AN ANALYSIS OF THE MONTANA CITIZEN BOTANY PILOT STUDY 2022 – 2024

PRESENTED TO

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BOTANY PROGRAM
MONTANA NATURAL HERITAGE PROGRAM

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Cover Photo: Revisiting an occurrence of Geyer's Biscuitroot (*Lomatium geyeri*) to find the plant and test the Survey123 data collection tool. 2022 MNPS Annual Meeting near Libby, Montana. Photo Credit: Andrea Pipp

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AN ANALYSIS OF THE MONTANA CITIZEN BOTANY PILOT STUDY - 2022 TO 2024

INTRODUCTION

To assist in native plant conservation efforts the Montana Natural Heritage Program (MTNHP) and the Montana Native Plant Society (MNPS or Society) jointly developed *A Proposed Framework for Developing a Montana Citizen Botany Program* in 2022[1,2]. As envisioned this program would build partnerships and engage citizen scientists to assist land management agencies and other interested landowners to carry out native plant-focused projects. Developing a statewide program requires on the behalf of organizations, big investments and long-term commitments for funding, effective workflow processes, and leadership, and a population of engaged, interested citizens. The MTNHP and MNPS jointly determined that a pilot study would be necessary to develop and test components of this proposed framework and assess if a plant-based citizen science program is feasible at this time. For the Montana Citizen Botany Pilot Study this report:

- Recaps the purpose, study objectives, technical approaches, and partnerships
- Analyzes and summarizes participation and vascular plant data
- Outlines the lessons learned and unexpected outcomes
- Makes recommendations for building a sustainable Montana Citizen Botany Program

Pilot Study

While a full program would incorporate many aspects of native plant conservation[3], the Montana Citizen Botany Pilot Study focused on a process to update Montana's aging dataset on known rare plant occurrences. Using the organizational structure of the Society, qualified citizen scientists, called Citizen Botanists, were recruited and trained in how to conduct revisits to known rare plant occurrences that had not been visited for at least 20 years. The two-year pilot study took place from 2022 to 2023 but was later extended to include 2024. Funding was provided by the MNPS, United States Forest Service (USFS)-Region 1, Montana/Dakotas Bureau of Land Management (MT/Dakotas BLM), and Montana State Library (MSL) for the MTNHP.

The purpose of the pilot study is to engage Society members to develop and test components of a process to survey and collect field-based data targeted on Species of Concern and Potential Species of Concern (P/SOC) vascular plants that have not been observed in at least 20 years. The study tested six objectives (Table 1), which are evaluated in this report (see Summary of Objectives). Ultimately, this pilot study served to determine if a Citizen Botany Program in Montana can be a sustainable method for carrying out plant-focused activities [i.e., seed collecting, inventory, monitoring] and provide critical data to federal and state land management agencies.

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[1] *A Proposed Framework For Developing A Montana Citizen Botany Program* document available at the MTNHP: https://mtnhp.org/Reports.asp?key=3

[2] *MNPS Presents! A Montana Citizen Botany Program* – a January 2022 video presentation available at MNPS: https://mtnativeplants.org/conservation/

[3] Other future citizen botany plant-focused tasks include, but are not limited to: rare plant monitoring and surveys, seed collecting, and assistance to herbaria curators/collection managers.

Table 1. ***The Montana Citizen Botany Pilot Study's six objectives.***

1) To engage MNPS members and use their organizational structure of local chapters to find and recruit citizen scientists to become Citizen Botanists.
2) To develop a communication process that allows for agency input on prioritizing locations for rare plant revisits.
3) To create a prioritized list of rare plant Species Occurrences (SOs) and associated information necessary for achieving a targeted revisit.
4) To develop written training materials field-based protocols and have Citizen Botanists test their use.
5) To develop field-based data collection, mapping, and photographing tools, and have Citizen Botanists test their use.
6) To analyze results and report on the findings of the Montana Citizen Botany Pilot Study.

TECHNICAL APPROACH

Overview

Co-managed by the MTNHP Botanist and Pilot Study Coordinator, protocols, data collection tools, and training materials were developed and tested by citizen botanists conducting revisits to rare plant occurrences that had not been documented in 20 or more years. The process included:

- MTNHP staff assembled a spreadsheet of information about vascular plant Species Occurrences (SOs) that were potentially eligible for a revisit. The spreadsheet was circulated to federal and state agencies for input.
- Pilot Study Coordinator compiled a list of federal and state agency botanists, biologists, and other land managers that could serve as local contacts for the Citizen Botanist and fieldwork.
- Using the organizational structure of the MNPS, interested volunteers were invited to participate.
- In 2022 and 2023, the MTNHP Botanist and Pilot Study Coordinator provided trainings through Zoom to volunteers who were interested in learning about or becoming a Citizen Botanist.
- Volunteers who met the minimum requirements, attended two virtual trainings, and signed a data use agreement qualified to be a Citizen Botanist. Citizen Botanists then gained access to the *Vascular Plant SO Revisit Spreadsheet* and additional resources to guide them in the process to achieve a successful revisit.
- From the spreadsheet of information Citizen Botanists selected at least one plant SO that fit their plant identification and field-based skills, geographical area of interest, and time period when the plant is identifiable.

- The MNPS Coordinator verified the assignment and sent the Citizen Botanist a customized information packet, which included the past observation data for their target plant SO.
- Using the manual and protocols, the Citizen Botanist planned their revisit and reached out to the local agency contact.
- The Citizen Botanist conducted a revisit to their target plant SO following methods and guidance outline in the manual. Using the digital or paper revisit survey form, current information, mapping, and photographs were collected on plant populations (including documenting absence), habitat conditions, and threats. Data was sent to MTNHP.
- MTNHP Botanist and Pilot Study Coordinator reviewed the data for accuracy and completeness and provided feedback to Citizen Botanists. Data from successful revisits was put into the MTNHP botany database and made available to users through Map Viewer and the Montana Field Guide. Data on unsuccessful revisits was archived and pertinent information relayed to the appropriate land management agency.

Programmatic Structure

The positions of MTNHP Botanist and Pilot Study Coordinator led the 3-year study while numerous other people in various positions made the study function. The major positions and the people involved included:

MTNHP Botanist

This position was served by Andrea Pipp, Program Botanist for MTNHP. The MTNHP Botanist was responsible for all aspects of the pilot study from concept to implementation. This included: outreach and communication to MTNHP staff and partnering organizations at all stages of the study; managing budgets; developing or assisting in the development of protocols, training materials, tutorials/manuals, data collection techniques, and teaching formats; teaching virtual trainings and workshops; reviewing submitted data; writing reports and grant proposals; and more.

Pilot Study Coordinator

This position was served by Kenda Herman, the MTNHP Botany Data Assistant. The Pilot Study Coordinator was responsible for most aspects of the pilot study from concept to implementation. This included: outreach and communication to MNPS members, Citizen Botanists, and MTNHP staff; assisting in refining protocols, training materials, tutorials, and data collection techniques; managing volunteers; tracking revisit assignments; compiling and providing past observation data; teaching virtual trainings and workshops; reviewing submitted data; analyzing study results; reviewing the pilot study report; and more.

> NOTE: The *Proposed Framework for Developing A Montana Citizen Botany Program* would use the MTNHP Botanist to manage plant data and information provided to Citizen Botany volunteers and a paid MNPS Coordinator to oversee the recruitment and management of volunteers. Together these positions would direct and maintain a citizen botany program, sharing in some responsibilities.

However, for the pilot study MNPS was not in position to assign duties or pay for an MNPS coordinator. Therefore, the MTNHP Botany Data Assistant tested the role of MNPS Coordinator under the title of Pilot Study Coordinator.

MNPS Primary Contact

This position was served by Elizabeth Bergstrom, the MNPS Conservation Committee Chair. Elizabeth served as the primary contact person between MNPS and MTNHP. This included: advocating for citizen botany and the pilot study; assisting to recruit volunteers; serving as editor for this report; writing proposals; relaying updates to the MNPS board; writing updates in the *Kelseya* newsletter; providing feedback to MTNHP as the study unfolded; and more.

Data and Software Technical Assistance

Braden Burkholder, MTNHP Data Systems and Sciences Lead, lead the effort to develop processes for data workflow; querying the botany database for eligible plant SOs; investigating Google Drive applications; developing the Survey123 - MTNHP Citizen Botany SO Revisit Form; creating georeferenced maps; managing the spreadsheet of information; and more. He was assisted at certain stages by Rob Fimbel, MTNHP volunteer and MNPS member, Kenda Herman, or Andrea Pipp. Braden also provided technical assistance to citizen botanists and the MTNHP botany program staff who were having difficulty with Survey123.

Chapter Coordinators

Each MNPS chapter assigned a member to the position of Chapter Coordinator. The Chapter Coordinator served as the point of contact between the Pilot Study Coordinator, MNPS members seeking information, and Citizen Botanists. The Chapter Coordinator helped to identify candidates for citizen botany, and some led group activities to build the Citizen Botany community. Preferred qualifications for a Chapter Coordinator included:

1) To have good communication skills and experience using an Excel spreadsheet;
2) To be able to participate in a training via Zoom;
3) To maintain confidential rare plant location data provided on the spreadsheet; and
4) To facilitate the process to help ensure Citizen Botanists complete their revisits and data collection in 2022 or 2023 and relay data to the Pilot Study Coordinator.

Citizen Botanist

Citizen Botanists are volunteers who meet the basic requirements, attended a two-part training, and signed the data use agreement form. Citizen Botanists were given access to a secure spreadsheet of rare plant SO data. They were encouraged to select a target plant SO, plan a revisit, and conduct a survey to collect current field-based information. The four basic requirements that a volunteer must have in order to apply for being a Citizen Botanist include:

1) To have completed at least 1 science class of High School level or above; and
2) To be familiar with botanical terms and the process to identify plants; and
3) To be able and willing to follow monitoring protocols; and
4) To be able and willing to independently conduct fieldwork or lead a group effort.

Terminology

To discuss the Montana Citizen Botany Pilot Study requires some understanding of standardized terminology, as follows:

Citizen Botanist: A volunteer who met the basic requirements, attended the two-part training, and signed the data use agreement or were inducted into the study as a Citizen Botanist because of their existing credentials and involvement.

Observation: Information provided by a specific person or group who found or successfully conducted a survey for the targeted plant species on a specific date(s) in a specified location.

Positive Observation: At least one individual of the target plant was found as present.

Negative Observation: The target plant species was searched for and not found. Absent.

Revisit (-ed): A return to the target plant SO to conduct a field survey and obtain new information on the plant and habitat. For the pilot study, revisits are conducted by a citizen botanist or citizen botanist inductee.

Successful Revisit: Citizen Botanist was able to locate at least part of the SO and conduct a survey for the target plant.

Unsuccessful or Attempted Revisit:

Citizen Botanist was able to initiate a field survey for the target plant SO, but was unable to access or locate the SO and therefore was not able to survey for the target plant. Sometimes the SO was accessed or located, but the survey of the target plant was terminated. A 'no survey' is caused by inaccessible terrain, changing weather conditions, animal activity, and/or safety concerns.

Revisit Not Conducted: Citizen Botanist selected a target plant, but never attempted an SO revisit.

Species Occurrence (SO): A discrete area where the target plant and occupied habitat has been documented as present. The SO is mapped as a polygon, either precisely (irregular shape) or imprecisely (symmetrical circle, oval, square, or rectangle). The SO is supported by one or more observations of the species that are mapped as observation points, lines, or polygons. An SO polygon is created by MTNHP only for P/SOC.

SO Assignment: A Citizen Botanist who accessed the Vascular Plant SO Revisit Spreadsheet to select a plant SO. Once verified by Pilot Study Coordinator the Citizen Botanist's assignment is official.

Selected Plant SO = *Target Plant SO*: The plant species and occurrence that is assigned to the Citizen Botanist for which they are to plan a revisit, conduct a survey, and collect field-based information. Where at least two vascular plant SOC and/or PSOC are found, the selected and target species is that which was assigned to the Citizen Botanist by the Pilot Study Coordinator.

Rare Plant Occurrence: A vascular plant categorized by MTNHP as a Species of Concern or Potential Species of Concern (P/SOC). Rarity can be caused by the species' intrinsic characteristics, limited habitat in Montana, or by declining population trends which are usually caused by anthropogenic sources.

Survey (-ed): A Citizen Botanist that reaches the plant SO location and searches for the target plant species. The survey may fully or partially cover the SO area. The survey can result in a positive or negative observation, or a tentative determination. Tentative determinations result when identifiable traits are in question and requires another expert to review the photographs and written information provided by the Citizen Botanist.

Target Plant: The vascular plant species selected by the Citizen Botanist that is the focus of their survey and revisit. For the pilot study on vascular plants classified as Species of Concern (SOC) or Potential Species of Concern (PSOC) qualify as a target plant. Future activities could target other plant species.

Vascular Plant SO Revisit Spreadsheet: A secured Microsoft Excel spreadsheet of plant data that shared with Citizen Botanists through Google Drive. The spreadsheet contains information on the vascular plant SO and associated information and maps.

Vascular Plant Data

Selecting Vascular Plant SOs

Criteria were established to determine which vascular plant P/SOC occurrences would be reasonable for a citizen botanist to search for, identify, and collect field-based data on (Table 2). Citizen botanists exhibit a wide range of skills, knowledge, and experiences that are either learned on their own, on the job, or in combination. Criteria focused on assembling a list of plant SOs that represented a range of conditions for identifying and opportunities for accessing that could be reasonable for a person with basic skills, knowledge, experience, and the ability to conduct their own learning. As examples, the list included plants from lilies to well-defined sedges and SOs that could be reached within a day's jaunt in vicinity of a road or trail, but not via a 5-day backpack trip.

Table 2. ***Criteria for determining vascular plant P/SOC occurrences that are eligible for a revisit.***

1) Plant species that are included in the *Manual of Montana Vascular Plants* (Lesica et al. 2018 and 2022) that also lack taxonomic problems.
2) Plant species that can be identified in the field using a hand-lens by a person who possesses basic knowledge of plant terminology, has experience in using taxonomic keys, and can spend some amount of quality time to research the target plant and its look-alikes. Plant species requiring specialized training or extensive field-based experiences were removed from consideration.
3) Plant SOs that have not been visited for at least 20 years, according to the MTNHP botany database.
4) Plant SOs that are accessible from and occur on public lands.
5) Plant SOs with a locational uncertainty that is less than a quarter-acre of a section in the MTNHP botany database.

The goal was to provide a selection of about 300 vascular plant SOs, in each year, that also provide the citizen botanist with choices in order for them to find a plant that fits their skillset, geographical preference, and time of year when they can visit. Thus, the spreadsheet of plant SOs:

1) had several representative occurrences in each of Montana's geographic regions.
2) represented an array of identification skills of easy, moderate, and difficult
3) represented an array of federal and state land management agencies
4) represented an array of months when the plant was identifiable in fruit or flower.

The goal was to provide a list of about 300 vascular plant SOs that not only were eligible for a revisit, but presented an array of choices for the Citizen Botanist in each region of Montana. The initial list was manually reviewed to provide an array of species options, geographical locations, physical terrain, and phenology in each region of Montana (Table 3). It was essential that a Citizen Botanist was presented with a plant SO list with multiple options so they could review and select an occurrence that fit their plant identification and field-based skills, geographical area of interest, and time period when the plant is identifiable.

Table 3. Additional Criteria used to finalize the *Vascular Plant SO Revisit Spreadsheet*.

1) Numerous and diverse suite of plant Species Occurrences (SOs) in each of Montana's six geographical regions: southeast, south-central, southwest, northeast, north-central, northwest.
2) Plant species exhibiting an array of identification skills categorized as easy, moderate, and difficult.
3) Plant SOs that occur on the array of federal, state, and local land management ownerships at various levels of jurisdictional boundaries.
4) An array of plant species displaying phenology in each month of the growing season.

The list of proposed vascular plant SOs was shared with federal and state agency contacts for their input. Agency contacts were asked to review and remove any plant SO that they knew was inaccessible (bridge closure, etc.), would likely compromise safety for the Citizen Botanist (active fire area, etc.), or interfere with on-the-ground land management projects (active timber sale, etc.) (see section on Communication Processes-Agencies). Agency contacts were also asked to prioritize appropriate plant SOs.

Developing the *Vascular Plant SO Revisit Spreadsheet*

A list of roughly 300 vascular plant SOs and associated information was compiled into a Microsoft Excel spreadsheet. The associated information was intended to help the Citizen Botanist review, assess, and select a target plant SO for which they felt qualified to identify, locate, and collect data on (Table 4). For example, the spreadsheet contained links to maps that showed the SO size and shape, topography, and aerial imagery.

Table 4. ***Informational fields in the Vascular Plant SO Revisit Spreadsheet.***

- MTNHP primary scientific species and family names
- MTNHP primary common name
- SO-ID
- Size of the SO (acre)
- County
- Region in state
- Assigned agency priority rating
- Identifiable months (phenology)
- Ease of identification rating; note when a technical key is needed
- Last Observation date
- Type of land ownership and the Land management agency
- Link to species profile on the Montana Field Guide
- Link to a georeferenced topographic SO map
- Link to a georeferenced aerial SO map

Plant SO Assignments

The final *Vascular Plant SO Revisit Spreadsheet* was loaded into Google Drive. Citizen Botanists were provided with access and a written tutorial for how to sort and peruse the spreadsheet, and reserve a plant SO. The Pilot Study Coordinator reviewed these reservations and examined the past observation data and other SO properties for potential problems. If no problems were found the Pilot Study Coordinator confirmed the assignment. This step to review reservations was very needed because it occasionally uncovered some problems that would have led to a failed or difficult revisit. Where a reserved plant SO was problematic, the Citizen Botanist was asked to select another plant SO from the spreadsheet.

Upon verification of the assignment, the Pilot Study Coordinator prepared a packet of information for the Citizen Botanist (Table 5). Citizen Botanists were asked to not share SO

plant data in order to limit knowledge of the rare plant's location – except with the person or group that assisted in their treasure hunt to revisit it. In 2022, the packet included all hardcopy materials and a pre-stamped addressed envelope that allowed the Citizen Botanist to return select items back to MTNHP. In 2023, the Pilot Study Coordinator inquired with the Citizen Botanist as to their preference for digital or hardcopy information; most information was provided digitally.

Table 5. ***Information packet contents sent to Citizen Botanists.***

- Past observation data, typically a survey form(s) and/or image of the plant specimen(s) with labelled information.
- Blank Revisit Survey Form with instructions [intent that it serves as a backup in case electronics fail]
- Geo-referenced PDF maps showing SO and topographic relief or aerial imagery
- Helpful hints on how or where to research one's target plant to learn identifiable traits, habitat, and look-alikes
- Manual on how to plan and safely conduct a revisit
- Other pertinent materials

The 2022 questionnaire asked people about the utility of the informational packet (Questions 40-45 and 61-62 in Appendix C). For 10 respondents who received a packet of hardcopy information, 8 people thought it was "mostly useful" or "essential" and 2 people thought it was "useful" or "somewhat useful". For 11 respondents who received digital information, 10 people thought it was "mostly useful" or "essential" and 1 person thought it was "useful". People were asked in what format would like information if they were to conduct another revisit in 2023. Out of 13 respondents, 7 responded "all in digital format" and 6 responded "a mixture of digital and hardcopy formats". When asked what types of information would be best to provide in a digital versus hardcopy format, the answers varied across all respondents.

MTNHP-Agency Communication Process

The communication process between federal and state agencies and the MTNHP evolved during the pilot study. The communication process fulfilled two purposes. First, it was essential to get input on information needs regarding vascular plant P/SOC and SOs. Agencies that find value in the products of a citizen botany program will strive to help fund these efforts. Second, it was important that an agency's needs for information and expectations fit within the constraints and capabilities of a citizen science program. Thus, the communication process works in two directions in order to prioritize the choices of species and occurrences to revisit in a given year. When effectively communicated and understood, the utility of a citizen science program improves at the same time that a citizen botanist is rewarded for contributing to meaningful tasks.

