



ECOLOGICAL RESTORATION





SWCA IS YOUR PARTNER FOR ECOSYSTEM SOLUTIONS

SWCA has served as a valued environmental resources partner to private and public clients in a range of geographies for more than 40 years. Our dedicated ecological restoration and engineering team designs, permits, and builds environmental restoration projects. We have the expertise and the relationships necessary to seamlessly guide clients' projects from inception to completion. With a strong record of project delivery, our team will help you achieve your project goals through sound science, creative solutions, and technical excellence.

OUR APPROACH

Ecosystems, with their intricate web of interactions, have the inherent ability to buffer against the shocks of a changing climate. They provide a natural solution for the protection of wildlife, and against flooding, coastal degradation, and other disasters. When aligned with climate adaptation policies, ecological restoration can enhance the natural resiliency of communities. Our experts provide support for federal, state, and municipal agencies, private companies, and non-profits in conceptualizing and completing resilience projects, including nature-based solutions, no matter the size.



Stream mitigation design services - inspecting wetland berm holding water

FULL-SERVICE SOLUTIONS

By offering a comprehensive range of ecosystem services, SWCA provides clients with streamlined timelines and reduced project costs. Our clients benefit from a seamless integration of diverse services that simplifies decision-making, reduces the complexities of managing multiple partners, and fosters a holistic approach to finding solutions.



Post construction vegetation planting - installing ground water monitoring wells





COMMUNITY DRIVEN

Experienced working with local, regional, state, federal, tribal, and non-government organizations, SWCA leads an inclusive planning process from inception to implementation. We engage with community leaders to learn about their values, concerns, and sense of place to create ecological restoration plans that meet their needs. We also use a variety of engagement strategies to reach the public and gain their input for ecological restoration plans.



We engage with community leaders at every level

SCIENTIFICALLY SOUND

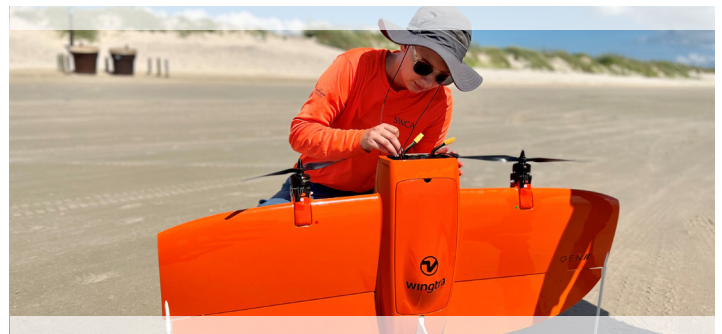
SWCA is an established leader in ecological restoration. Our experience includes providing coastal resiliency services with living shorelines, wetland and stream mitigation solutions for regulatory driven impacts, guiding habitat management plans to protect threatened species, and beyond. We anchor our solutions in sound science that enables project partners to make informed decisions on critical matters.



We use scientifically sound solutions to achieve project goals

TECHNOLOGY-ENABLED

We capture and merge relevant project data in near real time with a variety of technologies operating from land, sea, air, and space. Every project is different, and our data acquisition planners develop solutions tailored to your requirements. Our dedicated technologies team supports ecological restoration projects with advanced modeling and analysis, drones, satellite imagery, AI and machine learning, interactive online content (e.g., story maps, central websites), custom field data collection systems, and digital and online public meeting spaces.



Dedicated technology team supporting ecological restoration





SWCA

ECOLOGICAL RESTORATION LIFECYCLE

SWCA has negotiated and obtained tens of thousands of environmental and cultural resource permits, approvals, and entitlements and helps clients meet federal, state, and local regulations. By combining ecological and cultural expertise, our team provides time and expense efficiencies to keep projects moving, while reducing costs and maintaining compliance.

- National Environmental Policy Act
- Federal and state permitting
- Resource assessments and agency consultations
- Ecological restoration permit streamlining and statutory/categorical exemptions
- Compensatory mitigation plans and designs

With a long history of working with partners that have been awarded or are exploring funding through grants, our team has a unique understanding of the compliance challenges grantees face. SWCA guides grantees through the regulatory process, regardless of project type or organizational experience with federal funding and regulations.

- Funding source identification
- Grant proposal preparation
- Technical project support
- Grant application assistance
- Grant eligibility assessment



SWCA can help you understand your project site's constraints and potential. This information allows our clients to seize opportunities and avoid costly permitting or engineering problems while site planning. Decision analysis and workshop facilitation help guide collaborative efforts for funding, planning, building, and operating complex projects across multiple jurisdictions.

