Welcome to the coastal landscapes of Sines, part of the Southwest Alentejo and Vicentine Coast Natural Park — a meeting point of land and sea where dunes, temporary ponds, and marine cliffs form a mosaic of habitats protected under the Natura 2000 Network.

Protecting our local biodiversity through awareness and practical conservation work.

Overview

The Start Campus site sits in the transition zone between land and sea within the Southwest Alentejo and Vicentine Coast Natural Park (PNSACV). This coastal mosaic — mobile dunes, seasonal freshwater ponds, wet coastal heaths, rocky intertidal shores and nearby productive coastal waters — supports a remarkable concentration of plants and animals, including several species found only in this region. The area is part of Portugal's Natura 2000 network and is covered by national habitat conservation plans.

Key habitats you will find here

- **Mediterranean temporary ponds (Habitat 3170*)** — shallow depressions that flood in winter and dry in summer. These ponds harbour specialist amphibians, crustaceans and plants adapted to the wet-dry cycle — many species that depend on this habitat cannot survive elsewhere. Characteristic species include *Triops vicentinus*, *Isoetes* spp. and create a habitat where amphibians such as the *Tritão-marmorado-pigmeu* (*Triturus pygmaeus*) and rare crustaceans like the *Camarão-girino* (*Triops vicentinus*) thrive.
- **Temperate Atlantic wet heaths (Habitat 4020*)** — boggy heaths dominated by *Erica ciliaris* and *Erica tetralix*, usually where groundwater or winter waterlogging occurs. They form a vital part of the coastal mosaic and support insects, small reptiles and specialized plants.

- **Coastal dunes & dune slacks** — dynamic sands and stabilised dunes with dune-specialist plants such as *Pancratium maritimum* (sea daffodil) and other sand-loving grasses.
- *Montado* and Forest Fragments: Cork oaks (*Quercus suber*) and holm oaks (*Q. rotundifolia*) shelter small mammals and birds of prey.
- Intertidal shores & nearshore marine habitats — rocky platforms and sandy beaches that support marine invertebrates, seaweeds and provide feeding grounds for seabirds and dolphins.