Contact Information

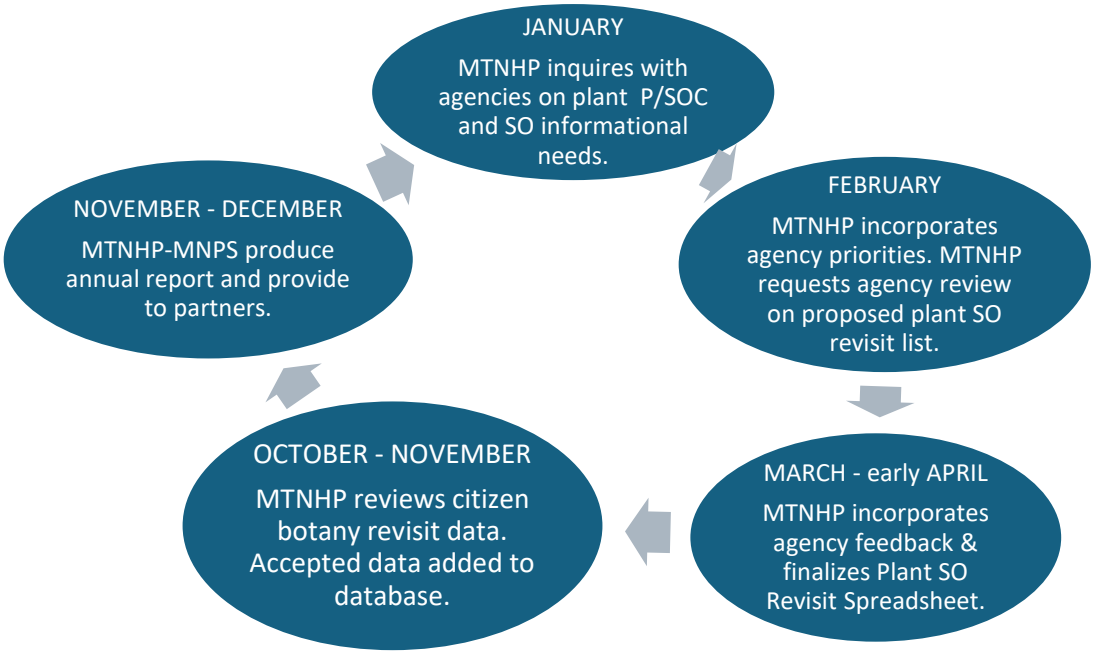
Contact information was gathered for botanists, biologists, and other managers working for federal and state land management agencies and other land-based conservation organizations (The Nature Conservancy, etc.). Contact information was obtained at multiple scales, pertinent to Montana, and tracked in a spreadsheet. For example, botanist contact names, addresses, emails, and phone numbers were sought and recorded for the US Forest Service at the regional, forest, and district levels. We strived to provide each Citizen Botanist with a local contact person specific for each plant SO revisit.

A local contact is essential to ensure that managers are aware of efforts by Citizen Botanists to find a rare plant occurrence, and vice versa. It builds partnerships in obtaining and sharing data and brings awareness to rare plants. The local contact is also a source of information that helps the Citizen Botanist plan their revisit, safely and with confidence. Information can be relayed regarding weather; road and other site conditions; maps to purchase; more details on the species, its location, or general phenology; forest fire conditions; and other details. Citizen Botanists are required to contact the local manager, botanist, or biologist at least 2 weeks prior to their revisit to help determine if they can safely access and conduct a revisit to their target plant SO polygon.

Communication Timeline

The communication process between federal and state agencies and the MTNHP evolved during the pilot study. The following timeline works pretty well, but will continue to be improved upon (Figure 1).

Figure 1. A conceptual timeline for the MTNHP-MNPS-Agency communication process.



January: Through email the MTNHP Botanist reaches out to all federal and state land management agency contacts and other land conservation organizations to inquire about their needs for field-based information on specific vascular plant P/SOC and sites (SOs). At this time agency contacts are also informed about the citizen botany pilot study (purpose, goals, eligible P/SOC and SOs, importance for feedback, etc.). In addition, the botanist requests new or updated contact information for staff at local and upper levels level who can assist Citizen Botanists.

February: MTNHP botany program incorporates agency priorities for plant species and SOs. MTNHP provides a proposed plant SO revisit list to agencies for review. Specifically, MTNHP wants to know if any Plant SOs are problematic for a Citizen Botanist to revisit, either because of on-the-ground project activity, inaccessible sites, or safety concerns.

March – early April: MTNHP botany program finalizes Vascular Plant SO Revisit Spreadsheet and posts on Google Drive. Citizen Botanists and federal and state agency contacts are informed. Citizen botanists can select and reserve plant SOs.

October – November: MTNHP botany program reviews data from revisits. Accepted data is appended to the botany database which makes it available on Map Viewer and Montana Field Guide. Problematic data is archived and information, if deemed relevant is provided to the land management agency's contact. Results of the final review are communicated back to each Citizen Botanist.

November – December: MTNHP and MNPS produce an annual report, outlining the work tasks accomplished, technical approach(es), results, summary, and other necessary information. The report is posted on the MNPS Citizen Botany web page (currently not in place) and emailed to Citizen Botanists, MNPS board, agency contacts, partners, and other identified people or groups.

Citizen Botany Training

The pilot study uses the structure of MNPS to find and recruit volunteers who could become a Citizen Botanist. Each chapter of the MNPS appointed a Chapter coordinator that served as the point of contact for Citizen Botanists between their chapter and the Pilot Study Coordinator. Several Chapter Coordinators helped to recruit Citizen botanists, answered questions, or got Citizen Botanists together to conduct a group revisit or a social event to get to know each other.

<u>Virtual Training</u>

People who are interested in becoming a citizen botanist must have the basic qualifications, participate in a two-part training, and sign a data use agreement form. The trainings do not teach plant identification because that is a pre-requisite for acceptance into the pilot study (or program). Rather the trainings address goals, purpose, and expectations on the part of MTNHP/MNPS and the Citizen Botanist, how to select a plant SO, how to plant and safely conduct a revisit, and other details (Table 6). The two-part training were co-taught by the

MTNHP Botanist and Pilot Study Coordinator and offered virtually through the Zoom platform. These live trainings allowed time for a question-answer segment and an opportunity to get to know each other. Due to the pilot study's late start in 2022, trainings were offered in early to mid-spring. Respondents to the 2022 questionnaire remarked that trainings were offered too late. We agreed. In 2023, the two-part training was offered twice in February and March, which seemed to work well. In addition, the Pilot Study Coordinator made videos form the live recordings. Recordings were made available to interested volunteers who could not attend the live sessions. In 2024 recordings were provided to Citizen Botanists who wanted a little refresher.

Table 6. ***Main topics covered in the two-part virtual trainings to become a Citizen Botanist.***

- Proposed program and pilot study overviews: purpose, need, and structure of study; commitments and expectations on part of MTNHP-MNPS and Citizen Botanist.
- What is and how does one become a Citizen Botanist.
- How to select an appropriate plant SO and navigate the *Vascular Plant Species Occurrence Spreadsheet*.
- How to use and understand the informational packet provided by MTNHP: terms, maps, etc.
- How to conduct additional study on one's target plant species, look-alikes, SO location, etc.
- How to plan and conduct a revisit safely and responsibly.
- What type of information to collect and how to collect the field data. How to document the observation, including absence.
- What types of personal gear and equipment is needed to complete the assignment safely with fun.
- How to submit the completed revisit data.
- Other details.

Training Materials

The MTNHP botany staff developed numerous training materials to help the Citizen Botanist safely and successfully conduct a plant SO revisit (Table 7). All training materials were available in hardcopy and digital formats. In addition, MTNHP staff developed the P/SOC Revisit Form in Survey123. The Survey123 form allowed the Citizen Botanist to use a GPS-enabled mobile device (phone or tablet) to collect the required data, photograph, and map the plant, its population, habitat, and other elements – all with a single app. After their review the app allowed the Citizen Botanist to review data, correct errors, and submit the data electronically to MTNHP.

Table 7. ***Training materials and data collection tools created by MTNHP for Citizen Botanists to carry-out plant SO revisits.***

- *MTNHP Manual To Conducting A Rare Plant Revisit*: This document outlines the entire process to plan and carry-out a plant SO Revisit, successfully, safely, and with enjoyment.
- *Recommended Plant Identification Resources for Montana's Vascular Plants*
- *Tutorial for Navigating the Vascular Plant SO Revisit Spreadsheet* on Google Drive
- *Tutorial for the MTNHP Citizen Botany SO Revisit Form in Survey123*
- *MTNHP Citizen Botany SO Revisit Form* for upload to Survey123 on GPS-enabled phones and tablets
- Instructions for the *MTNHP Citizen Botany SO Revisit* (hardcopy)
- *MTNHP Citizen Botany SO Revisit Form*: A printable, hardcopy form to record field data.

ACCOMPLISHMENTS AND OUTCOMES

Participation

From 2022 to 2024, about 178 people participated in some aspect of the Montana Citizen Botany Pilot Study (Table 8). Many people participated in multiple ways, such as being in leadership and becoming a Citizen Botanist. In leadership, 4 MTNHP staff, 13 MNPS board members, and 8 MNPS Chapter Coordinators were involved. About 30 working professionals served as an agency contact. Agency contacts provided input on the list of potential plant SOs in need of a revisit and/or served as a point of contact for the Citizen Botanist. People who wanted to learn more about citizen botany participated by attending at least one virtual training (124), an MNPS annual meeting workshop (36), or a group revisit led by a Citizen Botanist. During the initial pilot study period from 2022 to 2023, 102 people completed the requirements or were inducted to become a Citizen Botanist. Although the study was extended into 2024, opportunities to become a citizen botanist were not offered.

Table 8. ***The number of people and their roles of participation in the Montana Citizen Botany Pilot Study from 2022-2024.***

Participants in Pilot Study, 2022-2024	Number of People
Total Number of Participants[1]	178[1]
MTNHP Staff	4
MNPS Leadership / Board of Directors	13
MNPS Chapter Coordinator	8
MNPS Workshop participant	36
Citizen Botanists	102[3]
Served as an Agency Contact[2]	30[2]

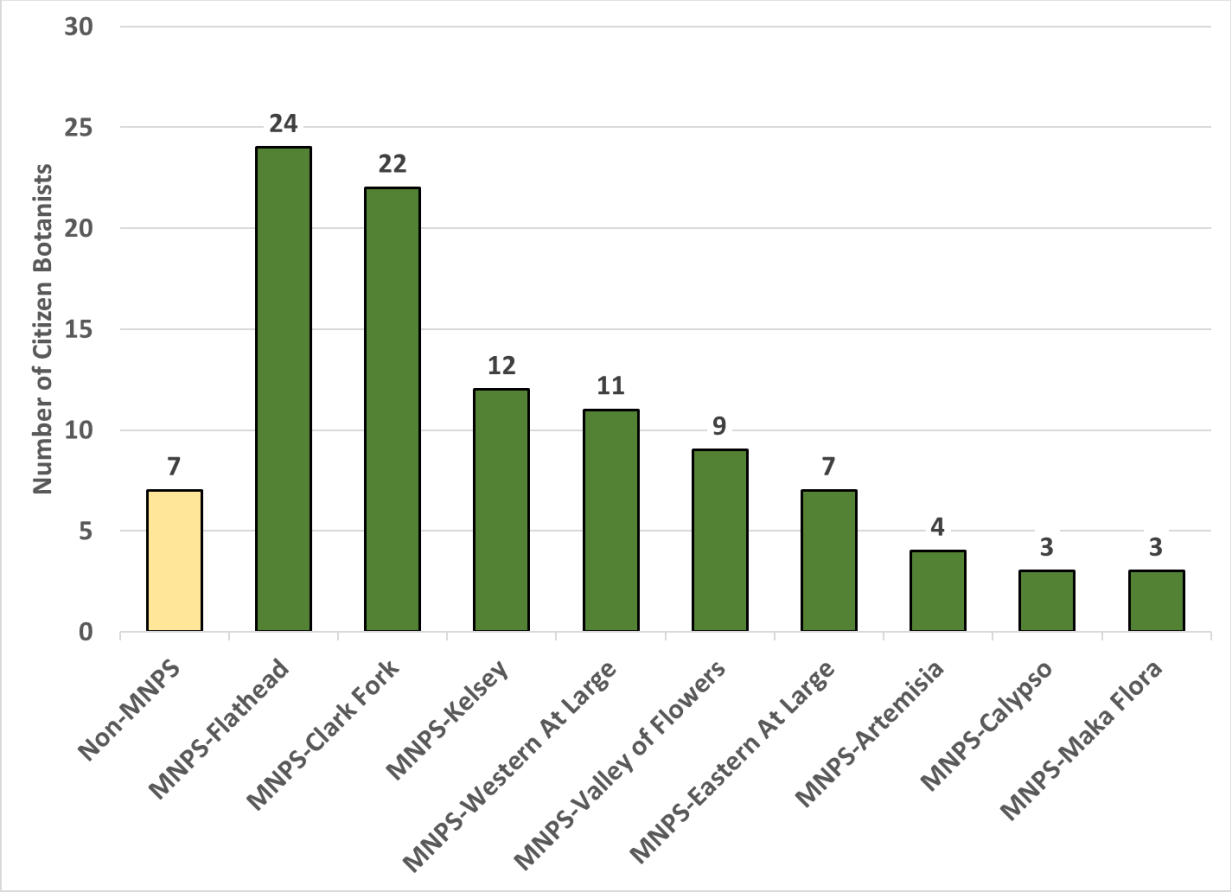
[1] Unique people or group of people who participated in at least one role with the Montana Citizen Botany Pilot Study. A majority of people participated in multiple roles.

[2] A federal or state botanist or other land manager who served as a point of contact for the citizen botanist.

[3] Includes 96 people who qualified as Citizen Botanist through the pilot study and 6 people who were inducted as a Citizen Botanist because they helped develop the pilot study or previously possessed the qualifications.

From 2022 to 2024, 102 people met the requirements and became a Citizen Botanist. The vast majority of Citizen Botanists were MNPS members because the Society was our primary source for recruiting volunteers. Each of the Society's nine chapters had at least three Citizen Botanists (Figure 2). The Flathead and Clark Fork Chapters accounted for the greatest number of Citizen Botanists (Figure 2). As word about this study spread, people from outside of the Society contacted us to inquire about participating. During the pilot study, 7 people not affiliated with MNPS became Citizen Botanists.

Figure 2. ***Montana Native Plant Society (MNPS) affiliations for the 102 Citizen Botanists***[1]**.**



[1] Affiliation is based on the year when the Citizen Botanist became involved in the pilot study.

Citizen Botanists represent a wide range of demographics. Citizen Botanists ranged in age from people in their 20s to those in their 70s. For the 25 people who responded to the 2022 questionnaire, each decade was represented by at least two people spanning the age period of 22 to 79 (Question 4 in Appendix C). Citizen Botanists ranged from professionals working in the natural sciences to skilled individuals attending college or working in other disciplines. Although job information was not collected on the 102 Citizen Botanists, we estimated that at least 47% of them currently work in or are retired from the natural sciences. For the 25 people who responded to the 2022 questionnaire, 23 people considered themselves to have low intermediate to advanced plant identification skills (Question 5 in Appendix C). When it comes to conducting plant surveys, 17 people thought their field skills were intermediate or advanced while 8 thought they were beginners (Question 6 in Appendix C).

Target Plant SO Revisits

<u>2022-2024 Data Results</u>

Citizen Botanists selected plant SOs that fit their plant identification and fieldwork skills, geographical area of interest, and time period when the plant is identifiable. Citizen Botanists were asked to select two plant SOs from the *Vascular Plant SO Revisit Spreadsheet* to target for

a revisit, and were given two years to complete their assignments; these were categorized as "self-selected" assignments. However, the two-plant SO requirement was not enforced because of the late start in Spring 2022 and the more important need to just get the Citizen Botanist to successfully complete the revisit process. As word about the pilot study spread, situations arose that allowed some Citizen Botanists to target plant SOs that were not on the spreadsheet; these were categorized as "other assignment". Plant SOs categorized as "other assignment" were chosen for the purpose of conducting a workshop, from another agency's database, or customized for the Citizen Botanist by the MTNHP botanist.

In the 2022 questionnaire, 19 people responded to questions about the *Vascular Plant SO Revisit Spreadsheet* (see Question 26 in Appendix C). When asked about the spectrum of choices that fit their plant identification skills, field skills, and time period when the plant is identifiable, 18 of 19 respondents thought the spreadsheet had enough choices. However, 16 of 19 respondents felt the choices in plant SO locations were too few. This is partially a consequence of not adequately querying the database and the fact that rare plants are unevenly distributed and limited on the landscape. In 2024, no additional plant SOs were added to the spreadsheet, and in certain regions of the state Citizen Botanists had no options from which to select. If a citizen botany program is continued, MTNHP will strive to improve its ability to query the database to provide more rare plant locations that also meet an array of conditions to meet the diverse preferences of Citizen Botanists.

The majority of Citizen Botanists selected a target plant SO and followed through on conducting a revisit between 2022 and 2024. Of the 102 Citizen Botanists, 69 selected at least one target plant SO and 63 of them conducted the revisit. Only 6 people did not attempt their assigned revisit during the 3-year window, as far as we know. We do know that some unique circumstances arose. We also know that several people contributed their time to the study in other major ways, and just didn't get to their revisit assignment. Of the 102 Citizen Botanists, 33 people (32% of Citizen Botanists) did not get involved in the study[4]. However, these 33 people are Citizen Botanists who could participate with a more involved role in the future. Otherwise, almost 62% of people who qualified to be a Citizen Botanist carried out their volunteer responsibility and attempted a revisit.

From 2022 to 2024 revisits were carried out to obtain current data, mapping, and photographs on target plant populations, habitat condition, and threats. During 2022 to 2023, 63 Citizen Botanists self-selected or were assigned 151 target plant SOs to revisit (Table 9). Of the 151-target plant SOs, revisits were conducted for 133 SOs and not conducted for 18 SOs (Table 9). For the conducted revisits, 124 SOs were successfully found and surveyed while 9 SOs were attempted and not successfully completed (Table 9). Attempted revisits were not successful for a variety of reasons, such as: the site (SO) was inaccessible (example: site burned with extreme blow down); problems arose in identifying the target plant and look-alikes; imminent storms, a herd of animals occupied the site, or other factors that created safety concerns. Where revisits to 124 SOs were successfully completed, the target plant was found present at 100 (81%)

[4] 33 Citizen Botanists who did not select a plant SO from the *Vascular Plant SO Revisit Spreadsheet*.

occurrences and not found at 24 (19%) occurrences. When target plants are surveyed for and not found, MTNHP will record the observation as negative in the database. However, the actual SO typically does not get coded as absent. Usually, a minimum of 3 consecutive years of surveys, conducted at the proper identifiable periods by qualified (citizen) botanists are necessary to determine a true absence for the SO. A major conversion of the habitat could also result in marking the SO as absent in the MTNHP botany database. In the process of conducting these revisits, Citizen Botanists discovered 4 new locations of a target rare plant.

Table 9. ***A summary of Target SOs selected, revisited, not revisited, and new finds as reported by Citizen Botanists from 2022 to 2024.***

Summary Of Revisits For Target Species Occurrences (SOs)	2022-2023[1]		2024 only[1]		3-Year Total
	Self-Selected	Other Assignment	Self-Selected	Other Assignment	
TARGET SO ASSIGNMENTS					
Number of Target SOs selected or assigned	140	11	20	16	
SO Selected / Assigned Total	**151**		**36**		**187**
REVISIT CONDUCTED					
Number of Successful Revisits – SO surveyed	**113**	**11**	**17**	**16**	**157**
• Target Plant present	90	10	14	13	127
• Target Plant absent	23	1	3	3	30
Number of Attempted Revisits - SO not surveyed	**9**	**0**	**2**	**0**	**11**
Revisit Conducted Total	**133**		**35**		**168**
REVISIT NOT CONDUCTED					
Number of Revisits Not Conducted	18	0	1	0	
Not Conducted Total	**18**		**1**		**19**
NEW SOs					
New SO Found Total	**0**	**4**	**0**	**15**	**19**

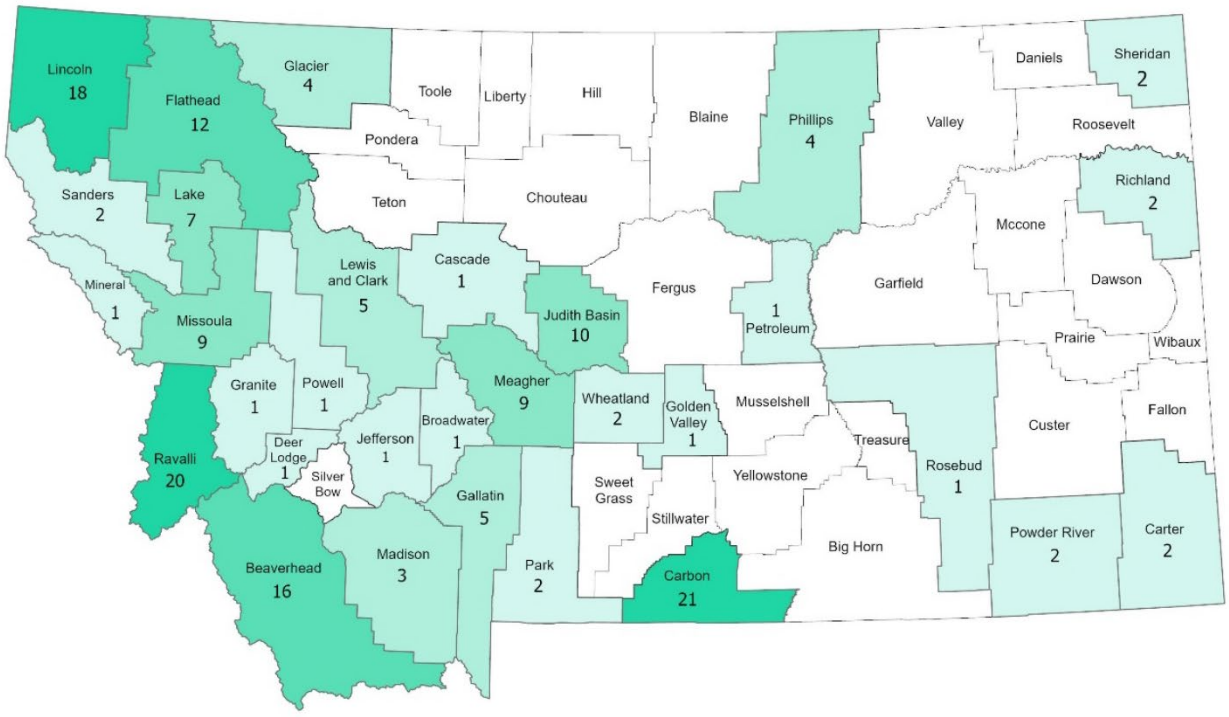
[1] Red numbers are pending a full review.

