

#### Case Study #4: Banc d'Arguin National Park in Mauritania

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Banc d'Arguin National Park is one of the top conservation areas of Africa. This study aims to deepen the understanding of the ecological importance of the place and its biodiversity. Firstly, it will briefly present the values of the park followed by a closer look at two aspects: the birds associated with the wetlands and the Mediterranean monk seal (*Monachus monachus*).

#### Presentation of the Banc d'Arguin National Park:

Created in 1976 and designated a UNESCO World Heritage Site in 1989, Banc d'Arguin National Park (PNBA) is one of the largest marine protected areas in Africa. The park was designated as a Ramsar site in 1982. It spans 12,000 km<sup>2</sup>, including 5,400 km<sup>2</sup> of marine zones, and covers nearly one-third of Mauritania's coastline. The intertidal flats extend across 453 km<sup>2</sup>, of which 80% is covered with seagrasses, mainly *Zostera noltei* ([ref](#)). The area borders the Sahara Desert and is unaffected by river inflows or human waste discharges ([ref](#)).

The park is a biodiversity hotspot, home to numerous species of fish and crustaceans, and hosts over two million migratory birds annually. It also shelters endangered species such as the Atlantic humpback dolphin (*Sousa teuszii*) ([ref.](#)), marine turtles, and the Dorcas gazelle (*Gazella dorcas*) ([PNBA, 2018, p. 2](#)). In addition to its rich avian diversity, a satellite reserve on the Cap Blanc peninsula and adjacent coastline is home to the endangered Mediterranean monk seal (*Monachus monachus*), which contributes to the marine ecosystem's health.

