Strategic Plan (2018-2020)

Ray J. Davis Herbarium (IDS), Idaho Museum of Natural History, Idaho State University

Executive Summary: The Ray J. Davis Herbarium, at the Idaho Museum of Natural History on the Idaho State University campus is a historically and geographically important collection of over 75,000 flowering plant, conifer, fern and lichen specimens representing the botanical diversity of Southeast Idaho and the Intermountain West. The collection was established in 1931 by Ray J. Davis, Professor of Botany at ISU. These early collections form the basis of Davis' "Flora of Idaho", published in 1952. The herbarium continues to add > 2000 specimens annually and is now one of the largest and most complete collections of SE Idaho plants in the country. The herbarium is the largest, most important, collection in the Division of Biological Sciences at the Idaho Museum of Natural History and is a valuable resource for research, education and public engagement. The collection is completely imaged, digitized and served online through the Consortium of Pacific Northwest Herbaria, Consortium of North American Lichen and Bryophyte Herbaria, and iDigBio websites, making it readily discoverable and useable by a wide variety of stakeholders. The herbarium is currently well-staffed with a part-time curator, full-time collection manager, and several undergraduate interns and volunteers.

The strategic plan was developed during the *Strategic Planning for Herbaria* course sponsored by the Society of Herbarium Curators and iDigBio in April-May 2018. The plan lays out a path to sustainability and increasing success based on our current strengths in a large, actively growing and comprehensive collection, experienced and dedicated staff, and affiliations with the museum and Department of Biological Sciences. It addresses our greatest needs for growth and protection of the collection, maintaining a strong staff, and building partnerships both on and off campus. The plan identifies five broad goals:

- Sustain and increase targeted collection growth
- Expand and upgrade specimen storage
- Expand online resources to enhance discoverability and utility for research, education and outreach
- Increase engagement and collaboration with stakeholders at the local, regional and national levels
- Assure sustainability for the herbarium in funding, staffing and space

The strategic plan describes clear evaluation criterion by which to measure our progress and success toward achieving our goals and objectives. The plan will be revisited and revised frequently as we work with our stakeholders and partners to realize the potential of the herbarium to achieve greater success and recognition in research, education and public engagement.

Mission: The Ray J. Davis Herbarium at the Idaho Museum of Natural History acquires, documents and protects plant specimens to provide resources for the study and appreciation of the flora of Idaho and the Intermountain West. The herbarium serves the education and research needs of students, plant-science professionals, land managers and the public, and provides training for the next generation of herbarium and museum professionals.

Vision: The Ray J. Davis Herbarium links high quality education and research in the biological and environmental sciences with physical, digital and human resources in collections-based biodiversity and botanical sciences. We strive to become the premier repository and provider of plant biodiversity knowledge for SE Idaho through the continuing expansion of our physical and digital collections and the resources to discover and utilize these data.

Strategy: The Ray J. Davis Herbarium uses its geographically and historically significant plant collections to promote and facilitate the appreciation, conservation and scientific study Idaho's flora. By careful preservation of physical specimens and serving our digitized collection online we provide access to a wide audience to make discoveries about Idaho's botanical diversity.

Strategic Planning Partners: The primary strategic planning team is composed of Rick Williams (Director and Curator), Janet Bala (Collections Manager), and Pam Reschke (long-time herbarium volunteer). A complete draft of the plan will be reviewed by Mike Thomas (Chair, Department of Biological Sciences), Leif Tapanilla (Director, Idaho Museum of Natural History), Scott Snyder (Dean, College of Science and Engineering), and Terri Bergmeier (Director of Development, Idaho Museum of Natural History). Their feedback will be incorporated into the next version of the document.

Key Stakeholders:

- IDS Herbarium staff: curator, collection manager, undergraduate interns, and volunteers.
- Other museum staff, including: curators of other collections, exhibit staff, outreach and education staff, registrar, student interns and volunteers.
- Affiliate faculty curators from outside the museum, particularly from the Department of Biological Sciences.
- ISU faculty and their students using the specimens and digital data for their courses.
- ISU faculty, graduate and undergraduate student researchers.
- Educators and students in Idaho public and private K-12 classrooms.
- Museum patrons and supporters.
- Collectors (and owners in the case of some NPS collections) of the specimens that IDS curates.
- Regional natural resource managers: IDFG, NPS, NFS, BLM, DEQ, DOR, DOE, Shoshone-Bannock Tribes, Idaho Parks and Recreation, City of Pocatello, Idaho Department of Transportation, regional land trusts, private environmental consulting firms.
- Specimen data aggregators, including iDigBio, Consortium of Pacific Northwest Herbaria, Consortium of North American Lichen and Bryophyte Herbaria, SEINet, GBIF, iNaturalist, and the Virtual Museum of Idaho.
- Researchers from outside the local area who use IDS Herbarium digital data or physical specimens.
- The local community of amateur naturalists, especially from the Sawabi Chapter of the Idaho Native Plant Society and members of the Idaho Flora project on iNaturalist.
- Funders, especially ISU's Department of Biological Science, ISU's College of Science and Engineering, National Science Foundation, etc.

