Université de Carthage
جامعة قرطاج

المعهد الوطني للعلوم الفلاحية بتونس
INAT
Institut National Agronomique de Tunisie
1898 أسس سنة

BiCADE
LR18ES13
Biogéographie, Climatologie Appliquée et Dynamiques Environnementales
Faculté des Lettres, des Arts et des Humanités de Manouba
Campus Universitaire La Manouba 2010 Tunisie

V. Plant conservation priorities within protected areas & IPAs in the Mediterranean

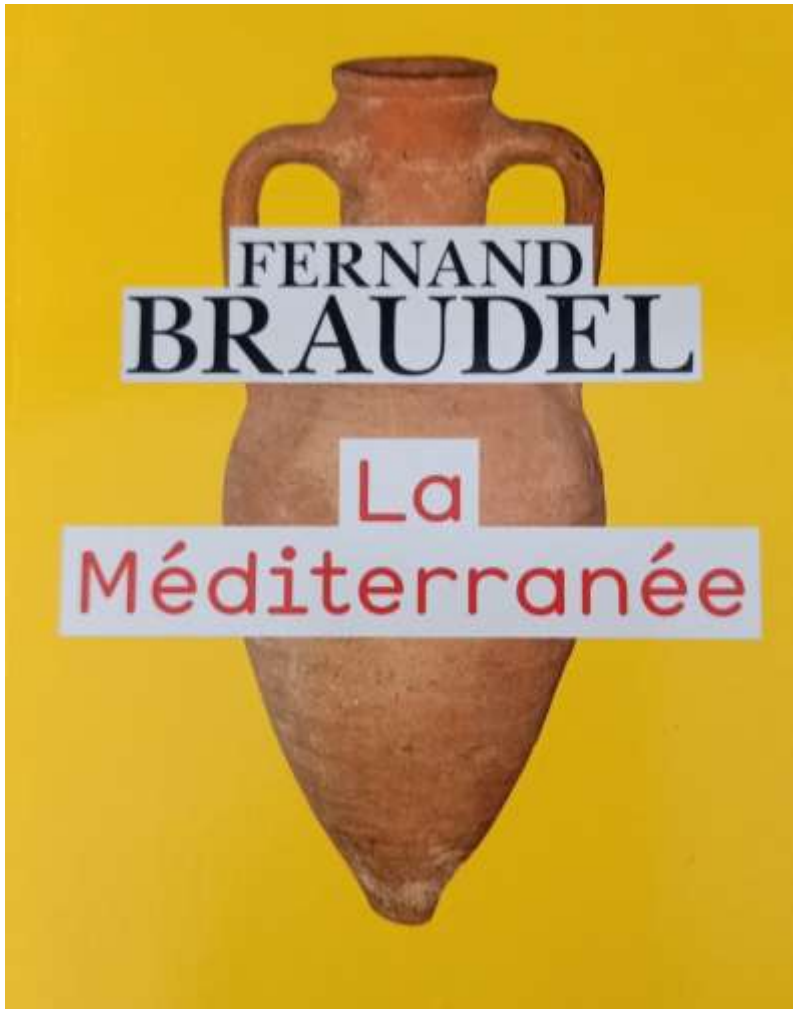
Plant conservation in the Mediterranean: drawing strength from its rich past to sustain the present & shape a resilient future

Imtinen Ben Haj Jilani

5th Mediterranean Plant Conservation Week
"Building alliances for plant diversity conservation in the Mediterranean"

April 07-11, 2025 Limassol, Cyprus

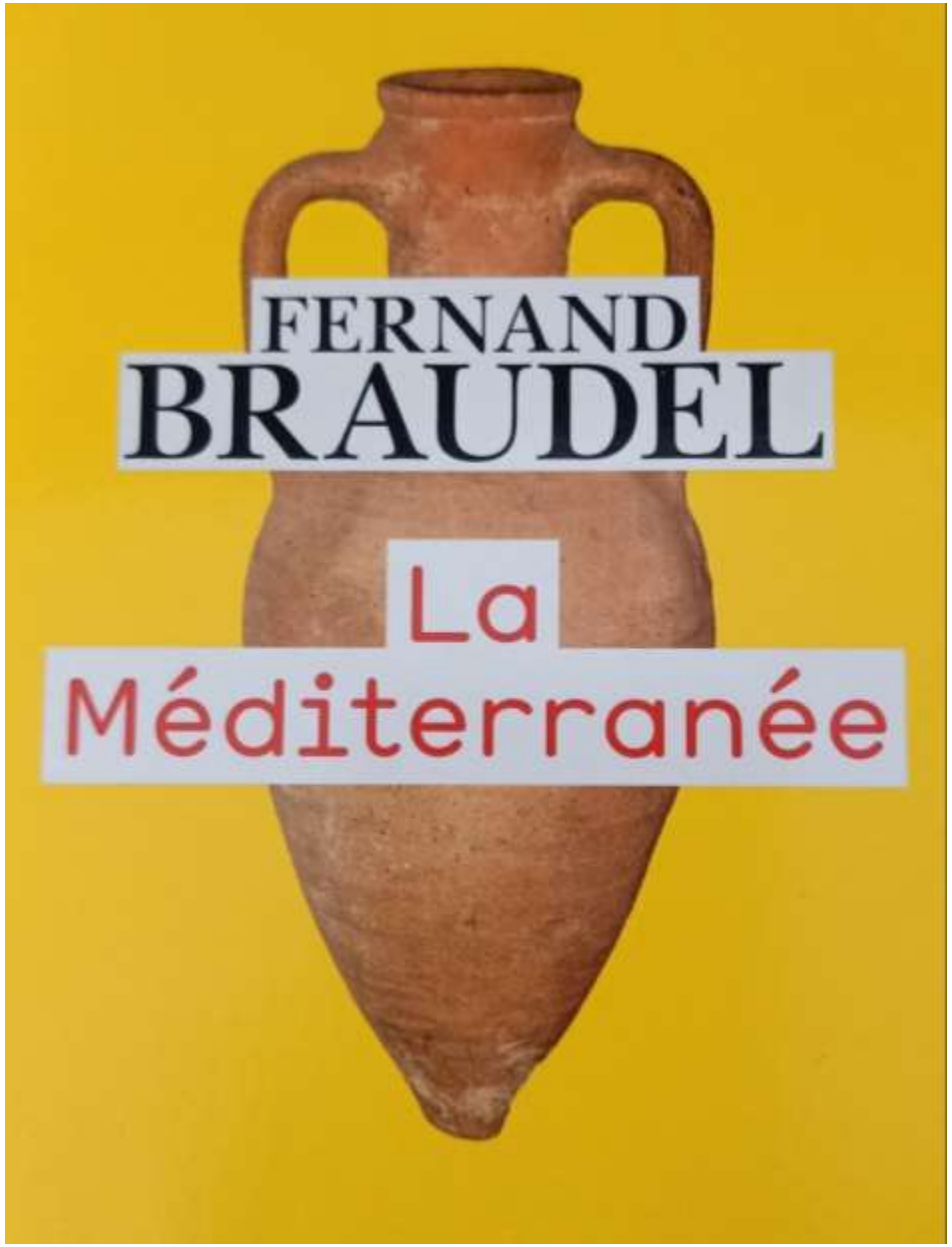
5MPCW CY-2025



*"…**Boats** sail; waves repeat their song; **vintners** descend the hills of **Cinque Terre** on the **Genoese Riviera**; **olives** are harvested in **Provence** and **Greece**; **fishermen** haul in their nets on the still waters of the **Venetian lagoon** or in the canals of **Djerba**; carpenters build boats today just as they did **yesterday**…*

*… More than any other human realm, the **Mediterranean never ceases to tell its own story**, **to relive itself**… **To have been is a condition for being."***

“Stretching along the Saharan shores of the Inner Sea, from the Near East to the Pillars of Hercules.”



The Mediterranean

It embodies a living tapestry of **historical**, **cultural**, and **natural heritage**.

This dynamic and ever-evolving history is etched into its monuments, traditions, and, most notably, its **uniquely rich and diverse ecosystems, particularly its flora**.

"Oh guys, if you keep insisting on migrating north during every interglacial period, you're going to end up extinct, trust me!..."

This remarkable diversity is believed to stem from ancient "**continental bridges**" that facilitated **species migration**, such as from Europe to Africa.

"There's no reason to be afraid, guys... It's just a tiny little bridge, nothing to worry about !"

The "**Siculo-Tunisian**" and "**Betico-Rifan**" connections, corresponding to the **Sicilian** and **Gibraltar straits**, date back to the **Messinian** period.

"Come on, ladies, stay strong! We're almost there!"

This era was **characterized** by the **partial dessiccation** of the **Tethys Basin**, which later refilled to form what is now the **Mediterranean Sea**.

