



MARIN COMMUNITY FOUNDATION

Letter of Intent

Project Name

Four Canyons Restoration and Early Detection Project

Community Grants goal area

Restoring ecosystem

Purpose for grant funds

We are blessed to live in a land that nurtures a grand diversity of living forms. We are challenged to live in a time when many of these evolutionary stories will be permanently cut short. The effects of climate change and biological invasions are likely to be severe in Marin County's fragmented wildlands. However, recent research also predicts that Marin may be a critical refuge for the persistence of California's biological diversity. With bold and careful action we can save much of what makes Marin unique and ecologically valuable.

We already possess the core tools needed for effective conservation. A recent analysis by Dr. Erika Zavaleta determined that the best defense against global change is to do what we are currently doing --better. We must restore habitats so populations can adapt to changes. We must manage invasions which are the primary threat to wildlands. We must heal nature so that nature can survive, adapt, thrive.

Audubon Canyon Ranch is restoring natural systems and building human communities in service of this goal. The Four Canyons project is a "swords-into-plowshares" restoration of former human-use areas to wild habitat. In the past two years we have removed buildings, built a native plant propagation center, and recruited a team of dedicated volunteers to grow thousands of native plants. These accomplishments were made possible by funding from the Marin Community Foundation. We now seek continued support to complete Phase I of the restoration, and to implement Early Detection and Rapid Response (EDRR) protocols to protect the region. Planned restoration includes propagating native plants, planting in former human use sites, and building a native grass increase field to provide seed for landscaping and erosion control.

The Early Detection and Rapid Response project protects wildlands from the most harmful plant invasions by identifying and removing outbreaks when they are still small enough to control and before they inflict ecological harm. Audubon Canyon Ranch is leading the initiative to build an integrated EDRR system for the Bay Area, the first in California. Early detection is coordinated by the Bay Area Early Detection Network (BAEDN). Rapid response is conducted by the Marin-Sonoma Weed Management Area (WMA). These efforts were initiated by ACR's Dr. Daniel Gluesenkamp, include dozens of agency and citizen partners, and have received funding from several agencies. MCF support will fund: (1) critical work by ACR needed to complete the EDRR system; (2) detection and response on ACR's 25 Marin properties and across Marin; (3) workshops to train professionals and volunteers in standardized detection protocols. The Community Foundation of Sonoma County is currently reviewing a request to fund the Sonoma County complement of this work.

Our collaborative work combines ecosystem repair with "stitch-in-time" prevention. This combined approach is necessary to restore important habitat and to build an Early Detection and Rapid Response network that will prevent future environmental degradation. The outcome

will be healthy coastal riparian forest, increased coordination of natural area managers, and infrastructure to protect Marin County from the most harmful invasive plant outbreaks.

Funding Type

Project

Requested Amount

\$97,606.00

Requested Grant Period:

from 02/01/2009 **to** 01/31/2010

Contact Person's Name:

Daniel Gluesenkamp

Organization Total Budget

\$2,781,000.00

Project Budget

\$285,944.00

Fiscal Year: 06/30/2009

Geographic Area Served

All of Marin

Project Name: Four Canyons Restoration and Early Detection Project

Prepare an overview of your project.

Audubon Canyon Ranch was founded in 1962 to save one of the largest heron and egret nesting sites on the west coast. Following the campaign to save Canyon Ranch, those early pioneers of Marin's conservation movement began a grassroots crusade to preserve the open spaces of Marin County. This success changed the area's land-use ethic forever. Audubon Canyon Ranch now protects 2000 acres in 27 properties in Marin and Sonoma Counties. These lands serve as wildlife sanctuaries and centers for environmental education and conservation-based research, and every year we learn more about these natural ecosystems and their unique value within the ecological landscape.

ACR's Habitat Protection and Restoration program leads stewardship of these special lands. The Marin Community Foundation was an essential partner in establishing the program in 2002. Dr. Daniel Gluesenkamp directs Habitat Protection and Restoration, which employs a science-based approach combining careful planning, scientific rigor, and innovative conservation action.

