1673 (b1) – Application Fee

No application fee required

1673 (b2) – Project Applicant

Santa Catalina Island Conservancy
Lauren Dennhardt, Senior Director of Conservation
ldennhardt@catalinaconservancy.org
310-510-2595
320 Golden Shore, Suite #220
Long Beach, CA 90802

1673 (b3) **– Project Name and Location**

The Catalina Island Restoration Project (Project) encompasses the entirety of Santa Catalina Island, totaling 47,884 acres, with restoration activities occurring primarily on lands owned by the Catalina Island Conservancy (centroid 33.383, -118.433). Limited project activities will also extend into areas near Two Harbors, as well as portions of land owned by the Santa Catalina Island Company, Hamilton Cove, and within the City of Avalon. Land ownership across the Island is depicted in Exhibit 1.

1673 (b4) – Project start and end dates

The Conservancy plans to initiate this Project in January 2026 and is committed to continuing it through December 2056.

1673 (b5) – Detailed description of project activities and desired outcomes

The Project aims to restore ecological integrity on Catalina Island, 88 percent (42,135 acres) of which is owned and managed by the Catalina Island Conservancy (the Conservancy) in Los Angeles County, California. The Project focuses on mitigating threats posed by nonnative ungulates (HRMP 1.3.3), invasive plant species (HRMP 1.3.4), human-caused fire ignition, and a changing climate, which have collectively led to biodiversity loss, erosion, decreased water capture, and reduced habitat quality on Catalina Island (HRMP 2.1.2,3,4,6,7, & 8)).

The Project will focus on the restoration of island resources by preserving biodiversity, enhancing ecosystem function, and reducing likelihood of wildfire. The Project will accomplish this through four major components: 1) active restoration, 2) biosecurity, 3) monitoring, and 4) outreach. This four-part framework ensures all the necessary components are present for Catalina Island to be resilient to change and to establish the components that exemplify the biodiversity that once thrived on the Island.

Project components include:

1. Landscape level active restoration – This plan outlined in detail in the attached Habitat Restoration and Monitoring Plan (HRMP) is proposed for the next 30 years and utilizes different approaches for active management including island scrub oak chaparral restoration (HRMP 1.3.5), top-of-watershed habitat restoration (HRMP 1.3.6), and cultural-based native revegetation (HRMP 1.3.7). Details on how the Conservancy will begin active restoration over the first ten years of the Project (2026-2036) in the attached Restoration Workplan (RW).
2. Biosecurity Measures – Biosecurity is critically important on an island (Thomas, 2025) due to the fragility of island ecosystems. Islands are at the center of the biodiversity crisis - more than 50% of species extinctions occur on islands (Fernández-Palacios et al, 2021). To prevent extinctions, it is critically important to have a strong biosecurity program (Whitby et al, 2015) on Catalina Island. The Conservancy aims to accomplish this through high priority invasive plant removal (HRMP, Appendix A); -Island-wide fox monitoring (RW 3.2), disease surveillance (RW 3.3), and mortality monitoring (RW 3.4); and the removal of invasive Mule deer (RW 3.5).
3. Monitoring and Documentation – The scale of active restoration is high (~100 acres at a time) and many other biosecurity measures will have impacts on the whole Island. Thus, monitoring programs to document the efficacy of interventions are critical for sharing the Conservancy's learnings and adapting management practices as needed. Monitoring programs will include island fox reporting to both state and federal entities (USFWS permit ES - 090990-3) (RW 4.1), highly intensive monitoring in active restoration plots (RW 4.2), annual reports on the overall Catalina Island Restoration Project (RW 4.4), faunal surveying (shrews, small mammals, herpetofauna, birds, and lepidoptera; RW 4.3, 4.6-4.8), and landscape-scale monitoring across 60 plots (RW 4.5).
4. Outreach, Education, Engagement, and Community Partnership – The Conservancy is committed to working in partnership with the community and a broad network of collaborators on all aspects of restoration. The Conservancy will tap into its supporters, volunteers and conservation partners (RW 5.1), while creating opportunities for workforce development in the Project (RW 5.2). Engagement efforts include public meetings, restoration site tours, and briefings with local officials and media (RW 5.3). Ongoing communication will continue through bilingual updates, newsletters, social media, and clear, accessible content online. The Conservancy has an Education Department with over 20 years of experience education locals schools and the community that will communicate this project (RW 5.4)