During 2024, 63 Citizen Botanists self-selected or were assigned another 36 target plant SOs to revisit (Table 9). We report preliminary data for 2024. Of the 36 target plant SOs, an estimated 35 revisits were attempted while 1 revisit was not attempted (Table 9). For the revisits that were attempted, 33 SOs were successfully found and surveyed while 2 SOs could not be surveyed (Table 9). Although attempted, the surveys were not conducted due to the SO problems with identifying the target plant, imminent storms, or other safety concerns. Where revisits to 33 SOs were successfully completed, the target plant was found present at 27 (82%) occurrences and not found at 6 (18%) occurrences. When target plants are surveyed for and not found, MTNHP will record the observation as negative in the database. However, the actual occurrence typically does not get coded as absent. Usually a 3-year minimum of consecutive surveys, conducted at the proper identifiable time periods by qualified botanists is necessary to determine a true absence. Other circumstances also help determine a true absence, such as a conversion of the habitat type. In the process of conducting these revisits, Citizen Botanists discovered 15 new locations of target rare plants.

Geographical Distribution

From 2022 to 2023, revisits to plant SOs took place in more than half of Montana's counties. Collectively the estimated 167 attempted revisits, successful or not, to plant SOs took place in 29 of Montana's 56 counties (Figure 3). The higher proportion of revisits in western Montana reflects both the greater abundance of P/SOC plant SOs and the greater number of current Citizen Botanists. However, Citizen Botanists do occur throughout the state and made demonstrable progress toward obtaining current data on these rare plant occurrences.

Figure 3. ***Montana's counties and the estimated number of revisits conducted by Citizen Botanists from 2022 to 2024.***



Land Ownership

Citizen Botanists carried out target plant SO revisits on public lands managed by federal, state, and local agencies from 2022 to 2024. On lands managed by a city or county, Citizen Botanists selected 3 plant SOs of which 2 (67%) were revisited (Table 10). On State of Montana lands, Citizen Botanists selected 19 plant SOs and revisited 16 (84%) of them across four agencies: Montana Department of Natural Resources and Conservation (MTDNRC), Montana Fish, Wildlife & Parks (MFWP); Montana Department of Transportation (MDT); and Montana Department of Corrections (MTDC) (Table 9). For the MTDNRC, 11 revisits occurred on Montana State Trust Land in 5 units of northwestern and northeastern Montana (Table 10). On federal lands, Citizen Botanists selected 164 plant SOs across 6 agencies, of which 148 were revisited across 4 agencies (Table 10).

Table 10. ***The number of Target Plant Species Occurrences (SOs) selected/assigned and revisited by Citizen Botanists on local, state, and federal land management agencies from 2022 to 2024.***

LAND MANAGEMENT AGENCY		Target SO Assignments 2022-2024	Target SO Conducted Revisits 2022-2024
	STATEWIDE TOTAL	**187**	**168**
Local Total		**3**	**3**
	City of Helena	1	1
	City of Whitefish	1	1
	Missoula County	1	1
State Total		**19**	**16**
	Montana State Trust Lands	13	11
	Dillon Unit Office	2	2
	Glasgow Unit Office	4	4
	Kalispell Unit Office	1	1
	Libby Unit Office	1	1
	Montana Department of Transportation	1	1
	Montana Fish, Wildlife and Parks	4	3
Federal Total		**164**	**148**
	Montana/Dakotas Bureau of Land Management	43	42
	Billings Field Office	18	18
	Dillon Field Office	15	15
	Lewistown Field Office	1	1
	Malta Field Office	6	5
	Miles City Field Office	2	2
	Missoula Field Office	1	1
	US Forest Service – Region 1	110	95
	Beaverhead-Deerlodge National Forest	10	5
	Bitterroot National Forest	23	21
	Custer-Gallatin National Forest	12	10
	Flathead National Forest	16	13
	Helena Lewis & Clark National Forest	26	26
	Kootenai National Forest	17	14
	Lolo National Forest	6	6
	National Park Service	7	7
	Big Hole Battlefield	1	1
	Glacier National Park	5	5
	Yellowstone National Park	1	1
	US Bureau of Reclamation	1	1
	US Department of Agriculture	1	0
	Fort Keogh Livestock Research Station	1	0
	US Fish and Wildlife Service	1	1
	Lee Metcalf Wildlife Refuge	1	1

The majority of plant SO revisits from 2022 to 2024 took place on federal lands which account for roughly 30% of Montana's land base[5]. Citizen Botanists conducted the majority of revisits on US Forest Service (USFS)-Region 1 lands. An estimated 110 plant SOs were selected of which 95 were revisited (Table 9). Revisits occurred on all six national forests in Montana (Table 9). Montana/Dakotas BLM received the second highest number of revisits. Citizen Botanists selected 43 plant SOs and revisited 42 (Table 9). The third highest number of plant SO revisits occurred on lands managed by three national parks: Big Hole Battlefield, Glacier NP, and Yellowstone NP. On lands managed by the National Park Service 7 plant SOs were selected and revisited. A single plant SO was selected and revisited on lands managed by the US Bureau of Reclamation and by the US Fish and Wildlife Service (Lee Metcalf National Wildlife Refuge) (Table 9). A single plant SO was selected on US Department of Agriculture lands, but the revisit was not attempted (Table 9).

Agency Priorities

In developing the *Vascular Plant SO Revisit Spreadsheet*, federal and state agency contacts were asked to provide a list of priority P/SOC plants and SO locations. Where these agency priorities were compatible with the capabilities of the citizen botany pilot study, MTNHP included the SO on the spreadsheet (see Communication Processes). Of the total 205 plant SO revisits that were either selected by or assigned to a Citizen Botanist, 40 SO locations were categorized as 'agency priority' (Table 11; Appendix B). Of the 40 selected/assigned plant SOs, 4 were not visited while an attempted revisit was made for the remaining 36 SOs (Table 11; Appendix B). Note that the 2024 data has not been finalized and some numbers in Table 11 may change. On State of Montana lands, two positive revisits and 4 new SO locations were found on MTDNRC lands while one negative revisit resulted on MTDC land (Table 11). On federal lands, one revisit was attempted, and the result is still under investigation; 28 positive and 4 negative revisits along with 7 new SO locations were found on lands administered by the MT/Dakotas BLM and USFS-Region 1 (Table 11). Overall, the pilot study was able to address a portion of agency priorities to bring forth current data and found additional sites.

[5] Montana Natural Heritage Program. 2024. Data analysis of species, land ownership, and ecological systems stored in the MTNHP databases. April. MTNHP, Helena, Montana.

Table 11. ***The number of target plant Species Occurrences (SOs) selected/assigned, revisited, or found new by Citizen Botanists on state and federal land management agencies from 2022 to 2024.***

LAND MANAGEMENT AGENCY	Agency Priority Revisits 2022-2024[1]	SO Not Visited[1]	SO Revisit Attempted[1]	SO Revisit Successful (Positive)[1]	SO Revisit Successful (Negative)[1]	SO New[1]
STATEWIDE TOTAL	**40**	**4**	**1**	**30**	**5**	**11**
State Total	**3**			**2**	**1**	**4**
Montana Department of Natural Resources and Conservation, Montana State Trust Lands	2			2		4
Stillwater State Forest/Unit Office	2			2		4
Montana Department of Corrections	1				1	
Federal Total	**37**	**4**	**1**	**28**	**4**	**7**
Montana/Dakotas Bureau of Land Management	15			13	2	6
Billings Field Office	12			11	1	6
Dillon Field Office	2			2		
Missoula Field Office	1				1	
US Forest Service - Region 1	22	4	1	15	2	1
Beaverhead-Deerlodge National Forest	3	1		2		
Bitterroot National Forest	10	2	1	7		
Custer-Gallatin National Forest	2			2		1
Flathead National Forest	2	1		1		
Lolo National Forest	5			3	2	

[1] The 2024 results are still pending. Numbers are subject to change.

Data Management

The MTNHP maintains a statewide botany database to track the species, distributions, and status of Montana's flora for the purpose of stewardship. Information in the database is publicly available through 'information requests' or to partnering organizations through agency-level access. Partnering organization include federal, state, and local government agencies, Tribal nations, non-government conservation organizations, Montana University System, and many others. The 134 revisits conducted from 2022 to 2023 have been reviewed by the MTNHP botany program using established quality control measures (Table 8). Both positive and negative data from the 123 plant SOs successfully revisited by Citizen Botanists, has been entered into the botany observation and threat tables, as appropriate, in the database. All photographs are attributed and archived in the ThumbsPlus photo database managed by MTNHP. Information gained from the 9 attempted revisits that were not completed in 2022 to 2023 was archived in the MTNHP botany database. Information on attempted revisits that were the result of changes in the habitat are shared with the appropriate land management agencies. The 35 revisits for 2024 are still being reviewed by the MTNHP botany program. They are undergoing the same process as used for the 2022 and 2023 pilot study results – which is the same standard applied to all observation data received by MTNHP.

SUMMARY OF OBJECTIVES

The pilot study aimed to test six objectives. Here, the authors, present a summary of how these objectives were addressed in the pilot study and provide their opinions on what was or was not accomplished.

1) To engage MNPS members and use their organizational structure of local chapters to find and recruit citizen scientists to become Citizen Botanists.

The MNPS board formally approved and allocated some funds toward the development of a pilot study. This sent a clear message to the membership that this is a significant statewide project that the Society undertook. The organizational structure of chapters and at-large sections created the opportunities to engage the statewide membership and facilitated communication. With the Society's support, funding, and large, chapter memberships we were able to engage and recruit MNPS members and obtain additional funds from the USFS-Region 1 and MT/Dakotas BLM. Chapter Coordinators and Presidents did a lot to garner support, encourage members to participate, and for some chapters create group-activities. Interest and participation – at some level- by 178 individuals or group events was deemed significant by the authors. The fact that about 124 members participated in one training, at least 90 completed requirements to become a Citizen Botanist, and 57 completed their assignment to revisit a rare plant occurrence, indicates that this objective was met – and was very successful.

2) To develop a communication process that allows for agency input on prioritizing locations for rare plant revisits.

Overall, the ability for MTNHP to communicate with federal and state agencies went well. The following outcomes are summarized as:

- Federal agency botanists were eager to provide input on P/SOC plants and SO locations where current information is needed.
- Most agencies were willing to suggest a local contact that the Citizen Botanist could reach out to in their stage of planning the revisit. Professional relationships with this pilot study were made with 30 agency contacts.
- Agencies appreciated being contacted and made aware of the Citizen Botany Pilot Study and Citizen Botanist's efforts to revisit a plant SO.

3) To create a prioritized list of rare plant Species Occurrences (SOs) and associated information necessary for carrying-out a targeted revisit.

The MTNHP not only maintains a statewide database to handle this objective, but employs staff savvy in database management. It was fairly straightforward to outline a process to create the *Vascular Plant SO Revisit Spreadsheet*. See also the Lessons Learned section

- A list of at least 300 vascular plant SOs that have not been visited in 20 or more years was created in 2022; additional sites were added in 2023. The task involved 3 staff members (see Programmatic Structure of Pilot Study) and took more time and effort than originally anticipated (see Lessons Learned).

- The fields of associated information (Table 4) was fairly straightforward to populate, including the geo-referenced PDF maps. There was a fair amount of trial and error to make the map at a useful scale and figure out how to include P/SOC plant SOs that overlap with the Target Plant SO. The ease of identification field was very subjective, and to date we have not received feedback on this field.
- Google Drive worked very well for populating the spreadsheet, posting, and password-protecting it. In providing a training and some written instructions most people seemed to be able to navigate the spreadsheet to select their plant SO. The Pilot Study Coordinator was able to easily convey communication that the Plant SO was reserved, giving her time to review past data, and then verifying that a revisit should be doable or not.
- In the 2022 questionnaire, people were asked about how easy it was to understand and navigate the *Vascular Plant SO Revisit Spreadsheet* (Question 32 in Appendix C). It was easy to mostly easy for 14 respondents and took some effort, but it worked for the remaining 4 respondents. No only said it was difficult or somewhat difficult to use.

4) To develop written training materials field-based protocols and have Citizen Botanists test their use.

This objective was fully met. People read, used, and appreciated the written training materials, as demonstrated by people's feedback to us and quality of the data received. Table 6 lists the 7 training material documents that were written and provided to most, if not all, volunteers interested in the pilot study. They covered how to navigate the *Vascular Plant SO Revisit Spreadsheet*, how to collect data using Survey123 and hardcopy survey forms, how to plan your revisit, recommended plant identification resources, and more.

- In the 2022 questionnaire, questions were asked about the written training materials (Questions 34-37 in Appendix C). Our of 18 respondents, 13 people read most or all of the Citizen Botany Manual while the remaining 5 people read some to half of the manual. People commented that it was thorough, had useful information, appreciated more context for the program and step-by-step instructions for using Survey123. People commented that the date collection and incorporating common names into the Survey123 could improved upon.

5) To develop field-based data collection, mapping, and photographing tools, and have Citizen Botanists test their use.

This objective was fully met. MTNHP staff created protocols for conducting fieldwork and two data collection tools:

1. *Citizen Botany SO Revisit* form for use with Survey123 app, a mobile app.
    - This app works on GPS-enabled phones and tablets. It allowed the Citizen Botanist to collect information, photograph, and map the plant population and habitat. A tutorial was written to help Citizen Botanists become comfortable and proficient at using the app (see Objective # 4 and Table 4).

- In the2022 questionnaire, 12 respondents used the Citizen Botany Revisit Form in Survey123. All 12 read and used the tutorial of which 5 people found it somewhat useful and 7 people found it extremely useful (Questions 46-49 in Appendix C). Respondents were asked how well the app worked for 10 elements of data collection (Question 50 in Appendix C). Reponses are provided in Appendix C, but for most people on most elements, the app "worked very well with practice". People seemed to have fun using the Survey123 app. People struggled the most with using the app to create polygons; this can be improved upon through in-person trainings.

2. Vascular Plant SOC/PSOC Revisit Form, a hardcopy survey form.
    - In 2022 and 2023 this survey form was printed and postal-mailed to all Citizen Botanists along with printed instructions on to complete it. It was strongly encouraged that it accompany each attempted revisit for use as a back-up in the event that one's electronics failed.
    - Several Citizen Botanists preferred using a printed form and pen/pencil over an electronic, mobile app. For those who completed their surveys using paper and pencil, we found the forms to be legible and fully completed. Photographs were sent to us through email. Mapping comments were provided on the printed forms of the geo-referenced maps, with written latitude/longitude locations, or provided electronically using KMZ files, images from Google Earth, etc.
    - In the 2022 questionnaire, 4 of 13 respondents used the hardcopy or printable Vascular Plant SOC/PSOC Revisit Form (Questions 44-45 in Appendix C). Two respondents found the form easy to use; one person liked writing her answers on the form and then putting them into the Survey123 app.

6) To analyze results and report on the findings of the Montana Citizen Botany Pilot Study.
This report satisfies Objective 6, and throughout are the results and findings.

UNEXPECTED OUTCOMES

The pilot study aimed to develop and test components of what could be a more comprehensive Citizen Botany Program in Montana. The pilot study focused in on getting current information on known locations of rare plant occurrences that have not been visited in over 20 years. During the three year study, some beneficial and unexpected outcomes occurred, as follows.

Plant Identification Class

A Citizen Botany Program has the ability to support plant education for a variety of purposes and in many ways. Robyn Klein, an MNPS member and teacher, generously offered to teach a webinar on basic plant identification to Citizen Botanists at no cost. Although a Citizen Botanist already possesses the basic plant identification skills, learning is always an on-going process. Robyn taught two webinars, providing refreshers for plant identification terms and family characteristics, and helping them prepare for their fieldwork. Approximately 33 Citizen Botanists attended the April 12th and 26th webinars in 2023.

'City-zen Botany'

A Citizen Botanist selected a site mapped to a minor type of public land owned by the City of Whitefish. This sent Kenda (Pilot Study Coordinator) in search of connecting with a local city contact. With support from the City Parks and Recreation Urban Forester, the Citizen Botanist revisited a tiny patch of *Cypripedium calceolus* (Small Yellow Lady's-Slipper) plants. This population was last documented in 1991 at the edge of a restaurant's parking lot. Whitefish has since doubled in size and hosts a staggering number of summertime visitors to Glacier National Park. On the initial survey the lady's-slipper plants appeared to be absent. However, the Citizen Botanist made a follow-up visit to the site, in case plants were overlooked and might flower later than expected. At the end of the survey polygon, a subtle splash of color signaled a small, but thriving cluster of little orchids! This revisit brought attention of this rare plant to the city and created another partnership for plant conservation.

"Stars Align At Big Hole Battlefield"

A specific occurrence of *Pedicularis contorta* var. *ctenophora* required additional administrative assistance. Katy Mathews lives in Idaho and manages vegetation at about seven small national parks in several states. By the time Kenda tracked her down, Katy had required that MTNHP

apply for a research activity permit on the Citizen Botanist's behalf. Kenda thought it was all going to cancel the revisit because these permits are expected to take six months to obtain - in the best-case scenario. Alas, Katy expedited the whole permitting process and coordinated her travel to match the Citizen Botanist's site visit. She was very enthusiastic and thrilled that our volunteer program was operating. The stars finally aligned, and the search for *Pedicularis contorta* var. *ctenophora* was performed. Following an intense search, a single *Pedicularis contorta* var. *ctenophora* plant was found. While it took an unexpected extra amount of effort to gather the necessary information and land management support to conduct this revisit, an important plant friendship and partnership was gained among National Park Service staff, MTNHP botany staff, and the Citizen Botanist. Further, it illustrated the need for more frequent revisits to obtain timely data.

Agency Involvement

Word about the pilot study spread through the Society's membership – as did a sense of enthusiasm and satisfaction from many Citizen Botanists. We assume it is for these reasons that some federal and state agency botanists and land managers reached out to MTNHP to inquire about revisiting occurrences in their jurisdictions as part of their normal workload. MTNHP provided several federal and state agency employees with information about the pilot study; verified the list of rare plants with old data that occur in their jurisdictions; provided forms, tutorials, and access to Survey123; and provided past observation survey data. The consequence is that awareness of Montana's P/SOC vascular plants and the great need for current information is increasingly being heard.

LESSONS LEARNED

The pilot study aimed to develop and test a process, written and electronic materials, a mobile app, and the use of citizens to conduct plant-focused tasks. During the three years we experimented and changed tactics while keeping the basic protocols in place as originally communicated. During the three-years we learned what worked well, what needs to be modified, and what components are missing - if Montana is to have a Citizen Botany Program.

Citizen Botany Coordinator

What Worked Well

The coordinator's position is essential to the success of a citizen botany program. The reasons are multiple and should be at least partially self-evident from this report. We learned how beneficial it is to develop friendly, respectful relationships between individual people and those working for an agency or other organization. To have several opportunities in the year to interact was important – with at least one chance to meet in-person. Much of the success of this pilot study is because of the Pilot Study Coordinator, and her ability to be reachable, to answer questions and provide timely information, and to complete many time-sensitive tasks. No doubt she put in extra hours to make the study run relatively smoothly.

What Needs Improvement

The proposed framework for a Montana Citizen Botany Program uses a paid MNPS Coordinator to oversee the recruitment and management of volunteers and the MTNHP Botanist to oversee the plant data and information provided to and received from Citizen Botanists. The pilot study put the bulk of the tasks from both positions onto the workload for the Pilot Study Coordinator, who is also the MTNHP Botany Data Assistant. It is estimated the Pilot Study Coordinator spent about 4-6 months each year focused heavily on the pilot study. For the MTNHP botany program, the consequence is that a certain amount of MTNHP core work (plant data entry, SO mapping, provisional observation review, etc.) was placed on hold, which also increased the backlog of plant data review and entry. It also decreased the availability of the MTNHP Botany Data Assistant for other work tasks.

From the perspective of the MTNHP botanist, the coordinator position must be: 1) a paid position because it has significant responsibility and coordination duties, and 2) separate from the existing MTNHP Botanist and MTNHP Botany Data Assistance in order for MTNHP to manage its annual workload responsibilities. Options for contracting the coordinator position, housing the position at MTNHP, jointly funding the position (example: MTNHP and Audubon share funding responsibilities for 1 employee); making it an MNPS employee, or other ideas should be explored jointly between MTNHP and MNPS.

See also Building A Sustainable Citizen Botany Program / A. Citizen Botany Coordinator

Agency Communication and Plant SO Selection

What Worked Well

Federal and state agencies were mostly responsive with providing a local agency contact.

What Needs Improvement

There is a learning curve in communicating needs for revisit data and understanding what species, habitats, or jurisdictions are subject to special management provisions within each federal, state, and local agency.