Restoration on Audubon Canyon Ranch lands is conducted by skilled staff including experts in native plant propagation, grassland restoration, vernal pools, and biological invasions. Much of the work is conducted by dozens of dedicated volunteers, and we actively collaborate with neighbors and partner agencies in collective action to save Marin County's beautiful and fragile biological diversity.

Many of the threats to Marin's biodiversity are familiar. Decades of human activity have transformed the land and introduced invasive species: productive creeks which once supported elderberry forests now wind through barren dirt channels; songbirds which once fed on abundant insects are absent from silent forests of French broom. Even when ecosystems are allowed to heal they often fail to recover without deliberate human assistance. To make matters worse, Marin's ecosystems are challenged by new threats. Global changes are resulting in local loss: the accelerating biological invasion crisis brings diseases such as Sudden Oak Death to fell our forests; rising sea levels will erase many of our protected lands; changing climate will drive many species northward, up, and away.

Fortunately, the key solutions to these challenges are also familiar. Damaged ecosystems can be restored with careful planning, planting, and weed control. Wildlands can be protected from disease and pestilence by applying the same hygiene and epidemiological tools which protect human populations. By healing nature we enhance the existing capacity to resist and adapt to climate change.

Our proposed work includes addresses MCF's goal to "preserve and protect the ecological health of Marin's important ecosystems." We are restoring seven highly degraded sites, replanting former parking lots and human use areas with native forest and scrub. To accomplish this, we are also building regional restoration capacity, training volunteers and staff in state-of-the-art restoration techniques, and establishing a native grass seed increase field. Upon completion of the proposed work we will have repaired ecological communities damaged in the past, and will have increased the ability of Marin's citizens and professionals to protect and restore all our ecosystems in the future.

Specifically, what do you wish to accomplish? What are the specific outcomes or impacts of the proposed project?

The work planned for the coming year is designed to address long-standing habitat degradation problems in four canyons of the Audubon Canyon Ranch. Achieving these ambitious restoration goals requires building new capacity in Marin County, and we have planned this capacity development such that it results in permanent gains to facilitate other restoration projects on our lands and across the county.

Our work will result in the following outcomes:

Outcome 1

We will complete restoration of five sites planted in 2008.

Restoration of these sites was initiated in 2007-2008: a site graded to mineral soil in 1962; a site bulldozed for PG&E; a yard waste dump; a creekside flood control zone; and PRBO's former parking lot. With MCF support, we built a native plant nursery, recruited volunteers to collect and grow native plants, designed detailed restoration plans. This winter we planted the five sites with thousands of native plants. The initial planting has been an exciting success, but to finish restoring these degraded sites we must conduct weed control this summer, monitor for mortality and fill in gaps with additional plants, and plant understory and annual plants next winter to complete habitat reconstruction.

Outcome 2

We will plant the two additional sites. MCF funding prepared these sites for planting; preparation of the former ranch dump and corporation yard is completed, and donated Marin Conservation Corps crews demolished two office buildings at the former PRBO headquarters. MCF also funded collection and propagation of native plants for these sites. The plants await planting next winter.

Outcome 3

We will build a native grass seed increase field in Volunteer Canyon on a highly degraded former garden site. A similar operation was recently built at ACR's Bouverie Preserve by Bouverie biologist Jeanne Wirka, former president of the California Native Grassland Association. This increase field will grow high quality native grass seed for use in restoration at the preserve, while replanting a degraded area with native grasses. It will also provide genetically local seed to maintenance staff, supplanting the use of non-local and potentially invasive grass seed in urgent trail stabilization and erosion control projects. This is the final component of the Bolinas native plant propagation facility and will complement the greenhouse and shadehouse that were built with assistance from MCF.

Outcome 4

We will hold five advanced training sessions for restoration volunteers, giving them tools needed to complete and maintain these restoration projects. Classes will train volunteers in important methodologies such as: native plant propagation genetics, seed collection, cleaning, and banking; nursery pest control; invasive plant removal; GPS and GIS in mapping and monitoring restoration projects. While primarily intended for Audubon Canyon Ranch restoration volunteers, these classes will be made available to interested citizens and partners as space is available. Our hope is to substantially increase Marin capacity in these important skills.

