



Research note

Recent increase in the distribution of the snail kite (*Rostrhamus sociabilis*) along the central Pacific Coast of México

Incrementos de la distribución del gavilán caracolero (*Rostrhamus sociabilis*) en la costa del Pacífico central de México

Salvador Hernández-Vázquez^{1✉}, Ricardo Rodríguez-Estrella², Francisco Ramírez-Ortega³, Juan Loera³ and Manuel Ortega³

¹Departamento de Estudios para el Desarrollo Sustentable de Zona Costera. Universidad de Guadalajara. Gómez Farías #82, San Patricio-Melaque, Municipio de Cihuatlán, 48980 Jalisco, México.

²Centro de Investigaciones Biológicas del Noroeste, Mar Bermejo 195, 23090 La Paz, Baja California Sur, México.

³Fundación de la Costa de Jalisco A.C. Av. Chapultepec #206. Col Roma Norte, Delegación Cuauhtémoc, 06700 México D. F., México.

✉ sahernan@costera.melaque.udg.mx

Abstract. New records of the snail kite (*Rostrhamus sociabilis*) are presented for the central Pacific Coast of Mexico. From April 2010 to August 2011, weekly or biweekly surveys were made through several wetlands of coastal Jalisco and Colima. We recorded 32 snail kites from October 2010 to August 2011. The recordings were in 8 wetlands. In all wetlands there was only 1 individual, except in the lagoons El Aguacate (June 2010) and El Tule (August 2012), where we recorded 3 and 5 individuals, respectively. Although we did not find any nests, we believe reproduction of snail kites is currently occurring because of the observed adult behavior (carrying small branches in its feet) and the records of juveniles during the month of February to July, a time corresponding to the breeding season of the species in Florida. Our records expand the distribution of the snail kite in Mexico as much as 900 km northwest of the previously published distribution of the species.

Key words: snail kite, *Rostrhamus sociabilis*, Jalisco and Colima, México.

Resumen. Presentamos nuevas observaciones del gavilán caracolero (*Rostrhamus sociabilis*) para la costa del Pacífico central mexicano. De abril de 2010 a agosto de 2011 se realizaron visitas semanales o quincenales a varios humedales costeros de Jalisco y Colima. Se observaron 32 individuos entre octubre del 2010 y agosto del 2011 en 8 humedales. En todos los humedales se registró sólo 1 individuo, excepto en las lagunas El Aguacate (junio de 2011) y El Tule (agosto de 2012), donde se observaron 3 y 5 individuos, respectivamente. Aunque no se han registraron nidos, consideramos que es probable que la reproducción del gavilán caracolero está ocurriendo actualmente en la región debido a la conducta observada de algunos adultos (p. ej. llevando ramas pequeñas en sus patas) y a la presencia de los juveniles durante los meses de febrero a julio, tiempo en el que ocurre la anidación de la especie en Florida. Nuestras observaciones incrementan la distribución del gavilán caracolero en México a cerca de 900 km al noroeste de su distribución registrada previamente.

Palabras clave: gavilán caracolero, *Rostrhamus sociabilis*, Jalisco y Colima, México.

The snail kite (*Rostrhamus sociabilis*) is found in open freshwater marshes and lakes, with shallow water and with a low density of emergent vegetation, which is its preferred foraging habitat (Sykes et al., 1995; Bennetts et al., 2006; Martin et al., 2006; Cattau et al., 2009). The kite is a specialist raptor feeding mainly on snails of *Pomacea*

spp. and *Marisa* spp. (Estela and Naranjo, 2005), but it can also prey on crabs, small turtles, rodents, and snakes, when snails are scarce (Sykes et al., 1995; Veiga et al., 2009).

