



Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

Cibola Valley Conservation Area 2010 Annual Report



January 2011

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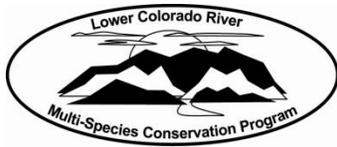
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Lower Colorado River Multi-Species Conservation Program

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Multi-Species Conservation Program
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ACRONYMS AND ABBREVIATIONS

AGFD	Arizona Game and Fish Department
cm ³ /m ²	cubic centimeters per square meter
CVCA	Cibola Valley Conservation Area
CVIDD	Cibola Valley Irrigation and Drainage District
DBH	diameter at breast height
FD	foliar density
FY	fiscal year
GBBO	Great Basin Bird Observatory
LCR	Lower Colorado River
LCR MSCP	Lower Colorado River Multi-Species Conservation Program
MCWA	Mohave County Water Authority
Reclamation	Bureau of Reclamation
SE	standard error
SWFL	southwestern willow flycatcher
TVV	total vegetation volume
YBCU	yellow-billed cuckoo

Symbols

%	percent
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Attachments

Attachment

- 1 Avian Species Detected

BACKGROUND

In 2007, the Bureau of Reclamation (Reclamation) secured 1,309 acres of land serviced by the Cibola Valley Irrigation and Drainage District (CVIDD) and established the Cibola Valley Conservation Area (CVCA). The Arizona Game and Fish Department (AGFD) acquired the CVCA in September 2007 through a multi-organizational agreement involving the AGFD, Reclamation, the Mohave County Water Authority (MCWA), The Conservation Fund, and the Hopi Tribe. Through these agreements, AGFD acquired CVCA fee title and water entitlements and agreed to manage the site.

Large habitat restoration sites such as CVCA are developed over a number of years, with restoration activities divided into phases as shown on figure 1. The report entitled *Cibola Valley Conservation Area Restoration Development Plan: Overview* (Reclamation 2007a) provides a summary of site and projected phase implementation.

In fiscal year (FY) 2006, Reclamation planted Phase 1, consisting of a 22-acre native plant nursery and approximately 69 managed acres of cottonwood-willow habitat. Phase 2 was originally scheduled for implementation in early spring of FY07 as reported in *CVCA Restoration Development Plan: Phase 2* (Reclamation 2007b), but was delayed for 1 year in an attempt to eradicate the invasive plant, morning glory's seed bank. Phase 3, consisting of 103 managed acres, was planted in FY07 as reported in *CVCA Restoration Development Plan: Phase 3* (Reclamation 2007c). Phase 2, a 71-acre parcel, was planted in March 2008 with approximately 160,000 coyote willow (*Salix exigua*), Goodding's willow (*Salix gooddingii*), and Fremont cottonwood (*Populus fremontii*) in accordance with *CVCA Restoration Development Plan: Phase 2*. Phase 4 consisted of two separate locations: 58 managed acres, north of Phase 3, and 187 managed acres west of Phase 1. These two sites were planted in FY09 with approximately 25,000 honey mesquite trees and 18,000 *Atriplex* plants in accordance with *CVCA Restoration Development and Monitoring Plan: Phase 4* (Reclamation 2008). Phase 5, consisting of 71 managed acres, was planted in FY10 as reported in *CVCA Restoration Development Plan: Phase 5* (Reclamation 2009). These development plans, as well as additional information on design, planting, and monitoring of the CVCA site, is located on the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) Web site <<http://www.lcrmscp.gov>>.

This report documents the development and management of land cover types through October 2010, presents the results of monitoring, and makes recommendations for future adaptive management of lands within CVCA.

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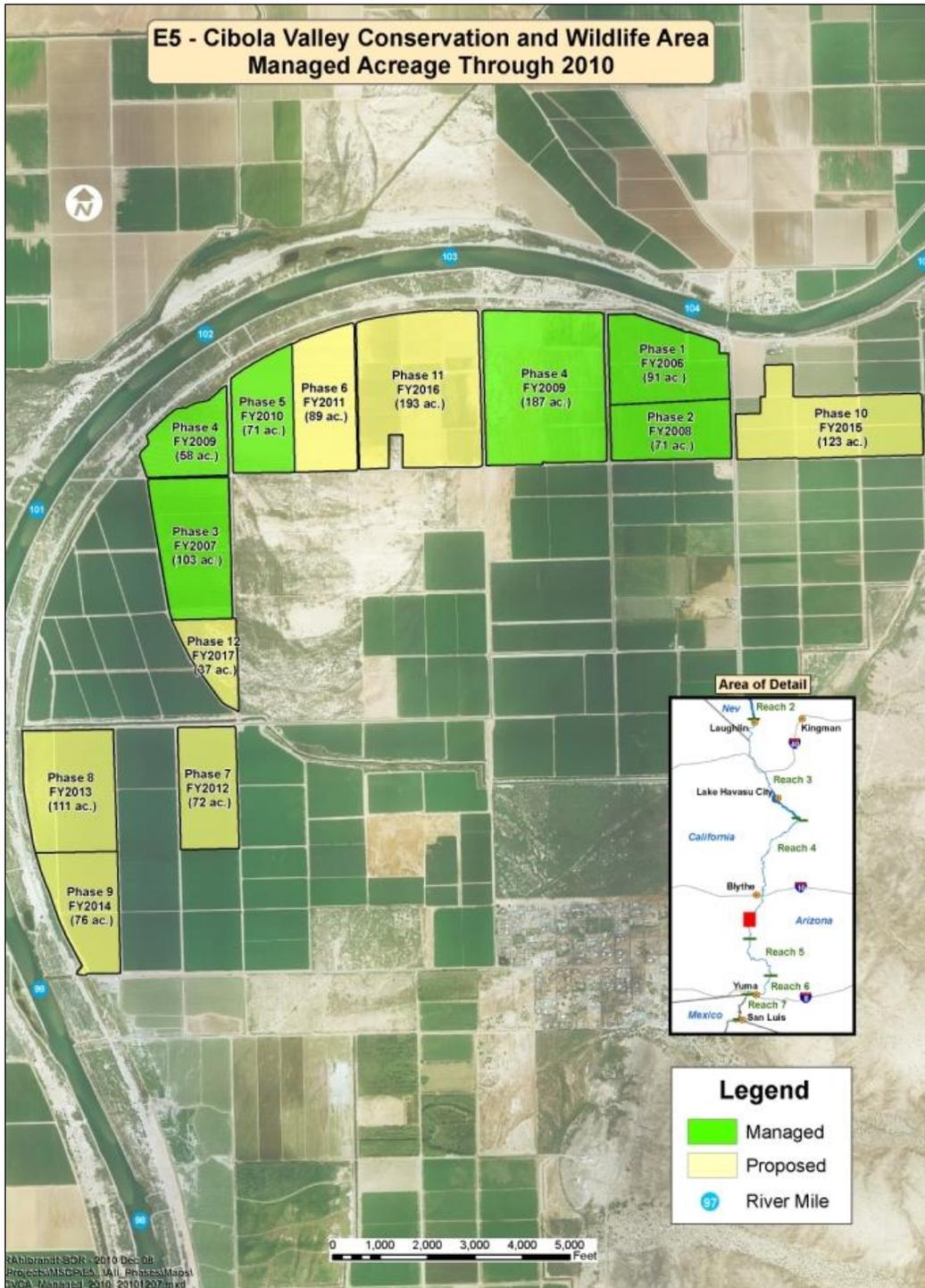