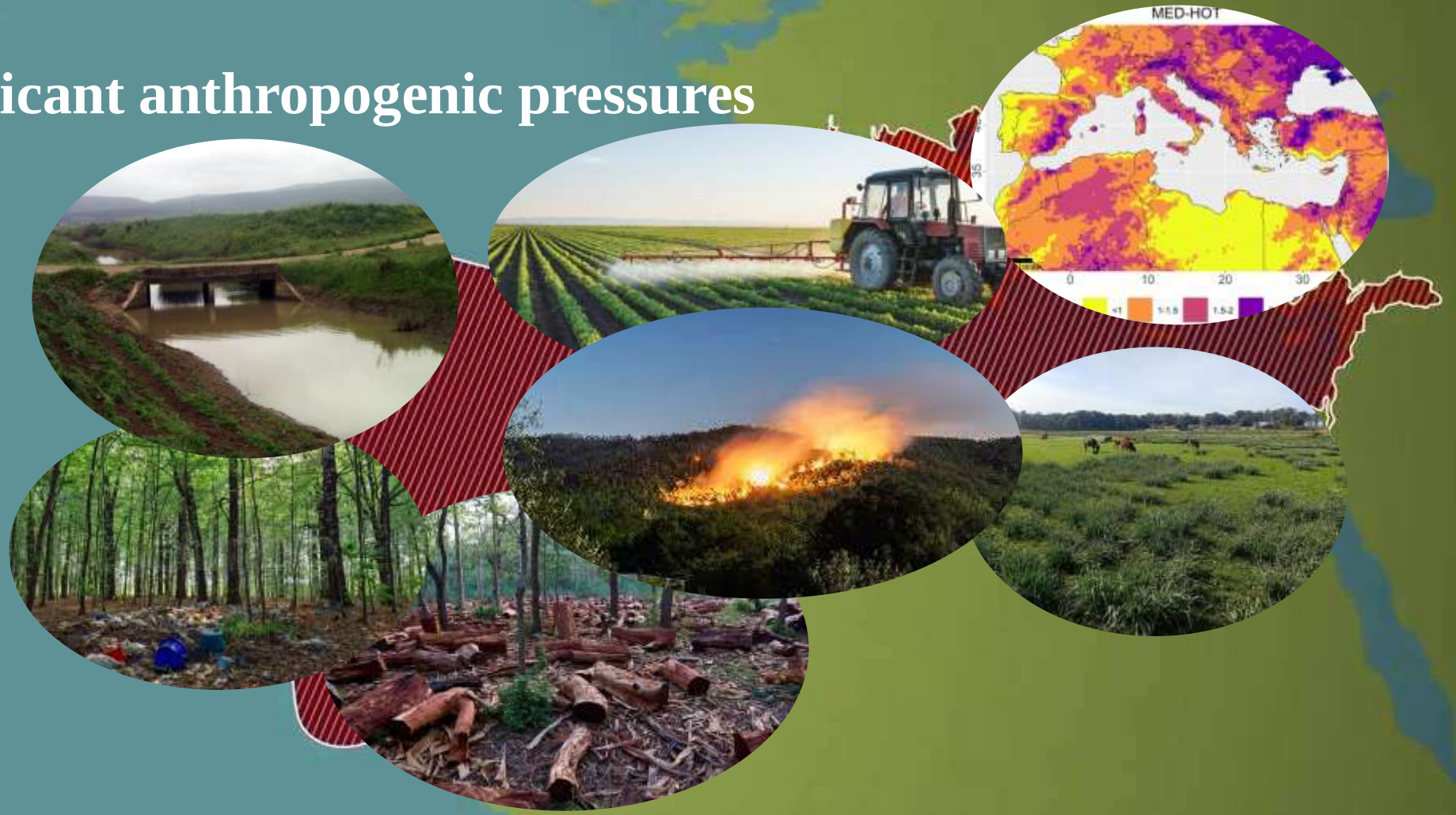
The Mediterranean: a dual identity

Biodiversity Treasure

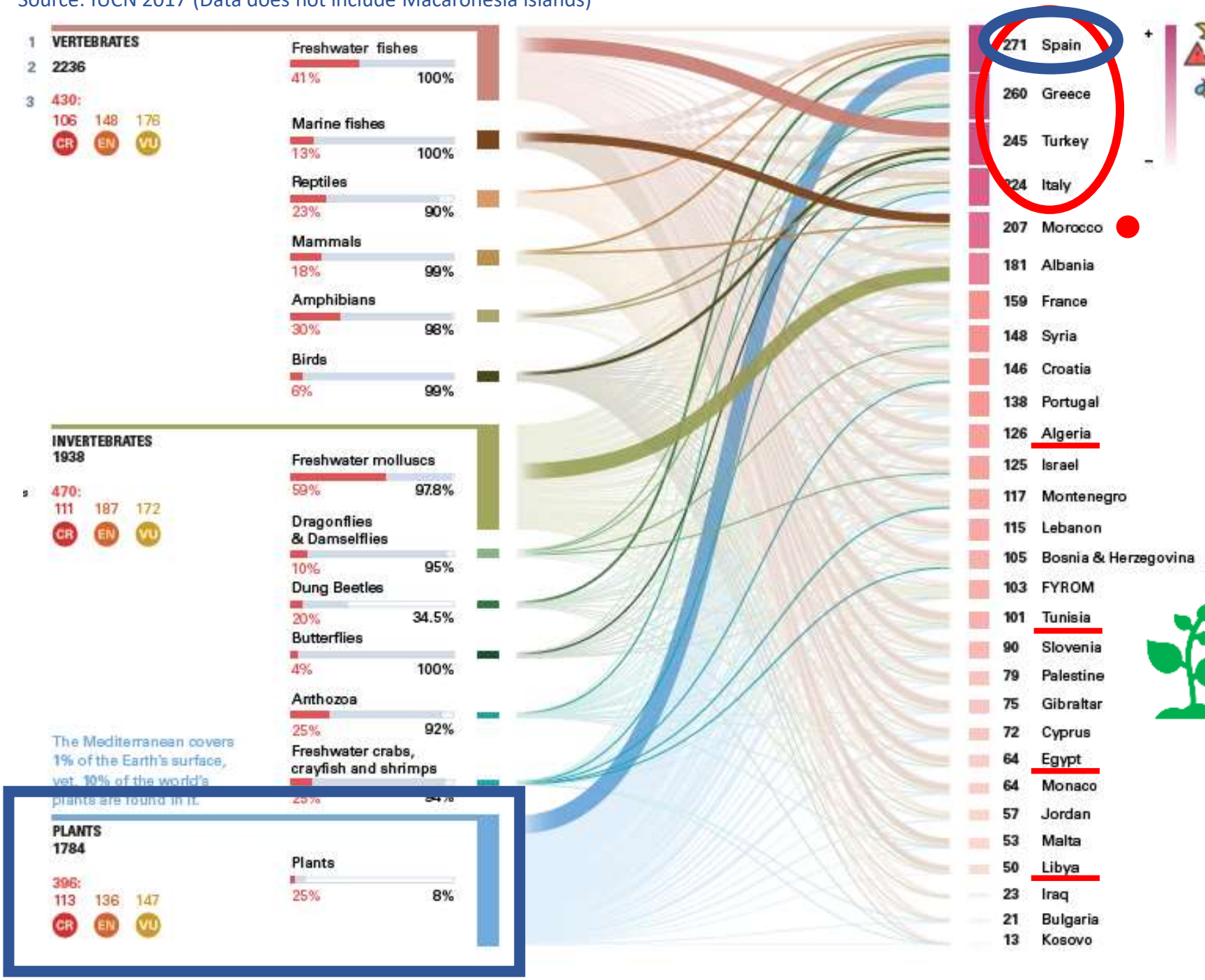
- **2nd largest Global Biodiversity hotspot**
- 30,000 vascular plant species
- 10% of the world's total
- **50% are endemic!**

The Mediterranean: a dual identity

Significant anthropogenic pressures



Source: IUCN 2017 (Data does not include Macaronesia islands)



Plant diversity loss!

IUCN RED LIST

Med 6000 assessed taxa

21% threatened with extinction

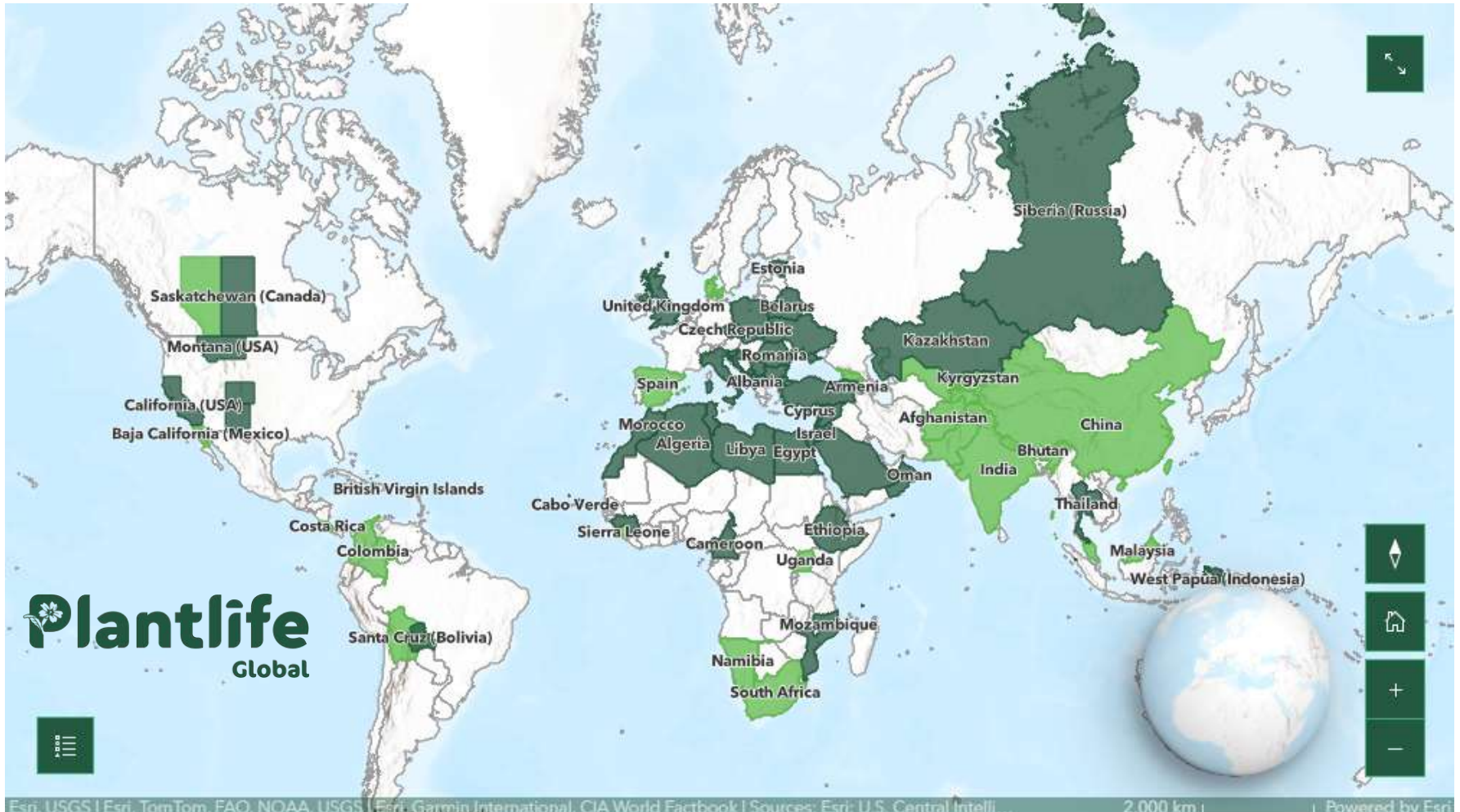
1784 assessed taxa (7% Med taxa)

396 (28%) threatened with extinction

CR **29%** EN **34%** VU **37%**

Important Plant Areas (IPAs)

The most important places in the world for wild plants and their habitats of **Global** significance for plant conservation.



Important Plant Areas (IPAs)

Plantlife Global

IPAs are identified at **various geographical levels** worldwide. Their focus can be **global**, **regional**, and/or **national**, depending on the **conservation priorities** of a specific country or region.

Criteria for IPA Selection

A

Threatened Species: conserving the most threatened plant and fungal species **globally** or **regionally** (IUCN Red List categories).

B

Exceptional Botanical Richness: regardless of threat, based on high-quality species assemblages.

C

Threatened Habitats: large, intact areas of threatened or **highly restricted** habitats, even if they are not particularly rich in species.

Important Plant Areas (IPAs)

IPAs & Global Strategy for Plant Conservation (GSPC)

IPAs are a key component of Target 5/Objective II in the 2011-2020 GSPC under the CBD

Objective II

Plant diversity is urgently and effectively conserved.

