

ABUNDANCE, BEHAVIOR, AND MORTALITY OF *BUTEO SWAINSONI* NEAR SAN FRANCISCO, CÓRDOBA, ARGENTINA IN 1997

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Abundancia, comportamiento, y mortandad de *Buteo swainsoni* cerca de San Francisco, Córdoba, Argentina en 1997.

RESUMEN. Observamos aguiluchos langosteros (*Buteo swainsoni*; Swainson's hawk) cerca de San Francisco de Córdoba, Argentina (31° 30' S, 62° 05' W) durante enero y febrero de 1997. Hicimos tres recorridos al noreste de Córdoba y al oeste de Santa Fé, el primero para reconocimiento del área, el segundo para localizar y capturar ejemplares, y el tercero para evaluar un incidente de mortandad. Los aguiluchos fueron abundantes (aproximadamente 3.500 aguiluchos en el primer viaje y 2.340 en el segundo viaje) en pampas y campos agropecuarios, en toda la región cerca de San Francisco. Encontramos sus dormideros en *Eucalyptus viminalis* y *Melia azedarach*. Los aguiluchos capturados en diciembre de 1996 en el norte de la provincia de La Pampa fueron luego descubiertos cerca de San Francisco de Córdoba, aproximadamente a 500 km de distancia. En el segundo viaje, un incidente con 24 aguiluchos muertos fue descubierto cerca de Pozo de Molle en Córdoba. La región cerca de San Francisco de Córdoba parece importante para aguiluchos langosteros durante la estación no reproductiva en Argentina.

Key words: *Buteo swainsoni*, abundance, behavior, Argentina, agriculture, grasslands

Palabras clave: *Buteo swainsoni*, abundancia, comportamiento, Argentina, agricultura, pastizales

INTRODUCTION

The austral (non-breeding) distribution of Swainson's hawks (*Buteo swainsoni*; aguilucho langostero) has been poorly defined until recent years. Banding records and reported sightings showed that Swainson's hawks were scattered across Brazil, Uruguay, and Argentina (Ambrosetti 1919; Delius 1953; Houston 1974; CIPA Sección Argentina 1987; White et al., 1989; Jaramillo 1993; Rudolph 1993; Schmutz et al., 1996). Large data gaps existed, however, until the advent of satellite radio telemetry, which has assisted

in locating hawks on the non-breeding grounds (England et al., 1997). Between 1994-97, over 50 Swainson's hawks were tracked via satellite radio telemetry from nesting locations in North America to South American destinations (Woodbridge et al., 1995; Schmutz et al., 1996). Habitat locations observed during January 1995 in northern La Pampa (Woodbridge et al., 1995) were originally ascertained from satellite observations. This eventually led to the discovery of mortality incidents in Argentina during January 1996 (Goldstein 1997).

More than 5,000 Swainson's hawks were found

dead in western Buenos Aires, eastern La Pampa, and southern Córdoba provinces from January through March, 1996 (Goldstein et al., 1996; Canavelli and Zaccagnini 1996). The mortality occurred primarily while hawks were foraging for grasshoppers on agricultural fields. Hawks were exposed to the organophosphate (OP) insecticide monocrotophos (MCP) and died both in fields and at roosts (Goldstein et al., 1999). As a result of the mortalities, Swainson's hawks were monitored in northern La Pampa from November 1996 through March 1997. In addition to toxicological sampling, conventional radio transmitters were placed on 22 hawks (Canavelli et al., in press) to obtain more detailed habitat specific information regarding hawk distribution and flock dynamics in the pampas.

With the use of satellite radio transmitters, Swainson's hawk distributions were further mapped across Argentina. Swainson's hawks with satellite transmitters were clustered around northern La Pampa province and the area surrounding San Francisco, Córdoba. We went to San Francisco during January and February 1997 to confirm satellite data and document Swainson's hawk distribution in this area. In this paper, we comment on hawk abundance, habitat use, roosts, diet, and movements across the non-breeding grounds. Lastly, we discuss the assessment of a mortality incident found near Pozo de Molle, Córdoba.

