



Vulture Restaurants

Best Practices for Establishment and Management of
Supplementary Feeding for Vultures in Aridlands



المركز الوطني
لتنمية الحياة الفطرية
National Center for Wildlife
المملكة العربية السعودية

The National Center for Wildlife (NCW) is the national authority responsible for conserving wildlife and biodiversity in the Kingdom of Saudi Arabia. NCW leads efforts to protect and manage terrestrial and marine protected areas, conserve endangered species, restore natural habitats, and advance scientific research and environmental monitoring. Through its programs and partnerships, NCW supports the objectives of Saudi Vision 2030 and the Saudi Green Initiative by strengthening environmental sustainability, protecting natural heritage, and promoting long-term biodiversity conservation across the Kingdom.



The Royal Society for the Protection of Birds in the United Kingdom (RSPB) is a charity for the conservation of birds and nature. RSPB brings people together who love birds and other wildlife, and who want to take action to restore the health and diversity of the natural world.

RSPB carry out conservation on a large scale, protect and restore habitats, and save species from extinction. This work is driven by science and evidence. It's rooted in five areas: species, science, place, policy and people.



The IUCN Species Survival Commission's Vulture Specialist Group is dedicated to vultures' conservation. The group was founded in 2011 and is made up of biologists, conservationists from other areas of expertise that work with or have an interest in vultures. The conservation philosophy is based on the concept that groups of concerned people can take a group of threatened species under their protection and assume responsibility for their survival.



The Convention on the Conservation of Migratory Species of Wild Animals (CMS) is an environmental treaty of the United Nations. CMS provides a global platform for the conservation and sustainable use of migratory animals and their habitats. It brings together the States through which migratory animals pass, the Range States, and lays the legal foundation for internationally coordinated conservation measures throughout a migratory range.



Saving Asia's Vultures from Extinction (SAVE) is a consortium of organisations from six range countries (Bangladesh, India, Nepal, Pakistan, Cambodia and Myanmar) with established expertise in vulture conservation. This network of partners share a common vision: To prevent the extinction and enable the recovery of Globally Threatened vultures in South and South East Asia, supporting the need to understand threats and guiding priority conservation actions. This vision will be achieved by co-ordinating and enhancing science, advocacy, conservation delivery, communication and fundraising activities.



The CMS Memorandum of Understanding on the Conservation of Migratory Birds of Prey in Africa and Eurasia (Raptors MOU) aims to promote internationally coordinated actions to achieve and maintain the favourable conservation status of migratory birds of prey throughout their range in the African-Eurasian region, and to reverse their decline when and where appropriate. The Raptors MOU is one of several instruments operating under the Convention on the Conservation of Migratory Species of Wild Animals (CMS).



EN

Lappet-faced Vulture

Arabic Name

نسر الأذون

Scientific Name

Torgos tracheliotos



NT

Bearded Vulture

Arabic Name

النسر الملتحي

Scientific Name

Gypaetus barbatus



NT

Cinereous Vulture

Arabic Name

النسر الأسود

Scientific Name

Aegypius monachus



LC

Griffon Vulture

Arabic Name

النسر الأسمر

Scientific Name

Gyps fulvus



EN

Egyptian Vulture

Arabic Name

الرخمة

Scientific Name

Neophron percnopterus

LC Least Concern
غير مهدد

NT Near Threatened
قريب من التهديد

EN Endangered
مهدد



Introduction :

The Kingdom of Saudi Arabia is home to several species of vultures, including the globally threatened Egyptian Vulture (*Neophron percnopterus*) and Lap-pet-faced Vulture (*Torgos tracheliotos*). Additionally, several colonies of the Griffon Vulture (*Gyps fulvus*) are distributed across the country, collectively accounting for the most numerous vulture population in the Arabian Peninsula. The wintering Cinereous Vulture (*Aegypius monachus*) is found in the Kingdom in smaller numbers. More marginally, The Bearded Vulture (*Gypaetus barbatus*) is present but probably no longer breeds in Saudi Arabia.

Vultures are a characteristic, distinctive, and iconic component of the biodiversity of the environments they inhabit. They also provide critically important ecosystem services by scavenging organic matter from carcasses and other organic waste in the environment: they are nature's organic waste collectors, and this translates into significant economic benefits by expediting decomposition. Studies have shown that in areas where there are no vultures, carcasses take up to three or four times longer to decompose. By expediting decomposition, vultures help limit the spread of disease in both wild and domestic animals, reducing transmission risk among animals and spill-over to humans (Plaza et al., 2020). Vulture populations are collapsing at an unsustainable rate across Africa and the Middle East, largely due to incidental poisoning (Shobraq, M. 2016) Across the region, farmers lace cattle carcasses with poison to deter predators from livestock, which are then consumed by scavengers. Poisoning can be both acute (lethally immediate) or chronic (depressing vital rates in the longer term).