Endemic and Flagship Species of PNSACV

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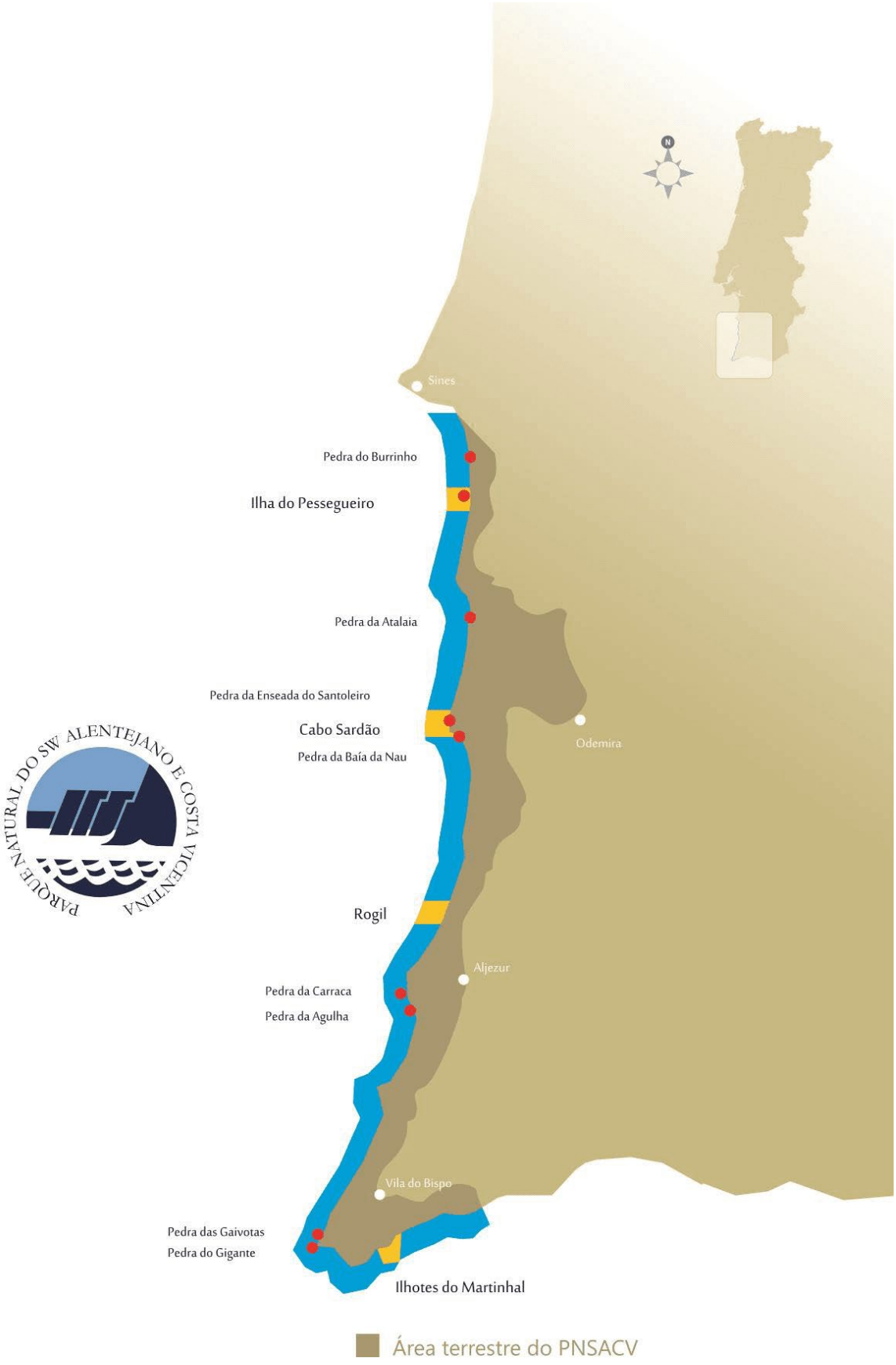

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Endemic and Flagship Species of PNSACV

Flora

- ***Erica ciliaris*** (Dorset Heath): Characteristic of wet heaths and temporary ponds; rare and with fragmented distribution in Portugal.
- ***Erica erigena*** (Irish Heath): Prefers sandy, coastal soils; also rare and locally endemic.
- ***Erica tetralix*** (Cross-leaved Heath): Another key species of wet heaths.
- ***Isoetes setaceum*** (Iberian Quillwort): Found in temporary ponds; endangered.
- ***Caropsis verticillato-inundata*** (Alcaravia-dos-charcos): Herbaceous perennial of temporary ponds; endangered.
- ***Pancratium maritimum*** (Sea Daffodil): Native to coastal dunes; protected.
- ***Helichrysum rupestre*** *subsp.* ***rupestre*** (Golden Everlasting): Found in rocky coastal areas; endangered.
- ***Quercus suber*** (Cork Oak) and ***Quercus rotundifolia*** (Holm Oak): Iconic trees of the region, supporting diverse ecosystems.

