Costa's Hummingbird, photo by ©Gordon Karre

Conservation Profile

Species Concerns
Invasive Species
Climate Change (Droughts)
Urbanization
Unsustainable Livestock Grazing
Increasing Fire Frequency

Conservation Status Lists	
USFWS[1]	BCC List (BCR 33)
AZGFD[2]	Tier 1C
DoD[3]	No
BLM[4]	No
PIF Watch List[5b]	No
PIF Regional Concern[5a]	No

Migratory Bird Treaty Act
Covered

PIF Breeding Population Size Estimates[6]	
Arizona	480,000 ◑
Global	3,400,000 ◑
Percent in Arizona	14.11%

PIF Population Goal[5b]
Maintain

Trends in Arizona	
Historical (pre-BBS)	Unknown
BBS[7] (1968 – 2013)	-3.22/year ○

PIF Urgency/Half-life (years)[5b]
37

Monitoring Coverage in Arizona	
BBS[7]	Not adequate
AZ CBM	Adequate

Associated Breeding Birds
White-winged Dove, Elf Owl, Ash-throated Flycatcher, Verdin, Cactus Wren, Black-tailed Gnatcatcher, Phainopepla, Lucy's Warbler

Breeding Habitat Use Profile

Habitats Used in Arizona
Primary: Sonoran Desertscrub
Secondary: Lowland Riparian Woodlands

Key Habitat Parameters	
Plant Composition	Paloverde, jojoba, ocotillo, acacia, ironwood, creosote, desert lavender, and chuparosa (especially important in winter)[8]
Plant Density and Size	Structural attributes variable, but generally require tall shrubs or trees for foraging and nesting
Microhabitat Features	Springs or dry washes important; 3 – 10 suitable flowering forbs and shrubs in territory; ocotillo, chuparosa, creosote bush, penstemon spp., desert willow, etc.[8]
Landscape	General avoidance of exotic urban landscapes and extensive agricultural lands[9]; otherwise unknown

Elevation Range in Arizona
100 – 4,700 feet[9]

Density Estimate
Density: Up to 30 – 40 birds/100 acres[8]
Territory Size: Not found

Natural History Profile

Seasonal Distribution in Arizona	
Breeding	January – early June[8,9]
Migration	Year-round resident in many areas, altitudinal migrant and wanderer post-breeding (May – September)
Winter	October – December

Nest and Nesting Habits	
Type of Nest	Cup[10]
Nest Substrate	Paloverde, jojoba, ironwood, acacia, etc.[8,9]
Nest Height	1.6 – 15.5 feet (average ~ 6 feet)[9]

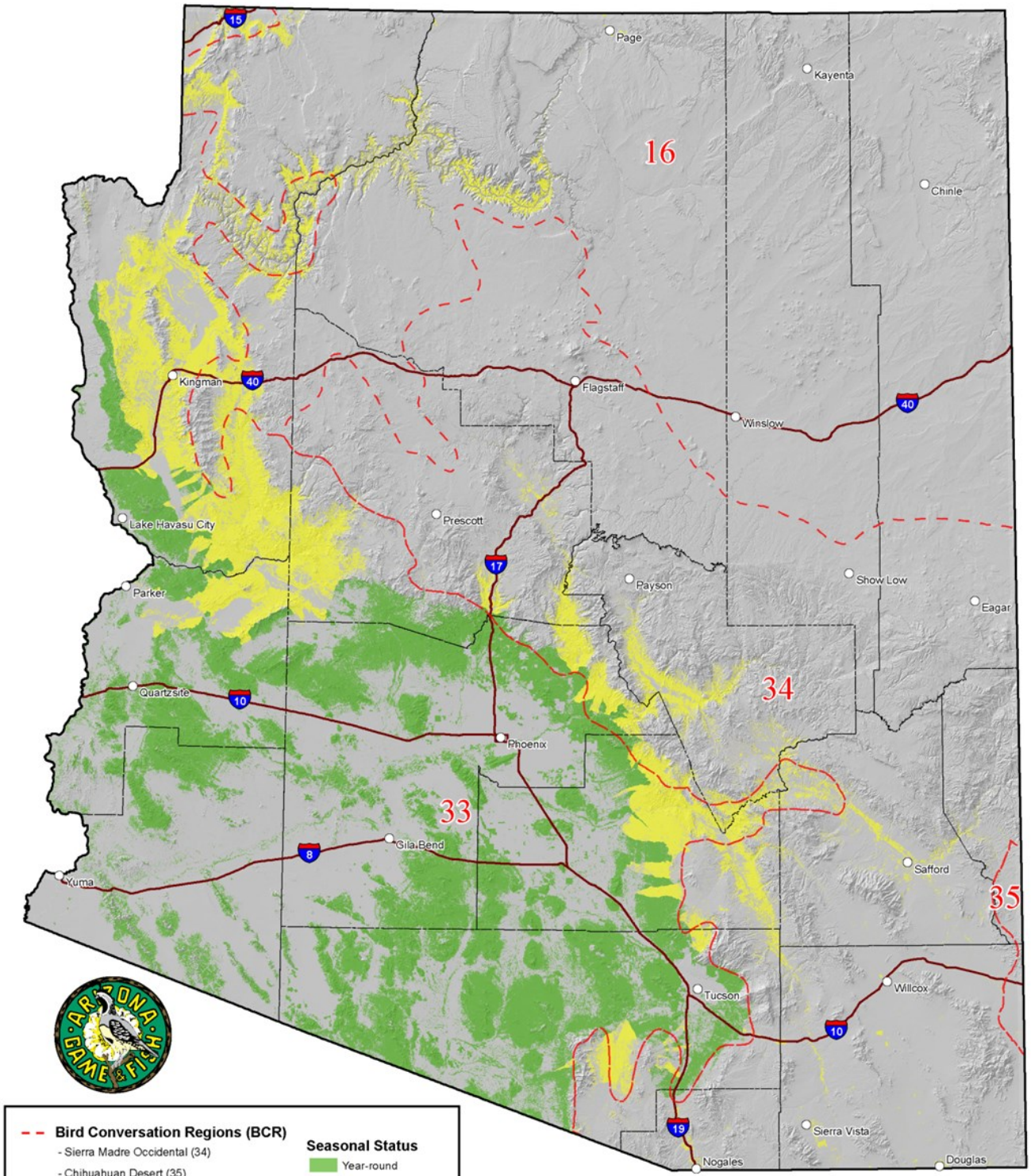
Food Habits	
Diet/Food	Primarily nectar and insects[10]
Foraging Substrate	Forb and shrub blooms, also fly-catches[10]

