

**Yellow-shouldered Blackbird or Mariquita**  
(*Agelaius xanthomus*)

**5-Year Status Review:  
Summary and Evaluation**



Photo by Jean P. González-Crespo

**U.S. Fish and Wildlife Service  
Southeast Region  
Caribbean Ecological Services Field Office  
Mayagüez, Puerto Rico**

**August 2023**

**STATUS REVIEW**  
**Yellow-shouldered Blackbird or Mariquita (*Agelaius xanthomus*)**

**GENERAL INFORMATION**

**Current Classification:** Endangered

**Lead Field Office:** Caribbean Ecological Services Field Office (CESFO), Mayagüez, Puerto Rico, José Cruz-Burgos, [jose\\_cruz-burgos@fws.gov](mailto:jose_cruz-burgos@fws.gov).

**Reviewers:**

**Lead Regional Office:** Carrie Straight, Atlanta Regional Office, (404) 679-7226.

**Date of original listing:** December 12, 1976 (41 FR 51019; November 19, 1976)

**Final critical habitat designation:** September 22, 1977 (42 FR 47840; September 22, 1977)

**Review History:** Previous 5-year status reviews were signed on February 2, 2011 (Service 2011) and September 24, 2018 (Service 2018). Both reviews recommended no change in status.

**Methodology used to complete the review:** In accordance with section 4(c)(2) of the Endangered Species Act of 1973, as amended (Act), the purpose of a status review is to assess each threatened species or endangered species to determine whether its status has changed and if it should be classified differently or removed from the Lists of Threatened and Endangered Wildlife and Plants. The U.S. Fish and Wildlife Service (Service) evaluated the biology, habitat, and threats of the yellow-shouldered blackbird to inform this status review. In conducting this 5-year status review, we relied on the best available information pertaining to historical and contemporary distributions, life history, genetics, habitats, and threats of this species.

**FR Notice citation announcing the species is under active review:**

May 13, 2022 (87 FR 29364). No public comments about this species were received during the public comment period.

**Species' Recovery Priority Number at start of 5-year review ([48 FR 43098](#)):**

2. The yellow-shouldered blackbird is recognized as a species with a high degree of threat and a high recovery potential.

**REVIEW ANALYSIS**

**Listed Entity**

**Taxonomy and nomenclature:**

We are not aware of any changes to the taxonomy of this entity; thus, this species is still considered valid by the Service.

### **Distinct Population Segment (DPS):**

The Act defines species as including any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate wildlife. This species was not listed as a DPS, and we have no new information that would indicate the species should be listed as a DPS under the Service's 1996 DPS Policy.

### **Recovery Criteria**

#### **Recovery Plan**

Yellow-shouldered Blackbird (*Agelaius xanthomus*) Revised Recovery Plan, November 12, 1996 (Service 1996).

Amended Recovery Plan for Yellow-shouldered Blackbird (*Agelaius xanthomus*), September 24, 2019 (Service 2019).

The Amended Recovery Plan establishes that the yellow-shouldered blackbird could be considered for delisting when the following three criteria are met:

1. The two (2) existing populations of yellow-shouldered blackbirds in southwest Puerto Rico and Mona Island demonstrate a stable or increasing trend, as evidenced by natural recruitment, and multiple age classes (addresses Factor A, C and E).
2. Establish two (2) additional yellow-shouldered blackbird populations on lands protected by a conservation mechanism on Puerto Rico or its satellite islands that show a stable or increasing population trend, evidenced by natural recruitment and multiple age classes (addresses Factors A, C and E).
3. Threat reduction and management activities (e.g., control of nest parasites and predators) have been implemented to the extent that the species will remain viable into the foreseeable future (address Factor C and E).

None of the above delisting criteria have been met.

### **Biology and Habitat Summary**

A detailed review of the species' biology, distribution, abundance, and its habitat can be found in the previous yellow-shouldered blackbird 5-year status review (Service 2018). This species is endemic to Puerto Rico and the adjacent Mona and Monito islands. Currently, the yellow-shouldered blackbird is mainly limited to four areas: Mona and Monito islands, where a subspecies apparently developed (*A. x. monensis*); and three small disjunct populations in eastern, southeastern, and southwestern Puerto Rico (Figure 1; Liu 2015, Service 2018). The Puerto Rico Department of Natural and Environmental Resources (PRDNER) has maintained a long-term program to monitor the populations and breeding activity of the yellow-shouldered blackbird mainly in southwestern (Cabo Rojo-Lajas) Puerto Rico, but also conducts surveys on Mona and Monito Island, southeastern (Salinas-Guayama) and eastern (Ceiba) Puerto Rico. In 2020, the monitoring efforts were interrupted by the COVID-19 pandemic. Recently the PRDNER contracted MC Environmental Specialists, LLC who works in collaboration with the Ecology

and Wildlife Conservation Laboratory of the University of Puerto Rico, Mayagüez Campus, to assess and monitor the yellow-shouldered blackbird populations (PRDNER 2022, González-Crespo et al. 2022).

