

Nesting biology of Coscoroba Swan *Coscoroba coscoroba* at La Angostura Dam, Tafí del Valle, Tucumán, Argentina

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El Cisne Coscoroba *Coscoroba coscoroba* nidifica en latitudes mayores a 33°S desde Buenos Aires (Argentina) y Chiloé (Chile) hasta Isla Grande en Tierra del Fuego y, ocasionalmente, en las islas Malvinas. Mostramos el primer registro de nidificación a 26°55'06"S 65°41'36"O y 2.000 msnm. Nuestro objetivo fue estudiar la nidificación de *C. coscoroba* para contribuir con información sobre la reproducción de esta especie. Llevamos a cabo nuestro estudio desde agosto de 2004 a noviembre de 2005 en el dique La Angostura, Argentina. Registramos 26 individuos e identificamos ocho nidos, cinco de los cuales mostraron actividad, con un total de cinco puestas.

One of two species of swans in South America⁹, Coscoroba Swan *Coscoroba coscoroba* inhabits shallow brackish lagoons with abundant fringing vegetation³. Documented nesting records outside the main breeding area are scarce⁸. It nests at latitudes above 33°S from Buenos Aires (Argentina) and Chiloé (Chile) to Isla Grande in Tierra del Fuego and, occasionally, in the Falkland Islands. In winter, the species moves north to northern Argentina, central Chile, southern Paraguay, south-east Brazil and Uruguay^{9,10,14}. The highest altitude at which nesting has been recorded is 1,300 m⁴, but we recorded the species at a dam in northern Argentina at 2,000 m. Ours are the first nesting records at this altitude and latitude. This study provides additional data on certain aspects of this swan's breeding biology, from a high-altitude artificial lake. In addition, we highlight the importance of artificial waterbodies as habitat for waterfowl⁷.

Methods

Study site.—La Angostura Dam is located at 2,000 m (26°55'06"S 65°41'36"W) in the Tafí intermontane valley, Tafí del Valle department, Tucumán, Argentina. The dam has a perimeter of 12 km and extent of 980 ha including the flooded area. It is situated in a high-altitude semi-arid region, with a mean max. temperature of 18.6°C in summer and min. of 8°C in winter. Precipitation is <410 mm p.a. and falls only in summer¹. This study was part of an ongoing project to assess the dam's bird community, in August 2004–November 2005. However, the study species has been present at the dam since 2001.

Sampling.—We surveyed the dam's perimeter using line transects². Each transect was 1 km long and 100 m wide, centred on the shoreline. We established 12 consecutive transects; however, they were sampled rotationally, switching the first transect to be sampled on each visit. Nests found during transects were colour flagged and

designated by a number. We visited each nest once per week and recorded data on materials and nest and egg measurements. In addition, we recorded nest activity (adults in the environs of nests and nest stage) during each visit. We spent 30 minutes observing each nest during each weekly visit p.a., with a total of 1,140 minutes of observation.

Results

We recorded 26 adults and eight nests, five of them active and one of them used three times. The first nest was found at the río Tafí mouth (26°54'04"S 65°42'10"W). Nests 2 and 3 were 2 m from each other in the floodplain of the río Tafí, 600 m from nest 1. Nest 4 was on the east side of the dam, 400 m from Provincial Route 307, and 1.7 km from nests 2 and 3 (Fig. 1). Adults were always observed

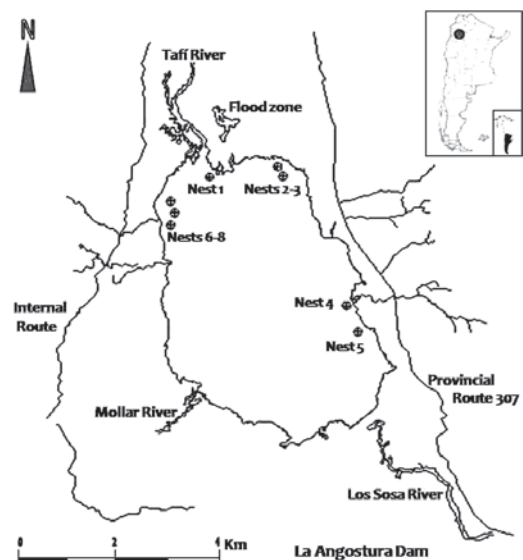


Figure 1. Map showing location of nests in the study area, Tafí intermontane valley, Tucumán, Argentina.

