

Determining Limitations to Northern Aplomado Falcon Nest Occupancy and Productivity in Coastal Texas

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Background

Anthropogenic factors, such as habitat loss, land use changes, and pesticides have resulted in extirpation and extinction of many species. Species reintroductions have been a strategy to combat these losses for decades, but successes are rare. One reason for this low success rate is that reintroductions often occur in highly modified ecosystems with altered trophic webs. Reintroductions into a novel ecosystem are unlikely to succeed without an understanding of the effects of species interactions and habitat changes. The Peregrine Fund has been working to reintroduce the Northern Aplomado Falcon in the U.S. since the 1980's, with a small breeding population now occurring in coastal Texas. Direct and indirect effects of woody vegetation encroachment are thought to be hindering these efforts.

Objectives

- Chapter 1: Determine how habitat impacts occupancy of predatory owl species in coastal Texas.
- Chapter 2: Confirm the link between Aplomado Falcon productivity and owl predation, and evaluate the effects of habitat mediated owl occupancy on Aplomado Falcon nest occupancy and productivity.

Methods

- Owl Occupancy: Use callback surveys (Barn Owl and Great Horned Owl) and autonomous recording units (Figure 1a) at 65 sites (Figure 2) from Dec.-Feb. of 2022 and 2023. Sites are 1.6 km from each other and distributed across four major habitat types (Figure 3) on Laguna Atascosa National Wildlife Refuge.
- Nest Occupancy and Productivity: Place cameras on up to 20 Aplomado Falcon nests (Figure 1b) with varying levels of woody encroachment (from LiDAR) to monitor occupancy and productivity, and to confirm causes of mortality.



Figure 1a. A deployed autonomous recording unit (Open Acoustic Devices).

Figure 1b. A Northern Aplomado Falcon perched on an artificial nesting structure in coastal Texas. Photos by Paul Juergens.



Figure 2. Laguna Atascosa National Wildlife Refuge in coastal Texas with locations for autonomous recording units and callback surveys.

Expected Results

Predatory owl occupancy is likely mediated by habitat, and we expect habitats with greater woody vegetation to support more owls. Presence of predatory owls likely decreases Aplomado Falcon nest occupancy and productivity, and we expect encroachment of woody vegetation into Aplomado Falcon habitat to facilitate this negative impact (Figure 4).

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Figure 3. Primary habitat types (from 30 m resolution satellite data) in the study site: salty prairie, Borrichia flats, swale grassland, and Tamaulipan thornscrub.

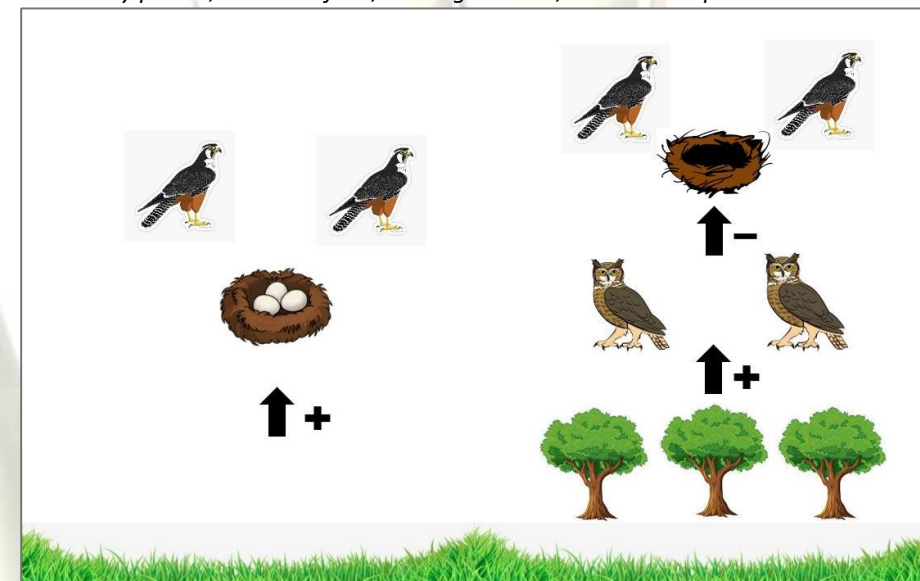


Figure 4. Expected results: Mesquite encroaching on open Aplomado Falcon habitat likely mediates presence of Great Horned Owls, leading to decreased falcon nest occupancy and productivity. (+/- indicates positive/negative effect).