Hot Springs: We knew hot springs are a rare and delicate habitat and we learned that hot springs come with additional regulations. The Montana Citizen Botany Program should refrain from allowing Citizen Botanists to conduct plant-activities in or near hot spring habitats, especially those managed by the National Park Service. Plant-focused tasks in thermal areas and other hot spring habitats should only be done as a special project carefully planned and permitted through collaboration with the NPS (or other land managing agency), MTNHP, and MNPS.

Permits: Depending upon the park, the National Park Service may require Citizen Botanists to have a permit in order to conduct a rare plant revisit or other plant-focused task. Earlier coordination is needed when proposed plant SO revisits at National Parks.

Restricted Management Areas: Better coordination is needed with each federal and state agency to determine if there are jurisdictions that require special permits, written permissions, or have other constraints that a Citizen Botanist must comply with before conducting a revisit. Many federal and state agencies have restricted public access on certain lands, such as gated access, vehicle restrictions, seasonal closures, and others. For example, motorized vehicle use is not allowed in Wilderness areas. MTNHP and land managers need to coordinate well in advance of May in each year about such areas, including Research Natural Areas, Areas of Critical Environmental Concern, Wildlife Management Areas, and others.

Local Land Management Agencies: The pilot study focused a lot on the major federal and state land management agencies, while including plant SOs on lands managed by agencies with smaller amounts of land holding, counties, and municipalities. MTNHP needs to improve communication processes to include counties, municipalities, and federal/state agencies with smaller land holdings.

Compiling Plant SO Revisit Data

What Worked Well

The final V*ascular Plant SO Revisit Spreadsheet* worked well for MTNHP and it seems for most, if not all, Citizen Botanists who selected a plant SO.

What Needs Improvement

The MTNHP developed a process for querying the botany database for plant SOs that met several eligibility qualifications, such as not visited in more than 20 years; mapped with a specific level of precision; and species that lack taxonomic problems (see Table 2). The resultant list was then further queried to select numerous plant SOs in each region of the state that provided representation and choices for the Citizen Botanists on phenology, land ownership, identification ease, and other factors (see Table 3). However, this process needs to be improved upon because it took a huge amount of time by two staff over the course of 2 months to finalize the V*ascular Plant SO Revisit Spreadsheet*. Finding efficiencies is possible, but not yet figured out by MTNHP staff.

Google Drive

What Worked Well

Google Drive worked well to load, share and display specified data to Citizen Botanists. Further it could be password protected.

What Needs Improvement

Although Google Drive worked well, the State of Montana's IT department is always working to increase data security for state agencies. It might be best for the MNPS to host the V*ascular Plant SO Revisit Spreadsheet* in Google Drive. Further discussions are needed with IT experts, MTNHP staff, MNPS board and webmaster, and Cedar Mountain software

Virtual Trainings via Zoom

What Worked Well

The pre-requisite to being a Citizen Botanist is to have a basic understanding of how to identify plant species and how to work in the field. Because of these pre-requisites it is more plausible to use virtual platforms to teach people about the citizen botany pilot study and how to conduct a revisit to a known rare plant occurrence. Virtual trainings make it easier for people to investigate a volunteer opportunity and learn about it with little cost, no travel, and little personal time commitment. In a large state like Montana with lots of intact habitat, we found that virtual technology led to better ways to obtain volunteers, create meaningful communication, and provide learning opportunities.

The 2022 questionnaire asked about the virtual trainings (Questions 13-23 in Appendix C). Overall, the 19 respondents found the Zoom trainings to be good, efficient, and at a useful time in the evening. As for using a virtual platform, 16 respondents liked it while 3 were ambivalent. When asked about travelling to an in-person training, 3 of 5 respondents were ambivalent or would not and two would travel. The only complaint was that the 2022 trainings occurred in spring when plants bloom and people are busy; we remedied this in 2023 by offering in-person trainings in February and March and an option to watch recorded trainings with a follow-up with the Pilot Study Coordinator. All 19 respondents rated specific content of the trainings as giving them a "reasonably well" to "excellent and essential" understanding of the pilot study

with one exception; one respondent felt they had a “somewhat good” understanding of the methods.

What Needs Improvement

Plant-focused conservation projects also need in-person and personal experiences. The MTNHP botanist inquired with Citizen Botanists about an in-person gathering and training, but never made it happen. The 2022 questionnaire asked about in-person gatherings for Citizen Botanists (Questions 60 and 63-71 in Appendix C). Most of 10 respondents were likely to attend, especially if it was a 2-day event, on a weekend, in May, with lodging options, and free or allowed to bring your own meals.

A Montana Citizen Botany Program does require opportunities to gather with people to teach and share botanical knowledge and experiences. Field trips, camping weekends, in-person classes, in-person presentations, and other activities that focus on plant identification, planting techniques, seed collecting, art, writing, or numerous other topics are necessary to retain volunteers that have educated, skilled, interested, and/or committed to a citizen botany effort.

Past Observation Data

People often think revisiting a known rare plant occurrence is simple, and just requires a latitude/longitude point. The vast majority of plant data is not collected with such precision, for multiple reasons. MTNHP and herbaria have digitized the information from survey forms and plant specimen labels. In digitizing, information is parsed, categorized, and/or may be left out of the database. This is particularly true for field survey forms, where only a portion of the data was put into the MTNHP botany observation table. It is essential that the original source of information, in its original format be made available and used when revisiting a plant SO.

What Worked Well

Providing a Citizen Botanist with the original past observation survey forms or plant specimen data, makes the adventure to re-locate a plant more fun and more likely to be successful. It is an essential tool that also required a bit of time from the Pilot Study Coordinator to assemble and provide.

What Needs Improvement

The MTNHP has digitized (scanned) most of the survey forms in the botany paper file drawers. However, a large number of these digitized survey forms that are awaiting to be re-named with a useful, informative file name. MTNHP also has a relatively small number of survey forms that are awaiting to be scanned. In order to provide past observation in a timely fashion, MTNHP has to get these digitized files re-named so that they can be efficiently found (retrieved) in the digital library system.

Website User Interface

A website user interface (UI) is the space where interactions between humans and machines occur. For citizen botany, a website UI creates 1) an aesthetically pleasing static webpage that

provides information on a citizen botany program and 2) allows users to interact with the website using buttons, menus, forms, apps, and other interactive components.

What Worked Well

What worked well was the response from Society members! A very large number of people reached out to the MTNHP Botanist and Pilot Study Coordinator to get information on the pilot study. Lots of people went through the process to become a Citizen Botanist. Lots of plant SOs were selected and visited, which created a large number of plant SO assignments to track and manage.

What Needs Improvement

Spreadsheets were used to house and track information about volunteers and other participants in the pilot study. Spreadsheets worked, but are less efficient then a database for retaining information, tracking assignments, and managing potential volunteers and Citizen Botanists. There is a need to discuss the type and level of security needed when collecting contact information for volunteers. A website UI is needed for an established program to give volunteers a place:

- To learn about citizen botany: what it is and how to get involved.
- To apply to be a citizen botanist.
- To give citizen botanists secure access to plant data so they can peruse, select, and be assigned a plant revisit.
- To house information to track volunteers' plant SO assignments.
- To have a secure place to retain contact information for volunteers, agency staff, and others.
- To give citizen botanists secure access to other components of the program, such as if set up to assist with other plant-focused activities.

See also Building A Sustainable Citizen Botany Program / C. Website User Interface

BUILDING A SUSTAINABLE CITIZEN BOTANY PROGRAM

Overall Impression of the Pilot Study

From the perspective of the MTNHP Botanist and Pilot Study Coordinator, the process of training citizen botanists to collect current field-based data (plant population; habitat; threats; photographs; and mapping) worked very well! Citizen botanists predominantly followed through on their assignments, PLUS

- accurately identified the target plant or its look-alike;
- reported useful information in a timely fashion;
- were accountable;
- produced excellent photographs to verify the identification, habitat, and site conditions of which many were used to improve the Montana Field Guide; AND
- brought forth a significant amount of current information that most likely would not have been collected.

The 2022 questionnaire asked the Citizen Botanist about their overall experience (Questions 59 and 63-63 in Appendix A). Their experience as a Citizen Botanist was "highly satisfactory" for 12 respondents and "mostly satisfactory" for 1 respondent. All 13 respondents were "very likely" to participate again in 2023. All 13 respondents were "very likely" to participate if MTNHP and MNPS established a joint Citizen Botany Program.

Next Steps

Although the pilot study resulted in many successes, the developed process is not yet sustainable. Below we outline the steps that we believe are needed to determine if MTNHP and MNPS want to develop a joint Montana Citizen Botany Program that is also sustainable.

1. Provide this report to the MNPS board and MTNHP Program Lead for their use and internal review.

2. Schedule a meeting with MTNHP Program Lead, MTNHP botany program staff, and MNPS President, Conservation Chair, and other board members to discuss the pilot study's outcomes and whether it is worth pursuing as a Montana Citizen Botany Program. Ultimately, A decision and/or agreement is needed to answer the question "Does the MNPS and MTNHP want to jointly manage a Montana Citizen Botany Program?"

3. Discussion on what would make a sustainable citizen botany program. We have identified four components, in order of priority, that need some joint discussion and direction:

   A. **Paid Citizen Botany Coordinator**. Citizen botany definitely involves a volunteer component and a data/plant-task component. MTNHP is in a natural position to manage the plant data aspects of a program. It is more difficult for MTNHP to manage volunteers.

I. How to manage and fund the Citizen Botany Coordinator position? Can MNPS manage the Coordinator's position? Possible options for the Coordinator's position include:
- as paid MNPS staff
- through a contract with MNPS
- as a MNPS/MTNHP jointly funded and/or housed employee [example: MTNHP/Audubon]
- as a MNPS supported position within a university / college [Example: WA Rare Care]
- other _____

II. How to manage the Coordinator's position? Monetary compensation; number of hours; responsibilities and tasks; hiring protocol; etc.

B. **Funding**. Read first the Funding Mechanism section. Funding is needed to continue this effort in the short-term and long-term. How to fund a jointly managed citizen botany program?

I. How much funding is needed to continue a citizen botany program?
II. How much funding is needed annually to run a citizen botany program?
III. Should MTNHP or MNPS take the lead in proposal writing for a grant opportunity or will it depend upon requirements of the funding source?

C. **Create a website user interface (UI)**. Read also Lessons Learned / Website UI.

I. A meeting to discuss UI was held on July 5, 2024 and attended by Andrea Pipp (MTNHP Botanist), Kenda Herman (MTNHP Botany Data Assistant), Carol Goffe (MNPS Webmaster), Elizabeth Bergstrom (MNPS Conservation Chair), and Leah Grunzke (MNPS Admin). Carol has been in conversation with Cedar Mountain Software about a website UI for citizen botany; Cedar Mountain Software built and maintains MNPS's website. Some important points from the meeting are as follows:

- From MNPS, Elizabeth, Carol, and Leah are in favor of the Society's website hosting a UI for citizen botany (assuming the effort continues). From MTNHP, Andrea and Braden think it would be more advantageous to MNPS, and not MTNHP, to host a UI for citizen botany.
- The MNPS website currently has an application to create forms. A website user can enter information into the form where the data gets stored into a CSV file, which then could be uploaded into a database. Therefore, a Citizen Botany Application form can be designed and hosted on the current website. This form would allow potential volunteers to apply for the citizen botany program.
- Tracking 'follow-up information' with the volunteer and their applicant is a little more problematic with the current capabilities of the MNPS website. When a person completes a form a ENTRY NUMBER/ID is generated; this could be used to link different forms together
- The MNPS website stores data. It is unknown if there are analytical tools available.

II. The MTNHP has funding from the USFS for Kenda to develop or to assist the MNPS webmaster in developing a Citizen Botany application form and to develop a static informational webpage.

III. If MTNHP-MNPS moves forward with a joint citizen botany program then website discussion topics include:
   - What entity should host a website UI? MTNHP, MNPS, or should a Citizen Botany Program fund and create its own website?
   - Can Kenda and Carol in fall 2024 design a Citizen Botany application form and a draft static webpage about the program?
   - Hosting location of the *Vascular Plant SO Revisit Spreadsheet* on Google Drive, including MNPS-MTNHP workflow process to updating spreadsheet data, etc.

4. **MTNHP and MNPS goals for a citizen botany program**, if continued:
   - Building the program to include more opportunities to assist federal and state agencies and NGOs. Other plant-focused tasks that can be led and managed by agency botanists and biologist and provide volunteer opportunities for Citizen Botanists include, but are not limited to: seed collecting, restoration/plant activities, specific plant monitoring, assisting herbaria.
   - Create targets for revisits on an annual basis, volunteer participation, citizen botanist enrollment, etc.

Funding Mechanisms

In our research to develop a Montana Citizen Botany Program, we have found that most citizen science programs rely on funding from multiple sources. This 3-year pilot study is no exception. Here, we outline how funding worked for the pilot study and where future sources for funding can be found.

Pilot Study Funding

From 2022 to 2024, the pilot study was made possible through funding from multiple sources (Table 12). Funding from each source was used to develop and test different components of the study. The MNPS initiated the study by contracting $5,000 to the MTNHP to fund Kenda in the role and responsibilities of Pilot Study Coordinator. Through a challenge cost share agreement, non-competitive funding was provided by the USFS-Region 1 to fund MTNHP to develop components of a citizen botany program in 2022. Additional funds were added to the agreement in 2023 and 2024. The Montana/Dakotas in most years provides funding opportunities through a competitive grant process. The MTNHP Botanist submitted a proposal to the Plant Conservation and Restoration Management competitive grant; funding was awarded in 2022 to lead and implement the 2-year pilot study. Of course, each Citizen Botanist contributes their own time and financial resources to study, prepare for, and conduct their plant SO revisit.

Table 12. ***Funding sources and amounts for the Citizen Botany Pilot Study from 2022 to 2024.***

Organization	Funding Provided by Year			Mechanism for Funding Study
	2022	2023	2024	
MNPS	$ 5,000			Contract between MNPS-MSL
MT/Dakotas BLM	$ 11,236			Competitive grant opportunity. Project Period: 5/9/2022 to 5/8/2025
USFS-Region 1	$ 5,000	$5,000	$10,000	Challenge Cost Share Agreement between USFS-Region 1 and MTNHP[1]
MTNHP	In-Kind	In-Kind	In-Kind	To primarily support work by Andrea and Braden.

[1] Funding from the USFS also required MTNHP to provide about $5,000 in matching funds from 2022 to 2024.

Funding A Montana Citizen Botany Program

There are many sources to fund citizen science programs. For a program that is jointly managed by a state agency and a non-profit organization, we believe that non-profits have more opportunities to acquire funding than state agencies. For example, non-profits can organize fund-raising campaigns where state agencies cannot.

Working collaboratively, there are many opportunities that could fund a sustainable citizen botany program now and into the future. Current and future funding sources – in no prioritized order – include, but are not limited to:

1. Montana Native Plant Society

A. Annual donation campaign to support an MNPS Citizen Botany Coordinator.

An annual strategic campaign to MNPS members and other conservation organizations that asks for contributions could bring in a significant amount of funding. In January 2022, Andrea presented on the Montana Citizen Botany framework through MNPS Presents! She received a tremendous amount of support including several Society members who wanted to financially contribute and knew they could not physically participate.

B. Budgeted Funding. An annual amount could be allocated to support the MNPS Citizen Botany Coordinator position or a Montana Citizen Botany Program. See Building a Sustainable Citizen Botany Program and Table 11.

2. Federal funding opportunities

A. USFS Challenge Cost Share Agreements. See also Table 11.

B. USFWS Section 6 Grant. This grant program is only to agencies with cooperative agreements in place with the U.S. Fish and Wildlife Service. Montana Fish, Wildlife & Parks and the MTNHP have cooperative agreements with the USFWS. Funds can only be spent on Endangered Species Act listed, proposed, or candidate species. This funding source would not fund annual citizen science work, but it could fund specific projects involving a citizen science program and monitoring of eligible species.

C. MT/Dakotas BLM Funding Opportunities. The BLM offers annual grants for funding on a competitive basis in most years. Any state, non-profit, and non-governmental organization can submit proposals for funding. The Notice Of Funding Opportunities (NOFO) is advertised through Grants.gov, GrantSolutions.gov, and likely other sources. In 2022 one of these opportunities funded the Montana Citizen Botany Pilot Study.

D. Participatory Science Project Grants

Several federal agencies have competitive grants geared towards participatory science (or citizen science). These grants likely fund special needs, equipment, or specific projects as opposed to providing annual revenue for an existing program. Our citizen botany program would qualify for this type of funding. They include, but are not limited to:

- *US Forest Service*
  https://www.fs.usda.gov/working-with-us/citizen-science/competitive-funding-program
- *Environmental Protection Agency, USFS, & National Science Foundation*
  https://www.epa.gov/participatory-science/funding-opportunities-participatory-science-projects

3. Montana State Wildlife Action Plan

A major goal of the *Montana Native Plant Conservation Strategy for Vascular Plants and Habitats of Greatest Conservation Need* is to get the list of 109 Vascular Plants of Greatest Conservation Need into the 2025 revision of the State Wildlife Action Plan (Montana SWAP). If achieved, Montana would be in position to receive federal funding for native plant conservation if Congress passes the Recovering America's Wildlife Act (RAWA) bill. This bill has been introduced annually into Congress with significant support. If passed, funding for plant conservation would be allocated to the states that have plants in their SWAP. This serves as a potential future source of funding for a Montana Citizen Botany Program.

4. Private Funding Partners

Many recreational and outdoor private companies have grants to support people getting outside, recreating, and volunteering in the outdoors. Examples include North Face, REI, Patagonia, and many others. These sources of funding need to be researched as grants and funding opportunities can come and go. There could also be opportunities to get financial support from the outdoor industry with local business and companies in Montana.

5. Association for Advancing Participatory Sciences

There is an organization to help organizations build community-science, citizen science, and volunteer-based monitoring and research. This organization and its website should be examined further as a means to garner more support and tools to build Montana's citizen botany program.

- Association for Advancing Participatory Sciences: https://participatorysciences.org/

6. Are you aware of our potential sources for funding a Montana Citizen Botany Program?

APPENDIX A

Species Revisit Checklist

An Analysis for the Montana Citizen Botany Pilot Study

Table A-1. ***The 206 Vascular Plant Species Occurrences that were selected from 2022 to 2024 for a revisit and resultant outcome. Data with bolded text were categorized as agency priority. Data with red-colored text and some black-colored text are provisional at the time this report was produced. All data is being reviewed by the MTNHP botany program.***

