

# Target Audience & Objectives

The target audience The Intermountain Herbarium is focused on reaching are academics, government agency employees, private consultants, and the general public interested in the Plantae Kingdom. There were no changes in the primary objectives of the Intermountain Herbarium in 2021 They remain:

- Increase knowledge of plant diversity within the Intermountain Region
- Assist others conducting research on plants
- Increase the utility of the herbarium's database
- Develop identification tools to meet specific needs
- Increase interest in the region's flora by a conscious effort at outreach

## ACCOMPLISHMENTS

These are divided into five categories: increasing knowledge of plant diversity, assisting others in research and education, databasing, development of identification tools, and outreach

### Increase knowledge of plant diversity, particularly within the Intermountain Region

· 2,757 specimens were added to vascular plant collection during 2021, bringing the total number of accessioned specimens to 289,520. Total counts of each metric (total records in collection, databased, georeferenced, and imaged) can be seen in Table 1.

· During 2021 an active effort of reengaging with neighboring herbaria through exchange was created. The vast amount of duplicate material that has built up was used to engage with various herbaria throughout North America (Table 2.) Final amount of material sent out through exchange was 1,174 specimens with a receival amount of 1,205 specimens. Exchange specimens range from across North America, however, the focus of material requested in exchange was from the intermountain region and western United States.

**Staff Collecting Activity:** Specimens collected by members of the herbarium (staff, associates, employees) during the year of 2021 totaled 451 specimens. This increase of 246 percent is the product of an active effort to prioritize collecting to increase exchange material, collecting in under collected areas, and under collected species that are not represented well in the herbarium.

**Dissemination of Results:** All data can be accessed through our regional Symbiota portal ([intermountainbiota.org](http://intermountainbiota.org)) and The Global Biodiversity Information facility ([gbif.org](http://gbif.org)). GBIF has

numerous data errors that the herbarium staff are currently correcting, however; a majority of these issues are due to incompatibility of hybrid names in their system or certain fields that are empty due to absence of collection information. These issues currently cannot be addressed due to the limitations of GBIF but georeferencing and other minor errors will be addressed in the coming year to strengthen our reputation for providing accurate data.

There have been no printed publications relating directly to development of the collection, but copies of portions of the database have been made available to various individuals in the form of a computer file. These are considered part of the herbarium's service function.

Various instructors and students visited the herbarium in support of course activities. Some of the students involved have subsequently returned to make use of the herbarium's resources. With laxing restrictions occurring we believe during 2022 more courses will take advantage of our resources.

## **Assist others in conducting research and education**

- Staff members invested approx. 120 (Table 3.) responding to inquiries during 2021. These inquiries are diverse in nature, ranging from requests for help in plant identification, access to plant occurrence records, and to suggest specific plant reference materials.

The amount of response time is variable per inquiry varies depending on needs, and usually ranges from 30 minutes to an hour. We expect in the coming year for this metric to increase as well with restrictions potentially lifting for travel for research.

- Herbarium associate Leila Shultz taught a wetland course to better educate USU students on the species occurring with focus on Utah wetland flora.

- 53 specimens were sent on loan during 2021 to assist with taxonomic research and assist with teaching, and 561 were received. The majority of received loans (551) were requested to assist Kristian R. Valles with ongoing research in the *Eriogonum brevicaulle* complex.

- There were 243 visits to the herbarium during the 2021 year, this is an increase from last year's visitations of 101. This increase is most likely due to loosening restrictions from the ongoing pandemic. However, visitations have increase beyond pre-pandemic numbers (209 visitors during 2019) which is believed to be due to an active outreach effort. With more individuals becoming vaccinated and restrictions lowering we believe that our numbers will increase further in 2022

## **Develop identification tools to meet specific needs**

- Kristian R. Valles started publishing the Flora of Northern Utah online to replace the dated Vascular Plants of Northern Utah. The treatments are currently being published up creation on Keybase (<https://keybase.rbq.vic.gov.au/projects/show/53>). Development of treatments are on going with 2021s treatments under revision.

