



A survey crew heads back towards Kennedy Meadows after four days of traveling and surveying in the Emigrant Wilderness backcountry. Read more about this unique project that GEI staff assisted with in our Project Updates section!

GEI Consultants Environmental Insights

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Practice and People Updates

GEI's Growing Environmental Practice Group



Sarah Roy is the latest edition to GEI's Regulatory Permitting Team. She is a botanist and regulatory specialist with over four years of experience in regulatory permitting, wetland delineations, botanical and biological surveys, and construction compliance monitoring. Sarah received her Bachelors of Arts in Environmental Studies from U.C. Santa Cruz. She will provide regulatory permitting expertise and conduct wetland delineations and biological surveys in support of GEI projects.



Grace Rhoades joined GEI's Biological Resources Team as a Botanist. She is a skilled botanist and vegetation management inspector, with almost three years of experience conducting forestry research on wildfire and fuel treatments with the Humboldt State University's Fire Lab and for Sequoia/Kings Canyon National Parks, and performing vegetation management inspections, including identifying hazard trees for removal, most recently with the El Dorado Fire Department. She will be supporting our Biological Resources Team's efforts to provide botanical surveys and vegetation assessments for a number of our projects.



Becky Dorff is the latest edition to GEI's CEQA/NEPA Compliance Team. As an Environmental Planner with over 10 years of experience, her expertise casts a wide net from working as a fisheries biologist in Alaska and a water quality project specialist for local government, to an emergency communications dispatcher. She holds a Masters degree in Environmental Management and Graduate Certificate in Geographic Information Systems from Portland State University. She will support documentation for NEPA/CEQA requirements, create project site maps and figures, and facilitate project coordination with GEI.

Staff Certifications



In July 2022, GEI Environmental Planner and Project Coordinator **Melinda Mohamed** earned her certificate in Venomous Snake Handling through a 16-hour Save the Snakes (<https://savethesnakes.org/>) -led course focusing on safe handling practices, snake bite management, and venom toxinology. Melinda is now qualified to relocate venomous snakes on any of GEI's numerous projects within rattlesnake habitat—keeping GEI and partner staff safe, while conserving these valuable contributors to healthy ecosystems.



In May 2022, GEI Archaeologist **Amy Wolpert** earned her Geographical Information Systems (GIS) certificate. The certificate provided her with a solid technical background in GIS concepts and applications including database design and management, cartography, GIS programming, spatial analysis and modeling, web-based GIS application development, the Global Positioning Systems, and remote sensing/digital image processing. Ms. Wolpert entered the program with a background in Archaeology, and will use her GIS certification to assist in map design and creation for GEI's projects.

Practice and People Updates (continued)

GEI Staff: Leaders in Our Practice

GEI Supports TechWomen



Claudette EL Hajj assisting other GEI staff with a channel inspection

Melinda Mohamed is currently participating in a program called TechWomen (<https://www.techwomen.org/>) as a Professional Mentor to Claudette EL Hajj (<https://www.techwomen.org/techwomen-mentees/claurette-el-hajj>), who is an engineer with a PhD and an interest in water quality from Lebanon. TechWomen empowers, connects, and supports the next generation of women leaders in science, technology, engineering, and mathematics (STEM) from Africa, Central and South Asia, and the Middle East by providing them the access and opportunity needed to advance their careers, pursue their dreams, and inspire women and girls in their communities. Participants also create a project with other emerging leaders from their home country that is aimed at solving a socioeconomic problem. Claudette and her team from Lebanon have pitched their project idea this month in hopes of winning one of a handful of \$3,000 seed grants sponsored by participating companies and organizations. Claudette has participated in tours and inspections of some GEI projects, and has also been attending several internal GEI meetings to gain knowledge of large-scale program management. Melinda is facilitating Claudette's networking internally and externally at GEI, so she can gain connections to aid in her water quality work both with TechWomen and to remain

GEI Representation on Certification Review Board



GEI's Senior Wildlife Biologist, **Kelly Holland**, was recently appointed to The Wildlife Society's (TWS) Certification Review Board. TWS supports the development and advancement of wildlife professionals throughout their careers. TWS offers the only certification program for professional wildlife biologists. Certification constitutes recognition by TWS that, to its best knowledge, a member meets the minimum educational, experience, and ethical standards adopted by the Society for professional wildlife biologists. TWS'

Certification Program (<https://wildlife.org/learn/professional-development-certification/>) is managed by the Certification Review Board, which is comprised of TWS members representing each of its eight geographical sections, and who provide equitable representation of professional disciplines. Kelly has been appointed to serve a 3-year term as the Western Section

GEI's Ginger Gillin Awarded Hydro International Award



GEI's Principal Environmental Scientist, **Ginger Gillin**, was awarded the Women with Hydro Vision Award at the HydroVision International conference in Denver, Colorado on July 13, 2022. Now in its eighth year, the Women with Hydro Vision award recognizes women who have made and/or are continuing to make significant contributions to the hydro industry by sharing their unique talents and "vision" to improve and advance hydropower. Ginger is a senior project manager who leads efforts to license and relicense hydroelectric

projects, including pumped storage projects, across the western United States.