Three subspecies are recognized, *R. s. plumbeus* (Florida, Cuba, and northwest Honduras), *R. s. sociabilis* (southwestern Nicaragua, Panamá, through South America and Argentina), and *R. s. major* (southeast of México, Guatemala, and northeastern Belize) (Sykes et al., 1995). In Mexico, the snail kite is found in wetlands of the lowlands of

Oaxaca, Veracruz, Tabasco, Chiapas, Campeche, Quintana Roo, and Yucatán (Sykes et al., 1995). There are only anecdotal records for the state of Jalisco (Palomera-García et al., 2006) along the central Pacific Coast. Pineda-López et al. (2012) reported the presence of the snail kite in the state of Jalisco after observing an individual in the mouth of the Marabasco River. Some snail kites have been anecdotally reported in the Mexican central Pacific since 2003, particularly in Manzanillo and Tecomán, Colima; Ticuiz, Michoacán; Zihuatanejo, Guerrero, and Nayarit (aVerAves, 2012). Here we present new records of the snail kite in the municipalities of Cihuatlán and Tomatlán, Jalisco, and in Manzanillo, Colima, (Fig. 1). These records were obtained while conducting a systematic study of the distribution of birds in the study area.

From April 2010 to August 2011, weekly or biweekly surveys were made through several wetlands and adjacent cultivated areas to survey and monitor all the avifauna. The surveys were made in the afternoon and followed a transect walk along the edge of the wetland. The length of each transect varied in each location. The time required for each census was 2 to 3 hours. The snail kite was found only in 8 of 14 surveyed wetlands (Fig. 1). These wetlands are small shallow areas with fresh water, except El Ermitaño estuary, which has contact with the sea through an opening called a 'boca barra' and the water is saline. The aquatic vegetation in these wetlands is composed mostly of water hyacinth (*Eichhornia crassipes*), water lettuce (*Pistia stratiotes*), tule (*Typha dominguensis*), and reed grass (*Arundo donax*). None of these wetlands has a permanent input of water, except El Tule and El Ermitaño. Water is received, after rains, from the highlands into the basin. The wetlands, where the species was not recorded, are larger and deeper, with mangrove forests at the edge, and connected to the sea, with water salinity that can exceed 35 psu (practical salinity units).

We have 32 records of snail kites. Solitary snail kites were more frequently recorded, but in some sites 3-5 individuals were counted at one time (Table 1). In El Tule Lagoon in July 2011, 1 adult male was observed frequently carrying small branches in its feet, so we suspect the bird was building a nest in this lagoon. However, we were unable to find nests. On subsequent visits to this site in August 2011, we recorded 5 snail kites: 1 female, 2 males, and 2 juveniles (Table 1). Juveniles were identified by feather and skin characteristics, as they had brownish eyes, blue-grey cere and facial skin, yellowish feet, a dark postocular stripe, and coarsely streaked dark brown underparts; We also observed that adults from the area were feeding them.

In 2005, we began a long-term monitoring program to determine waterfowl variations in the wetlands of the central and southern coast of Jalisco. During this

time and until 2010 we did not record any snail kites in the study area. Thus, our observations in 2010 and 2011 clearly indicate that the increase in snail kite numbers and distribution along the central Pacific Coast of México is very recent. Our new records expanded the distribution of the snail kite in Mexico as much as 900 km northwest of the previously published distribution of the species (Fig. 1). We are uncertain about the route and way the snail kite have colonized the central Pacific Coast but it is likely that it started from the Isthmus of Tehuantepec upwards. It is well documented that the snail kite distribution is closely tied to the distribution and abundance of snails of the genus *Pomacea* (Sykes et al., 1995; Estela and Naranjo, 2005). Angehr (1999) mentioned that the distributional increase of *Pomacea* snails has been a factor causing the colonization of wetlands by snail kites. In the wetlands of Jalisco, 2 snails of this genus have been reported: *Pomacea patula* (caracol manzano or tegogolo) (Hernández-Vázquez et al., 1999) and *P. flagellata* (Palomera-García et al., 2006). *Pomacea patula* was introduced in the 1980s into the Mexican central Pacific. They were put into reservoirs, river systems, and freshwater as a food source for the local communities (Jaime-Vargas, 1992). These snails have expanded their distribution along the coast of Jalisco during the last 10 years by colonizing many wetlands (V. Landa, unpubl. data). During our study we observed that reed grass and tule were used as a substratum by *Pomacea* snails to fix their eggs during reproduction. Thus, it is plausible that the increasing distribution of *Pomacea* snails

