Report on the outcomes of a Virtual Mobility[1]

Action number: CA18201

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Virtual Mobility Details

Title: Review of past and current citizen-science projects focusing on plant conservation in Europe

Start and end date: 15/03/2024 to 10/04/2024

Description of the work carried out during the VM

In this project, I undertook a comprehensive review of past and current citizen science (CS) projects focusing on endangered plant species. The primary objective was to discern the methodologies employed by these initiatives and evaluate their efficacy. To start this research, I designed an online questionnaire (through Google Forms) tailored for distribution among designated participants within the CA18201 network. Despite encountering challenges, such as minimal useful responses, I received a valuable insight from one respondent (project LIFE for Minuartia). I gathered 8 responses from the questionnaire, and it became apparent that the majority focused on either CS projects related to invasive plants or about gathering plant image-based data for applications. Additionally, I conducted internet searches to find other citizen science projects pertaining to endangered plant species. I mostly just used the Google and Google Scholar search engine and manually scanned through the search results. Digital platforms such as SciStarter and ECSA also proved to be very useful to my research as they both provided a few beneficial past projects. This proactive approach slightly expanded the pool of relevant projects for analysis, enhancing the range of the research findings. However, given the relatively niche nature of this research topic, the number of significant discoveries was limited; in fact, I found 4 projects that were appropriate for my research. These projects were:

- Citizen Science Contributions to Address Biodiversity Loss and Conservation Planning in a Rapidly Developing Region
- Camas citizen science monitoring program
- Plants of concern
- Wisconsin Rare Plant Monitoring Program

I also developed a table listing the project titles obtained through independent research and questionnaire responses (appendix). This table provides insight into the projects' primary

[1] This report is submitted by the grantee to the Action MC for approval and for claiming payment of the awarded grant. The Grant Awarding Coordinator coordinates the evaluation of this report on behalf of the Action MC and instructs the GH for payment of the Grant.

focuses, the CS techniques utilized, and the countries involved in each project's implementation.

Description of the VM main achievements and planned follow-up activities

While reviewing numerous articles on CS methods, I found that most of them were not particularly useful. This is because CS methods are currently primarily used for studying invasive plant species or for gathering image-based plant data to expand databases used in plant recognition applications, rather than focusing on endangered species.

A few projects that I found useful were all based in the United States of America. One of the particular ones was the Camas CS monitoring program where the researchers employed high school volunteers as citizen scientists to help with the long-term monitoring of the Camas lilies. The volunteers were trained in classrooms to recognize the morphological traits of the camas lilies. While doing field work, they logged their observations on paper forms and on handheld devices, which were later given to scientists working on the project to review the results. Camas lilies are of great cultural and ecological meaning to the Naz Perce National Historical Park, however because of the result of intense agricultural practices, flood control and effects of climate change the wet prairies of the region, on which camas lilies grow have been significantly reduced. These effects are the cause of great concern for the regions lilies and are the reason for the need to monitor them and other plant species in the park with the help of high school students that volunteer as citizen scientists each year.

Another useful project I found was the Plants of concern project, where scientists monitor rare and endangered plants in the state of Illinois. The main objective of the project is to employ citizens as citizen scientists to monitor and gather information on populations of different rare plant species to aid to the wellbeing of biodiversity of landscapes. The participants firstly go through an online training program to give them the knowledge to recognize rare plant species. After passing the program they collect data on plant populations as well as their habitats through the use of a mobile application (iNaturalist) and different websites to help with the identification of the plant species. This project was started in the year 2000 and has been growing ever since, contributing greatly to the rare and endangered plants study.

Despite the increasing use of CS approaches, the results of my research show the underutilised potential of CS in helping the conservation of endangered plants. Moreover, most of the CS initiatives focus on searching for new localities or monitoring of populations, while there is not much innovation in the approaches. This research will represent the initial dataset that will be elaborated into my final graduation thesis.

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Appendix

Table 1: Table listing the project titles obtained through independent research and questionnaire responses

Title of project	Project focus was on which species	What method of citizen science was used?	Countries included in the project
Life for Minuartia	*Minuartia smejkalii*	raising awareness and providing planting instructions for the species	Czech Republic
Flora capture: a citizen science application for collecting structured plant observations	Many plant species	Mobile application	Worldwide
Wikiplantbase #Italia	Many plant species	Website	Italia
Invasoras	Invasive species	Mobile application	Portugal
Dabas dati	Many plant species	Website	Worldwide
Plant alert	Invasive species	Website	United kingdom and Ireland
Regalnica	*Hyla arborea*	Filling out a form on paper	Slovenia
Sidewalk plants	Multiple plant species	Mobile application and Website	The Netherlands
Iščemo pomladanske jegliče	*Primula veris*	Website	Multiple European countries
Wisconsin Rare Plant Monitoring Program	Rare species	Mobile application and Website	Wisconsin (USA)
Plants of concern	Rare species	Mobile application and Website	Illinois (USA)
Camas citizen science monitoring program	Camas lily	Filling out a form on paper and handheld devices	Washington (USA)
Citizen Science Contributions to Address Biodiversity Loss and Conservation Planning in a Rapidly Developing Region	Multiple plant species	Mobile application and Website	Washington, Arkansas (USA)