Target 5

At least **75 %** of the most important areas for plant diversity of each ecological region protected with **effective management** in place for **conserving plants** and their **genetic diversity**.

Important Plant Areas (IPAs)

Leadership by Plantlife Global & IUCN

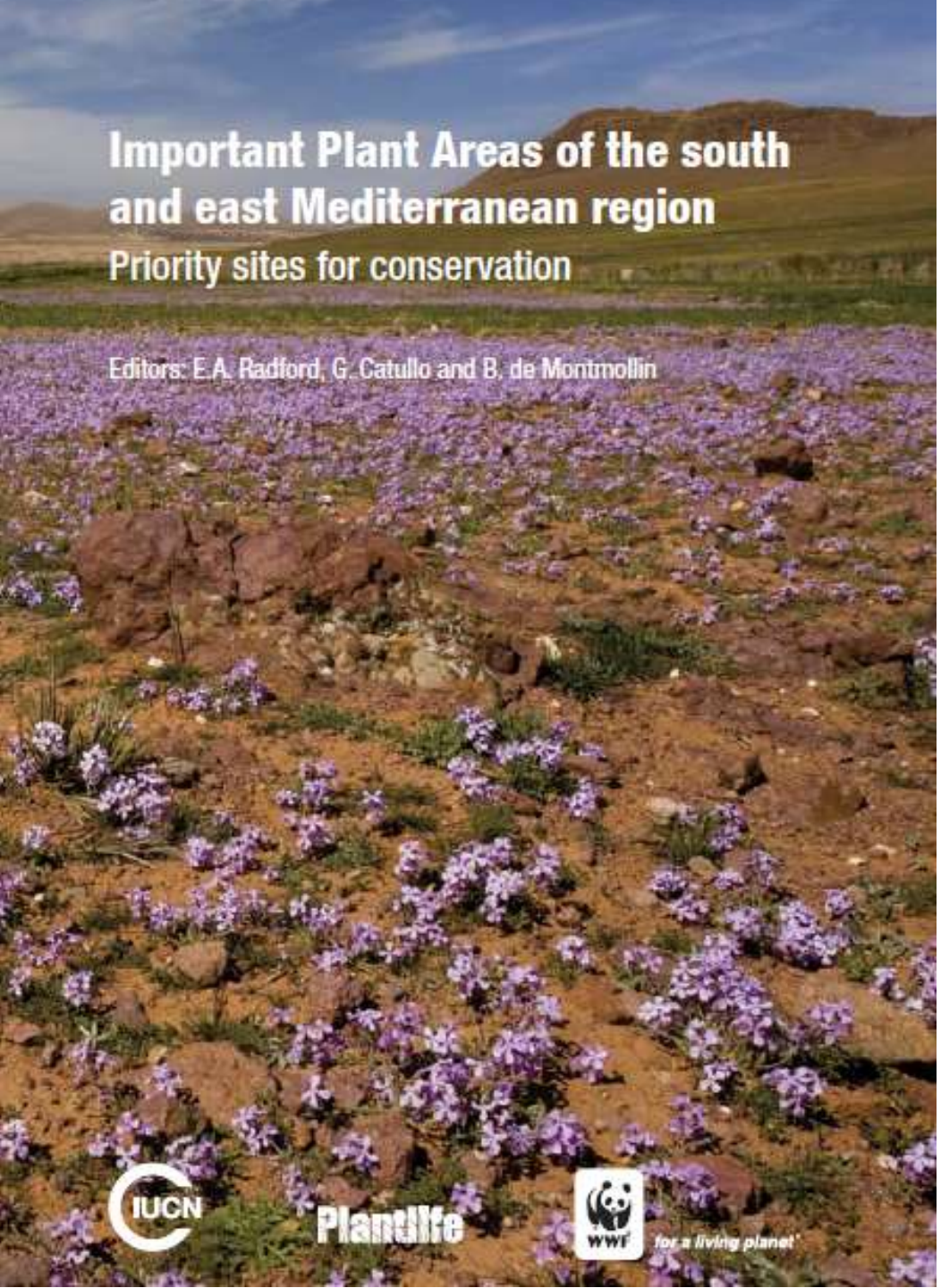
Plantlife Global

IUCN

- **Create** & **promote** the **concept of IPAs** worldwide.
- Lead the **identification of IPAs** in several regions, working with **local partners**, **including the IUCN and its experts**.
- SSC & Plant Specialist Group helped refine the approach and **integrate** it into broader **biodiversity conservation** efforts.
- Contribute expertise in **prioritization** and **assessing threatened species** (IUCN Red List).

Conservation Efforts

Awareness & Policy Advocacy



Important Plant Areas (IPAs)

The first effort to compile comprehensive national-level data on IPAs.

Aimed to integrate **IPAs** and **Mediterranean Red Lists** into the **CEPF Ecosystem Profile** for the **Mediterranean**.

Important Plant Areas (IPAs)

Country	N° of IPAs
Morocco	19
Algeria	21
Tunisia	13
Libya	5
Egypt	20
Israel	15
Palestine	4
Lebanon	20
Jordan	12

Country	N° of IPAs
Syria	33
Turkey	144
Albania	45
Macedonia FYR	42
Montenegro	21
Croatia	97
Slovenia	57
Italy	320
TOTAL	888

207 new IPAs

888 IPAs Mediterranean

82 IPAs (40%) overlap with 327 KBAs

Prioritization of IPAs for Conservation

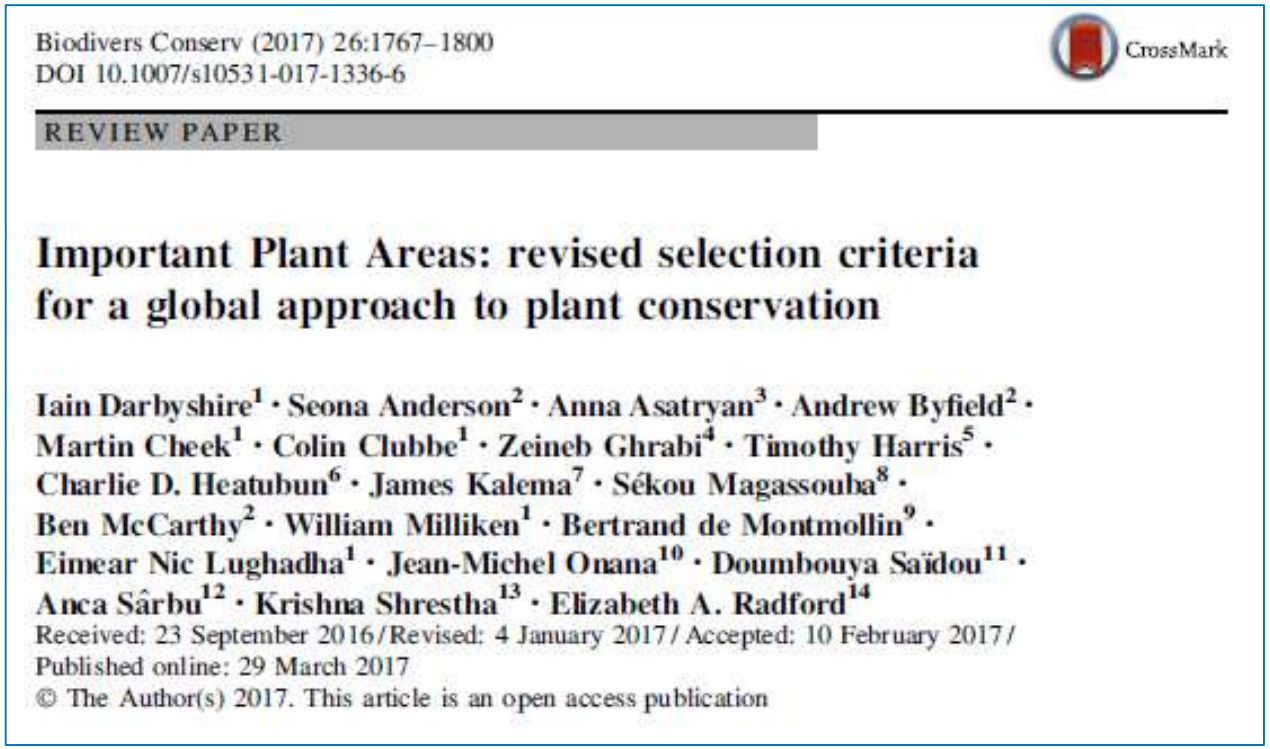
- Up to **five priority IPAs/ country**
- **9 priority IPAs** overlap with **priority** KBAs (**36**)
- **7 of them** were targeted for investment by **CEPF**

CRITICAL ECOSYSTEM PARTNERSHIP FUND

Funding conservation projects

Important Plant Areas (IPAs)

Revised IPA Selection Criteria



Biodivers Conserv (2017) 26:1767–1800
DOI 10.1007/s10531-017-1336-6

CrossMark

REVIEW PAPER

Important Plant Areas: revised selection criteria for a global approach to plant conservation

Iain Darbyshire[1] · Seona Anderson[2] · Anna Asatryan[3] · Andrew Byfield[2] · Martin Cheek[1] · Colin Clubbe[1] · Zeineb Ghrabi[4] · Timothy Harris[5] · Charlie D. Heatubun[6] · James Kalema[7] · Sékou Magassouba[8] · Ben McCarthy[2] · William Milliken[1] · Bertrand de Montmollin[9] · Eimear Nic Lughadha[1] · Jean-Michel Onana[10] · Doumbouya Saïdou[11] · Anca Sârbu[12] · Krishna Shrestha[13] · Elizabeth A. Radford[14]

Received: 23 September 2016 / Revised: 4 January 2017 / Accepted: 10 February 2017 /
Published online: 29 March 2017

Following a global consultation, the criteria were revised and published (Darbyshire *et al.*, 2017).

This revision aims to provide a more **standardized** and **globally** applicable framework for IPA identification, facilitating the conservation of critical plant diversity worldwide.

Important Plant Areas (IPAs)

Scope of the Criteria Review

1. **Criterion A: Greater emphasis on range-restricted and indicator species** to assess botanical richness.

2. **Criterion B: Recognition of socio-economically valuable plants** (e.g., medicinal, food, and culturally significant species); highlighting their role in human livelihoods and ecosystem services.

3. **Criterion C: Inclusion of both national and global threatened habitats** to account for varying levels of habitat data.