- Habitat assessments
- Watershed planning
- Flood analysis
- Post-fire restoration planning
- Wetland assessments and delineations
- Mitigation bank site identification
- Phase I and Phase II Environmental Site Assessments
- Archaeological assessments

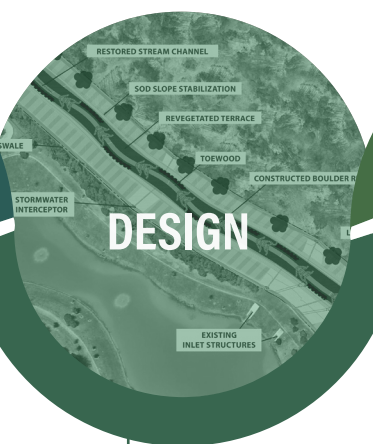


SWCA offers many services to support construction of your restoration project. Our experienced team can assist with all aspects of project management — from site preparation and plant installation to construction oversight and post-construction monitoring and maintenance. Our team understands the complexity of construction projects, building every project to last.

- Native seeding
- Wetland planting
- Biological Monitoring
- Tree and shrub planting
- Sediment and erosion control measures
- Construction oversight
- Environmental inspections

Monitoring ecological restoration projects creates a record of natural systems' development and guides adaptive management. Through monitoring techniques like field inspections, satellite imagery, and remote sensing, SWCA tracks changes in vegetation cover and species distribution. Monitoring ensures early detection of invasive species cover, sediment transport, species distribution, and other disturbances.

- Remote instream monitoring
- Surface and groundwater monitoring
- Statistical sampling design
- Vegetation monitoring
- Field surveys



SWCA's engineers and designers have planned all types of restoration projects, including dam removal, floodplain restoration/reconnection, meadow restoration, channel design, daylighting, culvert replacement/retrofits, streambank stabilization, and bioengineering. Our team has developed a design process through more than 80 years' collective experience with fluvial geomorphic assessments and river restoration design projects.

- Fluvial geomorphic assessments
- Natural Channel Design (NCD)
- Sediment supply and transport modeling
- Hydrologic and hydraulic modeling
- Fish passage design
- River migration studies



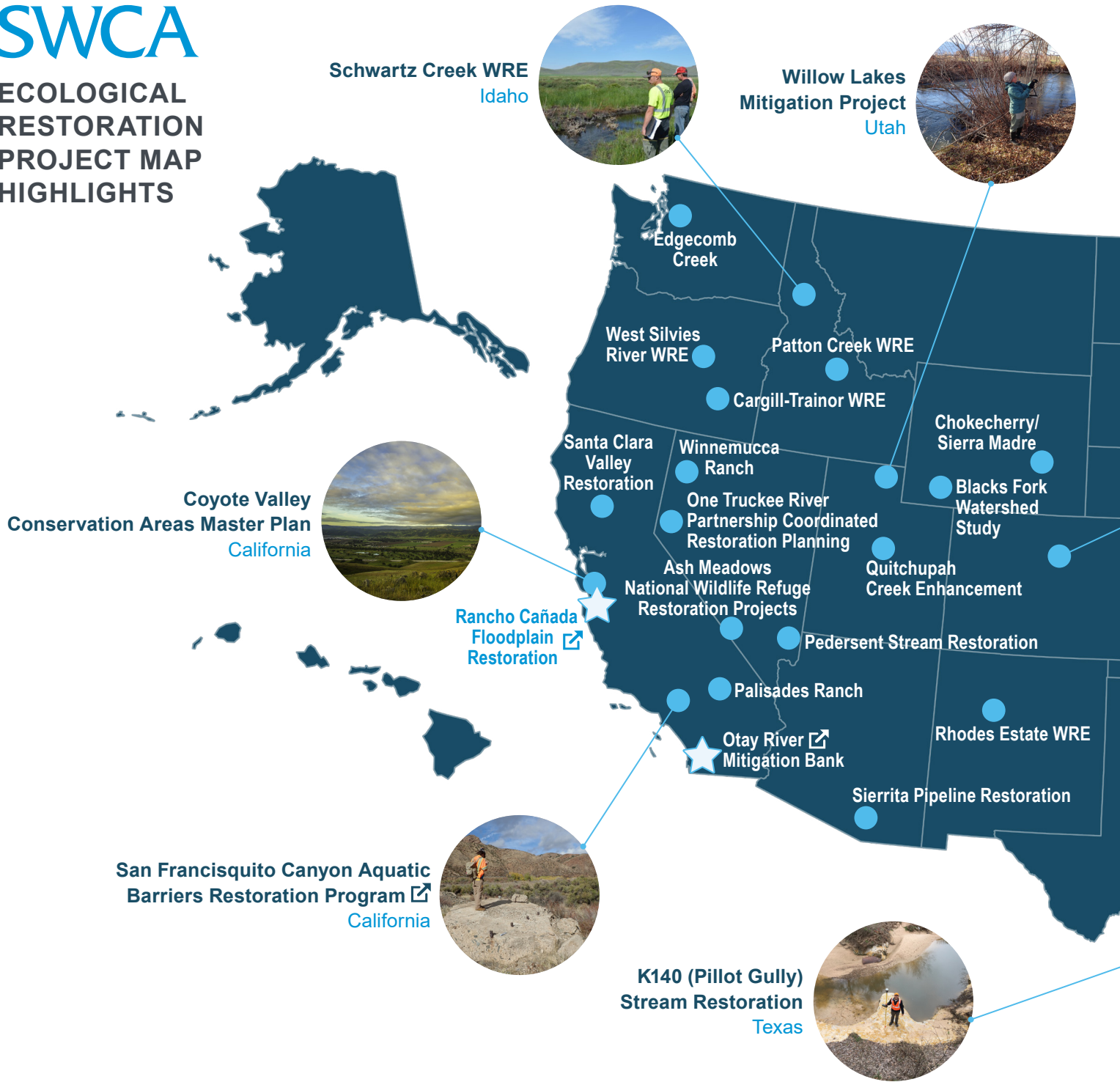
SWCA develops management plans and removes/controls plants in upland, wetland, and aquatic sites. Some plant management techniques that SWCA uses include foliar low-pressure and cut-stump herbicide applications, stem injection, wiping/wicking, and biological controls. Our specialists work primarily in sensitive resource areas. They have experience identifying native-desirable species and non-native-invasive species, while limiting disturbance of non-target species.




