LIFE med CLIFFS

Towards an integrative management of Invasive Alien Plant Species in Mediterranean sea cliffs of European interest

LIFE20 NAT/ES/001223

Online summary of the updated volunteer's monitoring records

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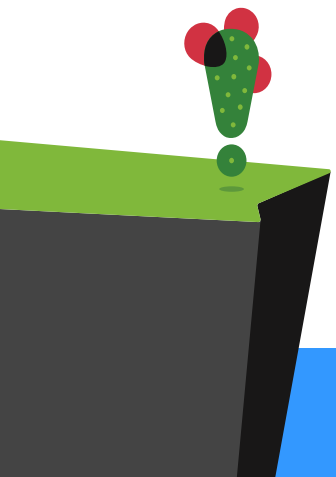

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Executive summary

The updated information recorded by the volunteers is available through the project's website, including maps of each species, images done by volunteers and a summary of all data. The present deliverable explains how all this information appear in the website.

Disclaimer

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1. LIFE medCLIFFS Volunteer network

The aim of the volunteers' network of LIFE medCLIFFS (https://www.inaturalist.org/projects/life-medcliffs-xarxa-de-voluntaris) is to detect and monitor the populations of 33 invasive or potentially invasive plant species that have been previously selected due their high risk of negative impact on the native habitats and species. It needs a high degree of commitment from the participants, since they must conduct the follow-up of their adopted transects (usually more than one, approximately one km long per transect) in the Costa Brava. Using the iNaturalist app, they record data such as the reproductive status of the observed individuals, the area occupied and the number of individuals observed.

Since April 2022, 81 volunteers have been recruited to monitor 78 transects, although the enrolment of volunteers is still ongoing. Volunteers are specifically trained for species recognition and data collection by specific courses, supporting materials such as dichotomous keys, complete descriptive cards of the 33 species and a protocol for monitoring, as well as planned mid-day trips to teach how to monitor in situ (see deliverable 8 for the early detection pack for volunteers).

Data recorded by the volunteers is revised and validated by the staff of the Botanical Institute of Barcelona (IBB), who check the correct identity of the plant and the consistency of the data with the images taken. The final objective of the data collection is the elaboration of invasion risk maps, which will be further used by land managers to prevent the establishment or advance of the most dangerous invasive species.

2. Data available online

At the link https://lifemedcliffs.org/en/context/invasive-flora/ is shown a list of the 33 species to be monitored. By clicking in each picture, a dedicated page for each species is available with the information of the species compiled during the preparatory action A1 (see deliverable 11 for the information already available online) and nowadays including also the data recorded by the volunteers. Only iNaturalist records that have been validated by IBB staff are shown.

2.1. Occurrences maps

Maps available online (Figure 1) show all occurrences recorded in the observers network project of iNaturalist (https://www.inaturalist.org/projects/life-medcliffs-xarxa-d-observadors). This project include the occurrences recorded by the volunteers and also all that are available in iNaturalist portal for the selected alien species.

