2026 UC ANR Cooperative Extension Position Template (Specialist)

Developed and proposed by: This position was developed jointly by the UC ANR Biodiversity Conservation and Stewardship Program Team (Greg Ira, Brian Todd, co-chairs), UC ANR Environmental Stewards Statewide Program (Greg Ira, Director), UCSC Ecology and Evolutionary Biology (Rita Mehta, Chair) and CALeDNA Program (Rachel Meyer, Director) with input from UCB Environmental Science, Policy and Management (Adina Merlender), and the UC AES (Stacy Philpott, Dean).

Position title: UCCE Specialist in Conservation Genomics and Community Science

Headquarter location and coverage area: This position will be based at the UCSC Dept. of Ecology and Evolutionary Biology (EEB) and will direct the CALeDNA Program within EEB. CALeDNA is community of scientists that supports community science, a large environmental sample collection, and a service lab that prepares sample kits, provides an array of molecular ecology assays (qPCR, metabarcoding, metagenomics), sequences libraries, and does eDNA research. This position will lead the strategic growth of CALeDNA with UC ANR to conduct research and extension with farmers, ranchers, scientists, and communities across California.

Position: The successful candidate will hold a PhD with an emphasis on evolution and ecology, conservation biology, and agricultural genomics, and have experience leading service research, managing big data, community science, and contributory data. The Specialist will create a center-scale eDNA hub, connecting CALeDNA to UC ANR programs, and thereby facilitating collaborative conservation and innovation research serving California. The Specialist's work will include enhancing community-based biodiversity monitoring using water, soil, and air eDNA molecular assays, and supporting restoration, agriculture, conservation, climate stewardship, and rangeland and natural resource management. The Specialist will create and provide training in using web tools (e.g., eDNA Explorer) and will build machine learning and AI tools to address UC ANR needs and to build capacity in the science community. This will create the necessary analytical power needed to translate eDNA data into insights and helpful decision support.

Justification: Needs: Biodiversity loss is a major global threat and every land-use intervention, whether by individuals, communities, or resource managers, impacts biodiversity. Yet, current biodiversity monitoring is time consuming, invasive, limited to direct, expert observations, and expensive. Soil and water biodiversity monitoring using eDNA is increasingly common, uses simple protocols, is relatively affordable, aligns closely with community-based water quality monitoring efforts, and provides a range of results. eDNA and associated analytical and predictive tools provide valuable information for identifying key species (e.g., invasive, endangered, pathogenic), providing insights into future conditions under varying environmental change scenarios, and monitoring and evaluating effectiveness of conservation-oriented stewardship interventions. The technology can also transform the evaluation of natural resource management interventions by providing consistent, objective, and timely methods for analyzing impact on biodiversity. Despite these benefits, there are currently no Specialist positions that combine conservation genomics and community science. This position will bring immediate benefits to several UC ANR statewide programs including Environmental Stewards, Sustainable Agriculture and Education Program, the California Institute for Water Resources, Integrated Pest Management, and Master Gardener.

Outcomes/Impact**:** This position will address three of UC ANR's new condition changes. First, the position will contribute to (1) improved land stewardship and (2) improved biodiversity through standardization of monitoring the impact of natural resource management interventions (e.g., riparian habitat restoration, erosion control, forest management, regenerative agriculture, rangeland management, restoration efforts) on biodiversity in water and soil samples, standardization of monitoring the impact of climate change on biodiversity, and by increasing the scale of biodiversity data collection. Second, the position will result in (3) increased public engagement and confidence in science by more systematically engaging communities, including Tribes and Tribal communities, in the process of prioritizing issues, and by engaging UC ANR volunteers in planning and collecting data, analyzing data, and determining relevant actions. This specialist position will contribute to *UC ANR's Strategic Vision 2040* Natural Ecosystems and Working Landscapes Challenge area. Potential actions for positive outcomes include engaging land managers in conservation efforts aimed at restoring and managing habitats, including protected natural areas and habitat corridors, and collaborating with community organizations to increase civic engagement in conservation, restoration, and participatory science.

Extension: The specialist will serve as a resource and collaborator with Advisors across UC ANR to plan, lead, collaborate, and scale research as well as to inform the development of a wide range of extension materials and programs including citizen science projects, participatory action research and field days, as well as online instruction including webinars and asynchronous online courses. They will bring CALeDNA services to UC ANR, facilitating research design, supporting biodiversity surveys using eDNA, maximizing genomic literacy, and translating information into actionable recommendations. They will create and package educational materials, including a UCANR-specific website about eDNA with resources and examples, train-the-trainer resources, and will deliver training and briefings at regular meetings with AES campuses and UC Cooperative Extension. They will also perform research and publish to address needs for information and discovery by UC ANR and partners, consult with groups on project ideas, fundraise through grant writing and contracts, and will consult with community partners, non-profit, and government groups on data management and ethics to ensure adherence to community needs and values, particularly for private land owners and Tribes.