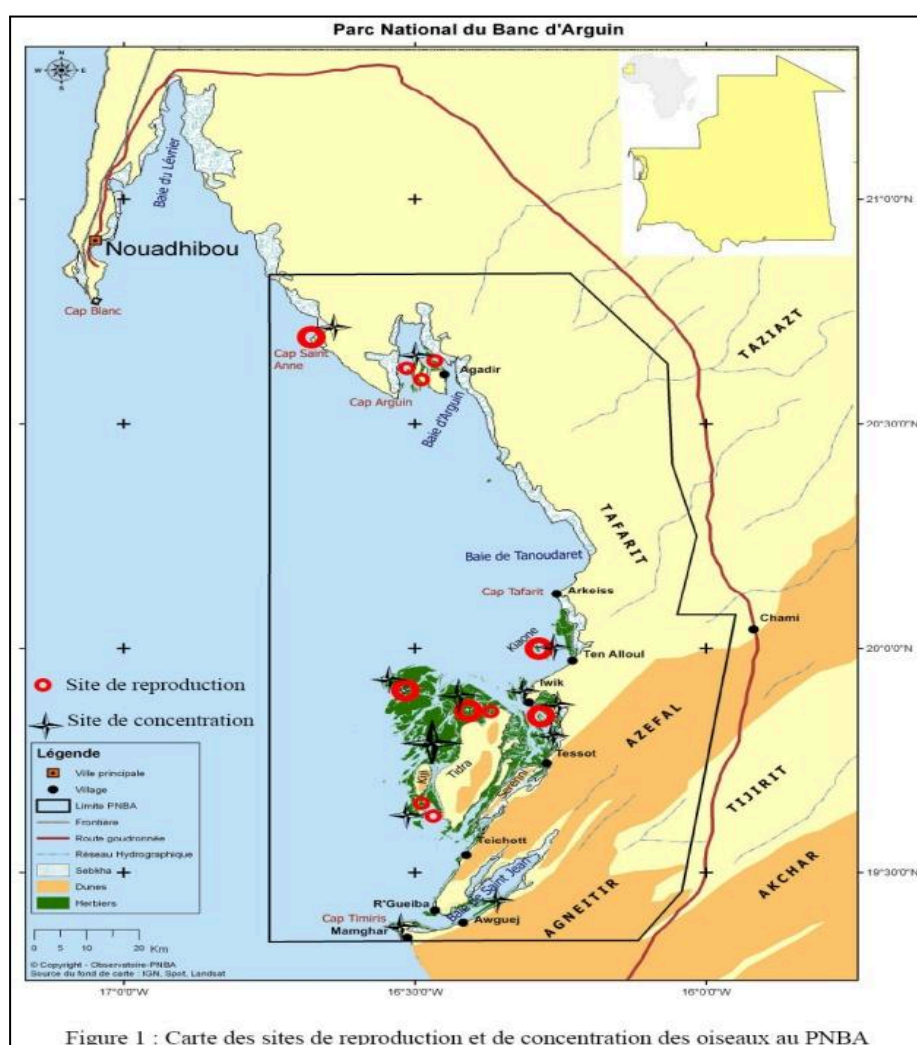


Figure 1 : Carte des sites de reproduction et de concentration des oiseaux au PNBA

**Fig. 1 Map of breeding sites and concentrations of birds in the Parc National du Banc d'Arguin**

The PNBA's unique ecological value stems from its shallow waters, mudflats, and seagrass beds, which support high biological productivity. This productivity is driven by upwelling, a natural phenomenon where deep, cold, nutrient-rich waters rise to the surface, sustaining dense populations of waterbirds, fish, invertebrates, and marine mammals. The park is a critical wintering ground for migratory birds from Europe and far away breeding areas in Northern Siberia, Greenland, and eastern Canada ([PNBA, 2018, p. 6](#)).



***Banc d'Arguin is the most important non-breeding area for migratory shorebirds in Africa.*** [Image source](#)

PNBA is also an important breeding ground of Afrotropical fisheating bird species, such as the White/Mauritanian spoonbill (*Platalea leucorodia balsaci*), Pale/Mauritanian Grey heron (*Ardea cinerea monicae*), West African Crested tern (*Thalasseus albidorsalis*), Caspian tern (*Hydroprogne caspia*), Greater flamingo (*Phoenicopterus roseus*), Great cormorant (*Phalarocorax carbo maroccanus*), Western reef heron (*Egretta gularis*), and Great white pelican (*Pelecanus onocrotalus*). They form large colonies, and an average of 46,000 breeding pairs was reported between 1969 and 2007<sup>8</sup>.

The PNBA is home to two notable endemic bird subspecies: the Pale/Mauritanian Heron (*Ardea cinerea monicae*) and the (Banc d'Arguin) White/Mauritanian Spoonbill (*Platalea leucorodia balsaci*). These species are unique to the region and are part of the park's exceptional avian biodiversity, which includes migratory, nesting, and endemic birds. Their presence highlights the ecological uniqueness of the PNBA and underscores its importance as a conservation area for rare and localized species as well as for far away migratory birds.

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<sup>8</sup> El-Hacen Mohammed El-Hacen 2024: A journey through the natural world of the Parc National du Banc d'Arguin, Mauritania,. In: "The East Atlantic Flyway of Coastal Birds", editor: Peter Prokosch, Lynx Nature Books, Barcelona.



***Banc d'Arguin is also a key area for colony breeding Afroropical fisheating bird species, like the West African crested tern and the Great cormorant.*** [Image source](#)

Total waterbird numbers in Banc d'Arguin decreased between 1980 and 2017, with only Great white pelicans showing a significant increase in numbers ([ref](#)). Five species showed significant declines: Long-tailed Cormorant (*Phalacrocorax africanus*), Red Knot (*Calidris canutus*), Bar-tailed Godwit (*Limosa lapponica*), Eurasian Curlew (*Numenius arquata*), and Western Marsh Harrier (*Circus aeruginosus*). In the remaining species, the variation in numbers between counts was too large, and the number of complete counts too small, for trends to be detected. Species depending on the intertidal mudflats for feeding generally declined whilst species depending on fish and crustaceans in the sublittoral and offshore zones increased.