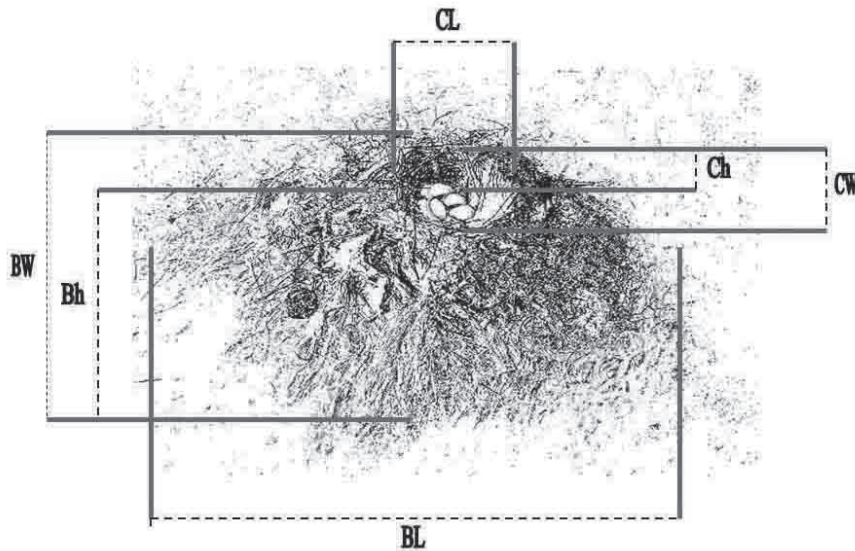


Figure 2. Model illustrating measurements (cm) of Coscoroba Swan *Coscoroba coscoroba* nests: basal width (BW), basal length (BL), basal height (Bh), chamber width (CW), chamber length (CL), chamber height (Ch).

near or on the nests when with eggs. Once nests were abandoned, adults stayed nearby. We did not observe inter- or intraspecific interactions.

Nests were built near (c.1–7 m) the dam's margins, in shallow water 12–50 cm deep, on marshy soil. The nests were truncated, cone-shaped, solid structures of mud and aquatic plants (*Ludwigia longifolia*, *Myriophyllum quitense*), and their interior was lined with aquatic plants and down feathers (Fig. 2). Mean nest height was 33.4 cm above water level. Mean cup diameter was 33.6 cm and depth 13.9 cm; basal length was 78.4 cm and width 77.5 cm. Nests lacked platforms (Table 1).

We recorded egg laying in June–October 2005, with a total of four active nests and five clutches (25 eggs total). In Table 2 we summarise these data. Eggs were elliptical, and ranged from white (52%), cream (32%) to buff (16%)³. Mean clutch size was 4.2 eggs (range 1–6 eggs), which were a mean 6.33 cm × 9.44 cm in size. Eggs were always completely covered with down feathers.

Discussion

This swan is included in CITES Appendix II with an estimated 10,000–25,000 individuals in Argentina^{4–6}. *C. coscoroba* is considered a partial austral migrant, moving to lower latitudes in autumn–winter¹⁰. However, we recorded a constant number of birds throughout August 2004–November 2005. For this reason, we considered this population resident.

Breeding activity was observed in June–October coincident with the observations of Navas¹² (July–December) and Nores & Izurieta¹³ (May–October)

Table 1. Quantitative characters measured (cm): basal width (BW), basal length (BL), basal height (Bh), chamber width (CW), chamber length (CL), chamber height (Ch).

Nest	BW	BL	Bh	CW	CL	Ch
1	50	50	33	26	26	9.5
2	77.5	67.5	29	33.5	31.5	17.5
3	72.5	76	21.5	30	31.5	13.5
4	110	120	50	45	45	15

for Argentina, and with those of Silva-García & Brewer¹⁶ (July–December) in central Chile.

Shape, material and location of nests agree with previous descriptions^{12,13}. However, nests were not sited in marshy vegetation, despite the presence of rushes (*Juncus* sp.), sedges (*Cyperus* sp. and *Eleocharis* sp.) and buttercups (*Ranunculus* sp.) at the dam's margins. Probably as a result, we did not see cygnets because the nests were almost certainly predated. Regarding nest size, dimensions were smaller than found by Navas¹². Clutch size was also lower than suggested by de la Peña¹⁵, Jugtlar⁹, Navas¹² and Nores & Izurieta¹³. Egg size matched previously reports^{12,15}.

We found Andean Coot *Fulica ardesiaca* eggs in swan nests on three occasions. Once the swan's nests had been abandoned or failed, coots used the nests for their own clutches. No interactions were observed while the adults were at the nest or in the environs, although nest defence against species like White-winged Coot *Fulica leucoptera* has been observed by Black-necked Swan *Cygnus melancoryphus*¹¹.

Table 2. Nest timeline data for Coscoroba Swan *Coscoroba coscoroba* at La Angostura Dam, Tafi del Valle, Tucumán, Argentina.