Figure 1.—Current phase map of Cibola Valley Conservation Area.

SITE INFORMATION

Cottonwood-willow land cover created within CVCA will be managed for the southwestern willow flycatcher (*Empidonax traillii extimus*) (SWFL), yellow-billed cuckoo (*Coccyzus americanus occidentalis*) (YBCU), and other species covered under the LCR MSCP. As part of habitat creation, native plant communities are established and managed for covered species by integrating seral stages of vegetation, moist soil, standing water, and open areas into mosaics of riparian habitat.

Location

The 1,309-acre CVCA is located in southwestern La Paz County, Arizona, which is approximately 15 miles south of Blythe, California. Cibola Valley encompasses the land inside an engineered bend of the lower Colorado River and a remnant oxbow on the west side of the river (Palo Verde Oxbow). Farmed primarily for cotton and alfalfa, CVCA is bordered to the south by Cibola National Wildlife Refuge and on the east by unimproved land under the jurisdiction of the Bureau of Land Management. The river forms the north and west boundaries, except for the Palo Verde Oxbow, from River Miles 98.8 to 104.9.

Land Ownership

AGFD acquired CVCA land and water rights in 2007 and 2008 through multiple agreements involving AGFD, Reclamation, MCWA, The Conservation Fund, and the Hopi Tribe. Through these agreements, AGFD acquired CVCA fee title and water entitlements and agreed to manage the site. The entitlements are subject to an existing long-term lease of the land and water rights to Reclamation through April 5, 2055, as part of the LCR MSCP. Short-term leases of the land to farmers for crop production also exist on portions of the acquired land.

Agreements

A lease was signed in 2007 between Reclamation and AGFD that assures availability of land and water resources for the 50-year term of the program.

Water Availability

For the long term, AGFD has a 2,719 acre-foot per year diversionary right of 4th Priority Colorado River water available. In addition, Reclamation has a 4th Priority entitlement for 118.94 acre-feet per year (table 1).

Table 1.—Water entitlement and priority

Term	Entitlement	Priority
Long-term		
AGFD entitlement	2,719 acre-feet/year	4th
Reclamation entitlement	119 acre-feet/year	4th
Long-term total	2,838 acre-feet/year	
Short-term		
Multi-year lease from MCWA entitlement	5,997 acre-feet/year	4th
Multi-year lease from MCWA entitlement	750 acre-feet/year	5th
Multi-year lease from MCWA entitlement	1,000 acre-feet/year	6th
Short-term total	7,747 acre-feet/year	

Additionally, a 7,747 acre-foot diversionary right of combined 4th, 5th, and 6th Priority Colorado River water is currently available for lease each year from MCWA to the LCR MSCP to accommodate the higher water diversions required to establish habitat.

HABITAT DEVELOPMENT AND MANAGEMENT

Planting

Honey mesquite was planted over 71 acres in Phase 5 of the development of CVCA. This phase is designed to mimic the historical landscape patterns of plant communities along the lower Colorado River (LCR) and create an integrated mosaic of habitats. Phase 5 was first planted with winter wheat in January 2009 at the request of AGFD. Wheat was used as a cover crop to help keep the site weed free and as a wildlife forage crop. Phase 5 was planted in March 2010 with approximately 10,000 honey mesquite trees (*Prosopis glandulosa* “torreyanna”) and 10,000 atriplex (*Atriplex lentiformis*). Phase 5 was divided into two fields (or checks), rather than the eight originally stated in the development plan, since furrows were being utilized (figure 2).



Figure 2.—As-built of Phase 5.

In Phase 5, native plants were planted in 2-foot-deep furrows with an in-line spacing of approximately 15 feet and a furrow row spacing of approximately 18 feet. One-gallon potted honey mesquites were hand planted in the trough of the furrow. Atriplex seedlings were planted just inside the furrows, near the top of the furrow, between each mesquite tree. This wide furrow spacing saves irrigation water and provides adequate room for a tractor to disk invasive saltcedar and volunteer cotton, which grow between the planted furrows (figure 3).



Figure 3.—Planting in furrows.

A contracted agronomist continued taking soil samples, recommending fertilizer applications, and providing soil moisture monitoring information. The consultant conducted inspections that focused on general plant health, evidence of disease, overirrigation, underirrigation, water drainage, general nutrition, and insect problems. All reports were forwarded to Reclamation with recommendations for treatment.

Irrigation

Method

Flood irrigation was used to provide water to each field. Irrigation scheduling was determined by the contract farmer and with input from Reclamation.

Water Applied

Table 2 depicts the number of acre-feet of water applied to each phase by calendar year. These values are based on monthly invoices received by CVIDD.