Land Ownerships	Land Managing Agency	Local Manager	COUNTY	Scientific Name	original SO_ID	Updated SO ID If applicable	Last Observation Date	Site visit year	REVISIT	revisit-other
Federal	MT/Dakotas BLM	Billings FO	Carbon	Astragalus geyeri		2330356		2023	Successful Revisit	positive observation reported
Federal	MT/Dakotas BLM	Billings FO	Carbon	Cleome lutea	5000776		6/10/1991	2023	Successful Revisit	negative observation reported
Federal	MT/Dakotas BLM	Billings FO	Carbon	Mentzelia pumila	3615	2330386	6/10/1991	2023	Successful Revisit	positive observation reported
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**	**3553**			**2024**	**Successful Revisit**	**positive observation reported**
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**	**3968**			**2024**	**Successful Revisit**	**positive observation reported**
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**	**5924**			**2024**	**Successful Revisit**	**positive observation reported**
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**	**6410**	**5003325**	**8/12/1995**	**2023**	**Successful Revisit**	**positive observation reported**
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**	**6412**			**2024**	**Successful Revisit**	**positive observation reported**
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**	**6413**			**2024**	**Successful Revisit**	**positive observation reported**
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**	**6414**			**2024**	**Successful Revisit**	**positive observation reported**
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**	**286960**			**2024**	**Successful Revisit**	**positive observation reported**
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**	**5001718**			**2024**	**Successful Revisit**	**positive observation reported**
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**	**5001720**			**2024**	**Successful Revisit**	**positive observation reported**
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**	**5001948**			**2024**	**Successful Revisit**	**negative observation reported**
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**	**5003325**			**2024**	**Successful Revisit**	**positive observation reported**
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**				**2024**	**NA**	**NEW SO: pending review**
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**				**2024**	**NA**	**NEW SO: pending review**
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**				**2024**	**NA**	**NEW SO: pending review**
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**				**2024**	**NA**	**NEW SO: pending review**
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**				**2024**	**NA**	**NEW SO: pending review**
Federal	**MT/Dakotas BLM**	**Billings FO**	**Carbon**	**Pyrrocoma carthamoides var. subsquarrosa**				**2024**	**NA**	**NEW SO: pending review**
Federal	MT/Dakotas BLM	Billings FO	Carbon	Shoshonea pulvinata	232487			2024	Successful Revisit	negative observation reported
Federal	MT/Dakotas BLM	Billings FO	Carbon	Shoshonea pulvinata	232488			2024	Successful Revisit	negative observation reported
Federal	MT/Dakotas BLM	Billings FO	Carbon	Shoshonea pulvinata	5001363			2024	Successful Revisit	positive observation reported
Federal	**MT/Dakotas BLM**	**Dillon FO**	**Beaverhead**	**Astragalus scaphoides**	**6539**	**5003332**	**7/9/1983**	**2023**	**Successful Revisit**	**positive observation reported**
Federal	**MT/Dakotas BLM**	**Dillon FO**	**Beaverhead**	**Astragalus scaphoides**	**6556**	**5003332**	**6/22/1986**	**2023**	**Successful Revisit**	**positive observation reported**
Federal	MT/Dakotas BLM	Dillon FO	Beaverhead	Astragalus scaphoides	5003333	5003333		2023	Successful Revisit	positive observation reported
Federal	MT/Dakotas BLM	Dillon FO	Beaverhead	Astragalus scaphoides	5003334	5003334		2023	Successful Revisit	positive observation reported
Federal	MT/Dakotas BLM	Dillon FO	Beaverhead	Delphinium bicolor ssp. calcicola		2330372		2023	Successful Revisit	positive observation reported
Federal	MT/Dakotas BLM	Dillon FO	Beaverhead	Delphinium bicolor ssp. calcicola		2330363		2023	Successful Revisit	positive observation reported
Federal	MT/Dakotas BLM	Dillon FO	Jefferson	Erigeron parryi	7491		6/2/1993	2024	Successful Revisit	positive observation reported
Federal	MT/Dakotas BLM	Dillon FO	Jefferson	Erigeron parryi	NEW SO	NEW SO		2024	NA	NEW SO: pending review
Federal	MT/Dakotas BLM	Dillon FO	Beaverhead	Lomatium attenuatum		2330327		2023	Successful Revisit	positive observation reported
Federal	MT/Dakotas BLM	Dillon FO	Carbon	Malacothrix torreyi		2330411		2023	Successful Revisit	positive observation reported
Federal	MT/Dakotas BLM	Dillon FO	Beaverhead	Phacelia incana		2330383		2023	Successful Revisit	positive observation reported
Federal	MT/Dakotas BLM	Dillon FO	Beaverhead	Physaria pulchella		2330368		2023	Successful Revisit	negative observation reported
Federal	MT/Dakotas BLM	Dillon FO	Beaverhead	Physaria pulchella		2330345		2023	Successful Revisit	positive observation reported
Federal	MT/Dakotas BLM	Dillon FO	Madison	Pleiacanthus spinosus	5000780		8/31/1995	2023	Successful Revisit	positive observation reported
Federal	MT/Dakotas BLM	Dillon FO	Madison	Primula incana	7997	5003148	8/28/1998	2023	Successful Revisit	positive observation reported
Federal	MT/Dakotas BLM	Dillon FO	Beaverhead	Sphaeromeria argentea	6602	5003345		2023	Successful Revisit	positive observation reported
Federal	MT/Dakotas BLM	Lewistown Field Office	Cascade	Mimulus ringens	7893	5003324	9/4/2000	2023	Successful Revisit	positive observation reported
Federal	MT/Dakotas BLM	Malta FO	Phillips	Elodea bifoliata	7237		6/27/1988	2023	Attempted Revisit	Due to SO found but survey not conducted
Federal	MT/Dakotas BLM	Malta FO	Phillips	Plagiobothrys leptocladus	3641		6/30/1997	2023	Successful Revisit	negative observation reported
Federal	**MT/Dakotas BLM**	**Malta FO**	Phillips	**Psilocarphus brevissimus**	10512		6/25/1988	2023	Successful Revisit	negative observation reported
Federal	**MT/Dakotas BLM**	**Malta FO**	Petroleum	**Psilocarphus brevissimus**	10513		7/8/1997	2023	Successful Revisit	negative observation reported
Federal	MT/Dakotas BLM	Malta FO	Carter	Quercus macrocarpa	5001984		7/12/1996	2023	Attempted Revisit	Due to not able to access
Federal	MT/Dakotas BLM	Malta FO	Phillips	Senecio integerrimus var. scribneri				2024	Attempted Revisit	negative observation reported

Federal	MT/Dakotas BLM	Miles City FO	Rosebud	Astragalus barrii	5001372	2330359	6/10/1997	2023	Successful Revisit	positive observation reported
Federal	MT/Dakotas BLM	Miles City FO	Golden Valley	Pediomelum hypogaeum var. hypogaeum	3771		7/7/1997	2024	Successful Revisit	positive observation reported
Federal	**MT/Dakotas BLM**	**Missoula FO**	**Missoula**	**Grindelia howellii**	**7466**		**8/4/1986**	**2023**	**Successful Revisit**	**negative observation reported**
Federal	National Park Service	Big Hole Battlefield	Beaverhead	Pedicularis contorta var. ctenophora	5000934	2330382	7/6/1981	2023	Successful Revisit	positive observation reported
Federal	National Park Service	Glacier National Park	Flathead	Corydalis sempervirens		5003306		2022	Successful Revisit	Positive observation reported
Federal	National Park Service	Glacier National Park	Glacier	Euphrasia subarctica	1426	5003330	8/22/1984	2023	Successful Revisit	positive observation reported
Federal	National Park Service	Glacier National Park	Glacier	Festuca viviparoidea	8233		8/22/1984	2023	Successful Revisit	negative observation reported
Federal	National Park Service	Glacier National Park	Flathead	Lobelia kalmii	274665	5003327	8/9/1986	2023	Successful Revisit	negative observation reported
Federal	National Park Service	Glacier National Park	Glacier	Papaver pygmaeum	10837	5003342	7/26/1994	2023	Successful Revisit	positive observation reported
Federal	National Park Service	Glacier National Park	Glacier	Tofieldia pusilla	1429		8/22/1984	2023	Successful Revisit	positive observation reported
Federal	National Park Service	Yellowstone National Park	Park	Tetradymia spinosa	284120		8/24/1995	2023	Attempted Revisit	Due to not able to access
Federal	US Army Corps of Engineers	Kootenai NF	Lincoln	Cypripedium parviflorum	10695	5003305	5/28/1995	2023	Successful Revisit	positive observation reported
Federal	US Bureau of Reclamation		Lewis and Clark	Downingia laeta	7143	5003309	6/29/1988	2023	Successful Revisit	positive observation reported
Federal	US Department of Agriculture	Fort Keogh Livestock Research S.	Custer	Penstemon grandiflorus	5001454		8/28/1996	2023	Not Revisited	not revisited
Federal	US Fish and Wildlife Service	Lee Metcalf Wildlife Refuge	Ravalli	Najas guadalupensis	9153		8/26/1987	2023	Attempted Revisit	Due to not able to access
Federal	US Forest Service	Beaverhead-Deerlodge NF	Jefferson	Adoxa moschatellina	5000721		7/6/1998	2023	Not Revisited	not revisited
Federal	US Forest Service	Beaverhead-Deerlodge NF	Beaverhead	Allotropa virgata	5001432	2330346	8/20/1991	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Beaverhead-Deerlodge NF	Gallatin	Balsamorhiza macrophylla	5001382		8/12/1995	2023	Not Revisited	not revisited
Federal	US Forest Service	Beaverhead-Deerlodge NF	Gallatin	Balsamorhiza macrophylla	5001385		8/12/1995	2023	Not Revisited	not revisited
Federal	US Forest Service	Beaverhead-Deerlodge NF	Gallatin	Balsamorhiza macrophylla	5001386		8/12/1995	2023	Not Revisited	not revisited
Federal	**US Forest Service**	**Beaverhead-Deerlodge NF**	**Beaverhead**	**Boechera fecunda**	**5076**		**6/7/1989**	**2023**	**Not Revisited**	**not revisited**
Federal	US Forest Service	Beaverhead-Deerlodge NF	Granite	Drosera anglica	538379	5003072	8/16/1990	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Beaverhead-Deerlodge NF	Beaverhead	Lomatium attenuatum	10277	2330342	6/2/1982	2023	Successful Revisit	positive observation reported
Federal	**US Forest Service**	**Beaverhead-Deerlodge NF**	**Deer Lodge**	**Micranthes tempestiva**	**5000650**	**2330388**	**7/21/1974**	**2023**	**Successful Revisit**	**positive observation reported**
Federal	**US Forest Service**	**Beaverhead-Deerlodge NF**	**Beaverhead**	**Mimulus primuloides**	**9074**	**5003170**	**7/15/1987**	**2023**	**Successful Revisit**	**positive observation reported**
Federal	US Forest Service	Bitterroot NF	Ravalli	Ageratina occidentalis	7443	5002079	7/18/1995	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Bitterroot NF	Ravalli	Ageratina occidentalis	7444	5002079	7/18/1995	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Bitterroot NF	Ravalli	Allium acuminatum	NEW SO	2341878	7/7/1976	2024	NA	NEW SO: pending review
Federal	**US Forest Service**	**Bitterroot NF**	**Ravalli**	**Allium parvum**	**3391**	**5003346**	**6/14/1993**	**2023**	**Successful Revisit**	**positive observation reported**
Federal	**US Forest Service**	**Bitterroot NF**	**Ravalli**	**Allium parvum**	**4543**		**5/22/1983**	**2023**	**Not Revisited**	**not revisited**
Federal	US Forest Service	Bitterroot NF	Ravalli	Allotropa virgata	5001702		8/28/1991	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Bitterroot NF	Sanders	Alnus rubra	286470		9/23/1998	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Bitterroot NF	Sanders	Berberis nervosa	272173	2330395	7/30/2001	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Bitterroot NF	Ravalli	Drosera anglica	5001455	5001455	7/14/1978	2023	Successful Revisit	positive observation reported
Federal	**US Forest Service**	**Bitterroot NF**	**Ravalli**	**Mimulus nanus**	**7886**		**6/17/1993**	**2024**	**Attempted Revisit**	**negative observation reported**
Federal	**US Forest Service**	**Bitterroot NF**	**Ravalli**	**Mimulus primuloides**	**286755**	**2330325**	**7/28/1984**	**2023**	**Successful Revisit**	**positive observation reported**
Federal	US Forest Service	Bitterroot NF	Ravalli	Mimulus primuloides		2331968	7/14/1978	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Bitterroot NF	Ravalli	Mimulus primuloides		2331961	7/14/1978	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Bitterroot NF	Ravalli	Pedicularis contorta var. rubicunda	5311	5003317	7/26/1979	2023	Successful Revisit	positive observation reported
Federal	**US Forest Service**	**Bitterroot NF**	**Ravalli**	**Penstemon lemhiensis**	**3093**	**5003344**	**6/29/1989**	**2023**	**Successful Revisit**	**positive observation reported**
Federal	**US Forest Service**	**Bitterroot NF**	**Ravalli**	**Penstemon lemhiensis**	**3103**	**5003316**	**8/30/1994**	**2023**	**Successful Revisit**	**positive observation reported**
Federal	US Forest Service	Bitterroot NF	Ravalli	Penstemon payettensis	9630			2024	Successful Revisit	positive observation reported
Federal	US Forest Service	Bitterroot NF	Ravalli	Penstemon payettensis	9631			2024	Successful Revisit	positive observation reported
Federal	US Forest Service	Bitterroot NF	Ravalli	Penstemon payettensis	9632			2024	Successful Revisit	negative observation reported
Federal	US Forest Service	Bitterroot NF	Ravalli	Penstemon payettensis	9635			2024	Successful Revisit	negative observation reported
Federal	**US Forest Service**	**Bitterroot NF**	**Ravalli**	**Tonestus aberrans**	**5000713**	**5000713**	**7/30/1990**	**2023**	**Successful Revisit**	**positive observation reported**
Federal	**US Forest Service**	**Bitterroot NF**	**Ravalli**	**Trifolium eriocephalum**	**5000860**	**5000860**	**7/6/2001**	**2023**	**Successful Revisit**	**positive observation reported**
Federal	**US Forest Service**	**Bitterroot NF**	**Ravalli**	**Trifolium gymnocarpon**	**5001303**	**5003128**	**6/28/1990**	**2023**	**Successful Revisit**	**positive observation reported**

Federal	**US Forest Service**	**Bitterroot NF**	**Granite**	**Trifolium gymnocarpon**	**5001716**		**4/20/2000**	**2023**	**Not Revisited**	**not revisited**
Federal	US Forest Service	Custer-Gallatin NF	Carter	Asclepias ovalifolia	4742	2330387	7/2/1994	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Custer-Gallatin NF	Powder River	Astragalus barrii	5879		5/14/1988	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Custer-Gallatin NF	Powder River	Astragalus barrii	5001452	**2330336**	5/23/1995	2023	Successful Revisit	negative observation reported
Federal	US Forest Service	Custer-Gallatin NF	Gallatin	Balsamorhiza macrophylla	5001384		8/12/1995	2023	Not Revisited	not revisited
Federal	**US Forest Service**	**Custer-Gallatin NF**	**Park**	**Castilleja exilis**	**5000704**	**5003278**	**5/12/1998**	**2023**	**Successful Revisit**	**positive observation reported**
Federal	US Forest Service	Custer-Gallatin NF	Gallatin	Castilleja gracillima	5001764	5003336	7/10/1993	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Custer-Gallatin NF	Gallatin	Castilleja gracillima	5001765	5003336	7/10/1993	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Custer-Gallatin NF	Gallatin	Castilleja gracillima	5001766	5003336	7/10/1993	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Custer-Gallatin NF	Gallatin	Castilleja gracillima	5001767	5003336	7/10/1993	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Custer-Gallatin NF	Carbon	Koenigia islandica	5001369	2330406	8/5/1993	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Custer-Gallatin NF	Park	Polygonum austiniae	5000875		8/5/1995	2023	Not Revisited	not revisited
Federal	**US Forest Service**	**Custer-Gallatin NF**	**Gallatin**	**Sidalcea oregana**	**5002042**	**5002042**	**8/17/1993**	**2023**	**Successful Revisit**	**positive observation reported**
Federal	**US Forest Service**	**Custer-Gallatin NF**	**Park**	**Tetradymia spinosa**	**NEW SO**	**2330374**	**5/22/1983**	**2023**	**NA**	**NEW SO RECORDED**
Federal	US Forest Service	Flathead NF	Flathead	Bidens beckii	6733		8/18/1998	2023	Successful Revisit	negative observation reported
Federal	**US Forest Service**	**Flathead NF**	**Lincoln**	**Corydalis sempervirens**	**1249**		**8/9/1995**	**2023**	**Not Revisited**	**not revisited**
Federal	US Forest Service	Flathead NF	Missoula	Cypripedium parviflorum	526	5003348	7/14/1993	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Flathead NF	Missoula	Cypripedium parviflorum	553	5003350	8/8/1995	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Flathead NF	Lake	Cypripedium parviflorum	10610	5003339	5/30/1991	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Flathead NF	Lake	Cypripedium parviflorum	5000712	5000712	6/26/1991	2023	Successful Revisit	negative observation reported
Federal	US Forest Service	Flathead NF	Lake	Cypripedium passerinum	620		6/20/1991	2023	Successful Revisit	negative observation reported
Federal	US Forest Service	Flathead NF	Flathead	Drosera anglica	7173	5003074	7/7/1988	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Flathead NF	Lake	Drosera anglica	238354	5003069	7/7/1987	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Flathead NF	Flathead	Drosera anglica	538402		7/27/1973	2023	Attempted Revisit	Due to SO found but survey not conducted
Federal	US Forest Service	Flathead NF	Lake	Dryopteris cristata	150		9/10/1998	2023	Not Revisited	not revisited
Federal	US Forest Service	Flathead NF	Lake	Dryopteris cristata	151		9/10/1998	2023	Not Revisited	not revisited
Federal	US Forest Service	Flathead NF	Flathead	Gaultheria ovatifolia	147559		7/12/1986	2023	Attempted Revisit	Due to not able to access
Federal	US Forest Service	Flathead NF	Flathead	Geocaulon lividum	160793		6/25/1984	2023	Successful Revisit	negative observation reported
Federal	**US Forest Service**	**Flathead NF**	**Flathead**	**Lycopodium inundatum**	**495**	**5003310**	**6/29/1994**	**2023**	**Successful Revisit**	**positive observation reported**
Federal	US Forest Service	Flathead NF	Flathead	Petasites frigidus var. frigidus	512	5003328	7/11/1997	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Judith Basin	Agoseris aurantiaca var. carnea	48362	5003197	7/23/1996	2024	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Meagher	Agoseris aurantiaca var. carnea	48369		8/6/1990	2024	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Meagher	Agoseris aurantiaca var. carnea	48370	5003335	8/20/1992	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Meagher	Agoseris aurantiaca var. carnea	48371	5003335	8/20/1992	2024	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Judith Basin	Agoseris aurantiaca var. carnea	5003197	5003197	7/23/1996	2024	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Judith Basin	Agoseris aurantiaca var. carnea	5003198	5003198	7/19/1991	2024	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Judith Basin	Aquilegia brevistyla	4683	2330377	7/2/1991	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Judith Basin	Aquilegia brevistyla	4731	2330326	7/16/1996	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Lewis and Clark	Cardamine rupicola	3327	5003275	8/1/1979	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Meagher	Cirsium longistylum	285	5002223	7/15/1992	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Meagher	Cirsium longistylum	785	5003064	7/15/1992	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Meagher	Cirsium longistylum	805	5002220	7/15/1992	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Broadwater	Cirsium longistylum	818	5003363	9/7/2001	2023	Successful Revisit	negative observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Meagher	Cirsium longistylum	7009	5001737	8/19/1992	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Meagher	Cirsium longistylum	11124	5002223	7/28/1992	2023	Successful Revisit	negative observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Meagher	Cirsium longistylum	NEW SO	2307037		2023	NA	NEW SO RECORDED
Federal	US Forest Service	Helena Lewis & Clark NF	Lewis and Clark	Cypripedium parviflorum	10623	5003347	6/18/1991	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Meagher	Goodyera repens	9558	5001677	9/5/1991	2024	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Flathead	Goodyera repens	1497743		8/6/1986	2023	Attempted Revisit	Due to not able to access
Federal	US Forest Service	Helena Lewis & Clark NF	Judith Basin	Goodyera repens	5001484	5001484	12/31/1995	2023	Successful Revisit	positive observation reported

Federal	US Forest Service	Helena Lewis & Clark NF	Judith Basin	Goodyera repens	5001485		12/31/1995	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Judith Basin	Goodyera repens	5001623		9/12/1994	2024	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Wheatland	Goodyera repens	5001626	5001624	12/31/1995	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Judith Basin	Goodyera repens	5001677		8/25/1995	2024	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Judith Basin	Goodyera repens	5001736	5001736	8/20/1993	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Wheatland	Goodyera repens	5001779		12/31/1995	2024	Successful Revisit	positive observation reported
Federal	US Forest Service	Helena Lewis & Clark NF	Lewis and Clark	Lilium philadelphicum	1432427		8/17/1995	2023	Attempted Revisit	Due to not able to access
Federal	US Forest Service	Kootenai NF	Lincoln	Clarkia rhomboidea	7044	5003337	7/11/1995	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Kootenai NF	Lincoln	Clarkia rhomboidea	7045	5001706	7/11/1995	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Kootenai NF	Lincoln	Clarkia rhomboidea	7046	5003338	7/11/1995	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Kootenai NF	Lincoln	Cypripedium parviflorum	538686	5003008	5/27/1989	2023	Successful Revisit	negative observation reported
Federal	US Forest Service	Kootenai NF	Lincoln	Cypripedium parviflorum	2187878	2187878		2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Kootenai NF	Lincoln	Cypripedium parviflorum	5000733		5/26/1995	2024	Successful Revisit	positive observation reported
Federal	US Forest Service	Kootenai NF	Lincoln	Cypripedium parviflorum	5001411	5000733	5/30/1991	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Kootenai NF	Lincoln	Cypripedium passerinum	8139			2024	Successful Revisit	negative observation reported
Federal	US Forest Service	Kootenai NF	Lincoln	Drosera anglica	7183		9/8/1997	2023	Not Revisited	not revisited
Federal	US Forest Service	Kootenai NF	Lincoln	Drosera anglica	538390	5003075	6/25/1988	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Kootenai NF	Lincoln	Dryopteris cristata	7209	2330396	6/23/1997	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Kootenai NF	Lincoln	Lilium columbianum	272124	2330354	6/26/1986	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Kootenai NF	Lincoln	Lilium columbianum	NEW SO	5003318		2023	NA	NEW SO RECORDED
Federal	US Forest Service	Kootenai NF	Lincoln	Lomatium geyeri	10280	2187853	4/22/1998	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Kootenai NF	Lincoln	Lomatium geyeri	10333		5/3/1995	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Kootenai NF	Lincoln	Lomatium geyeri	10335		5/3/1995	2024	Not Revisited	not revisited
Federal	US Forest Service	Kootenai NF	Lincoln	Lycopodium dendroideum	10402		10/1/1996	2023	Not Revisited	not revisited
Federal	US Forest Service	Kootenai NF	Lincoln	Phegopteris connectilis	226214	5001228	9/20/1996	2023	Successful Revisit	positive observation reported
Federal	**US Forest Service**	**Lolo NF**	**Mineral**	**Cypripedium fasciculatum**	**9199**		**9/21/1993**	**2023**	**Successful Revisit**	**negative observation reported**
Federal	US Forest Service	Lolo NF	Missoula	Dryopteris cristata	538559	5003340	9/25/1991	2023	Successful Revisit	positive observation reported
Federal	US Forest Service	Lolo NF	Mineral	Gaultheria ovatifolia	NEW SO	NEW SO		2024	NA	NEW SO: pending review
Federal	US Forest Service	Lolo NF	Mineral	Gaultheria ovatifolia	NEW SO	NEW SO		2024	NA	NEW SO: pending review
Federal	**US Forest Service**	**Lolo NF**	**Missoula**	**Grindelia howellii**	**5002107**		**8/2/1989**	**2023**	**Successful Revisit**	**negative observation reported**
Federal	**US Forest Service**	**Lolo NF**	**Missoula**	**Mertensia bella**	**5002123**	**5002123**	**6/13/1994**	**2023**	**Successful Revisit**	**positive observation reported**
Federal	**US Forest Service**	**Lolo NF**	**Missoula**	**Mertensia bella**	**5002124**	**5002123**	**6/13/1994**	**2023**	**Successful Revisit**	**positive observation reported**
Federal	**US Forest Service**	**Lolo NF**	**Missoula**	**Mertensia bella**	**5002125**	**5002123**	**6/13/1994**	**2023**	**Successful Revisit**	**positive observation reported**
Federal	US Forest Service	Lolo NF	Missoula	Mertensia bella	NEW SO	2330362		2023	NA	NEW SO RECORDED
Federal	US Forest Service	Lolo NF	Missoula	Pinguicula macroceras	NEW SO	NEW SO		2024	NA	NEW SO: pending review
Local	City Government	City of Helena	Lewis and Clark	Astragalus convallarius	5001591	2330391	6/20/1992	2023	Successful Revisit	positive observation reported
Local	City Government	City of Whitefish	Flathead	Cypripedium parviflorum	10605	5003349	5/27/1991	2023	Successful Revisit	positive observation reported
Local	County Government	Missoula County	Missoula	Impatiens aurella	554101		6/11/1976	2023	Attempted Revisit	Due to not able to access
State	**Montana Department of Corrections**		**Powell**	**Epipactis gigantea**	**7260**		**10/5/1989**	**2023**	**Successful Revisit**	**negative observation reported**
State	Montana Department of Transportation		Carbon	Asclepias incarnata	5001817	5001817	8/10/2000	2023	Successful Revisit	positive observation reported
State	Montana Fish, Wildlife and Parks	Polson Field Office	Sanders	Clarkia rhomboidea	5000754		6/8/1992	2023	Not Revisited	not revisited
State	Montana Fish, Wildlife and Parks	Polson Field Office	Lake	Nymphaea leibergii	9172	5002058	7/24/1985	2023	Successful Revisit	positive observation reported
State	Montana Fish, Wildlife and Parks	Polson Field Office	Flathead	Nymphaea leibergii	538799	5003331	7/29/1982	2023	Successful Revisit	positive observation reported
State	Montana Fish, Wildlife and Parks	Polson Field Office	Lake	Wolffia columbiana	5000773	2330337	7/1/1987	2023	Successful Revisit	positive observation reported
State	Montana State Trust Lands	Dillon Unit Office	Madison	Primula incana	4451	5003326	8/6/1996	2023	Successful Revisit	positive observation reported