On land, Dorcas gazelles contribute to the desert ecosystem by grazing on vegetation, helping to maintain ecological balance ([PNBA, 2018, p. 2](#)). Until 2013, the Striped hyena (*Hyaena hyaena*) was common but has not been reported since<sup>9</sup>. The only remaining (meso) predators are the Golden jackal (*Canis aureus*), Fennec fox (*Vulpes zerda*), Rüppell's fox (*Vulpes rueppellii*), and Sand cat (*Felis margarita*). The Golden jackal has been reported causing regular "enormous breeding failure" on one of the key breeding islands for colonial birds, Nair<sup>10</sup>. The Golden jackal and Striped hyena have been found to considerably overlap in feeding habits, which indicates high resource competition between the two species ([ref](#)). The disappearance of the hyena might have favoured the Golden jackal. Maybe the return of the Striped hyena would become beneficial for the breeding bird colonies of the park, reducing the number of jackals and their predation on colony nesting birds?

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<sup>9</sup> See footnote #1.

<sup>10</sup> See footnote #1.



***Maybe the return of the Striped hyena would become beneficial for the breeding bird colonies of the park? [Image source](#)***

The park is also culturally significant as the traditional territory of the Imraguen fishermen, whose sailboats are the only vessels permitted to fish within the park. However, overfishing, urban expansion in Chami, and the growth of artisanal gold processing are increasing environmental pressures and pollution risks ([PNBA, 2018, p. 7](#)).

The PNBA has received several international recognitions:

- Ramsar Wetland of International Importance (1982)
- UNESCO World Heritage Site (1989)
- WWF Gift to the Earth (2000)

These distinctions underscore the park's global importance in coastal and marine biodiversity conservation, including its role in replenishing regional fishery resources ([PNBA, 2018, p. 6](#)).

### **The ecological role of the birds in the Banc d'Arguin National Park**

Banc d'Arguin is the most important non-breeding area for migratory shorebirds in Africa. It serves as a vital feeding and resting stopover site for migratory species along the East Atlantic Flyway and provides essential breeding grounds for several endemic and threatened birds. Notably, the park recorded 221 nesting pairs of the Pale (Mauritanian Grey) Heron on Arel and Kiaone islands, 81 pairs of Great White Pelicans on Arel, and 332 pairs of Caspian Terns on Kiaone and Zira islands. The PNBA's diverse habitats - mudflats, seagrass beds, and shallow waters - offer rich feeding grounds that support these species throughout their life cycles. The extent of seagrass meadows is, however, not stable. During a severe drought from 1970 to 1995 (with the lowest levels of rainfall in 1984) and the expansion of the Sahara desert, the intertidal seagrass meadows declined through sedimentation and desiccation ([ref](#)). Since then, the seagrass cover has increased twofold. During the last three decades, the benthic secondary production - which provides food for the shorebirds - has decreased by a factor of four ([ref](#)). These shifts in community structure and production have most likely contributed to recent declines in the numbers of some migratory shorebirds, such as Bar-tailed

godwit (*Limosa lapponica*), Curlew sandpiper (*Calidris ferruginea*), Grey plover (*Pluvialis squatarola*), Ringed plover (*Charadrius hiaticula*), and Kentish plover (*Charadrius alexandrinus*), which all feed on polychaete worms, especially tube-building ones.

Shorebirds play a central role in mudflat trophic webs and exert major predatory, physical, and chemical impacts on mudflats ([ref](#)). During peak overwintering and start of the migratory periods species such as Dunlin (*Calidris alpina*) and Red Knot (*Calidris canutus*) have also been found to have positive impacts on ecosystem functions in British intertidal mudflats ([ref](#)), reducing erosion, controlling and engineering nutrient fluxes between the sediment and water column, and increasing carbon sequestration (uptake of dissolved organic carbon, DOC). Through ecological cascade, a large number of resting Semipalmated sandpipers (*Calidris pusilla*) have been shown to positively impact the sedimentation in North American mudflats ([ref](#)). A 2023 [study](#) in China's Yellow Sea demonstrated that shorebirds could also restore wetland multifunctionality by controlling crab populations, which enabled vegetation recovery and improved sediment accretion. It's likely that some of these processes also apply to Banc d'Arguin.

Breeding colonies of waterbirds generate a lot of nutrients (nitrogen and phosphorus) in wetlands around the world ([ref](#)). This is likely also to apply to the Afrotropical fish-eating bird species breeding in large colonies in the PNBA.