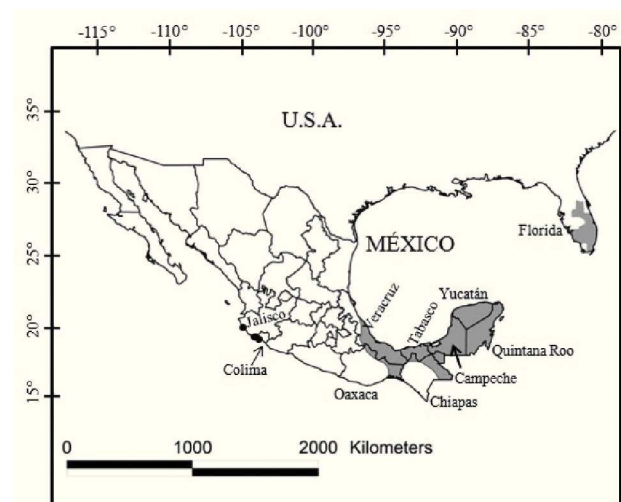


Figure 1. Sites in Jalisco and Colima that were recorded for the snail kite (black dots) and the distribution in the USA (Sykes et al., 1995 and Martin, 2007) and Mexico (Sykes et al., 1995) (in gray).

Table 1. Locations of snail kite recordings along the central Pacific Coast, México. Juvenile (j), female (f), male (m)

<i>Sites</i>	<i>Coordinates</i>	<i>M asl*</i>	<i>Area (ha)</i>	<i>Human activities**</i>	<i>Date of record</i>	<i>Bird records</i>
Municipality of Cihuatlán (Jalisco State)						
El Tule Lagoon	19°13'24" N, 104°41'34" W	6	41	tourism, urban area, fishing	6 Oct 2010	1j
					19 Nov 2010	1j
					26 Nov 2010	1j
					8 Jul 2011	1f, 1m
					3 Aug 2011	1f, 2m, 2j
Marabasco River	19°14'27" N, 104°33'08" W	26	-	agriculture, fishing	19 Feb 2011	1j
El Barro Lagoon	19°14'47" N, 104°39'40" W	12	14	agriculture	20 Feb 2011	1j
Ayvar Fish farm	19°12'28" N, 104°36'39" W	11	35	agriculture, fishing	25 Feb 2011	1j
Pinal Villa Fish farm	19°14'11" N, 104°41'31" W	11	1	urban area, agriculture	7 Mar 2011	1j
					9 Mar 2011	1j
					31 Mar 2011	1j
					8 Jul 2011	1j
Rancho La Lima Lagoon	19°11'45" N, 104°39'31" W	17	3	agriculture	29 Apr 2011	1j
El Aguacate Lagoon	19°13'17" N, 104°38'30" W	29	3	agriculture	4 Jun 2011	1f, 1j
					10 Jun 2011	3j
					16 Jun 2011	3j
					8 Jul 2011	2f
Municipality of Tomatlán (Jalisco State)						
El Emitaño estuary	19°59'04" N, 105°27'57" W	6	315	tourism, fishing	25 Jun 2011	1f, 1m
Municipality of Manzanillo (Colima State)						
Los Hachotes Lagoon	19°12'44" N, 104°32'11" W	10	80	agriculture, fishing	12 Mar 2011	1j
Potrero Grande Lagoon	19°09'05" N, 104°32'51" W	5	1079	agriculture, airport	30 Jul 2011	1m

*Meters above sea level. **Human activities recorded in and around the wetlands.

have caused the colonization and expansion of snail kites along the central Pacific Coast of Mexico.

Although the number of snail kites recorded to date is low, we expect that this number will increase in the future, similar to what has happened in the same area to the limpkin (*Aramus guarauna*), a snail specialist Gruiformes that has increased its numbers and distribution since they were first recorded in coastal Jalisco in 1999 (Hernández-Vázquez et al., 1999; Palomera-Gracia et al., 2006).

In Mexico there are no reports of snail kites during the breeding season. Only Palmer (1998) reported a couple near the Manzanillo Airport, in Colima, building a nest in September. Although we did not find any nests, we believe reproduction of snail kites is currently occurring because of the observed adult behavior (carrying small branches in its feet) and the records of juveniles during the month of February to July, a time corresponding to the breeding

season of the species in Florida (Valentine-Darby et al., 1998; Cattau et al., 2009).