Clearly state measurable outcomes for the project. How do you propose to achieve the outcomes of the project?

Outcomes 1 and 2

The main measurable objective for each restoration sites is that restored habitat mirror the species composition and density of its corresponding reference site. Each of the seven restoration sites has a corresponding reference site --an intact native community which is used to model the restoration design. Detailed surveys of these seven reference sites were conducted in 2007/8 and the data used to develop species mix and planting densities.

Site-specific measurable objectives for each site are listed in our "Implementation Plan for the Four Canyons Restoration Project. " For example, surveys of the reference site for VC3 provided

a numeric plant density and the following compositional objectives: tree density = 15% (coast live oak, alder by creek); shrub density = 50% (coffee berry, coyote brush, sagebrush, blackberry, monkey flower, elk clover and elderberry by creek). To achieve these objectives, appropriate seeds and cuttings for VC3 were collected and propagated and the site prepared by removing debris and invasive plants that will interfere with planting. Plants will be planted in the proportions prescribed in the implementation plan.

By January 2010, planting will be completed at the five sites initiated in 2008 and we expect native plant composition to be very similar to the reference sites. We also plan to conduct extensive control of invasive plants, to ensure survival of the natives which we have planted.

Outcome 3

In summer 2009 restoration volunteers and staff will collect native grass seeds from naturally occurring populations at the Bolinas Lagoon Preserve, and seeds will be cleaned and prepared for planting.

Site preparation for the native grass seed increase field will be completed by August 2009.

Native grasses will be planted summer 2009 and by January 2010 the field will contain at least 400 live individuals of three grass species: California oatgrass, purple needlegrass, and blue wild rye.

By August 2010 we will harvest genetically local seeds of these three grass species. Seed will be cleaned and available for planting in restoration sites and erosion control sites by the following winter.

Outcome 4

We will hold five advanced training sessions for restoration volunteers. Sessions will be held at regular intervals over the project period and will be scheduled as seasonally appropriate: for example; invasive plant control training Summer 2009, seed collection in Fall 2009.

Class size will vary based on the subject matter taught. Our objective is that at least five Audubon Canyon Ranch restoration volunteers are trained in each session. For topics which allow more than seven participants, we will contact partner agencies and offer space for their staff and volunteers. Additional spaces will then be made available to members of the general public.

Trainings will be designed to provide real experience in applying state of the art methodologies.

Trainees will receive instruction in the topic and then will be supervised in applying the lessons to field work. At the end of a session, trainees should be capable of conducting work independently at Audubon Canyon Ranch or other restoration projects.

Include the *quantitative* and *qualitative* evaluation indicators you will use to measure the progress and impact of the project?

Progress in replanting native plant habitat will be evaluated by inventorying the number of stems planted and number of stems surviving. Results will be analyzed annually to identify need for secondary plantings. A key quantitative indicator in the Implementation Plan includes ensuring survival of >70% of plantings. We will also compare restored sites with neighboring reference sites to measure progress toward site-specific objectives for final composition and structure of the restored sites. A key qualitative indicator of project success is met when survival rates are high enough that we have reasonable certainty that the restored site will develop composition and structure comparable with that of neighboring intact sites.

Eradication of the most harmful invasive plant species will be assessed by monitoring presence or absence of target species. These species include Cape ivy, Pampas grass, and eupatory.

Quantitative indicators of success include: number of high priority invasive plant occurrences and

number of high priority invasive plant species eradicated. Qualitative indicators of success include: ability to detect new populations of priority invaders before they become abundant, and success in engaging neighbors and other stewards in these early detection and response efforts.

Reductions in abundance of other harmful plants will be assessed using our Geographic Information System (GIS). Outbreaks are mapped by staff and volunteers and managed using a database which simplifies tracking effort and evaluating effectiveness. Our goal is to reduce the harmful species to levels which do not harm restoration plantings and which can be managed with minimal ongoing effort. Detailed evaluation indicators for each site are presented in the Implementation Plan. We also plan to develop specific numeric objectives for long-term management of each species based on area treated per unit effort, to inform ACR's ongoing habitat protection work.