4. **Alignment of IPAs and KBA Criteria:** ensures that **both systems can work together** to **enhance globally biodiversity conservation efforts.**

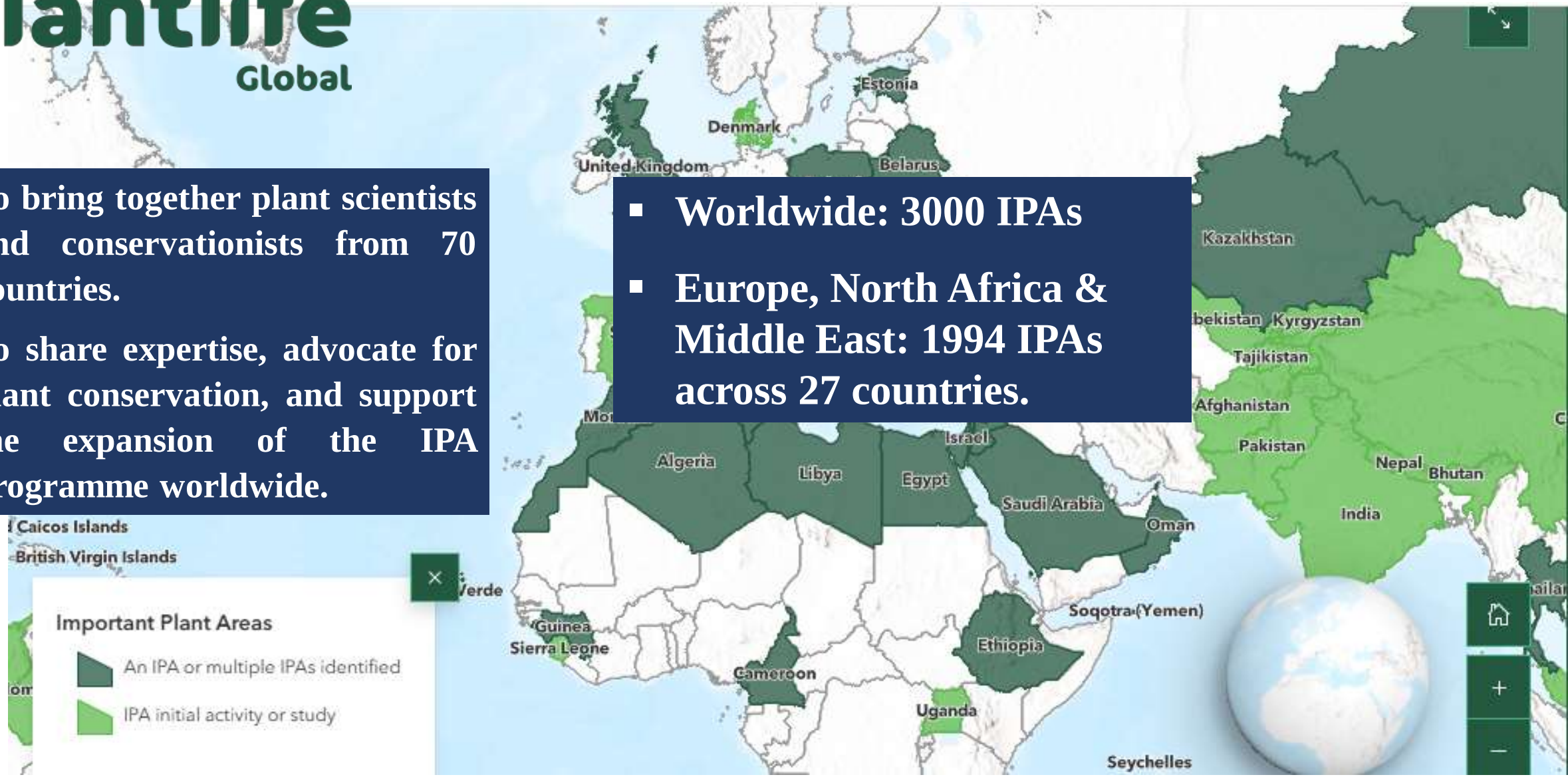
Important Plant Areas (IPAs)

Global IPA Network (GIPAN)

Plantlife Global

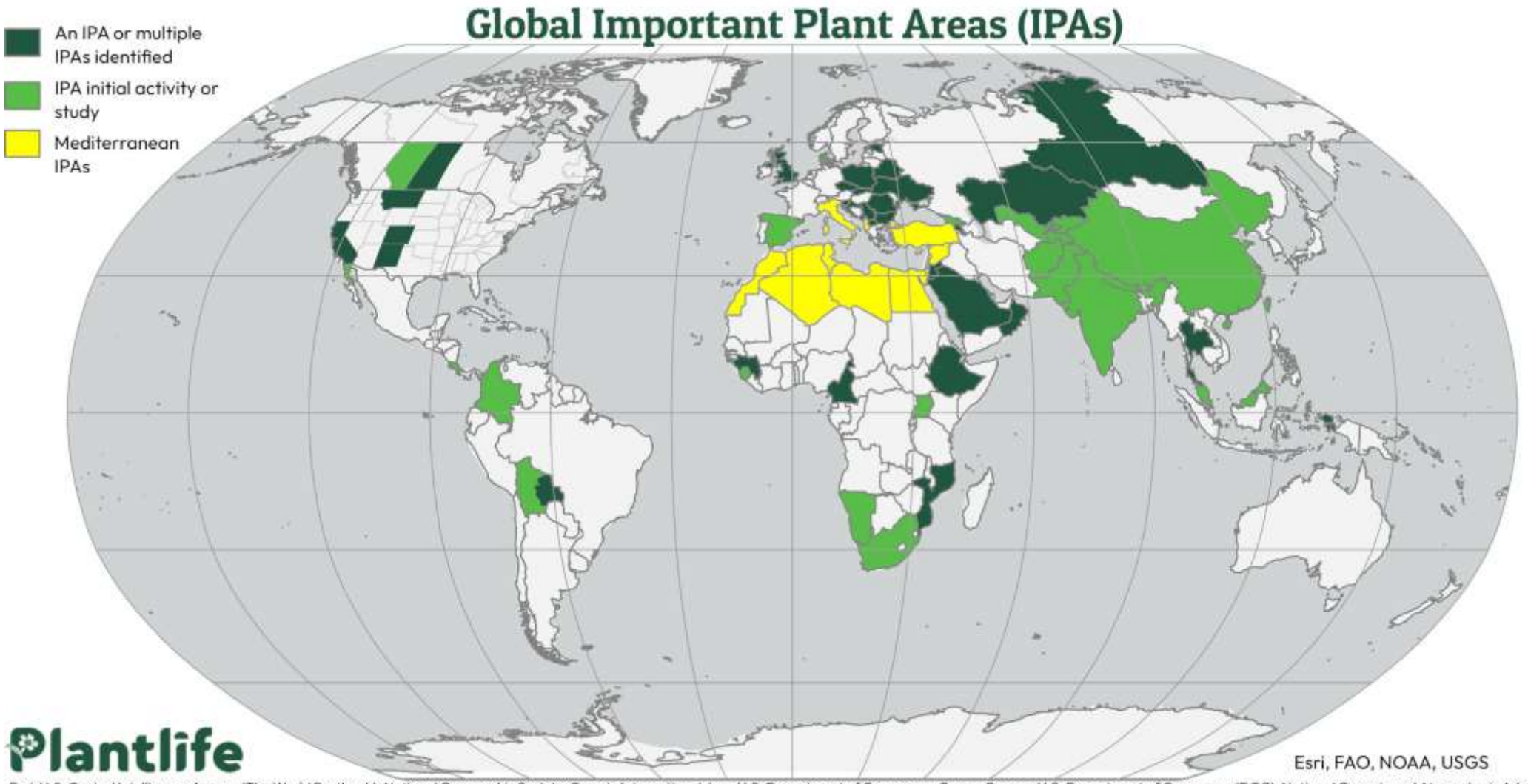
- To bring together plant scientists and conservationists from 70 countries.
- To share expertise, advocate for plant conservation, and support the expansion of the IPA programme worldwide.

- Worldwide: 3000 IPAs
- Europe, North Africa & Middle East: 1994 IPAs across 27 countries.



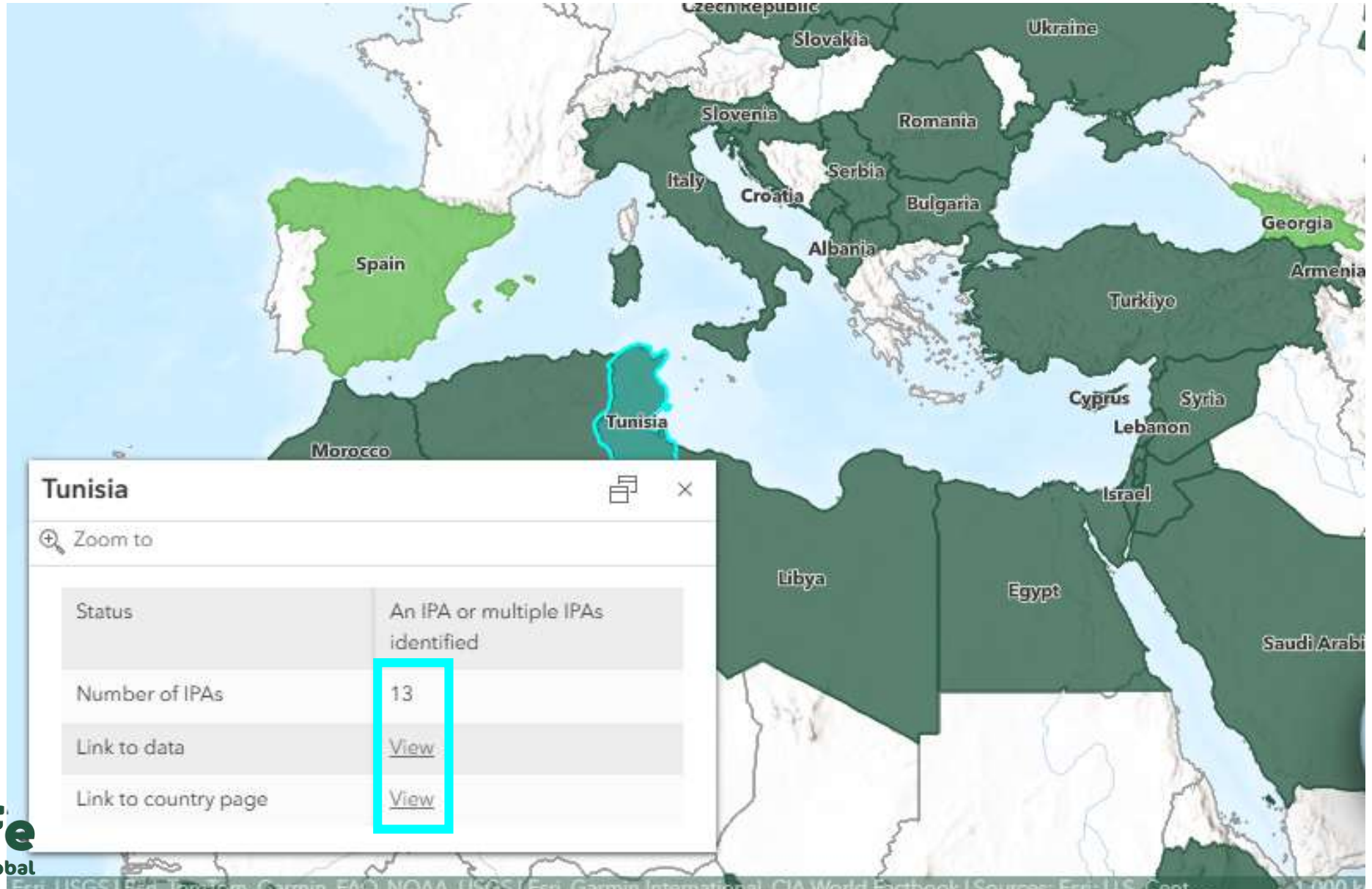
Important Plant Areas (IPAs)

