

## SHORT REPORT

# Notes on the behavioural response to artificial nest mounds as environmental enrichment for greater flamingos

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### Abstract

Artificial nest mounds were made to facilitate environmental enrichment and record the behavioural responses from 73 greater flamingos (*Phoenicopterus roseus*) through direct and indirect observation in Dubai Safari Park (Dubai, UAE). In a three-month observation period, significant interactions expressed through breeding behaviours from the birds were evident. These results support the effectiveness of the enrichment in stimulating a natural behaviour, as well as the potential reproductive management of this species.

### Resumen

Se hicieron montículos de nidos artificiales para facilitar el enriquecimiento ambiental y registrar las respuestas de comportamiento en 73 flamencos rosados (*Phoenicopterus roseus*) a través de la observación directa e indirecta en Dubai Safari Park (Dubai, EAU). En un período de observación de tres meses, las interacciones significativas expresadas a través de los comportamientos de reproducción de las aves fueron evidentes. Estos resultados apoyan la efectividad del enriquecimiento en la estimulación de un comportamiento natural, así como el manejo reproductivo potencial de esta especie.

### Résumé

Des nids artificiels ont été fabriqués afin de rendre l'environnement plus incitatif à la reproduction et enregistrer les réponses comportementales de 73 flamants roses (*Phoenicopterus roseus*) par observation directe et indirecte au Dubai Safari Park (Dubai, Émirats Arabes Unis). Au cours d'une période d'observation de trois mois, les interactions significatives exprimées par les comportements de reproduction des oiseaux étaient évidentes. Ces résultats confirment l'efficacité de l'enrichissement de l'environnement par la construction de nids dans la stimulation d'un comportement naturel, ainsi que le potentiel de gestion de la reproduction de cette espèce.

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### Introduction

The greater flamingo (*Phoenicopterus roseus*) the largest and is the most widespread species in the flamingo family. This water bird species mainly lives in saline or alkaline bodies in typically large congregations. Breeding cycle is well known and is dependent on appropriate available nesting site, temperature, and rainfall (Brown et al. 2005), wild populations were recorded to have their breeding periods

extending from March-July and specifically May- June in Southwest Asia & South Asia with Iran population sample (Childress et al. 2008). Captive populations on the other hand are highly dependent on various important factors such as flock size, sex ratio and age structure, the design of the enclosure and nest site, manipulations of water levels and diet (Duplaix-Hall and Kear 1975). The flamingos on exhibit in Dubai Safari Park consist of sexually matured and two-year-old individuals

together in a large open wading pool. The institution houses 34:39 greater flamingos, with occasional wild specimens joining the group. Currently, some individuals in the collection have been observed to show breeding behaviours; as small nest bowls were observed on the flat ground, courtship display, and vocalizations were also evident. Captive-bred Chilean flamingos at WWT Slimbridge first breed between two and ten years of age (Pickering 1992). Providing an enriching environment for animals to exhibit natural behaviours is an important task in any zoological institution. To further stimulate these natural behaviours, Nest mounds are placed in the island as well as mud substrate is added into the surrounding area of the mound to aid the process. A wet mix of sand and mud is necessary for nest building, at San Antonio Zoo a sand/clay mix is used in 50% sand : 50% clay mix is used (Brown et al. 2005). The aim of this work was to provide an

environmental enrichment program and breeding opportunities for the birds by the addition of appropriate substrates to uphold good behavioural health of the flamingos.

### Evaluation

A total of ten nest mounds were prepared from concrete bases with sizes extending to about 20 cm tall and 38 cm for base diameter, these are placed in the nesting island as close as 1.5 metres to each other (Figure 1). A shallow depression is formed on the top as nest bowl. The exhibit is also fitted with sprinkler to allow muddy surrounding where the birds gather additional material for the mound and regulate temperature of the area. An excess of nest mounds are provided to allow the flamingos to select their own nests, and these nest are labelled accordingly for proper recording of observations.



*Figure 1: Flock gathered around the nest island with mounds.*

Nest cameras with motion sensors were used to assist data collection, recordings including photos and videos on site helped well in obtaining observations during dawn and dusk period where keepers are not present (Figure 2). Results from these observations on months

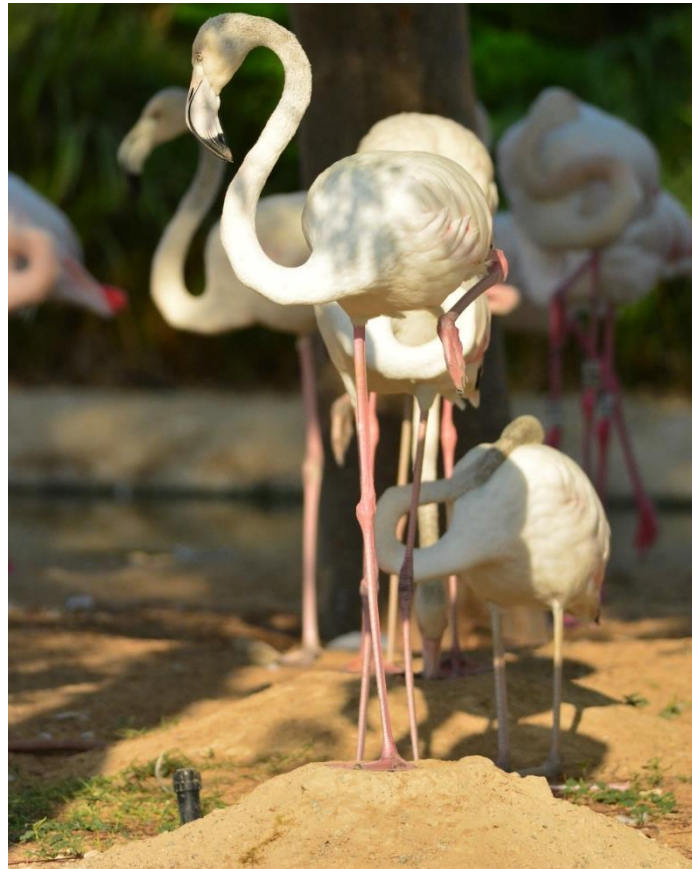
August-October showed a positive response of the flock to the enrichment provided, breeding behaviours such as nest building, clearing and picking up debris, stamping and sitting on the mounds were evident (Figures 3 and 4).



*Figure 2: A pair of greater flamingo performing nest building (taken by an IR camera).*

Although no egg laying behaviour was noted, some females have been recorded to be sitting on the nest while with males guarding their territory. These observed behavioural

interactions expressed by the flamingos could possibly lead to establishing pairings in the group and stimulating breeding success in the future.



*Figure 3: A young female greater flamingo standing on top of a "starter" nest.*



Figure 4: Juvenile flamingos “prepping up” the nest sites.

## Conclusions

Positive behavioural responses from these greater flamingos towards the nest mounds are evident in these records. Therefore, stimulation of natural behaviours that are beneficial to the general welfare of the flock was provided. These behaviours could also suggest possible initiation of pair bonding, and eventual reproductive success, which would help in creating a sustainable flock and contribute to the management of this species in captivity.

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