

Further records for the Swainson's Hawk *Buteo swainsoni* in Venezuela

Paolo Ramoni-Perazzi¹, Carlos Rengifo² e Irma Alejandra Soto-Werschitz³

¹Laboratorio de Zoología Aplicada, Departamento de Biología, Facultad de Ciencias, Universidad de Los Andes, Mérida 5101, Venezuela. rpaolo@ula.ve

²Estación Ornitológica La Mucuy, Parque Nacional Sierra Nevada, Mérida, Venezuela

³Instituto de Ciencias Ambientales y Ecológicas, Facultad de Ciencias, Universidad de Los Andes, Mérida 5101, Venezuela

The Swainson's Hawk *Buteo swainsoni* is a medium-sized Accipitridae noted by its remarkable long-distance migration: breeds mostly in the grasslands and prairies of Western and Central North America, from Southern Alaska to Northern Mexico, and spends the winter mainly in the grasslands of Argentina, also in S and W USA, especially in Florida (Meyer de Schauensee 1982, Howell and Webb 1995, White and Kirwan 2013). They use the Mesoamerican Land Corridor during their journey along with the Turkey vulture *Cathartes aura* and the Broad-winged hawk *Buteo platypterus*, in mixed-species flocks of up to ten of thousands of individuals (Goodrich and Smith 2008). Meyer de Schauensee and Phelps (1978) indicated that their migration route is little known, and Meyer de Schauensee (1982) highlighted that their not well understood winter range includes spotted records from central and SE Colombia, W Peru, E Brazil, E Bolivia and Trinidad. More recently, Restall *et al* (2006) indicated that Swainson's Hawk is uncommon on migration and a very rare winter resident in Colombia, rare transient in Ecuador, rare accidental in Tobago, but not recorded in Trinidad. Information on migration routes of Swainson's Hawk from individuals tracked using satellite telemetry (Fuller *et al* 1998, Kochert *et al* 2011, Groen 2015) indicate a corridor placed obliquely across South America, from the Panama Isthmus to Argentina, throughout NW, Central and SE Colombia, NE Peru, W Brazil, E Bolivia and Paraguay, during both fall (southward) and spring (northward) migrations. This route is corroborated by the citizen-science data from the web-based repository eBird (Sullivan *et al* 2009), which gathers sightings records of Swainson's hawks from 1990 to 2016.

In Venezuela, Swainson's Hawk has been considered as a "probable transient" (Meyer de Schauensee and Phelps 1978), a "very rare passage migrant" (Hilty 2002), and a "rare transient" (Restall *et al* 2006), which has been recorded at six localities: (a) San Cristóbal (Táchira State) on November (Meyer de Schauensee and Phelps 1978); (b) along the Chama river (Mérida State) on September (Meyer de Schauensee and Phelps 1978, Hilty 2002); (c) 12 km S of Calabozo (Guárico State) on 10 January 1976 (Hilty 2002); (d)

a northward migrant tracked at Falcón State, perhaps in Federación Municipality, between 1995 and 1998 (Kochert *et al* 2011); (e) Reserva Forestal de Palmichal (Carabobo State) on November 19, 2006 (Kvarnäck 2006); and (f) Autopista Regional del Centro antes de Turmero (Aragua State) on February 28, 2016 (Miranda 2016).

We report two new localities and 17 additional Swainson's Hawk sighting records between 2009–2015. Most of them while we monitoring bird migrations in a paramo area at Laguna de Mucubají, Parque Nacional Sierra Nevada (08°47'N–70°50'W, 3570 m), where three individuals were recorded on 07 October 2009; four individuals and one individual on 16 and 20 October 2010 respectively; two individuals on 28 October 2011; one individual on 14 and another one on 25 October 2012; and four individuals on 22 October 2013. All were light-morph adult individuals, soaring high along with Turkey vultures and Broad-winged hawks. These sightings represent elevation records for the species in Venezuela.

Another light-morph individual was observed on 23 October 2015 in Mérida City (Mérida State), soaring alone on an area combining buildings, grasslands and scattered second growth forest around the conjunction of Mucujún and Chama rivers (08°36'15.80"N–71°08'15.24"W, 1640 m).

