

100 Years, 100 Treasures Museum Exhibit Project



Inside you'll find an assignment for the *100 Years, 100 Treasures* online exhibition and resources to go with this assignment. This assignment can be applied to many topics within Science and History; this is recommended for Grades 9-12.

The link for the *100 Years, 100 Treasures* Exhibition this assignment is based on is on the Beaty Biodiversity Museum website: <https://beatytreasures.com/>

Other online exhibitions can be found here: <https://beatymuseum.ubc.ca/exhibits/online-exhibitions/>

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Introduction to the Beaty Biodiversity Museum

Explore the museum before this assignment using one of these virtual tours:

- This audio tour takes you through each of the collections. A written transcript is available for the full tour: <https://beatymuseum.ubc.ca/audiotour/>
- If you prefer to spend time looking through photos, you can explore our 360° tour: <https://beatymuseum.ubc.ca/visit/virtual-tour/>
- Watch our virtual tour with an interpreter: <https://youtu.be/5hSDow-7dQs>

Beaty Biodiversity Museum:

The *100 Years, 100 Treasures* Online Exhibition is part of the Beaty Biodiversity Museum (BBM), a natural history museum located at UBC, open since 2010. The BBM is on the traditional, ancestral, and unceded territory of the Musqueam First Nation (<https://www.musqueam.bc.ca/>).

We have both physical and online exhibits, a database of specimens from six different collections, an education classroom and research labs. The purpose of the BBM is to showcase the biological collections and research at UBC. We have 20,000 square feet of collections and exhibit space, with an estimate of 2,200,000 specimens.



The museum floor consists of six different collections. The layout map can be seen on Appendix One, pg.14:

- Cowan Tetrapod Collection: vertebrate species with four limbs, including reptiles, amphibians, birds, and mammals.
- Marine Invertebrate Collection: animal species without a spine, some may have hard parts like shells. This includes animals like sponges, jellies, sea stars, worms, crustaceans, molluscs, and more!
- Herbarium: a collection of vascular plants, non-vascular plants, algae, fungi, and lichen.
- Spencer Entomological Collection: terrestrial arthropods including insects, arachnids, millipedes, and more!
- Fish Collection: vertebrate animals who use gills for respiration, including hagfish, cartilaginous fishes, and bony fishes.
- Fossil Collection: fossils throughout different times of many different organisms, including stromatolites, trilobites, and casts of dinosaur trackways. This collection is jointly managed by the Pacific Museum of Earth (<https://pme.ubc.ca/>)
- Learn more about the collections: <https://beatymuseum.ubc.ca/collections>



A view inside the Beaty Biodiversity Museum's Fish Collection.

The 100 Years, 100 Treasures Online Exhibition:

To celebrate the 100th anniversary of the University of British Columbia, the Beaty Biodiversity Museum selected 100 treasures from its collection to inspire stories from the communities around the museum. Discover the treasures, large and small, contained in the museum, and how they relate to those in other collections.

View the full exhibition online at <http://beatytreasures.com>



Curriculum Links: Sciences

Life Sciences 11:

Big Ideas: Evolution occurs at population level; Organisms grouped based on common characteristics

Core Competency:

- Processing and analysing data information:
 - Apply First Peoples perspectives and local knowledge as sources of information
 - Seek and analyze patterns, trends, and connections in data
- Evaluating:
 - Demonstrate an awareness of assumptions, question information given, and identify bias in their own work and in primary and secondary sources
 - Consider the changes in knowledge over time as tools and technologies developed
- Communicating:
 - Communicate scientific information for a specific purpose and audience, constructing evidence-based arguments and using appropriate scientific language.
 - Express and reflect on a variety of perspectives, and worldviews through place

Topics:

- Level of Organization (specifically organism, population, community, ecosystem)
- First Peoples understandings of interrelationships between organisms
- Microevolution and Macroevolution

Environmental Science 11

Big Ideas: Complex roles and relationships contribute to diversity of ecosystems.

Curricular Competencies: See Curricular Competencies for Life Sciences 11

Topics:

- Levels (ecosystem, species, genetic) of biotic diversity
- Ecosystem complexity (roles, relationships, population dynamics)
- First Peoples knowledge and other traditional ecological knowledge
- Sustaining Biodiversity
- Human actions and their impact on ecosystem integrity

Environmental Science 12

Big Ideas: Human activities cause changes in the global climate system.

