1673 (b1) – Application Fee

No application fee required

1673 (b2) – Project Applicant

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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 asking for approval of restoration activities through December 2035. The intention of the Conservancy is to continue work on restoration for decades which is referenced in the documents accompanying this permit application. After ten years, the Conservancy will apply for another Restoration Management Permit if needed for continued restoration activities.

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 exclusively proposes activities to restore Catalina's unique ecosystem through active native plant restoration, and by reducing threats posed by nonnative ungulates (HRMP 1.3.3) and invasive plant species (HRMP 1.3.4), which have 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 restoring ecosystems. Incidental benefits will include reducing the likelihood of wildfire, improving water capture, reducing erosion, and enhancing recreational opportunities. The Project will accomplish this through four major components: 1) active restoration (across 204.9 acres), 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 many decades and will continue beyond this permit application 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 (2026-2035) are in the attached Restoration Workplan (RW).
2. Biosecurity Measures – Biosecurity is critically important towards restoration of 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 (Fernandez-Palacios, et al., 2021). To prevent extinctions, it is critically important to have a strong biosecurity program (Whitby, Novossiolova, Walther, & Dando, 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 the Conservancy's adapting management practices, in addition to sharing knowledge gained through the restoration process. Monitoring programs are critical for the Project since monitored species will inform Conservancy scientists on adjustments to seeding mixes, high priority invasive plant removal, biosecurity interventions, and any other necessary interventions to advance the Restoration Project. 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's Education Department has over 20 years of experience educating locals schools and the community. Their expertise will be instrumental to communicating milestones of the 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. Monitoring is essential for restoration since it guides adaptive management to ensure the long term success of the restoration effort. 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 10-acre fenced exclosure outlined in Exhibit 1 will serve as a pilot site for intensive invasive species control and passive restoration which will be expanded to 105 acres after three years and the Haypress site after six years (Exhibit 2 & 3). Monitoring in the fenced area will guide adaptive herbicide use and determine readiness for native seeding. Once native seeding begins, the Conservancy will use a belt transect method throughout to measure effectiveness of native seeding.

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).

Butterflies and moths serve as indicators of climate response, habitat integrity, and ecosystem productivity. The Conservancy will conduct Lepidoptera surveys across watersheds of the Island, replicating the Island-wide lepidoptera survey methodology originally used by Dr. Jerry Powell to develop a database of species occurrence that builds on previous Island-wide checklists (Powell, Lepidoptera recorded on Santa Catalina Island., 2012).Land use changes on Catalina over the past 200 years, particularly the introduction of feral ungulates, have led to severe alterations in vegetation and, likely, the associated Lepidoptera species composition. Around 530 species of moths and butterflies are currently known to inhabit Catalina Island, and at least six species are island endemics (Powell 1994). With ongoing ungulate removal, there is promise that a more natural state can be reached, and native insect populations and species that depend on them can rebound and expand from the pockets of remaining native vegetation that act as refugia. As the last ungulates are removed, these Lepidoptera surveys can provide important information about how vegetation recovery is impacting insect biodiversity and thus food availability for birds, mammals, and herpetofauna. Information from these surveys can inform land managers to increase presence of certain plant species and ecosystem types to support greater lepidoptera diversity in the future.

As part of the Project, the Conservancy has developed a long-term monitoring strategy for measuring the response of bird species to restoration activities (HRMP 5.3.4). Ground- and mid-story nesting species are expected to show the most rapid population response to invasive Mule deer removal and restoration activities, since invasive Mule deer browsing disproportionately affects understory vegetation, which is essential for many breeding bird species during the nesting season (Chollet, Bergman, Gaston, & Martin, 2014). Acoustic monitoring provides a non-invasive, scalable method to document changes in bird community composition and relative abundance over time, enabling the Conservancy to link restoration interventions to breeding bird responses. This monitoring will assist the Conservancy in determining which rare or threatened birds are utilizing certain ecosystems and find potential plant species that will increase biodiversity. Those plant species can be prioritized for adaptive management and future restoration.

