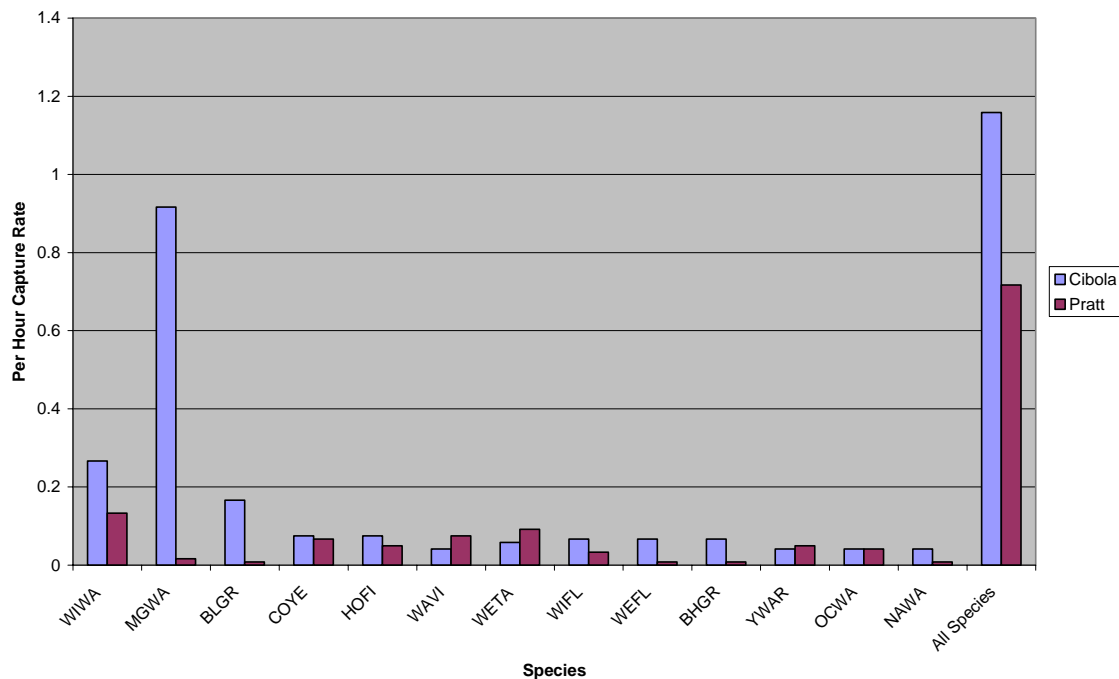


- Plot 1. Potted Gooding's Willow and Fremont Cottonwood Planted Dec. 2000.
- Plot 2. Seeded Gooding's Willow and Fremont Cottonwood Planted Spring 1999.
- Plot 3. Potted Gooding's Willow and Fremont Cottonwood Planted Spring 1999.
- Plot 4. Seeded Gooding's Willow and Fremont Cottonwood Planted Spring 1999.
- Plot 5. Potted Gooding's Willow and Fremont Cottonwood Planted Spring 1999.
- Plot 6. Seeded and Experimental Poles Gooding's Willow and Fremont Cottonwood Spring 1999.
- Plot 7. Potted Gooding's Willow and Fremont Cottonwood Planted Dec. 2000.





Select Species Per Hour- Cibola and Pratt 2003



## Literature Cited

- Bibby, Colin J.; Burgess, Neil D; Hill, David A. 1992. *Monitoring Bird Populations*. Academic Press Inc. San Diego, CA.
- DeSante, David F.; Burton, Kenneth M.; Velez, Pilar; Froehlich, Dan. 2002. *Maps Manual 2002 Protocol instructions for the establishment and operation of constant-effort bird-banding stations as part of the monitoring avian productivity and survivorship (MAPS) program*. The Institute for Bird Populations. Point Reyes Bird Observatory Bolinas, CA.
- Latta, Steven C. and John Faaborg. 2001. Winter site fidelity of prairie warblers in the Dominican Republic. *The Condor*: Vol. 103, No. 3, pp. 455-468.
- Latta, Steven C. and John Faaborg. 2002. Demographic and population responses of Cape May warblers wintering in multiple habitats. *Ecology*: 83(9), pp. 2502-2515.
- Murphy, Michael T.; Cornell, Kerri L.; Murphy, Karmel L. 1998. Winter bird