METHODS

Between 16 January and 14 February 1997, we made three trips in search of Swainson's hawks in northeastern Córdoba province, Argentina. All three trips originated from Estancia Chanilao (35° 14' S, 63° 57' W) in northern La Pampa province, the base for our La Pampa studies. We made the first trip on 16-17 January 1997, the second trip from 29 January through 1 February 1997, and the third trip on 13-14 February 1997. We traveled the area surrounding San Francisco, Córdoba, (31° 30' S, 62° 05' W) by car and counted the number of hawks at each sighting. Hawks in large groups were estimated by counting the birds in as many binocular fields as necessary to cover each flock completely, rounding to the nearest 10 hawks. We also recorded foraging when it was observed. Vehicular surveys were made from 0630 – 1200 and 1600 – 2000 local time.

On Trip 2, we conducted surveys in the same fashion as on Trip 1; however, each time hawks were seen, we scanned the 22 radio signals to locate birds with transmitters using a handheld antenna. On Trip 3, we assessed a mortality incident near Pozo de Mo-

lle, Córdoba. We interviewed farmers to determine agrochemical use at the time of the incident. With no tissue samples available, we sampled feathers of wings from 7 carcasses for organophosphate pesticide residue analysis (Clemson University, SC, USA).

RESULTS AND DISCUSSION

On Trip 1, we estimated 3,500 Swainson's hawks in 9 locations within 50 km of San Francisco, Córdoba (Table 1). Approximately half the birds were soaring, with the rest either perched or feeding. On Trip 2, we located approximately 2,340 hawks in 14 locations within 50 km of San Francisco (Table 1). We located four hawks instrumented with conventional radio transmitters that were originally captured in December 1996 in northern La Pampa province.

Habitat Use

Hawks occurred mainly in agricultural fields and occasionally in non-cultivated natural pastures. They were also found on fence posts surrounding fields and along roadsides. Agricultural fields used by hawks included alfalfa, sunflower, corn, sorghum, and soybean, in addition to fallow fields. Hawks were most commonly found in freshly plowed, tilled, and sowed fields, followed by fields with emerging crops and fields in early stages of development. Grazed or cut alfalfa fields were also used. Hawks were not found in fields with plant growth higher than 40 cm unless large open spaces existed in these fields. In densely planted fields or fields with wide-leaf crops, such as soybean, sunflower, or sorghum, maximum plant height decreased to approximately 30 cm.

Roosts

Roosts containing as many as 800 hawks were found. Large aggregations of Swainson's hawks utilized the height and infrastructure of *Eucalyptus viminalis* groves as roosts in Córdoba province. Hawks were also observed roosting on the tops of the snow cone shaped branches of paraíso (*Melia azedarach*) near Quebracho Herrado, but were not observed roosting in any other type of tree.

Diet

Similar to previous findings in Argentina (White et al. 1989, Jaramillo 1993, Woodbridge et al., 1995, Goldstein et al., 1996), and similar to non-breeding birds in North America (Johnson et al., 1987; England et al., 1997), we observed that hawks foraged in or above fields abundant with insects, eating grasshoppers (Orthoptera), beetles (Coleoptera), dra-

Table 1. Counts and estimates of Swainson's hawks on roadside surveys near San Francisco, Córdoba during January and February, 1997.