Project Updates

GEI Assists with Resource Assessment in Backcountry Sites in the Sierras

In September, GEI Biologist **Maggie Woodworth** and Archaeologist **Ben Curry** assisted the California Department of Water Resources (DWR) with resource assessments in the Emigrant Wilderness in Stanislaus National Forest. DWR is planning maintenance for some of its snow monitoring stations in the wilderness, so GEI was called in to do preconstruction surveys and evaluations for biological and cultural resources at the worksites. Being in the Emigrant Wilderness, access to the sites was on horseback, with the longest day of riding being a full 8-hour ride. The crew camped in the backcountry and were well taken care of by the guides from Kennedy Meadows. GEI was excited to collaborate with DWR on this unique and very important project!

GEI Contact



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GEI Biologist Maggie Woodworth with her horse, Mouse



Staff from GEI assisted DWR with recording observations and measurements at one of the snow monitoring sites in the Emigrant Wilderness

GEI Uses Emerging Technology to Assess Project's Impacts to Vegetation

In August 2022, GEI staff **Val Yap** and **Melinda Mohamed** completed a multi-day drone survey of a 10-mile reach of Cache Creek in Yolo County. The imagery gathered from the survey will be used to inform invasive vegetation management and native vegetation conservation. Val and Melinda worked together to create a methodology for completing thorough photo documentation of the site while avoiding impacting native bird species nesting along the riparian corridor, including the State-threatened Swainson's hawk (*Buteo swainsoni*). Behavioral responses to drone activity were carefully monitored throughout the duration of the survey in hopes of informing future use of drones near sensitive wildlife resources.

GEI Contact



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Val Yap piloting a drone

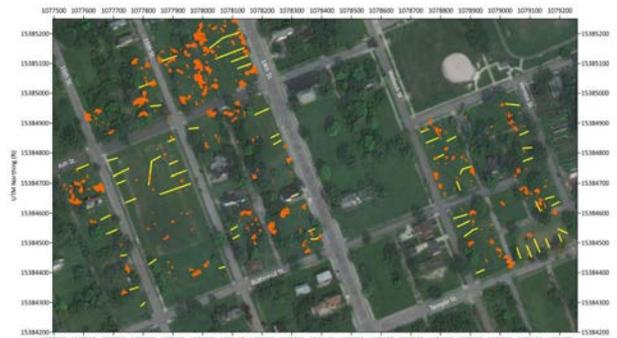
Project Updates (continued)

GEI's Cultural Resources Staff Teams with GEI's Geophysical Team for the Preserve On Ash Project

GEI was contracted by The Community Builders, Inc. (TCB) to provide cultural resources technical services to support the Preserve on Ash (POA) Project. The POA Project consists of a comprehensive neighborhood revitalization occupying approximately 11.60-acres in the North Corktown neighborhood in the City of Detroit, Wayne County, Michigan. As part of the archaeologist investigation, GEI cultural resources staff teamed with GEI's geophysical team to complete an integrated geophysical survey to identify potential areas of heightened cultural resources sensitivity within the POA Project. The geophysical survey was completed by GEI Senior Geologist/Geophysicist Craig Padar, P.G., and GEI Senior Instrumentation Specialist Sean Brady. This survey consisted of time- and frequency-domain electromagnetics (EM-61 and EM 31, respectively) and Ground Penetrating Radar (GPR) survey techniques. The EM methods were used to identify buried metallic targets, specifically, potential remnant reinforced foundations, cisterns, utility alignments, or potential zones of refuse and debris burial. Targeted GPR transects were then collected to determine depth and configuration of target areas identified in the EM-61 and EM-31 surveys.



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EM-31 and EM-61 Anomalies Plotted on a Current Aerial Photo, Preserve on Ash, North Corktown, Detroit, MI
Photo credit: GEI Consultants, Inc. 2022

GEI Adding Climate Resilience to National Levee Safety Guidelines

GEI Climate Resilience Program Manager, **Rebecca Verity**, is leading the incorporation of climate change risk and adaptation practices into the National Levee Safety Guidelines (<https://www.leveesafety.org/pages/nlsg>) being developed by the U.S. Army Corps of Engineers. She has drafted a supporting document, Climate Risks to National Levees, and spent a week in Chicago, Illinois, working one-on-one with national experts and Guideline authors to weave climate resilience, including nature-based and ecological solutions, into the recommended approach for every facet of a levee's lifecycle.