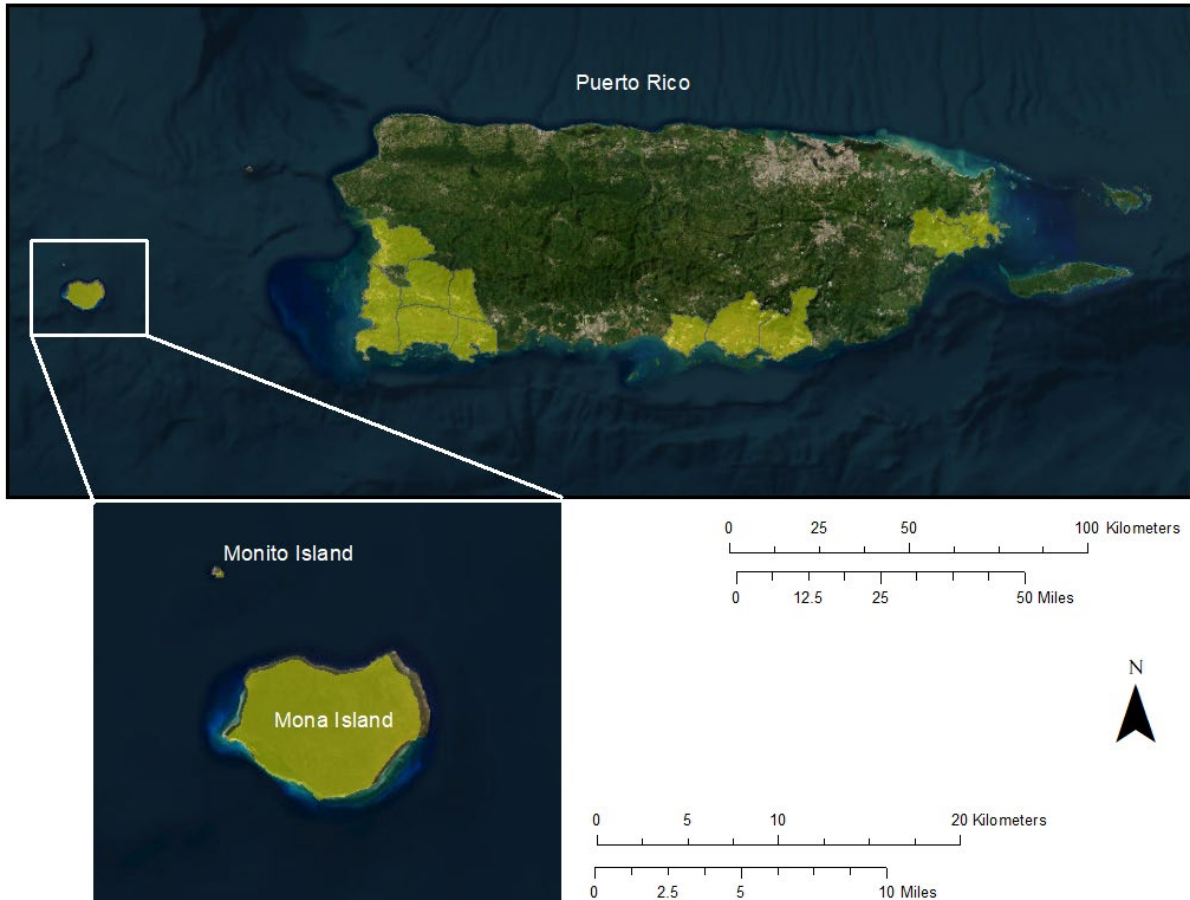


Figure 1. General map of Puerto Rico with area occupied by yellow-shouldered blackbird noted in yellow. From west to east Monito Island and Mona Island, the southwestern, southern, and eastern populations.

Below we present the most recent available information regarding the abundance, nest parasite control, and shiny cowbird (*Molothrus bonariensis*) parasitism of the yellow-shouldered blackbird. Shiny cowbird is a nest parasite that is one of the reasons for listing of the species and is discussed as a threat below under Factor E.

#### Southwestern Puerto Rico

In 2018, staff from PRDNER conducted yellow-shouldered blackbird and shiny cowbird surveys in main roosting sites within southwest Puerto Rico and recorded 326 yellow-shouldered blackbirds (Table 1) and 129 shiny cowbirds (PRDNER 2018). In 2019, PRDNER in collaboration with the Service, the University of Puerto Rico-Mayagüez Campus (UPRM), the Inter-American University-San German Campus, and North Carolina State University, conducted further surveys at yellow-shouldered blackbird roosting sites in southwestern Puerto

Rico and reported an estimate of 520 blackbirds (Table 1) and 265 shiny cowbirds (PRDNER 2019). In 2022, before Hurricane Fiona made landfall in southwestern Puerto Rico in September 2022, the abundance of the yellow-shouldered blackbird population was estimated in approximately 400 individuals (Table 1) (González-Crespo 2023a, pers. comm.). In November 2022, two months after Hurricane Fiona, biologists from the Ecology and Wildlife Conservation Laboratory, UPRM, and the Service conducted a survey in a roosting area known as Bahía Sucia and counted only 30 yellow-shouldered blackbirds (Table 1) (González-Crespo, 2023a, pers. comm.). A similar drop in estimated numbers of individuals was recorded following Hurricane Maria in 2017, but they recovered to over 500 individuals within a few years (González-Crespo et al. 2022). González-Crespo (2023b, pers. comm.) believes that some individuals may have died as the result of the direct impact of Hurricane Fiona, or that individuals displaced to forested areas away from the coast and were temporarily using other undetected roosting sites. After a hurricane, the habitat destruction that occurs will diminish food supplies, affect mangrove nesting areas and tree coverage to protect nests and fledglings from the heat, thus affecting fledgling mortality and juvenile success. In March 2023, a total of 98 yellow-shouldered blackbird individuals were recorded in different sites (Combate, Boquerón, Cabo Rojo National Wildlife Refuge and La Parguera) at the municipalities of Cabo Rojo and Lajas (González-Crespo 2023b, pers. comm.). However, the most recently conducted census (August 3, 2023) in a Bahía Salinas roosting area counted 479 individuals (Table 1) (González-Crespo et al. 2023).