- communities on San Salvador, Bahamas. *Journal of Field Biology*: 69 (3): 402 – 414.
- National Geographic Society. 1999. *Field guide to the birds of North America*, Third edition. National Geographic Society, Washington D.C. 457 pp.
- Nur, N., S.L. Jones, and G.R Geupel. 1999. *A statistical guide to data analysis of avian monitoring programs*. U. S Department of the Interior, Fish and Wildlife Service, BTP-R6001-1999, Washington, D.C.
- Powell, Brian F., and Robert J. Stiedl. 2000. Nesting habitat and reproductive success of southwestern riparian birds. *The Condor* 102:823-831.
- Pyle, Peter. 1997. *Identification guide to North American birds*. Slate Creek Press, Bolinas, CA
- Ralph, C. John.; Geupel, Geoffrey R.; Pyle, Peter.; Martin, Thomas E.; DeSante, David F. 1993. *Handbook of field methods for monitoring landbirds*. U.S Department of Agriculture; Gen. Tech. Rep Report PSW-GTR-144. Pacific Southwest Research Station, Albany, CA.
- Skagen K. Susan, *Population Trends and Habits of Neotropical Migratory Birds in National Parks*, Fort Collins Science Center, Fort Collins, CO
- Sogge, K. Mark; Marshal, M. Robert; Sferra, J. Susan; Tibbitts, J. Timothy; A *Southwestern Willow Flycatcher Summary and Survey Protocol 1997*. US Department of Interior, National Park Service, Colorado Plateau Research Station, Northern Arizona University, Flagstaff, AZ 3pp.
- U. S. Bureau of Reclamation 2001. *Yearly report for the 2001 MAPS field season*. Report for the Bureau of Reclamation, Lower Colorado Region, Boulder City, Nevada. 3 pp.
- U. S. Bureau of Reclamation 2003. *Habitat Restoration on the Lower Colorado River Demonstration Projects: 1995-2002*. U. S. Department of the Interior, Lower Colorado Regional Office, Bureau of Reclamation. Boulder City, NV.
- U. S. Fish and Wildlife Service 1997. *Biological and conference opinion on lower Colorado operations and maintenance- Lake Mead to southerly international border*. Biological opinion issued to the Bureau of Reclamation. 1997.
- U. S. Fish and Wildlife Service. 2003. *Cibola National Wildlife Refuge*. <http://southwest.fws.gov/refuges/arizona/cibola.html>. Accessed Sept. 2003

Appendix 1. American Ornithological Union Codes, Common and Scientific Names for Birds Captured at Cibola and Pratt

<u>CODE</u>	<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>	<u>SITE CAPTURE</u>
ABTO	Abert's Towhee	<i>Pipilo aberti</i>	Both
ANHU	Anna's Hummingbird	<i>Calypte anna</i>	Pratt
BHGR	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	Both
BLGR	Blue Grosbeak	<i>Guiraca caerulea</i>	Both
BTYW	Black-throated Gray Warbler	<i>Dendroica nigrescens</i>	Cibola
CHSP	Chipping Sparrow	<i>Spizella passerine</i>	Both
COGD	Common Ground-Dove	<i>Columbina passerina</i>	Cibola
COYE	Common Yellowthroat	<i>Geothlypis trichas</i>	Both
GAQU	Gamble's Quail	<i>Callipepla gambelii</i>	Pratt
GTTO	Green-tailed Towhee	<i>Pipilo chlorurus</i>	Cibola
HAFL	Hammond's Flycatcher	<i>Empidonax hammondii</i>	Cibola
HOFI	House Finch	<i>Carpodacus mexicanus</i>	Both
HOWR	House Wren	<i>Troglodytes aedon</i>	Both
LAZB	Lazuli Bunting	<i>Passerina amoena</i>	Both
LBWO	Ladder-backed Woodpecker	<i>Picoides scalaris</i>	Pratt
LEGO	Lesser Goldfinch	<i>Carduelis psaltria</i>	Pratt
LISP	Lincoln's Sparrow	<i>Melospiza lincolnii</i>	Cibola
LUWA	Lucy's Warbler	<i>Vermivora luciae</i>	Both
MAWR	Marsh Wren	<i>Cistothorus palustris</i>	Cibola
MGWA	MacGillivray's Warbler	<i>Oporornis tolmiei</i>	Both
NAWA	Nashville Warbler	<i>Vermivora ruficapilla</i>	Both
OCWA	Orange-crowned Warbler	<i>Vermivora celata</i>	Both
RBNU	Red-breasted Nuthatch	<i>Sitta canadensis</i>	Cibola
SAVS	Savannah Sparrow	<i>Passerculus sandwichensis</i>	Both
SOSP	Song Sparrow	<i>Melospiza melodia</i>	Both
SWFL	Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	Unknown
VESP	Vesper Sparrow	<i>Pooecetes gramineus</i>	Cibola
WAVI	Warbling Vireo	<i>Vireo gilvus</i>	Both
WCSP	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	Cibola
WEFL	Western Flycatcher	<i>Empidonax difficil or occidentalis</i>	Both
WEKI	Western Kingbird	<i>Tyrannus verticalis</i>	Pratt
WETA	Western Tanager	<i>Piranga ludoviciana</i>	Both
WIFL	Willow Flycatcher	<i>Empidonax traillii</i>	Both
WIWA	Wilson's Warbler	<i>Wilsonia pusilla</i>	Both
YWAR	Yellow Warbler	<i>Dendroica petechia</i>	Both