Table 2.—Irrigation water applied in 2010

	2010						
	Phase 1 (86 acres)	Phase 2 (70 acres)	Phase 3 (101 acres)	Phase 4 (60 acres)	Phase 4 ground stabilization (175 acres)	Phase 5 (61 acres)	Phase 6 (89 acres)
	Acre-feet applied*	Acre-feet applied*	Acre-feet applied *	Acre-feet applied*	Acre-feet applied*	Acre-feet applied*	Acre-feet applied*
March	47.00	40.40	75.00	0.00	0.00	18.80	46.20
April	121.80	0.00	39.60	40.10	101.90	24.30	81.40
May	112.50	45.30	106.40	18.60	0.00	22.00	31.60
June	134.20	82.90	88.50	16.60	160.60	29.90	0.00
July	165.60	55.30	104.20	48.00	233.80	14.90	0.00
August	35.10	0.00	108.90	0.00	52.60	0.00	0.00
September	37.20	0.00	0.00	0.00	49.10	0.00	0.00
October	0.00	0.00	0.00	0.00	0.00	0.00	0.00
November	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acre-feet/ year	653.40	223.90	522.60	123.30	598.00	109.90	159.20
Acre-feet/ acre of phase	7.64	3.22	5.17	2.06	3.42	1.82	1.79

* Acre-feet applied – Represents the quantity of acre-feet of irrigation water in acre-feet applied to each phase.

The amount of water applied to the individual fields of Phases 1 and 2 during 2010 is an approximation. In 2008, the irrigation system was modified, and it was difficult of to measure the exact volume of water delivered to each of the adjacent fields. When calculating the volume of water applied to each phase during 2010, it is more accurate to combine the volumes delivered to Phases 1 and 2, as exactly how much water reached the individual phases is unknown.

Site Maintenance

There were no major improvements to this site, with the exception of scheduled field maintenance. However, over the life of the program, additional site improvements are likely.

Management of Existing Habitat

Weed Management

Ivyleaf morning glory was present again in the fields of both Phases 1, 2, and, to a smaller degree, in Phase 3. The incursion was not as widespread as in the previous year. In an attempt to control the morning glory, a trial application of Harrell's granular herbicide 75 was aerially applied in field B-2 (5 acres) in Phase 1 and fields 2-5 (6.5 acres) in Phase 2 (figure 4). The manufacturer recommended two separate applications on each field. The two treatments did not noticeably affect the morning glory's growth.

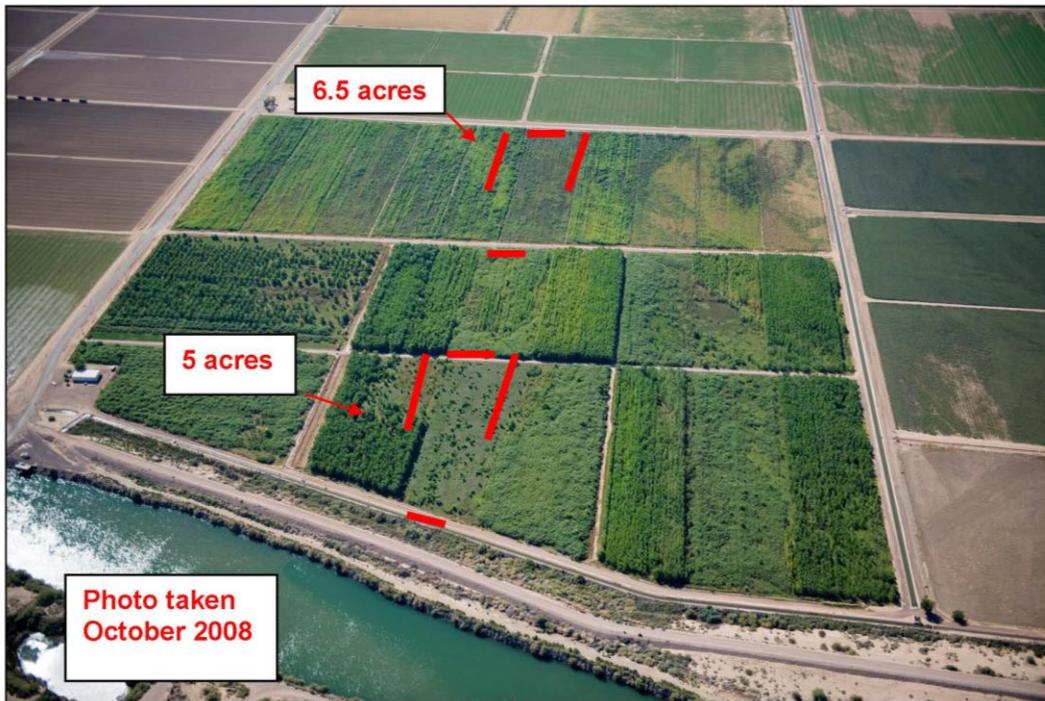


Figure 4.—Aerial view of herbicide application in Phases 1 and 2.

Field crews continued to control morning glory, volunteer cotton, and saltcedar with handtools. Using crews proves to be an effective method of controlling invasives as they germinate. The crews remove these weeds and other invasives from the fields twice a year – in the spring and in the fall.

Nursery Management

The nursery, created in Phase 1, will be available for collection of plant material (seeds and cuttings) to support the establishment of native trees along the LCR.

Pest Management

No pest management was needed this year.

Wildfire Management

An LCR MSCP Conservation Area Specific Fire Management and Law Enforcement Strategy has been finalized for CVCA and is posted on our Web site. The LCR MSCP will continue to work with local State and Federal fire agencies to reduce the risk of wildland fire and maintain clear lines of communication between agencies.

Public Use

AGFD has the authority (and is the lead) to regulate hunting and recreation uses pursuant to AGFD statutes, regulations, and policies at CVCA. In cooperation with Reclamation, AGFD coordinates its public use and related activities so they are consistent with and do not adversely affect restoration activities at CVCA.

Law Enforcement

Reclamation continues to work proactively with AGFD to ensure all State wildlife statutes are enforced. The Mohave Valley County Sherriff's Department is the agency responsible for enforcement of State statutes on the conservation area.