#### Southeastern and Eastern Puerto Rico

During 2022, González-Crespo et al. (2022) found that both populations, southeastern and eastern, had significantly lower numbers of yellow-shouldered blackbirds and were very challenging to monitor because individuals moved through relatively large areas difficult to access such as mangrove forests (PRDNER 2022). A total of eight surveys were conducted in three areas adjacent to the Jobos Bay National Estuarine Research Reserve (JBNERR): Puerto Rico Electric Power Authority (PREPA)-Aguirre Thermoelectric Plant, Baxter pharmaceutical facilities, and the Salinas Marina (PRDNER 2022). Yellow-shouldered blackbirds were consistently detected only at the Aguirre Thermoelectric Plant with a maximum of 32 individuals, which is the highest number of yellow-shouldered blackbirds observed in the municipalities of Salinas and Guayama to that date (PRDNER 2022). Nonetheless, González-Crespo et al. (2022) stated that this population number (32) may be underestimated, and population may be bigger as yellow-shouldered blackbirds may be using multiple roosting sites and spread-out through a relatively large area and individuals were not accounted in these surveys (PRDNER 2022). On July 18, 2023, González-Crespo et al. (2023) conducted a survey at Aguirre Thermoelectric Power Plant that resulted in 55 individuals of yellow-shouldered blackbirds (Table 1).

In eastern Puerto Rico during 2022, a total of seven surveys were carried out throughout the former Roosevelt Roads Naval Station, Ceiba Airport, Playas Los Machos, and the abandoned fish market near Playa Los Machos in the municipality of Ceiba (PRDNER 2022). Only 12 individuals were observed in Playa Los Machos (PRDNER 2022). Historically this has been considered a small population since the mid 80's (i.e., less than 100 individuals) (PRDNER 2022).

In 2023 González-Crespo et al. (2023) conducted 14 surveys carried out throughout the Roosevelt Roads Naval Base, Ceiba Airport and Playas Los Machos in the municipality of Ceiba. During all these surveys, the greatest concentration of yellow-shouldered blackbirds was found in Playa Los Machos, where up to 9 birds were sighted, which is a 25% decrease from the previous study period (González-Crespo et al. 2023). Surveys in other locations yielded fewer sightings of yellow-shouldered blackbirds, suggesting that currently, Playa Los Machos and its surrounding areas could be the most suitable locations for observing this species (González-Crespo et al. 2023). However, González-Crespo et al. (2023) stated that monitoring individuals in this site is still difficult because they use multiple roosts and some individuals used different roosts each day. Furthermore, this makes it very difficult to establish an efficient way of determining population size at this site.

Mona and Monito Island

In April 2019, staff from PRDNER conducted a rapid assessment of the yellow-shouldered blackbird population in Mona Island and reported 106 individuals (Table 1) (PRDNER 2019). However, no recent comprehensive census for the yellow-shouldered blackbird population has been conducted at Mona and Monito, a survey will be needed to assess the current population status in this site.

Table 1: Summary of the number of yellow-shouldered blackbirds counted in southwestern, eastern, and southern Puerto Rico, and Mona and Monito Island (PRDNER 2018, 2019, 2020, 2022; González-Crespo 2023a, 2023b, 2023c pers. comm.; and González-Crespo et al. 2023).

Site	Date	Number
Southwestern	December 2018	326
Southwestern	September 2019	527
Southwestern	August 2022 (pre-Hurricane Fiona)	407
Southwestern	November 2022 (post-Hurricane Fiona)	30
Southwestern	March 2023	98
Southwestern	August 2023	479
Eastern (Ceiba)	July 2022	12
Southern (Salinas and Guayama)	July 2022	32
Southern (Salinas and Guayama)	July 2023	55
Mona and Monito Islands	January 2019	106

**Monitoring of yellow-shouldered blackbird nesting activity**

A summary of 2018-2023 nesting information is provided in Table 2. Information related to an overall summary of nesting information from 1995-2023 is provided in Table 3. Although natural nests were searched for during 2018 to 2021 breeding season, no yellow-shouldered blackbird natural nests were found. In 2022, a total of 20 natural nests were documented in La Parguera (18) and the Pitahaya Mangrove Forest (2); all nests were located in black mangroves (González-Crespo et al. 2023). However, in 2023, only 12 natural nests were found, eight in La Parguera and four in the Pitahaya Mangrove Forest (González-Crespo et al. 2023). Overall,

artificial nesting structures have provided more nesting opportunities and higher nest success for yellow-shouldered blackbirds than natural nest substrates.

