
STRATEGIC PLAN (2018-2020)

OREGON STATE UNIVERSITY HERBARIUM

EXECUTIVE SUMMARY

Established in **1886**, only about 20 years after the university's founding, the Oregon State University's Herbarium contains over 550,000 specimens from Oregon and around the world. The herbarium provides a repository for vascular plants, fungi, lichens, algae and non-vascular plants such as mosses and liverworts. A little more than half of the specimens have at least some label data available through online databases, greatly expanding the pool of potential users of the specimens and data we curate. Our partnership with OregonFlora, which is documenting and publishing the *Flora of Oregon* in three volumes, has resulted in the annotation of all Oregon specimens of vascular plants and the digitization of their label data. Much effort the past three years has been directed toward incorporation of ca. 150,000 US Forest Service lichen specimens into the herbarium, a projected that has been funded by the National Science Foundation and has involved a graduate curator and 28 undergraduate student workers. The creation of this document, the first strategic plan for the herbarium, has provided us an opportunity to understand how the herbarium fits within our organizational context (for example, by reading the strategic plan of Oregon State University, OSU), to appreciate the breadth of the herbarium's activities and how they complement and support the mission and values of OSU, to brainstorm new ways to leverage our strengths, and to develop a strategy for sustainable growth and continued excellence through clearly-articulated objectives and formative evaluation. Although many benefits of strategic planning have been realized through the process of creating the plan, we anticipate that four major conclusions of the strategic plan will remain relevant to the herbarium's success and sustainability during the three-year period 2018-2020. First, the extensive collection of plants, fungi, and algae from Oregon is the herbarium's greatest asset and sets it apart from other herbaria as the most-comprehensive repository of Oregon's biodiversity; continued growth and curation of that asset is fundamental to nearly all of the herbarium's other successes. Second, graduate curators and undergraduate workers contribute substantially to the herbarium, but we need to develop these students beyond their job functions in order to fulfill our mission and vision, as well as to align more fully with OSU's education mission. Third, the partnership between the herbarium and OregonFlora has been invaluable for all parties; however, inadequate financial support for the resources and service provided by OregonFlora may pose a threat to the herbarium, so we will strive to communicate the value of OregonFlora (and the herbarium) to OSU decision-makers. Fourth, insufficient working space inside and adjacent to the collection limits the number of users who can access the herbarium at any given time, while limited free parking options discourage visits to the herbarium by external users and volunteers; we must find creative solutions to both these issues in order to cultivate our engagement with community volunteers and to provide adequate accommodations for users of the herbarium.

STRATEGIC PLANNING PARTNERS

The strategic planning team is composed of Melanie Link-Pérez (Curator), Aaron Liston (Director), Richard Halse (Curator Emeritus), and Linda Hardison (Director, OregonFlora).

KEY STAKEHOLDERS

1. Oregon State University Herbarium staff, including Melanie Link-Pérez (Curator), Aaron Liston (Director), Richard Halse (Curator Emeritus, donor), Joseph Spatafora (Mycology Curator), and Graduate Student Research Assistants (Vascular Plants, Mycological Collections, NSF-supported curation projects).
2. OSU undergraduate curatorial assistants and data entry specialists.
3. Grant- and gift-funded curators.
4. OregonFlora (program producing flora of the state, webpages hosting atlas and photos of Oregon species), which employs one director, one taxonomist, and two half-time data managers.
5. Private companies using the herbarium for taxonomic research (e.g., Carex Working Group).
6. OSU instructors and their students using the specimens or visiting the herbarium for coursework (e.g., Horticulture courses, Aquatic Botany, Plant Structure, Plant Systematics, Flora of the Pacific Northwest, and others; 9 different courses in 2017).
7. OSU researchers (e.g., graduate students, undergraduate and faculty; includes Courtesy Faculty and Emeritus faculty active in research).
8. Specimen data aggregators (Consortium of Pacific Northwest Herbaria, currently; iDigBio when our DiGIR portal is upgraded).
9. Researchers from outside the local area who use OSU Herbarium digital data (at the OregonFlora portal or in specimen data aggregators such as Consortium of Pacific Northwest Herbaria) or physical specimens (as visitors or through loans to other herbaria).
10. Taxonomists and systematists at other institutions.
11. Taxonomist authors contributing floristic treatments for the *Flora of Oregon*.
12. Illustrators for *Flora of Oregon*.
13. Natural History Collections Club (student club that volunteers in the collection and does outreach promoting the herbarium and other collections).
14. The local community, general public across the state, citizen scientist groups (e.g., Native Plant Society of Oregon), and OSU extension agents who submit photos or samples for plant identification.
15. Extension program leaders and content developers for Master Gardeners, Pollinator Health Program, Master Naturalists, Agroforestry.
16. State and Federal Agencies, including Bureau of Land Management, US Forest Service, and Oregon Department of Agriculture.
17. Regional governmental/NGO agencies including (Portland) Metro, Soil & Water Conservation Districts, Watershed Councils, municipal Parks & Recreation Departments.
18. Seeds of Success Program (vouchering, identifications).
19. Seed Certification program at OSU (identify weeds in crops or the crops themselves; helping Oregon agriculture).

