

ERTEC Environmental Systems

Protecting Global Lands and Waterways™

Case Study E-Fence™

Wildlife Containment and
Directional Control



- > Lower Project Costs
- > Better Performance
- > ZERO Waste
 - ✓ Recycled
 - ✓ Reusable
 - ✓ Recyclable



Photo 1: E-Fence™ HDPE Polymer Matrix



Photo 2: Funnel in both directions allow small animals to move between areas (frogs, rodents)

Application: Wildlife Containment and Directional Control
Product: ERTEC E-Fence™, 20" width, black for permanent installation, with and without climber barrier
Project: Mountain Lake Restoration
Owner: San Francisco Presidio

Mountain Lake is located at the southern boundary of the San Francisco Presidio. The Lake area and bordering national park offer a contiguous multiple-use recreational area. Its surrounding natural environment provide potential plant and wildlife habitat, attracting many waterfowl and migratory bird species. In addition to problems associated with its location in the urban landscape, the management of Mountain Lake is further complicated due to the various jurisdictions of its borders: city park, state highway, national park, and private golf course. Mountain Lake had experienced a severe degradation of its environment related to these diverse boundaries. Mountain Lake and its surrounding area is currently undergoing a long and comprehensive restoration process. It has been dredged and cleansed of sediments and toxic chemicals that have poisoned it for a century. Non-native fish and vegetation have been removed. The Lake's natural vegetation has been restored to provide new wildlife habitat. Conservationists have reintroduced native species like Western pond turtles and Pacific chorus frogs.



Fig. 1: Area A: Lake and wetlands; Area B: Northern Habitat; Area C: East Arm

Species Management Objectives for E-Fence:

Native to Mountain Lake, the Western pond turtle (WPT) and Pacific chorus frog (PCF) were reintroduced in 2015. Given all the hazards surrounding the area and with an eye towards protecting the new populations, conservationists hoped to contain them in certain areas and direct them to other areas. A permanent barrier that could function in different ways in different locations was needed. The Western pond turtle is a threatened species and to minimize losses, it was decided to contain it within Areas A, B and C. It was desired to allow it to move between its breeding Area A and upland habitat Areas B and C and back again via ground level corridors. The adjacent areas are hazardous so it was important to keep it off the adjoining road, public access areas and the golf course. Since the WPT cannot climb, a simple short 15" high barrier, trenched 5" (Fig 2) and installed around Areas A, B & C would be needed. To tie together fragmented habitat, and allow WPT to move to its upland habitat in Areas B and C and return to its breeding Area A a series of directional corridors were installed.

The Pacific chorus frog, not a special-status species, is also native to Mountain Lake. It was decided that it be allowed migrate away from its breeding Area A in any direction except towards the adjacent roadway (HWY 1, west of Area A). At two inches long fully grown, PCF is unable to jump over the WPT barrier, but as an adept climber, it easily can climb over and able to reach all areas. The portion of E-Fence installed along HWY 1 therefore needed a climbing barrier (see Fig. 3).

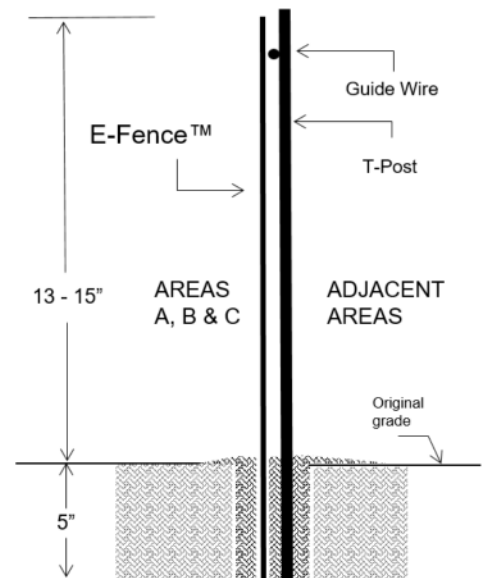


Fig. 2: Simple E-Fence configuration



Photo 3: E-Fence™ with 5" climber barrier. About 10" tall and positioned between Mountain Lake and HWY 1 to contain PCF

E-Fence™

ERTEC E-Fence™ is a highly reliable and low-cost species exclusion and control barrier designed for projects in habitat where threatened small vertebrates are present. The fence is designed to exclude small vertebrate species from active construction areas, control movement within fragmented habitat and for survey perimeter control. E-Fence allows high wind and heavy stormwater flow-through. It can be installed across contours (up and down hills) without enduring the destructive and scouring effects of stormwater runoff. It is non-toxic and environmentally safe. Even after extensive exposure to sunlight, harsh weather and salt water it continues to perform. E-Fence provides very high reliability (up-time) which significantly reduces maintenance and monitoring costs. E-Fence can be used for temporary or permanent requirements. It is a ZERO Waste solution, made from recycled materials.

- Typically cuts project costs significantly
- Highly configurable for different species and habitat
- Particularly important in this project is E-Fence's ability to pass heavy stormwater flows. The lowest point in the watershed is Mountain Lake. All flows move towards the lake. A critical design factor for the containment fencing was to allow flows, and not introduce points of water accumulation, ponding, or unnatural flow diversions which often cause unwanted erosion and sediment movement.

E-Fence™ allows concentrated stormwater flow-through

Summary:

"The quality of the containment fencing gives us confidence that these sensitive animals will remain protected from dispersing to harmful areas such as the highway or the golf course. The installation was timely, went smoothly, and the final product is unobtrusive." January 2016

Based on the recent completion of a western pond turtle citizen science monitoring project is looks like a fair amount of the turtles are still alive at the lake, suggesting that the fence served its purpose in keeping those would-be dispersing individuals around long enough to acclimate to the area. Jan 2017

" - Jonathan Young, Project Manager, Wildlife Ecologist, Presidio Trust

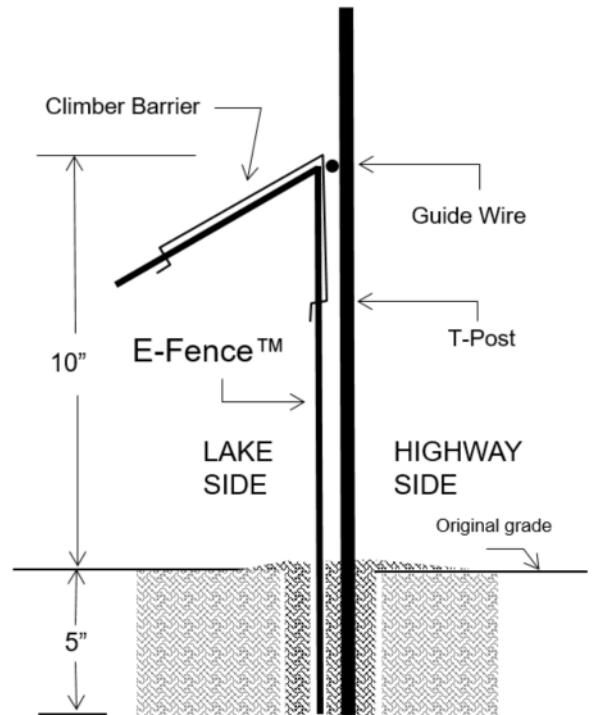


Fig 3: E-Fence™ with a climber barrier along HWY 1



Photo 4: E-Fence™ with climber barrier



Photo 5: E-Fence™ gate panel with ground sweep for access gates