The bioaccumulation of toxins in vultures is a conservation challenge globally.

This is compounded by regional threats including collision and electrocution by powerlines, habitat loss and fragmentation.



With the exception of Western Europe, global vulture populations are in decline. In Africa, eastern Europe, and Asia, vultures are rapidly declining in the face of a range of threats from a variety of anthropogenic factors. The IUCN Red List status of vultures has seen drastic changes in recent years (Botha et al. 2017). The collapse of vulture populations in South Asia 25 years ago, caused principally (if not entirely) by veterinary use of the non-steroidal anti-inflammatory drug (NSAID) Diclofenac is now well known (Oaks et al. 2004). Existing data on the threats to vultures in Saudi Arabia are anecdotal (Shobrak 2003). There are indications that Saudi Arabia faces similar vulnerabilities, if it is not already experiencing population depressions in its vultures through similar veterinary drug practice to those in South Asia. Short-term interventions may help mitigate impacts before they can be confirmed and resolved longer-term.

Diclofenac is known to be extremely toxic to vultures, with elevated mortality expressing days after exposure (Rattner et al., 2008; Johnson et al., 2008). In one study, Diclofenac was experimentally administered to vultures, resulting in renal failure and visceral gout-like problems (Oaks et al., 2004; Meteyer et al., 2005). In addition to the widespread use of Diclofenac and acute toxicity from poisoned carcasses, significant threats to vultures and other scavenging birds include the common practice of using poison baits to control stray dogs and other terrestrial predators (Shobrak et al. 2020; Shobrak et al. 2023).



A study to evaluate major threats to a migratory raptor, Egyptian Vulture, along the eastern Mediterranean flyway showed that they vary geographically (Oppel et al. 2021). This study found that veterinary medical products that are known to cause fatal liver failure in vultures (Diclofenac, Ketoprofen) were widely available in veterinary pharmacies in Saudi Arabia. Veterinary drugs that are lethal for vultures (containing “fenac” substances) were imported from Spain, India, Pakistan and Jordan and produced locally in Saudi Arabia (Shobrak et al. 2020). Despite their availability, however, the use of these drugs for livestock and their accessibility to vultures is not well documented in the region. Although there is no direct evidence whether diclofenac administered to livestock accumulates to lethally toxic levels in Egyptian Vultures (Cuthbert et al 2007), the prevalence of these drugs is of conservation concern as these substances can affect other vulture species that are steeply declining in Saudi Arabia.

To mitigate population declines and the potential effect of harmful veterinary drugs, the use of poison baits, and lead-contaminated meat on vultures, the NCW is proposing implementation of best-practices through the establishing and managing vulture restaurants for vultures in Saudi Arabia.

The establishment of vulture restaurants is a well-established tool in the conservation of vulture species. Among their many applications, “vulture restaurants” are used to provide a safe food source in areas where carcasses are commonly baited with poisons (Gilbert et al. 2007).

It should be emphasised that vulture restaurants, must be used only as a conservation tool to supplement food resources in addition to the natural ones, which is often scarce, and must not be regarded as a permanent source of food for vultures.



Rationale :

Controlled, augmented feeding in specific locations known as “vulture restaurants” is considered a key management tool for the conservation of scavenger bird populations (Piper 2005).

This provision of safe and chemical free food to target species is believed to offset the negative effects of anthropogenic threats that cannot be readily eliminated in a short period of time. By increasing of food availability (Duriez et al. 2022), vulture restaurants can increase survival rates, improve breeding performance (Gonzalez et al. 2006), increase micronutrient availability such as calcium (Piper 2005), and reduce the risk of poisoning (Oro et al. 2008).

This practice may also be used as part of vulture’s reintroduction efforts to encourage higher site fidelity and to increase breeding success where it has been constrained by depleted food resources, and the population is facing a limited recruitment of new individuals.

In a study conducted in 2007 in Pakistan, a vulture restaurant was established for the Oriental White-backed Vulture *Gyps bengalensis* colony to test the effectiveness of the vulture feeding station in modifying ranging behaviour and mortality at the colony (Gilbert et al. 2007). The study showed that there was considerable variation in individual home-range size with birds occupying smaller home-ranges centred closer to the restaurant being more successful in locating the reliable source of food. Mean daily mortality during provisioning was 0.072 birds per day (8 birds in 111 days), compared with 0.387 birds per day (41 birds in 106 days) during non-provisioning control periods. These findings indicate that vulture restaurants can reduce vulture mortality through Diclofenac exposure and represent a valuable interim measure in slowing vulture population decline locally until Diclofenac can be withdrawn from veterinary use.