State	Montana State Trust Lands	Dillon Unit Office	Beaverhead	Primula incana	8004	5003326	7/7/1986	2023	Successful Revisit	positive observation reported
State	Montana State Trust Lands	Glasgow Unit Office	Sheridan	Almutaster pauciflorus	11044	2330397	7/24/1998	2023	Successful Revisit	positive observation reported
State	Montana State Trust Lands	Glasgow Unit Office	Richland	Dalea villosa	3888		9/11/1979	2023	Successful Revisit	negative observation reported
State	Montana State Trust Lands	Glasgow Unit Office	Sheridan	Lobelia spicata	5001723		7/14/1999	2023	Successful Revisit	negative observation reported
State	Montana State Trust Lands	Glasgow Unit Office	Richland	Solidago ptarmicoides	4765		9/2/1979	2023	Successful Revisit	negative observation reported
State	Montana State Trust Lands	Kalispell Unit Office	Flathead	Bidens beckii	627	5003272	8/17/1985	2023	Successful Revisit	negative observation reported
State	Montana State Trust Lands	Libby Unit Office	Lincoln	Cypripedium passerinum	8143		6/26/2001	2023	Successful Revisit	negative observation reported
State	Montana State Trust Lands	Polson Field Office	Lake	Cypripedium parviflorum	245114	5003000	6/11/1990	2023	Successful Revisit	positive observation reported
State	Montana State Trust Lands	Polson Field Office	Lake	Liparis loeselii	5002349		7/14/1992	2023	Not Revisited	not revisited
State	Montana State Trust Lands	Polson Field Office	Lake	Potamogeton obtusifolius	10474		8/16/2000	2023	Not Revisited	not revisited
State	**Montana State Trust Lands**	**Stillwater State Forest**	**Flathead**	**Dryopteris cristata**				**2024**	**NA**	**NEW SO: pending review**
State	**Montana State Trust Lands**	**Stillwater State Forest**	**Flathead**	**Lobelia kalmii**				**2024**	**NA**	**NEW SO: pending review**
State	**Montana State Trust Lands**	**Stillwater Unit Office**	**Lincoln**	**Amerorchis rotundifolia**	**5003045**			**2024**	**Successful Revisit**	**positive observation reported**
State	**Montana State Trust Lands**	**Stillwater Unit Office**	**Lincoln**	**Cypripedium passerinum**	**5001331**			**2024**	**Successful Revisit**	**positive observation reported**
State	**Montana State Trust Lands**	**Stillwater Unit Office**	**Flathead**	**Drosera rotundifolia**				**2024**	**NA**	**NEW SO: pending review**
State	**Montana State Trust Lands**	**Stillwater Unit Office**	**Lincoln**	**Silene spaldingii**				**2024**	**NA**	**NEW SO: pending review**

APPENDIX B

Select Photographs, 2022 to 2024

An Analysis for the Montana Citizen Botany Pilot Study

Select Photographs from Citizen Botanists, 2022 - 2023

Photo 1. A Citizen Botanist searches for *Astragalus barrii* in SE MT. Photo Credit: Sara Maslen

Photo 2. A search of where *Cleome lutea* was once documented resulted in a negative find. Photo Credit: Jeff DiBeneditto.

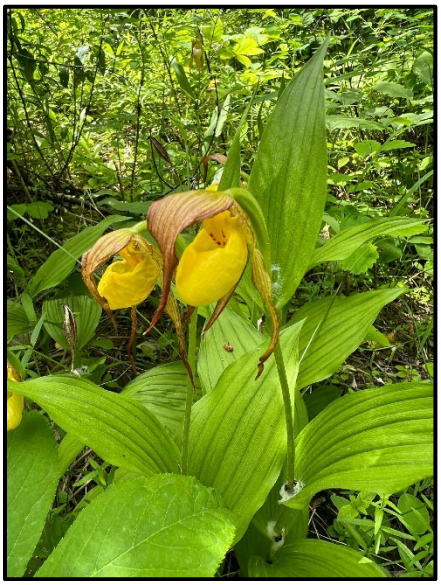


Photo 3. *Cypripedium parviflorum* was found in a forest opening. Photo Credit: Kim Lugthart

Photo 4. *Sidalcea oregana* is still present amongst the noxious weed *Leucanthemum vulgare*. Photo Credit: Henry Hardin

Photo 5. A Citizen Botanist finds *Penstemon lemhiensis* in SW MT. Photo Credit: Jill Davies

Photo 6. A Citizen Botanist documents a campsite within the the mapped SO for *Sidalcea oregana*. Photo Credit: Henry Hardin.

Photo 7. A search of where *Dalea villosa* was once documented resulted in a negative find. Photo Credit: Fraser Watson

Select Photographs from Citizen Botanists, 2022 - 2023

Photo 8. A Citizen Botanist recognizes the look-alike, *Dalea purpurea*.
Photo Credit: Fraser Watson

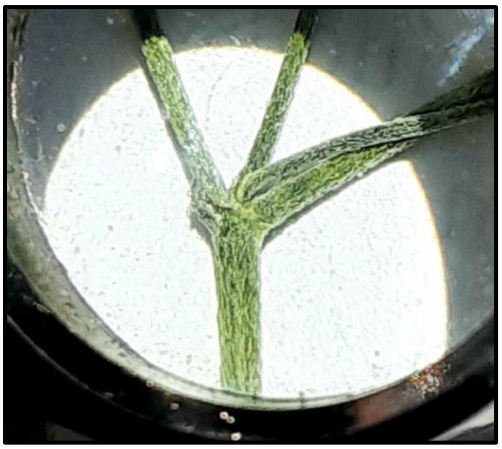


Photo 9. A Citizen Botanist examines the hair structures for *Astragalus convallarius*.
Photo Credit: Camie Westfall

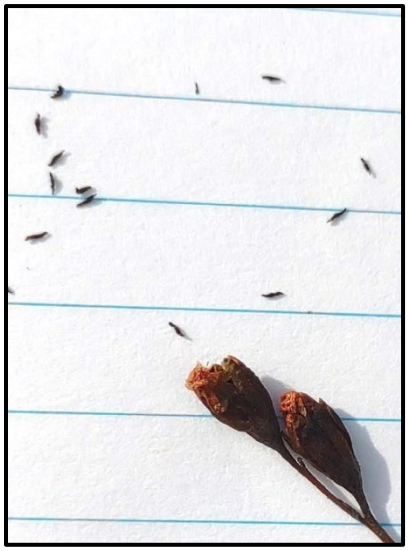


Photo 10. A Citizen Botanist examines the seed characteristics for *Drosera anglica*
Photo Credit: Mason Mara-Randazzo

Photos 11 and 12. A Citizen Botanist uses the information given her to thoroughly search for *Lobelia kalmii*. Alas, she shows her sadness at only finding a changed habitat. Photo Credits: Caroline Hill

Photo 13. A Citizen Botanist revisits the site in 2022 and 2023 And makes a closer examination to find *Nymphaea leibergii*.
Photo Credit: Kate Mostad

Photo 14. A Citizen Botanist photographs the sori to help verify the presence of *Phegopteris connectilis*.
Photo Credit: Edward Zyniecki

APPENDIX C

2022 Questionnaire

An Analysis for the Montana Citizen Botany Pilot Study

Montana Citizen Botany Pilot Study - Survey Version 1

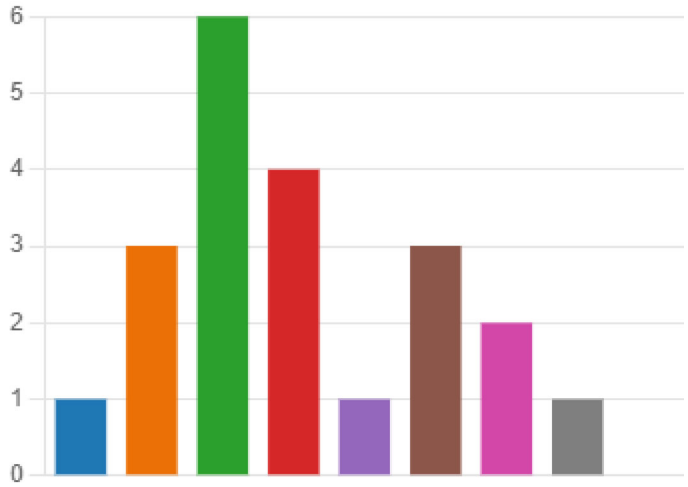
25	41:01	Active
Responses	Average time to complete	Status

1. In 2022 were you a Montana Native Plant Society member?

Yes	21
No	4
Unsure	0

2. If you were an MNPS member in 2022, what chapter or area did you affiliate with? Select one option.

Calypso Chapter	1
Clark Fork Chapter	3
Flathead Chapter	6
Kelsey Chapter	4
Maka Flora Chapter	1
Valley of Flowers Chapter	3
Eastern-At-Large area	2
Western-At-Large area	1
I do not know or have not select...	0



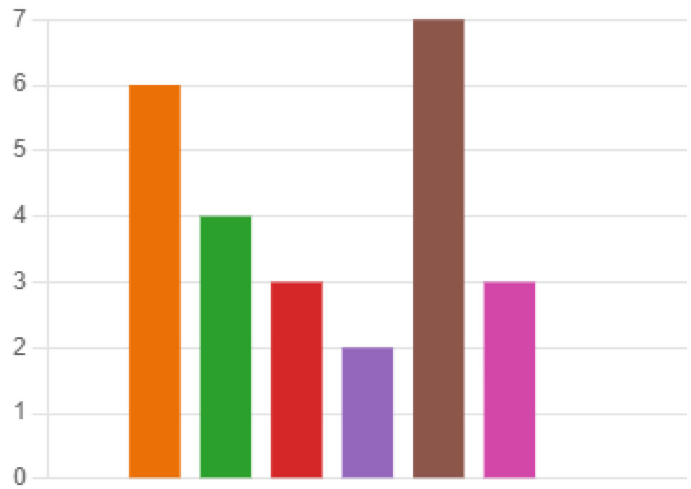
3. In what town do you reside? Also provide the state if your town is not in Montana.

25
Responses

Latest Responses
"*Polson*"
"*Bozeman*"
"*Troy*"

4. What is your age group?

21 or younger	0
22-29	6
30-39	4
40-49	3
50-59	2
60-69	7
70-79	3
80-89	0
90-99	0



5. How would you describe your plant identification skills. Select one.

BEGINNER: I have basic knowled...	2
LOW INTERMEDIATE	3
INTERMEDIATE: I know many pl...	8
HIGH INTERMEDIATE	5
ADVANCED: I am well-versed in ...	7

6. How would you describe your prior level of experience in conducting plant surveys? Select one.

BEGINNER: I attend group field ...	8
INTERMEDIATE: I have conducte...	6
ADVANCED: I have conducted e...	11

7. Was your participation in the Montana Citizen Botany Pilot Study strictly in an advisory role?

Yes, I strictly served in an adviso...	5
Yes, I served in an advisory capa...	3
No, I served in other aspects of ...	17

8. Prior to the decision for MNPS and MTNHP to jointly develop a Montana Citizen Botany Pilot Study, what was your attitude about using a citizen science approach to collect data on vascular plant SOC and PSOC.

Very unfavorable	0
Somewhat unfavorable	0
Neutral - neither favored or aga...	1
Mostly favorable	2
Highly favorable	2

9. The Montana Citizen Botany Pilot Study has completed its first year of implementation. Based on information you have gained, either directly or indirectly, what is your attitude towards the prospects of using a citizen science approach to collect data on vascular plant SOC and PSOC.

Very unfavorable	0
Somewhat unfavorable	0
Neutral - I need more informati...	1
Mostly favorable	1
Highly favorable	3

10. As we prepare an annual report for 2023 and two-year report by February 2024, are there specific topics, summaries, or metrics you would like to see in this report?

3
Responses

Latest Responses

11. Was your participation in the Montana Citizen Botany Pilot Study as a MNPS Chapter Coordinator?

Yes	7
No	13

12. Did you attend a workshop for Citizen Botany on either June 24 or 26 during the 2022 MNPS Annual Meeting?

Yes	9
No	11

13. Did you participate in the Montana Citizen Botany Pilot Study by attending at least one training through the Zoom platform?

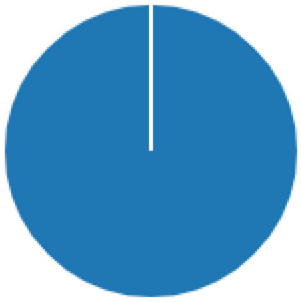
Yes, I attended at least one train...	19
No, I did not attend a training t...	1

14. Which Zoom trainings did you complete?

Part 1 only	1
Part 2 only	0
Both Parts 1 and 2	18

15. Zoom trainings were offered from 7:00pm to 8:30pm during the week. Did you find this time to be convenient or workable?

Yes	19
No	0



16. If the 7:00pm to 8:30pm training time was not convenient or workable, then please explain or provide ideas for how we can make improvements:

1
Responses

Latest Responses

17. Did you find the date of the training(s) in 2022 to be at an appropriate or useful time?

Yes	14
No	5

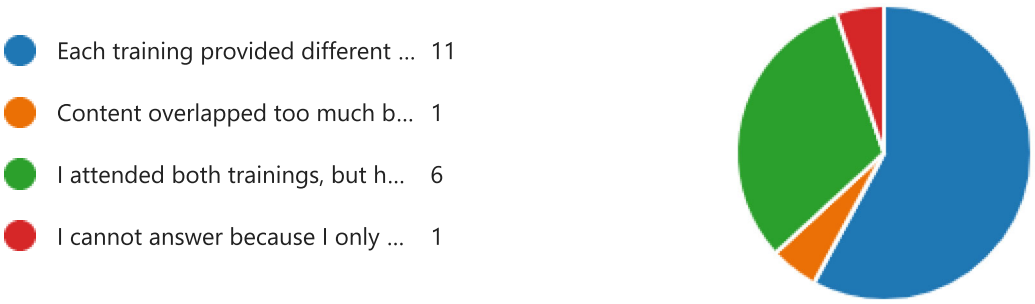
18. If the training date(s) was (were) not at an appropriate or helpful time period then please explain.

6
Responses

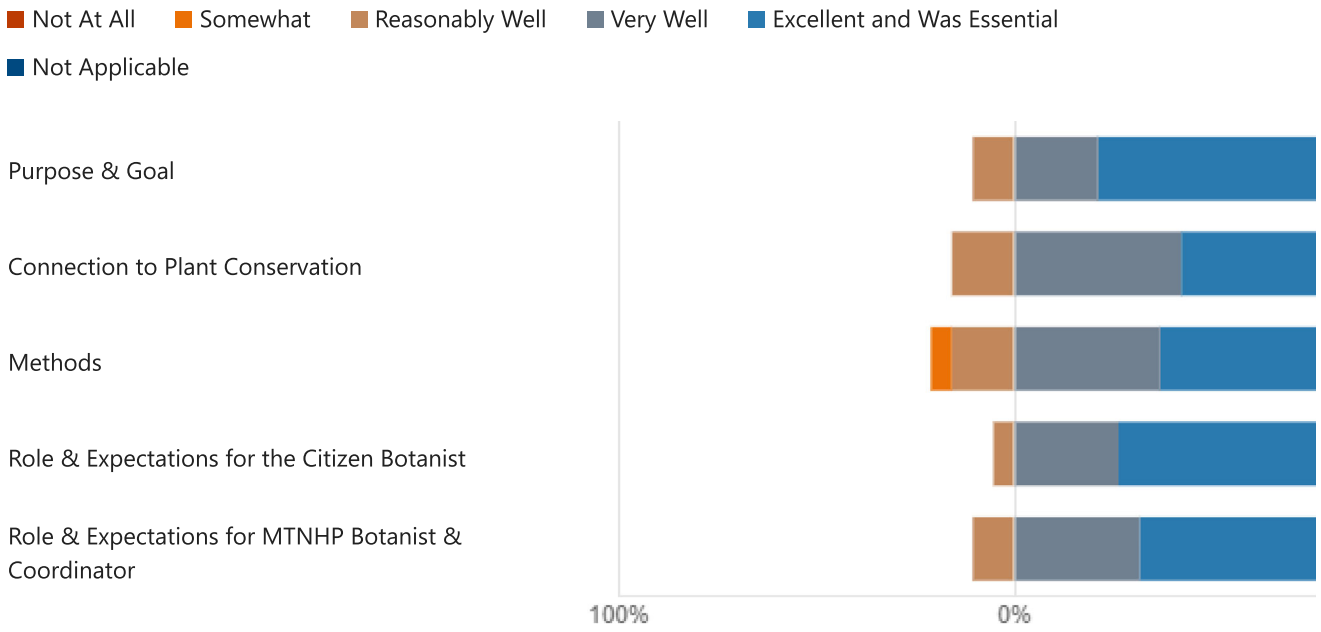
Latest Responses

"I think the trainings were a little too late in the year for partici...

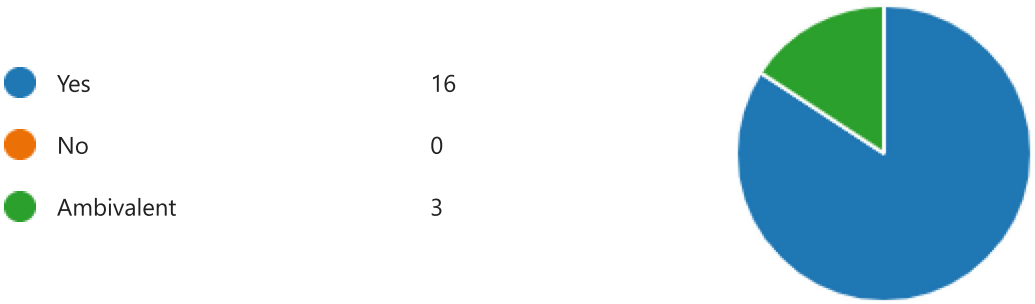
19. If you attended both Part 1 and Part 2 of the trainings, did you find their content to be distinct or to overlap?