Distribution of IPAs in the Mediterranean



Important Plant Areas (IPAs)

Tunisia



Important Plant Areas (IPAs)

Tunisia

Site Search

Search terms
Country/Territory = Tunisia
Ordered by Country, Site Name

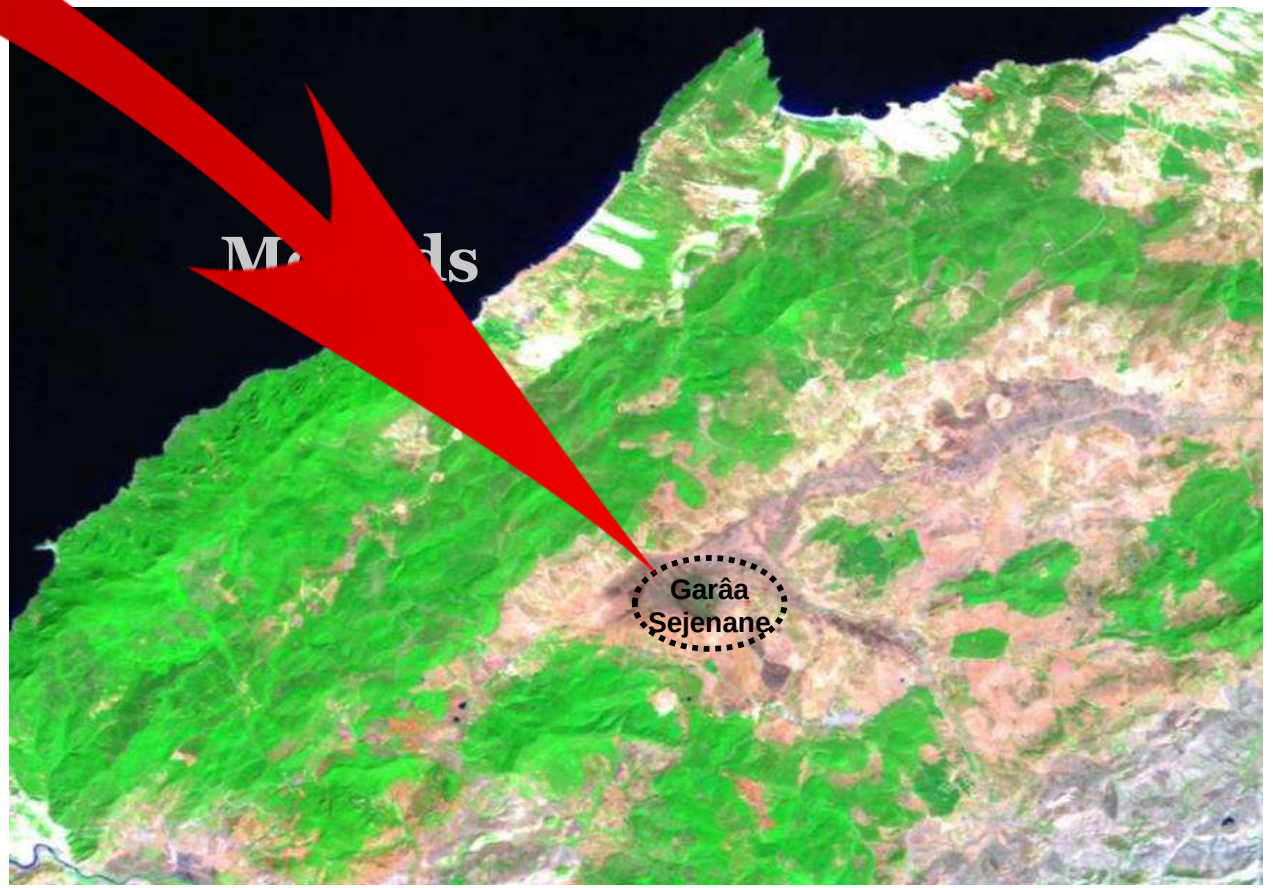
Number of sites 13

Show results on map

Country/Territory	Site name	KML
Tunisia	Ain Zana Natural Reserve	Yes
Tunisia	Dar El Orbi Peat Bog	Yes
Tunisia	El Feija Jbel Ghorra	Yes
Tunisia	Garaa Sejanane Majen Chitane Lake	Yes
Tunisia	Ichkeul	Yes
Tunisia	Jbel Zaghouan	Yes
Tunisia	Kroumirie	
Tunisia	La Galite Archipelago	Yes
Tunisia	Majen Choucha	Yes
Tunisia	Oued Ziatine 1 + 2	Yes
Tunisia	Sidi Ali El Mekki	Yes
Tunisia	Toujane	Yes
Tunisia	Zembra and Zambretta National Park	Yes

