Enhancing Biodiversity in an Increasingly Urban World

Robin Grossinger, San Francisco Estuary Institute, robin@sfei.org

Throughout the 20th century a wave of urbanization has swept across the planet, driving a radical transformation of our landscapes that is predicted to accelerate over the next century. These changes challenge us to find new ways to design and manage our cities. This session will explore advances in enhancing the ecological function of urban settings, highlighting the potential to improve biodiversity while providing benefits for people. The Bay Area is a center of significant examples of research and application, from innovative projects such as the Presidio of San Francisco to comprehensive ecological investments at the Google campus in the South Bay. We will explore the benefits, from improving wildlife connectivity and linking regional ecosystems to bringing nature closer to urban residents. This exciting, highly visual session will create a new understanding of existing nature and potential future of our familiar neighborhoods and cities, drawing on remote wildlife cameras, innovative urban ecological visions, and cutting edge demonstration projects in San Francisco and Silicon Valley.

Keywords: urban biodiversity, ecological function, urban ecology, ecological resilience, landscape resilience

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Speaker Biography: Robin Grossinger is a Senior Scientist at the San Francisco Estuary Institute, where he co-directs SFEI's Resilient Landscapes program. Robin leads efforts throughout the state to reintegrate natural processes within our highly modified landscapes, creating healthier and more adaptive neighborhoods, cities, and surrounding landscapes. He has advised restoration strategies for San Francisco Bay, the Sacramento-San Joaquin Delta, urban landscapes such as the Google campus, and rivers throughout California. He has been recognized with a Local Hero award from Bay Nature magazine and the Carla Bard Bay Education Award from The Bay Institute and Aquarium of the Bay.

Re-Oaking Silicon Valley: A Science Strategy for Re-Establishing Ecological Functions

Erica Spotswood, San Francisco Estuary Institute, ericas@sfei.org
Robin Grossinger, San Francisco Estuary Institute, robin@sfei.org
Steve Hagerty, San Francisco Estuary Institute, steveh@sfei.org
Erin Beller, San Francisco Estuary Institute, erin@sfei.org
April Robinson, San Francisco Estuary Institute, april@sfei.org
Letitia Grenier, San Francisco Estuary Institute, letitia@sfei.org
Ruth Askevold, San Francisco Estuary Institute, ruth@sfei.org

Could restoring lost ecosystems to cities play a role in building ecological resilience across landscapes? Here, we explore this opportunity in Silicon Valley, using oak ecosystems as a model. Both beautiful and functional, native oaks can be excellent choices for streetscapes, backyards, and landscaping. Requiring little water after establishment, oaks can save money by reducing irrigation requirements while sequestering more carbon than most other urban trees common to our region. Oaks are also foundation species, forming the base of a complex biotic community that forms the most diverse habitat type in California.

Over the last century, oaks were felled across Silicon Valley as woodlands were converted to orchards and then urbanized, eliminating much of this habitat from our cities. Building on the foundation developed by SFEI's historical ecology research, we compare the historical structure and composition of Silicon Valley oak woodlands to contemporary urban forests to quantify the extent of ecosystem transformation. A loss of large trees coupled with the importation of hundreds of species of non-native trees likely reduces the ability of urban forests to support biodiversity. Replacement of grasses, wildflowers and shrubs with lawns and pavement has altered the landscape further. However, we show that canopy cover remains similar, making it possible to re-oak our cities without dramatically increasing the number of trees.

We also consider the benefits native oaks could offer to urban communities—from drought-tolerance to deeper connections to nature and a greater sense of place. Providing an array of specific guidelines for urban forestry and landscaping, this project begins to envision how we could design the more ecologically healthy and resilient cities of the future.

Keywords: oaks, urban ecology, biodiversity, historical ecology, ecosystem services

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Speaker Biography: Erica Spotswood is an Applied Ecologist at the San Francisco Estuary Institute where she leads projects related to urban ecology and ecological resilience. Current projects address how regional planning can integrate with local project-scale design, and how urban greening efforts can be coordinated to contribute to broader regional goals. Her areas of expertise include urban ecology and plant community ecology. Before joining SFEI, Erica conducted postdoctoral research with Katherine Suding, and received her PhD from the University of California at Berkeley in the department of Environmental Science, Policy and Management.

Prior to graduate school, Erica worked for the Wildlife Conservation Society in Central Africa, and as a Peace Corps volunteer in West Africa.