### Southwestern Puerto Rico

The active yellow-shouldered blackbird artificial nesting structures were monitored twice weekly during the breeding seasons from 2018 to 2021 in southwestern Puerto Rico (i.e., Pitahaya Mangrove Forest and Bahía Sucia) (Table 2). Artificial nest structures resulted in an average of 175 active nests per year and ranged from a minimum of 114 and maximum of 246 nests (PRDNER 2018, 2019, 2020 and 2021). During these four years, PRDNER reported that nests within artificial structure produced an average of 415 blackbird eggs per year, with an average hatching success of 50% during each season (Table 2) (PRDNER 2018, 2019, 2020, and 2021). However, nest success was variable ranging from only 27 to 37% (i.e., a nest produced at least one blackbird chick) (Table 2). From the chicks produced during these four years, an average of 92 per year successfully fledged their nests (Table 2) (PRDNER 2018, 2019, 2020, and 2022).

Furthermore, between 2018 and 2021, an average of 78% of artificial nest structures occupied by yellow-shouldered blackbirds were parasitized by shiny cowbirds (Table 2) (PRDNER 2018, 2019, 2020, and 2022). As a conservation measure, all shiny cowbird eggs were removed from yellow-shouldered blackbird nests.

During the 2019 breeding season, 16 artificial nest structures were monitored with trail cameras to document predation in the Pitahaya Mangrove Forest until all nestlings had fledged, and no predation was recorded (PRDNER 2019). During the 2020 breeding season, 14 artificial nest structures were also monitored with trail cameras to document predation (PRDNER 2020). Although no predation was recorded, on September 16, 2020, they did document the first incident of intra-specific usurpation for this species (PRDNER 2020). A banded adult yellow-shouldered blackbird visited an occupied nest structure in the territory of another male and removed a 14-16-day old nestling and dropped it in the water (Figure 2) (PRDNER 2020). Although the reason for this behavior of nest usurpation is unknown, MC Environmental Specialists, LLC suggests that competition for limited suitable nesting sites could be one explanation. The Pitahaya Mangrove Forest has dozens of artificial nest structures available to all yellow-shouldered blackbirds, however, those structures are all located in different areas with different levels of shade and/or proximity to live mangroves or other forested areas, and not all might be suitable or preferred for nesting by the yellow-shouldered blackbird individuals (PRDNER 2020). This may make certain structure locations preferred and result in intraspecific competition for those sites.



Figure 2. Photos showing an adult yellow-shouldered blackbird removing a yellow-shouldered blackbird nestling from its nest (PRDNER 2020).

Table 2. Monitoring results of yellow-shouldered blackbird (YSBL) reproduction in artificial nests structures (ANS) between 2018 and 2021 in southwestern of Puerto Rico and assessment of shiny cowbird (SHCO) parasitism (PRDNER 2018, 2019, 2020 and 2022).

<b>Variables</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
Total ANS available	218	274	274	273
Number of active ANS	155	114	246	187
YSBL eggs	422	292	402	544
Number (%) of successful ANS	53 (34%)	42 (37%)	86 (35%)	50 (27%)
YSBL chicks	194	161	208	251
YSBL fledglings (% of chicks hatched)	116 (60%)	78 (48%)	98 (47%)	92 (37%)
Parasitized ANS (% of ANS used by YSBL)	125 (81%)	103 (90%)	104 (42%)	183 (98%)
SHCO eggs found and removed	285	189	169	407
SHCO chicks removed	0	0	0	0



Table 3. Natural and artificial nesting structure nest counts and success rates in southwest Puerto Rico (shown as percent indicating that the nest fledged at least one individual young from 1996-2023)(Service 2018, PRDNER 2018, 2019, 2020, 2022, González-Crespo et al. 2023).

Year	Natural Nest Count (percent fledgling success)	Artificial Nest Count (percent fledgling success)
1996-1997	3 (0%)	82 (39%)
1999-2000	54 (49%)	249 (33%)
2001-2002	28 (33%)	254 (43%)
2003-2004	39 (15%)	266 (32%)
2004-2005	120 (18%)	385 (44%)
2005-2006	10 (0%)	234 (42%)
2006-2007	34 (NA)	311 (81%)
2012	19 (50%)	202 (78%)
2013	14 (0%)	250 (72%)
2014	3 (0%)	159 (77%)
2016	3 (0%)	272 (34%)
2018	NA	155 (34%)
2019	NA	114 (37%)
2020	NA	246 (35%)
2021	NA	187 (27%)
2022	20 (45%)	NA
2023	12 (NA)	NA

#### Eastern (Ceiba)

In May 2021, 14 artificial nest structures were installed in the Medio Mundo Wetland in the municipality of Ceiba to evaluate if artificial nesting structures at this new location would be used by yellow-shouldered blackbirds (PRDNER 2022). In addition, yellow-shouldered blackbird dummies were placed in two of those artificial nest structures and yellow-shouldered blackbird vocalizations were played periodically through speakers to help attract nearby individuals and increase the chances of structure use (Figure 3) (PRDNER 2022). Although no yellow-shouldered blackbirds were observed using the artificial nest structures, they remain at the site hoping that yellow-shouldered blackbirds use them in the future (PRDNER 2022). In addition, González-Crespo et al. (2022) conducted yellow-shouldered blackbird nest searches in Ceiba during 2022, but no active nests were found, nor were any behavior characteristic of a yellow-shouldered blackbirds fledgling (e.g., begging for food, vocalizing like a fledgling) observed. Also, no yellow-shouldered blackbirds were observed attending or defending shiny cowbird fledglings, indicating that no nesting parasitism had occurred at that time (PRDNER 2022).