- Invasive species control
- Biological control of species
- Herbicide application
- Permit compliance
- Integrated Pest Management (IPM) planning
- Natural area stewardship



SWCA

ECOLOGICAL RESTORATION PROJECT MAP HIGHLIGHTS

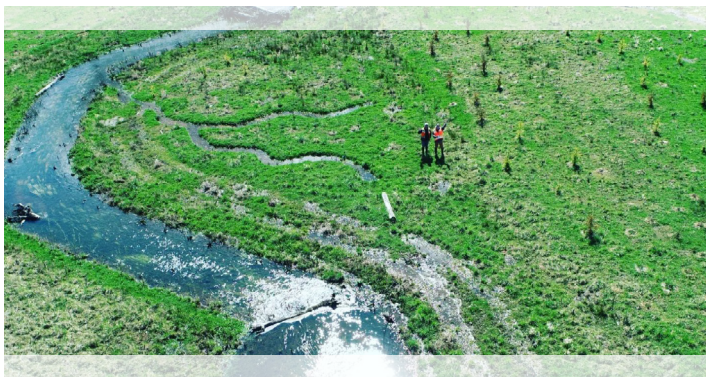


-  Link
-  SWCA projects
-  SWCA projects highlighted in Relevant Project Experience section





RELEVANT PROJECT EXPERIENCE



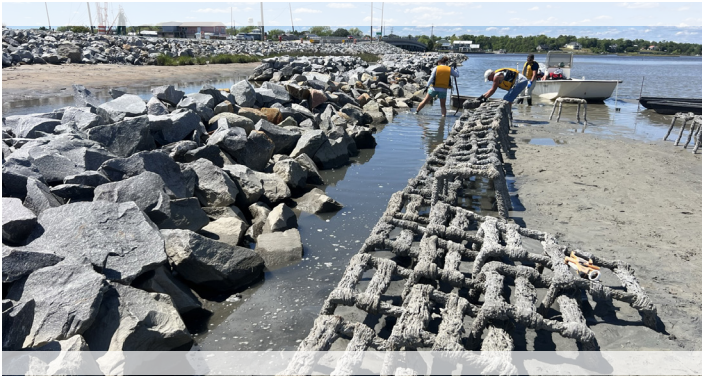
AMERICA THE BEAUTIFUL CHALLENGE GRANTEE FEDERAL COMPLIANCE TECHNICAL ASSISTANCE National Fish and Wildlife Foundation Nationwide

SWCA is providing technical guidance and federal compliance review support to the National Fish and Wildlife Foundation (NFWF) for their flagship Bipartisan Infrastructure Law + Inflation Reduction Act-funded program, the America the Beautiful Challenge (ATBC). The ATBC is a half-billion-dollar grant program that is focused on implementing large-scale conservation, restoration, and sustainability projects throughout the United States and its territories. SWCA works with grantees (primarily state governments, Tribal governments, and environmental nonprofits) to ensure compliance with federal regulatory compliance mechanisms such as the National Environmental Policy Act, Endangered Species Act, and National Historic Preservation Act. SWCA has provided compliance reviews for over 45 grantees with projects that span 48 states and three territories. The NFWF was pleased with SWCA's performance and elected to extend SWCA's contract into a second year. SWCA has worked on over 100 projects that cover all 50 states, four territories and the District of Columbia.