Active restoration locations are identified in Section 3 of the HRMP. Each location is identified as either top-of-watershed, oak enhancement, or cultural resource

enhancement (projects such replanting plants that are culturally important to the Gabrieleno-Tongva). These activities will be accomplished through large-scale invasive plant treatment (physical removal, mowing, herbicide treatment) paired with annual monitoring. After three years of treatment, depending on the site, it will be left as-is if sufficient native species are present, reseeded with a low diversity cover seed mix, followed by a diverse seed mix, and/or enhanced with outplantings.

Seeds and planting for site enhancements will all come from locally (Catalina Island) sourced seeds, to maintain unique island genetics, but some will be bulked off-Island (HRMP 1.3.8). Plants will be collected in the wild through cuttings, seed collection, or air layering. Once collected, they may be grown at the Ackerman Native Plan Nursery (located on the Island), bulked at the Conservancy's future seed farm on-Island, or bulked off-Island. Bulking off-Island will be necessary since a general seeding rate requires 50-100 pounds per restoration acre and there is not enough flat land on the Island to fulfill the demand for seeds needed for landscape scale restoration. On-Island bulking will be reserved for the species most at risk for genetic contamination off-island.

Biosecurity is another important component of the Project. A good example of how a novel disease can disrupt a population on Catalina comes from the Catalina Island Fox. In 1999, the fox population declined dramatically due to the introduction of a novel strain of canine distemper virus (HRMP 2.2.2). The Conservancy in partnership with the Institute for Wildlife Studies recovered the fox population, and the Conservancy continues to maintain it with its biosecurity program that analyzes deceased foxes for diseases, and conducts at least 864 trap nights annually to catch, measure, vaccinate, and exam the fox. The other major biosecurity program is the Catalina Invasive Plant Program (CIPP), which is found in HRMP Appendix A. This program identifies invasive species that threaten Catalina's unique ecosystems. It also involves identifying new invasive plants early on, eradicating them before they are able to spread. The Project's final major biosecurity measure is the removal of invasive Mule deer, which has prevented restoration efforts for decades (HRMP 1.3.1, 1.3.3, 2.1.7, 2.2.1, 2.2.4, and Appendix C).

Success monitoring is the lynchpin for the whole Project as it helps direct which methodology to use and where. There are many established monitoring and reporting programs that will be used for this project. The details of these monitoring programs can be found in the workplan (RW 4.1-4.9) and HRMP (5.2 & 5.3), which allow for adaptive management (HRMP 5.4). A brief synopsis is described below.

Annually, the Conservancy completes a fox report on all data it collects on the Catalina Island fox (RW 3.2-3.4, 4.1). This includes a population estimate, survival estimate, quasi extinction risk estimate, number of vaccinations, ectoparasite summaries, infectious disease prevalence study, radio collar monitoring, and injured foxes from the Conservancy fox hotline. The Conservancy will monitor where it completes active restoration by dividing a subset of locations into a randomized block design with a line transect method. Each year the Conservancy will complete a report on its findings. Other surveys completed will include: lepidoptera (RW 4.3), landscape level monitoring of vegetation (RW 4.5), bird acoustics (RW 4.6), and Santa Catalina ornate shrew (RW 4.7).

Island restoration on Catalina Island is a collaborative effort that engages diverse communities through education, workforce development, public outreach, and volunteerism. The Conservancy has scaled these initiatives to meet restoration needs and public interest while fostering stewardship and connection to the Island's biodiversity. Weekly volunteer events at the Ackerman Native Plant Nursery and "Restore and Explore" programs provide hands-on opportunities for conservation work, now including seed collection and invasive plant removal.