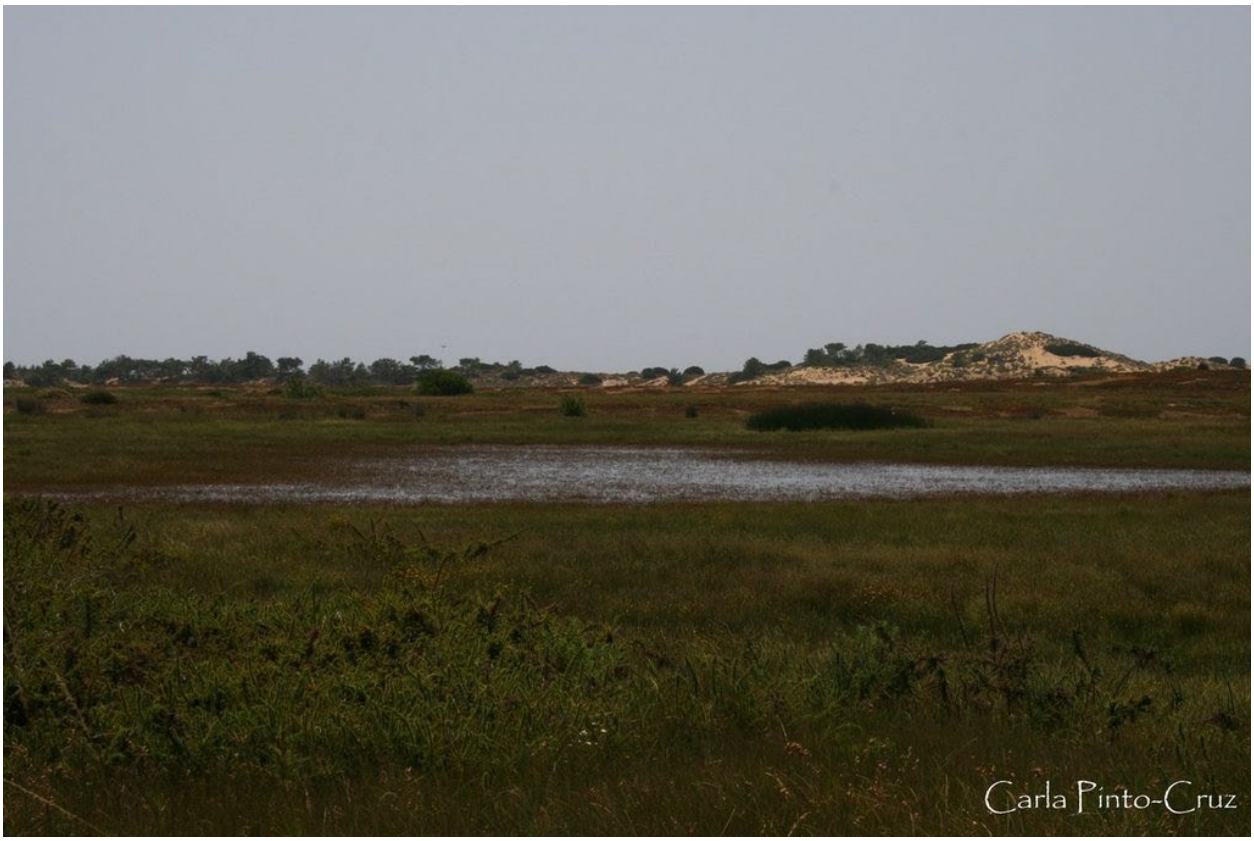
Fauna

- ***Dufourea lusitanica*** (Lusitanian Sweet Bee): Critically endangered, known from Sines.
- ***Maghrebestheria maroccana*** (Clam Shrimp): Endangered, exclusive to temporary ponds.
- ***Tanymastigites lusitanica*** (Fairy Shrimp): Endangered, found in the Southwest Conservation Zone.
- ***Squalius torgalensis*** (Mira Chub): Endangered freshwater fish.
- ***Iberochondrostoma olisiponense*** (Lisbon Arched-mouth Boga): Endangered freshwater fish.

- ***Chioglossa lusitanica*** (Lusitanian Salamander): Vulnerable amphibian.
- ***Emys orbicularis*** (European Pond Turtle): Vulnerable reptile.
- ***Pandion haliaetus*** (Osprey): Endangered bird, nests locally.
- ***Hieraaetus fasciatus*** (Bonelli's Eagle): Endangered, formerly nested in Sines.
- ***Lynx pardinus*** (Iberian Lynx): Critically endangered, present in the region.
- ***Rhinolophus mehelyi*** (Mehely's Horseshoe Bat): Critically endangered, found in caves.
- ***Dermochelys coriacea*** (Leatherback Turtle): Critically endangered, coastal waters.
- ***Microtus cabrerae*** (Cabrera Vole): Vulnerable, may be present in temporary ponds.
- ***Delphinus delphis*** (Common Dolphin): Protected, common in coastal waters.