Core Competencies: See Curricular Competencies of Life Sciences 11

Topics:

- Bioindicators (plants, animals, microorganisms, indicator species, biological integrity, species range of tolerance, species richness, diversity indices)
- Impacts of global warming
- Adaptations
- Address the impacts of climate change
- Land use and degradation

Science 10: Topics:

- Natural selection (adaptive radiation, selection pressure, adaptations, extinctions)
- Local and global impacts of energy transformations

Science 9: Topics:

- Bioaccumulation and biomagnification within biotic and abiotic components of ecosystems
- Sustainability of systems
- First Peoples knowledge of interconnectedness and sustainability

Curriculum Links: Social Studies

Exploration in Social Studies 11

Big Ideas:

- Cultural expressions convey the diversity and resiliency of [B.C. First Peoples (12)]
- Physical features/natural resources influence population distribution (Human Geography 12)
- Social, cultural, or technological innovations and developments in the 20th century (20th Century World History 12)
- Colonialism and contemporary issues for indigenous people in Canada and around the world (Contemporary Indigenous Studies 12)
- Natural resource and local, regional, national, or global development (Human Geography 12)

Curricular Competency:

- Use Social Studies inquiry processes and skills to ask questions; gather, interpret, and analyze ideas; and communicate findings and decisions
- Assess the significance of people, places, events, ideas, or developments (significance)
- Compare and contrast continuities and changes, trends and patterns (continuity and change)

Physical Geography 12:

Big Ideas: Incorporating data from a variety of sources allows us to better understand our world.

Curricular Competencies:

- Identify and assess how human and environmental factors and events influence each other (interactions and associations)
- Evaluate how particular geographic actions or events affect human practices or outcomes (geographical value judgments)
- Evaluate features or aspects of geographic phenomena or locations to explain what makes them worthy of attention or recognition (geographical importance)

Topics:

- Structure of, feedback within, and equilibrium of natural systems
- Features and processes of Sun–Earth interactions and resulting patterns of climate, landscapes, and ecosystems
- Characteristics of global biomes, including climate, soil, and vegetation
- Features and processes of the anthroposphere and their effects on natural systems.
- Natural resources and sustainability

Social Studies 10:

Big Ideas: Worldviews lead to different perspectives and ideas about developments in Canadian society.

Core Competency:

- Communication (Communicating Research and Collaboration) and Creative Thinking
- Assess the significance of people, places, events, or developments, and compare varying perspectives on their significance at particular times and places (significance)
 - Whose stories are told and whose stories are missing in the narratives of Canadian history?
- Compare and contrast continuities and changes for different groups at particular times and places (continuity and change)
 - How has the Canadian government's relationship with First Peoples regarding treaties and land use changed or stayed the same?
- Explain and infer different perspectives on past or present people, places, issues, or events by considering prevailing norms, values, worldviews, and beliefs (perspective)
 - How do humans' relationships with land impact political and economic ideologies?
 - How do art, media, and innovation inform a shared collective identity?

Introduction to Assignment:

You are a curator at a Natural History Museum, and you are responsible for the creation of a new exhibit. This exhibit needs to have a specific theme or topic relating to biodiversity, so careful consideration of the available specimens is vital.

To do so, you need to choose 5 out of the 100 Treasures of the *100 Years, 100 Treasures exhibition* to use for an exhibit in this museum. You will communicate your plan for the exhibit through a chosen format depending on your preferred communication style. You can do a PowerPoint, a report, diorama, poster, model, exhibit proposal, or any other form of design that your teacher recommends. You will then present your proposed exhibit to your peers. Your teacher may consider this to be an independent project, or a team project.

Time Required:

3-6 hours, or 2-3 class periods (one to explore exhibit and research specimens, one to structure and organize exhibit theme, and finally a presentation period)

Resource List:

- Computer and access to Wifi
 - *Note, for students with limited access to the internet, you can get them to explore a set of the specimens in Appendix Two on page 15.*
- Graphic Organizer for structuring project
 - *See Appendix Three on page 27*
- Depending on your chosen mode of presentation you may need:
 - Google Doc, Google Slides, Prezi
 - Pen and paper
 - Poster boards, cardboard boxes, modeling clay, etc

Definitions:

Throughout this assignment, we use the words “organism,” “species,” and “specimen.”

- An organism is a living thing: from bacteria, invertebrates, plants, and other animals. They may be alive today, extinct, and/or fossilized.
- Species refer to one group of organisms, such as humans, *Homo sapiens*. For this assignment, learning about the species that your specimen falls into will give you extra information for the context of your created exhibit.
- A specimen is an individual of a species, preserved and kept within a museum, such as at the BBM. A specimen could also be another object, photograph, sound, data, letter, or other type of record. Each specimen has information associated with them, which gives us information to better understand that species as a whole. Each individual is unique, and the stories in *100 Years, 100 Treasures* may reflect specifically on that individual’s story, such as the blue whale. Others may describe a full species, such as the sockeye salmon.
- Think about the differences between these terms and how you may use these differences in the creation of your exhibit.

Success Criteria:

- I am able to find connections between different, natural history specimens.
- I am able to select specimens from at least two different museum collections.
- I am able to communicate my topic/theme using scientific terms and academic language in a clear, concise manner.
- I am able to correctly label specimens (including scientific names and common names), and identify which museum collection the specimen belongs in.
- I am able to be creative in my connections and communications.
- I have provided effective evidence/reasoning for my exhibit theme/topic.
- I have demonstrated effective research skills and I have used credible sources and cited them in the APA method.