Moreover, birds serve as important indicators of environmental health and support migratory pathways. Changes in bird populations can reflect broader ecological shifts, such as those caused by climate change, habitat degradation, or changes in food availability. Monitoring bird populations provides valuable insights into the overall health of the park's ecosystems. The park is a critical stopover for migratory birds traveling along the East Atlantic Flyway, providing essential resting and feeding grounds that enable these birds to complete their long migrations. This makes the conservation of the Banc d'Arguin National Park crucial not only for the local ecosystem but also for the broader migratory patterns of these species ([ref](#)).

### **Cap Blanc Reserve: A Beacon of hope for Mediterranean Monk Seal Conservation**

Located near the PNBA, the Cap Blanc Reserve and coastal areas northwest of the reserve, on the Cap Blanc Peninsula just north of Nouadhibou, play a vital role in the conservation of the Mediterranean monk seal, hosting the largest population of this critically endangered species, with over 350 individuals recorded in 2024, up from just 100 in 1998. The Mediterranean monk seal is one of the rarest marine mammals in the world, typically measuring 2.1 to 2.7 m in length and weighing between 300 to 335 kg. Adults have short, bristly coats; males are usually black with a white belly patch, while females are brown or grey with lighter undersides. Pups are born with a dark woolly coat and a distinctive white belly patch, which helps in early identification ([NOAA Fisheries](#)). This conservation success is the result of 24 years of continuous surveillance, supported by the BACoMaB Trust Fund and implemented by the PCPM (Mediterranean Monk Seal Conservation Program) in partnership with CBD-Habitat and Annajah. In 2024, 44 new pups were born, and significant progress was made on the translocation project at Cap Alzaz, including the construction of acclimatization enclosures in preparation for the first transfers planned for 2025 ([BACoMaB, 2024, pp. 36–38](#)).

## Ecological Role of the Mediterranean Monk Seal

Mediterranean monk seals contribute significantly to the marine ecosystem through their role as apex predators. They feed on a variety of prey, including bony fishes, cephalopods, and crustaceans, which helps maintain the balance of marine life by controlling the populations of these species ([NOAA Fisheries](#)). Their presence indicates a healthy marine environment, as they require clean, undisturbed habitats for resting and pupping. The seals' selection of remote marine caves for giving birth and resting (to avoid human persecution on open beaches) also highlights the importance of preserving these specific habitats to ensure their survival ([Marine Mammal Commission](#)). Furthermore, the Mediterranean monk seal serves as an indicator species for marine conservation efforts. Their population trends can reflect broader environmental changes, such as habitat degradation, pollution, and human disturbances. Conservation programs aimed at protecting the monk seal also benefit other marine species and habitats, promoting overall biodiversity and ecosystem health ([NOAA Fisheries](#)). The success of these programs, as seen in the increasing population of monk seals at Cap Blanc, underscores the importance of sustained conservation efforts and international cooperation in preserving marine biodiversity ([Marine Mammal Commission](#)).

## Main Threats to waterbirds in the Banc d'Arguin National Park

The main threats to waterbirds in the Banc d'Arguin National Park, as identified in the [East Atlantic Flyway Assessment 2023](#), include:

- **Fishing:** This is a significant pressure at most sites along the flyway, including Banc d'Arguin. It represents a major threat to seabirds, particularly due to bycatch and habitat degradation.
- **Buildings and Infrastructure:** Development activities such as construction contribute to habitat loss and fragmentation, pollution, and disturbance to sensitive species like flamingos and pelicans.
- **Recreation and Tourism:** These activities can lead to disturbance and habitat degradation, impacting bird behavior and habitat quality.
- **Roads and Cars:** Infrastructure development facilitates illegal hunting and land conversion, contributing to habitat loss and pollution.
- **Climate Change:** This disrupts migration cycles and causes the loss of critical habitats. It also exacerbates other threats like flooding and water scarcity.
- **Pollution:** Improper waste disposal, oil spills from boating, and chemical runoff from wetlands are significant threats, often linked to recreational activities.
- **Avian Influenza:** Outbreaks have impacted several waterbird species in West Africa, between 2021 and 2023.

These threats collectively undermine the ecological integrity of the park, necessitating concerted efforts by scientists, governments, site managers, and civil society to mitigate negative impacts and conserve the park's unique biodiversity and ecological values.