

# Objectives

There were no changes in the primary objectives of the Intermountain Herbarium in 2020. 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, databasing, development of identification tools, and outreach

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

- 2,851 specimens were added to vascular plant collection during 2020, bringing the total number of accessioned specimens to 286,763. Total counts of each metric (total records in collection, databased, georeferenced, and imaged) can be seen in Table 1.
- Steve Furgson donated 100 specimens of vascular plants from the Intermountain Region to the herbarium. Among these specimens were approx. 10 specimens collected by Millie Tillford in Cache Valley in the late 1800's
- Graduate students from the Quinney College of Natural Resources and Biology deposited approx. 70 specimens from the intermountain region
- The Vernal Bureau of Land Management (BLM) office donated roughly 100 specimens from their 2020 field season, the collections were primarily from the Uintah Basin.

**Staff Collecting Activity:** Herbarium staff members collected a total of 100 specimens. This is considerably down from previous years. We are committed to increasing this number in future years, but it will require funding to support the work involved. In 2020, without leadership from a botanist director and with gaps in herbarium staffing, specimen collecting by the staff was not a priority

**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 the COVID-19 pandemic impacting herbarium visitation in 2020, numbers of class visits were greatly reduced.

## **Assist others in conducting research**

- Staff members invested approx. 66 hours (Table 2.) responding to inquiries during 2020. 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.

- Staff members have collected material for use in molecular studies from herbarium specimens for individuals at other institutions. In all cases, a notation on the specimen is left showing its use in recent molecular work.

- Kristian R. Valles assisted the Utah Heritage Program in identification and collecting of endemic flora in the Naomi Wilderness area in Cache county.

- 20 specimens were sent on loan during 2020, and 15 were received. The received loans on the *Eriogonum brevicaulle* complex and Poaceae.

- There were 101 visits to the herbarium, a decrease over the average of 209 for the previous four years. The drastic decrease in visitation is most likely due to the novel coronavirus impact on agencies, researcher, and students travel and research activities. We expect that there will be a resurgence of visitors once the pandemic ends. Many of those that do find their way to the herbarium have complimented us on the facility and the assistance that they have received.

- 164 books have been added to the herbarium library, many of which were donated in kind by Noel and Patricia Holmgren, Jack Greene, and Mary Barkworth Director Emeritus. Merrill Library continues to incorporate all additions to the herbarium's library into the university's integrated library catalog. The collection consists primarily of diagnostic keys, but includes other plant literature and media resources. Other items included in our library are research articles, maps, CDs of multiaccess keys, and videos. The rarity and existence of our ample library is an essential element to our collection and helps maintain our status as a "Major Regional Herbarium"

## **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.rbg.vic.gov.au/projects/show/53>).

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

· Kristian R. Valles joined the states Rare Plant Committee to increase community outreach and to help prioritize sensitive species.

· Proven of professional workshops concerning the local flora continues as a goal of the herbarium, but due to restraints put on society from the novel coronavirus this was strongly limited in 2020. Webinar work-shops are under development to be offered in the coming year with online posting to serve as an ongoing resource for others.

# Opportunities

Three undergraduate student technicians were hired and trained on curatorial procedures followed in the herbarium. Current average of hours worked per pay period of all three technicians is 31.38 hours. 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.

# Plan of Work for 2021

## **Kristian R. Valles (100%), 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.
- Prepare and publish 20% of the Northern Utah Flora families in Keybase. This work will depend on other priorities in the herbarium
- Start a 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.
- Increase national and global specimen exchanges
- Rearrange cabinets to reflect current nomenclature
- Confirm nomenclature of incoming specimens
- Annotate specimens to reflect current nomenclature

### **Student employees (100%), 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 o 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. Following the end of the COVID-19 pandemic, the hire of a new faculty director, and the acquisition of research and collection curation funds, the Intermountain Herbarium will continue to thrive and grow into the future.

## **Tables – Data for 2020**

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	286,763
Number of databased specimens	188,379 (65%)
Number of georeferenced specimens	75,489 (26%)
Number of imaged specimens	96,706 (34%)

Table 2. 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
70	30 minutes	35 Hours
31	1 Hour	31 Hours
		66 Hours