MONITORING

Vegetation Monitoring

A new monitoring protocol was implemented in 2010 at CVCA. Five phases were monitored, including: Cibola Valley Conservation Area Phase 1 (CVCA1), planted in 2006; Cibola Valley Conservation Area Phase 2 (CVCA2), planted in 2008; Cibola Valley Conservation Area Phase 3 (CVCA3), planted in 2007; Cibola Valley Conservation Area Phase 4 (CVCA4), divided into east and west sections, planted in 2009; and Cibola Valley Conservation Area Phase 5 (CVCA5), planted in 2010. Vegetation data were collected within several parameters to evaluate vegetation composition and structure from the ground layer to the upper canopy layer. The parameters included tree and shrub density, tree heights, canopy closure, total vegetation volume, foliage density, ground

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cover, and distance to nearest surface water. Detailed descriptions of sampling design, methodology, analyses, and discussion will be found in the report entitled *Results from 2010 Vegetation Monitoring at Four Multi-Species Conservation Program Habitat Creation Areas* (Bangle, in press).

Table 3 summarizes the habitat characteristics at CVCA. Cottonwood, Goodding's willow, and coyote willow were planted at CVCA in Phases 1–3. Honey mesquite was planted in Phases 4E, 4W, 5, and one section of Phase 3.

For clarity, a “standard tree” is defined here as any tree that generally displays one main trunk (i.e., cottonwood, willow, etc.). This is contrary to multi-stemmed trees such as mesquite or saltcedar. Additionally, standard tree size classes were determined by diameter at breast height (DBH) and are defined as:

- *Size Class 4* = >4.7 inches (>12 centimeters) DBH
- *Size Class 3* = >3.1–4.7 inches (>8–12 centimeters) DBH
- *Size Class 2* = 1.0–3.1 inches (2.5–8 centimeters) DBH
- *Size Class 1* = <1.0 inch (<2.5 centimeters) DBH

Whereas, mesquite trees were recorded in two size classes based on height as follows:

- *Size Class 2* = ≥ 4.6 feet (≥ 1.4 meters) height
- *Size Class 1* = <4.6 feet (<1.4 meters) height

The average heights of all tree species combined per phase are shown in table 3 as well as averages by species. In 2010, standard tree heights were measured in two size classes (3 and 4).

Cottonwood and Goodding's willow dominated the upper canopy in Phases 1 through 3 (figure 5a). Coyote willow dominated the mid-canopy in Phases 1 and 2. The shrub canopy dominated in Phase 3. Honey mesquite dominated the three mesquite-planted phases (4E, 4W, and 5) (figure 5b).

The estimated total number of trees per acre by species is presented in table 3. The “trees per acre” calculation was extrapolated to total acres to get an estimated number of trees per phase.

The average percent canopy closure by phase is also presented in table 3. Phases 1 and 2 averaged 89 and 83 percent (%) closure, respectively; Phase 3 averaged 66.4% closure. Closures in the mesquite phases were lower, averaging 5.4, 16.7, and 0.7 % closure, respectively.

Vegetation structure was evaluated using total vegetation volume (TVV) and vertical foliage density (FD). TVV is an index that estimates the total amount of

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Table 3.—Summary of habitat characteristics within plots at Cibola Valley Conservation Area

(n refers to number of plots unless otherwise noted. * n for tree heights represents the number of trees measured. § surface water refers to the Colorado River. ^Δ trees in size classes 3 and 4 were measured for height; two *Salix* individuals were measured in SC3, the remaining were in SC1 or SC2 and not measured for height.

Popfre = *Populus fremontii*; Salgoo = *Salix gooddingii*; Salexi = *Salix exigua*; Progla = *P. glandulosa*. Note: The order of sites is by planting year; therefore, CVCA3 is before CVCA2.)

Parameter		CVCA1 2006 (n = 35)	CVCA3 2007 (n = 37)	CVCA2 2008 (n = 22)	CVCA4E 2009 (n = 18)	CVCA4W 2009 (n = 22)	CVCA5 2010 (n = 27)
Average height ^Δ (feet) (SE)* range	All species	n = 307* 35.8 (1.0) 0.0–46.0	n = 147* 22.3 (1.0) 3.9–37.7	n = 93* 31.2 (0.3) 26.2–36.1	n = 141* 6.2 (0.1) 3.6–9.8	n = 183* 7.2 (0.1) 3.6–11.2	n = 351* 6.2 (0.1) 2.6–9.5
	Popfre	n = 250* 37.1 (0.3) 29.5–45.9	n = 91* 29.5 (0.3) 23.0–37.7	n = 83* 31.2 (0.3) 26.2–36.1	n = 0* 0.0	n = 0* 0.0	n = 0* 0.0
	Salgoo	n = 54* 31.5 (0.3) 23.0–37.7	n = 7* 24.6 (0.7) 23.0–27.9	n = 10* 30.2 (1.3) 26.2–34.4	n = 0* 0.0	n = 0* 0.0	n = 0* 0.0
	Salexi	n = 2* ^Δ 20.3 (0.7) (19.7–21.0)	0.0 ^Δ	0.0 ^Δ	n = 0* 0.0	n = 0* 0.0	n = 0* 0.0
	Progla	n = 1* 6.2 (0.0)	n = 49* 8.9 (0.3) 3.9–11.2	n = 0* 0.0	n = 141* 6.2 (0.1) 3.6–9.8	n = 183* 7.2 (0.1) 3.6–11.2	n = 351* 6.2 (0.1) 2.6–9.5
Estimated trees per acre/ Estimated trees per phase	All species	5,995/ 545,512	3,083/ 317,558	2,401/ 170,445	151/ 6,795	189/ 10,951	149/ 10,579
	Popfre	500/ 45,524	801/ 82,532	338/ 23,998	0/ 0	0/ 0	0/ 0
	Salgoo	137/ 12,502	456/ 46,970	685/ 48,626	0/ 0	0/ 0	0/ 0
	Salexi	5,356/ 487,395	1,776/ 182,962	1,369/ 97,173	0/ 0	0/ 0	0/ 0
	Progla	0/0	49/ 5,094	0/0	151/ 6,795	189/ 10,951	149/ 10,579
Average percent canopy closure (SE) range	89.3 (1.3) 75.1–100.0	66.4 (3.3) 0.0–92.4	83.0 (6.7) 1.1–99.4	5.4 (2.1) 0.0–36.7	16.7 (4.7) 0.0–74.6	0.7 (0.6) 0.0–15.7	
Total vegetation volume (cm ³ /m ²)** (SE)	0.13 (0.01)	0.15 (0.01)	0.16 (0.01)	0.1 (0.02)	0.17 (0.03)	0.03 (0.01)	
Average percent cover live vegetation (SE) range	18.1 (2.1) 0.0–97.5	28.2 (2.0) 0.0–85.0	9.2 (2.0) 0.0–85.0	24.2 (2.9) 0.0–85.0	15.7 (2.5) 0.0–85.0	6.2 (1.2) 0–62.5	
Average percent cover litter (SE) range	57.2 (2.9) 0.0–97.5	36.1 (2.4) 0.0–97.5	58.0 (3.6) 0.0–97.5	0.8 (0.5) 0.0–37.5	2.2 (0.5) 0.0–17.5	0.0 (0.0) 0.0–0.0	
Average percent cover bare ground (SE) range	1.5 (0.5) 0.0–37.5	12.4 (2.1) 0.0–85.0	6.4 (1.5) 0.0–85.0	49.7 (3.1) 62.5–97.5	43.9 (3.2) 37.5–85	60.1 (2.2) 62.5–97.5	
Distance to surface water § (feet) (SE) range	1,178 (84) 404–2,106	2,927 (113) 1,640–4,167	2,438 (70.5) 1,781–3,001	1,945 (181) 860–3,274	1,290 (70.9) 797–1,952	1,866 (100) 984–2,900	