Guiding Questions:

In planning this exhibit, you may consider the following **Guiding Questions**:

- What are the connections between the chosen treasures?
- What could be a theme for your exhibit? How will you display them visually?
- What story will you tell? How can you connect this to your subject?
- Does isolating five specific treasures from a collection change their meaning?
- How can you communicate the history surrounding the specimens and what role it plays in the biodiversity of the area effectively?
- What role does this specimen have in their environment?
- How do humans interact with this species? How has it changed in the last 10 years, 100 years, or 500 years?
- What do we know now that we didn't when this specimen was collected?
- Compare how these specimens were perceived 100 years ago versus today. Has anything changed in its status/importance?
- Is it present in the environment in the same way it was 100 years ago?
- Why do humans make collections such as these? What is the purpose in organizing visual/physical information like this?
- Some of the specimens in this exhibit are currently on display and some others are locked away in cabinets. Why do you think some specimens are put on display over others? What motivates this decision?
- Why is it important to look at connections between different specimens?

These guiding questions are the same questions that museum curators and educators consider when creating an exhibit or tour. If you need some inspiration, the BBM has images of cases within the museum, most of which contains five specimens. You may also look for specimen specific questions in Appendix 2 on pg 15; this section will provide specific questions to prompt students.

The photos below show a collection of five specimens from our *100 Years, 100 Treasures* exhibition. This may help give you a visualization of what a collection of 5 specimens could look like. Please explore the museum's flickr page for larger photos.

- <https://www.flickr.com/photos/beatymuseum/albums/72157670712230575>
- <https://beatymuseum.ubc.ca/exhibits/online-exhibitions/>



The Beaty Biodiversity Youtube channel also has some great videos that can help with this project:

- Find all of these videos from our main page or playlists tab: <https://youtube.com/beatymuseum>
- “Can (and should) Biotechnology reverse extinction?” In this lecture, Beth Shapiro, ancient DNA scientist and author of *How to Clone a Mammoth*, discusses the real science behind the emerging idea known as “de-extinction,” exploring biodiversity now and in the past. https://www.youtube.com/watch?v=zB_Yuunpi2I
- The Backyard Biodiversity series explores British Columbia plants with the Herbarium’s collection curator, Linda Jennings.
- The Beaty@Home video series features recordings of various topics, chats with scientists, and museum activities.
- Researchers Revealed is an online exhibition exploring current biodiversity research. Explore the full playlist! We suggest you start with Jamie Fenneman’s video, “One Stem at a Time” to learn about how museum specimens contribute to biodiversity science: <https://youtu.be/QrOxl0m-V64>



Topic Ideas:

- Changes in Environment/Climate Change
- Indigenous Connection to Land
- Keystone species
- Extinct/Endangered Animals
- Unconventional Treasures
- Historical Biodiversity
- BC Treasures
- Cultural Connections
- Art in Science
- Evolution
- Cultural Stories/Mythology of Creatures

The above topics are just a place to start! You are more than welcome to create your own theme. We recommend looking through the *100 Years, 100 Treasures* webpage before making your mind up on a topic! Challenge yourself to choose diverse specimens, while choosing five fishes might make a concise exhibition, choosing five very different organisms will be more compelling! Though the specimens are very diverse, there are common connections that can be made between the specimens.

Go past information that is present in the *100 Years, 100 Treasures* exhibit and spend time researching the organisms individually, in order to make your connections/argument stronger. The next two pages include a wide variety of resources to help your research.



Information Databases and Suggested Resources:

- Beaty Biodiversity Museum research and collections: <https://beatymuseum.ubc.ca/research-2/>
Some specimens from 100 Years, 100 Treasures have specimen numbers listed on their photographs. You may be able to learn more about the specimen by looking up this number in our collections database.
- X̱wi7x̱wa Library at UBC, helpful for Indigenous connections: <https://xwi7xwa.library.ubc.ca/>
- Rare Books and Special Collections UBC has collections relating to the historical landscape of BC and the industries here: <https://rbsc.library.ubc.ca/>
- Biodiversity Heritage Library, makes biodiversity research accessible: <https://www.biodiversitylibrary.org/>
- National Geographic Classroom Resources: <https://www.nationalgeographic.org/education/classroom-resources/>
- Parks Canada (Past and Present Landscapes, Indigenous connections) <https://www.pc.gc.ca/en/culture/autochtones-indigenous/connections>
- Government of Canada: Climate Change and Biodiversity: <https://www.canada.ca/en/environment-climate-change/services/biodiversity.html>
- Government of Canada: Canadian Species Index; tracks changes past and present:
 - <https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/canadian-species-index.html>
 - <https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/status-wild-species.html>
- Canadian Museum of Nature's online database: <https://www.nature.ca/en/research-collections/collections>
- Hinterland Who's Who by the Canadian Wildlife Federation: <https://www.hww.ca/en/wildlife/>
- Google Scholar is a search engine that can be useful in accessing academic articles for free: <https://scholar.google.ca/>
- McGill University Canadian Biodiversity Website: <http://www.canadianbiodiversity.mcgill.ca/english/index.htm>

