

Final Report on Roseate Terns (*Sterna dougallii*) breeding colony on Chumbe Island 2012



Conservation Department
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CHUMBE ISLAND
CORAL PARK
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A) Introduction

The Roseate Tern (*Sterna dougallii*) is similar in size to a Common Tern (*Sterna hirundo*) but very white-looking, with long tail-streamers, a black cap and a black beak with a reddish base. In summer adults have a pinkish tinge to their underbelly which gives them their name.

Colonies are almost always on small offshore islands and their nest sites be sheltered, often by overhung rocks or vegetation.

In Zanzibar the Roseate terns is a rare migratory coastal seabird. The species is listed on the IUCN Red List, however, with the status 'Least Concern' due to an extremely large global range (thresholds for 'Vulnerable' under the range size criterion is not approached) and an estimated global population of about 70,000-82,000 individuals. Roseate terns are threatened by a number of agents of which hunting in the wintering quarters may be the most significant. Natural predators can also take a great toll on localized colonies, particularly when terns are disturbed from the nest by other birds and humans. Finally, habitat loss and extreme weather events have caused local extinction of some colonies.



Sterna dougallii,
Chumbe Island, 2012

Vital statistics

Eggs:	1-2	Incubation:	21-26 days	Fledging:	22-30 days
Lifespan:	21 years	Length:	33-38cm	Wingspan:	72-80cm
Weight:	92-133g				

B) History of Roseate Terns breeding on Chumbe Island

First breeding event, 1994

From July to October 1994, Dudley Isles reported a breeding colony of Roseate terns on the two small islets South of Chumbe and on the southern tip on mainland Chumbe (reports attached). Nest counts, photograph counts and over 200 chicks ringed suggested about 820 pairs. Unfortunately, the breeding colony was much decimated by rats (invading the breeding spaces in masses to feed on eggs & chicks) and harsh weather conditions (high tides and strong winds). Nonetheless, Isles estimated about 600 chicks that successfully flew Chumbe.

No accurate records exist for any sightings prior to 1994, although R.H.W. Pakenham in "The Birds of Zanzibar and Pemba (1979)" writes "*Sterna dougallii* has bred on Zanzibar and Pemba, "their movements are erratic and not fully understood" and "irregularly visit the islands to breed". According to Dudley Isles, the terns breeding on Chumbe in 1994 were typical of those breeding off the Kenyan coast, although the species is widespread throughout the tropics.

Second breeding event, 2006

Although rats were successfully eradicated from Chumbe Island through a comprehensive campaign in 1997, it took 12 years before a second breeding colony could be observed on Chumbe (Peters, 2006). The survey team led by Dr. Bakari estimated a total of 300 adults in the breeding colony and managed to tag 100 chicks (Inform Safring, Univ. Cape Town SA, # 4 H 23701 to 4 H 23800). To maximise breeding success 23 crows were killed from 17/8 till 23/8 2006. However, many chicks drowned in the little pools on the islets. By mid of September 2006 all Roseate Terns have left Chumbe.

C) Observations and initial survey of a third breeding colony in 2012

Initial observations

The Roseate Terns arrived at the beginning of July 2012. Both islets to the south of Chumbe were occupied, but none were observed to breed on the main island of Chumbe.

On July 22nd, Conservation manager, Ulli Kloiber and volunteer Tim Woolven climbed the islets and spent one hour making observations, taking photographs and conducted a rough egg count estimation of 300 eggs on the North Islet where also one adult was found dead, trapped in the vegetation (Fig. 1 and 2). Neither Indian House Crows, nor the African Fish Eagle was seen during the observations.



Figure 1. Breeding colony at South islet which has no vegetation; majority of nests were found with a single egg.



Figure 2. Egg count estimation on North Islet where one dead adult was found trapped in dense vegetation

After these initial observations, contact was made with the Ministry of Forestry and Ministry of Environment in Zanzibar to plan for a comprehensive survey that would form the base for a recommended 'Plan of Action' to ensure breeding success.