## Increase interest in the region's flora by a conscious effort at outreach

- Kristian R. Valles spoke with an introduction to graduate studies class to increase awareness of resources available to incoming graduate students. Other classes assisted were a Career Planning for Botanist class at Weber State University
- Professional workshops concerning the local flora continues as a goal of the herbarium, but due to restraints put on society from the pandemic this was strongly limited in 2021. Work-shops are under development to be offered in the coming year with online posting to serve as an ongoing resource for others with specific focus on Polygonaceae, Poaceae, and the flora of Northern Utah

## Opportunities

Two undergraduate student technicians were retained for employment for the fall semester on curatorial procedures followed in the herbarium. Total hours worked by students were 948 hours with an average of 51 hours per month. First week of work and holiday break weeks have been omitted from that average due to not representing students actual work schedule due to either starting midway through a pay period or being out of town for the holidays.

During the summer of 2021 no students were retained as employees due to obtaining jobs in their respected fields of ecology and curation. Two returned during the fall semester and continue to be a vital part of the herbarium. Changes in undergraduate student employment occurred during the 2021 year with loss of only one employee occurring during the summer to better benefit their career goals.

Assistance of a Graduate student in the department of Biology assisted the herbarium during the summer with focus on cleaning up errors seen in the database. Total hours assisted were 160 within a 14-week time span.

## Plan of Work for 2022

### Herbarium Manager

- Supervise students working on the herbarium's routine curatorial activities and special projects.
- Improve the current herbarium practices to include freezing of incoming specimens and requiring all specimens to be placed in cabinets to eliminate insect pests.
- Continue collection of sensitive species to the state of Utah to assist researchers and land management groups

- Determine policies and priorities for the herbarium, in discussion with the Director.
- Process incoming gifts, exchanges and loan request.
- Host Logan Endemics walk, if allowed (depending on social distancing limitations).
- Assist researchers, agency employees, consultants, and students in identification and resource access.
- Continue national and global specimen exchanges
- Rearrange cabinets to reflect current nomenclature
- Confirm nomenclature of incoming specimens
- Annotate specimens to reflect current nomenclature

### Student employees, Herbarium technicians

- Continue specimen imaging
- Continue digitization of collection and incoming specimens
- Clean data in GBIF
- Geo-reference vascular plant collection
- Assist collection manager in rearrangement of collection
- File specimens into the collection
- Bring to the attention of the Herbarium manager any discrepancies in the collection labels or data

## Practical Results

The Intermountain Herbarium is a resource used by academics, extension service professionals, government agency employees, private consultants, and the agricultural community. The skills learned by student employees and visitors provides expertise not commonly found in plant biologist, botanist, foresters, and range managers due to the disappearance of herbaria. The current usage of the herbarium has been primarily plant identification and access to our library which is not found in most herbaria in the current day. The resources offered by the Intermountain Herbarium are essential to support formal instruction and outreach education to the public. With the hire of our new Director coming summer 2022, the Intermountain Herbarium will continue to thrive and grow into the future.

## Tables – Data for 2021

Table1. The number of records we currently housed in the Intermountain Herbarium collection. Imaging of nonvascular specimens is currently not being conducted due to absence of adequate technology.

Number of specimens in the collection	289,520
Number of databased specimens	190,856
Number of georeferenced specimens	78,406
Number of imaged specimens	96,706 (34%)

Table 2. Exchange and gift material received and sent during 2021

Herbarium Code	Exchange Sent	Exchange Received	Gifts sent	Gifts Received
BRY	148	21	-	-
COLO	110	-	-	-
DBG	-	119	-	-
GH	-	-	10	-
IDS	330	-	-	-
NY	16	-	75	-
RENO	118	914	-	-
RM	76	-	-	-
RSA-PO	23	-	2	-
TAES	152	151	-	-
US	37	-	-	-
USUUB	-	-	-	32
UT	85	-	-	-
WSCO	79	-	-	-
Totals	1174	1205	87	32

Table 3. Number of visitors and hours spent on service request. Time was spent on specimen identification and record acquisitions from the collection

Number of Visitors	Avg. time spent	Total
164	30 minutes	41 Hours
79	1 Hour	79 Hours
		120 Hours