Related Articles and Resources:

- Orca Whales and Misconceptions (History of modern Conservation movement):
<https://thewalrus.ca/moby-doll/>
- Biodiversity art exhibit (Art in Science, Climate Change, Anthropocene, Endangered, Landscapes (forest and ocean): <https://www.davidellingsen.com/Work-II/SeaLife/thumbs>
- Indigenous Connection to Land (Canadian Geographic):
<https://indigenouspeoplesatlasofcanada.ca/article/connection-to-the-land/>
- Indigenous People defend Biodiversity (Indigenous Connection)
<https://www.nationalgeographic.com/environment/article/can-indigenous-land-stewardship-protect-biodiversity->
- Canadian Parks and Wilderness Society: Biodiversity and Climate Change:
<https://cpaws.org/biodiversity-and-climate-change/>
- Scientific American: Climate Change threat to Biodiversity:
<https://www.scientificamerican.com/article/climate-change-is-becoming-a-top-threat-to-biodiversity/>
- Salmon: Keynote species in BC (Keynote species, climate change):
https://www.psf.ca/sites/default/files/PSF_2011_AR_keystonespecies.pdf
- CBC: "These Canadian species are found nowhere else on Earth"
<https://www.cbc.ca/news/technology/endemic-species-1.5597186>
- Arctic Lemmings as Keynote Species:
<https://arcticwwf.org/newsroom/the-circle/a-new-deal-for-the-arctic/lessons-from-lemmings-eco-system-disruptions-can-have-cascading-effects-on-species/>
- Is Canada's Boreal Forest Ancient? <https://cfs.nrcan.gc.ca/pubwarehouse/pdfs/30085.pdf>
- Canadian population of at-risk species declined over last 50 years: report:
<https://www.cbc.ca/news/technology/wwf-at-risk-species-decline-in-canada-1.5709093>
- The Science of Art: Why Botanical Illustration Matters (Women in Science)
<https://www.smithsonianmag.com/science-nature/meet-woman-who-meticulously-illustrates-plants-name-science-180969544/>
- How Culture impacts Biodiversity: Hindu Mythology:
<https://ethnobiology.org/impact-culture-biodiversity-conservation-review-hindu-mythology>
Explore the rest of the Ethnobiology webpage for more articles!
- Climate Change: Why are thousands of species facing extinction? (BBC News):
<https://www.youtube.com/watch?v=nho73BtDQtE>

Extension of Assignment:

You may notice that some of the entries do not contain as much information as others. Some of them only have the name of the specimen! If you are interested in these specimens, what information would you include about them? What role would they play in your exhibit? What kind of context will you give them?

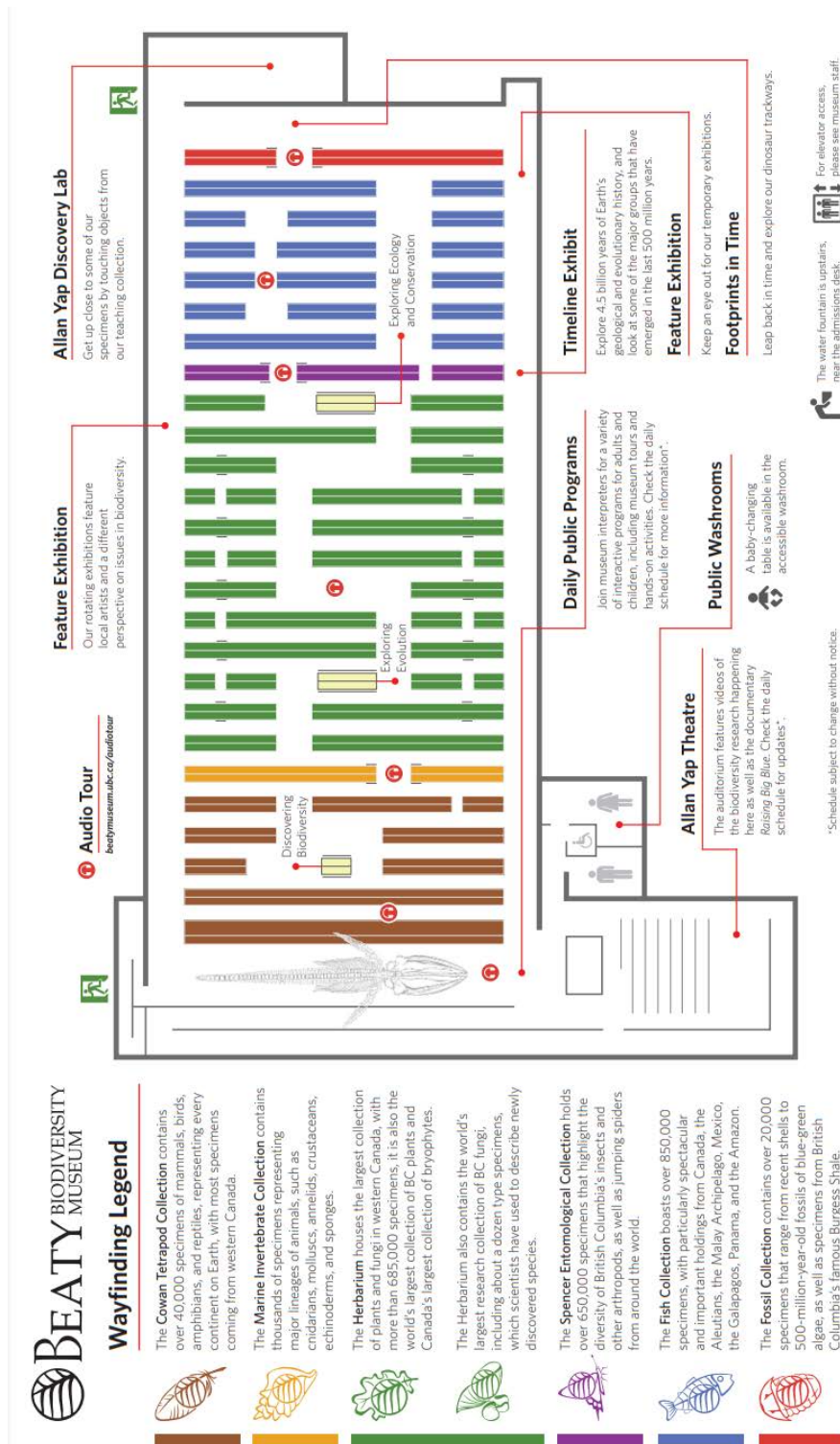
Specimens with limited information:

- White's seahorse; *Hippocampus whitei*
- Blue whale; *Balaenoptera musculus*
 - Information about the BBM specific Blue whale specimen can be found here:
<https://beatymuseum.ubc.ca/exhibits/permanent-exhibitions/blue-whale-display/blue-whale-project/>
- Staghorn sculpin; *Leptocottus armatus*
- Dark-winged fungus gnat; *Cramptonomyia spenceri*
- Hyracodon; *Hyracodon nebraskensis*
- Cyanobacteria; *Marpolia spissa*
- Easter island fishes
- Moss; *Brotherella canadensis*
- Chain coral; *Halysites*
- Baler volute; *Melo broderipii*
- Graptolite; *Monograptus*
- Varied thrush; *Ixoreus naevius naevius*
- Lesser goldfinch; *Spinus psaltria witti*
- Porifera (fossil sponges); *Archaeocyatha*
- Ammonite; *Pseudophyllites*
- Sea scorpion; *Eurypterida*
- Cow path tiger beetle; *Cicindela purpurea audubonii*
- Northern abalone or pinto abalone; *Haliotis kamtschatkana*
- Great green turban; *Turbo marmoratus*
- Hover fly; *Sericomyia chalcopyga*
- California root borer; *Prionus californicus*



Appendix One: Museum Collections Map

Download a pdf version: <https://beatymuseum.ubc.ca/beatyvisitorguide2018/>



Appendix Two: Specimen Specific Questions

This appendix contains questions for 15 of the specimens in this exhibition. This can provide a support or structure for your students to start thinking about what themes these specimens can reflect and start to make connections between the exhibits from a smaller specimen pool in order to better visualize the aims of this assignment. This will also be helpful if some students cannot access the website online or may be sharing devices.



John Davidson's field kit; City of Vancouver Archives reference number AM505-S1-: CVA 660-663; 1910; BC.

"Having participated in collection forays with field botanists, I can attest to the fact that the modern-day botanist's field kit has changed very little since Davidson's time"

- What does this quote say about the evolution of field research in biology since 1910? Does this surprise you? How do you think it should change?
- Is this kit sustainable for the environment? Why or why not?
- What do you carry around to navigate your environment?

Man-eating clam; *Tridacna gigas*; Indo-Pacific.

“This great mollusk gained notoriety through myth and legend mercilessly devouring unlucky divers. While today it is considered neither aggressive nor dangerous, its biggest battle is with overfishing as numbers diminish to near-extinct levels.”

- What does this quote say about the way our perception of a species have changed over time?
- How have they been threatened over time? Has there been a change?
- How does human perspective affect how we view a species? Can you think of any other species that has had similar misconception?



***Melanotus textilis*; 1982; BC; Collected by Paul Kroeger**

“I found little mushrooms growing on a rotting woollen carpet heaped in their garden. This carpet at one time was sunk with a boat in False Creek for a month, and after salvage served as an outdoor carpet till decay rendered it more suitable as garden mulch. The same *Melanotus* species was found on discarded blue-jeans, rolled up work socks, seat covers of abandoned cars, furniture upholstery, old hemp rope and a variety of other man-made fibres so it was given the name *Melanotus textilis*. The designated TYPE specimen was growing on jute-like fabric of an abandoned chair in woods on the Musqueam Indian Reservation near UBC.”