Plantlife Global

Garâa Sejenane: A Success Story for IPA/KBA

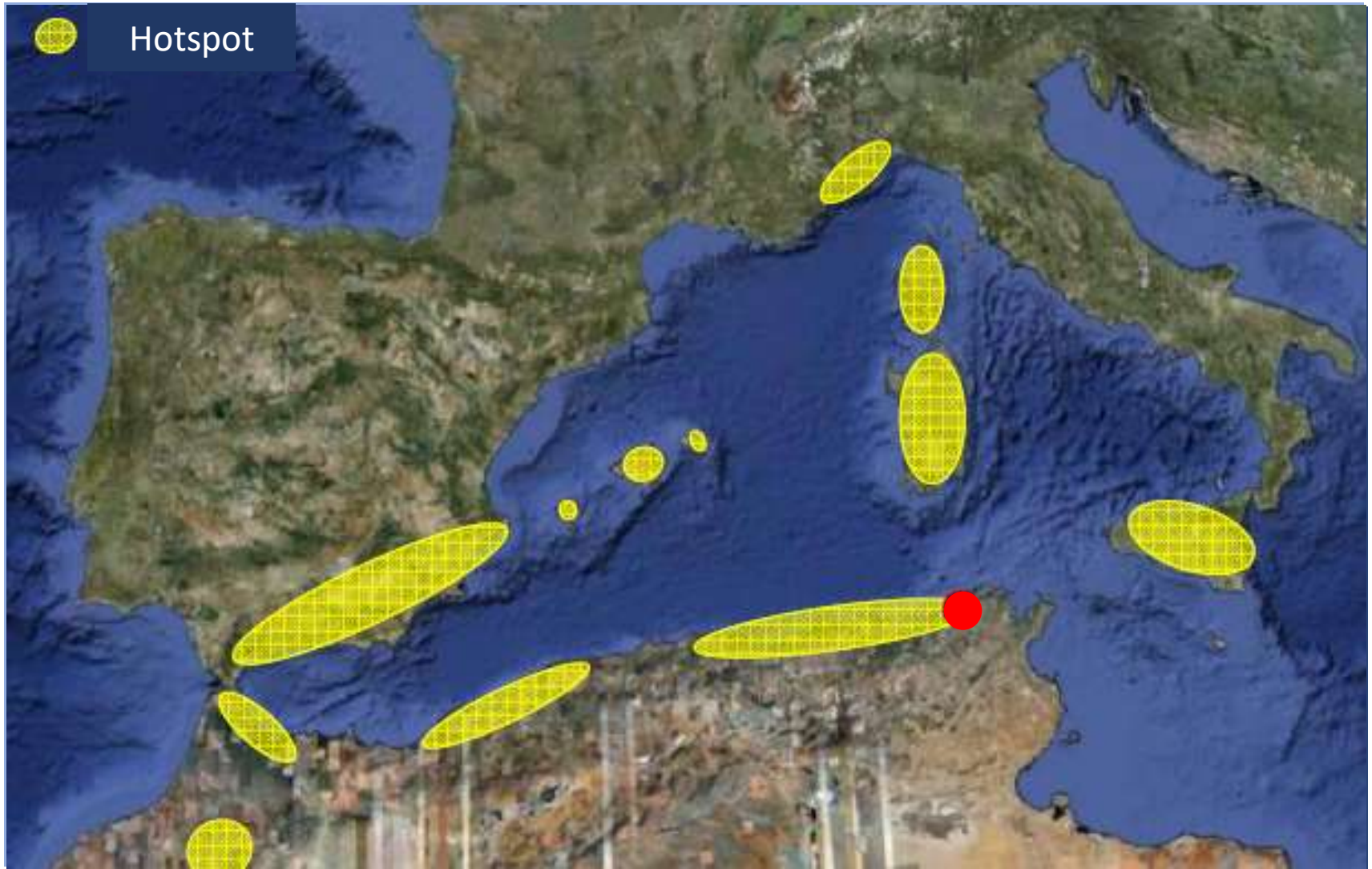


Garâa Sejenane: A Hidden Gem of Tunisia

High conservation value at multiple levels

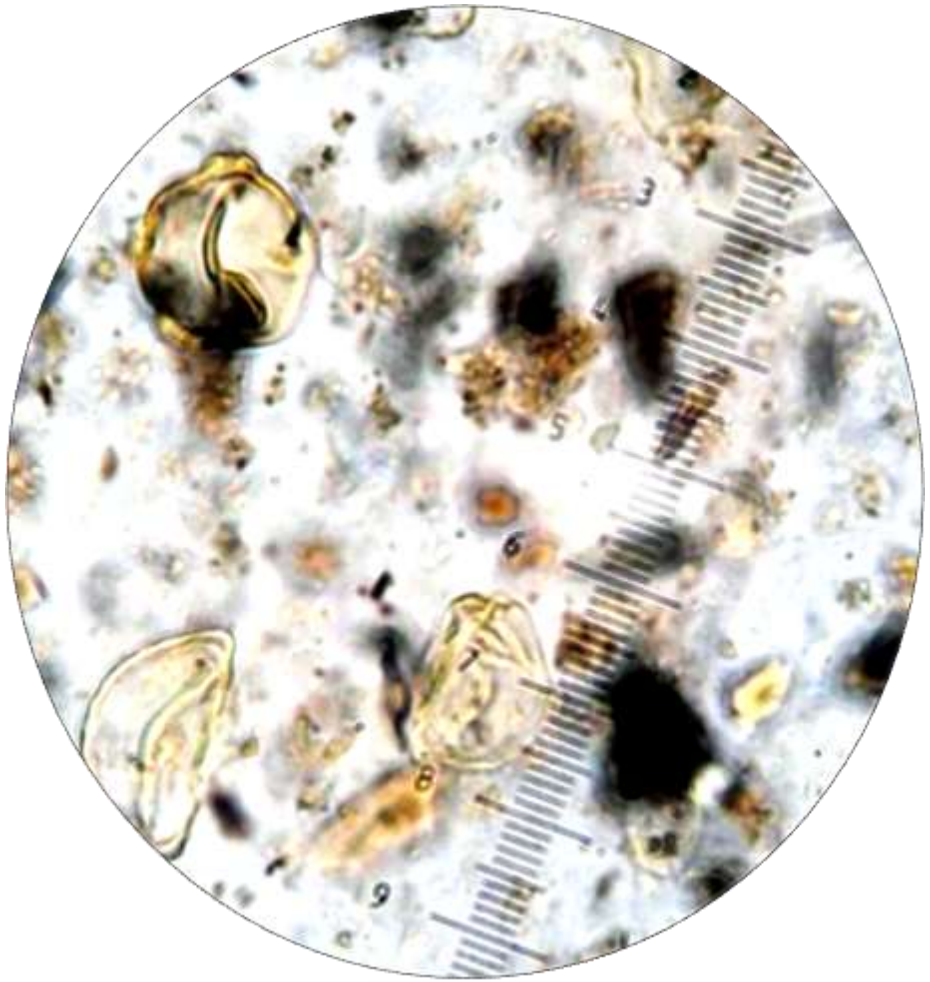
Biogeographic Importance

Easternmost part of the Kabylies-Numidia-Kroumiria hotspot



Historical Significance

A heritage ecosystem, dated to at least 20,000 years (Pleistocene)



Historical Significance

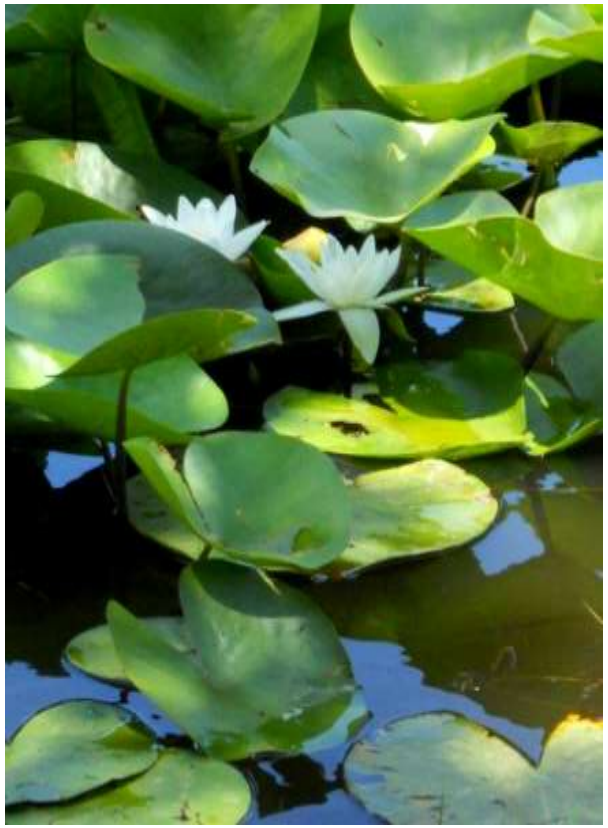
From Research to Recognition

Collaborative research: EGIDE-CMCU Projects, since **2006** (Maghreb-France partnership on **Mediterranean wetlands**).

Heritage Flora

Extinction of 10 wetland plants (4 extinct in Tunisia, 6 disappeared from Garâa Sejenane)

Myriophyllum alterniflorum



Nymphaea alba

Utricularia vulgaris

Rumex tunetanus

Steno-endemic of Garâa Sejenane /CR

Pilularia minuta

Elatine campylosperma

Very rare/ Garâa Sejenane = Largest population / CR

Crassula vaillantii

Persicaria amphibia

Nitella gracilis

Nitella capillaris

Very rare/ Garâa Sejenane = Unique population in Tunisia / CR

Lysimachia tyrrhenia

Rare/NT

Garâa Sejenane

Site of major ecological and conservation interest
IPA, KBA, and a priority conservation site

Conservation Project Implementation

SAVE PLANTS
CONSERVATION DES PLANTES PATRIMONIALES

Preserve heritage plants of two “KBA”
Garâa Sejenane (Mogods) and Dar Fatma (Kroumiria)

CRITICAL ECOSYSTEM PARTNERSHIP FUND

WWF

ASSOCIATION LA RECHERCHE EN ACTION

INAT
Institut National Agronomique de Tunisie
1898

FACULTE DES SCIENCES DE TUNIS

Fiche descriptive Ramsar

Publiée le 31 mars 2021

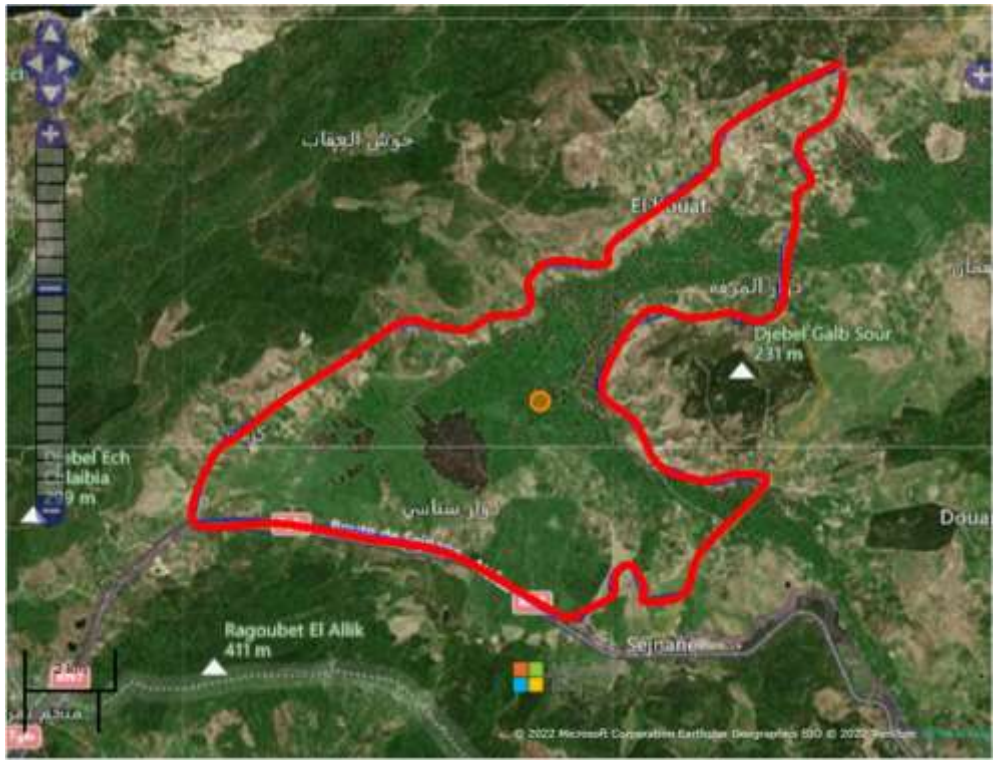
Tunisie

Garâa Sejenane

Date d'inscription	2 février 2021
Site numéro	2447
Coordonnées	37°05'51"N 09°12'48"E
Superficie	4 322,00 ha

Key Achievement

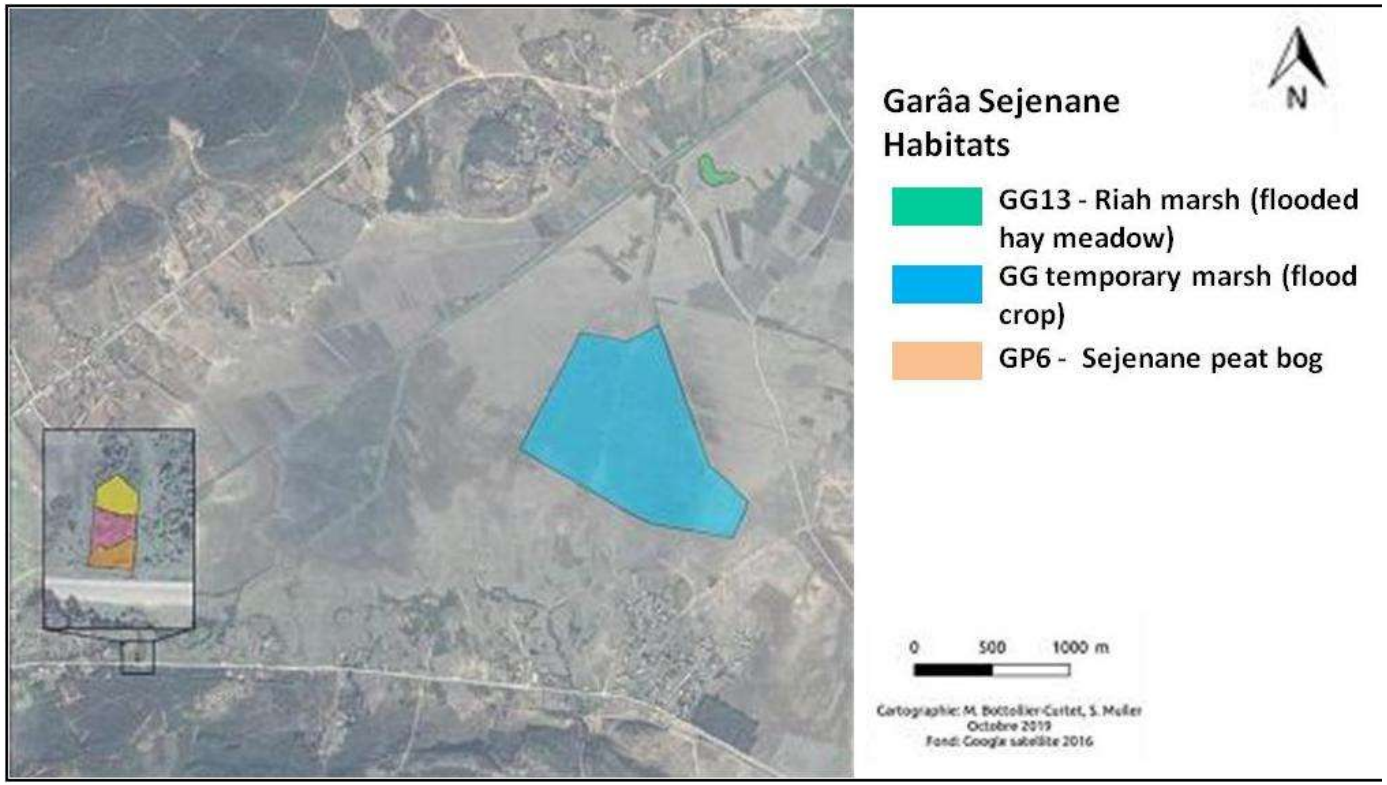
First private Ramsar site in Tunisia, achieved through extensive local **awareness** and **advocacy**.