During the 2023 breeding season, none of the yellow-shouldered blackbird were observed displaying behavior characteristic of being a fledgling/juvenile (e.g., begging for food,

vocalizing like a fledgling/juvenile) at the Roosevelt Roads Naval Base in the municipality of Ceiba (González-Crespo et al. 2023). In addition, no yellow-shouldered blackbird was observed accompanying or defending shiny cowbird fledglings (González-Crespo et al. 2023). Nonetheless, the fact that this population survived the impact of Hurricane María and with no artificial nesting structures provided, and the recent record of a higher number of individuals suggest the yellow-shouldered blackbirds at Ceiba are successfully recruiting.



Figure 3. Yellow-shouldered blackbird dummy placed inside an artificial nest structure at Medio Mundo Wetland in the municipality of Ceiba (PRDNER 2022).

### **Yellow-shouldered blackbird fledglings monitoring**

#### Southwestern Puerto Rico

A total of 29 yellow-shouldered blackbird fledglings were banded and tagged with radio transmitters during the 2019 breeding season (PRDNER 2019). All 29 fledglings were tracked for approximately 30 days. During this period all fledglings were constantly fed and protected by their parents and 26 individuals survived until the transmitter's battery life lasted (PRDNER 2019). Three of the fledging died during the first day after fledging. In 2020, a total of 22 fledglings were also radio-tagged and approximately 87% survived until their transmitter's battery life lasted (63 days on average). The post-fledging survival estimate during 2020 was high (i.e., 0.73-1.00), however, fledglings were still receiving parental care by the time the transmitter died (PRDNER 2020). As in 2019, the fledglings that did not survive died during the first three days after leaving the nest, suggesting that this is the most critical period of this stage (PRDNER 2020).

In 2021, 23 fledglings were radio-tagged and tracked into the 2022 season. Four of these fledglings perished, all dying within five days after leaving their nests (González-Crespo 2023b, pers. comm.). González-Crespo (2023a, pers. comm.) believes their deaths were related to dehydration or harsh hot climate, as all bodies were recovered near their nests in dead mangrove areas without any protection from the sun. During the 2022 monitoring season, 24 additional fledglings were tagged, and 2 died within four days of hatching (González-Crespo 2023b, pers.

comm.). Before Hurricane Fiona made landfall in southwest Puerto Rico, the remaining 41 tagged individuals were being monitored, and only 15 of these individuals were found alive after the hurricane passed through the area (González-Crespo 2023b, pers. comm.).

#### Southeastern and Eastern Puerto Rico

As previously mentioned above, the southern and eastern populations had significantly lower numbers of yellow-shouldered blackbirds and were very challenging to monitor because individuals moved through relatively large areas difficult to access such as mangrove forests (PRDNER 2022, González-Crespo et al. 2022). Nevertheless, in 2022 six individuals were captured and tagged with a 0.75g solar-powered transmitters, five in Ceiba and one in Salinas (Figure 4) (González-Crespo et al. 2022, PRDNER 2022). Movements of these individuals were recorded, but home range estimates were not available by the time this review was completed (PRDNER 2022, González-Crespo et al. 2022).



Figure 4. Yellow-shouldered blackbird tagged with a Life Tag transmitter in the municipality of Ceiba (PRDNER 2022, González-Crespo et al. 2022).

#### **Monitoring of Yellow-shouldered blackbird nests with “smart” nests**

During 2023 breeding season, approximately 15 “smart” nests were placed in the Pitahaya Mangrove Forest (González-Crespo et al. 2023). These nests use a solar panel, sensors and cameras to gather comprehensive environmental data and record nest activity, which is recorded and transmitted to a web application for remote access and analysis. In July 2023, the data collected from “smart” nests in Pitahaya Mangrove Forest showed extremely high temperatures inside the artificial nests (around 98°F) (González-Crespo et al. 2023). In one nest, a fledgling was captured, banded and tagged, and while inspecting its nest, its siblings’ corpse was found inside. The fledgling was only one day older than its sibling, and the body found was fresh and intact (i.e., no signs of predation) and was significantly underdeveloped when compared to its sibling (González-Crespo et al. 2023). Furthermore, González-Crespo et al. (2023) suspected that the successful fledgling outcompeted its sibling for food, and the underdeveloped chick could have died from dehydration due to the extreme heat.