Nest	Date	Activity	No. eggs	Observations
1	30 June 2005	Incubating first clutch	6	Eggs covered
	28 July 2005	Incubating first clutch	5	
	5 August 2005	Failed	0	
	25 August 2005	Incubating second clutch	4	
	22 September 2005	Incubating third clutch	4	
	20 October 2005	Empty	0	Probably fledged (faeces in nest), although fledgings never observed
	23 November 2005	Abandoned	-	
2	30 June 2005	Prelaying	0	
	8 July 2005	Incubating first clutch	1	
	28 July 2005	Failed	4	<i>Fulica ardesiaca</i> incubating
	5 August 2005	Empty	0	
	11 August 2005	Empty	0	
	18 August 2005	Empty	0	
	25 August 2005	Empty	0	
	20 October 2005	Abandoned	-	Untidy
	10 November 2005	Abandoned	-	Untidy
	23 November 2005	Abandoned	-	Untidy
3	30 June 2005	Built	0	
	8 July 2005	Empty	0	
	28 July 2005	Empty	0	
	5 August 2005	Failed	1	<i>Fulica ardesiaca</i> initiating first clutch
	11 August 2005	Failed	2	<i>Fulica ardesiaca</i> initiating first clutch
	25 August 2005	Empty	0	
	20 October 2005	Incubating first clutch	5	Eggs not covered
	10 November 2005	Failed	0	
23 November 2005	Abandoned	-		
4	13 October 2005	Incubating first clutch	5	
5	3 November 2005	Building		
	10 November 2005	Abandoned		
6	28 July 2005	Built	-	Eggs never laid
7	28 July 2005	Built	-	Eggs never laid
8	28 July 2005	Built	-	Eggs never laid

The year-round availability of floating and rooted aquatic vegetation means that La Angostura Dam provides the resources required for breeding (nesting material, locations, protection against predators) and therefore has the potential characteristics needed for Coscoroba Swan and other wildfowl to become established there. Our study highlights the importance of artificial waterbodies to wildfowl, but further research is required to evaluate nesting success in artificial wetlands.

Acknowledgments

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References

- Barbieri de Santamarina, E. & Rohmeder, G. (1947) Deducción de topoclimas en el Valle de Tafi por medio de la vegetación autóctona. In: Gómez Omil, D., Barbieri de Santamarina, E. & Rohmeder, G. (eds.) *Tres contribuciones a la climatogeografía de Tucumán*. Universidad Nacional de Tucumán, Instituto de Estudios Geográficos, Ser. Monogr. (9): 17–27.
- Bibby, C. J., Burgess N. D. & Hill, D. A. (1993) *Bird census techniques*. London, UK: Academic Press.
- Canevari, M., Canevari, P., Carrizo, G. R., Harris, G., Rodríguez Mata, J. & Straneck, R. J. (1991) *Nueva guía de las aves argentinas, 2*. Buenos Aires: Fundación Acindar.
- Coconier, E. (2005) *Reporte final aves acuáticas en la Argentina*. Buenos Aires: Aves Argentina / Asociación Ornitológica del Plata. www.avesargentinas.org.ar/.
- Delany, S. & Scott, D. A. (2002) *Waterbird population estimates*. Third edn. Wageningen: Wetlands International (Global Series 12).
- Di Giacomo, A. S. (ed.) (2005) *Áreas importantes para la conservación de las aves en Argentina: sitios prioritarios para la conservación de la biodiversidad*. Buenos Aires: Aves Argentinas / Asociación Ornitológica del Plata.
- Echevarria, A. L., Marano, C. F., Chani, J. M. & Cocimano, M. C. (2008) Comunidad de aves del Embalse La Angostura, Tafi del Valle, Tucumán, Argentina. *Acta Zool. Lilloana* 52: 98–105.
- Escalante, R. (1963) Notes on three species of waterfowl in Uruguay. *Condor* 65: 533.
- Jutglar, F. (1992) Family Anatidae (ducks, geese and swans). In: del Hoyo, J., Elliott, A. & Sargatal, J. (eds.) *Handbook of the birds of the world, 1*. Barcelona: Lynx Edicions.
- Mazar Barnett, J. & Pearman, M. (2001) *Lista comentada de las aves argentinas*. Barcelona: Lynx Edicions.
- Nascimento, J. L. X., Flores, J. M., Ataguile, B. S., Koch, M., Scherer, S. B. & Parreira dos Santos, P. J. (2001) Biological aspects of the Black-necked Swan (*Cygnus melancoryphus*) and Coscoroba

- Swan (*Coscoroba coscoroba*) in Rio Grande do Sul state, Brazil. *Melopsittacus* 4: 31–38.
12. Navas, J. R. (1977) Aves. Anseriformes. In: de Castellanos, Z. A. (ed.) *Fauna de agua dulce de la República Argentina*, 43(2). La Plata: Fundación para la Educación, la Ciencia y la Cultura.
 13. Nores, M. & Izurieta, D. (1980) *Aves de los ambientes acuáticos de Córdoba y centro de Argentina*. Córdoba: Academia Nacional de Ciencias de Córdoba.
 14. Olrog, C. C. (1979) Nueva lista de la avifauna Argentina. *Opera Lilloana* 27: 1–324.
 15. de la Peña, M. R. (1978) *Enciclopedia de las aves argentinas*, 2. Santa Fe: Ed. Colmegna.
 16. Silva-García, C. M. & Brewer, G. L. (2007) Breeding behavior of the Coscoroba Swan (*Coscoroba coscoroba*) in El Yali wetland, central Chile. *Orn. Neotrop.* 18: 573–585.
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