Our observations indicate that the snail kites have been increasing their numbers since our first observation in 2010 (3 in 2010, 29 in 2011; Table 1). Further research is needed to find nests and determine the snail kite productivity in the region. It is possible that more wetlands will be occupied in the future by the snail kite, thus an increase in its distribution is expected because snail kites have high dispersal capabilities (Martin et al., 2006).

We thank Martin Ortiz, Foundation of the Jalisco Coast and the Department of Studies for Sustainable Development of Coastal Zone, University of Guadalajara for logistical support, and the instructors of 'Sal a Pajarear' project for their contributions to the field observations. We thank Dr. Ellis Glazier for editing this English language text.

Literature cited

- Angehr, G. R. 1999. Rapid long-distance colonization of Lake Gatun, Panama by Snail Kite. *Wilson Bulletin* 111:265-268.
- aVerAves. 2012. <http://ebird.org/content/averaves/>; last access: 27.VIII.2012.
- Bennetts, R. E., P. C. Darby and L. B. Karunaratne. 2006. Foraging patch selection by Snail Kites in response to vegetation structure and prey abundance and availability. *Waterbirds* 29:88-94.
- Cattau, C., W. M. Kitchens, B. Reichert, J. Olbert, K. Pias, J. Martin and C. Zweig. 2009. Snail Kite demography, annual report 2009. Unpublished report for the U.S. Army Corps of Engineers, Jacksonville, Florida.
- Estela, F. A. and L. G. Naranjo. 2005. Segregación en el tamaño de caracoles depredados por el gavilán caracolero (*Rostrhamus sociabilis*) y el carrao (*Aramus guarauna*) en el suroccidente de Colombia. *Ornitología Colombiana* 3:36-41.
- Hernández-Vázquez, S., R. E. Salas, B. C. D. Martínez and L. F. A. Ramos. 1999. Primer registro del carrao (*Aramus guarauna*) en la costa de Jalisco, México. *Boletín del Centro de Investigaciones Biológicas* 33:93-99.
- Jaime-Vargas, M. 1992. Contribución al fototactismo, velocidad de desplazamiento, marcaje y anillos de crecimiento en opérculo del caracol de agua dulce *Pomacea patula* (tegogolo) en condiciones de cautiverio. Tesis, ITMAR-SEP, Veracruz, México. 85 p.
- Martin, J., J. D. Nichols, W. M. Kitchens and J. E. Hines. 2006. Multiscale patterns of movement in fragmented landscapes and consequences on demography of the Snail Kite in Florida. *Journal of Animal Ecology* 75:527-539.
- Palmer, R. 1998. Birding the Americas. Trip report and planning repository Jalisco – Colima. <http://maybank.tripod.com/Mexico/Colima-Jalisco-09-98.htm>; last access: 20.I.2012.
- Palomera-García, C., S. Contreras-Martínez., B. Y. Cruz-Rivera, B. Villa-Bonilla and J. C. Gómez-Llamas. 2006. Registros adicionales del carrao (*Aramus guarauna*) en el estado de Jalisco, México. *Huitzil* 7:23-26.
- Pineda-López, R., N. Febvre and M. Martínez. 2012. Confirmación de la presencia del gavilán caracolero (*Rostrhamus sociabilis*) en Jalisco, México. *Huitzil* 13:39-42.
- Sykes, Jr., P. W., J. A. Rodgers, Jr. and R. E. Bennetts. 1995. Snail Kite (*Rostrhamus sociabilis*), *The birds of North America Online* (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/171> doi:10.2173/bna.171; last access: 2.III.2012.
- Valentine-Darby, P. L., R. E. Bennetts and W. M. Kitchens. 1998. Seasonal patterns of habitat use by Snail Kites in Florida. *Journal Raptor Research* 32:98-103.
- Veiga, J. O., J. M. Raggio and R. M. Güller. 2009. Cangrejos y tortugas en la dieta del caracolero (*Rostrhamus sociabilis*) en Argentina. *Nuestras Aves* 54:47-48.