- What does this communicate about how humans have impacted the environment? Is this a positive or negative impact?
- What do you think about the reasoning for the scientific name of this species?
- What is a “type” specimen and why is it important?
- Could this kind of human made objects be considered sustainable for the environment because it creates a habitat for these mushrooms to grow? How do you think this affects the surrounding environment?



Passenger pigeon; *Ectopistes migratorius*; ON; Collected by H.J Baker / ROM

“The passenger pigeon is extinct, and the one we saw was from the 1800’s”

- How did the passenger pigeon go extinct?
- What does this say about how humans have impacted the environment? Has our impact gotten better or worsened in recent years in terms of extinction?
- How can we best communicate the threat of extinction through this species?

Saskatoon serviceberry; *Amelanchier alnifolia*; 1970; BC; Collected by Nancy Turner.

"I was with my friend and teacher, the late Sam Mitchell from Xaxl'ep (Fountain). A speaker of the Stl'atl'imx (St'at'imc) Interior Salish language, Sam was an expert in all aspects of his territory. As part of my doctoral research, he was sharing his amazing knowledge of different varieties of Saskatoon berry (*Amelanchier* spp.; Klinkenberg 2015) called stsekwum, with me. These included: spekkep, 'white-white'; swelhkwa7-u7sa7 "red-berry"; stl'exel'us "sweet berry", stsekwum-ul "real/original saskatoon" and, finally, the one in this collection, nek'nakw'-ukw'sa7 "rotten berry". Each variety had its own characteristics of growth form, habitat, and taste, colour, seed size and juiciness. This one, he explained, had large seeds and tended to rot quickly, so was not very popular (cf. Turner 1974)



Other Interior Salish First Peoples – and some coastal groups – also recognized multiple varieties of the culturally important fruit. I was so fortunate to have been able to document some of these through collaborative botanical research with my Indigenous colleagues, as a way of highlighting the rich ethnobotanical heritage we have here in British Columbia (cf. Turner 2014)."

- Has there been any changes in the status of the saskatoon serviceberry culturally, socially, environmentally, or politically in the past 40 years compared to today?
- How does the presence of this plant have an impact on the culture of its environment?
- How can we incorporate Indigenous education into our understanding of biology? How can we incorporate the Truth and Reconciliation Commission into biology?

Sockeye salmon; *Oncorhynchus nerka*

“In my eyes, there’s no animal that says ‘British Columbia’ more than the salmon. As a supporter of the Pacific Salmon Foundation AND a seasoned sportfisherman I’m passionate about making sure the delicate balance of sustaining this keystone species, while still being able to have some on our collective plates, is maintained. Over the decades the research that’s been done in this province and beyond has - and continues to - educate the policy that will hopefully ensure the salmon will be around for generations to come.”

- “There’s no animal that says ‘British Columbia’ more than the salmon” In your opinion, is this true? What is culturally significant about the salmon in BC? Is there a difference in its significance for different cultural groups, and how so?
- How is the salmon a keystone species? What impact does it have on their environment?
- How can we have a sustainable relationship with salmon?



Great spirit gummy bear; *Pseudohydnum gelatinosum*; Collected by B Didier

“While most other fungi reflect the earthy tones of an autumnal colour palette, *Pseudohydnum gelatinosum* is devoid of colour, translucent, filled with the soft light of cloudy skies filtered through hemlock needles. When dried, it is a less impressive specimen: a twisted, tanned skin of itself.”

- How do you think our perception of these specimens differ from what they look like in their actual environment? Does this affect the way you think about them?
- Is there a way to better represent this specimen in the museum?
- What role does this fungi have in the BC ecosystem? Why is it different from the other fungi?
- How do you think scientists come up with names for specimens, particularly “funny” names like the “Great spirit gummy bear”? Do you think this affects our perception of the species?



Speckled dace; *Rhinichthys osculus*

"The 'Speckled Dace' is a small fish that, in Canada, only lives in the Kettle River. There is a major waterfall (Cascade Falls) just before the US border, and the Kettle River above the Cascade is the only place in Canada where you can find the Speckled Dace."

- Why do you think this fish only lives in this specific environment?
- How can we protect species that live in a very limited environment?



"A breath of the sea" Souvenir of Santa Cruz; 1889; CA; Collected by Emily Brand

"Queen Victoria collected seaweed. So did a lot of other Victorians, both in Britain and North America. Keeping with the Victorian fascination of collecting and a cataloging the natural world, men and women combed the shores, carefully pressing algae into scrapbooks for both science and mementos. Seaweed collecting was not as popular as pressing flowers, but it held social, scientific, and spiritual meaning for the collector: such a collection demonstrated patience, artistic talent, a refined sensibility for the subtle beauty of nature, as well as improving one's scientific knowledge, while deepening the appreciation of the what was commonly seen as God's creations."

- What does this specimen say about the role of art in science?
- What does this say about early collections? What was the intention behind collecting this? Was it meant to be displayed?