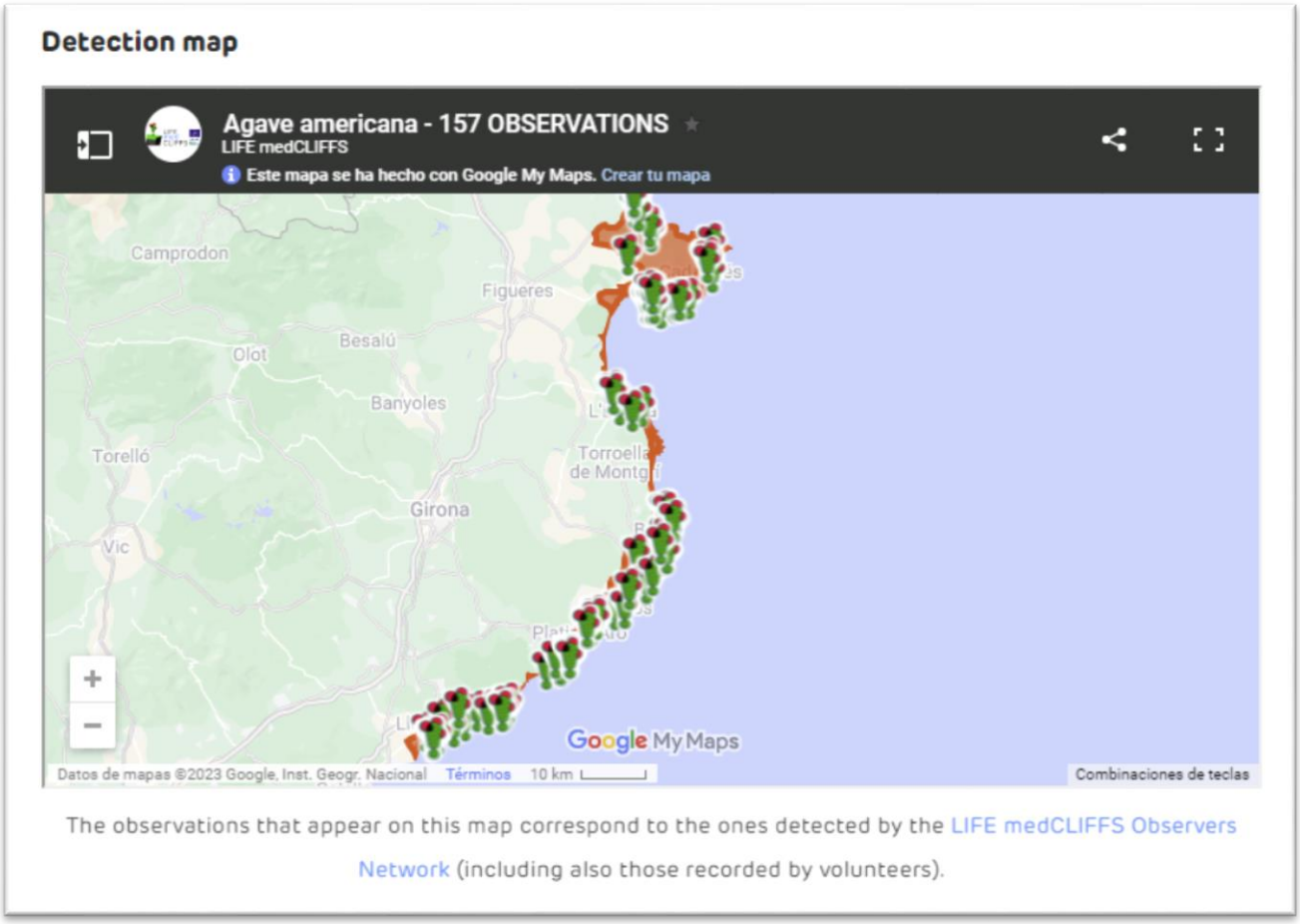

Figure 1. Map of occurrences registered by volunteers and observers for *Agave americana*.

2.2. Pictures of the plants

A selection of six pictures made by volunteers is available (Figure 2). In the link below is possible to review all occurrences of the species in the iNaturalist project of the volunteer network (e.g.

https://www.inaturalist.org/observations?captive=any&place_id=any&project_id=135257&subview=table&taxon_id=64103&verifiable=any for *Agave americana* records).