GEI Contact



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Strolling Chicago's restored Riverwalk, during an authors' workshop for the National Levee Safety Guidelines.

Industry Updates

GEI's Environmental and Climate Resilience Scientists Present at the 2022 Floodplain Management Association Conference

Several of GEI's senior environmental and climate resilience scientists made key presentations at the recent Floodplain Management Association Conference, which was held in Sacramento from September 6 – 9, 2022.

- Senior Restoration Ecologist, **Lynn Hermansen**, presented about the Beach Stone Lakes Multi-Benefit Woodland Corridor project, and discussed how GEI helped to design this project to balance flood risk reduction with an increase in ecological value through designing vegetative wind-wave buffers.
- GEI's Climate Resilience Program Manager, **Rebecca Verity**, co-led a workshop with U.S. Army Corps of Engineers staff on "National Trends in Nonstructural Solutions: Creative solutions, new challenges, and maximizing multi-use benefits." Nonstructural solutions are a rapidly growing component of integrated flood risk management. From elevating or floodproofing structures, to diverting floodwaters for groundwater, to reducing wave heights by engineering with nature, nonstructural solutions can bring additional community benefits, add resilience for long-term community vitality, and increase eligibility for grant funding. Read more: (https://www.geiconsultants.com/thought_leadership/reducing_flood_risks/)
- Senior Restoration Ecologist, **Dr. Jennifer Burt**, presented on process-based floodplain habitat restoration and the ecological and practical benefits realized by vegetation establishment via natural recruitment, which can rapidly restore diverse communities that are highly resilient to disturbance and climate change. Planning, permitting, and adaptive management considerations, and factors affecting likelihood of success, were explored and illustrated through multiple Central Valley restoration site examples.
- Senior Climate Specialist, **Dr. Kwabena Asante**, co-presented the results of climate change analysis and hydrologic modeling for the 2022 update of the Central Valley Flood Protection Plan. The presentation highlighted future changes in Sierra Nevada snowpack characteristics, flood hazards, reservoir inflows, and floodplain vulnerabilities in the Central Valley. Projected future changes in water surface elevations in the Sacramento – San Joaquin Delta, where climate-impacted freshwater flows from rivers encounter salt water, from ocean tides and sea level rise, were also presented. The technical analysis will inform prioritization of infrastructure investments to address flood vulnerabilities in the Central Valley.



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Process-based floodplain restoration, or natural riparian habitat recruitment following a flood event, at the McCormack-Williamson Tract. Photo credit: Dr. Jennifer Burt.

Industry Updates

Understanding and Adapting to Increasingly Frequent Climate Catastrophes

Two recent blog posts by GEI's Climate Program Manager, **Rebecca Verity**, explore the recent explosion in “Thousand Year Floods” in America, and the way two communities in Florida successfully prepared for, and weathered, the devastation of Hurricane Ian.

Eight Weeks and Four Floods: How Understanding Compound Weather Events Can Help You Predict and Manage Emergency Weather (https://www.geiconsultants.com/thought_leadership/compound-weather-events/). Over the summer of 2022, the U.S. weathered a “thousand-year flood” on an average of every other week. These events ravaged communities from California to Missouri, from Wyoming to Kentucky. None were caused by an exceptional hurricane or even a named storm. Rather, each of them was what is called a “compound event” or weather catastrophe caused by the collision of two or more weather patterns. To better predict, avoid, and manage emergency weather, we need to understand how and why devastating impacts come not just from huge weather events like large hurricanes, but also from the interactions of much smaller weather patterns.



This summer's storms wrought catastrophic damage to roads in Yellowstone National Park.

In the Wake of Hurricane Ian, Two Florida Communities Prove the Power of Climate Adaptation (https://www.geiconsultants.com/thought_leadership/power-of-climate-adaptation/). In the midst of the tragedy, devastation, and heroism left in the wake of Hurricane Ian, two very different stories stand out. Both offer hope and confidence that, despite the devastating increase in the frequency and intensity of big weather events, climate adaptation can, and does, preserve communities in the face of extraordinary, dangerous weather.



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A tree is uprooted but a house still stands in Punta Gorda, FL, after Hurricane Ian.

