Checklists: why and how

In botany, a checklist often refers to a list of the species present in an area. OpenHerbarium makes it easy to construct three kinds of species: teaching checklists, dynamic checklists, and personal checklists.

Teaching (stable) checklists contain species that are important for a group of people to know. For example, a list of the common species in an area, or those that are weeds, need protection, have medicinal value, or are edible. The person creating a teaching checklist decides which species to include. The reason they are called "stable" is that the *species* they include do not depend on the records in OpenHerbarium, but creators of teaching checklists are encouraged to add field images and descriptions of the included species to OpenHerbarium. Doing so will increase the value of the checklist to its intended users and to many other users.

Dynamic checklists attempt to include all the species known from an area. They are dynamic because they are generated from the records in OpenHerbarium. This means they can change when new records are added to a collection, or the identification of a specimen is changed. Dynamic checklists are created by searching OpenHerbarium. How complete they are depends, of course, on how well the plants of the target area have been explored, how accurately the specimens concerned have been identified, and how many of the plants found have been deposited in herbaria that prioritize sharing its specimen records.

Dynamic checklists can also be linked to each other in a "parent-child" type relationship. For example, a checklist of District Bannu can be declared a child of a checklist for Khyber Pahktunkhwa (KP). If this is done, any species in the Bannu checklist will automatically be added to the Khyber Pahktunkhwa checklist. Moreover, the KP checklist can be declared a child of the Pakistan checklist. In this way, contributions to a district checklist contribute to a larger goal, developing an interactive checklist of the plant species in Pakistan.

Personal checklists be developed for any region and any purpose, they might be of the plants in your garden, the plants you see on the way to work, or the herbs you use for cooking. They can only be viewed by you, the people you share them with, and the portal administrator. They cannot be made a child of another checklist.
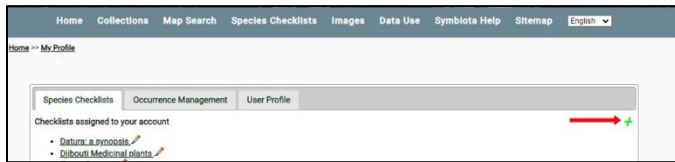
Creating checklists

Creating a checklist requires being given permission to do so. To obtain that permission, contact the portal manager, [Mary Barkworth](). Include in your email, the kind of checklist you wish to develop and what kind of checklist it is (Teaching, Dynamic, or Personal).

All checklists start as personal checklists. It is up to you to decide whether and when you wish them to be made public. These are the steps to follow, once you have permission to create checklists.

1. Login and click *My profile* (the button is in the top right of the banner).

2. Click the plus sign (green plus signs on OpenHerbarium pages mean you have permission to add an entry to the form being displayed).

3. Complete the form the plus sign brings up. The image below is of the top part of the form. It is followed by instructions on how to complete the fields.

1. **Checklist name**: Checklists have to give your checklist a name. Please follow the standard format described below for general and teaching checklists. It makes them easier to find

   General checklists: Specify administrative levels involved, followed by the group of plants included. Admin Level 1 is always the country. The name of the lower levels varies among countries. For Pakistan, Admin Level 2 is a province or territory. In OpenHerbarium, Admin level 3 refers to districts, and Admin Level 4 to Tehsils. In Somaliland, Admin Level 2 refers to regions and Admin level 3 to districts.

   Focused checklists: If the checklist focusses on a specific group of plants from a given area, name the group after specifying the area. For example: Pakistan, Khyber Pakhtunkhwa, District Swat (Bryophytes) or **Pakistan, Khyber Pakhtunkhwa, District Lower Dir (Medicinal plants)** .

Teaching checklists: Name the institution or group, followed by the name and number of the course. For example, University of Hargeisa, AGR 223.

2. **Authors**: You and anyone else who will be helping you build the checklist.

3. **Checklist Type**: Select from the drop-down list, using the downward arrowhead. Almost all checklists are "General". The two other kinds are "Rare, threatened, protected species list" and "Species exclusion list". The Rare, threatened, protected species list is used to prevent people without special permission from seeing the specimen images, location information, and

4. **Locality**: A description in words of the location. For example: District Sialkot, a district in Punjab that is adjacent to Azad Jammu and Kashmir on the northeast and is surrounded on its other sides ty the Punjabi districts of Gujarat, Gujranwawa, and Narowal.