Priority Habitats in the Landscape

Habitat 3170*: Mediterranean Temporary Ponds



Description: Shallow depressions that fill with water seasonally, supporting unique plant and animal communities. These are biodiversity hotspots and are considered a priority habitat under the EU Habitats Directive. Temporary ponds have a typical Mediterranean flora. Plant communities are organized in stripes, more or less concentric (inner, middle and outer vegetation belts) according with ecological preferences of each species. In general, it is possible to find in the inner area plants better adapted to long wet periods, such as the white buttercups (or watercrowfoots). These plants are among the first to bloom during the annual cycle. The outer belt – a humid area, yet, usually not flooded– is colonised by small seasonal plants, such as the grass plant Chaetopogon, rushes and the Boyd's clover. In the middle belt, it is possible to find species such as the lesser water-plantain and the forget-me-not. Due to changes in the wet period and the height of the water column every year, the shape and size of the vegetation belts can also change. For this same reason, the presence and abundance of all plant species can also vary.

In the ponds of the Southwest Coast, 248 plant species were identified, 11 of which have protection status. Among these, *Pilularia minuta* is classified as "Threatened" in the IUCN Red List, *Isoetes setaceum* as "Near-Threatened" and *Caropsis verticillato-inundata* as "Vulnerable". *Hyacintoides vicentina* – included in Annexes II and IV of the European Habitats Directive – and *Juncus emmanuelis* – one endemic rush of the Southwest region of the Iberian Peninsula – are also present in these habitats.

- **Ecological Value**: Support rare and endemic species, including amphibians, crustaceans, and specialised plants. They are highly sensitive to disturbance and climate change.

These shallow, seasonal wetlands are biodiversity hotspots, supporting rare and endemic species adapted to alternating wet and dry periods.

Key Bioindicator Species

- *Isoetes setaceum* (Iberian Quillwort)
    - Aquatic fern-like plant, endemic to Iberia, found in temporary ponds. Sensitive to water quality and hydroperiod. Its presence signals healthy, undisturbed pond cycles.
- *Caropsis verticillato-inundata* (Alcaravia-dos-charcos)
    - Perennial herb, characteristic of Mediterranean temporary ponds. Indicator of undisturbed hydrology and minimal pollution.
- *Tanymastigites lusitanica* (Fairy Shrimp)
    - Endangered crustacean, exclusive to temporary ponds. Its occurrence reflects intact pond hydrology and absence of chemical disturbance.
- *Maghrebestheria maroccana* (Clam Shrimp)
    - Rare, endemic to temporary ponds. Sensitive to habitat fragmentation and water quality.
- *Triops vicentinus* (Tadpole Shrimp)
    - Endemic crustacean, indicator of pond connectivity and sediment quality.
- *Erica ciliaris, Erica erigena, Erica tetralix (*Heaths)

- Heath species at pond margins, indicating good habitat connectivity and transition zones.

- *Ulex minor* (Dwarf Gorse)
    - Indicator of pond edge and wet heath transition zones.
- *Eryngium corniculatum* (Blue Thistle/Cardo-das-lagoas)
    - Sensitive to water quality and pond hydroperiod.

Large Branchiopods (Freshwater Crustaceans)

- Exclusive to temporary ponds: These small crustaceans (e.g., fairy shrimp, clam shrimp, tadpole shrimp) only live in ponds that dry up in the summer.
- Survival strategy: The cysts (encapsulated eggs) remain in the dry soil and hatch when the pond refills.
- Identified species: 6 species on the Southwest Coast, half of the 12 found in Portugal, including:
    - ***Chirocephalus diaphanus*** (fairy shrimp)
    - ***Branchipus cortesi*** (fairy shrimp endemic to the Iberian Peninsula)
    - ***Tanymastix stagnalis*** (ecological indicator)
    - ***Cyzicus grubei and Maghrebestheria maroccana*** (clam shrimp)
    - ***Triops vicentinus*** (tadpole shrimp, endemic to SW Portugal)