* SE = Standard error.

** Cubic centimeters per square meter.

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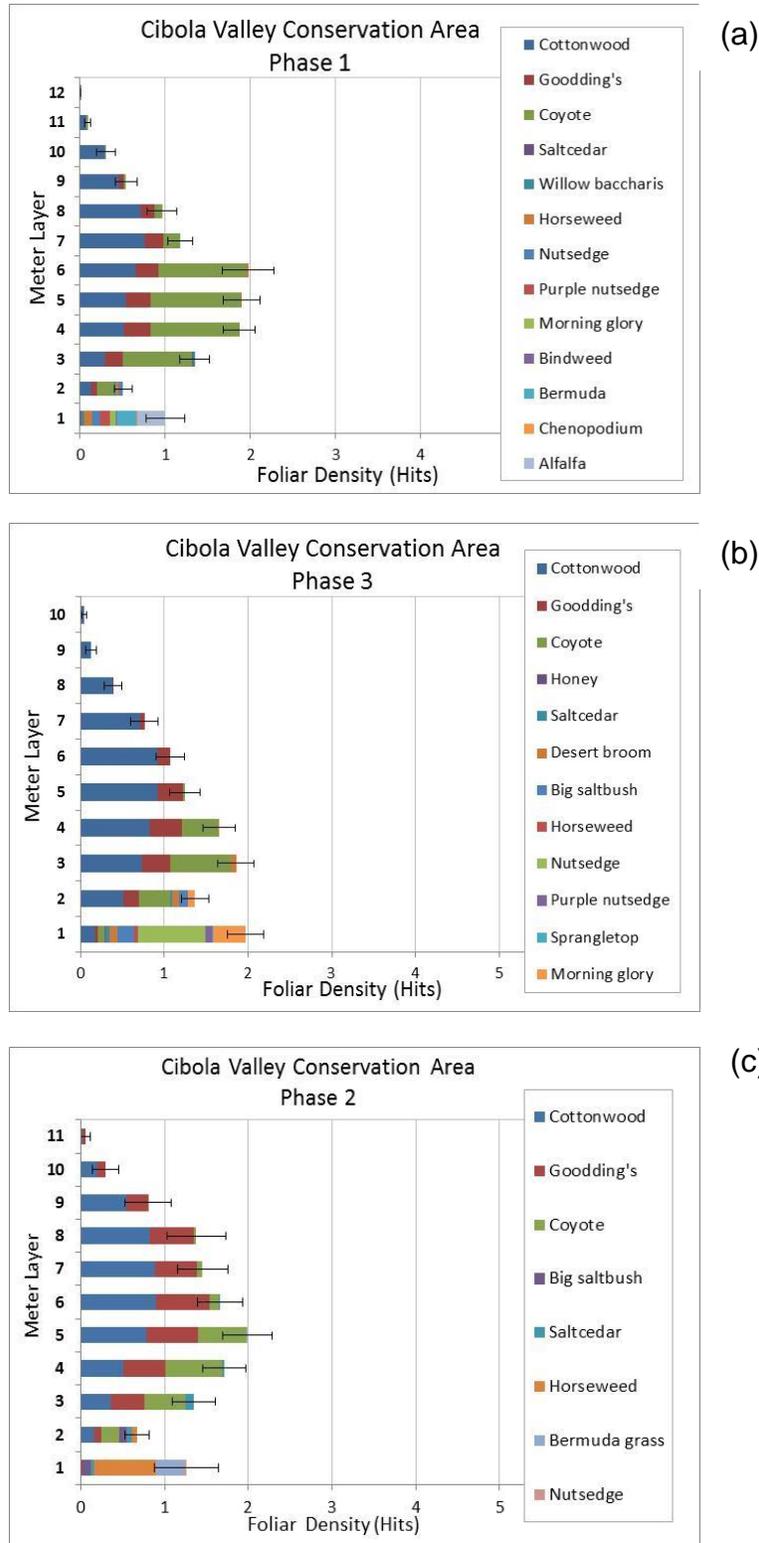


Figure 5a.—Vertical foliage density by species and meter layer (\pm SE) at Cibola Valley Conservation Area: (a) Phase 1, (b) Phase 3, and (c) Phase 2 presented in order of planting year.

(Note: CVCA3 was planted before CVCA2.)