Industry Updates (continued)

Addressing Environmental Justice within NEPA Documents

Environmental Justice (EJ) concerns are increasingly important to lawmakers, regulators, and local communities. The Biden Administration released two Executive Orders in January 2021 addressing EJ issues within federal agencies. During the NEPA process, federal guidance recommends using the Environmental Justice Screening and Mapping Tool to identify communities that are marginalized, underserved, and overburdened by pollution (otherwise known as EJ communities). Whether the tool identifies EJ communities or not, further investigation may be necessary. However, if EJ communities are identified, communication and community engagement are important to incorporate throughout the project's permitting process. A report released by the White House Environmental Justice Advisory Council references the need for plain language or translated materials to engage with EJ communities. Visuals to show where facilities or project sites are located in relation to EJ communities (i.e., homes, schools, and other gathering spaces), can help achieve community engagement. GEI's Environment Planning Practice is adept at performing EJ methodologies recommended by the U.S. Environmental Protection Agency, utilizing the Environmental Justice Screening Tool, and developing equitable communication materials and strategies to identify and engage with EJ communities throughout the permitting process.



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Updates About State Listings of California Species

The California Supreme Court recently declined to review an appellate court finding that the California Fish and Game Commission (Commission) can protect bumble bees under the California Endangered Species Act (CESA) definition of fish, seemingly ending a years-long dispute. In 2018, a petition to protect four species (western, Crotch, Franklin's, and Suckley's cuckoo bumble bees) was submitted to the Commission. The Commission voted to provide temporary protection by designating the four bumble bees as candidates under consideration for listing as endangered species. Several agricultural and pesticide industry groups challenged this decision, arguing that CESA does not allow listing of invertebrates such as bees. The Commission countered that a separate section of the California Fish and Game Code defines fish to include "wild fish, mollusk, crustacean, invertebrate, or amphibian" and that, while insects are not specifically listed under the types of species that can be protected, the listing authority extends to insects and other invertebrates under this broad definition of fish. A Superior Court trial sided with the industry groups, but the listing petitioners appealed. In May 2022, the trial court ruling was reversed by a District Court of Appeal opinion that found the California Legislature defined the term "fish" as "a wild fish, mollusk, crustacean, invertebrate, amphibian, or part, spawn, or ovum of any of those animals" and CESA's definition of "fish" extends beyond the commonly understood meaning. In response, the industry groups filed a petition asking the California Supreme Court to take up the case. In declining to hear arguments, the California Supreme Court indicated that even though the law does not use the word "insects," sections of the law suggest that invertebrates may be grouped under the category of fish. The four bumble bee species in question are again designated as candidates for listing as endangered species.



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Industry Updates (continued)

New Federal Policy to Streamline Permitting for Wetland Restoration

The U.S. Fish and Wildlife Service (USFWS) recently released a Programmatic Biological and Conference Opinion (PBO) on the Statewide Programmatic Biological Assessment for Restoration: Multi-Agency Implementation of Aquatic, Riparian, Floodplain and Wetland Restoration Projects to Benefit Fish and Wildlife in California. This was developed in partnership with the USFWS, U.S. Army Corps of Engineers, and the National Oceanic and Atmospheric Administration's Restoration Center. This statewide consultation will help to simplify implementation of important aquatic habitat restoration projects in California for the benefit of wildlife and people while also fulfilling Endangered Species Act obligations. This programmatic biological opinion covers 72 federally listed species and 40 critical habitat areas for 10 types of restoration projects. Some types of restoration projects that are covered include improvements to stream crossings and fish passage, water conservation projects for wildlife habitat, and removal of invasive species and revegetation with native plants. Currently, eligible projects funded, authorized, or carried out by federal agencies referenced above are covered by the consultation; however, any agency interested in using this consultation when conducting qualified restoration projects may join the consultation as a "late arriving agency."



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Floodplain restoration. Photo credit: Dr. Jennifer Burt.



Floodplain restoration. Photo credit: Dr. Jennifer Burt.

New State Policy to Streamline Permitting for Restoration Projects

The State Water Resources Control Board (SWRCB) recently adopted a *Clean Water Act Section 401 and Waste Discharge Requirements General Order for Restoration Projects Statewide*. Whereas the SWRCB already has a General Order for Water Quality Certifications for Small Habitat Restoration Projects (File # SB09016GN), that General Order covered restoration activities that were no more than five acres in size and no more than 500 linear feet, cumulatively, along stream banks and coastlines. The new General Order covers restoration activities larger than the limits of the small habitat restoration projects, so long as the activities meet the definition of a restoration project, the project fits within the pre-defined categories of covered activities, and the applicant agrees to follow the general in-water measures listed in the General Order. The General Order was adopted by the SWRCB on August 16, 2022 but the General Order has not yet been released as a final order.



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