Thick-billed Parrot

Conservation Research Overview

1. Conservation challenges

San Diego Zoo Wildlife Alliance has been working with the thick-billed parrot since the 1990s, and our binational conservation program for this charismatic species was spearheaded by Chief Conservation and Wildlife Health Officer, Nadine Lamberski.

Thick-billed parrots once ranged from central Mexico all the way into the high-elevation forests of Arizona and New Mexico. Sadly, the species has experienced rapid population declines due to habitat loss, unregulated hunting, and the pet trade. Thick-billed parrots have been extirpated from the USA since the 1930s and are currently restricted to highland pine forests at elevations above 2,000 m in the Sierra Madre Occidental ranges of north-western Mexico. The thick-billed parrot is a flagship species for the Sierra Madre Occidental ecosystem and the parrot has cultural significance for the indigenous people of the Sierra Madre.

Thick-billed parrots are currently classified by the Mexican government and the U.S. Fish and Wildlife Service as ‘Endangered’. The species is listed in Appendix I of CITES, and the IUCN lists its status at ‘Endangered’ because of its decreasing populations, specialized conifer diet, limited geographic range, and niche as an obligate cavity-nesting bird. The most recent population census estimates that there may be less than 2,000 individuals remaining and that the population continues to decline.

The remaining high-elevation forests that are critical for supporting thick-billed parrots populations are increasingly fragmented and degraded and are under ongoing pressure from mismanaged forestry practices and climate change.

2. Conservation opportunities

San Diego Zoo Wildlife Alliance has partnered with the AZA, Arizona Department of Game and Fish, World Parrot Trust, and our in-country collaborators at the Mexican conservation NGO OVIS to lead a long-term binational program in conjunction with the

Mexican Government to halt the decline of thick-billed parrot populations, protect their core habitats and restore their population health.

San Diego Zoo Wildlife Alliance maintains a breeding collection of thick-billed parrots at the Safari Park, and we know a lot about parrot captive husbandry. However, there are large knowledge gaps concerning the species' ecology in the wild which has hindered efforts to improve our *in-situ* conservation strategies.

We know that the parrots spend their breeding season (June to October) primarily within the northern Mexico states of Chihuahua and Durango, then overwinter (November to May) within the south-central Mexico States. However, the locations of core overwintering habitats are unknown, as are the locations of parrot migratory routes and stopover sites. It is hard to protect core habitats for an endangered species if the locations and attributes of these habitats are unknown.

3. Conservation value

San Diego Zoo Wildlife Alliance provides ongoing scientific and veterinary expertise to the thick-billed parrots conservation program, and in 2019 we conducted the first successful tracking study of parrots in Mexico with a deployment of an initial 10 miniature transmitters on wild birds, followed up by a deployment of another 10 transmitters in 2020. We plan to deploy a final batch of 10 transmitters during the 2021 breeding season. These transmitters are designed not to impact the birds' movements or behavior, and are solar powered to last for multiple years.

The location data we have collected from these transmitters has enabled us to track the movements of the parrots as they departed their northern spring-summer breeding sites where they were first captured and as the birds migrate south to their overwintering sites. The timings of their seasonal migrations have been identified, and for the first time we have been able to identify and characterize the locations of their southern habitats. We have also been able to elucidate how the birds fly together when migrating and we identify the locations of their key stopover sites along their migratory routes. We have tracked these little parrots traveling at far south as 580 km from their capture locations, which they covered in under two weeks.

Another future research goal is to deploy song-meters at key parrot nesting sites to acquire remote information on the bird's population dynamics and the timing of migratory and breeding behaviors. This new ecological and behavioral information will allow OVIS's team, together with land owners, local community stakeholders and forest administrators, to enhance habitat protection strategies - including protecting natural areas and the implementation of improved practices for forest usability and sustainable management.

4. Project links:

https://animals.sandiegozoo.org/animals/thick-billed-parrot

https://science.sandiegozoo.org/species/thick-billed-parrot

https://science.sandiegozoo.org/science-blog/parrot-tracking-mexico

https://ovis.org.mx/uncategorized/unidos-para-conservar-a-la-cotorra-serrana-occidental/

The many partner organizations working together to improve the conservation outlook for thick-billed parrot populations.

Miniature solar-powered transmitters attached to wild thick-billed parrots in Mexico. These transmitters provide valuable insights into the spatial behaviors, migratory paths, and habitat associations of the parrots.