Roseate Tern survey - 2nd August 2012

Survey Team:

1. Omari Nyange (Head ranger, Chumbe)
2. Alawi Hija (Senior Environmental Officer, Ministry of Environment)
3. Salim Ali Khamis (Wildlife officer, DFNR)
4. Habib Abdulmajid (Ecologist, Jozani Forest)
5. Ulli Kloiber (Conservation manager, Chumbe)
6. Sophia Masuka (Conservation assistant, Chumbe)
7. Tim Woolven (Conservation volunteer, Chumbe)

The team arrived at 9am on Chumbe Island and after a brief introduction to the history of Roseate Terns on Chumbe by Head ranger, Omari Nyange, the team progressed to the two islets in the South of Chumbe (Fig.3). Survey time (90 min) was limited by tide and only three members of the team climbed the islets to avoid stress and risk of stepping on eggs (Fig.5). The rest of the team made observations with binocular and assisted with taking photographs.

Tab.1.

	# of nests with			
	1 egg	2 eggs	3 eggs	# eggs total
South Islet	479	186	27	932
North Islet	488	100	16	736
	Total # of nests: 1296			1668

Nest and egg count results are given in table 1. A total number of 1296 nests was found with a total number of 1668 eggs (majority of the nests had one egg). Some eggs were found in nests, some just bare on the coral rag and some in the vegetation. No chicks were found indicating that hatching has not started yet.

Other observations: adults were found resting on the intertidal flat (Fig.4), no Indian House crows (*Corvus splendens*) or fish eagle (*Haliaeetus vocifer*) around the small islets, however, 2 crows seen on main island of Chumbe.



Figure 3. South (left) and North (right) islet colonized by Roseate terns (*Sterna dougallii*)



Figure 4. Adult Roseate terns resting on the North islet (left) and intertidal area (right)



Figure 5. Survey team climbing the North islet (left) to conduct nest and egg count. Eggs (indicated by red arrow) were scattered all over the islet, often on bare rock (right).

D) Recommended 'Plan of Action'

According to the knowledge of the present survey team, Chumbe Island is the only well-documented breeding area for Roseate Terns within Zanzibar. Therefore, monitoring and breeding success efforts should be ongoing.

1. Reducing crow numbers on Chumbe Island

There is a fluctuating number of the invasive, Indian House Crow on Chumbe. Although the island has been free of crows during the last 2 months, two crows are now seen daily while another 2-3 crows are occasionally flying over from Zanzibar mainland. Chumbe's crow hunter will come to the island and try to shoot the two resident crows.

As a national crow eradication program has started on Zanzibar few months back, alternative methods to shooting were discussed. However, poison and traps have not been proven successful on Chumbe in the past. More information on current poison type will be requested from Tim Davenport at the Wildlife Conservation Society (WCS) Zanzibar by Chumbe's conservation team.

2. Monitoring by head ranger

Head ranger, Omari Nyange, remains in charge for ongoing monitoring and will inform the survey team about arising issues and start of hatching.

3. Restrictions for island visitors

The species has been known to desert its colony if there is too much interference with their activities. Therefore, it was agreed to inform island staff and visitors that the colony should only be viewed from the guest beach (about 200m away). Intertidal walks with guests will spare out the two islets but guests will receive detailed information on the reason and provided with binoculars to observe the birds. Climbing the islets for scientific purpose will be an exception but should also be restricted to a minimum. Once chicks have hatched, further instructions will be given.

4. Involving bird experts

The survey team agreed to inform and involve national and international bird experts in order to proceed with a 'Plan of Action'. The following needs highest attention:

5. Tagging yes/no?

Ringling was done in 2006 (Peters, 2006), however several problems were encountered such as difficulty to reach chicks in vegetation, limited time due to tide, lack of instruments and poor preparation. In addition, no method has been developed to assess in a long term if and which percentage of terns returning to Chumbe Island carry rings (visual observations with binocular do not allow accurate information!).

6. Human intervention to minimize impact on the breeding colony's success

Main factors impacting the breeding colony in 2006 were (1) strong winds, spring high tides and salt water spray from the waves during August, (2) **chicks drowning in water pools**, (3) predation by < 10 Indian House crows and fish eagle.