Additional Outcomes

Establishment of a monitoring protocol for target & indicator plant species

Serge Muller (ISEM)



Distribution of the three habitats selected for scientific monitoring at Garâa Sejenane

Additional Outcomes

Establishment of a monitoring protocol for target & indicator plant species

Rumex tunetanus

Additional Outcomes

Training of young botanists

5-session "Flora Week"

Additional Outcomes

Training of young botanists

PhD training on plant conservation

Additional Outcomes

Scientific dissemination & public outreach

Écosystème

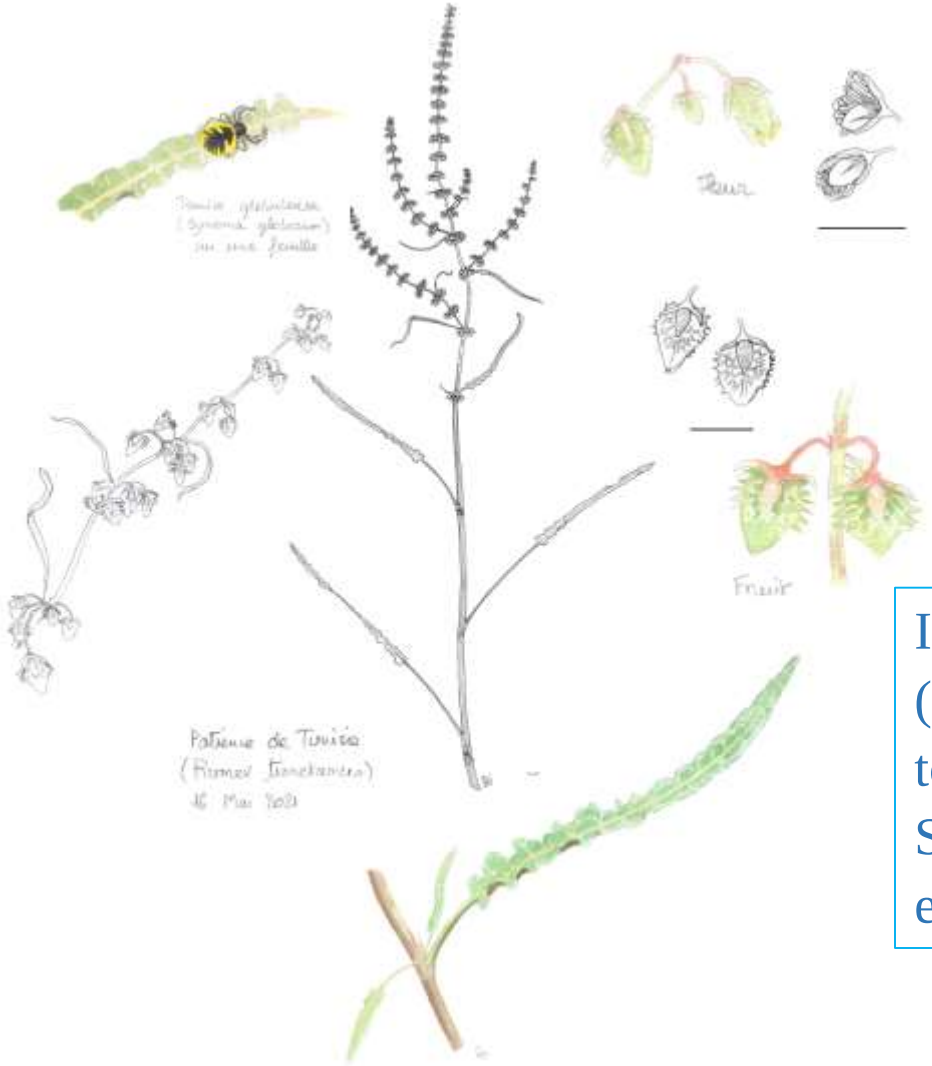
La Garâa Sejenane

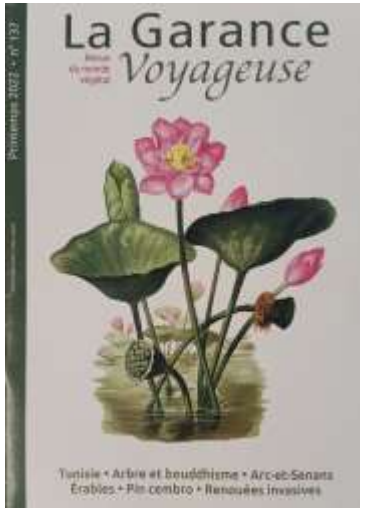
Un joyau méconnu de la Tunisie

La Garâa Sejenane aujourd'hui, vue depuis un relief situé à l'ouest de la plaine.

Texte : Serge D. MULLER, Amina DAOUD-BOUATTOUR, Zeineb GHRABI-GAMMAR & Intissen Ben HAJ JILANI
Dessins : Serge D. MULLER

Sejenane se trouve dans le Nord de la Tunisie, à peu près à mi-chemin entre Bizerte et Tabarka. C'est une petite ville rurale, à l'écart des routes touristiques. La rue principale, toujours active, est bordée par quelques commerces et cafés. Il n'y a pas d'hôtel à Sejenane et la gare est désaffectée. Il en reste le bâtiment principal et de vieux portiques rouillés sur lesquels s'est installée une colonie de cigognes blanches. La ville est entourée de collines gréseuses, couvertes de chênes-lièges (*Quercus suber*) et de maquis. En termes bioclimatiques, on se trouve ici dans l'étage thermo-méditerranéen humide à hivers doux. La région comprend des formations littorales à chêne kermès (*Quercus coccifera*), des formations de fond de vallon à oléastre (*Olea europaea* var. *sylvestris*) et lentisque (*Pistacia lentiscus*), des formations de versant à chêne-liège et lentisque, ainsi que des ripisylves à chêne zéen (*Quercus canariensis*), aulne glutineux (*Alnus glutinosa*) et frêne à feuilles étroites (*Fraxinus angustifolia*). Les populations humaines ont laissé de nombreux vestiges dans la région : niches funéraires libyco-puniques (*hacoumet*) ornées de peintures rupestres, ruines antiques et plusieurs mines de fer, aujourd'hui à l'abandon, qui trahissent les anciennes activités minières de la région. Connue sous le nom de Mogods, celle-ci constitue le piémont oriental de la Kroumirie, une chaîne de montagnes qui s'élève à plus de 1 200 m d'altitude sur la frontière algérienne.





Illustrated scientific outreach (watercolors by **Serge Muller**) to raise awareness of Garâa Sejenane and other key wetland ecosystems.

National and Global Impact

IPA work contributed to the National Red List
Pteridophytes, Gymnosperms, & Monocotyledons

Pilularia minuta Durieu

Pilulaire délicate, Pilulaire menue / Dwarf Pillwort

Source : Amina Daoud-Bouattour

Évaluateur(s)
Daoud-Bouattour A., Ghrabi-Gammar Z., Ben Haj Jilani I. & Muller S.D.

Partenaire(s)/Institution(s)
Faculté des Sciences de Tunis
Institut National Agronomique de Tunisie
ISEM, Université de Montpellier

Autorité
Ministère des Affaires Locales et de l'Environnement

Date : octobre 2021

1. TAXONOMIE

Règne	Phylum	Classe	Ordre	Famille	Genre
Plantae	Tracheophyta	Polypodiopsida	Salviniales	Marsileaceae	*Pilularia*

Synonymes
Pilularia globulifera L. subsp. *minuta* (Durieu) Bonnier & Layens

Sources taxonomiques
Board of Trustees, RBG Kew. 2021. Plants of the World Online Portal. Richmond, UK. Available at: http://www.plantsoftheworldonline.org (Accessed: 20 June 2021)

IUCN 2021. The IUCN Red List of Threatened Species. Version 2021-1. Available at: www.iucnredlist.org. (Accessed: 20 June 2021)

Pilularia minuta Durieu

Evaluation: CR: B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)

Répartition:

- Kroumirie : Majen el Ma
- Mogods : Garâa Sejenane, Guetma

Taille de la population: La population est sévèrement fragmentée en 3 sous-populations extrêmement réduites, et une grande sous-population (Garâa Sejenane), également sévèrement fragmentée dans une mosaïque de petits habitats humides temporaires résiduels isolés au sein de zones de pâturage et de champs cultivés en été. Cette population semble aujourd'hui stable.

Habitat: Marais/Mares temporaires d'eau douce (< 8ha)