5. **Citation**: How you would like to see the checklist cited in a paper. For example:

Barkworth, (M.E. 2023). Plants of District Sialkot, Punjab, Province.

6. **Abstract**: Summarize what your checklist offers and interesting features resulting from its preparation. For the Sialkot checklist, I have stated the following:

"This checklist has been initiated by downloading records for Sialkot from OpenHerbarium and GBIF on 13 Sept 2023. There were 9 species in OpenHerbarium that were not included in the GBIF download. The only Pakistani herbarium with specimens from Sialkot at that time was ISL, the herbarium of Qaid-i-Azam University. Sialkot has an area of 3,016 km^2. When created, the checklist included 75 species in 22 families giving it a species density of 0.025 spp./km^2. "

Lower half of form for creating a checklist.

7. **Notes**: This can, and usually is, left blank. For the Sialkot Checklist I added the reason I created it, "Used to in preparing a document on constructing checklists."

8. **More inclusive reference**: If the taxa in your checklist should be included in the checklist for a larger region or more uses, add it here. For the Sialkot checklist, the taxa should be included in the Checklist for Punjab Province. By selecting the link to that checklist here, the addition with be automatic. Only taxa not already on that checklist with be added. Moreover, because the Punjab Checklist is a child of the Pakistan checklist, any of the

taxa listed as being present in Sialkot will also be added to the Pakistan checklist, unless they are already there.

9. **Latitude**, **Longitude**, and **Point Radius**. IGNORE THESE FIELDS, and the POLYGON TOOL for TEACHING and PERSONAL checklists.

This part of the description enables searching OpenHerbarium for additional records later, but the three fields can only be used to search a circular region. *To conduct a more accurate search,* use the Polygon Footprint tool.

10. **Polygon Footprint:** Click the globe icon to create a polygon that includes your target area. If you are creating a teaching or personal checklist.

IGNORE THIS TOOL IF CREATING A TEACHING OR PERSONAL CHECKLIST.

1. Start by dragging the map and zooming in on it until the area you are targeting is easy to see. Click the polygon symbol at the top (see figure below).
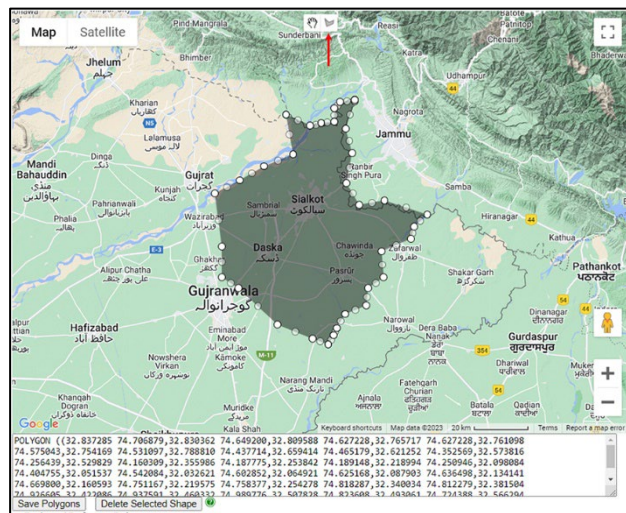
Then start clicking around the perimeter. It is better to include a slightly large area than a smaller one.

Close the polygon by clicking on the starting point. If it is a reasonable approximation of your target area, save the polygon and you will see an array of numbers below the map. These are the coordinates of the points you clicked. If you want to move a few of them, click on the shaded area and then click on the point you wish to move and drag it to a more appropriate location.

If you think you should start over, delete the polygon and do so.

2. **Default Display Settings**. You can leave the key option activated, but it will not work until the necessary data have been entered into the key tool.

3. **Default Sorting Sequence:** Leave at 50. When you make the checklist public, it will be sorted alphabetically.

4. **Access:** Leave as private until you have added some species to the list.

4. CLICK **CREATE CHECKLIST.** To view it, go to My Profile in the banner. It should be listed under the checklist table.

5. NEXT TASK: Add species! The procedure will vary depending on whether you are creating a teaching or dynamic checklist. It will be the subject of a separate document.