20. Agri-business companies that submit weeds for identification.
21. Funders, especially OSU's Department of Botany & Plant Pathology, OSU's College of Agricultural Sciences, the National Science Foundation, Georgia Mason endowment, Richard Halse endowment, and the Shirley Tucker gift for lichen curation.
22. Volunteers, including those engaged with OregonFlora.
23. Collectors of the specimens that the OSU Herbarium curates.

AUDIENCE FOR THE STRATEGIC PLAN

1. Mission and Vision statements will be added to the home-page of the herbarium website and be posted in the herbarium (or next to both herbarium doors).
2. The document in its entirety or in part will appear elsewhere on the herbarium website. The document is intended as a guiding document for the curatorial staff when determining allocation of resources and planning and prioritizing various initiatives. It is also intended to demonstrate to our administration and potential donors that the herbarium is aware of its position within Oregon State University's Mission and Vision and will present a compelling narrative of how the herbarium is a valuable asset that impacts all sectors of the University, both on the main campus and its satellites, and is critical to fulfilling the institution's goals.

MISSION STATEMENT

Oregon State University's Herbarium supports learning, discovery, and engagement by obtaining and curating our state's most comprehensive collection of plants, fungi, lichens, and algae from around the world, with a geographic emphasis on Oregon and the Pacific Northwest. Our resources are used at OSU, across Oregon, nationally, and globally to create knowledge and solve problems. Curation and research in the collection fosters leadership and science-based expertise in our students, preparing them for service in natural resource and data management positions worldwide. We enrich communities across Oregon through our plant identification services, outreach and training sessions, and through our partnership with OregonFlora.

VISION STATEMENT

Oregon State University's Herbarium is the premiere resource for the documentation and study of Oregon's diverse plants and fungi. We provide experiential learning opportunities for our students, inspiring and preparing them to be the next generation of scientists, leaders, and stewards of our natural resources. We engage in citizen science and provide opportunities for volunteerism both locally and digitally. We are responsive to the queries from citizens of our state and, in collaboration with OregonFlora, provide reliable information about Oregon's plants and fungi. We are a flagship of community engagement and pride within the Department of Botany & Plant Pathology and the College of Agricultural Sciences.

STRATEGY STATEMENT

We commit to developing both our collections and the people who use them, knowing that each enriches the other.

