DISSEMINATION
LIFE Ilhas Barreira

Safeguarding one of the Algarve's protective barriers

A group of small islands plays a crucial role on the south coast of Portugal. They are called the Barrier Islands because that's exactly what they do: they form a barrier between sea and land, enabling a rich lagoon system to form. But these islands aren't simply a barren barrier. They are fast becoming a haven for seabirds which are struggling elsewhere. Project LIFE Ilhas Barreira has been protecting the Barrier Islands and nurturing their ecological potential with promising results.

Seabirds

The Barrier Islands are home to the largest breeding colony of Audouin's Gull (*Larus audouinii*) in the world. This species is declining worldwide—but not here. Since establishing itself in the region a decade ago, Audouin's Gull numbers have steadily increased in the area. Specialists from project partners ICNF, Ecotop-MARE/University of Coimbra and SPEA counted over 7000 nests in 2024, almost three times more than at the start of the project in 2019. And it appears to be expanding. Initially, gulls were only breeding on Deserta Island, but in 2022 they colonised the neighbouring island of Culatra, and numbers there have also been growing ever since. This is good news, but it raises challenges.

Being confined to only a couple of breeding sites leaves the species especially vulnerable to threats such as natural catastrophes, invasive predators and human disturbance. The LIFE Ilhas Barreira project has tackled some of these threats in the species' main breeding colony on Deserta Island.

This island is mostly uninhabited, but its beaches make it a popular tourist destination. Visitors come from the mainland by tour boats, disembarking on the island's small dock and heading across the island to the beach or for a meal or drink at the restaurant. Holiday-makers with private boats also roam the Ria Formosa lagoon system, weighing anchor off the island's shore to enjoy its waters.

One of the threats to Audouin's Gull and other birds nesting on the island is predation by invasive mammals. Cats and alien rodents did not occur naturally on Deserta Island; they were brought over by humans (intentionally or not), and they find the eggs and chicks of ground-nesting birds an irresistible temptation. A feral cat can (and has) lay waste to dozens of nests in a single night. The project team removed all feral cats from the island to ensure it remains a safe haven for seabirds to rear their young. Working with a local animal shelter, the cats were sterilised and relocated to cat colonies in a town on the mainland. To control the rodent population and prevent large numbers of rats from threatening seabird colonies, the project team strategically

Removing invasive plants © Mauro Hilário

placed biosecurity traps to create a barrier at likely entry points.

The LIFE Ilhas Barreira project also developed a biosecurity plan detailing measures and procedures to ensure that the threat of invasive predators on the island is kept low.

Although expanding the Audouin's Gull colony to Culatra creates a safety net for the species, managing these threats at the new breeding site will be much harder, as Culatra houses human settlements.

With these uncertainties in mind, another important outcome of this project was the updated international Species Action Plan for Audouin's Gull. This plan, which covers all countries where the species occurs or breeds, had not been updated since its creation 30 years ago. Bringing these countries together to cooperate and make joint commitments to protecting the species is a landmark achievement.

Considering the importance of the Portuguese population in the species' current situation, the project team is also advocating for a national commitment to protecting Audouin's Gull, not only on land but also at sea. To this end, the LIFE Ilhas Barreira project submitted an official proposal to expand the Ria Formosa Special Protection Area into the sea to guarantee that feeding grounds for this and other seabirds are also protected.

Another threat the project aimed to address was nest disturbance, not only for Audouin's Gull but also for Little Tern (*Sternula albifrons*). Both species lay their eggs directly on the ground and rely on camouflage for protection. The mottled greyish-brown eggs and chicks easily go unnoticed on the sand, and the camouflage that helps conceal them from predators also means they can easily be trampled by beach-goers. Having people constantly walking close by also increases stress on the parents and can prevent them from adequately caring for eggs and chicks, as their natural behaviour is to stay away from the nest to avoid revealing its location. To reduce nest disturbance, project partners ICNF, Ecotop-MARE/University of Coimbra and SPEA cordoned off areas around Little Tern colonies and placed warning signs on the beaches alerting people to the importance of keeping their distance, with positive results.

Video: Conheça a chilreta

Reducing nest disturbance was also one of the positive behaviours emphasised in the project's outreach and education activities. An animation video presented the Little Tern to young (and not-so-young) audiences and is available online. The video was widely screened in local schools as part of the project's environmental education programme, which visited all schools in the region and reached a total of 6807 students. To complement the team's activities and extend their reach, the project produced a teacher dossier that enables educators to independently explore topics such as seabirds, biodiversity and conservation in greater depth.

Bird rehabilitation

The islands' seabird population will be more likely to thrive if the birds are kept healthy. With that in mind, project LIFE Ilhas Barreira improved the capacity of the region's wildlife rescue centre—project partner RIAS—to care for injured, sick or weakened seabirds. Thanks to the project, the rescue centre now has more and better equipment, including a rehab tank for seabirds to practice swimming and diving for food, and its staff were able to improve their knowledge and skills through dedicated training.