Audience for the Strategic Plan:

- The Mission and Vision statements will be displayed on herbariums home page and whenever posts referring to the herbarium are added to the museum's website and social media feeds.
- The document in its entirety will appear on the herbarium and museum's website. The document will be used in grant proposals and University funding requests. It is intended to demonstrate the important links between the herbarium, museum, university departments, university as a whole, and the state of Idaho in education, research and service.

Goals and Objectives:

Overarching Goal. Better serve and engage our stakeholders with physical and digital herbarium resources and staff expertise for biodiversity research, education, workforce training, and outreach.

Goal 1. Sustain collection growth to best represent the botanical diversity of SE Idaho over extended time spans.

- Add 2000 specimens annually through targeted collecting by herbarium staff and affiliates at undercollected localities and historical resurveys of sites well-collected in the past. *Continuous*.
- Inventoring, prioritizing and processing legacy collections (>10,000) in storage. *2018-2019*.
- Inventoring, prioritizing and exchanging duplicates. *2018-2019*.

Goal 2. Expand and upgrade specimen storage to meet best practices for long-term preservation.

- Add 25 new herbarium cabinets. *2019-2020.*
- Replace door seals on existing cabinets. *2019-2020.*
- Move specimens to new, archival folders. *2019-2020.*

Goal 3. Expand online herbarium resources (data, images and tools) to enhance discoverability and utility for research, education and outreach.

- Make all specimen records available on searchable, public websites (CPNWH, iDigBio), including those not yet verified for accuracy (ca. 30000 of the 73000 records). *Immediately*.
- Annotate all specimens requiring nomenclatural updates (ca. 10,000 specimens) *2018-2020.*
- Georeference all specimens (46600 of 72500 records). *2018-2020 and beyond?*
- Continue to build collaborations with regional and national herbarium digitization efforts. *Continuous*.

Goal 4. Increase engagement and collaboration with stakeholders at the local, regional and national levels.

- Build collaborations with the ISU Department of Biological Sciences and others to facilitate research, teaching and outreach. *Continuous*.
- Develop innovative resources for teaching using specimen data. *Continuous*.
- Expand workforce training for the museum, biological sciences and plant-focused careers. *Continuous*.
- Support the research, education and interpretation mission of the IMNH. *Continuous*.

Goal 5. Assure sustainability for the herbarium in funding, staffing and space.

- Work with the museum, Department of Biological Sciences and College of Science and Engineering to maintain faculty curator, staff collection manager, and student intern positions. *Continuous*.
- Work with Museum and University Development Officers to identify and cultivate donors. *Continuous*.
- Establish an endowment fund for the herbarium. *2018-2020 and beyond?*

SWOT Analysis:

Strengths:

- Herbarium is currently well-staffed (1/2 time curator, full-time collection manager, 5-6 undergraduate interns and research students, 3-4 volunteers).
- Large and comprehensive collection representing SE Idaho over past 80-100 years.
- Active collecting and exchange programs add >2000 specimens/year.
- Targeted collecting to fill in distributional gaps and extend temporal coverage in collection.
- Adequate space for ongoing work, room to expand storage, prominent location in museum lobby.
- Collection completely digitized and served online through regional consortia and iDigBio.
- Good university support for herbarium interns through Career Path Internship Program (ca. 40 hours/week).
- Active citizen science projects using iNaturalist.
- Support for education/outreach/development/policies&procedures through umbrella of museum.
- Local landscape, strong local interest in outdoors and wilderness preservation.

Weaknesses:

- Lack of adequate up-to-date storage (cabinets & archival folders), specimens overcrowded, no room for growth (cabinets >90% full).
- Equipment for teaching and research minimal (*e.g.,* need better scopes).
- Poor museum website, navigation to herbarium and databases obscure.
- Biology department has no plant systematist (or any other kind) on staff.
- Lack of research in museum or in biology utilizing/contributing to collections.
- Low/no budget for herbarium outside of staff salaries.
- Collection policies and procedures need updating.

Opportunities:

- Potential to increase collaborations with ISU Biology Department and others to develop and support curriculum and research.
- New university, college and department administration with potentially stronger support for herbarium and museum's missions.

- Plan to hire faculty with split biology/museum position to replace retiring curator (hopefully to reinvigorate systematics and field botany program in biology).
- Newly hired development officer at museum with biological interests/training can help with targeted gifts to herbarium, potential endowment.
- Continued growth of collaborations with other regional herbaria for proposals, collecting expeditions, databases, and exchanges.
- Increased collaborations with private, state and federal land management/conservation organizations for field surveys, plant identification, and voucher repository.
- Better data analytics to track database use and relevance.

