

To: University of California Natural Reserve System

From: Erica Krimmel, Collections Manager at Sagehen Creek Field Station

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Subject: Suggested Goal for UCNRS Strategic Planning

Why is Biological Collections Digitization Important to the UC Natural Reserves?

Summary. Biological collections—e.g. herbaria, mammal specimens, specimens preserved in alcohol, etc.—have always been a cornerstone of field biology and continue to provide baseline insight into modern biological science inquiry. The concentrated temporal and geographic scales of biological collecting at field stations within the UCNRS represents an investment that should be matched with continued support. Historical data about species distribution and community structures are valuable resources for researchers, and access to these resources must be improved to both facilitate more comprehensive science, and to ensure that UC Reserves are valuable assets to the broader academic community. Collections digitization is the entry point for improving this access.

Why now? The National Science Foundation estimates that a total of 6 billion biological specimens exist in institutions across the country, many trapped in analog format. Since 2011, fifteen million biological collection specimens have been digitized via iDigBio, the national resource for NSF's Advancing Digitization of Biological Collections (ADBC) program. This program continues to be well funded through 2021, but beyond that funding for collections digitization is uncertain. The UCNRS represents 39 distinct reserves and over 60,000 specimens, including everything from birds to paleontological artifacts. Although many of the University of California campuses have already invested in digitizing their collections, the Reserves have, for the most part, been disappointingly left behind; only approximately 8% of UCNRS specimens have been digitized. The Reserves cannot afford to wait on the UC campuses to recognize this need. Instead, UCNRS must leverage its own collective resources to promote biological collections digitization and management at each Reserve. By doing so, UCNRS will add data-rich facilities to its legacy as a premier field research network.

Proposed Goal. In the next five years, the UCNRS must prioritize biological collections digitization in order to take advantage of current funding and resource streams, and to invest in the Reserves' future as networked, data-rich research facilities. Digitized specimens will serve to preserve as well as extend biological collections at individual Reserves, but digitization efforts must be made at the system level in order to best support individual Reserve staff.

- **Objective 1:** Digitize all specimens at each UC Natural Reserve site. To the extent that it is feasible, maintain collections on location; in the event that this is unreasonable, transfer specimens to the Reserve's parent campus.
- **Objective 2:** Create a UCNRS-wide data management plan that can be customized to guide digitization efforts at individual Reserves. This plan must include sharing digitized data with appropriate regional and national biodiversity data repositories, e.g. the Keck EcoEngine at UC Berkeley, the California Consortium of Herbaria, the Global Biodiversity Information Facility, etc.
- **Objective 3:** Collaborate with projects such as UC Berkeley's "Quantifying ecological effects of land use and climate change using historical collections" to document reserve digitization and collection protocols. Establish the UCNRS as a leader in field station biological collections management by making these protocols available to other reserves.

- **Objective 4:** Promote downstream use of digitized collections data via the development of web-based applications for analysis and visualization. Use such applications to enhance the teaching resources available at each Reserve, as envisioned by the UCNRS mission.

Recommended Further Reading

iDigBio. (2011). Advancing Digitization of Biological Collections (ADBC) overview. Retrieved from <https://www.idigbio.org/content/advancing-digitization-biodiversity-collections-adbc-overview>

National Science Foundation. (2014). Advancing Digitization of Biological Collections (ADBC). Retrieved from http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503559

National Science Foundation. (2014). Collections in Support of Biological Research (CSBR). Retrieved from http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503651&org=NSF

Networked Integrated Biological Alliance. (2010). A strategic plan for establishing a network integrated collections alliance. Retrieved from <http://digbiocol.files.wordpress.com/2010/06/digistratplanfinalv1.pdf>