Throughout the project, 7562 seabirds from the Algarve region were admitted to RIAS hospital: 5199 live birds and 2363 dead. The majority were gulls: Yellow-Legged Gull (*Larus michahellis*) was the most common species, followed by Lesser black-backed Gull (*Larus fuscus*) and Audouin's Gull. The main cause of admittance was 'paretic syndrome', a condition which causes paralysis and diarrhoea. Thanks to the project, it was possible to identify the cause as botulism.

As part of the project, the RIAS team developed a standard treatment protocol for emaciated seabirds, which has been made available for other rescue centres to use. It is also a good practice protocol for rehabilitating seabirds.

In the course of the LIFE Ilhas Barreira project, the team was able to return 3208 seabirds to the wild after treatment at RIAS.

As a result of the project, not only is there a clearer picture of the main causes of seabird mortality in the region, but also an improved capacity for treating seabirds and for detecting and monitoring future disease outbreaks, which could be especially relevant in the near future, as bird flu outbreaks are likely to increase.

Dunes

Waves and currents break against the Barrier Islands, constantly reshaping these sandy banks. A crucial component of this dynamic ecosystem is the grey dunes: the fixed, stable sand dunes farther from the waterfront, which are covered in vegetation. Project LIFE Ilhas Barreira aimed to protect the grey dunes on Deserta Island through a three-pronged approach: investigating the causes of grey dune degradation, removing invasive plant species and reducing trampling.

Based on historical data, one of the known causes of grey dune degradation was the arrival and rapid increase in the number of gulls: researchers had

Audouin gull's nest © Luis Ferreira

Audouin's Gull. Adobe Stock © Arnau Soler

observed a direct relationship between gull expansion and dune degradation. To analyse the potential for recovery of the grey dunes, researchers from project partner CIMA created exclusion zones, blocking the gulls' access to parts of the most degraded areas, and monitored the effect on the dunes. The results indicate that the recovery time of the dunes will be longer than several years, probably due to changes in the soil promoted by gulls' trampling and guano. The team observed that opportunistic plant species are colonising the affected area, changing the plant community and thus the habitat, leading to the fragmentation of the grey dune habitat in Deserta Island. Nevertheless, the system should be able to recover naturally if the pressure is reduced or removed.

Restoring native plants

To restore this crucial ecosystem, the project team removed all invasive plant species from Deserta Island. With the help of dozens of volunteers, over the course of four years, a team led by project coordinator SPEA removed nearly 1.6 ha of three different species: Acacia (*Acacia saligna*), Century Plant (or American aloe, *Agave americana*), and Hottentot Fig (*Carpobrotus edulis*).

For Hottentot Fig, alongside the more traditional approach of manually uprooting the plants, the team tested a new method: the use of mulching sheets. This creeping plant forms mats along the dune floor, with massive root systems making it tough to remove. To try to make the process easier, the team spread sheets of black plastic over the plants to trap heat and prevent sunlight, leading the plants to die out and turn to mulch. This new approach appeared to be more efficient. However, as with any attempts to control invasive plants, it is essential to monitor the area to ensure that no stray seeds remain or are brought in later by wind or accident—or on purpose. This is where the project's outreach component once again played a crucial role, raising awareness of the negative impacts of these invasive plants and animals: the project produced a guide to invasive plants and a biosecurity manual.

The success of the project's actions inspired a knock-on effect, spurring local authorities to remove or control invasive plant species on the other Barrier Islands of Tavira and Armona.

Deserta Island © Luis Ferreira

To reduce the trampling of the dunes, and its attendant negative effects, project LIFE Ilhas Barreira improved the boardwalks on Deserta Island. To encourage visitors to use the boardwalks, the project team placed information boards along the path, highlighting the island's natural values. Instead of the typical project leaflet, the LIFE Ilhas Barreira team produced a map with useful information for visitors, highlighting the islands' wildlife and how visitors can help protect this paradise.

When birds and people meet

Thousands of seabirds die every year, accidentally caught in fisheries. A team led by project partner CCMAR worked with fishermen to prevent these accidents. By conducting almost 1000 surveys of fishermen at harbours in the area, the team identified bottom-set nets (gill and trammel nets) and purse-seines as the fishing methods with higher seabird bycatch risk, mainly occurring during autumn and winter.

Thanks to the fishermen who generously welcomed them, the team could board as observers on over 60 fishing trips per year. During these trips, they identified the most dangerous moments for seabirds: when nets are released and hauled in. Leftover fish attract birds if the net isn't completely clean, prompting them to dive in pursuit and risk entanglement. In the case of gillnets and trammel nets, the slow sinking process during net release extends this risk up to 100 metres from the boat.

IAS Control © SPEA

When the nets are hauled in, seabirds are further attracted to the fish trapped in the nets: a promise of an easy meal.

According to the data obtained during the project, the most frequent victims of these accidents are Northern Gannets (*Morus bassanus*), Cormorants (*Phalacrocorax carbo*) and gulls.