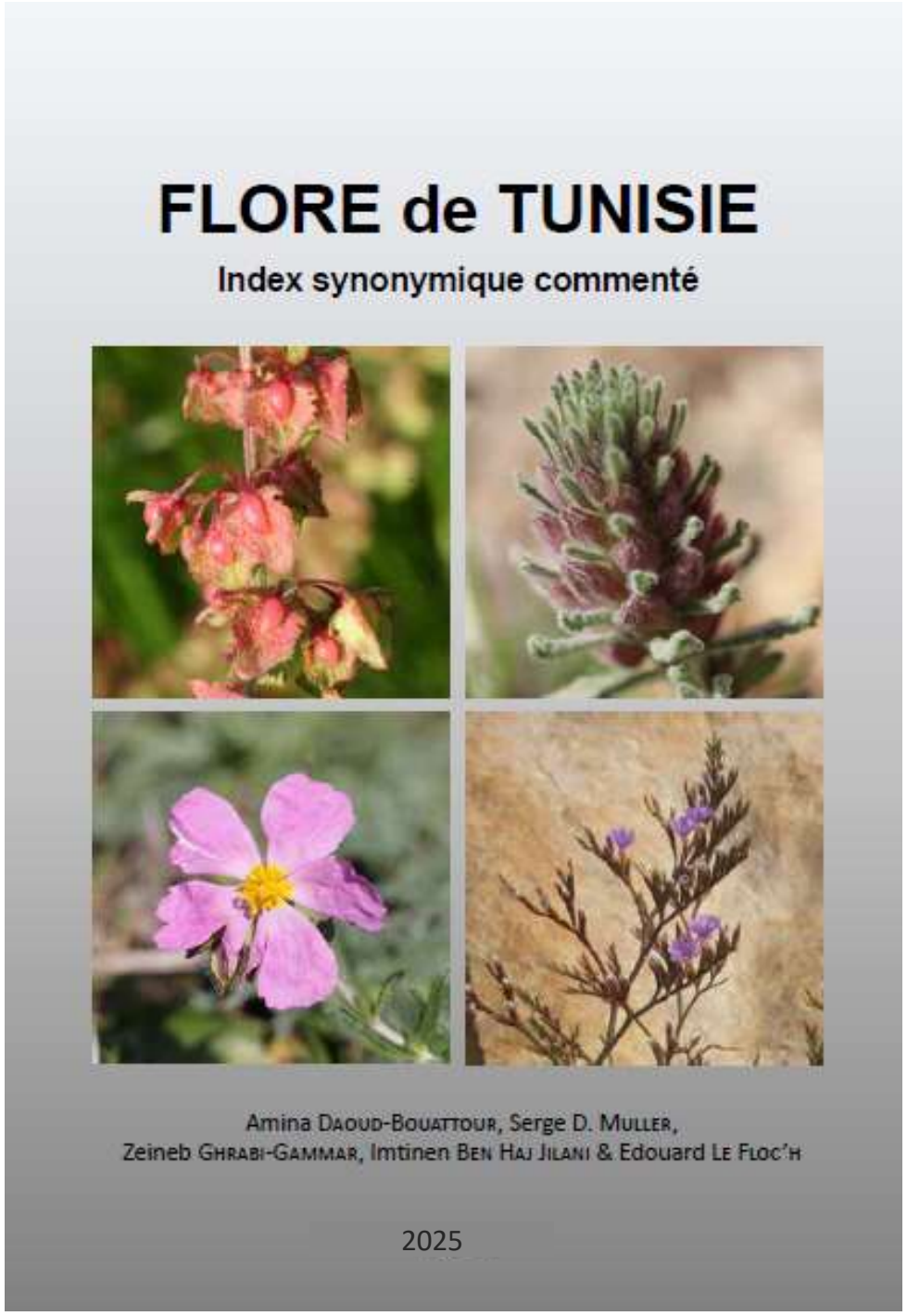
Menaces: Agriculture et aquaculture; Modifications du système naturel (Gestion de l'eau/Utilisation); Changement climatique et intempéries: Sécheresse, Températures extrêmes

Protection en place: Garâa Sejenane, récemment désignée site Ramsar (2021)

Plan d'action proposé pour la conservation et la protection du taxon

Actions proposées	D'ici 2025	D'ici 2027	D'ici 2030	Intervenants	Coût (euros)
Conservation in-situ : sensibilisation des décideurs afin de mobiliser leur soutien pour la protection de l'habitat de Garâa Sejenane, contre toute modification de l'hydrologie du site				• DGF • GDA • CRDA • Autorités locales • Structures Enseignement/Recherche • Société civile	< 10 000
Développement d'un protocole de conservation ex-situ adapté à ce taxon : cryoconservation...				• BNG • Structures Enseignement/Recherche • Experts	< 10 000
Intégrer ce taxon dans la liste des taxons protégés du code forestier				• DGF	
Mise en œuvre du protocole de conservation ex-situ adapté à ce taxon				• BNG • DGF • Structures Enseignement/Recherche	< 10 000
Conservation dans des collections ex-situ vivantes (jardins botaniques, banques de semences, collections de cultures in-vitro), et herbiers accessibles, notamment dans leur pays d'origine				• BNG • Structures Enseignement/Recherche • DGF • CRDA • Herbiers • Autorités locales	< 10 000
Mise en œuvre du protocole pour le suivi annuel du taxon dans Garâa Sejenane (protocole élaboré				• DGF • Structures Enseignement/Recherche	< 10 000

40



National and Global Impact

Updated flora database for Tunisia

Daoud-Bouattour et al., 2025

From IPAs to Protected Areas (PAs)

IPAs

- Identified based on **scientific criteria:** sites of global botanical importance.
- **Not legally designated** but inform conservation priorities and planning.

Ancient Juniper trees (*Juniperus foetidissima*)
Troodos National Park, Cyprus

Protected Areas

- "A clearly defined geographical space, recognized, dedicated, and managed, through **legal** or other **effective means**, to achieve the long-term conservation of nature with associated ecosystem services and cultural values."

Key difference

- IPAs highlight **key plant conservation** sites that may **lack formal protection**, whereas PAs have **legal status** for implementing conservation strategies.

IUCN PA Categories

1. Strict Nature Reserves (I)
2. National Parks (II)
3. Natural Monuments (III)
4. Habitat/Species Management Areas (IV)
5. Protected Landscapes/Seascapes (V)
6. Protected Areas with Sustainable Use (VI)


Shouf Biosphere Reserve, Lebanon


Ichkeul National Park, Tunisia

Regional Conservation Efforts

- **Natura 2000 (EU):** Europe's largest coordinated network of PAs
- **Barcelona Convention's Specially Protected Areas of Mediterranean Importance (SPAMI)**
- **MedPAN (Mediterranean Protected Areas Network)**

Key Priorities for Mediterranean Plant Conservation

- **IPAs as bridges** between science, policy, and community action.
- **Strengthening the IUCN Red List** to **update** conservation priorities.
- **Integrating IPAs into national and regional PA networks** to ensure effective site protection.
- **Mapping plant diversity** to identify conservation gaps.

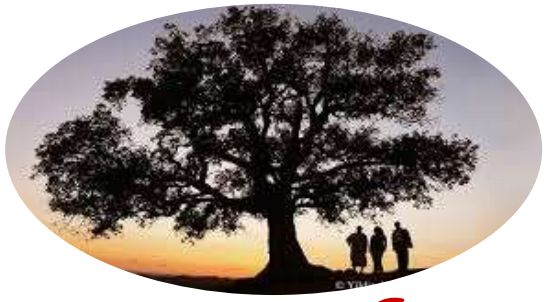
Nora - Archaeological park of Pula, Sardinia, Italy

Camargue Nature Reserve, France

- **Engaging local communities** for sustainable conservation.
- **Aligning conservation with global frameworks** (e.g., Kunming-Montreal GBF, IUCN Green List).
- **Fostering regional collaboration** to share knowledge and best practices.

From the ‘3Ps’ to the ‘4Ps’

Priorities



People

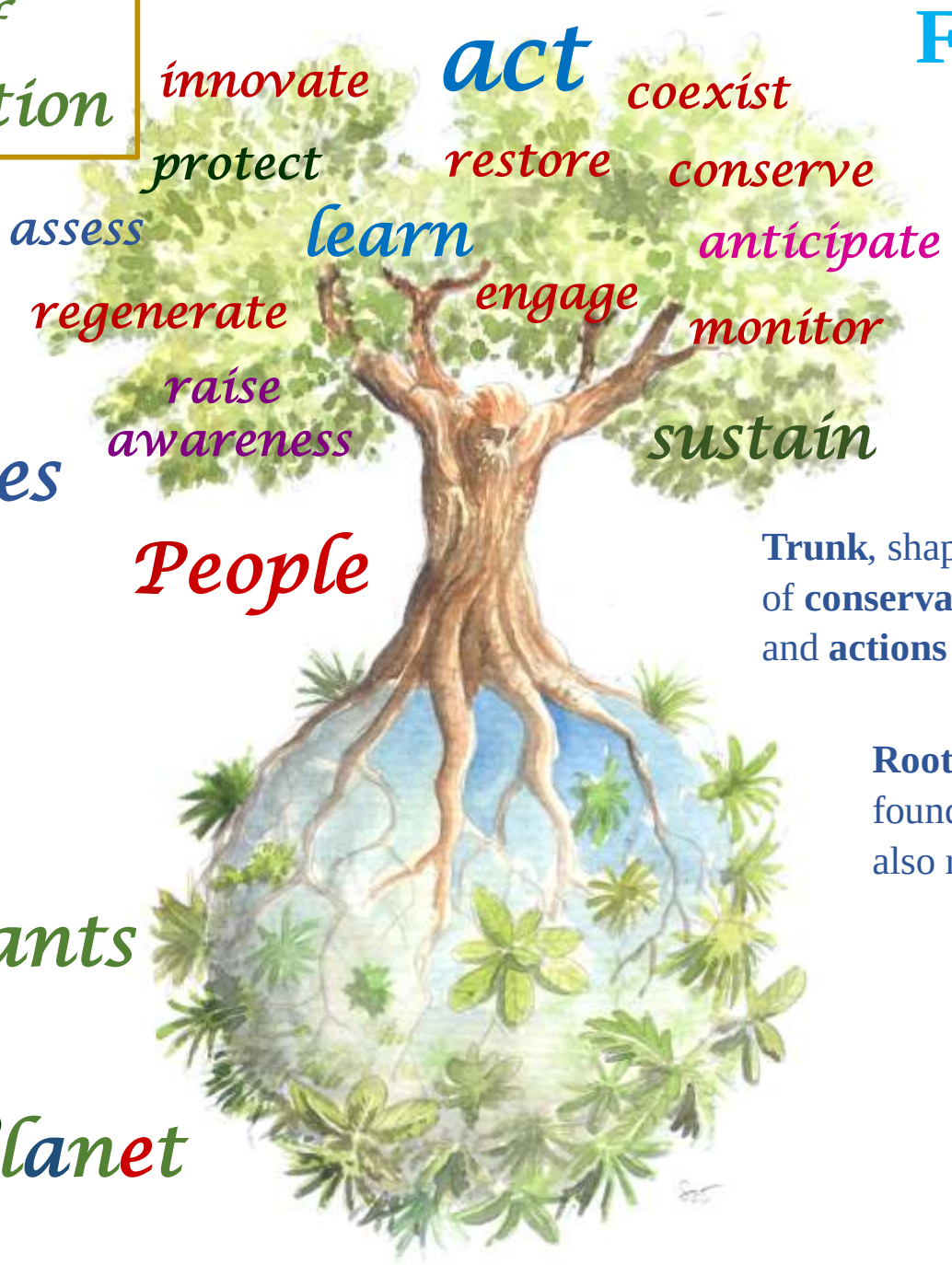
Planet

Plants

Urgency of focused conservation efforts !

From the ‘3Ps’ to the ‘4Ps’

Tree of Conservation



Branches, leaves, **flowers,** and **fruits** reaching outward, embody the **prioritization of actions**, where we must **act**, conserve, restore, raise awareness,… and engage to ensure a sustainable future!

Trunk, shaped like a human figure, embodies **People**, at the heart of **conservation efforts**. It represents the **present**, where **decisions** and **actions** determine the fate of our natural heritage.

Roots, deeply anchored in the **Earth**, represent the very foundation of life and the source of nature’s richness. They also represent our **rich past.**

The power of collaboration: Conservation is a collective effort

" Only what exists in isolation is condemnable... in the whole, everything resolves and asserts itself !" (Nietzsche)

IUCN

Plantlife Global

The global voice for wild plants and fungi

Grazie

Gracias

Ευχαριστώ πολύ

شكرا

Thank you

Merci pour votre attention

Muito obrigado

imtinenbhj@yahoo.fr