The Conservancy will also monitor herpetofauna on the Island. There are many native herpetofauna on Catalina, more so than any of the other Channel Islands. Threats to their populations include disease, worsening drought conditions from climate change, and impacts from the invasive bullfrogs. Monitoring efforts would aim to address these threats, track population trends and document the impacts of island restoration efforts on these sensitive species

To capture long-term ecological trends, the Conservancy will revisit 60 legacy vegetation monitoring plots first established nearly 20 years ago (HRMP 5.3.2). These plots were previously assessed under historic vegetation mapping and habitat condition assessments and represent a range of elevations, aspects, and habitat types across the Island. This data will establish a quantitative baseline to compare with historical data, inform ecosystem change analyses, and prioritize restoration needs.

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 and e.

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) pages 28-144 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). We have provided a recent analysis of landscape type in the below text. Dozens of plant and wildlife taxa (species, subspecies, varieties) are endemic to the Channel Islands, meaning that they are found on one or more of the eight islands that make up the archipelago but not on the mainland, and some species are found only on Catalina Island. The project will positively influence all 60+

endemic species across the entirety of Catalina Island. The full list of all special-status species and listed species is found in section 2.5 of the HRMP.

The baseline condition of Catalina Island is strongly influenced by the long history of introduced ungulates. Catalina Island has been severely degraded by these introduced ungulates, of which the goats, sheep, cattle, 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 remaining 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).

Many endemic island plants are preferentially consumed by invasive mule deer, thereby restricting their distribution from their natural habitat to difficult-to-access locations, such as sea bluffs, cliff faces in the interior of the island, and within thorny cactus patches (Junak, et al., 2012). This selective browsing decreases island biodiversity and increases the frequency of nonnative plants and other native plants that retained their herbivore defenses, such as lemonadeberry (*Rhus integrifolia*), toyon (*Heteromeles arbutifolia*), white sage (*Salvia apiana*), black sage (*Salvia mellifera*), and prickly pear cactus (*Opuntia littoralis*). Many of these browse resistant plants are now more frequent in many areas of the island. Coastal Bluff Scrub, because of its inaccessibility to invasive ungulates is one of the best-preserved native vegetation communities on Catalina Island (Thorne, 1967).

Island vegetation lifeform (e.g., tree, shrub, herb) is responsive to long-term climatic trends (i.e., wetter, or drier periods of time) and impacts from invasive ungulate browsing, and to a lesser extent grazing and trampling from a small herd of bison. The introduced bison population is currently managed by the Conservancy through an immunocontraception program, with about 80 individuals currently living on Catalina. Browsing pressure from invasive mule deer is magnified during periods of drought, as the animals are driven to consume less nutritious forage to survive, which impacts the limited island vegetation resources that grow below the browse line (e.g., green leaves and small stems within reach of mule deer to a height of about 4 to 5 feet).

Recent large fires, coupled with the impacts of drought and mule deer browsing, have significantly altered the vegetation structure on Catalina Island (HRMP - Appendix C). The human-caused Empire Fire in 2006 and the Island Fire in 2007 collectively burned 12% of the island, with the latter being the largest recorded fire since 1915 (Exhibit 4). The Island Fire alone scorched 4,723 acres, surpassing the previous record set by the Goat Fire,

which burned 285 acres. From 1985 to 2022, unburned watersheds saw a 5.2% decrease in barren soil cover and an 8.1% increase in shrub cover, which coincides with successful removal of feral goats and pigs between 1990 and 2005 (Exhibit 5). Tree cover increased from 40.2% to 48.7% in 1998 but then declined to 40.1% in 2022 following successive drought years from 2011 to 2016 and 2020 to 2022. While in watersheds that burned in the 2006 and 2007 fires, tree cover had increased from 52.0% in 1985 to 63.2% in 2005 (before the Empire Fire). However, 15 years after the fires tree cover has not recovered and is at 54% in 2022, 9.2% below pre-fire levels. Following fire, newly germinated plants from the native soil seed bank and basal resprouting shrubs and trees are subject to intense browsing pressure from mule deer (e.g., see Exhibit 6), even for plants that deer would not find palatable after they have grown to a mature size (e.g., chamise, *Adenostoma fasciculatum*) (Minnich, 1982; Ramirez, Pratt, Jacobsen, & Davis, 2012). The browsing pressure from mule deer on the Island is intensified during drought when forage is limited.