GOALS & OBJECTIVES

1. Continue to improve the quality of our collections, ensuring that we remain the premier resource for botanical and mycological diversity research within the state of Oregon.
 - Maintain curatorial excellence. *Continuous.*
 - Improve our partnership with OregonFlora (www.oregonflora.org) to better support dissemination of specimen records and botanical information via their website and the taxonomic revisions resulting from their completion of the *Flora of Oregon. 2018 and on.*
 - Refine destructive sampling protocol and add to loan documentation. *2018.*
 - Produce a collecting and accessioning priorities list. *2018 and Continuous.*
 - Maintain collecting and accessioning activities, including accessioning of newly-acquired algal and bryological specimens. *Continuous.*
 - Review outstanding loans to other herbaria and request returns of the material or, at least, updates. *2019; yearly, thereafter.*
 - Produce a deaccessioning policy/protocol after conversing with herbarium community about their practices. *2019.*
 - Maintain our provision of data to data aggregators for discoverability of our resources. *Continuous.*
 - Achieve 100% of our digitized records uploaded and updated on iDigBio and GBIF. *2019.*
 - Explore and respond to requests for proposals to secure grant funding for curatorial and research missions, including imaging. *Continuous.*
 - Put exchange program on hiatus until we fully survey backlog of unmounted exchange material and determine a sustainable acquisition policy that will ensure that our herbarium grows in a manner compatible with our Vision and Mission. *2019.*
 - Reduce size of our backlog through gifts to other herbaria in preparation for temporary relocation of herbarium during the anticipated remodel of Cordley Hall (late summer 2019-for two years). *2018-2019.*
 - Image all newly accessioned material, followed by database entry of skeletal data (in anticipation of citizen science transcription of full label data). *Continuous.*
 - Produce a plan for imaging the entirety of the vascular plant specimens. *2019.*
 - Produce an herbarium strategic plan with relevant stakeholders. *2018 onward.*

- Determine how best to allocate various herbarium activities between the Curator and Director to enhance their partnership in support of achieving herbarium goals. *2018 onward.*
2. Prepare the next generation of scientists, leaders, and stewards of our natural resources for success in their future careers/endeavors.
- Maintain current undergraduate worker positions but provide additional emphasis on training and mentoring. *Continuous.*
 - Establish the undergraduate course “BOT 406 Curatorial Assistant” to engage more students in the herbarium by making it satisfy their Experiential Learning Requirement and offering credit; students enrolled in this course will all participate in one weekly group meeting to share project reports, discussion, and enrichment activities. *2018.*
 - Advertise undergraduate “Curatorial Assistant” opportunity to increase and diversify students pursuing the opportunity. *Starting 2018.*
 - Maintain graduate student curator positions (vascular plants, mycological collection); regularly review education priorities for position, including opportunities to participate in outreach and education events.
 - Maintain current course visitation and usage rates but implement better system of documenting usage. *2018.*
 - Implement a “Herbarium Ambassador” program, where students who are working in the collection (either as researchers, employees, or volunteers) are trained to provide tours to other students or small groups who want an introduction to the Herbarium; Herbarium Ambassadors can establish a set schedule when they are available to give tours or will have their contact information available on small fliers. *2019.*
3. Enhance engagement with herbarium users, the University, the local community, and the global community.
- Expand our partnership with OregonFlora to best leverage all available resources to support aggregation and dissemination of botanical information via online presence/tools. *2019.*
 - Work with OregonFlora and their Symbiota website platform to develop user-friendly transcription portal to engage citizen scientists in databasing efforts that adhere to the standards already in place for our onsite database. *2019.*
 - Create a new dynamic webpage for the herbarium. *2019.*
 - Use social media to document recent or current research/activities in the herbarium, announce visitors, introduce new users, etc.; recycle that content to the herbarium users email list to keep everyone informed about the herbarium and to transmit announcements, and so on. Try to engage undergraduates or volunteers in this task. *2018.*
 - Maintain successful outreach/volunteer events (e.g., Natural History Collections Club-associated events) on campus that potentially engage a diverse audience and further other herbarium goals and objectives. *Continuous.*

- Implement a Photo Roster of “People in the Herbarium” (poster with color photographs of all herbarium personnel, including active Courtesy Faculty, student workers, etc.; names and project/role below photos), updated periodically, to encourage a sense of community and belonging. *2018.*
- More efficient use of space (at times, we are beyond maximum capacity and spill over into non-herbarium space); work with our Department to get space scheduling online. *2018.*
- Maintain plant identification service (no charge) for samples/photographs submitted to the herbarium. *Continuous.*
- Implement DNA-based plant identification service (fee) for vegetative samples. *2020.*