Threats:
- Lack of sustainable funding.
- Variable nature of state, university and grant funding.
- Loss of key staff to retirement (curator 2018, collection manager 2019).
- Lack of ties to Department of Biological Sciences faculty/student research and curriculum.
- Biological themes and objects underrepresented in museum exhibits.
- Low research use of collections = perceived lack of relevance to administration and funding agencies.
- Overcrowded storage conditions lessens opportunities for growth (perceived threat to any newly reposited material).
- Pests, aging infrastructure (climate control and flood risk), and natural disaster (earthquake).

Sustainability:

Maintain Strengths: In order to maintain the depth, breadth and value of the collection, IDS will continue to pursue targeted collecting, processing of archival material, and exchanges to best represent the flora of SE Idaho for research, education and outreach. In addition, all new accessions will be routinely imaged, databased, georeferenced and served online to provide maximum access and utility. We will continue to mentor students, interns and volunteers in herbarium best practices and train the next generation of plant scientists and land managers. We will continue to engage the public in citizen science activities that promote an understanding and appreciation of Idaho's botanical diversity.

Address Weaknesses: IDS will continue to pursue financial support to expand storage by leveraging its underutilized physical space, well-funded workforce of student interns, and comprehensive taxonomic, geographic and temporal coverage of SE Idaho's flora by working closely with the museum's new development officer to identify and reach out to potential donors and identify funding opportunities. Making the herbarium more visible and relevant to its stakeholders through greater outreach, service, and media presence will facilitate these fundraising efforts.

Capitalize on Opportunities: One of IDS' biggest unmet opportunities is the potential collaboration with ISU faculty in biological sciences, and local land management and conservation organizations. Utilizing the resources and staff of the herbarium we will work with faculty to better integrate the herbarium into their teaching and research, as well as offer more training opportunities and collaborate in surveys and provide identification services. This also addresses some of our weaknesses in visibility and perceived utility.

Mitigate Threats: IDS will accelerate its efforts to mitigate the risks of earthquake damage by stabilizing shelving and cabinets by approved methods. We will mitigate fire/flood risk (water damage in event of fire from sprinkler systems) by replacing worn-out door seals on cabinets to make them more water-tight.

Match our strengths and opportunities to address weaknesses and threats: The upcoming plan to hire a new faculty member in Biological Sciences who will bridge the gap between the museum and department presents a critical opportunity to advance the herbarium and botanical research and education at Idaho State University.

This hire could address: the ***threats*** of loss of the current curator to retirement, lack of ties to the biology department, and low research use of collection; the ***weaknesses*** of no plant systematist on staff, a lack of synergy between the herbarium and biology department for research and education; the ***opportunities*** of the upcoming job search to fill an open position, new administrators interested in building ties between the biological sciences department and the museum, the potential to increase museum/biology department collaborations, and the potential to increase herbarium collaborations with local land managers, conservation organizations and citizen scientists/plant enthusiasts; and our ***strengths*** in an active, well-curated, regionally and nationally important plant collection, good funding for student interns and a collection manager, and our location in SE Idaho. The herbarium and museum should be promoted as a valuable resource and opportunity for research and education to attract highly qualified candidates to fill the faculty position in biological sciences that will replace the retiring curator. The herbarium curator position should be promoted (and compensated) as an integral part of the position that will benefit the faculty's career, as well as the goals of the museum, biology department, college and university. This will require working closely with new administrators at all levels to develop the expectations and compensation for the position. **The outcome of this hire is crucial to the sustainability of the herbarium.**

Evaluation:

We developed a logic model describing activities, outputs and outcomes derived from our goals and objectives. This evaluation tool lists activities that lead to measurable outputs, leading to broad outcomes parallel with our goals. Outputs and outcomes are evaluated based on a set of benchmarks and milestones that reflect maintenance and improvement on current herbarium metrics, comparisons to peer institutions of similar size and situation, and the aspiration to achieve our vision for the herbarium.

The logic model is presented in the associated Excel spreadsheet:

Acknowledgements:

The strategic plan was produced as part of the "2018 Strategic Planning for Herbaria" course sponsored by the Society of Herbarium Curators and iDigBio and co-taught by Austin Mast, David Jennings, and guest-instructor Shari Ellis. Thanks to them for providing guidance and inspiration as we developed our plans. Ideas presented in our plan benefited from conversations with and work presented by the 2018 strategic planning course participants (Jennifer Ackerfield, Sarah Chamberlain, Sara Fuentes-Soriano, Amanda Grusz, Maribeth Latvis, Maribeth Link-Perez, Amy Litt, Alicia Lopez, Adriana López-Villalobos, Nina Lundholm, Kirstin Phillips, Alan Prather, Nina Rønsted, Tristram Seidler, Karly Tumminello, Rick Williams, Paul Wolf, and Ya Yang).

Draft of 16 May 2018