An important outcome of this project is the improvement of both biological and human communities throughout the region. Education opportunities and volunteer participation are keys to achieving this outcome. Quantitative indicators of education progress include the number of youth volunteer teams that participate; we expect at least two MCC youth teams and two school visits to participate in the restoration project in the coming year. Other quantitative indicators include the number of volunteers, the number of returning volunteers, and the number of volunteer hours. These will be tracked by project staff and we will work to ensure at least a 25% increase over the implementation period. We also expect at least five advanced trainings with at least five attendees per training.

For all indicators, Audubon Canyon Ranch science staff will initially assess the results, with subsequent review by the ACR Conservation Science and Habitat Protection (CSHP) Committee which includes members of the Board of Directors, Advisors, key volunteers, and science staff. Relevant results will be published in-house publications and (if appropriate) in peer-reviewed scientific and industry journals. Philosophical lessons and methodological innovations resulting from this restoration work will be shared with other restoration professionals at via informal discussions, at conferences, and in professional training workshops.

Indicate populations to be served by this project, including numbers, geographic location, age groups, genders, and racial/ethnic group composition

Audubon Canyon Ranch serves thousands of community members through its preservation, education and research programs. Between 6,000 and 7,000 schoolchildren from ethnically and economically diverse neighborhoods in San Francisco, Marin, Alameda, Sonoma, and Napa counties participate in experiential nature education programs on Audubon Canyon Ranch properties each year. Audubon Canyon Ranch trains and supports 800 active community volunteers in education, research, and habitat protection and restoration activities. Many ACR volunteers are senior citizens, and other volunteer groups include high-school students, rotary clubs, groups from sister environmental organizations, neighborhood coalitions, and employees of local companies. In addition, ACR staff and volunteers continuously contribute knowledge, resources, and the results of research to the environmental education and scientific communities.

Implementation of these Habitat Protection and Restoration projects, including the restoration activities described above, will specifically impact certain segments of Audubon Canyon Ranch's constituency. Habitat Protection and Restoration volunteers involved in this work will learn about the challenges land managers must solve to succeed in their efforts to preserve populations of native species and critical habitat in the region. Community volunteers become better connected

to the environment of Marin and empowered in their knowledge of ways to help preserve their natural heritage. In particular, we look forward to continuing our partnership with Marin Conservation Corps's Project ReGeneration and youth corps. These groups have partnered in Audubon Canyon Ranch restoration work for the last four years and this project increases the quantity and quality of opportunities for these bright and energetic partners.

The results of this project will also have a significant impact on local efforts of sister organizations including the Golden Gate National Recreation Area, Marin Municipal Water District, Marin County Open Space District, and the Point Reyes National Seashore. Audubon Canyon Ranch's Habitat Protection and Restoration Specialist, Dr. Daniel Gluesenkamp, has been active in the creation of a collaborative infrastructure to improve information sharing among restoration professionals (including leadership in the Marin-Sonoma Weed Management Area). He serves as President of the California Invasive Plant Council, and regularly presents results of Audubon Canyon Ranch restoration work at scientific conferences and via public speaking. Recent teaching has included results of Audubon Canyon Ranch restoration projects, including several training workshops for restoration professionals, as well as an Environmental Restoration class he taught at Sonoma State University. These networks will allow results of Marin Community Foundation supported work to be communicated to citizens of Marin and to thousands of restoration professionals.

It is important to note that the Four Canyons Restoration Project will contribute in a significant manner to creating ACR's Ecological Restoration Center. We expect that the work described in this proposal will restore and protect diverse biological communities, create and strengthen connections with neighboring human communities, and help Audubon Canyon Ranch develop a restoration "community center" which spreads innovative environmental solutions with the region and beyond.

Audubon Canyon Ranch was founded in 1962 to save one of the largest Great Blue Heron, Great Egret and Snowy Egret heronries on the West Coast. To prevent intensive commercial development in the pristine West Marin area surrounding the colony, early pioneers of Marin's environmental and conservation movement began a grassroots crusade to protect and preserve the open space of Marin and Sonoma counties and subsequently change the areas' land-use ethic.