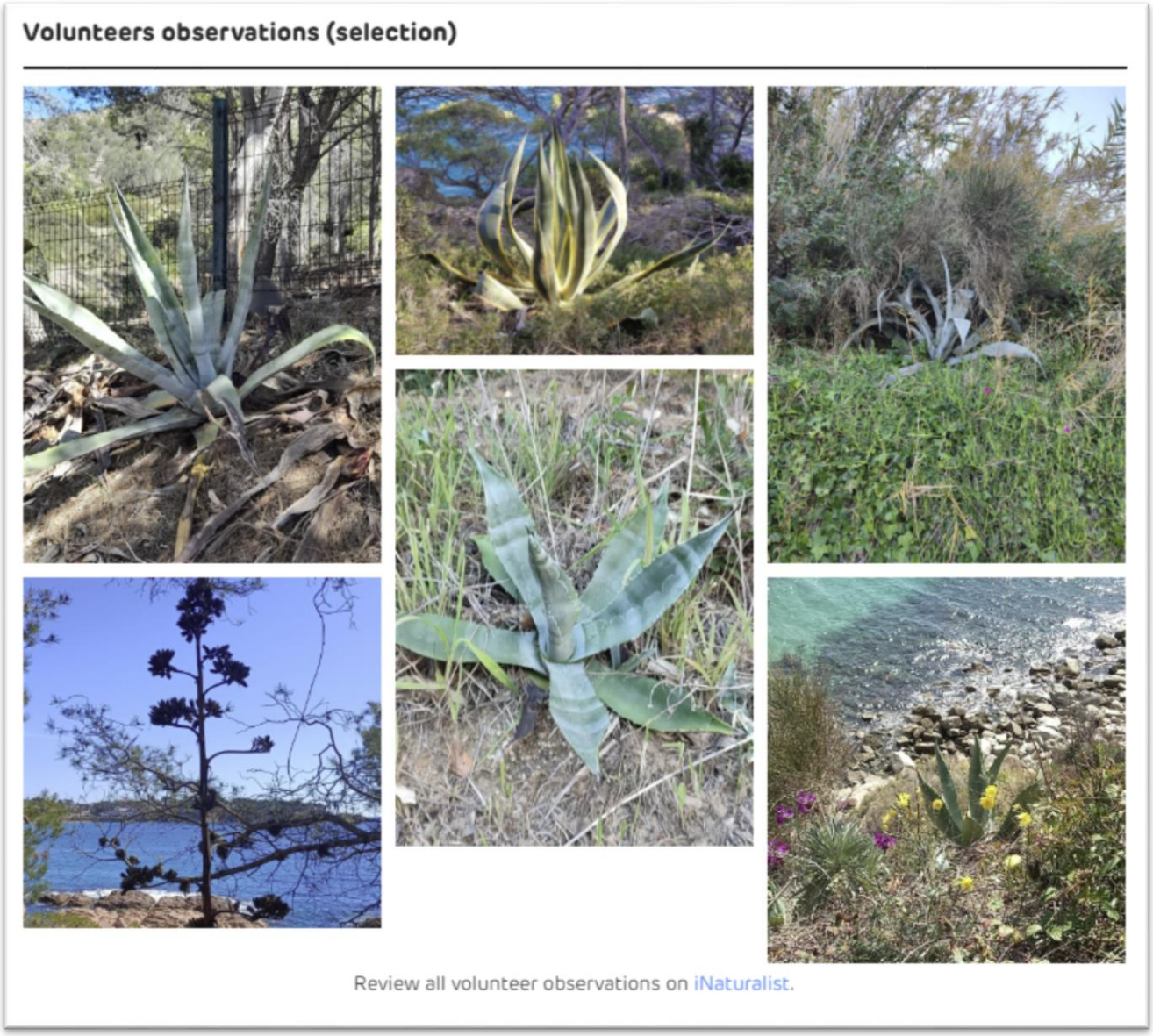

Figure 2. Selected volunteer's pictures for *Agave americana*.

2.3. Population data of alien species

A summary of all data recorded by the volunteer network for each species is presented in an online table (Figure 3).

Monitored ecological data	
Reported observations:	59
Transects with observations:	23
Total area with individuals:	202 m^2
Observed individuals:	72
Percentage of observations with juvenile individuals:	59%
Percentage of observations with adult individuals:	43%
Percentage of observations with senescent individuals:	39%

These results have been obtained from the data reported by the members of the LIFE medCLIFFS Volunteer Network during the monitoring of the transects and have been validated by the Botanical Institute of Barcelona.