To prevent this problem, the project team tested several measures to keep seabirds away from boats and nets, including the 'scarybird' kite, shaped like a bird of prey, or loudspeakers emitting seabird distress calls. However, the measure that proved most effective was simple and didn't even require extra equipment.

During their time on board, observers noticed that fishermen often gutted the fish immediately after catching them while the net was still being hauled in. They discarded fish waste overboard, along with low-value or unsellable fish. This practice inadvertently provided an easy food source for seabirds at precisely one of the dangerous moments—when they were at high risk of entanglement. Consequently, the team asked fishermen to collect the discards in buckets or boxes and only throw them overboard during the journey back to shore. They also advised fishing crews to delay boat cleaning until the return journey, as cleaning also sends pieces of fish overboard, which can attract birds. The result? Fewer seabirds approach the boat during periods of greater bycatch risk. This simple, low-cost measure is worth trying in other locations where bycatch is a threat to seabirds. As a result of the project, it is being trialled in Sagres, at the westernmost tip of the Algarve.

Monitoring breeding colonies © Luis Ferreira.

As in many coastal areas around the world, towns around the Barrier Islands are also grappling with a rise in tension between people and Yellow-legged Gulls. The gulls are attracted by human waste, especially around fishing harbours and landfill sites. Project LIFE Ilhas Barreira included efforts to understand the effects of restricting gulls' access to these anthropogenic food sources.

At the landfill site, the project team tested the presence of a falconer during the gulls' incubation period to prevent them from feeding on the waste. This measure was so successful that the landfill management hired a falconer year-round once the project's trials were over.

At the fishing ports, the team found that the gulls were mostly feeding on scraps discarded by fishermen while cleaning their nets. To mitigate this, they focused on raising awareness among fishermen, encouraging them to either dispose of discards at sea during the return journey—rather than in the port—or, if they were cleaning gear on land, to gather the waste in a bucket and dispose of it in a way that prevented gull access. Unfortunately, these efforts were somewhat hindered by the absence of adequate infrastructure: in many cases, ports don't have appropriate bins for the disposal of fishing discards. The team also noticed that when the falconer was active at the landfill site, Yellow-legged Gull numbers at fishing ports increased, although this didn't always translate into more gulls feeding at the ports.

To enable this work to be continued beyond the project—both in terms of time and location—the LIFE Ilhas Barreira team produced a best practice manual for reducing anthropogenic food sources for gulls at fishing ports and landfills, which is freely available.

Deserta Island © Fabio Marcelino

Looking forward

Over the course of five years, project LIFE Ilhas Barreira restored and protected the Barrier Islands and laid the groundwork for local communities and authorities to guarantee that the dunes are protected and ensure that these crucial islands remain a haven for seabirds, continue to promote a healthy lagoon system, and become part of a better-protected land- and seascape. From invasive plant removal to bycatch prevention, the project's results and experience demonstrate effective measures and best practices which can be sustained in the region and applied in similar circumstances elsewhere.

The team will continue their efforts to protect the region, but maintaining this protection long-term will require concerted, strategic action by local and national authorities. To protect the Barrier Islands for future generations, local authorities must take responsibility for continued monitoring and control of invasive species and for providing adequate waste disposal infrastructure at fishing ports, for instance, and work with national authorities to ensure effective monitoring of the health of seabird populations and preparedness for outbreaks of diseases such as bird flu. And, of course, to ensure that the area is truly protected, it is paramount that national authorities approve, implement and enforce the extension of the Special Protection Area. These actions will determine the future of the Barrier Islands and the natural paradise they sustain.

Audouin Gull Colony © Maria Ruiz.

PROJECT NAME
LIFE Ilhas Barreira

PROJECT SUMMARY
The LIFE Ilhas Barreira project ran from 2019 to 2025 and aimed to protect species and habitats on the Barreira Islands, Portugal. Co-financed by the European Union's LIFE programme, the project was coordinated by the Portuguese Society for the Study of Birds (SPEA), with partners Animaris, RIAS/Aldeia, ICNF, CCMAR/UAlg, CIMA/UAlg and Ecotop-MARE/University of Coimbra.

THE BARRIER ISLANDS
The Barrier Islands are a set of five islands (Culatra, Armona, Tavira, Cabanas and Deserta, also known as Barreta) and two peninsulas (Ancão and Cacela). Culatra, Armona, Tavira and Ancão have varying degrees of human occupation, ranging from permanent residents to beach bars. The islands are a popular tourist destination for beach—lovers, requiring a delicate balance to ensure human pressure doesn't threaten the seabirds, plants and dunes.

PROJECT LEAD PROFILE
The LIFE Ilhas Barreira project coordinator, Joana Andrade, is a biologist who joined SPEA in 2008, coordinating monitoring programmes of marine and coastal birds and seabird conservation projects. She has been involved in several LIFE projects and is responsible for leading the SPEA strategy on marine conservation and policy along with Birds and Habitats Directives, Marine Strategy Framework Directive, Biodiversity Strategy and restoration targets.

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