PLAINWELL SPILLWAY REMOVAL AND CHANNEL RESTORATION

Taplin Group
Plainwell, Michigan

SWCA provided services associated with the restoration of roughly 7,000 linear feet degraded riverbank and 10 acres floodplain along the Kalamazoo River near Plainwell, Michigan. With federal funding made available through the Great Lakes Restoration Initiative, SWCA is working with their client to remediate the site and establish native vegetation throughout the newly created floodplain. Work includes the installation of over 10 acres of native seed, 550 b&b trees, over 900 containerized shrubs, and overseeing the installation of over 30 root-wad structures. SWCA worked with local plant material vendors to supply materials with local genetics to improve client resiliency. When complete, the project area will provide substantially greater ecological value to local wildlife while also being more resilient to large storms and flooding events. The project team also assisted in the redesign of the bank restoration based on current field conditions, construction feasibility, and ecological value. As with most large federal restoration projects SWCA provided critical coordination among the varied stakeholders that included site contractors, environmental oversight professionals, Michigan DNR staff, and restoration engineers to ensure the project proceeded as planned.



NC-24 RESILIENCY AND LIVING SHORELINE PROJECT

North Carolina Department of Transportation
Swansboro, North Carolina

SWCA received a Project Merit Award from the Climate Change Business Journal for collaborating with the North Carolina Department of Transportation (NCDOT) to stabilize a vulnerable stretch of highway using a living shoreline and coastal restoration. SWCA is the lead designer on this project for three separate marsh restoration, stormwater treatment, sidewalk rehabilitation, and living shoreline projects along the NC-24 causeway. These areas experience frequent flooding/overlapping, and the hurricanes in 2018 caused extensive erosion along the existing sidewalk and riprapped causeway. A diverse partnership between NCDOT, the North Carolina Coastal Federation, and Carteret Community College was formed for the submittal of a National Fish and Wildlife Foundation grant requesting \$1.6M as a 50% match for design and construction of the shoreline protection and resiliency project. The current design includes converting and enhancing approximately 2,000 feet of hardened shoreline to living shorelines with the restoration and creation of two acres of tidal marsh along the causeway. The existing sidewalk will be stabilized to allow pedestrians to view the marsh, oyster reef, and living shoreline system as they walk along the top of the bank.

CHANDELEUR ISLAND RESTORATION PROJECT - SEAGRASS SURVEY

Louisiana Coastal Protection and Restoration Authority
St. Bernard Parish, Louisiana

The Chandeleur Island Restoration (PO-0199) Project (Project) is located on the Chandeleur Islands in St. Bernard Parish, Louisiana. The purpose of the Project is to engineer and design a restoration project benefiting the Chandeleur Islands and the many species that use them with a particular focus on birds as defined in the Restoration Plan and Environmental Assessment Plan #1 of the Region-wide Trustee Implementation Group. Phase 2 of the Survey Plan is to map the current extent and document the species composition and relative density of the seagrass beds in conjunction with the Project data collection efforts; and describe the changes to the seagrass beds over time.

SWCA is currently providing environmental services to support the design and implementation of a barrier island reconstruction benefiting the Chandeleur Islands in coastal Louisiana. The project will focus on the restoration and reconstruction of the main Chandeleur Island. SWCA developed and executed a rapid assessment survey for approximately 3,000 acres of seagrasses along the barrier island chain, providing a comprehensive baseline dataset to support the project design and habitat restoration plan.



RELEVANT PROJECT EXPERIENCE



BOIS D'ARC CREEK

Resource Environmental Solutions
Fannin County, Texas

SWCA was retained to design the stream and wetland restoration components of the comprehensive Permittee Responsible Mitigation (PRM) to offset Clean Water Act Section 404 impacts to waters of the U.S. resulting from the construction of the Lower Bois d'Arc Creek Reservoir by the North Texas Municipal Water District in Fannin County, Texas. The project was the largest stream and wetland mitigation project on a single site in the U.S. to date and included 30 miles of Rosgen Priority 1 and 2 stream restoration; 40 miles of Rosgen Priority 3 stream restoration and riparian-only restoration; and over 10,000 acres of emergent, scrub/shrub, and forested wetland restoration on a contiguous 15,000-acre tract of land largely occupied by the historic Riverby Ranch on the southern banks of the Red River. SWCA also conducted cultural resources monitoring during construction.