SWOT ANALYSIS

STRENGTHS

1. Curates the world’s most comprehensive collection documenting the plants and fungi of Oregon. The approximately 550,000 specimens include over 3800 types, important historical collections and vouchers that underpin the OregonFlora treatments.
2. Label data from 364,152 plant and fungal specimens are accessible online via GBIF, Consortium of Pacific Northwest Herbaria, OregonFlora (<http://oregonflora.org>), MycoPortal and other taxon-specific portals. Images of vascular plant type specimens are accessible via JSTOR Global Plants, OregonFlora, and Oregon Digital.
3. Dissemination of specimen records through the accessible website of OregonFlora (<http://oregonflora.org>).
4. Access to database, data management services, worker training, and resource development provided by OregonFlora in support of the Herbarium’s vascular plant collections.
5. Knowledgeable and engaged Director, Curator, two Emeritus Curators, two Graduate Curatorial Assistants, and OregonFlora staff.
6. Provides employment and experiential learning opportunities to undergraduate students, giving them opportunity to develop highly employable skills in botanical research, specimen curation, and data management.
7. OregonFlora staff available to help provide “customer service” to Herbarium users (thereby expanding Herbarium staff capacity), such as physical access to collections, plant/image identification, answering questions, and responding to data requests.
8. Access to wider range of stakeholders (Pollinator Health Program, organic gardeners, Native Plant Society of Oregon, Agroforestry Working Group, etc.) who become aware of the Herbarium through their interactions with OregonFlora.
9. Provide training and expertise in the management of herbarium data through accurate and thoughtful data entry and management.

10. A database structure that identifies taxonomic complexities such as synonymies, ambiguities, and misapplied names; this data accession process immediately brings added value to each record (within the vascular plants).
11. Highly visible location in Cordley Hall allows the Herbarium to be well-integrated and appreciated as a hub of activity in the Department of Botany & Plant Pathology.

WEAKNESSES

1. Absence of priority list for accessioning leaves opportunities to strengthen collection in innovative ways unexplored.
2. Lack of cabinet space will stop growth after ca. 5 years at current rate.
3. Limited free parking options discourage visits to collection by external users and volunteers.
4. Insufficient working space inside and adjacent to the collection limits the number of users.
5. Very large backlog (30,000+ unmounted specimens in neighboring storage area).
6. Limited social media activity.
7. Outdated and static webpage.
8. Five independent and separately managed databases for vascular plants, fungi, lichens, bryophytes and algae.
9. We only have 163,659 vascular plant records on GBIF, and those have not been updated since 2015.
10. Only 86,408 of our specimen records are on iDigBio (served via fungal, algae, lichen, & bryophyte portals); no vascular plant records have been uploaded.
11. Inefficient or sparse communication between herbarium users.
12. Funding allocated for only one student plant-mounter position (10 hours/week) during the academic year, limiting the quantity of specimens that can be prepared.

OPPORTUNITIES

1. Potential to develop BOT 406 Curatorial Assistant course to train students in all aspects of curatorial work, including special projects (such as recent acquisitions and digitization).
2. Strong outreach potential with curator's extension activities (e.g., Master Gardener workshops, STEM outreach events).
3. Link public interest in gardening with native species, ecosystem services, and ecological sustainability to the core knowledge the Herbarium provides to inform these concepts in order to promote public financial support of Herbarium (via OregonFlora initiatives with new website).
4. Renovation of Cordley Hall may provide opportunity for more effective use of space.
5. Undergraduates who are interested in natural history collections (including the Natural History Collections Club); represents a large potential volunteer pool.
6. Increased funding could be pursued to hire more students to mount plants, thus helping reduce specimen backlog.
7. Corvallis has a large population of retired/semi-retired individuals; again, a large potential volunteer pool.
8. Collaborations with curators of other natural history collections on OSU campus.

