

the species is known as the "aguilucho langostero" (grasshopper hawk) due to the fact that grasshoppers are considered to be an important prey item (B. Woodbridge et al. 1995. *J. Raptor Res.* 29:202–204). Observations on predation are scarce in Argentina, although an unusual incident has been reported (D.C. Rudolph 1993. *Wilson Bull* 105:365–366).

A specimen was shot 11 January 1991 by a rural worker in Monte Nievas, Conhelo department, La Pampa, Argentina, and brought to the Museo Provincial de Historia Natural of Santa Rosa, La Pampa, where it was prepared as a study skin and the stomach preserved. An analysis of the stomach contents revealed a total of 40 prey items, of which most were grasshoppers (26 *Dichroplus elongatus*, 2 *Xileus* spp.). The remainder were either undetermined grasshoppers (2 adults), lepidopterans (8 larvae) or chrysomelid beetles (1 adult, 1 larva).

It is obvious that in this case, acridid grasshoppers (called "tucuras" in Argentina) were an important and well represented item in the diet of this bird. The genus *Dichroplus* of acridid grasshoppers has been reported in Swainson's hawks pellets and have been mentioned as a hazard for hawks because of insecticides used against them (B. Woodbridge et al. 1995. *J. Raptor Res.* 29:202–204).

The bird was a female that had been banded near Edmonton, Alberta, Canada, in July 1982. This is further evidence that this portion of La Pampa province is used as the wintering grounds by Swainson's hawks from western Canada.

We wish to thank G. B. Siegenthaler for permission to study the specimen.—**Ramón Serracín Araujo, Departamento de Ciencias Naturales, Universidad Nacional de La Pampa, Uruguay 151, 6300 Santa Rosa, La Pampa, Argentina and Sergio I. Tiranti, Department of Biological Sciences, Texas Tech University, Lubbock, TX 79409-3131 U.S.A.**

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## AN ASSESSMENT OF MORTALITY OF SWAINSON'S HAWKS ON WINTERING GROUNDS IN ARGENTINA

Swainson's hawks (*Buteo swainsoni*) migrate from breeding areas in grasslands and shrubsteppe areas of North America to spend the austral summer in similar habitat in Argentina (White et al. 1989, *Raptors in the Modern World*, Berlin, Germany). The overall population, estimated at 450,000 birds, appears to be stable although declines have been reported in California (P.H. Bloom 1979, USDI BLM Dept. Fish and Game W-54-R-12, Sacramento, CA U.S.A.), Oregon (C.D. Littlefield et al. 1984, *Raptor Res.* 8:1–5), Nevada (G.B. Herron and P.B. Lucas 1978, Nev. Dept. Fish and Game, Perform. Rept. W-43-R, Reno NV U.S.A.), and Alberta and Saskatchewan (C.S. Houston and J.K. Schmutz 1995, *J. Raptor Res.* 29:198–201).

To better describe the migration route of the Swainson's hawk, two satellite radio transmitters were attached to females in 1994. Following radio-transmitter locations to La Pampa Province in Argentina, a roost with over 700 dead Swainson's hawks was encountered in 1995 (Woodbridge et al. 1995, *J. Raptor Res.* 29:202–204). The hawks arrived at the roost after feeding in a sunflower field and died during the following three days. The landowner stated that the field had been sprayed with the organophosphate (OP) monocrotophos. Although monocrotophos is used widely abroad, it is not registered in the United States. One possible reason is that this pesticide has been related to large-scale bird mortalities in the past (H. Mendelsohn and U. Paz 1977, *Biol. Conserv.* 11:163–169).

In a follow-up study in 1996, we observed Swainson's hawks roosting in groves of exotic *Eucalyptus* sp. trees and feeding on grasshoppers (*Dichroplus* spp.) in sunflower and alfalfa fields in La Pampa Province. We surveyed approximately 2,500 km<sup>2</sup> and encountered large flocks of up to 12,000 hawks scattered throughout the area. In late January, we recorded four incidents of large-scale mortality with an estimated total of approximately 4,100 dead hawks. Chemical-use data from these incidents were obtained from landowners or applicators. Two incidents involved monocrotophos applications on alfalfa fields for grasshopper control. A total of 982 dead Swainson's hawks were found in fields and roosts adjacent to fields where the pesticide had been applied. In a third incident, 103 hawks were found dead after the OP dimethoate was sprayed on alfalfa for grasshopper control. In all three incidents, we found no age-class differences in mortality.

The largest incident of Swainson's hawk mortality occurred in a 120 ha alfalfa field sprayed with an unknown pesticide. An estimated 3,000 hawks were killed after this application. In this case, an estimated 75% of the dead hawks were adults. Overall results of this study indicate that continued large-scale mortalities from OP pesticide applications in Argentina wintering areas may threaten the future status of this species.

Based on past band recoveries and sightings (CIPA Seccion Argentina 1987, *Nuestras Aves* 13:13–16), as well as current data, wintering areas of the Swainson's hawk in Argentina include La Pampa, Buenos Aires, Cordoba, San Luis, and Sante Fe Provinces. The extent of the wintering range, however, has not been fully described. Crop production throughout much of La Pampa, Buenos Aires, and Cordoba consists largely of sunflower seed and alfalfa. Due to the area of overlap between these forms of agriculture and the high concentrations of Swainson's hawks in the area, it is likely that pesticide-related mortality may well exceed 5% of the world's population, 1% of which we recorded.

We are currently performing residue analyses on tissue samples of dead hawks. These data will lead to more conclusive evidence for the identity of the pesticides that led to the large-scale mortalities observed on the austral summer habitat of this species.

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