Amphibians

- Importance of ponds: They are excellent sites for amphibian reproduction, where larvae (tadpoles) hatch from eggs left in the water.
- Diversity: 13 species identified on the Southwest Coast (out of a total of 19 in Portugal).
    - ***Lissotriton boscai*** (Bosca's newt)
    - ***Triturus pygmaeus*** (pygmy marbled newt)
    - ***Pleurodeles waltl*** (Iberian ribbed newt)
    - ***Hyla molleri and Hyla meridionalis*** (tree frogs)
    - Pelobates cultripes (western spadefoot toad)
    - Pelodytes atlanticus (Lusitanian parsley frog)

Reptiles

- Representatives: Freshwater turtles, snakes, and lizards.

- Identified species:
    - ***Emys orbicularis*** (European pond turtle, most frequent in ponds)
    - ***Mauremys leprosa*** (Mediterranean pond turtle, less common)
    - ***Natrix astreptophora and Natrix maura*** (water snakes, non-venomous)
    - ***Chalcides striatus*** (three-toed skink, a lizard with vestigial limbs)

Rodents

- Species:
    - ***Arvicola sapidus*** (southern water vole)
    - ***Microtus cabrerae*** (Cabrera's vole, endemic to the Iberian Peninsula)
- Habits: They feed on herbaceous vegetation, are difficult to observe, but leave tunnels and droppings as evidence.

Habitat 4020*: Atlantic Wet Heaths

- **Description**: Moist heathlands dominated by heather species, found on acidic, peaty soils. These habitats are rare and support a range of endemic and threatened flora and fauna.
- **Ecological Value**: Provide refuge for rare plants and invertebrates, contribute to carbon sequestration, and maintain landscape diversity.

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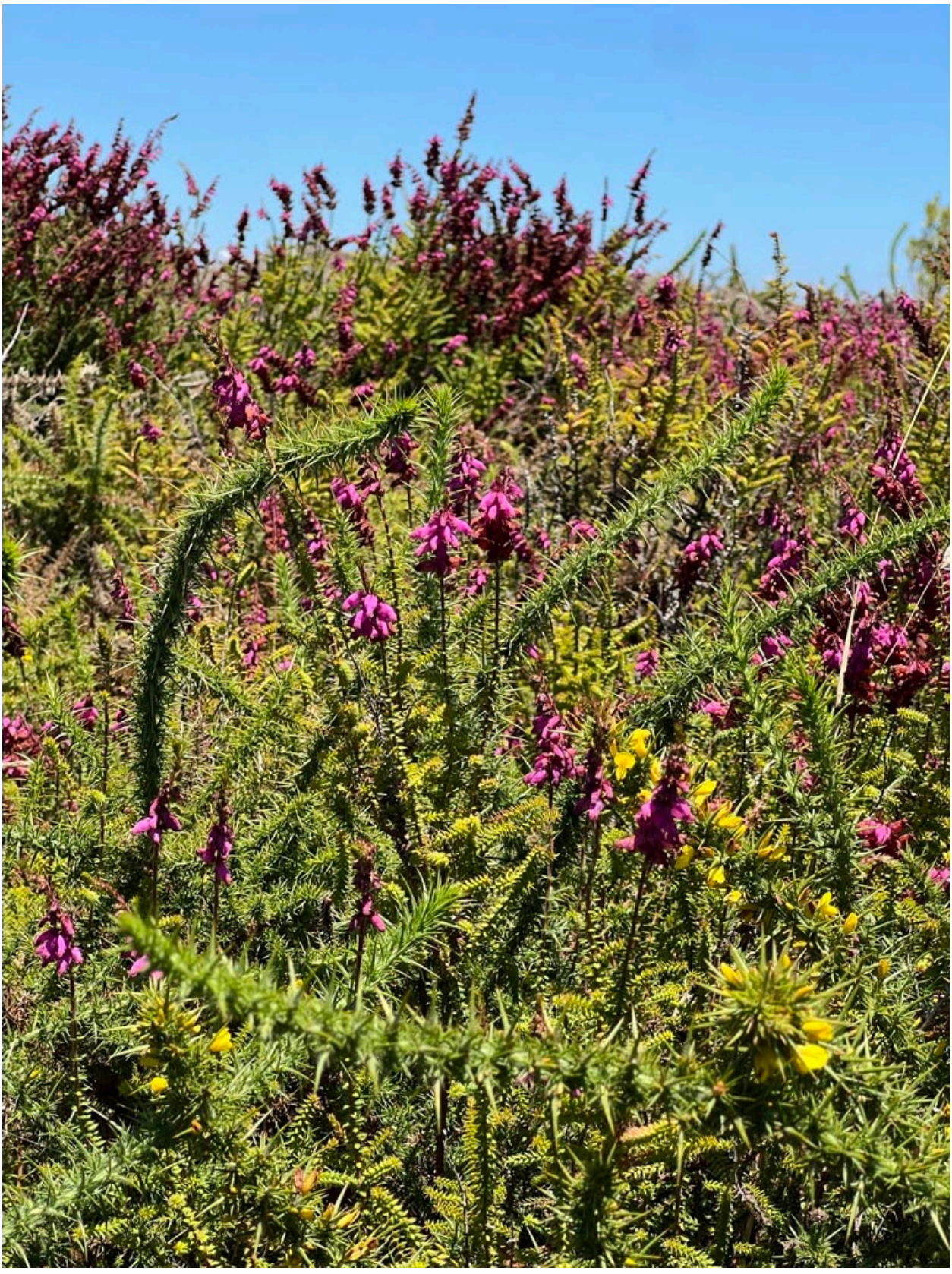
- 