Managing Among the Masses: Preserving Biodiversity in America's Most Heavily Visited National Park

Michael Boland, The Presidio Trust, mlboland@comcast.net

For over 200 years the historic Presidio of San Francisco served the military needs of three nations – Spain, Mexico, and the United States. When it closed in 1994, our nation's longest operating military site became part of the Golden Gate National Recreation Area, the most heavily visited national park unit in the United States. Although the U.S. Army had radically transformed most of the Presidio in the course of its military use of the site, it inadvertently preserved the most intact collection of remaining biodiversity in San Francisco. Although these small relic natural areas were isolated by derelict historic landscapes and senescent plantations, they preserved rich biodiversity – over 300 native plant species in 13 different plant communities, including 22 special status plant species.

Since 1994, the Presidio Trust, National Park Service, Golden Gate National Parks Conservancy and thousands of community volunteers have used a community-based stewardship approach to return these relic natural systems to health and to double the acreage of natural area at the Presidio. Implementation of "green" design and maintenance practices throughout the historic designed landscapes and forest plantations improved the environmental performance of the surrounding national historic landmark district at the same time that the Presidio community, which includes over 800 buildings, was undergoing a dramatic revitalization to become the first self-funding national park site in the United States.

Keywords: Presidio, Urban Biodiversity, Urban National Park, Tennessee Hollow, Mountain Lake

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Speaker Biography: Since 2001 Michael Boland has played a key role in making the Presidio a world class national park site. Under his leadership, his team has delivered an array projects that include restoring the Presidio's rich mosaic of natural and cultural landscapes, establishing national park experiences that serve urban youth, and reinventing the historic army post as a contemporary park community. Boland has also played a role in the transformation of the GGNRA, America's largest urban national park. Between 1990 and 1997, as Director of Park Projects for the Golden Gate National Parks Conservancy, he managed the transformation of Crissy Field, the Alcatraz Island Master Plan, National AIDS Memorial Grove, and early work on the Presidio's transition from Army post to national park. Boland holds a bachelor's degree in architecture, and master's degrees in landscape architecture and in city and regional planning, all from the University of California at Berkeley.

Linking Open Space and Urban Biodiversity Planning

Nicole Heller, Peninsula Open Space Trust, nheller@openspacetrust.org

The conservation of natural lands in the San Francisco Bay Area is critical in light of heightened vulnerability due to climate change. Conservation of large open spaces around cities, in conjunction with smaller open spaces within cities -- such as linear or pocket parks with forest or wetland patches -- together have the capacity to diminish the vulnerability of human communities to higher temperatures, water shortages, flooding and other impacts of climate change. In addition, native plants and animals need to migrate to track their climate niche, and the chances of successful migration will be increased if species have access to safe habitat across the entire landscape from the uplands to the baylands and to the ocean. Thus there is a strong rationale to do more conservation and restoration in urban areas for both biodiversity protection and urban community resilience. Despite this alignment, nature conservation has tended to ignore urban lands in planning and action, and urban recreation and landscape planning is typically not done with the aim of biodiversity conservation. The two sectors have essentially been developing on separate paths. In this talk, I will discuss how urban greening can better align with open space conservation by drawing on ecological research and theory, and with examples from projects conducted in the San Francisco Bay Area. Research and theory suggest that there are considerable opportunities for linking agendas across sectors in ways that could yield multiple benefits and ensure greater resilience for biodiversity. There are however both social and ecological challenges to linking agendas. In some cases difficult choices will need to be made about which values are most important, or where in the landscape different values should be prioritized. The nexus of open space conservation with urban greening is ripe for greater collaboration, experimentation and demonstration of impact.

Keywords: Open Space, Resilience, Climate Change, Urban Greening, Connectivity, Green Infrastructure

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Speaker Biography: Nicole Heller is the Director of Conservation Science at Peninsula Open Space Trust. Trained as a field ecologist, she been conducting research and working in the Bay Area since 1999. Her work is focused on applying ecological and climate science to the sound management of California ecosystems. She has led various efforts to forward a biodiversity resilience agenda through collaborations with colleagues at POST, the Terrestrial Biodiversity and Climate Change Collaborative (TBC3.org), Resilient Silicon Valley, Santa Cruz Mountains Stewardship Network, and the Amah Mutsun Land Trust. She has authored or co-authored ~ 30 articles and book chapters in ecology, conservation and climate change. Nicole holds a BA in Ecology and Evolution from Princeton University, a PhD in Biological Sciences from Stanford University. Nicole conducted postdoctoral research at University of California Santa Cruz, and has held teaching positions at Franklin and Marshall College and Duke University.