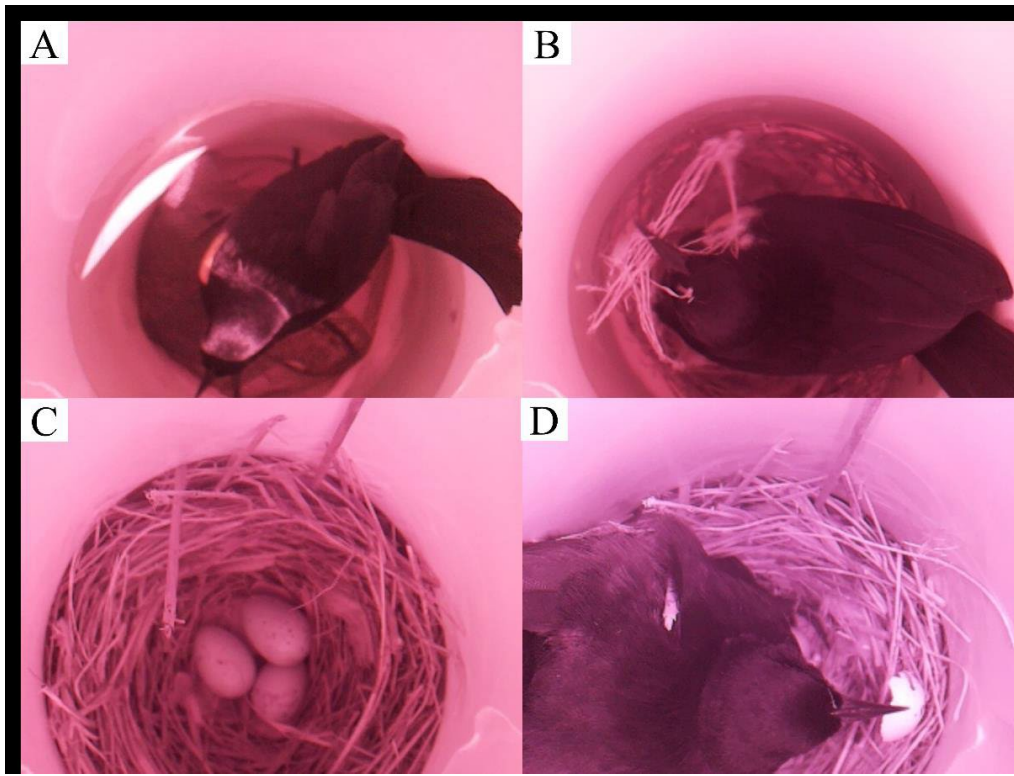


Figure 5. Images showing the nesting process of a yellow-shouldered blackbird (YSBL) that nested in the “smart” nest installed in the Pitahaya Mangrove Forest (González-Crespo et al. 2023). (A) YSBL adult entering the smart nest and inspecting the structure a few days after installing the smart nest in the PMF. (B). Adult YSBL with nesting material in its bill while constructing its nest. (C) Nest with three YSBL eggs. (D) One of the parents removing a piece of eggshell from a recent hatch egg.

### **Yellow-shouldered blackbird survival during the post-fledging period**

Over the past four years, González-Crespo et. al (2023) has been working on and completing a comprehensive study as part of his doctorate thesis to determine yellow-shouldered blackbird survival during the post-fledging period in Pitahaya Mangrove Forest and Bahía Sucia (Southwestern of Puerto Rico). In this study, between 2019 to 2022, González-Crespo et. al (2023) trapped and fitted 98 fledglings with transmitters, which has allowed for tracking individuals for approximately one to two months, depending on the transmitter battery (González-Crespo et al. 2023). González-Crespo et al. 2023, gathered morphological measurements (i.e., mass, wing chord length, and tarsus length) before returning these fledglings to their nests, and preliminary results showed that in nests with more than one yellow-shouldered blackbird, the oldest chick was larger and more developed at the time of fledging than their younger counterparts. Additionally, all deceased fledglings found were the youngest sibling in its nest, and they were all markedly underdeveloped in comparison to their siblings (González-Crespo et al. 2023). This study confirms that there is strong competition for food between nestlings, which directly affects post-fledgling survival rate (González-Crespo et al. 2023). Furthermore, he identified that all recorded deaths of fledglings occur within the first five days

post-fledging, and all carcasses were found in areas with dead mangroves and minimal cover (González-Crespo et al. 2023). If fledglings are not able to reach adequate cover, they face dehydration and possible death during their juvenile stage.

### **Summary**

Although not all locations were monitored in every year, the population counts of yellow-shouldered blackbirds ranged from a high of 1398 in 1995 (Service 2018) to a low post-Hurricane Fiona in 2022 when the southwestern population count dropped from 400 to 30 individuals (Table 1). Although birds may have dispersed as a result of the hurricane, the 2023 southwestern population numbers (479 individuals in Bahia Salina) suggest that an increase in adult population occurred after Hurricane Fiona (González-Crespo 2023c, pers. comm.).

From 2018 through 2021, there was zero nests found within natural nesting structures, although searches through all available, potential habitat was limited. In 2022 and 2023, several natural nests were identified, 20 and 12 nests respectively (González-Crespo et al. 2023). Although nesting in natural substrates is occurring, it appears that recently the primary nesting for the species is within the artificial nesting structures, likely because of loss of habitat from hurricane damage in the past (Service 2018). Although variable from year to year, yellow-shouldered blackbird natural nesting attempts have generally declined since 1999. This decline has likely been driven by the lack of natural nesting opportunities since the early 2000's and other threats that have reduced nesting success and breeding population size. An additional contributing factor of decline has been direct habitat loss, indirect impacts to nesting success from hurricane damage to habitat (see further discussion below), and likely direct hurricane impacts over individuals. Based on recent studies, fledgling survival is lowest in the first five days after leaving the nest.