SPECIES ACCOUNT ● *COSTA'S HUMMINGBIRD Calypte costae*

Confidence in Available Data: ● High ◑ Moderate ○ Low ^ Not provided

Last Update: April 2023

Distribution of Costa's Hummingbird



General Information

Distribution in Arizona

Costa's Hummingbirds occur in the Sonoran and Mojave regions of western and southwestern Arizona, along the Nevada border and lower Grand Canyon region, and in a few scattered sites in southeastern part of the state (Corman 2005). Birds begin to arrive in the desert in late fall and winter and increase in numbers until breeding in late winter and early spring (Corman 2005). Most depart the region in May and early June, sometimes earlier, with small numbers remaining throughout summer in desert, mountain foothills, and nearby residential areas that have feeders (Baltosser et al. 1996). The wintering range in Arizona is concentrated along the western state line (lower Colorado and Gila River valleys) and around the cities of Phoenix and Tucson (Baltosser et al. 1996).

Habitat Description

Costa's Hummingbirds breed primarily in Sonoran Desertscrub habitat, especially along desert washes, bajadas, and rocky slopes. Unlike most hummingbirds, they breed in hot, dry environments and select desertscrub even when riparian habitat is available nearby (Szaro and Jakle 1985). Costa's Hummingbirds tend to be more abundant in the Upper rather than the Lower Sonoran Desertscrub zone because the former features paloverde and similar trees that are used for nesting and flowering plants that are used as nectar sources.

Microhabitat Requirements

Costa's Hummingbirds nest primarily in trees and shrubs, with a preference for paloverde (Corman 2005). Like most hummingbirds, Costa's selects territories based on the abundance of nectar producing plants. Its two most important nectar sources are chuparosa, which is particularly important because it flowers in winter, and ocotillo (Baltosser et al. 1996). Other nectar sources include desert lavender, wolfberry, creosote bush, fairy duster, paloverde, saguaro, desert willow, ironwood, desert honeysuckle, larkspur, and penstemon (Baltosser et al. 1996).

Landscape Requirements

Costa's Hummingbirds maintain relatively small territories compared to other desert-dwelling species. They respond to the availability of flowering plants on the landscape. Unlike some other hummingbirds, this species is not common in urban landscapes, especially those with exotic plantings (unless near natural desert areas) (Corman 2005).

Conservation Issues and Management Actions

Population Decline

Costa's Hummingbirds are declining at 4% per year across the Mojave and Sonoran deserts (Sauer et al. 2016). Breeding Bird Survey (BBS) sample sizes for this species in Arizona are currently insufficient for trend analysis, possibly due to later timing when most desert BBS surveys are conducted. Hummingbirds in general are difficult to monitor with standard multi-species protocols. The phenology of arrival and departure of Costa's Hummingbird and its ties to food plant phenology complicate this issue further.