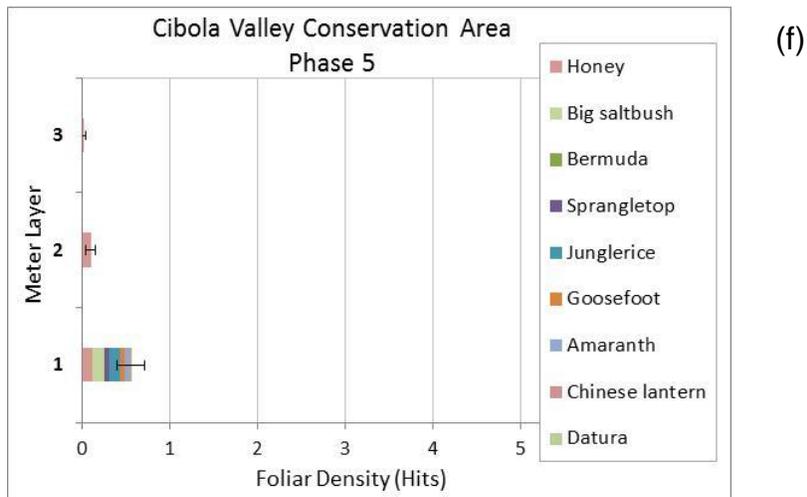
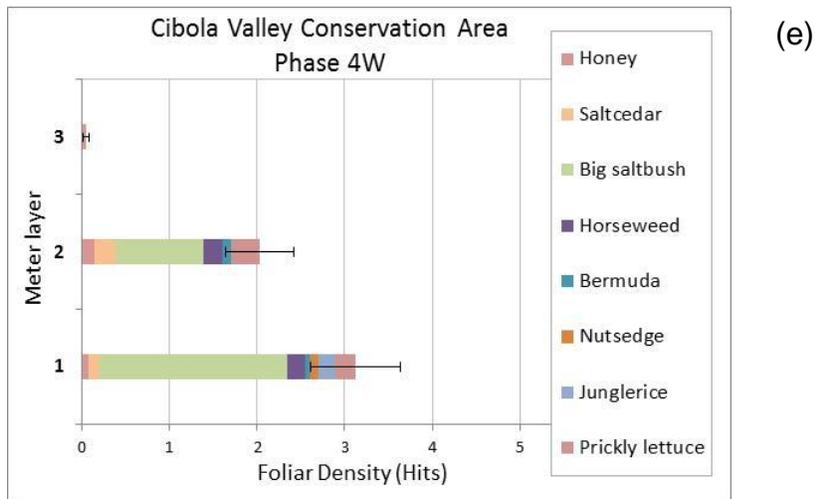
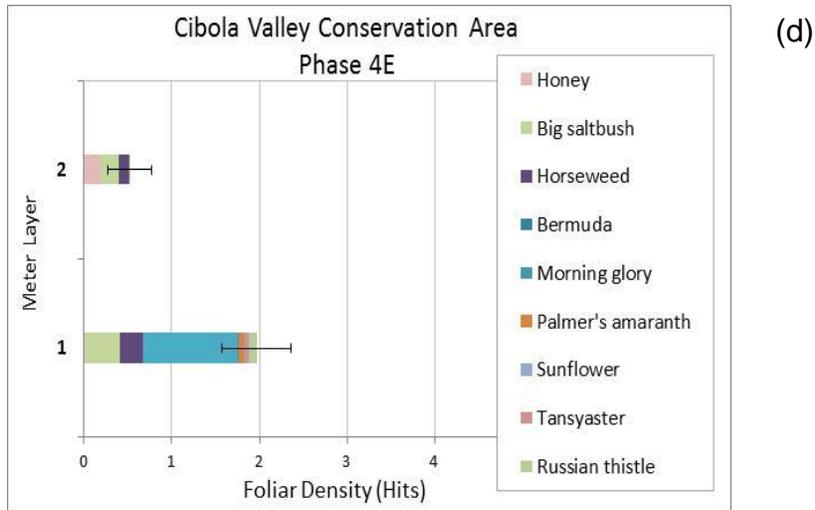


Figure 5b.—Vertical foliage density by species and meter layer (\pm SE) at Cibola Valley Conservation Area: (d) Phase 4E, (e) Phase 4W, and (f) Phase 5.

vegetation in an area. Table 3 shows TVV for all phases at CVCA, which are on the low end of known values from other studies in similar habitat (reportedly ranging between 0.1–1.1 cubic meters per square meter).

Foliar density reflects the distribution of vegetation in vertical layers within the habitat. Figure 5a (a–c), shows FD in Phases 1–3, and figure 5b (d–f) shows FD in Phases 4E, 4W, and 5. The highest density of vegetation at CVCA1 was in the 5–6 meter layer (16.4–19.7 feet), at CVCA2 in the 4–5 meter layer (13.1–16.4 feet), and at CVCA3 in the 0–1 meter layer (0.0–3.3 feet). At the mesquite phases, vegetation occurred mostly in the first 2 meters (6.6 feet). Vegetation volume and FD are likely to increase as the sites mature and additional species establish at each site.

Figure 6 shows the vertical distribution of vegetation averaged across canopy layers identified as important distinctions in structure for several bird species: shrub canopy (1–3 meters), middle canopy (3–6 meters), and upper canopy (>6 meters). The herbaceous layer (0–1 meter) was separated from the actual canopy “layers” so as not to overestimate the shrub canopy; the “herbaceous layer” is not exclusively herbaceous species.

Ground cover estimates for live vegetation, litter, and bare ground are shown in table 3. Ground cover of live vegetation varied across phases ranging from 6.2 to 28.2% cover. CVCA Phases 1 and 2 had the highest litter cover at 57 and 58%, respectively. Bare ground cover was highest in the mesquite phases (4E, 4W, and 5).

The distance to surface water was measured using digital aerial imagery and ArcMap software (table 3). The nearest constant surface water to CVCA was the Colorado River that ranged from 1,178 to 2,927 feet from the plots.

Small Mammal Monitoring

Presence/absence surveys were conducted on March 30, 2010. Two rows of 30 traps were placed on the east side of Phase 3 in an area with open canopy. Dead sedge and plenty of grasses and weeds had created a thick ground cover. Several *Baccharis* approximately 2.5 feet (0.75 meter) tall were also scattered throughout the area. A single adult male *Sigmodon arizonae* was captured (Reclamation 2010).

Bat Monitoring

Acoustic and capture survey methods were used to monitor bats at CVCA.