Key Bioindicator Species

- ***Erica ciliaris*** (Dorset Heath)
    - Flagship species for wet heaths; sensitive to soil acidity, moisture, and disturbance. Its abundance reflects habitat integrity.
- ***Erica erigena*** **(**Irish Heath)
    - Indicator of sandy, coastal soils and habitat connectivity. Rare and locally endemic.
- ***Helichrysum rupestre subsp. rupestre*** (Golden Everlasting)
    - Found in rocky coastal areas; sensitive to habitat fragmentation and disturbance.
- ***Biscutella sempervirens subsp. vicentina*** (Vicentine Biscutella)
    - Endemic to the Vicentine coast, found in paleodunes and coastal scrub. Indicator of undisturbed sandy habitats.
- ***Centaurea vicentina*** *(*Vicentine Centaurea)
    - Endemic thistle-like plant, found in clearings and edges of low scrub and heaths. Sensitive to habitat loss and disturbance.
- ***Diplotaxis vicentina*** (Vicentine Diplotaxis)
    - Local Brassicaceae with restricted distribution, indicator of healthy coastal heaths.
- ***Hyacinthoides vicentina*** (Vicentine Bluebell)
    - Bulbous spring ephemeral, limited to the Vicentine area, indicator of undisturbed heath and scrub.
- ***Potentilla erecta*** (Tormentil)
    - Indicator of moist, acidic soils typical of wet heaths.
- ***Ulex minor*** (Dwarf Gorse)

- Characteristic of wet heath margins.

Why These Species Matter

- Presence and abundance of these species reflect the ecological integrity, hydrology, and connectivity of their respective habitats.
- Decline or absence signals habitat degradation, pollution, or hydrological disruption.
- Endemics (e.g., *Biscutella vicentina, Centaurea vicentina, Diplotaxis vicentina, Hyacinthoides vicentina*) are especially valuable as bioindicators due to their restricted ranges and sensitivity to disturbance.