Benefits of Vulture Restaurants :



Provide safe (non-toxic / non-poisoned) food for vultures



Attract non-breeding individuals and encourage congregations in lower risk areas



Attract vultures to historical breeding sites



Reduce competition with other scavengers



Increase breeding success by alleviating resource constraints, reducing toxin loads & promoting aggregations



Encourage released vultures to stay near release sites in lower risk areas



In Saudi Arabia, vultures from Europe and Asia cross the region en route to Africa or southern Arabian Peninsula. vulture restaurants distributed along this migration corridor could encourage birds in transit to feed at safe places along their migration. vulture restaurants may serve as safe aggregation points similar to estuaries for waders, especially in desert landscape where chances to find food are very rare.



Establishment of the vulture restaurants

Site Selection

The site for the establishment of the feeding station is critical for their success and should be considered carefully to maximise value. Criteria for assessing suitability of feeding station include:

- Proximity to breeding colonies: selected sites should be close enough to breeding cliffs (ideally no more than 2 km away from the nearest breeding cliff).
- Water availability: Presence of water points is essential when establishing feeding station. Water sources should be protected by fences where domestic animal use presents a risk.
- Visibility: Station must be placed in an open area with few trees for better visibility.
- Preference for livestock dump sites: sites used by livestock owners to dispose dead animals are preferred options to establish vulture restaurants as they are known to vultures, although strict regulations must be in place to ensure that contaminated meat, e.g. by veterinary NSAIDs is not provided.
- Distance from high-risk infrastructure: areas close to powerlines (medium voltage and high voltage powerlines) and windfarms must be excluded from establishment of vulture restaurants as such infrastructures pose high electrocution and collision risks to vultures.
- Distance from air traffic: Proposed sites for vulture restaurants must be at least 20 km away from the nearest aerodrome.
- Distance from roads: vulture restaurants must be far from existing network of roads (a minimum 2 km distance away from paved roads is preferred).
- Coordination and partnership with local communities in and around proposed feeding station is key success factor.



Research Objectives of Vulture Restaurants

There are various research gaps that can be filled by monitoring vulture restaurants

- Determine age-classes of populations for demographic monitoring (Duriez et al. 2012).
- Determine population size / trends – monitoring mark-recapture tags at the station
- Determine usage and behaviour of vultures visiting the feeding station (helps to understand the importance and impacts of supplementary feeding).
- Identify and monitor the presence of nocturnal carnivores at the site

Permits

According to the Executive Regulations for the Protection of Wildlife, their Products and Derivatives of the Environment Law issued by Royal Decree No. (M/165) dated 19/11/1441, in which Article IV related to the licenses of activities related wildlife, stipulates in the first paragraph that: "Without prejudice to the provisions of the relevant executive regulations of the Law, persons shall be prohibited from practicing any activity related to wildlife listed by the relevant center without a license, and such activities include: Feeding wildlife in nature." One of the requirements of the Regulations is to obtain, before practicing any of the activities specified in paragraph (1), to apply for a license from the relevant center with the relevant documents.

Permits are required to establish vulture restaurants in the Kingdom of Saudi Arabia through the National Center for Wildlife to ensure the application of best practices and support the documentation of vultures across the country. In addition, coordinated efforts will help understand the impacts of vulture restaurants and the dynamics of vultures in Saudi Arabia.



Fencing the vulture restaurants

In many countries where vulture restaurants are operational, protective fencing is considered essential to exclude mammal scavengers that consume the remains intended for vultures. Fencing may also be necessary to prevent livestock entering and discouraging scavenging. If livestock or other animals prevent vultures from feeding on carcasses for a sufficiently long, the carcass may rot or become undesirable to vultures, negating its potential benefit. Enclosures of at least 100*100 meters (to allow vultures to land and take off) are ideal. While beneficial in many cases, however, fencing is not considered a suitable option for vulture restaurants in Saudi Arabia for the following reasons:

- Vultures routinely congregate and feed on open areas used concurrently by livestock.
- Expected station locations are remote and in places seldom visited by stray animals.
- vulture restaurants are expected to attract nocturnal carnivores whose documentation is desirable and would be hindered by fencing.



Operation of the Feeding Station

vulture restaurants should be optimized to meet objectives of the establishment of the station. All vultures targeted for this practice in Saudi Arabia share similar nutritional ecology. When, what, and how much food to be deposited are critical to successful implementation of the feeding station. Moreover, the reasons for establishing the proposed feeding station dictate frequency and timing of food supplementation. When prompted by urgency, improvised stations may be deployed in the breeding season (Dec – April every year). To target migratory vultures, vulture restaurants could be operated in September or October (for Egyptian Vultures) and November for Griffon Vultures and Cinereous Vulture, and finish in May.