It is very likely that the 2012 breeding success will also highly depend on weather conditions. However, in 2006 it was suggested to use wire netting to cover or to use rocks to fill up as many holes as possible to prevent chick drowning.

E) Hatching success of the Roseate Tern colony 2012

Management actions taken after the survey in August, included (1) reducing crow numbers on Chumbe by shooting, (2) continuous monitoring through the Head ranger, and (3) restrictions for island visitors.

Tagging and human intervention was still under discussion with international bird experts, when Head ranger Omari Nyange reported that the majority of the breeding colony had left the two islets two weeks after the survey. As this was a sign of worry, he climbed the Northern Islet on August 15th and found very few adults present and no hatchlings. On August 16th he climbed the Southern Islet and counted 103 chicks (very young) alive and 7 chicks dead in their nests. Other observations included 4 Indian House Crows and a nesting pair of African Fish Eagle (Fig 6).



Figure 6. Indian House Crow shot by hunter (left), African Fish Eagle (middle and right) on Chumbe

In order to avoid additional stress for the remaining colony and hatchlings, CHICOP decided against tagging and other human interventions.

However, in order to evaluate the hatching success a final survey was conducted on the 3rd and 5th September 2012, involving only the Head ranger and the Conservation manager. When approaching the Southern Islet on the 3rd of September, only a small colony of about 30 adult Roseate terns was observed around the islet (Fig. 7, left). On the islet 648 eggs were still found intact but deserted, 46 chicks were found dead, few of them in their nests (Fig. 7, right) while the majority had drowned in the water filled rock pools (Fig. 8). Only 11 fledglings were found alive and in healthy condition (Fig. 9).



Figure 7. Small breeding colony remained on Southern Islet (left), dead chick in the nest (right)



Figure 8. Chicks of different age drowned in the water filled rock pools on the Southern Islet



Figure 9. Only few chicks were found alive and healthy

Breeding success on the Northern Islet was checked on 5th September 2012. On the islet, neither adult terns nor hatchlings/fledglings were observed. A total of 557 eggs were still found intact but deserted, while others were broken and rotten (Fig. 10, left). The rock pools were also filled with water but no dead chicks were found inside (Fig. 10, right), indicating that none of the eggs had hatched.



Figure 10. Rotten and broken eggs (left, middle), and water-filled rock pools (right) on the Northern Islet

By mid September 2012 no Roseate Terns were seen on Chumbe.

F) Discussion

The reproductive success in tropical seabirds is influenced by several factors. Ralph et al. (1976) found that the most common category of egg failure in Common terns *Sterna Hirundo* was disappearance from the nest. For tropical populations, biotic features, notably predatory fish that drive prey close to the water surface, also appear to be an important factor in terms of food availability. However, the importance of weather events and oceanographic conditions, which are likely to determine marine productivity, still needs a better scientific understanding (Ramos et al, 2002).

In terms of the 3rd breeding colony in Chumbe, hatching and fledging was not successful in 2012 compared to the breeding success in 1994 and 2006. While it is obvious that hatching was not successful because the colony left by early August, it remains unclear why 2/3 of the birds deserted the islets, leaving behind only a small colony of about 30 adult birds that accounted for the hatchlings observed on the Southern Islet. Weather conditions have been fairly good and the rock pools have not filled up with water until mid August. However, by looking at the high number of hatchlings that did drown in the water filled pools on the Southern Islet, it should be questioned if human intervention (e.g. filling up the pools with gravel or covering with wire nets) would have been appropriate in order to prevent drowning.

Roseate Terns have a reputation for “inexplicable desertions” and an inconsistency in the occupation of a nesting site (Dudly, 1995). Considering the long gap between the three breeding seasons on Chumbe (1994, 2006, 2012), it is not possible to predict if the Roseate Terns will return to Chumbe in 2013. However, Chumbe’s Conservation Team will take the observations from all three breeding events and will again seek advice from national and international bird experts to further improve management strategies for this endangered bird species.

Acknowledgments

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