Musk Ox; *Ovibos moschatus*; 1976; NT; Collected by Zonailo Family

“Muskoxen are masters of the tundra and are some of the few large mammals able to survive every season of this harsh environment. Although management regulations have recently released them from the persecution of two centuries of overhunting, they still face an increasingly more immediate threat – habitat loss due to accelerating climate change. Since the Pleistocene, a changing climate has characterized the contracting range of the muskox. The herds that extended as far south as Kansas 20,000 years ago are now restricted to the northern rim of the continent. While muskoxen no longer roam as far south as the Okanagan valley, such ecological change has been drawn out over thousands of years of natural glacial cycles. Now it is occurring within a single muskox generation.”

- How has climate change contributed to the loss of habitat of the musk ox? Who else might be impacted by the same climate change impact the musk ox experiences?
- How has muskox evolved to survive in the tundra? Do you think they will be able to evolve quickly enough to survive the current rate of change in its environment?



Paper watercolors and spore prints; Shaggy mane; *Coprinus comatus*; Early 1900's; BC; Collected by Albert Hills

"The botanical illustration is the perfect intersection of art and science, documenting and recording plants and their uses long before the advent of photography."

- Do you think this is a technique that should still be used today or is it too outdated? Does this method of representation affect how we see this specimen?
- What does this say about the history of biodiversity preservation?



Eulachon; *Thaleichthys pacificus*; Central Coast

“Who wouldn’t be fascinated by a fish so oily that when dried and fitted with a wick it can be used as a candle? Or a fish so enigmatic that it can just disappear from long established spawning locations? Or a fish so mysterious that even its name is ambiguous?”

The history and biology of eulachon, *Thaleichthys pacificus*, are intriguing. Among other names, eulachon are known as oolican, ooligan, hooligan, saviour or salvation fish and candlefish. They are a type of smelt, a small silvery anadromous fish, and are found only along part of the Pacific coast of North America.

Eulachon have always had special cultural significance in BC, and were used for many purposes. They were often the first fresh food source available in the spring, and both the fish and their prized grease were used as trade items throughout the province.

Their limited range and persnickety nature make eulachon a prime candidate for population decline, and in fact they have faced a coastwide decline for many generations. Eulachon are currently considered endangered in many parts of their range. Although their populations are defined by freshwater spawning location, this elusive little fish spends more than 95% of its life in the ocean. It is challenging to determine the causes of population declines and disappearances when we cannot track them for most of their life span.”

- In which cultures is this fish culturally significant? Why?
- Why has this fish been disappearing from their original habitats?
- How can we protect an elusive species?



Department of Agriculture, Reference Collection of Economic and Weed Seeds; Dominion of Canada; 1911; Canada

“People bought this collection to help them identify seeds. Today collections are just as important to enable accurate identification as they were then, especially in areas such as Agriculture and Control of Borders. The only difference is that today we need accurate identification to support national and international laws, to prevent losses in the billions of dollars, and there is much more that needs to be identified. Today this identification job utilizes a Canada-wide network of collections and libraries in museums and research centres along with their associated experts. Where could you find a 100 year old seed today, other than in a collection like this one? From these seeds we can study the past atmosphere, or even reactivate DNA of a crop that has long since disappeared. We may rediscover medicinal properties. Biological collections are now understood to have enormous value, much more now than at the time when this collection was made.”

- Why is it important to keep 100 year old seed samples? What do you think we can learn from older specimens, now that we know more about the world and have new technologies?
- What could this communicate about past ecosystems?
- Do you think it is possible to have a complete seed collection?