NCW Best Practices:

- Supply only safe food sources: Only use carcasses known to be free of poisons (predator poison, NSAIDs, lead shot, and others).
- Ensure the carcass is accessible to vultures: Large carcass must be opened near abdomen soft tissues to allow immediate access of vultures to visceral organs.
- Supply food consistently: at least twice a week or daily in the case of large feeding stations for large vulture colonies.
- Check food regularly: food supplementation may be needed more frequently than expected in the case of rapid consumption by vultures.
- Time the feeding: Food supplementation is recommended in the early morning to avoid the risk for carcass to be consumed by mammalian scavengers before the vultures.
- Move the feeding: Although feeding should be carried out in the same general location, the position of the carcass at a fine scale should be rotated to ensure best hygiene practices.

- Clean feeding sites: Hygiene measures should include the cleaning of the carcass location after each feed and the use of rotational feeding places, as above.
- Scatter food when suitable: Placing scattered food remains allow rapid access of vultures and avoid dominance of adult vultures on food. Placing entire carcasses is a preferred option for Griffon Vultures mostly, and this may prevent other vultures such as Egyptian Vultures or Kites to access food.
- Examine any livestock: Animals from dairy farms and livestock must be examined prior to be used as food sources for vultures.
- No road kill: Road kills (feral dogs and other carnivores) must not be used as they could be victims of poisoning or shooting.
- Establish networks: A network of vulture feeding stations is advised near large Griffon vulture colonies. It is recommended to establish a network of three or more feeding stations for colonies exceeding 20 vultures
- Label food appropriately: The container or vehicle used to carry food must have a label that clearly states, " food is not intended for human consumption."



Monitoring

Daily monitoring of vulture restaurants is advised as a best-practice to confirm the presence and use of the station by vultures and other raptors. Monitoring is essential for understanding the impacts of the station and ensure achieving the objectives of establishing the station. This can be done in-person or remotely.

To the extent monitoring can be conducted indirectly through cameras (trap or livestream), it should be done to avoid disturbance. Depending upon the size of the feeding station, multiple cameras may be necessary for monitoring. The use to trap cameras provides a collateral benefit of enabling nocturnal carnivores to be documented in tandem with vultures.

When cameras are unfeasible for monitoring, a camouflaged viewing hide should be built near the supplementary feeding station for research and photography, a minimum 500 meters away from the station. Observers should arrive prior to vulture feeding time.

Regardless of monitoring method (by observer or via trap camera) all information in the monitoring data form must be recorded. Observation frequency is advised at 2 times daily during active use of the station.

Vultures Feeding Station Monitoring Template

Date	Start	End	Observer	Organization	Template No
Site Name			Food Type		
Feeding Station Coordinates			Time		
Food Disposal Time			Weather		
Food Amount			Temperature		
Species	Age	Number	Behaviour/marked	Time	





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The aim of this guidance document is to demonstrate best practices for the establishment and operation of vulture restaurants as a conservation tool for vultures.

Vultures are distinctive, and iconic component of the biodiversity, they play a vital role in maintaining ecosystem health by removing animal carcasses, limiting the spread of disease, and contributing to the overall balance of our natural environments.

Vulture populations have faced alarming declines across its range in the Arabian Peninsula. This decline is driven by indirect poisoning, electrocution, habitat loss, and exposure to toxic veterinary drugs such non-steroidal anti-inflammatory drug (NSAID) Diclofenac.

This document, “Vulture Restaurants: Best Practices for Establishment and Management of Supplementary Feeding in Aridlands,” provides guidance for the planning, implementation, and monitoring of vulture restaurants across Saudi Arabia. It integrates global best practices with the ecological, logistical, and cultural knowledge of the Arabian Peninsula’s arid landscapes.

Recognizing the urgent need to conserve vultures across their range in the Kingdom of Saudi Arabia, the National Center for Wildlife has prepared this evidence based conservation measure as a tool to help vulture conservation by reducing silent threats of poisoning. One important and effective tool to mitigate such a threat is the establishment of vulture restaurants – safe and controlled vulture restaurants that supports vulture conservation by reducing mortality from poisoning.

By setting a national guideline for vulture feeding programs, this guide aims to support conservation practitioners, researchers, and local communities in their collective efforts to ensure the long-term survival of vultures in the Kingdom. It also aligns with Saudi Arabia’s commitment to biodiversity conservation and sustainable environmental stewardship under Vision 2030.



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