OTAY RIVER MITIGATION

HomeFed Corporation
Chula Vista, California

SWCA is leading the restoration design and permitting of a habitat restoration project at the Otay River mainstream through an area historically disturbed by sand mining and now invaded with tamarisk. The project team is recreating a braided channel network and active floodplains to support riparian, transitional, and upland native habitats totaling approximately 148 acres where no riverine functions currently exist. The project team has worked with the regulatory agencies, the City of Chula Vista, and the private developer to finalize the design, and implemented the first phase (approximately 40 acres of restoration) in the fall 2016. SWCA continues to work with HomeFed and the City of Chula Vista to implement a Mitigation Bank (an additional ~140 acres of restoration directly downstream of the first phase) for the extended protection of sensitive animal and plant species, while promoting public engagement and education via implementation of trails that create an interpretative experience. The project lies within the boundaries of the Otay Valley Regional Park (OVRP) Concept Plan and the City of Chula Vista Greenbelt Master Plan.



RANCHO CAÑADA FLOODPLAIN RESTORATION

McBain Associates
Carmel, California

SWCA and teaming partner are currently providing professional environmental services to model, design, and permit restoration of an approximately 1-mile reach of the Carmel River for the Rancho Cañada Floodplain Restoration Project in the Rancho Cañada Unit, Palo Corona Regional Park in Carmel Valley. The project is approximately 185 acres in size and spans both banks of the Carmel River. It is part of a concerted effort by federal, state, and local government to restore migration and spawning of steelhead in the Carmel River watershed. Ultimately, the project will reconnect the Rancho Cañada portion of the Carmel River with historic floodplain habitat.

SWCA's comprehensive services for this important project include biological and cultural resources assessments; field investigations, including, but not limited to, establishing a survey control, conducting a topographic survey and Light Detection and Ranging (LiDAR) flight of the project area, fish habitat mapping, geomorphic mapping, vegetation mapping, and bathymetric survey; permit preparation; conceptual, 30%, and 60% design; environmental review; grant writing assistance; and extensive public outreach to incorporate community feedback into the design and restoration process. SWCA's natural resources and restoration specialists are working closely with the design team to select a preferred design that will avoid sensitive resources to the greatest extent possible and identify opportunities for the restoration of multiple species habitat.

NRCS NATIONWIDE ON-CALL CONTRACT **American Conservation Experience** Nationwide

SWCA, in partnership with American Conservation Experience, holds an on-call contract with the NRCS to provide nationwide environmental and ecological restoration services in support of restoration of degraded streams, wetlands, and floodplains through NRCS easement programs. SWCA is currently providing ecological restoration services for the NRCS from Massachusetts to Oregon. In Kentucky, SWCA is assisting with assessment, design, planning, contracting, and implementation of restoration of six project sites. All sites include environmental-engineered designs to enhance/improve aquatic habitats and wetlands for fish passage and aquatic organism health and to reconnect the hydrology. In total, we are restoring/rehabilitating 133 acres of riparian and upland habitats, 56 acres of wetlands, and 11,281 linear feet of dike removals and stream restoration. In Idaho, SWCA is designing and permitting Patton Creek, located on the Stevenson Wetland Reserve Easement in Blaine County, Idaho. The project includes the restoration of Patton Creek by rerouting the creek to bypass the existing impoundment utilizing a Priority One restoration approach. A diversion will be included at the upstream end of the project to provide the ability to divert water back to the impoundment for irrigation. By restoring Patton Creek, we seek to improve the health and function of riparian and stream habitat while restoring natural hydrologic function and sediment transport and reducing water temperature within the drainage area.

LOCAL EXPERTISE, BIG FIRM SUPPORT

Founded in 1981, SWCA is an employee-owned global environmental consulting firm. SWCA provides a full spectrum of environmental services focused on planning, natural and cultural resources management, permitting, regulatory compliance, water resources, ecological restoration, sustainability and management consulting, disaster and resilience. Our team of professionals combines scientific expertise with in-depth knowledge of permitting and compliance protocols to achieve technically sound, cost-effective solutions for environmental projects across the globe.

For more information, visit SWCA.com.

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