9. New Department Head has been Curator of the Mycological Collections, so understands the importance of the Herbarium.
10. Position description for currently advertised Assistant Professor includes 20% of time towards curation of the mycological collection – this represents a doubling of current commitment.

THREATS

1. Perception of reduced relevance for research, education, or outreach among decision-makers relative to other resources might lead to cuts in funding, space, or personnel.
2. Pests, including cigarette beetles (these are a periodic problem that can quickly destroy affected specimens so continual monitoring for their presence is mandatory).
3. Inadequate financial support for the resources and services provided by OregonFlora.
4. Curator has multiple other roles in the department, including undergraduate advising, which limit time available to attend to the Herbarium.
5. Cordley Hall renovation; the relocation of the collection during the renovation, potential risk of pests, damage of resources in transit, disruption in access, uncertainty of future space/location.

SUSTAINABILITY

MAINTAINING STRENGTHS

The herbarium's core strengths involve its specimens documenting the plant and fungal species of Oregon, its staff and associates (including OregonFlora, two emeritus curators, and the graduate curatorial assistants), its online visibility and dissemination of records via OregonFlora, the undergraduate students working in specimen curation and data management, and its highly visible location in Cordley Hall. Maintaining the herbarium's capacity to meet its goals and objectives involves best-practice curation of the specimens, developing the staff and associates and empowering them to contribute in meaningful ways towards maintaining herbarium strengths, developing student workers beyond their job function, and developing and evolving the partnership between the Herbarium and OregonFlora in ways that continue to strengthen both parties.

ADDRESSING WEAKNESSES

The herbarium's most significant weaknesses are the lack of sufficient working space inside and adjacent to the collection and limited free parking options, both of which limit the number of users and/or volunteers that can visit or access the herbarium at any time. Other important weakness are a large backlog of unmounted specimens, outdated and static webpage, and five independent and separately managed databases (vascular plants,

fungi, lichens, bryophytes, and algae). In 2019, the strategic planning team will establish a priority list for accessioning and long-term curation and design a plan to address the herbarium's capacity to continue growing in high-priority areas. A planned renovation of the Herbarium's home building (Cordley Hall) may help address some space issues by floor-plan changes, but it is not anticipated that additional square-footage will be allocated; a solution for the short-term needs to be identified (especially since renovation plans are tentative). Upcoming initiatives by OregonFlora and Symbiota may present opportunities to consolidate the diverse databases. The strategic planning team will communicate with University Parking Services to explore possibilities that may make it easier to attract volunteers to work in the herbarium.

CAPITALIZING ON OPPORTUNITIES

The herbarium will work closely with OregonFlora to connect to diverse stakeholders via the new OregonFlora website, and will support their efforts to link public interest in native species, ecological sustainability and other topics in ways that will highlight the value of the Herbarium and enhance their content. We will train and engage more undergraduates through the new BOT 406 Curatorial Assistant course, which will help the herbarium meet its goals and objectives, deepen its connection to the Botany major in its home department, and improve its visibility within the College. The involvement of the Curator and Director on several committees concerning the Cordley renovation will help ensure that the renovation provides more effective use of space allocated to the herbarium.

MITIGATING THREATS

The herbarium's most significant threat is the inadequate financial support for the resources and services provided by OregonFlora. We are committed to our partnership with OregonFlora and hope that our inclusion of OregonFlora within our strategic plan will help us strengthen this partnership and help us communicate its value to OSU decision-makers. We recognize that continued, effective communication of herbarium strengths and successes to our administrators is critical to continued support in terms of financial, personnel, and space resources. The threat posed by herbarium pests will continue to be mitigated by preemptive freezing of specimens according to a posted schedule and monitoring of pheromone traps, along with spot-checking in the herbarium and storage room.

EVALUATION

A logic model involving activities leading to outputs leading to outcomes (with metrics, benchmarks, and milestones for outputs and outcomes) is under development. These will be derived from our stated goals and will be primarily formative at this time.

The logic model is presented in the accompanying Excel workbook "OSC_Herbarium_Evaluation_May2018.xlsx".

ACKNOWLEDGEMENTS

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