In all cases, several clearly visible structural and plumage features prevented us to misidentify or confuse the birds with other co-occurring raptors (for example, *Geranoaetus melanoleucus* and *Buteo platypterus* in the case of Mucubají, and *Buteo platypterus*, *B. brachyurus*, *B. leucorrhous* and *Rupornis magnirostris* in the case of Mucujún). Some of these features included: medium size, noticeably long pointed dihedral wings, dark brown head and dark flight feathers contrasting with white underwings and belly.

Several factors have been alleged to promote the movement of long-distance migrants outside from their habitual breeding or wintering ranges, or migratory pathways (Bildstein 2004, Silva and Olmos 2006, Newton 2008, Jiguet and Barbet-Massin 2012, Nunes *et al* 2015): (1) population growth or expansion; however, Swainson's Hawk population is generally consi-

dered stable (IUCN 2013); (2) drift due to atmospheric causes such as particular weather conditions, especially in juveniles (Thorup *et al* 2003, Bildstein 2004), but the prevailing northeast trades typical of low latitudes should prevent the eastward deviations from the mainstream migration route and, on the other hand, the observed specimens were adult in all cases; (3) overshooting, when the long-distance migrants go beyond their normal destination, which does not apply in this case; (4) mirror-image migration, when migrants correctly move on the north-south axis but fail in the east-west side of that axis, which does not apply in this case; (5) climate change, which act on the altitude axis not in the longitude one as in this case; (6) reverse-direction migration, or the mistake north for south by their internal navigational mechanism, which does not apply in this case; (7) man made habitat adequacy for stopping places, a factor that could be facilitating the eastward movements given this hawk has been recorded mainly on herbaceous habitats, and the forest cover in the Venezuelan Andes has decreased drastically as a result of anthropogenic causes (Portillo-Quintero *et al* 2012). Finally, deviant directional tendencies is another of the factors that has been alleged to promote the movement of long-distance migrants outside from their habitual breeding or wintering locations, but the lack of long and consistent time series of records impede to determine tendencies and, hence, to include or exclude this factor.

However, a more parsimonious explanation is normal dispersal (Newton 2008), that is, perhaps this hawk crosses Venezuela recurrently, but is overlooked because its low densities, short staying, and deficient observer's coverage in the country (which is, as suggested by Miguel Lentino, *pers. comm.*, worsened by the fact that the species is illustrated in none of the guides of the Venezuelan birds). Meller and Benke (2012) made similar considerations in the case of the Broad-winged hawk in southern Brazil.

The information gathered from individuals tracked using satellite telemetry shows that northward and southward migration paths are similar in this hawk species (Fuller *et al* 1998, Kochert *et al* 2011, Groen 2015), but the individual northward vectors tend to be predominantly east of southward vectors south of 10° N and predominantly west of southward vectors thereafter (Kochert *et al* 2011). Thus, Venezuela is located approximately at the reversion point of the relative positions of both northward and southward migration vectors. Therefore, and after reasonably excluding any historical tendency with regards to field observation effort skewed toward fall (southward) season, northward and southward migrants should have similar chance to be detected in Venezuela. Kochert *et al* (2011) and Groen (2015) indicate that southward migration of Swainson's hawks begins from mid-August to mid-October (transiting during 42 to 98 days), while northward migration begins from mid-February

through March (transiting during 48 days in average accordingly to Groen 2015, but 51 to 82 days according to Kochert *et al*. 2001). Therefore, except for the unique returning individual tracked by Kochert *et al* (2011) at Falcón State, and the sighting from Aragua State reported by Miranda (2016), the great majority (12 events) of Swainson's Hawk sightings in Venezuela correspond to southward migrants ($X^2= 7.1429$, $p=0.0075$). That is, considering that those birds observed at 12 km S of Calabozo (Guárico State) on 10 January 1976 were not "early returning migrants or wintering birds" as suggested by Hilty (2002), but late southward migrants according to dates indicated by Kochert *et al* (2011) and Groen (2015).

This pattern, as well as the fact that none of the hawks radio marked by Fuller *et al* (1998), Kochert *et al* (2011) or Groen (2015) wintered in S or W USA, clearly indicated that there is still much to investigate with regards of the Swainson's Hawk wintering ecology and behavior.

ACKNOWLEDGEMENTS

Jorge Pérez-Emán and Miguel Lentino provided comments and suggestions that greatly improved the manuscript.

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