To date, ACR has acquired 2,000 acres in Marin and Sonoma. We safeguard these beautiful properties as wildlife sanctuaries and use them as centers for environmental education and conservation-based research. ACR's properties include the Cypress Grove Research Center on Tomales Bay; the 1,000-acre Bolinas Lagoon Preserve in Stinson Beach, which is home to the Great Egret and Great Blue Heron nesting site; and the 535-acre Bouverie Preserve in Glen Ellen, which safeguards a portion of the Stuart Creek watershed.

Audubon Canyon Ranch (ACR) protects the natural resources of its sanctuaries while fostering an understanding and appreciation of these environments. We educate children and adults, promote ecological literacy that is grounded in direct experience, and conduct research and restoration that advances conservation science.

ACR's vision is for all adults and children to feel a strong and continuing connection with the wonder and beauty of the natural world. We seek to inspire this connection through our preservation, education, and research programs.

The goal of ACR's experiential education programs is to teach people about the environment and the need to protect it. This year, we seek to inspire more than 15,000 visiting students and families to love and respect nature, and better understand our natural heritage.

ACR also strives to help the scientific community and community-at-large have a greater understanding of natural processes, conservation science, and a shared commitment to responsible methods of land management. ACR's scientific inquiries have a big-picture conservation focus. ACR seeks to provide scientific solutions to regional problems, specifically those affecting wetland ecology and the ecology of herons and egrets.

Through efforts to carefully steward our sanctuaries, we seek to preserve biodiversity and protect endangered and threatened species. ACR habitat protection programs address threats to native plant and wildlife populations on ACR sanctuaries and in the region.

ACR's broader goals include working to support the development of a community of people, who, as a whole, restore and preserve the natural environment. Working together, our community will support a growing network of natural preserves, wildlife corridors, preserved watersheds, wetlands, connected open space and urban parks.

**If funds are granted for the proposed budget, how long do you anticipate needing MCF funding?
What provisions are now being made for financing beyond the grant period?**

We anticipate that the proposed project will not require additional MCF funding once the proposed work has been completed.

Restoration of these seven sites has required significant upfront investment. Without support from the MCF, it is unlikely that Audubon Canyon Ranch could have built the nursery infrastructure within this short time frame. Preparation of seven restoration sites, propagation of 7000 native plants, and initial planting has been conducted on an ambitious timeline and has been resource intensive. The requested funding will enable us to complete this up front work, as well as the most critical first year of weed control. Cost of ongoing maintenance of the completed sites will be integrated into the regular ongoing natural resource maintenance schedule for the preserve.

What have been some of your major accomplishments in the past three years? If you have received MCF funding in the past, please include a brief description of the results of that funding.

The last three years have been very productive for ACR's Habitat Protection and Restoration program. In that time we have:

- Completed our 15 Year Habitat Protection Action Plan to guide our work.
- Initiated habitat restoration of Bouverie Preserve vernal pools, including reintroduction of the rare dwarf downingia (*Downingia pusilla*) and the federally endangered Sonoma sunshine (*Blennosperma bakeri*).
- Created the Bay Area Early Detection Network (BAEDN), a collaborative effort to identify and prioritize the most harmful outbreaks of invasive plants in the nine county San Francisco Bay Area.
- Restored coastal dunes at Toms Point to recover declining populations of rare dune plants, and nearly completed full removal of Highway Iceplant (*Carpobrotus edulis*) from important coastal strand habitat.
- Led the Marin-Sonoma Weed Management Area in building a program for rapid response to the highest priority invasive plant outbreaks, and successfully advocating for state funding of California's WMA program.
- Completed experimental evaluation of the ecological impacts of introduced turkeys.
- Stabilized pot farms built by trespassers on ACR land in Marin.
- Initiated the Four Canyons Restoration project.