Research: The Specialist will be highly productive in research broadly related to conservation genomics with applications across UC ANR priority areas. The primary area of research will be biodiversity monitoring to understand how ecological communities change over space and time in response to land management and climate change, and how to conserve biodiversity in California ecosystems and working landscapes. Research areas could include: 1) demonstrating effectiveness of using eDNA for community-based water quality monitoring and identifying indicators of stream health; 2) climate-adapted forestry including the use of adaptive genomics for biodiversity to respond to heat, drought, pests, and wildfires; 3) early detection and monitoring of invasive species and pests; and 4) monitoring the impact of agroecological and regenerative agriculture practices on soil biodiversity, health, and microbiomes. The Specialist will advance eDNA and other genomics techniques and will direct and sustain a cutting-edge molecular lab to make these techniques available to others across the UC ANR network. Outputs should be peer-reviewed papers as well as briefings, white papers, policy reports, and social media. The Specialist will publish in venues such as *Molecular Biology and Evolution*, *BioScience*, *Ecological Applications*, *Nature Plants*, and *Nature Genetic*s.

UC ANR network: The Specialist will be a key member of the UCSC AES and will collaborate with Specialists and Advisors across California. This position was the top-ranking position for the EEB Dept. at UCSC and for the Biodiversity Conservation and Stewardship Program Team. The Specialist introduces to UC ANR an new area of expertise and technology that aligns with the Biodiversity Conservation and Stewardship Program Team and has strong links to several other Program Teams (e.g., Climate Science and Ecosystems Impacts, Agroecology, Organic, and Regenerative Systems, Forest and Upper Watershed Systems, Soil Health and Management, Water Quantity, Quality, and Security). The Specialist will direct the CALeDNA program at UCSC and will interact with faculty, CE Specialists, and staff in EEB, Environmental Studies, Institute for Marine Sciences, and the Genomics Institute. The Specialist will engage with faculty and staff at the UC ANR Research and Extension Centers, UC Natural Reserve System and CITRIS-Banatao Institute and genomics colleagues across UC. The Specialist will work with UC ANR's Environmental Stewards to expand community and participatory science projects in conservation genomics and molecular monitoring of biodiversity across its large statewide network. The Specialist will participate in UC and UC ANR leadership activities, through committees, task forces and other formal and informal structures.

Network external to UC ANR: The Specialist could interact with scientists and practitioners in federal government (e.g., National Park Service, US Geological Survey, Bureau of Land Management, US Forest Service, CAL FIRE, NASA, Office of Naval Research, Tribes engaged with the Bureau of Indian Affairs), state agencies (e.g., CA Department of Fish and Wildlife, CA State Parks, CA Water Boards, CA Natural Resources Agency, CA Dept of Food and Agriculture) and with local government entities (e.g., LA Department of Sanitation and Environment, LA Museum of Natural History). The Specialist may also work with non-profits (e.g., The Nature Conservancy, Cal Academy of Science, River Partners, Center for Natural Lands Management, Sierra Streams Institute, Sentinel Sites for Nature), community science coalitions (e.g., CA Biodiversity Network, CA Institute for Biodiversity, Friends of the River, Adventure Scientists), private industry (e.g., Chevron, Dudek), and international initiatives. While many agencies and organizations are listed, the Specialist's collaborations will be phased to allow deep connections while also maintaining a strong research program.

Support: The EEB Department will provide office space and a 1000-sq ft molecular lab, and a 500-sq ft shared molecular lab in the Coastal Biology Building. The labs are fully equipped, providing highly efficient and flexible space where automation is available for high throughput sample processing. EEB and CALeDNA maintain deep freezers for archiving environmental samples, which are meant to be long-term research resources. The UCSC AES is committed to providing research funding for all of our Specialists as possible given budget constraints.

Other support: The UC Environmental Stewards, California Institute for Water Resources, and CALeDNA recently received an EPA grant ($333K) related to the work proposed for this position. The CA Dept. of Fish and Wildlife Cannabis Program is also currently funding CALeDNA and partners including UC ANR and many listed here to build a stream health index with eDNA ($2.2M; 2026-2028). The Specialist will seek research funding from NSF, USFS, USDA, USGS, CDFA and other federal and state funding sources. The Specialist will compete for grants in these programs, with or without on- and off-campus colleagues as appropriate. The Specialist will also be expected to compete for research funds available from UC ANR.