### **Threats (Five-Factor Analysis) Summary**

A detailed review of the species' threats can be found in the 2018 yellow-shouldered blackbird 5-year status review (Service 2018). The status of a species is determined from an assessment of factors specified in section 4 (a)(1) of the Act, including:

Factor A (the present or threatened destruction, modification, or curtailment of its habitat or range).

Factor B (overutilization for commercial, recreational, scientific, or educational purposes).

Factor C (disease or predation).

Factor D (the inadequacy of existing regulatory mechanisms).

Factor E (other natural or manmade factors affecting its continued existence).

The threats to the species described in the 2018 5-year status review continue to impact the species (Service 2018). The primary stressors to the yellow-shouldered blackbird include habitat loss and degradation due to human activities (Factor A), opportunistic predators (e.g., dogs, cats, rats) (Factor C), and a restricted distribution, low population numbers, climate change, hurricane impacts, invasive species, and nest parasitism by shiny cowbirds (Factor E).

According to González-Crespo et al. (2023), habitat modification in both southwestern and southeastern Puerto Rico continues to be observed in areas used by the yellow-shouldered blackbird, likely affecting the species' breeding success and survival. Moreover, he stated that the increased loss of mangrove habitat in the Pitahaya Mangrove Forest (Figure 6) has had a direct effect on the yellow-shouldered blackbird's reproductive success, further contributing to a decline in population numbers. The loss of mangrove cover due to hurricanes and probable increases in salinity has left most artificial nest structures exposed to direct sunlight (Figure 6), resulting in exposure to elevated temperatures inside the structures, which can cause significant egg and chick mortality (González-Crespo 2023). Furthermore, the survival of yellow-shouldered blackbird chicks that successfully fledge their nests is also threatened by exposure to direct sunlight during the crucial early post-fledging period when fledglings are most vulnerable due to their impaired ability to fly (González-Crespo et al. 2023).

In addition to the loss of breeding habitat due to habitat changes, food availability seems to be another major factor affecting the survival and breeding success of the yellow-shouldered blackbird (González-Crespo et al. 2023). González-Crespo et al. (2023) stated this is worst during the dry season when food resources are limited and competition for food with older siblings can increase as it is typical in species with asynchronous egg hatching (Figure 7). This situation may be exacerbated if shiny cowbird chicks are present in the yellow-shouldered blackbird nest because they can also outcompete yellow-shouldered blackbird chicks for food resources, further exacerbating the species' struggle to maintain its population (González-Crespo et al. 2023).

Invasive species can also negatively affect the yellow-shouldered blackbird's survival and reproductive success. This issue has been particularly prominent in the municipality of Ceiba, where González-Crespo et al. (2022) has observed significant numbers of potential opportunistic predators such as feral dogs and cats, and Small Indian mongooses (*Herpestes auropunctatus*) (PRDNER 2022). However, he did not report any incident of predation from these animals on yellow-shouldered blackbirds. Nevertheless, González-Crespo et al. (2023) reported a population of over 40 feral cats being fed by community members at yellow-shouldered blackbird breeding site areas in Ceiba, which increases the potential for predation (PRDNER 2022). Natural nests and fledglings that have poor flight abilities are both particularly vulnerable to predation events and would be unlikely to be detected during monitoring.



Figure 6. Drone image showing the condition of mangrove mortality on yellow-shouldered blackbird nesting site (top) and an image showing artificial nesting structures along damaged mangroves at (bottom) in the Pitahaya Mangrove Forest (González-Crespo et al. 2023).



Figure 7. Nestling yellow-shouldered blackbird siblings, showing the distinct difference in development of fledgling chicks and how older siblings may have an advantage in obtaining food from their parents when resources are limited (González-Crespo et al. 2023).

The shiny cowbird was first reported in Puerto Rico in 1955 (Grayce 1957). Shiny cowbirds have been known to parasitize a large percent of yellow-shouldered blackbird nests (Service 1996, 2018). Parasitism has resulted in reduced success in fledging yellow-shouldered blackbird young (Service 1976, 1996 and references therein). Shiny cowbirds are still a large threat to the yellow-shouldered blackbird. González-Crespo et al. (2023) only observed adult yellow-shouldered blackbirds caring for cowbird nestlings in southwestern Puerto Rico.

Although assessments of the species after the hurricanes Irma, María, and Fiona suggest individuals survived these atmospheric events (Service 2018, PRDNER 2022), the cumulative effects of hurricane impacts (i.e., habitat destruction, reduction of food sources, some direct impacts to individuals) and persistently low yellow-shouldered blackbird population numbers could be detrimental to the species. Such cumulative effects appear to be reflected on the fact that although generally chicks' survival seems to be high during the first two months post-fledgling, the number of yellow-shouldered blackbirds produced during each breeding season does not appear to be enough to augment the overall species' population (i.e., in any given span of years, the number of young surviving to adulthood are not more than losses of adults). Moreover, yellow-shouldered blackbirds nesting outside artificial nest structures with no management might also be suffering from increased shiny cowbird parasitism, which would result in little or no yellow-shouldered blackbird fledglings.

Recent studies on climate change research predict a reduction in land cover of coastal wetlands due to sea-level rise in response to global warming (Intergovernmental Panel on Climate Change (IPCC 2022)). The habitat and the main nesting sites on which the yellow-shouldered blackbird depends for reproduction are extremely vulnerable to storm surges cause by hurricanes and to sea level rise due to their proximity to the sea (González-Crespo et al. 2023). During 2022 to 2023, González-Crespo et al. (2023) monitored the salinity levels at the Pitahaya Mangrove Forest, and found that salinity levels before Hurricane Fiona were over 100 ppt and after the hurricane those levels decreased to 35-70 ppt. He indicated that this stabilization is likely due to Hurricane's Fiona clearing blockages in tidal creeks, allowing for more consistent tidal exchange. Stabilizing the salinity levels would provide an opportunity for implementing a mangrove restoration project through planting (González-Crespo et al. 2023).

### **Synthesis**

The yellow-shouldered blackbird is endemic to Puerto Rico and the adjacent Mona and Monito islands. The species was once common in the coastal forests, but during the early 20th century most Puerto Rico's coastal forests were replaced by agriculture and development. Since the 1980s the Puerto Rico Department of Natural and Environmental Resources has implemented actions to improve the breeding success of the yellow-shouldered blackbirds, which have helped the species to persist. Currently, the species is mainly limited to four areas: Mona and Monito islands, and three small disjunct populations in eastern, southern, and southwestern Puerto Rico. The size of individual disjunct populations continues to remain relatively low. According to the most recent surveys, the greatest numbers of the yellow-shouldered blackbirds occur in the southwestern population, ranging annually between approximately 100-500 individuals. This is followed by the Mona and Monito Island population, with approximately 100 individuals. The southern and eastern populations have approximately 55 and 12 individuals, respectively. Results of a rapid assessment of the southwestern population following Hurricane Fiona suggests



that yellow-shouldered blackbirds survived this catastrophic natural event. However, accurate estimates of post-hurricane numbers have yet to be obtained for the Mona and Monito Island populations. The species was listed as endangered and continues to be threatened by habitat loss and degradation, invasive species, nest parasitism by the invasive shiny cowbird, climate change, hurricane impacts and a restricted distribution as well as low population numbers. Because of ongoing threats and the current condition, the species continues to meet the definition of an endangered species.

## **RECOMMENDED FUTURE ACTIVITIES**

A detailed discussion of recovery actions and criteria are presented in the Recovery Plan (Service 2019). In the course of this status review new and/or targeted potential recovery activities were identified and are included below.

### **Recovery Activities:**

The following are additional recommendations to help the recovery of the yellow-shouldered blackbird (see the 2018 five-year review for the prior recommended actions).

- Continue weekly monitoring of yellow-shouldered blackbird nests and removal of shiny cowbird eggs to maximize nesting success of yellow-shouldered blackbirds.
- Conduct a study to refine the yellow-shouldered blackbird habitat description and suitability in coastal wetlands based on geographical analyses.
- Develop and implement a comprehensive habitat restoration plan for southwestern Puerto Rico and implement conservations strategies like mangrove restoration, restore appropriate hydrology and salinity levels to improve the habitat conditions.
- Establish a shiny cowbird trapping project in eastern and southern Puerto Rico during the yellow-shouldered blackbird breeding season to help increase the species' nesting productivity.
  - Focus on areas where yellow-shouldered blackbirds are observed in the municipalities of Ceiba, Salina, and Guayama.
- Conduct a study to determine if shiny cowbird brood parasitism has a significant impact on eastern and southern populations.
- Initiate a head start program with chicks, and probably eggs, from the southwestern yellow-shouldered blackbird population to help boost the yellow-shouldered blackbird populations in southern and eastern Puerto Rico.
- Implement food supplementation (suet bars) in nesting areas, to both aid adults in locating and providing food to their young, and to reduce competition between nestlings.
- Assess genetic diversity of the populations of yellow-shouldered blackbirds to inform future recovery activities and head start programs.
- Install artificial nesting structures equipped with sensors to monitor moisture and temperature, and with motion cameras to help determine causes of nests failures.

- González-Crespo et al. (2023) installed about 15 new artificial nest structures during the 2023 breeding in the Pitahaya Mangrove Forest.
- Establish an educational and awareness project with the community to protect the wetlands and the yellow-shouldered blackbird populations.

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**RESULTS / SIGNATURES**

**U.S. Fish and Wildlife Service  
Yellow-Shouldered Blackbird or Mariquita (*Agelaius xanthomus*)**

**Status Recommendation:**

On the basis of this review, we recommend the following status for this species. A 5-year review presents a recommendation of the species status. Any change to the status requires a separate rulemaking process that includes public review and comment, as defined in the Act.

- Downlist to Threatened
- Uplist to Endangered
- Delist:
  - The species is extinct*
  - The species does not meet the definition of an endangered or threatened species*
  - The listed entity does not meet the statutory definition of a species*
- No change needed

**FIELD OFFICE APPROVAL**

**Field Supervisor, Caribbean Ecological Services Field Office, Fish and Wildlife Service**

Approve \_\_\_\_\_

\* Since 2014, Southeast Region Field Supervisors have been delegated authority to approve 5-year reviews that do not recommend a status change.