20. How well did Part 1 and/or Part 2 trainings provide you with an understanding of the Montana Citizen Botany Pilot Study's:



21. Did you like that the trainings were offered through a Zoom platform?



22. Please provide any comments on what was helpful or informative from the trainings.

11
Responses

Latest Responses

"*Nice PowerPoint presentations!*"

"*Background info was solid. *"

23. Please provide any comment on what was confusing, unnecessary, or not helpful from the trainings.

11
Responses

Latest Responses

"*The first google sheets training was a little confusing, but I'm ...*

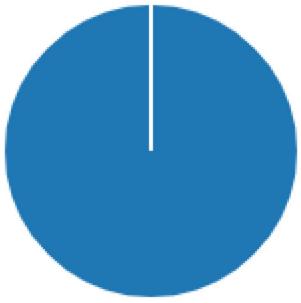
"*Less step by step on Survey 123 and more about the packet.*"

24. Were you given access to the 2022 SOC/PSOC Plant Revisit Site spreadsheet?

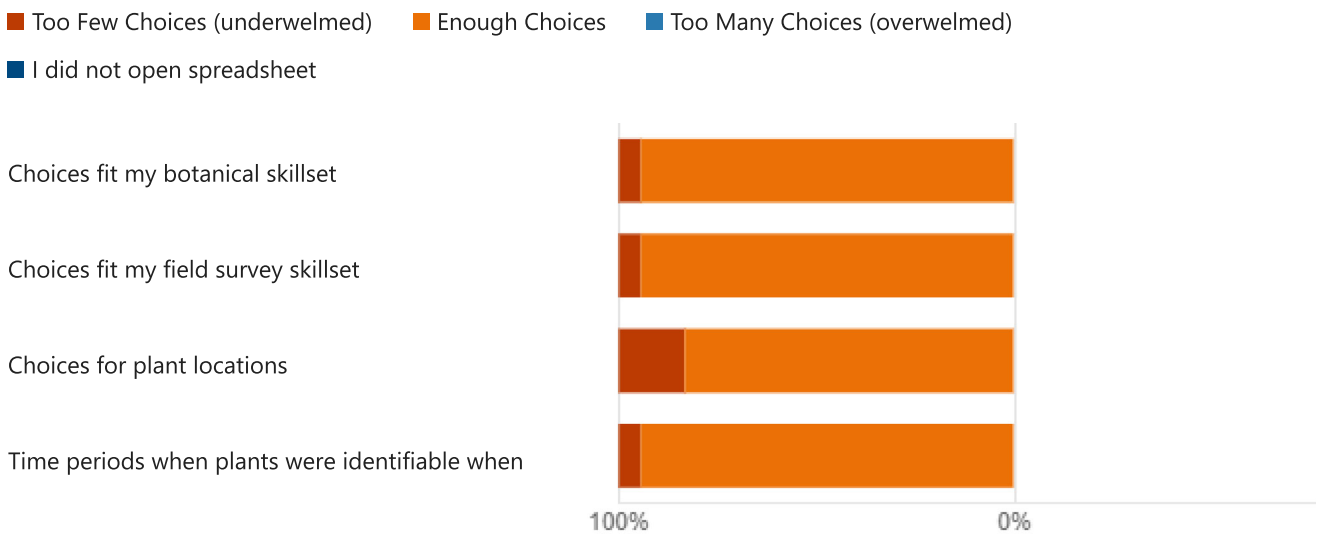
Yes, I got access	18
No, I did not get access	1

25. Did you attempt to access the spreadsheet and look at the information provided?

Yes, I was able to look at the dat...	18
No, I did not access and open t...	0



26. 2022 SOC/PSOC Plant Revisit Site spreadsheet. Did you find plants that fit your botanical and field skillsets, geographical area of interest, and timeframe for conducting a revisit? Please rate the following components regardless if you did or did not attempt a revisit in 2022.



27. If you did not have an appropriate array of choices then please explain what was lacking.

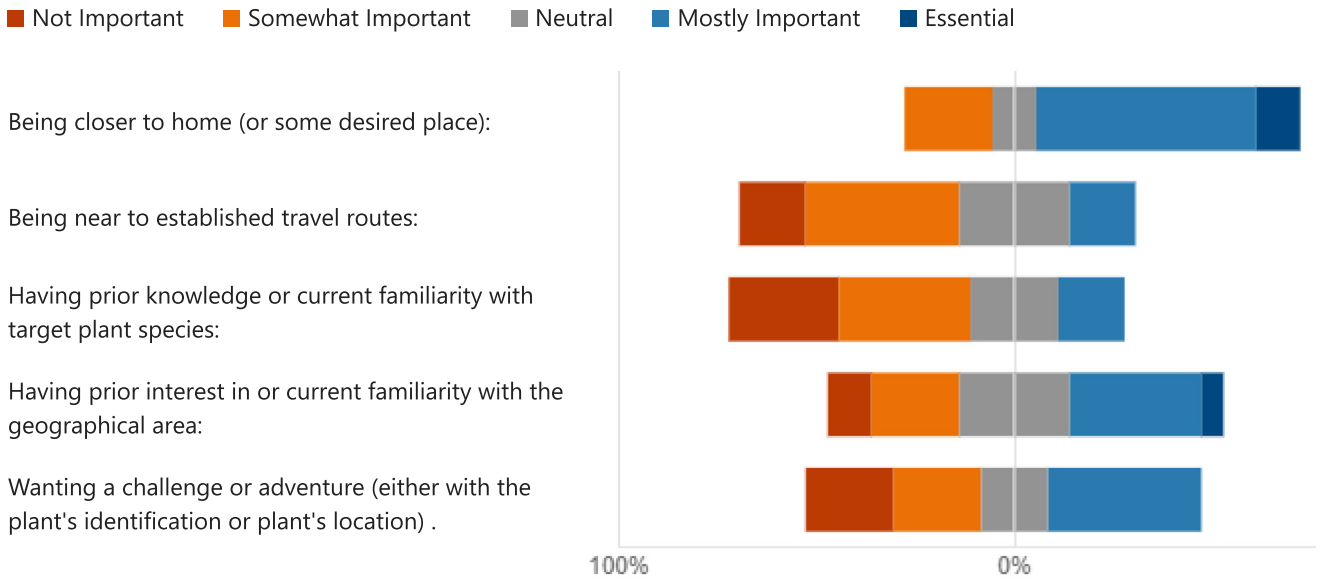
7
Responses

Latest Responses

"I thought there would be a lot of people participating in Boze...

28. Did you select at least one target plant from the 2022 SOC/PSOC Revisit Site spreadsheet?

29. Rate the importance of the criteria you used to selecting (a) target plant occurrence(s) to revisit. Also complete if you have only pondered selecting a plant, so that we may better understand what goes into your decision making process.



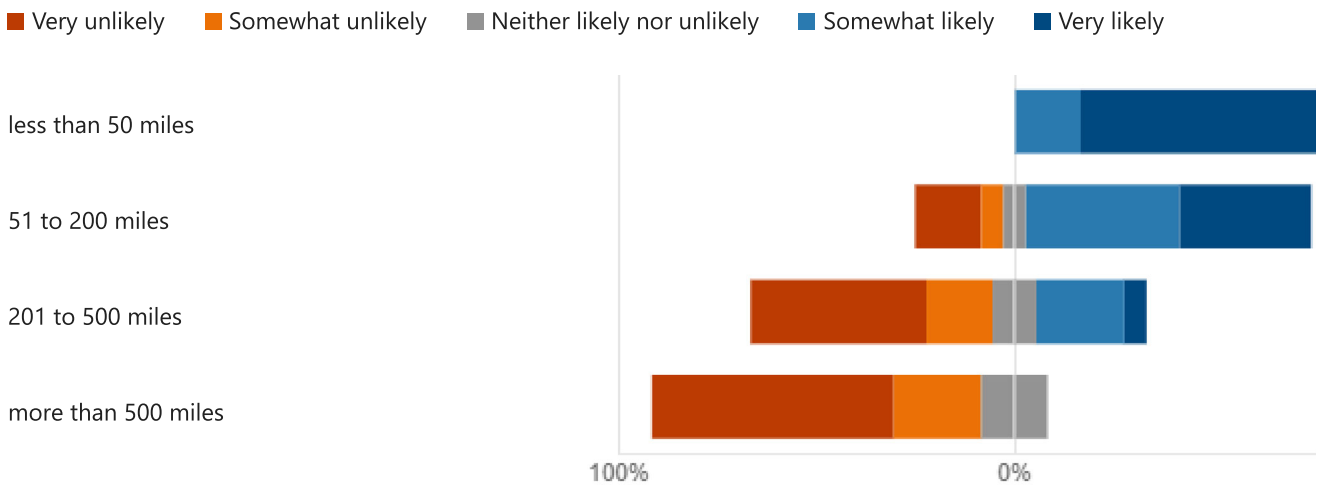
30. Please explain if there were other factors that influenced you decision in selecting a target plant occurrence to revisit.

7
Responses

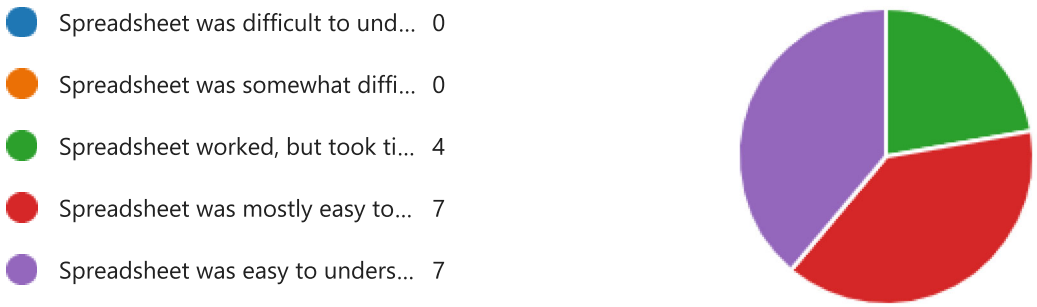
Latest Responses

"I tried to choose a species that was an agency priority."

31. How likely are you to select a target plant occurrence that requires travel that is:



32. How easily did you understand the data fields and navigate within the spreadsheet in order to select your target plant occurrence(s)?



33. Please provide any comments about the spreadsheet. We are particularly interested to know what data fields did not help you in either selecting a target plant or locating and navigating to the target plant occurrence.

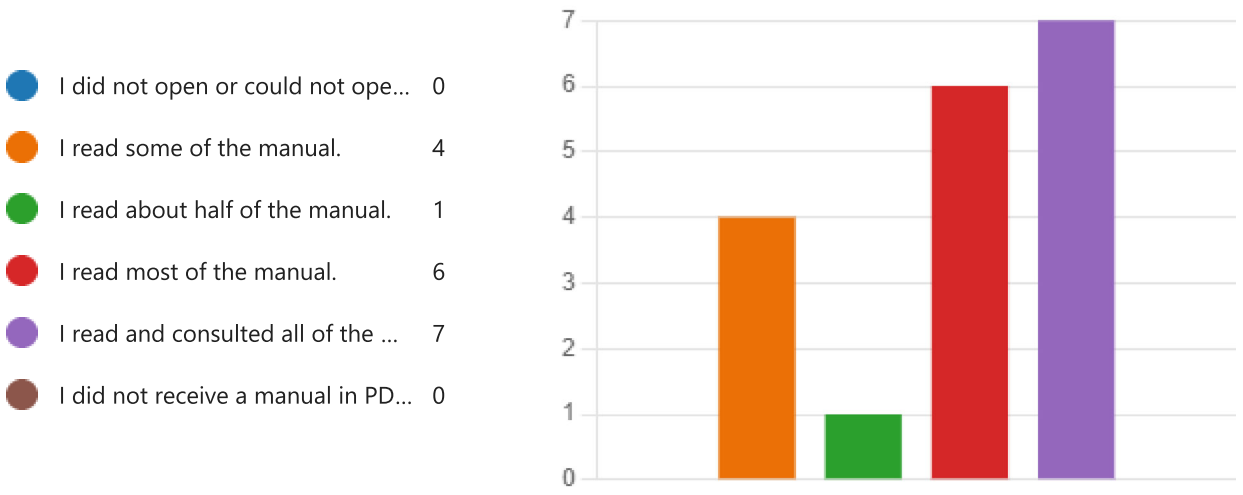
11
Responses

Latest Responses

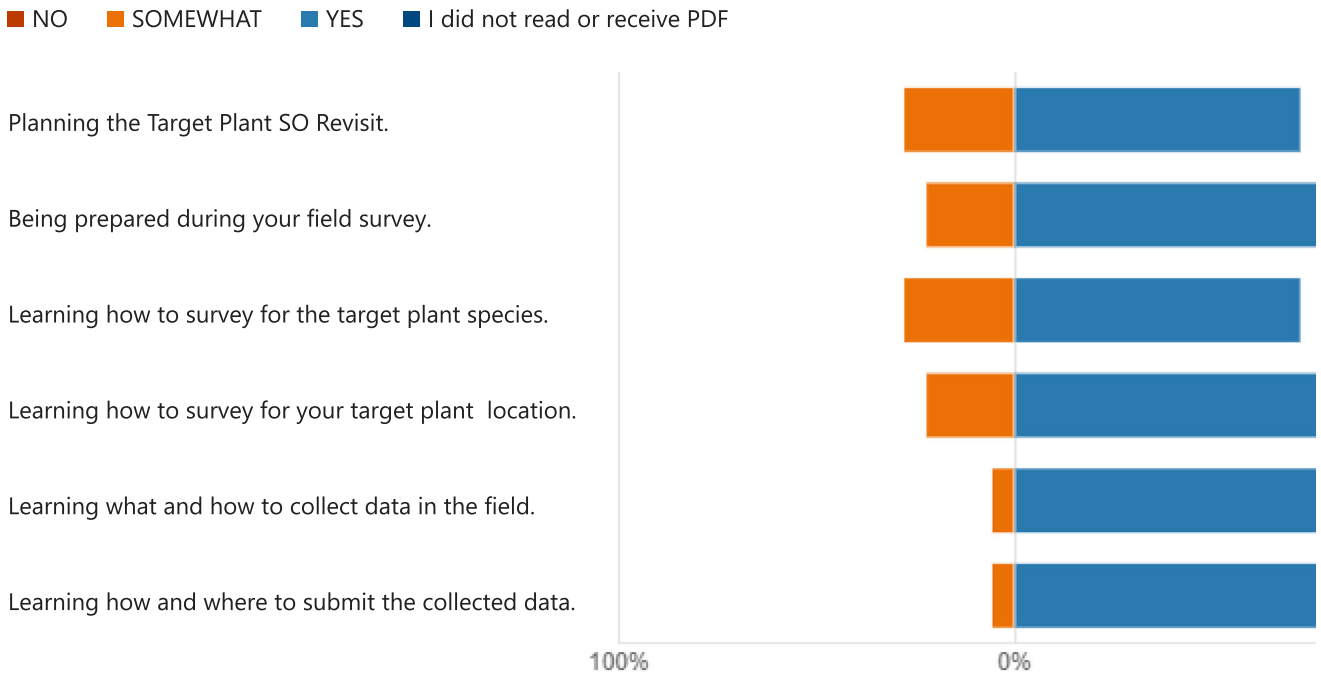
"*I thought all data was useful and interesting to include*"

"*I ended up bringing the data into GIS so that I could view it sp...*

34. Did you read and use the Citizen Botany manual provided in a PDF format?



35. If you read at least some of the manual rate its usefulness for the following components:



36. To help us improve the Manual please provide your comments for elements that were useful.

9
Responses

Latest Responses

"*I particularly appreciated the step-by-step directions on how t...*

"*The manual is very thorough!* "

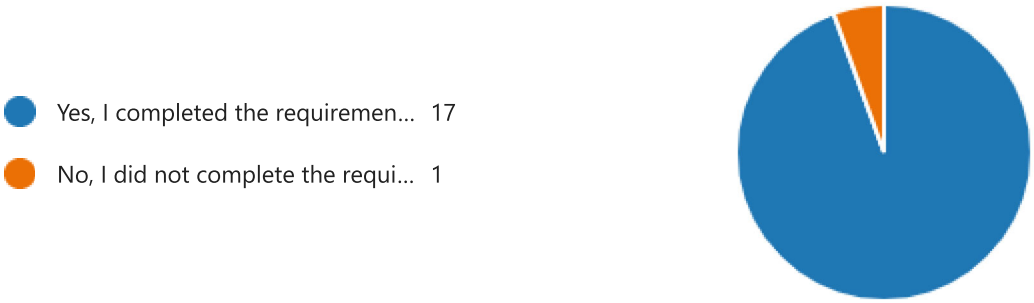
"*It had adequate information.*"

37. To help us improve the Manual please provide comments on what was not useful, confusing, or unnecessary.

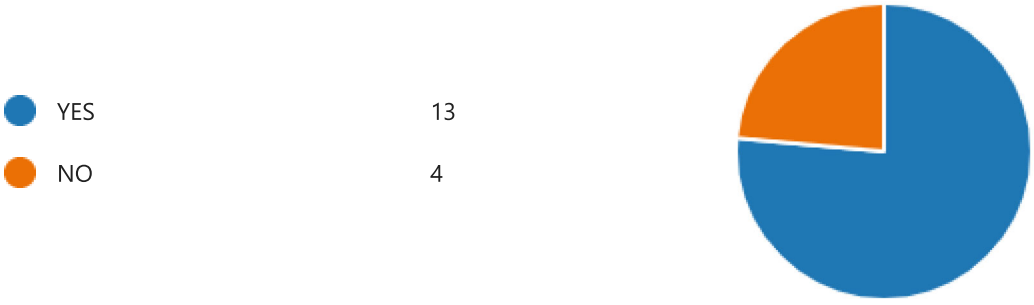
3
Responses

Latest Responses

38. Did you qualify in 2022 to become a Citizen Botanist?



39. If you participated as a Citizen Botanist, were you able to attempt a revisit to a target plant occurrence in 2022?



40. What types of observation data did you receive from the Pilot Study Coordinator for your first assigned plant species? Note: We are not collecting data beyond two assigned plant species.

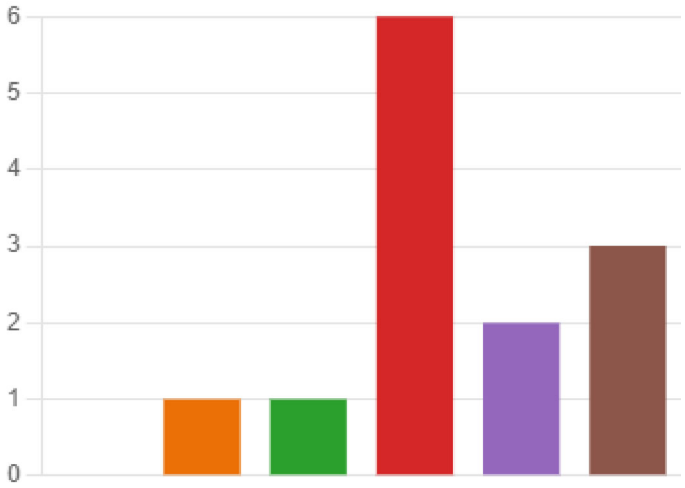
Past Observation Data with Maps	12
Past Observation Data without ...	3
Image of Herbarium Specimen ...	8
Other Information	5
Not Applicable	0

41. What types of observation data did you receive from the Pilot Study Coordinator for your second assigned plant species? Note: We are not collecting data beyond two assigned plant species.

Past Observation Data with Maps	9
Past Observation Data without ...	3
Image of Herbarium Specimen ...	7
Other Information	3
Not Applicable	3

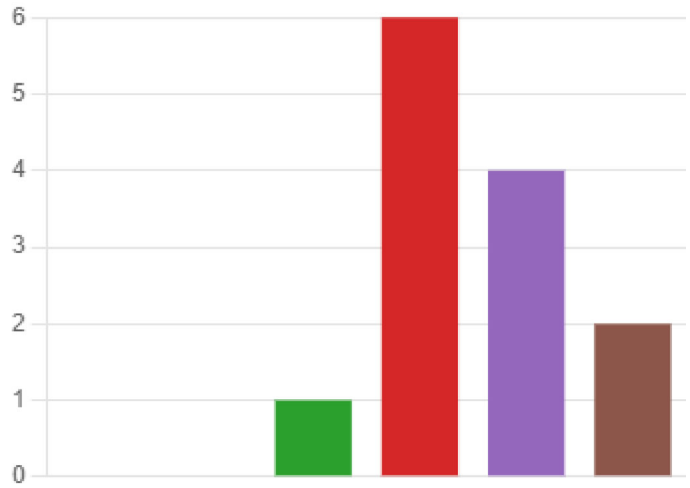
42. If you received a packet of hardcopy (printed) information from the Coordinator, how effective was it in helping you plan and conduct the the target plant occurrence revisit?

Information was useless.	0
Information was somewhat usef...	1
Information was useful, but not ...	1
Information was mostly useful a...	6
Information was entirely essential	2
I did not receive a packet of har...	3



43. If you received digital information through e-mail from the Coordinator, how effective was it in helping you plan and conduct the target plant revisit?

Information was useless.	0
Information was somewhat help...	0
Information was useful, but not ...	1
Information was mostly useful a...	6
Information was entirely essential	4
I did not receive digital informat...	2



44. Regardless of how you obtained the survey form, did you use the hardcopy or printable version of the Vascular Plant SOC/PSOC Revisit Form (for any of your revisits)?

Yes	4
No	9

45. If you used the hardcopy or printable Vascular Plant SOC/PSOC Revisit Form, please provide any comments about its format, ease or difficulty in completing the form, etc.