Threats Assessment

This table is organized by Salafsky et al.'s (2008) standard lexicon for threats classifications. Threat level is based on expert opinion of Arizona avian biologists and reviewers. We considered the full lexicon but include only medium and high threats in this account.

Threat	Details	Threat Level
Residential and Commercial Development • Housing and urban areas • Commercial and industrial areas		Medium
Agriculture • Livestock farming and ranching		Medium
Natural System Modifications • Fire and fire suppression		Medium
Invasive and Problematic Species • Invasive non-native/alien plants	Invasive non-native grasses and forbs provide fuel for wildfires	Medium
Climate Change • Ecosystem encroachment • Changes in temperature regimes • Changes in precipitation and hydrological regimes		Medium

In the following section we provide more detail about threats, including recommended management actions. Threats with similar recommended actions are grouped.

Residential and Commercial Development:

- Housing and urban areas
- Commercial and industrial areas

In the U.S., Sonoran Desertscrub is mostly located in Arizona. It is the habitat type most commonly subject to destruction from urban sprawl. Costa's Hummingbirds use non-native vegetation sparingly for both nesting and foraging, although they prefer native flowering plants over hummingbird feeders (Baltosser et al. 1996).

Recommended Actions:

1. Work with developers and residents to set aside habitat patches of desertscrub that are rich in flowering plants.
2. Create interpretive tools and resources for native desertscrub habitat patches near urban areas to encourage public awareness of wildflowers and hummingbirds.
3. Develop and implement programs focused on urban residents to encourage landscaping that uses native, desert-adapted plants, especially those that provide the nectar for hummingbirds and feature tubular flowers, such as chuparosa.

Agriculture:

- Livestock farming and ranching

Natural System Modifications:

- Fire and fire suppression

Invasive and Problematic Species:

- Invasive non-native/alien plants

Unsustainable livestock grazing practices reduce understory vegetation, encourages weed invasion, causes soil disturbance and compaction, and likely eliminates many flowering plants. It is unknown to what extent these impacts affect Costa's Hummingbird, although seedlings and herbaceous plants are usually grazed by both domestic livestock (Baltosser et al. 1996) and burros. Particularly during drought years, effects of burro browsing on lower limbs of paloverde, where Costa's often place their nests, can be locally severe. Motorized off-road recreation has similar impacts to plant survival and causes soil compaction.

Non-native grasses and forbs have changed fire regimes in desert shrublands throughout the west, as has the increased presence of fire-causing land uses, such as off-road vehicles and camping. Desert scrublands are not resistant to fire, and trees used by Costa's Hummingbird for nesting can be easily killed in wildfires. On the other hand, some forage species, such as chuparosa, appear to respond positively to fire (Baltosser et al. 1996).

Recommended Actions:

1. Discourage livestock management practices that lead to loss of flowering plants in desertscrub landscapes, particularly during winter and spring.
2. Set aside high-quality areas with rich flowering plant life for light grazing or as grazing exclosures.
3. Manage burros at a reasonable carrying capacity to achieve sustainable populations of flowering plants and shrubs.
4. Manage fuels carefully in areas occupied by Costa's Hummingbird, particularly if these are invaded by exotic weeds.
5. Reduce chances of catastrophic fires by removing vegetation from major roadways and creating fire barriers along fence lines in areas that are occupied by Costa's Hummingbirds.

Climate Change:

- Ecosystem encroachment
- Changes in temperature regimes
- Changes in precipitation and hydrological regimes

The likely effects of prolonged droughts on nectar plant availability and blooming phenology warrant a systematic approach to monitoring of Costa's Hummingbirds and their habitats.

Recommended Actions:

1. All recommended actions are listed in the Research and Monitoring Priorities Section.

Research and Monitoring Priorities

1. Develop and implement a monitoring program for Costa's Hummingbird to develop better estimates of current trends.
2. Determine area requirements and landscape use of Costa's Hummingbird, including in developed and disturbed areas.
3. Determine Costa's Hummingbird use of areas with artificially planted native vegetation including urban areas.
4. Monitor effects of grazing exclosures on habitat quality for Costa's Hummingbird.
5. Monitor climate change sensitivity of the abundance and phenology of nectar plants (using tools provided by the National Phenology Network at https://www.usanpn.org/). This is particularly suitable for a community science approach, which would have the added advantage of raising public awareness of climate change effects on wildflowers and wildlife.

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[5a]Partners in Flight. 2019. Avian Conservation Assessment Database, version 2019. Accessed on March 31, 2020.

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