1673 (b6) – A detailed description of where the project will be carried out

Santa Catalina Island is located approximately 22 miles offshore from Southern California, with the most frequently used mainland access points being Long Beach, San Pedro, Dana Point, and Newport Beach. Monitoring and invasive plant and animal work will be completed across the entirety of the Island. Active Restoration work will be started in two locations within the next two years which is near the Airport and Haypress (Exhibit 2). Additional future active restoration sites beyond the first 200 acres are provided in HRMP in Figure 3-5.

1673 (b7) – Department Authorizations Sought

Under the Restoration Management Permit Act, the Conservancy is seeking authorization for take under 1672 b, e, and f.

1673 (b8) – Baseline Conditions for all areas of project

A full description of the current conditions on the Island are found in the attached Habitat Restoration and Monitoring Plan (HRMP) including geology (section 2.1.1), topography (2.1.2), climate (2.1.3), soil (2.1.4), plant diversity (2.3.1), vegetation communities (2.3.2), vegetation alliances and associations (2.3.3.), endemic taxa (2.4), and special-status plant and wildlife taxa (2.5).

Catalina Island has been severely degraded by a long history of introduced ungulates, of which the goats and pigs have been removed (HRMP 2.2.1). This history remains today with a heavily degraded landscape of which much of the historical Island chaparral is reduced and less biodiverse largely due to damage caused by ungulates, including the remain Mule deer.

Endemic species are often rare on the Island, which is the case with Catalina Island Mountain mahogany, Catalina Island Ironwoods, and the Catalina Island shrew. In many areas of the Island, invasive annual grasses and other invasive plant species such as flax leaved broom (*Genista linifolia*) dominate the landscape. The full description of the current Island conditions can be found in the HRMP section 2. Presently, all restoration activities occur exclusively in exclosures or in cages (~0.5% of Island). The continued presence of

Mule deer prevents the full recovery ecosystems in other locations on the Island (HRMP 2.2.3., 2.2.4). There has been some limited recovery post pig and goat removal, but when fire occurs, drought and deer continue inhibit the growth of diverse ecosystems (HRMP Appendix C).

1673 (b9) – Benefits to native fish, wildlife, plants, or their habitat

The Project will improve climate resiliency and conserve state and federally listed species. These benefits are detailed in HRMP Table 1-1.

Reducing the risk of catastrophic wildfires: The restoration of native perennial vegetation is crucial in mitigating the risk of wildfires, particularly those fueled by “flashy” dry fuels from nonnative annual grasses and other plants. By replacing these highly flammable plants with less ignition prone native species, the Project can help reduce the likelihood of fire ignition and also slow the spread of wildfires if they do occur. This is particularly important in protecting the community of Avalon, as well as the Island's unique flora and fauna. By promoting a more fire-resilient ecosystem, the Project can help create a safer and more sustainable future for Catalina Island, reducing the risk of catastrophic wildfires and their devastating impacts.

Increasing biodiversity and native vegetation cover: Removing invasive Mule deer will allow Island endemic plants to recover and naturally recruit in the absence of nonnative Mule deer that they lack defenses against. This will increase biodiversity and restore the Island's native vegetation, promoting a more resilient and diverse ecosystem. Additionally, the recovery of native plants can help improve soil health, stabilize slopes, and provide habitat for native wildlife, further enhancing the resilience and sustainability of the Island's ecosystem.

Restoring native habitats: By restoring areas such as coastal sage scrub (CSS), island chaparral, island scrub oak chaparral, maritime cactus scrub, dune, riparian, and native grassland, which are all currently infested with invasive plants, the Project will help improve the resilience of the Island's ecosystem to climate change by promoting biodiversity and improving ecosystem function. The resulting higher quality habitat across the Island will provide increased opportunities for native wildlife species such as the Catalina Island Fox or Catalina Island shrew to thrive, including seeking refuge, breeding, and foraging.

Enhancing habitat connectivity: By improving the quality and connectivity of habitats across the Island, the Project will help species adapt to climate change by providing them with the resources they need to move and survive in a changing environment.

Reducing invasive species: By reducing the population of invasive plants and animals on the Island, the Project can help protect and restore native species and habitats, including those of state and federally listed species.

Conserving soil: Reducing topsoil erosion is crucial for improving soil health, restoring native habitats, and protecting downstream sensitive species and cultural resources. To achieve this, the Project will implement erosion control measures and restore native vegetation in highly degraded areas. Researchers have shown that deeper soils can be held intact under shrublands when they would fail under grasslands. This will help stabilize slopes, increase water infiltration, and reduce sedimentation in waterways, ultimately protecting local water supplies and enhancing the resilience and sustainability of the Island's ecosystem.

Increasing carbon sequestration: The Project's focus on revegetation of native perennial vegetation communities, such as CSS, chaparral, and native bunch grasses, can help increase carbon sequestration, thereby mitigating the effects of climate change and improving the Island's resilience to its impacts.

Increasing water retention and stormwater quality: Restoring native perennial vegetation can significantly improve the Island's water retention and infiltration capacity. This will help reduce stormwater runoff, decrease erosion, and increase groundwater recharge, ultimately benefiting the Island's freshwater supply. The restoration of deep-rooted native plants can also help capture and store more water in the soil, making it available for use by plants and animals during dry periods. In addition, increased water retention can help mitigate the impacts of drought and climate change on the island's ecosystem, supporting Island ecosystem resilience and sustainability. Native vegetation will reduce the amount of nitrogen and suspended sediments in stormwater runoff.

Monitoring and adaptive management: By monitoring the success of the restoration efforts and adapting management strategies as needed, the Project can help ensure that the Island's ecosystem remains resilient to climate change and other stressors over the long term.

1673 (b10) – Department Authorizations Sought

Scientific Name	Common name	Protected Status	Source of Proposed Take Authorization
Cercocarpus traskiae	Catalina mountain-mahogany	CESA endangered species (Fish & G. Code, § 2050 et seq.	Fish and Game Code, § 1672, subd. (b)
Pentachaeta lyonii	Lyon's pentachaeta	CESA endangered species (Fish & G. Code, § 2050 et seq.	Fish and Game Code, § 1672, subd. (b)

Odocoileus hemionus	Mule Deer	Fish & G. Code, § 3950	Fish and Game Code, § 1672, subd. (e)
Urocyon littoralis catalinae	Catalina Island Fox	CESA threatened species (Fish & G. Code, § 2050 et seq.	Fish and Game Code, § 1672, subd. (b)

Proposed Take Level				
Common name	**Proposed Authorized Take or Possession Limit**	**Proposed Authorized forms of Take or Possession**	**Method**	**Procedure**
Catalina Island Fox	Whole Island Population for vaccination/monitoring; kill only in cases of humane euthanasia	Capture; Possess; Procedure; Release; Kill; Salvage	Trap; Baited; Chemical euthanasia; Net; Hand	Measure and Weigh; Non-invasive swabs; Sample, Blood; Tag, Passive Integrated Transponder (PIT), GPS collar, VHF collar, basic wound care; Chemical euthanasia
Snakes, lizards, salamanders, skinks, and chorus frogs (e.g., two-striped garter snake, Coast and mountain kingsnake, gopher snake, Southern Pacific rattle snake)	Whole Island Population	Capture; Procedure; Release; Salvage	Hand; Lasso; Cover Boards; Pitfall; Funnel trap; Net; Spot-Lighting/Night-Lighting;	Measure and Weigh; Non-invasive swabs; Tag, External Color Mark (Temporary); Toe clipping; lizards only: Tail tissue samples
Small Mammals [Rodents (Muridae & Sciuridae) & Insectivores] (Mammalia); Shrews (Soricidae)	Whole Island Population; Kill only in case of incidental take	Capture; Possess; Procedure; Release; Kill; Salvage	Cover Boards; Trap, Pitfall; Trap, Box, or Cage (e.g. Sherman or Tomahawk); Baited	Measure and Weigh; Tag, External Color Mark (Temporary), PIT, fur clipping, metal ear tagging; Sample collection, fur, whisker, feces; Non-invasive swabs