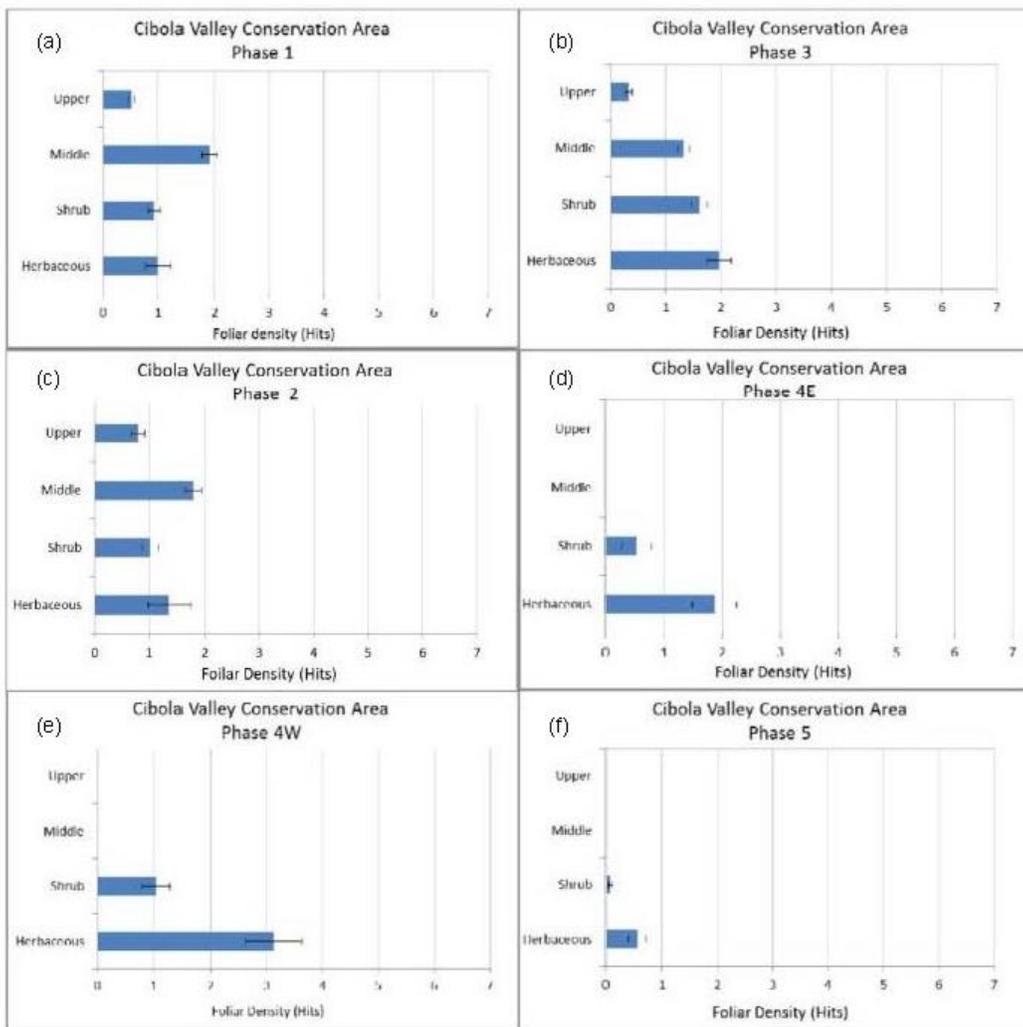


Figure 6.—Vertical foliage density in the herbaceous, shrub, middle, and upper canopy layers at Cibola Valley Conservation Area (\pm SE).
Herbaceous = 0–1 m, shrub = 1–3 m, middle = 3–6 m, and upper = >6 m.
(a) CVCA1, (b) CVCA3, (c) CVCA2, (d) CVCA4E, (e) CVCA4W, and (f) CVCA5. Note: CVCA3 was planted before CVCA2.

Acoustic Surveys

Anabat bat detectors were deployed across the site quarterly to determine bat activity across habitat types. Sixty detector nights were completed in 12 monitoring sites in 2010. Bat activity is expressed in call minutes, which indicate that a given species is present if it is recorded at least once within a 1-minute period. Table 4 lists the raw data for the total number of call minutes of LCR MSCP bat species for each year sampled in cottonwood, willow, and mesquite habitats combined across 4 years of sampling. It provides a very general view of the number of minutes of bat activity for the four focal bat species

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Table 4.—Total number of call minutes recorded for the four focal bat species, plus all other bat species, at Cibola Valley Conservation Area from FY07 through FY10 in restoration habitats

Species	FY07	FY08	FY09	FY10	All years
Western red bat	4	0	91	197	292
Western yellow bat	0	0	3	55	58
California leaf-nosed bat	36	18	14	55	123
Townsend's big-eared bat	1	0	1	5	7
All other species	1,294	1,426	1,687	7,643	12,050
Total call minutes	1,335	1,444	1,796	7,955	12,530

in comparison to the entire bat community at habitat creation areas. A dramatic increase in western red bat activity occurred initially in 2009, with an even greater increase in 2010.

For more details of how these data are collected and analyzed, see the report entitled *Post-Development Bat Monitoring 2007–2010 Intensive Acoustic Surveys Completion Report* (Broderick 2012).

Capture Surveys

This was the second year of bat capture surveys at the CVCA. Mist nets were deployed 1 night each month from May – September. One winter survey was also conducted in early February. Table 5 shows the captures of LCR MSCP species compared to all other species across all years. The western red bat (*Lasiurus blossevillii*) and California leaf-nosed bat (*Macrotus californicus*) were captured during the winter survey in FY10. The western yellow bat (*Lasiurus xanthinus*) was captured during the summer season. Bat capture surveys will continue in 2011. See *Post-Development Bat Monitoring of Habitat Creation Areas along the Lower Colorado River – 2010 Capture Surveys* (Calvert 2012) for a more detailed account of the bat capture surveys and methods.

Avian Monitoring

General avian surveys were conducted at CVCA for six LCR MSCP avian covered species and all noncovered avian species. Single species surveys were conducted for the SWFL and YBCU.

General Bird Surveys

Surveys of habitat creation sites with more than 2 years' growth to determine their use for breeding by other LCR MSCP avian species were conducted using an

Table 5.—Total LCR MSCP bat species captures across years at Cibola Valley Conservation Area (n= number of survey nights)

Species	FY09 n = 5	FY10 n = 6	All years
Western red bat	3	2	5
Western yellow bat	5	4	9
California leaf-nosed bat	1	4	5
Townsend's big-eared bat	0	0	0
All other species	112	179	291
Total	121	189	310

intensive area search method. In 2010, Phase 1 was split into three area search plots, Phase 2 was covered with one area search plot, and Phase 3 was split into two area search plots. The Sonoran yellow warbler (*Dendroica petechiasonorana*) was confirmed breeding. Yellow warblers (*Dendroica sonorana*) that were classified as nonbreeders were also detected at the site. Details of the intensive area search method and further results are found in *Summary Report on the Lower Colorado River Riparian Bird Surveys, 2008–2010* (Great Basin Bird Observatory 2011).

Southwestern Willow Flycatcher Surveys

Restoration sites at CVCA were surveyed five times during 2010. All birds detected before June 15 are not considered to be of the covered *extimus* subspecies. All information is from McLeod and Pellegrini (2011).

- Phase 1 – Fifteen willow flycatchers were detected on May 2, 17, and June 9. The site was surveyed five times, totaling 14.8 observer hours.
- Phase 2 – Eighteen willow flycatchers were detected on May 24. The site was surveyed five times, totaling 16.5 observer hours.
- Phase 3 – Four willow flycatchers were detected on June 9. The site was surveyed five times, totaling 9 observer hours.

Yellow-billed Cuckoo Surveys

Yellow-billed cuckoo's were detected at CVCA Phases 1, 2, and 3 multiple times throughout the breeding season. Table 6 lists the number of nests detected at

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Table 6.—LCR MSCP covered avian species detected at Cibola Valley Conservation Area in 2010

LCR MSCP covered species	Detected	Number of confirmed breeding pairs
Arizona bell's vireo	0	0
Sonoran yellow warbler	6	3
Willow flycatchers	13*	0
Yellow-billed cuckoo	25	12 (6 nests)

* = Migrants.

CVCA Phases 1–3. Researchers detected possible, but not confirmed, breeding in Phase 3. Of the 6 nests detected, 5 nests were successful and fledged a total of 13 young; 12 of the birds were banded.

MacNeill's Sootywing Monitoring

Restoration plots containing quailbush (*Atriplex lentiformis*) shrubs at CVCA were sampled for adult MacNeill's sootywing on seven to eight dates during April to September 2010. Table 7 shows where phases were sampled.

Table 7.—Sampling at Cibola Valley Conservation Area by phase

Phases	Year planted	Acreage	Transect sampled	Detected
2	2008	8	West edge	ND ¹
3	2008	6	South edge	X ²
4 – West	2009	58	Center E-W road	X
4 – East	2009	90	Center E-W road and south edge	X
5	2010	71	South edge	X

¹ ND = Not detected.

² X = Species present.

Most sootywings were found at the west planting of Phase 4. Sootywings were abundant from late April to early July. Sootywing populations were absent in Phase 2 and low at the remaining phases. By mid-August, sootywing populations had disappeared at the phases, most likely resulting from an absence of rainfall that eliminated the butterfly's primary source of nectar, heliotrope (*Heliotropium curassavicum*). Heliotrope responds to summer rainfall events and produces

flowers that many species utilize as a nectar resource during the hot summer months. At the end of the season, sootywings began to increase in Phase 5, the latest phase to be planted at CVCA.

HABITAT CREATION CONSERVATION MEASURE ACCOMPLISHMENT

The process for habitat creation conservation measure accomplishment has not yet been finalized. Once the process is finalized, information in this section will be used to establish acres of created habitat for each conservation measure.

ADAPTIVE MANAGEMENT RECOMMENDATIONS

Adaptive management relies on the initial receipt of new information, the analysis of that information, and the incorporation of the new information into the design and/or direction of future project work (Reclamation 2007b). The Adaptive Management Program's role is to ensure that habitat creation sites are biologically effective and fulfill the conservation measures outlined in the Habitat Conservation Plan for 26 covered species and to potentially benefit 5 evaluation species. Post-development monitoring and species research results will be used to adaptively manage habitat creation sites after initial implementation. Once monitoring data are collected over a few years, and then analyzed for CVCA, recommendations may be made through the adaptive management process for site improvements in the future. At this time, there are no adaptive management recommendations for CVCA.

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ATTACHMENT 1

Avian Species Detected

Presence of all avian breeders, migrants, and other nonbreeders detected during rapid area searches at Cibola Valley Conservation Area habitat creation plots in 2010. Fly-overs are included in this list, but incidental birds that were not in or above the plot during the survey are not included (Great Basin Bird Observatory 2011). Breeders are denoted by an *.

Abert's towhee*	Lesser goldfinch*
American kestrel	Lesser nighthawk
American robin	Lincoln's sparrow
Anna's hummingbird*	Lucy's warbler
Ash-throated flycatcher*	Macgillivray's warbler
Barn owl	Mallard
Barn swallow	Merlin
Bendire's thrasher	Morning dove*
Black-chinned hummingbird*	Nashville warbler
Black-headed grosbeak	Northern harrier
Black-tailed gnatcatcher	Northern mockingbird
Black-throated gray warbler	Northern parula
Blue grosbeak*	Northern rough-winged swallow
Brewer's blackbird	Olive-sided flycatcher
Brown-headed cowbird*	Orange-crowned warbler
Bullock's oriole*	Phainopepla
Cassin's vireo	Red-winged blackbird*
Chipping sparrow	Ruby-crowned kinglet
Cliff swallow	Say's phoebe
Common ground-dove*	Swainson's hawk
Common raven	Song sparrow
Common yellowthroat*	Townsend's warbler
Cordilleran flycatcher	Tree swallow
Costa's hummingbird	Turkey vulture
Double-crested cormorant	Vaux's swift
Eurasian collared-dove	Verdin
European starling*	Violet-green swallow
Gambel's quail*	Warbling vireo
Great blue heron	Western-type flycatcher*
Great egret	Western kingbird*
Greater roadrunner*	Western tanager
Great-horned owl	Western wood-pewee
Great-tailed grackle	White-crowned sparrow
Green-tailed towhee	White-faced ibis
Harris's hawk	White-throated swift
Hermit thrush	White-winged dove*
House finch	Willow flycatcher
Indigo bunting*	Wilson's warbler
Killdeer	Yellow warbler*
Ladder-backed woodpecker*	Yellow-breasted chat
Lazuli x indigo bunting hybrid	Yellow-headed blackbird