Conservation status & threats

Many of the species and habitats above are protected under the EU Habitats and Birds Directives and by Portuguese national law. Key threats include: habitat loss and fragmentation, pollution and wastewater, trampling and unsanctioned access, overfishing and bycatch in nearshore waters, and climate change (altered rainfall patterns that modify pond hydroperiods). The Start Campus EIA and conservation program is framed monitoring and mitigation measures to reduce impacts; the site will be managed under those plans and in coordination with ICNF and other scientific partners.

- **How we monitor and what the EIA recommends**
  The EIA and associated technical annexes call for: i. baseline habitat mapping, seasonal surveys of temporary ponds (to capture species present in wet vs dry phases), targeted monitoring of listed/endemic taxa, and an adaptive management plan that links construction/activity schedules with ecological windows to avoid breeding seasons. Data must feed a public repository (and the QR page will link to monitoring summaries). This is the best way to characterise the site scientifically while making the results accessible to the public.

Start Campus' Initiatives to Ecological Restoration and Community Engagement

Start Campus is committed to conserving these habitats and species through habitat restoration, species translocation, and ongoing monitoring, as outlined in the Environmental Impact Assessment. Educational programmes, workshops, and informative signage are being implemented to raise awareness and foster a culture of stewardship among visitors and the local community.

The Environmental Impact Assessment (EIA) highlighted key conservation Implications. Habitat mosaics and connectivity are crucial and must be managed as interconnected systems. Monitoring bioindicator species provides early warning of habitat degradation and guides adaptive management, where special attention should be given to endemic and threatened species, as their conservation status reflects the health of the entire ecosystem.

In essence, our approach is highlighted by:

- **Maintaining habitat mosaics**: Preserving patches of wet heath, temporary ponds, and adjacent woodlands.
- **Protecting endemic and threatened species**: Through translocation, habitat restoration, and ongoing monitoring.
- **Community engagement**: Education and awareness programs, including signage and digital resources, to foster stewardship.

Start Campus ´ Ecological Conservation Project

Start Campus is leading an innovative environmental conservation project with the main goal of restoring and protecting two priority habitats in Portugal—the Atlantic wet heaths (habitat 4020*) and Mediterranean temporary ponds (habitat 3170*)—across a 55-hectare area at Herdade das Pousadas Novas (HPN), within the Southwest Alentejo and Vicentine Coast Natural Park. This section of the estate presents the ideal soil and climate conditions

for this purpose, serving as the baseline scenario for the translocation of habitat 4020* and the restoration/creation of habitat 3170*.

In addition to meeting the Environmental Impact Statement (DIA) requirements for these two priority habitats (4020* and 3170*), Start Campus is laying the groundwork for an active conservation management program that embodies holistic protection for various habitats and species of community interest, under a total lease of 150 hectares for a period of 25 years. Although this project is based on compliance with Sines DC's environmental licensing, the Ecological Conservation Project (PCE) goes far beyond legal requirements by integrating a robust and scientifically grounded plan to ensure not only mitigation of construction impacts, but also the active enhancement of local biodiversity.

In collaboration with specialists from the University of Évora's Mediterranean Institute for Agriculture, Environment and Development (MED), and the Institute for the Conservation of Nature and Forests (ICNF), Start Campus is committed to developing the various phases of the project, namely:

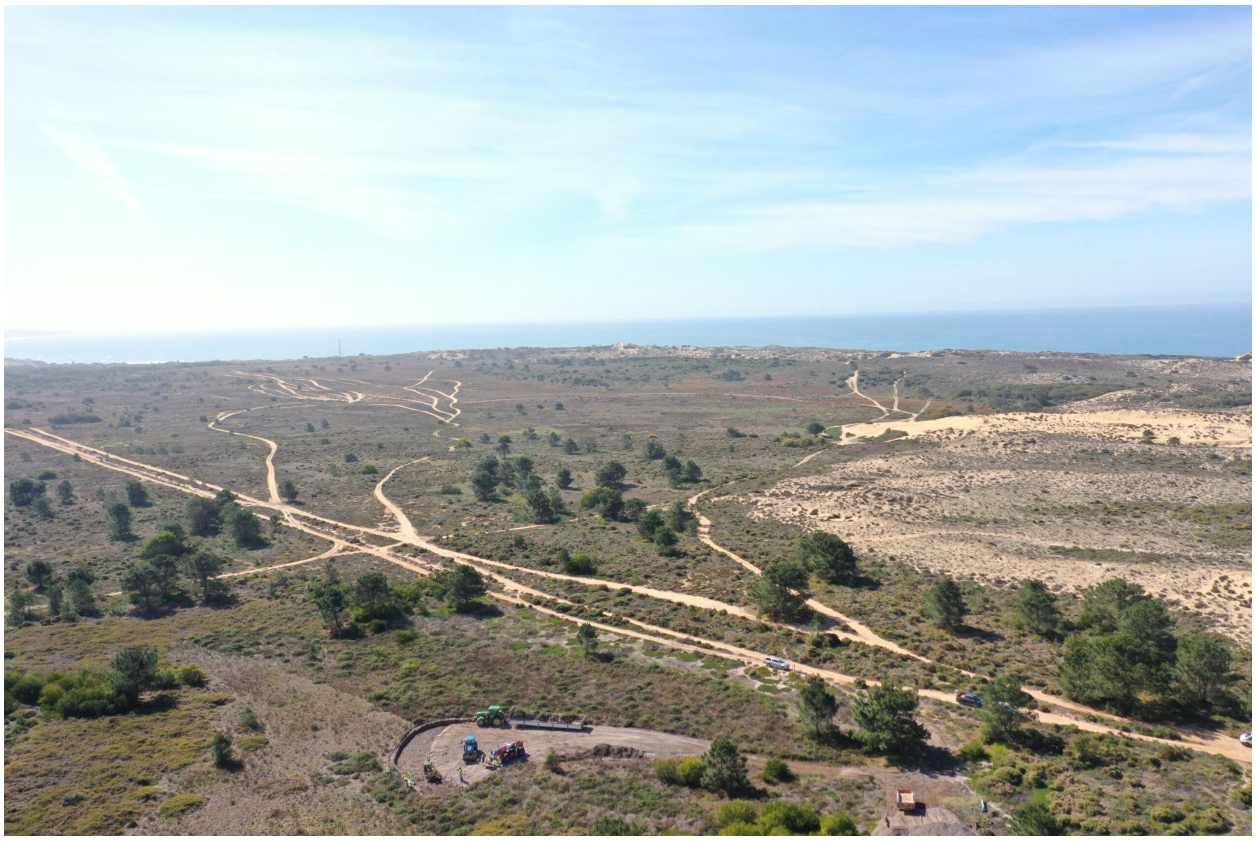
- The safeguarding and translocation of three habitat 4020* clusters (covering an area of 0.50 hectares), as well as 185 big bags from this habitat containing blocks of soil with rooted vegetation.
- The conservation and restoration of the Mediterranean temporary ponds (3170*) present in the target area;
- The creation of a 25-year conservation plan, with continuous scientific monitoring;
- The enhancement of other threatened and endemic species of the PNSACV.

The first phase of the Project was completed on March 26, 2025, and constituted the largest translocation of habitat and protected plant specimens at the European level.

All habitat blocks were transferred to ecologically suitable areas within HPN, with no impact on existing habitats. The operation was carried out under daily technical-scientific supervision and was frequently monitored by drones.

For translocation at the final destination, seven areas within HPN were identified, with easy access via existing roads. Prior to translocation, invasive species were removed and treated according to ICNF guidelines.

These actions are detailed in the Technical Report Pinto-Cruz & Almeida (2024), led by Prof. Carla Pinto Cruz, which should be accompanied by the Addendum to the Plan referencing the changes resulting from reference situations observed as of February 2025.



References & Further Reading

- **Flora-On: Área protegida sudoeste alentejano e costa vicentina [flora-on.pt]**
- **ICNF - Instituto da Conservação da Natureza e das Florestas**
- Portugal Endemic Species List [Intreasures.com]
- **Projeto LIFE Charcos**
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