Mule Deer	Whole Island Population	Capture; Procedure; Possess; Release; Kill	Bait; Firearm (e.g. Centerfire Rifle/Shotgun); Gun, Airgun (e.g. Rifle, Pistol); Drop Net; Spot-Lighting/Night-Lighting, Detection dogs; Trap	Anesthetize/Chemical Immobilization; Humanely Euthanize; Medical/Surgical Procedure; Sample, Blood; Tag, Ear; Tag, GPS Collar
Catalina mountain-mahogany	< 5% of each plant	Take (seed, air layering, and vegetative collection), Possession (micropropagation, grow, hydroponics/aeroponics, and seed storage)	Hand	N/A
Lyon's pentachaeta	< 5% of each plant	Take (seed, and vegetative collection), Possession (micropropagation, grow, hydroponics/aeroponics, and seed storage)	Hand	N/A

Catalina Island Fox (RW 3.2, 3.3, 3.4, and 4.1) - Covered activities surrounding the Catalina Island fox allow for the Conservancy's annual fox vaccination and monitoring program. Capture is completed using modified Tomahawk #106 single-door live traps baited with dry and canned cat food and loganberry lure. When foxes are captured they are handled by a wildlife biologist (approved by Director of Conservation) who may perform the following procedures: draw blood, vaccinate, weigh/measure, tag, collar, apply topical anti-parasitic treatment, administer subcutaneous fluids, clean eyes and apply optic ointment, and address mild injuries in the field including the application of topical and injectable

antibiotics. All deceased foxes are collected and assessed for the cause of death. Foxes that are in good condition with unknown cause of death will be sent in for necropsy analysis by scientists at UC Davis. In some cases, when foxes are injured, an injectable agent may be used to humanely euthanize and reduce pain/suffering. Euthanized foxes will be sent to UC Davis for necropsy.

Herpetofauna (RW 4.9) - Covered activities for herpetofauna on the Island include monitoring. Throughout the Island, cover boards and other techniques are used to estimate populations of herpetofauna. Once found, herpetofauna are weighed and measured by hand. In some cases, herpetofauna who are deceased are salvaged. These are sent to the Natural History Museum of Los Angeles for biobanking, used for genetic analysis or kept on site and sent in for research/analysis.

Small Mammals (RW 4.8) - Small mammals will be captured using pit fall traps, Sherman traps, and Tomahawk cage traps. Cage/box traps will use bait alone, and pitfall traps will use bait and drift fences to attract small mammals to traps. The only mortality will be incidental, and all traps will be checked frequently. Any incidental mortality will be sent to the Natural History Museum of Los Angeles for biobanking. All small mammals will be measured and released afterward. See the workplan for details on all handling procedures and techniques. The goal of any trapping will be to document and measure Catalina's unique small mammal inhabitants.

Invasive Mule Deer (RW 3.5)- Mule deer will be dispatched via shooting on foot or from a land vehicle, by net capture with aerial and ground teams, thermal detection, surgical sterilization, baiting, and both daytime and nighttime dispatch. Deer will be located using thermal imagery, detection dogs who will locate and bay, and aerial detection. No deer will be dispatched using aerial firearms. Deer will be captured using nets from air and ground in order to reach deer in remote locations and for the purpose of surgical sterilization during the sentinel phase. In remote locations, deer will be captured by aerial nets followed by euthanasia. In Avalon, deer will primarily be chemically demobilized, followed by euthanasia along with dispatching with an air rifle. Meat may be recovered and used for the California Condor recovery program, depending on funding. Locals and tribal partners may harvest meat separately from this permit through the ongoing Private Lands Management Program if there is a desire.

The methods will follow the American Veterinary Medical (AVMA) Guidelines for the Depopulation of Animals (AVMA, 2020). No snares or poison would be used for the project.

During deer removal operations there will be continuous open communication between the Conservancy, local law enforcement, and the contractor to keep necessary people well informed regarding field activities to avoid conflicts. Proper topography or elevation

will always be used to provide a safe earthen backdrop. In urban environments, elevated positions will be utilized to provide an earthen backdrop. In human populated areas, deer will primarily be taken using chemical immobilization. Dispatch operations will cease immediately if unsafe conditions exist (e.g., unauthorized personnel in operational areas). Operations will not be resumed until conditions are deemed safe. Detection dogs will be with a handler and trained to be deer specific to avoid any incidental take of the Catalina Island fox.

Plants- This authorization covers the collection of propagation material from the two federally and state-listed species Catalina Island mountain mahogany (*Cercocarpus traskiae*) and Lyon's pentachaeta (*Pentachaeta lyonia*) occurring on Santa Catalina Island, Los Angeles County, California.

For Catalina Mountain Mahogany, non-hybrid vegetative plant tissue will be collected from up to the last seven remaining individuals. Material collection will occur in the fall and will not exceed five percent of the material from any single plant, nor five percent of the total remaining population. Each cutting will be accessioned by source plant and replicate. Pruners and razor blades will be flame-sterilized and treated with 95 percent isopropyl alcohol before each cutting. Micropropagation trials will be conducted on wild cuttings to determine the most effective sterilization chemicals, concentrations, and exposure times to produce clean propagules free of microbial contamination with minimal tissue damage. Propagules will be multiplied to create a library of individual clones, and nutrient formulation trials will be conducted to optimize macro- and micronutrients, vitamins, and growth regulator concentrations. Clean propagules will be inoculated into sterilized culture vessels containing pre-formulated nutrient agar. Data will be collected on new leaf and shoot production, percent chlorosis, vitrification, and callus formation. Rhizogenesis trials will follow, testing different phytohormone mixtures and concentrations to promote root initiation. Rooting trials will be monitored for rooting percentage, chlorosis, vitrification, and callus formation. Plants may be grown by the Conservancy through pottings, hydroponics, micropropagation, or aeroponics.

For Lyon's petachaeta, mature seed will be collected directly from wild individuals prior to natural dispersal, without clipping the flower heads, by gently extracting seeds by hand. No more than five percent of the seed produced by any individual plant will be collected in a given year, with collections spread evenly across available population(s) whenever feasible to maintain genetic representation. Gloves will be worn and changed between populations to prevent the spread of pathogens or invasive species. All seeds will be labeled with source population identifiers, GPS coordinates, collection date, collector name, and relevant site conditions. A portion of the seed will be used for germination trials to determine optimal propagation methods, including potential pre-treatments such as cold

stratification or alternating temperature regimes. The remainder will be cleaned, dried, and stored in a climate-controlled seed bank, with duplicate samples placed in accredited conservation seed repositories. Germination trials will record germination percentage, time to germination, seedling vigor, and survival rates under nursery conditions. Newly discovered populations will be vouchered if there are more than 10 individuals.

All data collected for both species will be stored in the Catalina Island Conservancy's central data repository and made available to agency partners or collaborators upon request. Five year summary reports will be submitted to the California Department of Fish and Wildlife, detailing collection activities, propagation trial results, and the disposition of all plant material. These records will serve both as compliance documentation and as a resource for advancing best practices in rare plant conservation.

All other plants that are not state listed will follow similar protocols (RW 2.4, 2.5; HRMP 4.5.2, 4.5.3). For any plant considered rare, no more than 5% will be collected from an individual/population. Although for common species, up to 10% may be collected. Collections can include seed, cuttings, and air layering. Plants will be grown on-Island, stored in a climate-controlled environment and bulked off-Island by a certified grower with proper biosecurity measures in place to eliminate the risk of genetic contamination. Plants on-Island can be farmed for seed, planted in pots, or grown using micropropagation, hydroponics, or aeroponics. Once plant seed is bulked it will be reseeded on the landscape, which is outlined in the workplan.

1673 (b11) – Description of any modifications to stream/riverbed

The Project will restore native vegetation in watersheds throughout the Island. In total there are 80.47 acres of freshwater on Catalina that are covered by this permit. The Conservancy does not plan to substantially alter the flow, bed, or bank of any body of water on Catalina Island through the Project.

1673 (b12) – Copy of any other federal, state, or local permit for project

Take of Santa Catalina Island fox is authorized in accordance with the most current amendment of federal permit ES-090990.

References

AVMA. (2020). AVMA Guidelines for the Euthanasia of Animals: 2020 Edition. American Veterinary Medical Association.

Fernández-Palacios, José & Kreft, Holger & Irl, Severin & Norder, Sietze & Ah-Peng, Claudine & Borges, Paulo & Burns, Kevin & de Nascimento, Lea & Meyer, Jean-Yves & Montes, Elba & Drake, Donald. (2021). Scientists' Warning - The Outstanding Biodiversity of Islands is in Peril. Global Ecology and Conservation. 31. e01847. 10.1016/j.gecco.2021.e01847.

Thomas, M. L. (2025). Mitigating Biosecurity Risks on Islands: Preventative Measures. IntechOpen. doi: 10.5772/intechopen.1009181

Whitby, Simon & Novossiolova, Tatyana & Walther, Gerald & Dando, Malcolm. (2015). Preventing Biological Threats: What You Can Do A Guide to Biological Security Issues and How to Address Them Credits Contents.

Exhibit 1

Map depicting Catalina Island and various ownership

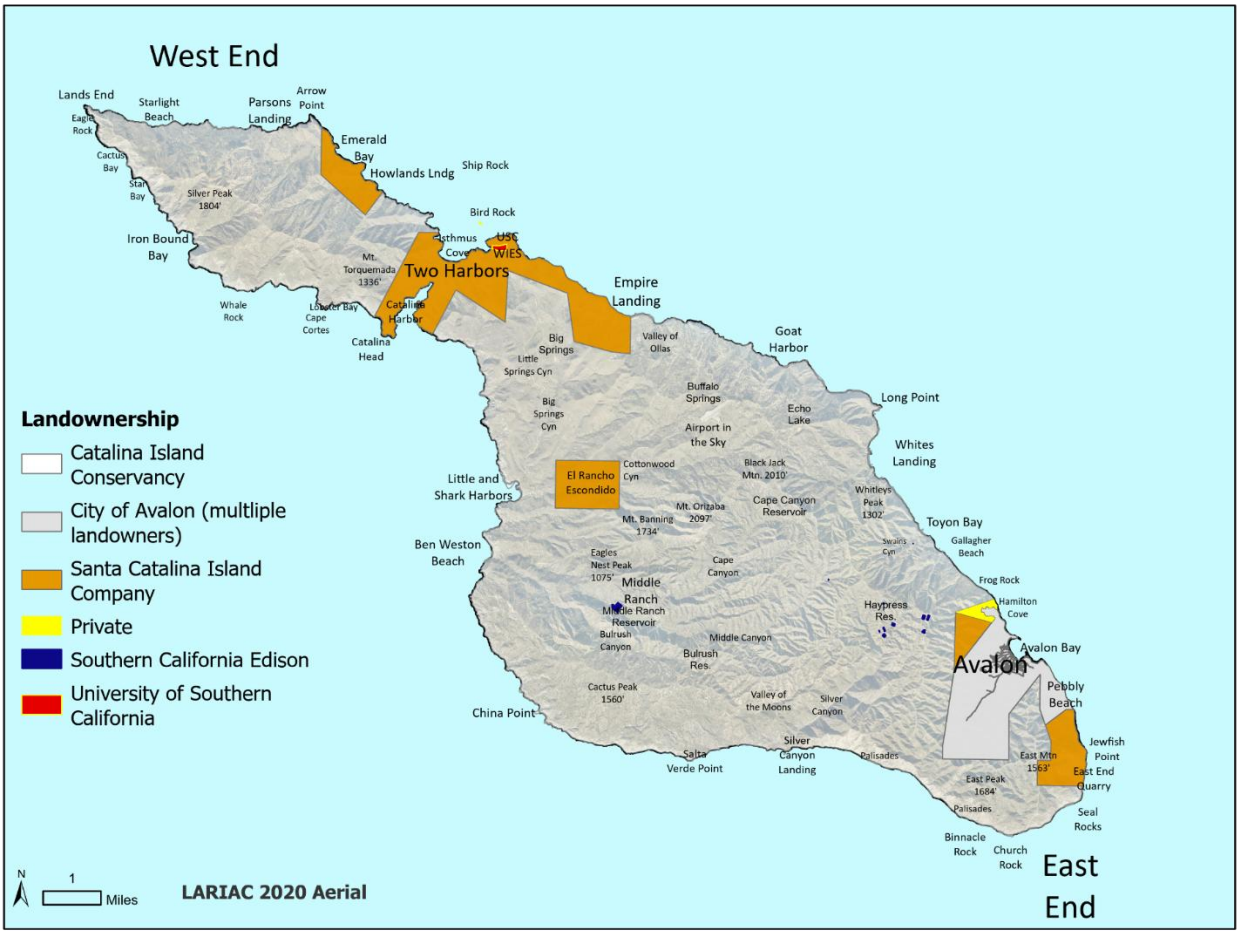

Exhibit 2

First and second location of most intensive restoration work.

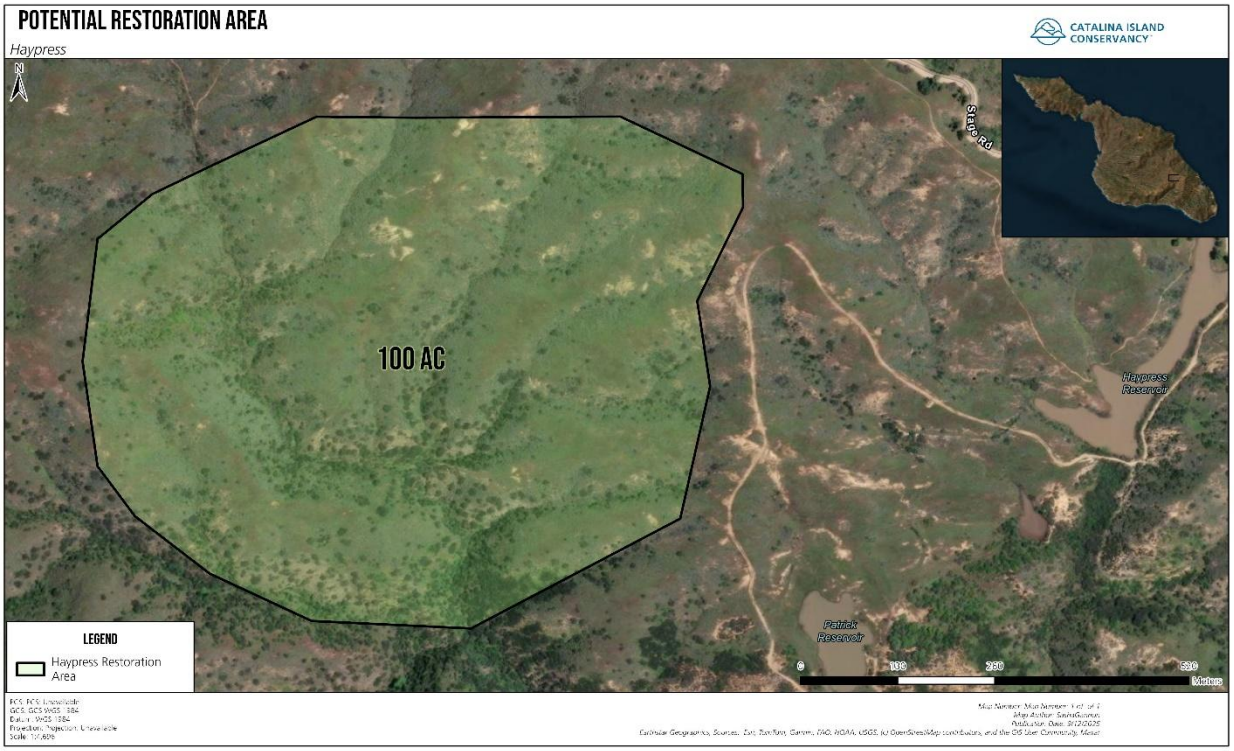

Exhibit 3 – Exclosed herbicide testing site