Figure 3. Summary table for *Agave americana* with data recorded by volunteers.

The information presented include the following data:

- **Reported observations**: number of occurrences included by volunteers in iNaturalist that are already validated by IBB staff.
- **Transects with observations**: number of transects where the species has been detected (out of the 106 designed transects).
- **Total area with individuals**: sum of the area recorded by each observation.

- **Observed individuals**: number of all individuals counted by volunteers for all transects.
- **Percentage of observations with juvenile individuals**: percentage of the populations that are able to grow, calculated from the reported observations where plantlets or young individuals have been detected.
- **Percentage of observations with adult individuals**: percentage of the populations that are well stablished, calculated from the reported observations where adult individuals have been detected.
- **Percentage of observations with senescent individuals**: percentage of the populations that are old, calculated from the reported observations where senescent individuals have been detected.

It should be noted that one population (i. e. one observation) can be considered as able to grow, well stablished and old if it has juvenile, adults and senescent individuals at the same time. Monitoring all these data for the next three years would permit to understand the populations dynamics of each species in the Costa Brava area.

Annex I. Information available online for all species

Table 1. Information available online for the 33 alien species from data recorded by volunteers.

Species	Obs.	Transects with obs.	Total area (m^2)	Ind.	% obs. with juveniles	% obs. with adults	% obs. with senescents
Acacia dealbata [1]	3	3	11	14	33	33	33
Agave americana [1]	59	23	202	72	59	43	39
Ailanthus altissima [1]	10	7	91	188	90	100	50
Araujia sericifera [1]	0	0	-	-	-	-	-
Arundo donax [1]	46	23	622	1932	74	100	54
Carpobrotus acinaciformis [1]	47	21	506	155	57	100	62
Carpobrotus edulis [1]	95	33	1444	269	58	100	53
Cenchrus longisetus [1]	6	3	102	-	83	100	100
Cenchrus setaceus [1]	0	0	-	-	-	-	-
Chenopodium nutans subsp. *nutans* [2]	73	16	360	50	64	100	22
Cylindropuntia pallida [1]	0	0	-	-	-	-	-
Delairea odorata [2]	2	2	30	-	50	100	0
Dimorphotheca ecklonis [3]	22	13	81	78	23	100	95
Disphyma crassifolium [3]	1	1	<10	-	0	100	0
Drosanthemum floribundum [3]	24	9	188	101	25	100	33
Fallopia baldschuanica [1]	0	0	-	-	-	-	-
Gazania rigens [2]	21	8	69	64	48	100	10
Ipomoea indica [1]	0	0	-	-	-	-	-
Kalanchoe × houghtonii [2]	24	11	216	623	71	100	58
Kalanchoe tubiflora [3]	7	2	48	69	100	100	43
Lonicera japonica [2]	24	10	397	33	58	100	21
Matthiola incana [3]	52	13	412	267	58	100	27
Mesembryanthemum cordifolium [3]	59	18	365	25	49	100	10
Opuntia aurantiaca [2]	0	0	-	-	-	-	-
Opuntia ficus-indica [1]	147	36	1202	387	54	100	60
Opuntia lindheimeri var. *linguiformis* [3]	8	3	39	61	75	100	50
Opuntia stricta [1]	71	8	887	419	55	100	14
Oxalis pes-caprae [1]	5	4	36	-	80	100	0
Phyllostachys aurea [3]	1	1	40	-	100	100	0
Pittosporum tobira [3]	171	29	1064	329	39	100	10
Senecio angulatus [2]	51	18	1065	407	86	100	41
Senecio inaequidens [1]	0	0	-	-	-	-	-
Senecio pterophorus [2]	1	1	<1	1	0	100	0

[1] Catalogued species of invasive exotic flora (RD 630/2013)
[2] Species of invasive exotic flora in Catalonia (expert criteria) and not catalogued in the regulations
[3] Observed in the Costa Brava as naturalized and that may have invasive potential (own observations and other bibliographic sources)