The Marin Community Foundation has made much of this work possible. In 2005 we received support to help implement the Toms Point Natural Resource Management Plan. Goals of that project included:

- Removal of European beachgrass (*Ammophila arenaria*) from dunes and recovery of dynamic native dune vegetation.
- Eradication of highway iceplant clones currently invading periphery of the sanctuary and removal of large highway iceplant mats from coastal strand.
- Creation and sustenance of a regular (annual) detection and response program and prioritization of invasive plant species and eradication of high-priority invaders.
- Dissemination of results and best management practices with local organizations, land owners, and land managers.

These goals were all met, and we have continued to make progress since the end of the MCF-funded project period:

- We have removed European beachgrass from all the key habitat zones and native dune vegetation has recovered very well.
- We expect to have the property completely free of Highway iceplant within 12 months.
- The invasive plant detection and response program, and our dissemination of results and lessons, have resulted in the formation of the Bay Area Early Detection Network. This exciting group includes dozens of agencies and citizens from throughout the nine counties, working together to conduct early detection of the most harmful invaders. The project has been funded, is hiring a coordinator soon, and looks to become an important component of Bay Area conservation infrastructure.

More recently, MCF has funded the Four Canyons Restoration program described in this proposal. MCF funding was critical to the success of this ambitious project. Results of this funding include:

- Building the Bolinas Lagoon Preserve native plant propagation facility, including full rehabilitation of the derelict greenhouse, construction of a modern shade house, installation of automated watering systems.
- Ongoing development of restoration plans, including characterization of reference sites and improvement of early restoration prescriptions.
- Collecting of native plant seeds and cuttings from populations local to each of the restoration sites.
- Preparation of restoration sites, including demolition of two buildings, closure of a parking lot, clean up of the ranch dump, and removal of priority invasive plants.
- Recruitment, training, and leadership of more than 50 nursery and restoration volunteers.
- Grew approximately 7000 native plants and planted material at five restoration sites.

Project Budget

Income

	<i>Current Year Income</i>	<i>Proposed Income</i>
	02/01/2009 to 01/31/2010	02/01/2009 to 01/31/2010
<i>Contributed</i>		
MCF	\$86,441.00	\$86,441.00
ACR Volunteers	\$20,706.00	\$20,706.00
<i>Subtotal Contributed</i>	\$107,147.00	\$107,147.00
Grand Total Income	\$ 107,147.00	\$ 107,147.00

Expenses

	<i>Current Year Expenses</i>	<i>%</i>	<i>Proposed Expenses</i>	<i>%</i>	<i>Requested from MCF</i>
<i>Salaries and Benefits</i>					
Benefits at what percent	\$12,836.00		\$12,836.00		\$12,836.00
Full Time Salary	\$0.00		\$0.00		\$0.00
Part Time Salary	\$42,685.00		\$42,685.00		\$42,685.00
Contractors and Seasonal staff	\$10,800.00		\$10,800.00		\$10,800.00
Other	\$500.00		\$500.00		\$500.00
<i>Subtotal Salaries and Benefits</i>	\$66,821.00		\$66,821.00		\$66,821.00
<i>Professional Fees</i>					
Professional Fees	\$350.00		\$350.00		\$350.00
<i>Subtotal Professional Fees</i>	\$350.00		\$350.00		\$350.00
<i>Operating Expenses</i>					
Rent	\$0.00		\$0.00		\$0.00
Utilities	\$3,000.00		\$3,000.00		\$3,000.00
Supplies	\$6,100.00		\$6,100.00		\$6,100.00
Conf. and Meetings	\$300.00		\$300.00		\$300.00
Books, periodicals, subscriptions	\$260.00		\$260.00		\$260.00
Insurance	\$500.00		\$500.00		\$500.00
ACR Volunteer Expense	\$20,706.00		\$20,706.00		\$0.00
Mileage	\$1,053.00		\$1,053.00		\$1,053.00
Office	\$1,000.00		\$1,000.00		\$1,000.00
Administration	\$7,057.00		\$7,057.00		\$7,057.00
<i>Subtotal Operating Expenses</i>	\$39,976.00		\$39,976.00		\$19,270.00