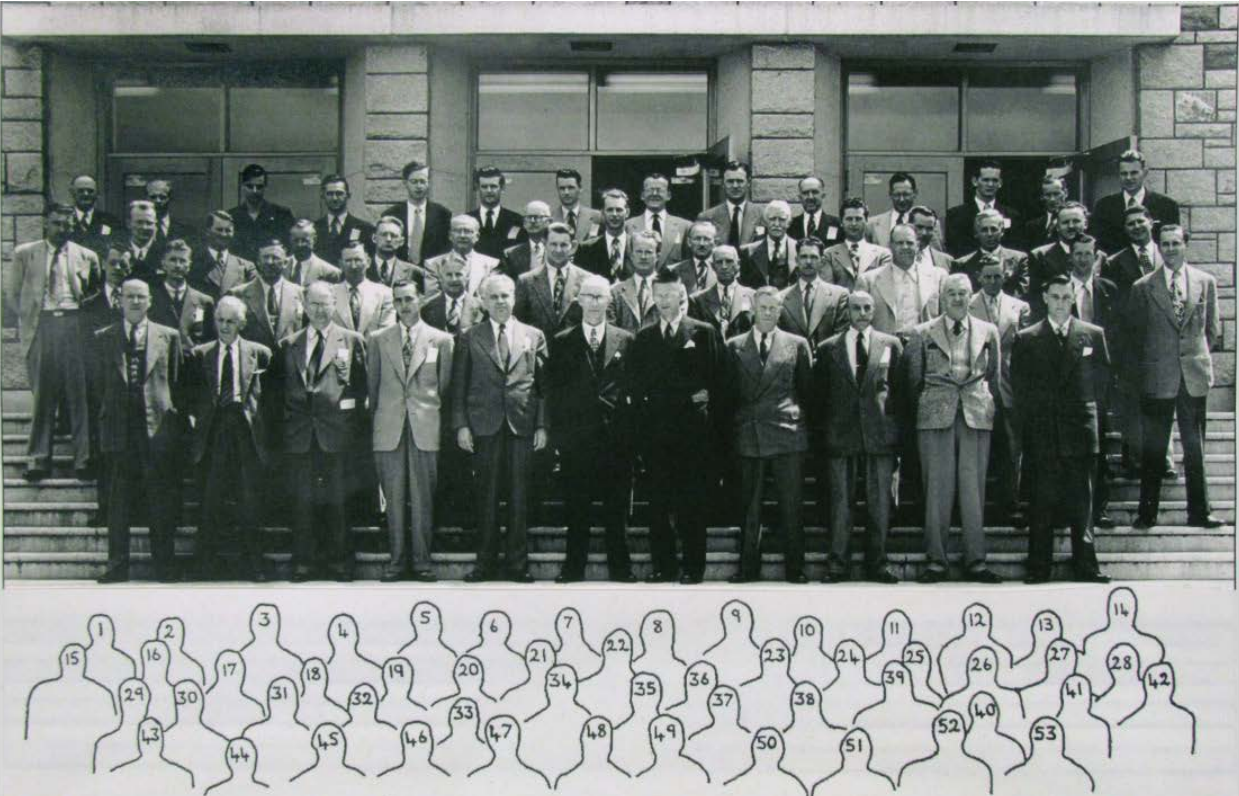


Figure 1. Group photograph of those at the 50th Annual General Meeting of the Entomological Society of British Columbia (taken 14 June 1951 at the University of British Columbia, Vancouver, BC): 1 J.R.J.L. Jones, 2 N.V. Tonks, 3 L.E. Wade, 4 C. Morgan, 5 A.R. Forbes, 6 A.T.S. Wilkinson, 7 A.D. Henderson, 8 P. Zuk, 9 G.E. White, 10 A.E. Barss, 11 J. Weintraub, 12 D.A. Chant, 13 G.B. Rich, 14 N.B. Wright, 15 W.H. Wilde, 16 R. Robertson, 17 G. Thompson, 18 H.R. MacCarthy, 19. W. Lazorko, 20 D.K. Campbell, 21 C.P. Clausen, 22 W. Waddell, 23 J.W. Eastham, 24 D.R. Finlayson, 25 K. Graham, 26 R.E. Fitzpatrick, 27 F.L. Billings, 28 J. Follwell, 29 H. Richmond, 30 L.C. Curtis, 31 K.M. King, 32 M.C. Lane, 33 W.G. Mathers, 34 H.G. Fulton, 35 C.L. Neilson, 36 J.H. Foster, 37 E.R. Buckell, 38 D. Arnott, 39 O. Hitchcock, 40 C.R. Cunningham, 41 R. Stace-Smith, 42 D.A. Ross, 43 G.J. Spencer, 44 E.P. Venables, 45 M.H. Hatch, 46 J.D. Gregson, 47 W.A. Ross, 48 H.F. Olds, 49 J. Marshall, 50 J.H. McLeod, 51 W. Downes, 52 R. Glendenning, 53 F.L. Banham.

Attendees of the 50th Anniversary of the Entomological Society of BC; 1951; UBC Vancouver, BC

“The reason that this photograph is striking (besides the demographic monoculture that it displays) is because it was taken in 1951, the beginning of the 50th anniversary year of the founding of the Entomological Society of British Columbia. The ESBC was founded on 13 March 1902. The ESBC is still alive and kicking today, 64 years after this photograph was made and 113 years after the founding of our organization. We maintain strong and (substantially more) diverse membership, and we invite anyone interested in insects in the Pacific Northwest to join our organization.”

- What does this photograph communicate about the history of biology research? Who is represented? Who is missing?
- What would this photograph look like today? What would this photograph look like in 100 years?
- What does this communicate about accessibility of science?



Giant elephant-bird egg; *Aepyornis maximus*; Madagascar; Collected by Michael C Whitlock

“Why all this diversity? Certainly flightless birds, including elephant birds, ostriches, and kiwis, can carry heavier eggs because they don’t need to fly. But why so big, or so small, or so colourful? Scientists are still trying to figure out the exact details. But for now, we can look at this display and be reminded of the diversity of life that has evolved on earth.”

- How does it change your perception of the egg to do a size comparison with other species? How does the way a specimen is displayed affect how you see it?
- If you had to display the elephant-bird egg with specimens other than the hummingbird eggs on display, what would it be and why? What kind of story would that tell?
- How does this exhibit represent the diversity of the ecosystems on Earth?

Appendix Three: Graphic Organizer

Use this table to organize your ideas through your exhibit planning.

My Theme:

Specimen and Photo	Exhibit Information	APA Citation

Specimen and Photo	Exhibit Information	APA Citation

Other notes for my exhibition: