



BISHOP MUSEUM

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Bishop Museum and Partners Awarded Funding for Conservation Science and Action Supporting Hawaiian Land Snails

*The \$1.5 million award will help develop conservation actions and assessments,
broaden educational outreach for improving conservation awareness,
and expand partnerships to support biodiversity conservation in Hawai‘i.*

Honolulu, Hawai‘i — Bernice Pauahi Bishop Museum, along with its partners the Hawai‘i State Department of Land and Natural Resources’ Snail Extinction Prevention Program, the University of Hawai‘i, and Pomona College have been awarded funding from the National Science Foundation (NSF) and the Paul G. Allen Family Foundation for conservation science and action supporting Hawaiian land snails. The Museum and its partners will use the three-year, \$1,595,518 award to carry out the research needed to develop effective conservation actions and assessments, broaden educational outreach for improving conservation capacity and awareness, and expand partnerships to support integrative biodiversity conservation in Hawai‘i.

Hawaiian land snails, most of which are found nowhere else in the world, are among some of the most threatened animals on the planet. With nearly 60% already extinct, research to inform immediate conservation action for the remaining few is urgently needed. Bishop Museum and its partners will use the funding from the NSF and the Paul G. Allen Family Foundation to support a project addressing major knowledge gaps regarding endemic land snail feeding ecology. Specifically, the project will examine the microbial food resources found on native plants on which snails live, and develop culturing methods to grow the preferred plants and microbial communities to improve the efficiency of captive rearing.

Bishop Museum’s *Addressing Knowledge and Capacity Shortfalls to Advance Conservation Science and Action of Endangered Hawaiian Land Snails* is one of six projects funded by a partnership between the NSF and the Paul G. Allen Family Foundation. Collectively, the projects will combine scientific research and conservation activities to learn from and preserve Earth’s biodiversity, with a focus on protecting diverse ecosystems and imperiled species across the country.

Continued

“Over the last half century, single-species focused conservation efforts have prevented extinction for many plants and animals, but broader integrative research efforts focused on community and ecosystem level processes are needed to develop effective conservation actions for the more than a million critically imperiled taxa across the globe,” said Dr. Kenneth Hayes, Bishop Museum director of the Pacific Center for Molecular Biodiversity, and lead principal investigator for the project. “This award will allow our team to develop a foundation for transforming conservation of Hawaiian land snails in the coming decade, and provide deeper insights into how plants, snails, and microbes interact in Hawai‘i’s diverse native ecosystems.”

For more than two decades, Bishop Museum Malacology staff and volunteers have been captively rearing native land snails, actively protecting them by removing them from the wild where they are being lost due to habitat destruction, invasive predators, and climate impacts. The snail hui, a partnership among the state’s Snail Extinction Prevention Program, the Honolulu Zoo, and Bishop Museum, cares for more than 50 species of critically endangered snails, many of which are already extinct in the wild. Knowledge gained from this recently funded project will help improve the diets of snails in captivity, reduce impacts on native plants that are harvested for feeding snails, and benefit the restoration of native ecosystems into which captively reared snails can be released, improving conservation for a diversity of Hawaiian organisms that rely on these ecosystems and the services they provide.

Addressing Knowledge and Capacity Shortfalls to Advance Conservation Science and Action for Endangered Hawaiian Land Snails and the other projects awarded funding are part of a new \$8 million collaboration between the NSF and the Paul G. Allen Family Foundation, called Partnership to Advance Conservation Science and Practice (PACSP). In accordance with PACSP’s goals, Bishop Museum’s team and their partners will develop science-informed conservation action plans and contribute to the development of tools and efforts that advance biodiversity conservation. Additionally, the team will work to engage policymakers, students, teachers, and the public on topics related to conservation.

“More than 1 million species across the globe are threatened with extinction, and these projects are a step towards decreasing that number and slowing the rate of biodiversity loss on Earth,” said Simon Malcomber, acting assistant director for the NSF’s Directorate for Biological Sciences. “These efforts are critical as losing any species impacts society, whether by changes in disease patterns, decreases in natural pest control, ecosystem degradation, or by losing one of life’s unique solutions to problems that humans could’ve harnessed to our benefit.”

Bishop Museum’s critical efforts stand alongside other institutions across the country addressing today’s biodiversity crisis. These include associations between researchers at 11 academic institutions, including two Minority Serving Institutions, and conservation practitioners from: the Fresno Chaffee Zoo, North Carolina Aquariums, the U.S. Fish and Wildlife Service, the Hawai‘i Department of Land and Natural Resources, the San Diego Zoo Wildlife Alliance, The Nature Conservancy, and the North Carolina Coastal Federation.

“The breadth of biodiversity loss in the United States is reflected in the wide range of species covered in these six projects. While the approaches are different, each study addresses systemic issues that are much bigger than a singular species, and they leverage science and technology to accelerate conservation solutions,” said Lara Littlefield, executive director on behalf of the Paul G. Allen Family Foundation. “The increased number of new-to-NSF applicants also tells us that there is untapped potential for more collaboration between primary research and applied technology.”

More information about Bishop Museum’s *Addressing Knowledge and Capacity Shortfalls to Advance Conservation Science and Action for Endangered Hawaiian Land Snails* project can be found at BishopMuseum.org/PILS. Information on the [Partnership to Advance Conservation Science and Practice program](#) and the full list of awards is available at NSF.gov.

For news media:

An online folder of Hawaiian land snail photos can be accessed [here](#). When using, please credit Bernice Pauahi Bishop Museum.

The images represent eight of the approximately 100 species of Hawaiian land snails of greatest conservation need:

- *Cookeconcha hystricella*,
- *Kaala subbrutula*
- *Laminella sanguinea*
- Helicinidae_Maui = *Pleuropoma honokawaiensis*
- Leptachatina_kauai = *Leptachatina cuneata*
- *Pronesopupa* sp.
- *Partulina mighelsiana*
- *Amastra intermedi*

These eight species represent some of the most critically endangered land snails in Hawai‘i, spanning six of the 13 families found in the islands. Many of these no longer exist in the wild and can only be found in captive populations maintained by members of the snail rearing consortium in Hawai‘i, which includes Bishop Museum, the Hawai‘i Department of Land and Natural Resources, and the Honolulu Zoo.

Cookeconcha hystricella, a member of the Endodontidae, was thought extinct until the Bishop Museum team rediscovered it in 2005; it is now one of only two remaining species of the more than 200 species of endodontids that once called Hawai‘i home. Similarly, *Pleuropoma honokawaiensis* and all the Hawaiian Helicinidae were thought extinct, but the team rediscovered this species and 10 more helecins in the last decade — work supported by the NSF (DEB-1120906).

Kaala subbrutula is endemic to the highest point on O‘ahu, Mt. Ka‘ala. It too was thought extinct, or at least had not been recorded since the 1960s despite living in a Natural Area Reserve that was surveyed in 1990 when the reserve was created. The Bishop Museum team rediscovered this species in 2009, and this image was the first ever of the snail with a one-day old offspring. Since their rediscovery the Museum has been monitoring this species, and they have steadily declined. The team brought them into captivity in 2016, and there continues to be a healthy population in the Museum awaiting return to their native habitat where they belong.

Laminella sanguinea and *Leptachatina cuneata* are members of the Hawaiian endemic family Amastridae. This family once had 325 species but fewer than 25 remain, all critically endangered, and most extinct in the wild.

Pronesopupa sp. is one of the smaller species of land snails in Hawai‘i, usually measuring less than 1 mm in shell height, but when seen up close show extraordinary shell sculpture. These tiny snails are often found on plants and in the leaf litter where they consume microbial films that grow on the leaves.

Partulina mighelsiana, a member of the famous Acahtinellidae, is endemic to the island of Moloka‘i, while *Amastra intermedia*, a member of the endemic family Amastridae, is from O‘ahu. *Amastra intermedia* went extinct in the wild in 2015. However, due to captive rearing and reintroduction efforts, thousands of individuals have been released back into the wild in protected areas. The Amastridae once had more than 325 species in it, all found only on the islands of Hawai‘i, and included ground-dwelling and tree-dwelling species.

Unfortunately, there are fewer than 25 species left, and most can only be found in captivity. Species from both of these families are part of the study into diet and what is needed to help them survive through the next decade and beyond.

About Bernice Pauahi Bishop Museum:

Bernice Pauahi Bishop Museum's mission is to inspire our community and visitors through the exploration, celebration and perpetuation of the extraordinary history, culture, and environment of Hawai'i and the Pacific. The Museum was founded in 1889 by Charles Reed Bishop in memory of his wife Bernice Pauahi Bishop, a royal descendant of King Kamehameha I. Today, the Museum thrives as an educational center for the community and is widely regarded as the world's premier institution for Hawaiian and Pacific content.

Bishop Museum's vast collections of more than 25 million objects and specimens represent nine disciplines and include more than 22 million biological specimens, over two million cultural objects, 115,000 historical publications, and one million photographs, films, works of art, audio recordings, and manuscripts. These collections tell the stories of the cultures and biodiversity of Hawai'i and the Pacific as well as the proud legacy of scholarly research spanning 130 years.

Bishop Museum proudly serves more than 200,000 visitors each year, including 20,000 children on school visits.

To learn more about the Museum's research, collections, exhibits, and programs, visit BishopMuseum.org, follow @BishopMuseum on [Twitter](#) and [Instagram](#), become a fan of Bishop Museum on [Facebook](#), visit Bishop Museum's [YouTube](#) channel, or call (808) 847-3511. Bishop Museum is a 501(c)(3) nonprofit organization.

Bishop Museum is proud to be an Equal Employment Opportunity and Affirmative Action Employer, and welcomes applicants from the military, veterans, and those with disabilities. Learn about careers at Bishop Museum at BishopMuseum.org/Careers and on its [LinkedIn](#) page.

[Bishop Museum Press](#) is Hawai'i's oldest book publisher and one of the first scholarly publishers in the Western Hemisphere, and has published over 1200 titles and distributed over 1,000,000 books in 72 countries worldwide.

Past news releases can be viewed and downloaded at BishopMuseum.org/NewsRoom.