| | Location of Hawk Sighting | Number of Hawks | Type of Count | Observed Behavior |
|--------|--------------------------------------|-----------------|---------------|----------------------------|
| Trip 1 | 3 km SW of Saturnino Laspiur | 300 | Estimate | Soaring / Pasture |
| | Near Saturnino Laspiur | 200 | Estimate | Soaring |
| | Near Colonia Prosperidad | 120 | Estimate | Soybean – foraging |
| | Near Colonia Prosperidad | 30 | Count | Perched |
| | Near Colonia San Bartolome | 1,500 | Estimate | Soaring (in 4 thermals) |
| | Near Colonia San Bartolome | 600 | Estimate | Ground – soybean, alfalfa |
| | Near Rafaela | 264 | Count | In fields / On fence posts |
| | Intersection of Routes 19 and 34 | 19 | Count | In fields / On fence posts |
| | Route 19 (near San Francisco) | 470 | Estimate | Pasture – foraging |
| | | | | |
| | Counts | 313 | | |
| | Estimates | 3,190 | | |
| | Approximate Total | 3,500 | | |
| Trip 2 | Route 158 near Quebracho Herrado | 102 | Estimate | Roosting |
| | Route 158, 18 km SW of San Francisco | 300 | Estimate | Plowed field |
| | Route 158, 20 km SW of San Francisco | 200 | Estimate | Foraging in sorghum |
| | Near Saturnino Laspiur | 200 | Estimate | Soaring |
| | Near San Bartolome | 28 | Count | Settling into roost |
| | Near La Francia | 24 | Count | Fence posts |
| | Near Plaza Luxardo | 12 | Count | Fence posts |
| | Route 19 over San Francisco | 10 | Count | Flying northeast |
| | 5 km NW of Esmeralda | 17 | Count | Soaring |
| | Over Esmeralda | 50 | Count | Flying south |
| | 10 km west of Esmeralda | 600 | Estimate | Foraging |
| | Near Quebracho Herrado | 800 | Estimate | Roosting (seen 2 nights) |
| | | | | |
| | | | | |
| | Counts | 243 | | |
| | Estimates | 2,100 | | |
| | Approximate Total | 2,340 | | |

gonflies (Odonata), and caterpillars (Lepidoptera). Hawks took advantage of insect outbreaks and prey made available when agricultural fields were cut or tilled. We did not see Swainson's hawks capturing or eating mammals, birds, or herpetofauna.

Movement from La Pampa Province to Córdoba

During Trip 2, we located four hawks in Córdoba instrumented with conventional radio transmitters. These birds were trapped 500 km southeast, at Estancia Chanilao, in northern La Pampa province in December 1996. The first bird was located soaring west of Route 35, 2 km south of the turnoff to San Basilio. The second hawk was located roosting in paraíso, 37 km southwest of San Francisco, on Route 158 bet-

ween Saturnino Laspiur and Quebracho Herrado. The following day we relocated the second bird near its roost and again just west of Esmeraldas. The third radio-tagged bird was found southeast of Quebracho Herrado and, several hours later, in a roost 2 km east of San Francisco on Route 19. A fourth radio-tagged bird was also found in the roost at this location.

Trip 3 – Mortality Incident

On 13–14 February, we assessed a mortality incident found near Quebracho Herrado, approximately 7 km northwest of Pozo de Molle. The incident was first discovered by L. A. Gaviglio (Municipad de la Ciudad de San Francisco) and reported to AOP and INTA.

The incident occurred under a *Eucalyptus* spp. roost in a driveway separating two soybean fields. Nineteen Swainson's hawk carcasses were encountered and collected by AOP biologists on 10 February 1997. During interviews and surveys on 13 February 1997, five more carcasses were found, for a total of 24 dead Swainson's hawks. All carcasses were found face down, scavenged and desiccated. No organophosphate pesticide residues were detected on wing feathers (Goldstein 1997). Testimonies of insecticide use by the estate owner and two proximal landowners do not immediately correlate to the time of Swainson's hawk mortality.

CONCLUSIONS

In an effort to describe the non-breeding distribution of Swainson's hawks, satellite radio transmitters were used to track their migration to South America. Telemetry data indicated that Swainson's hawks would be found in the area surrounding San Francisco, Córdoba. We confirmed the presence of Swainson's hawks near San Francisco in January and February 1997, supporting the satellite telemetry data. In addition, it was uncertain whether groups of hawks on the non-breeding grounds intermixed, or whether they moved large distances during the non-breeding season. Four of the 22 hawks captured early in the 1996-97 season in La Pampa province were located 500 km away 6 weeks later, confirming that Swainson's hawks travel large distances across the non-breeding grounds.

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