Proceedings of
Association of Pacific Rim Universities (APRU)
Research Symposium on University Museums:
Forming a University Museum Collection Network as the Core of Frontier Research
O-10

The Beaty Biodiversity Museum at UBC: An Experiment in Curation, Research, and Public Outreach

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Background

The state of many natural history collections in Canada and in North America in general has declined over the last 30 years. The vast holdings, some two million specimens of fishes, birds, mammals, reptiles, amphibians, invertebrates and plants, many collected over a century ago, at the University of British Columbia (UBC) were no exception to this general trend. The collections suffered from substandard and fragmented curatorial facilities and lack of financial support for improvements or even basic curation. Our collections were founded in the 1920–50s, but in 1989 many faced extinction at UBC.

A New Beginning

After our departments of Zoology and Botany re-committed to maintaining these collections, we were successful in obtaining major funding from federal and provincial governments and from private individuals such that in the autumn of 2010 the Beaty Biodiversity Museum (BBM) opened its doors as part of the Biodiversity Research Centre (BRC) at UBC (Fig. 1). The BBM brought together all of the various collections into one state-of-the-art archival system, that is integrated into an adjoining research facility, the BRC, with 42 faculty members whose research spans from understanding the origins of microbial diversity, experimental tests of ecosystem process, systematics and biogeography, conservation biology, to experimental and theoretical evolution and empirical population genetics and genomics. In addition, the BBM was designed to have the archival cabinets accessible to the public for external viewing of various displays and provides a full menu of public outreach and education programs. The latter attributes were key factors in obtaining funding.

Fig. 1. Overview of the Beaty Biodiversity Museum at the University of British Columbia.
How the Museum Is Organized

The research and curatorial aspects of the BBM are organized into six major collections: the Fish Collection, the Cowan Tetrapod Collection, the Spencer Entomological Collection, the Marine Invertebrate Collection, the Herbarium (itself composed of five collections from algae to bryophytes), and the Fossil Collection. The Fish Collection is the largest with over 850,000 specimens, the Herbarium and Spencer Entomological collections have over 600,000 specimens each, while the others are much smaller at no more than 40,000 specimens each; most collections are searchable online. In addition, some collections have extensive DNA and tissue samples associated with voucher specimens (particularly for plants, fishes, spiders, and birds). The BBM has a faculty science director, an administrative director and a faculty curator for each collection. There are also several staff members employed in curation, administration, and public outreach. The public educational component of the BBM also depends heavily on a dedicated number of volunteer docents. At the larger university level, the BBM is paired with the UBC Botanical Garden (together forming the UBC Biodiversity Collections) and is part of a network of museums at UBC that includes the Museum of Anthropology and the Pacific Museum of the Earth.

Below our signature blue whale skeleton (Fig. 2), the holdings of the BBM are organized into rows of cabinets, a large proportion of which contain glass windows containing specimens of interest with interpretive signage (Fig. 3, 4). Each collection is organized in an evolutionarily systematic fashion, with interpretive signage, and small curatorial coding, such that the public, who are free to walk amongst the cabinetry, can take self-guided tours through the diversity of life while at the same time specimens can be easily found for research and curatorial purposes. Sprinkled throughout the collection are interpretive display “islands” that present research of members of the BRC or explain major themes of biodiversity (e.g., processes of evolutionary change, issues in conservation, etc). The BBM also has a “Discovery Lab” for public programs, abundant wall space for temporary displays (e.g., photographs of wildlife, wildlife art), and a small lecture theatre. The BBM also has a small public education staff group who design and deliver public education programs (school programs, tours, special lectures, workshops, private functions, etc).

In this way, the organization of the BBM serves academic research, archival and curatorial needs, and public education and outreach. Our major goals connected to the latter two functions are to help to bring university based research to the public, instill or reinforce a sense of the wonder of biodiversity and a conservation ethic in the public, and widen the appeal.

Fig. 2. The largest blue whale (Balaenoptera musculus) skeleton in Canada (26 m) graces the upper floor atrium of the Beaty Biodiversity Museum.

Fig. 3. Publically-accessible cabinetry in the BBM.

Fig. 4. Behind the BBM atrium, the collections are situated underground, where a field above them serves as a natural biodiversity “laboratory” for public events and school groups.
and appreciation of the importance of natural history, and natural history collections in particular, to the university as a whole and also beyond the academic environment.

**What the Museum Does**

The primary mandate of the BBM is to provide archiving and curation for its biological specimens to support fundamental and applied research in the origins and persistence of biodiversity, undergraduate and graduate education, and public outreach. For instance, some researchers have made extensive collections to document and describe new species within the Salticidae (jumping spiders) and to understand the evolution of eyesight and behaviour within this diverse clade (Fig. 5, see http://salticidae.org/wpm/). Other work includes extensive inventory and evolutionary genetics and morphological analysis in fishes to examine, for instance, how environmental changes impact species persistence. Extensive historical voucher and DNA samples housed at the BBM have been critical to these investigations (Fig. 6, see http://www.zoology.ubc.ca/~etaylor/). Still others are using morphological and DNA assays to study the deep roots of the plant tree of life, the nature of traits that influence the “invasiveness” of different species, and large scale phytogeography.

The BBM’s extensive public outreach includes technical workshops on species identification and specimen preparation (Fig. 7), very popular school group educational sessions and tours (Fig. 8), and public lectures (Fig. 9).

![Fig. 5. Some Salticidae studied by W. Maddison’s group at the BBM.](image)

![Fig. 6. Historical collections of threespine stickleback housed at the BBM were critical to documenting “reverse speciation” in species pairs in one lake.](image)

![Fig. 7. A BBM-sponsored workshop on bryophyte identification.](image)

![Fig. 8. Inspiring children about the wonders of biodiversity is a chief aim of the BBM’s public outreach program.](image)

![Fig. 9. One of the first public lectures held at BBM.](image)
To date, the BBM has been successful at integrating the goals, demands and challenges of meeting our archival, curatorial, and university-based research and education responsibilities with those that promote broad public engagement and provide accessibility to our collections for the general public. This is an important achievement given the spectacular public legacy that our collections represent and because the BBM is the only natural history and biodiversity museum in Vancouver, Canada’s third largest, and one of its fastest growing, metropolitan areas.

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Fig. 10. Pholis clemensi, one of 33 holotypes of fishes housed at the BBM.

Fig. 11. Part of the Cowan Tetrapod Collection at the BBM.