3
Responses

Latest Responses

46. On your mobile device, did you use the Citizen Botany Revisit Form in Survey123?

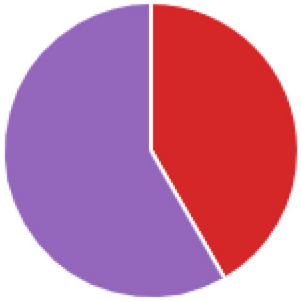
Yes	12
No	1

47. Did you read and use the MTNHP Citizen Botany SO Revisit Form for Survey123 tutorial provided through in a PDF format (version June 27, 2022) and sent through e-mail?

Yes, I read and used at least so...	12
No, I did not read or use the Sur...	1
I did not receive the tutorial cre...	0

48. If you read and used at least some of the Survey123 tutorial then how useful was it?

Extremely not useful	0
Somewhat not useful	0
Neutral	0
Somewhat useful	5
Extremely useful	7



49. Please provide any comments about the Survey123 tutorial (not the actual mobile device app) and any ideas of how to make improvements.

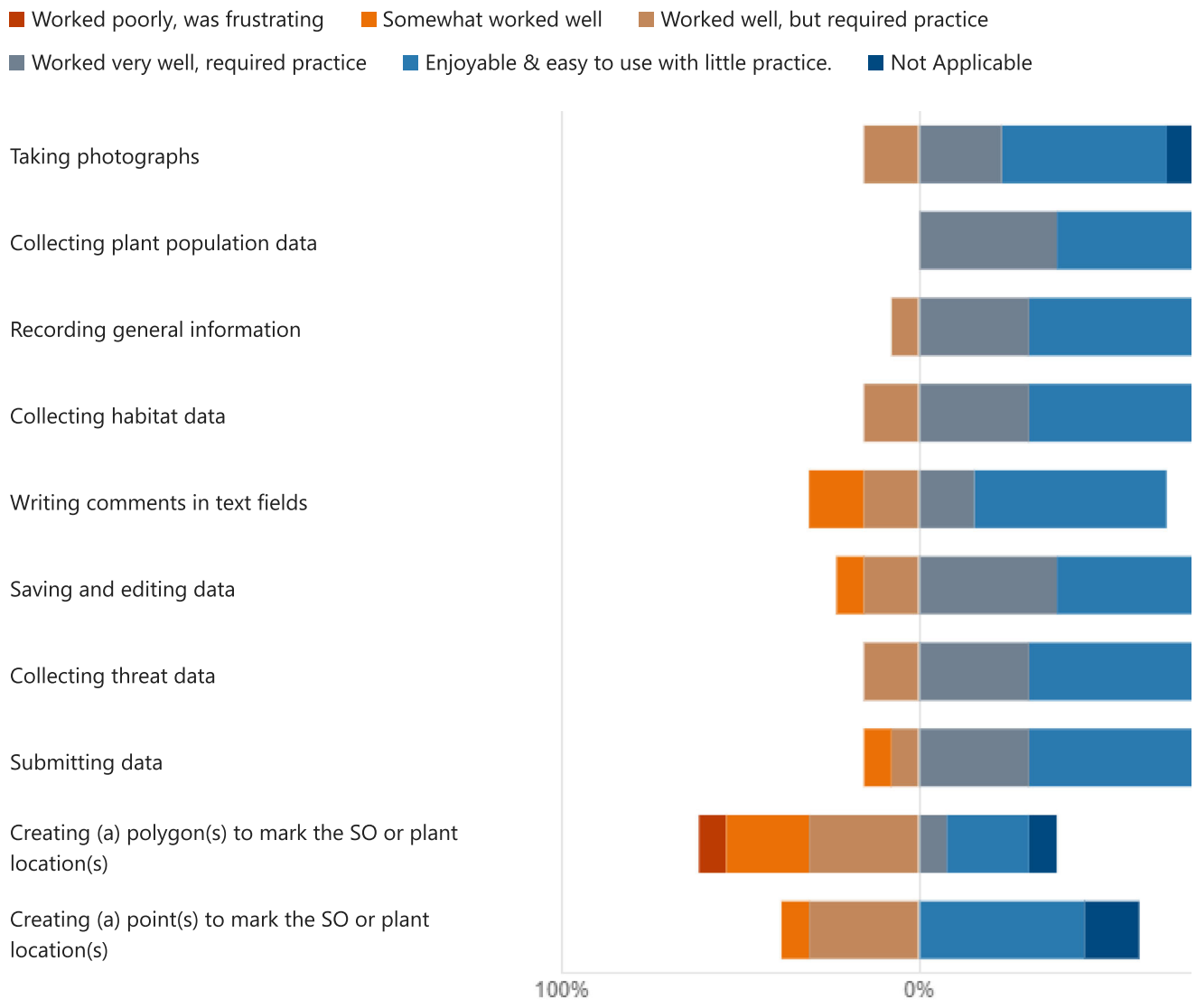
5
Responses

Latest Responses

"*Very useful and easy to read!*"

"*If I remember correctly, the Survey123 tutorial provided more i...*

50. How well did the Citizen Botany Revisit Form in Survey123 work for you regarding the following elements of data collection:



51. Did you encounter any problems or challenges while surveying or searching for or collecting data on the target plant occurrence?

Yes	5
No	8

52. If you encountered any problems or challenges would you be willing to share what you experienced?

4
Responses

Latest Responses

"One of the sites I chose was in the process of an intensive reha…

"I had trouble saving my data in Survey123, but MTNHP staff fi…

53. From the moment that you selected a target plant occurrence to the moment that you submitted data on your revisit, about how many hours did you volunteer?

13
Responses

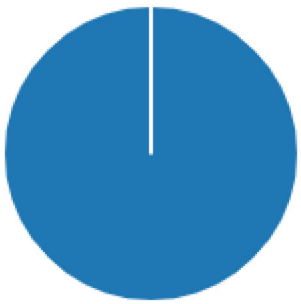
Latest Responses

"40"

"I would estimate about 4-5 hours per SO."

54. Did you find the number of volunteer hours to complete the assignment to be:

Reasonable	13
Not Reasonable	0



55. If the amount of volunteer hours to complete the assignment were not reasonable, please provide your comments and any ideas for how we can help to make improvements.

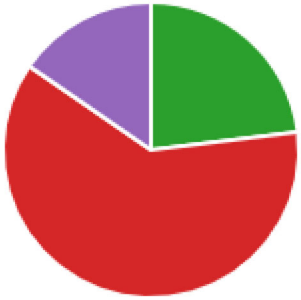
2
Responses

Latest Responses

"I think the part that felt like it took too long was getting in tou...

56. How well did the trainings, information provided, Survey123 tutorial and/or Citizen Botany manual prepare you for planning and conducting the target plant site visit?

Not At All	0
Somewhat	0
Reasonably Well	3
Very Well	8
Excellent	2



57. Were you able to find the target plant ?

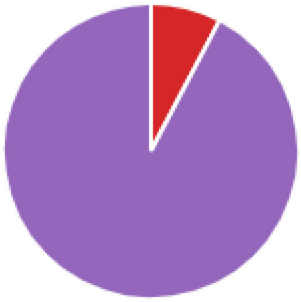
Yes	9
No	4
Unsure if I found the correct tar...	0

58. Did the data fields, such as lat/long and maps, in the 2022 SOC/PSOC Plant Revisit Site spreadsheet actually help you later to locate or navigate to the target plant occurrence?

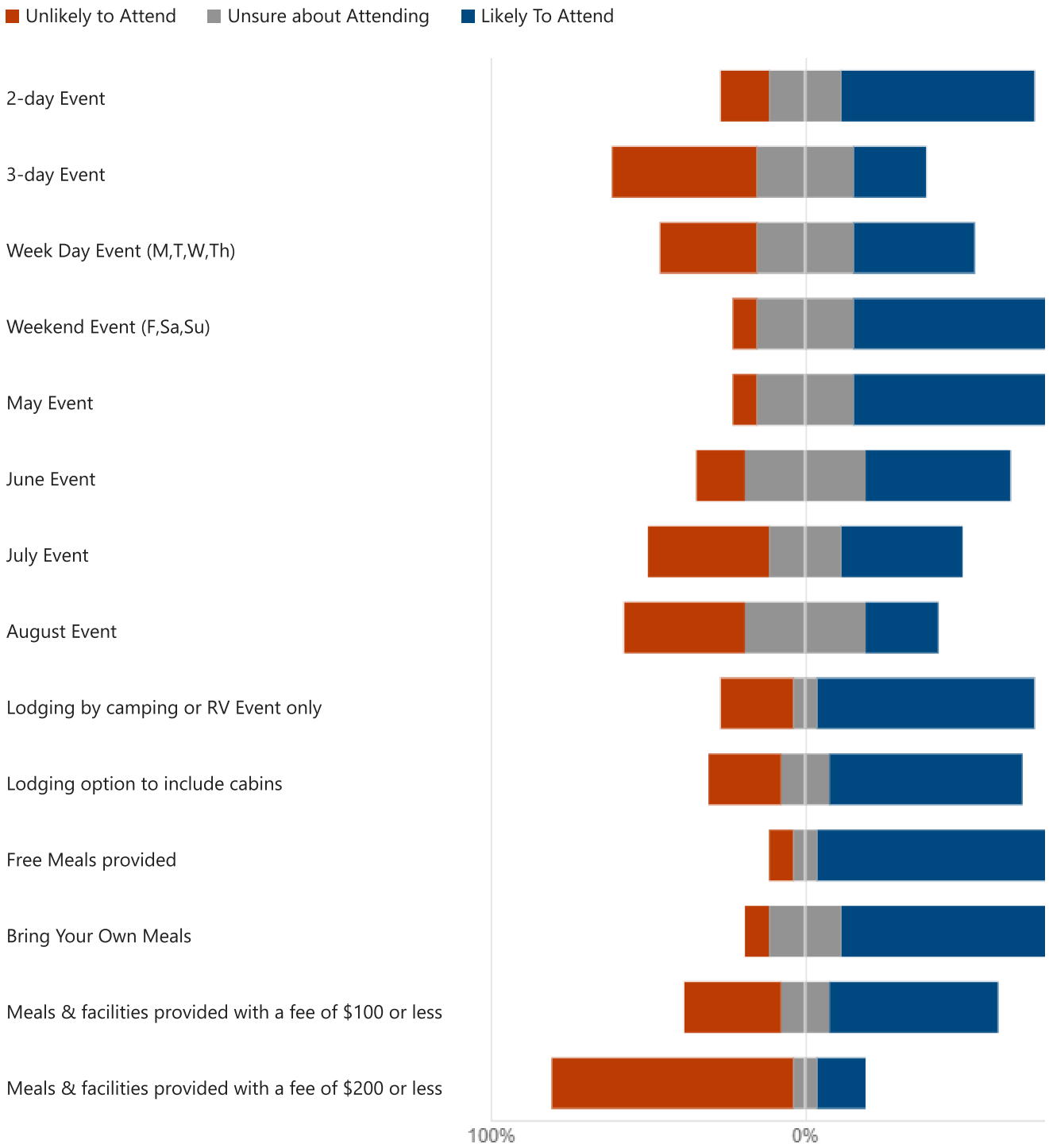
Yes	12
No	1

59. Overall, how satisfactory was your experience as a Citizen Botanist?

Highly Unsatisfactory	0
Somewhat Unsatisfactory	0
Okay - Sort of Neutral	0
Mostly Satisfactory	1
Highly Satisfactory	12

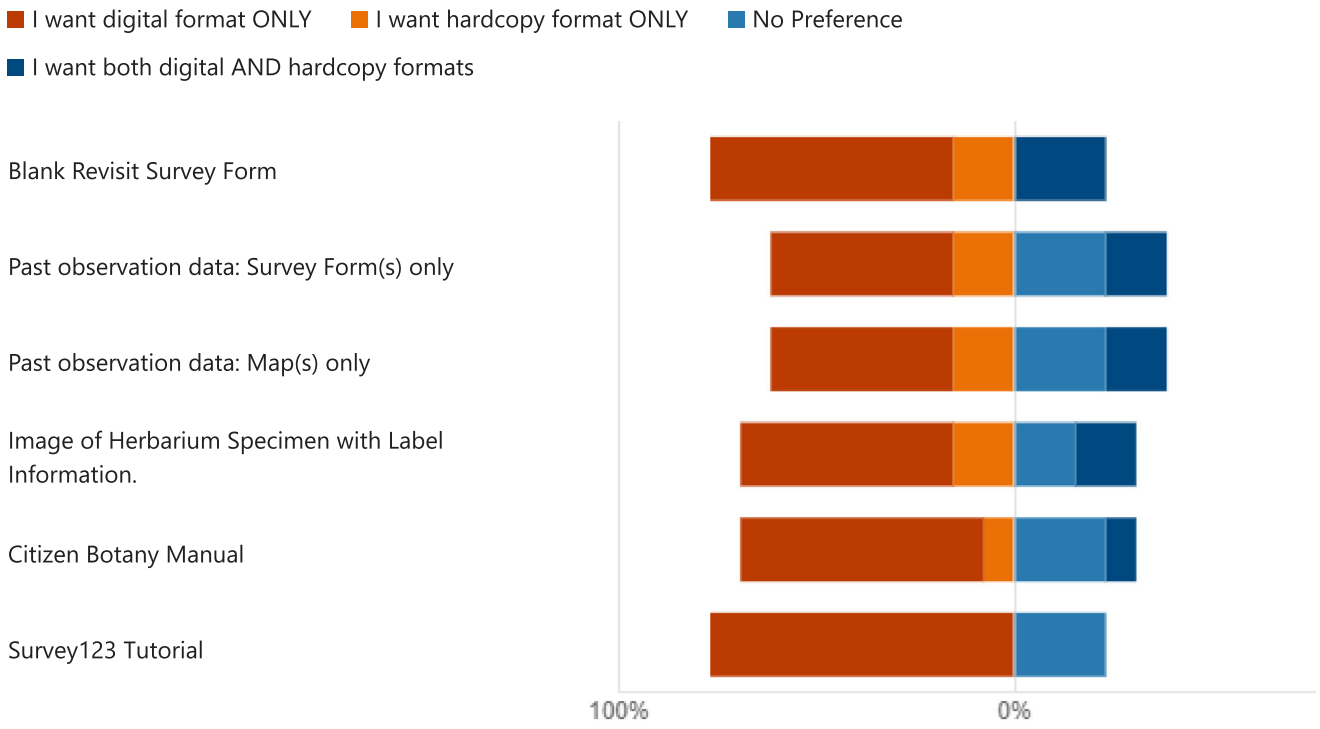


60. In 2023, if we held a gathering for Citizen Botanists to meet and work on skills in plant identification, surveying, and mapping, how likely would you attend under the following conditions.



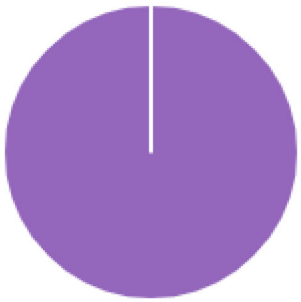
61. If you conducted another target plant occurrence revisit in 2023, how would you like the information provided to you?

62. If you prefer a mixture of digital and hardcopy formats, then tell us the format:



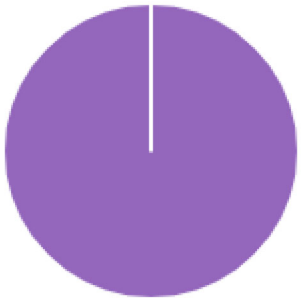
63. Based on your experience as a Citizen Botanist in 2022, how likely would you be to participate again to revisit a target plant occurrence in 2023?

Very unlikely	0
Somewhat unlikely	0
Neither likely nor unlikely	0
Somewhat likely	0
Very likely	13



64. Based on your experience as a Citizen Botanist in 2022, how likely would you be to participate if a joint Citizen Botany Program was established by MTNHP and MNPS in the near future (2024 or beyond)?

Very unlikely	0
Somewhat unlikely	0
Neither likely nor unlikely	0
Somewhat likely	0
Very likely	13



65. If an in-person training was offered in February or March of 2023, would you be willing to travel in order to attend?

Yes	2
No	1
Maybe	2

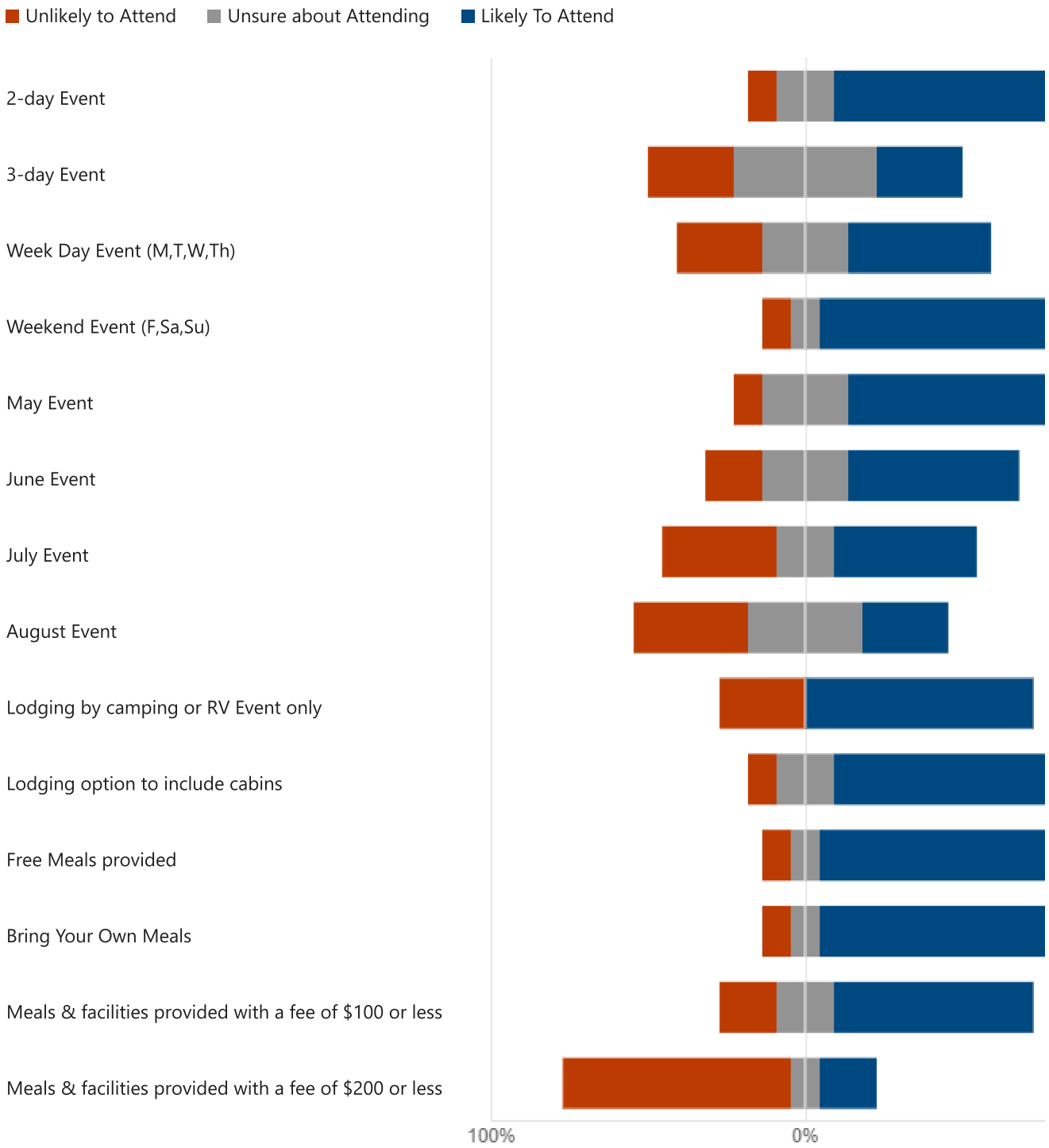
66. If you were willing to travel to an in-person training in February or March of 2023, how many hours or miles would you be willing to travel?

2
Responses

Latest Responses

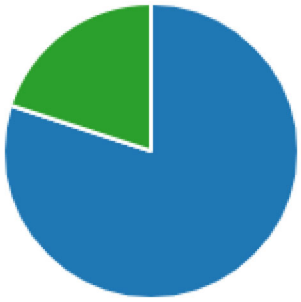
"*I would be willing to travel about 3hrs to attend!*"

67. In 2023, if we held a gathering for Citizen Botanists to meet and work on skills in plant identification, surveying, and mapping, how likely would you attend under the following conditions.



68. Would you be interested in attending a 2-part training through the Zoom platform as part of the process in becoming a Citizen Botanist?

Yes	4
No	0
Maybe	1



69. If an in-person training was offered in February or March of 2023, would you be willing to travel in order to attend?

Yes	1
No	2
Maybe	2

70. If you were willing to travel to an in-person training in February or March of 2023, how many hours or miles would you be willing to travel?

3
Responses

Latest Responses
"*3 hours.*"

71. In 2023, if we held a gathering for Citizen Botanists to meet and work on skills in plant identification, surveying, and mapping, how likely would you attend under the following conditions.