Impacts of introduced Flora

Invasive annual grasses and forbs have become a significant component of Catalina Island's flora, constituting approximately one-third of its species (see HRMP Table 2-4 and Appendix B). These nonnative plants compete with native vegetation for resources, often hindering the recruitment and growth of native species. For instance, a study by Knapp (2007a) documented a 30% reduction in island scrub oak cover between 1943 and 2005, potentially linked to the aggressive spread of invasive annual grasses. Research suggests that the presence of nonnative annual grasses can impede oak recruitment by outcompeting oak seedlings for water resources (Griffin, 1973; Bernhardt & Swiecky, 1991; Danielson & Halvorson, 1991).This competition may have contributed to inadequate regeneration of valley oaks in California during the 20th century. Given these findings, managing and controlling invasive plant species on Catalina Island is essential for preserving native plant communities and fostering the successful recruitment of key species such as island scrub oak.

Other common invasive plants on the island that impact ecosystem health include Italian thistle (*Carduus pycnocephalus*), sweet fennel (*Foeniculum vulgare*), Harding grass (*Phalaris aquatica*), and Mediterranean broom (*Genista linifolia*). Mediterranean broom is particularly aggressive and has the potential to establish on most of the island (see Appendix D). First introduced in 1920 as a horticultural landscaping plant at the Saint Catherine Hotel at Descanso Beach that replaced the Banning home burned down in the 1915 Avalon Fire, Mediterranean broom has naturalized in the Avalon watershed, and as of 2015, has infested at least 9 percent of the island (Dion, 2018).

The Project is a voluntary restoration project undertaken by the Conservancy. No more than four acres out of nearly 205 acres of active restoration land will be used for mitigation in upcoming years.

1673 (b9) – Description of how project satisfies the definition of qualifying restoration project

The Catalina Island Restoration Project is a "qualifying restoration project" because it is both a "Management" and a "Propagation" project with the exclusive purpose of restoring habitat for native fish, wildlife, plants, and their habitat.

The Project's activities qualify as both "Management" and "Propagation":

1. The fox monitoring and vaccination program is management because it helps aid the conservation and assists recovery of Island foxes through vaccinations and selective treatment of foxes with anti-parasite cream and antibiotics when needed. This program is also propagation because it aids in increasing fox population for conservation, scientific, and management purposes through vaccinations and selective treatment of foxes with anti-parasite cream and antibiotics when needed.
2. Invasive species control through the Invasive Plant Program qualifies as management because it is a restoration activity that will aid in the conservation and recovery of native plant species by reducing competition of invasives plants, and improves habitat of wildlife which aids in recovery of wildlife species. This work is also propagation because it is an activity that helps sustain or increases wildlife and plant populations by reducing competition of invasive plants for native plant species, which in turn improves habitat.
3. Growing native plants in a nursery followed by outplanting qualifies as management because it is a restoration activity in which native plants are put back on the landscape to aid in the recovery of native plants directly and native wildlife indirectly. This work is also propagation because it is an activity that helps both sustain and increase native plants directly and wildlife indirectly through improved habitat for scientific, conservation, and management purposes.
4. Bulking of seed and seeding on the landscape qualifies as management because it is a restoration activity in which native plants are put back on the landscape to aid in the recovery of native plants directly and native wildlife indirectly. This work is also propagation because it is an activity that helps both sustain and increase native plants directly and wildlife indirectly through improved habitat for scientific, conservation, and management purposes.
5. Monitoring of birds, lepidoptera, and small mammals qualifies as management because it is an activity that informs future adaptive management decisions around habitat restoration to continually improve the conservation and assist in the recovery of all listed wildlife species monitored. This work is also propagation because it is an activity that informs future management decisions around habitat that helps sustain and increase all native wildlife for scientific, conservation, and educational purposes.
6. Removal of mule deer qualifies as management because it is an activity that removes a key invasive species that damages native plants and wildlife habitat which will improve the conservation and assist in recovery of native wildlife and plant species. This work is also propagation because it is an activity that helps

sustain or increase native wildlife and plant populations for scientific, conservation, and management purposes by eliminating the threat of ecosystem transition from Chaparral to invasive grasslands.

Outlined below are the substantial net benefits above baseline conditions for each category.

Native Fish

Catalina Island only has 80.5 acres of freshwater and no native freshwater fish. However, its surrounding marine environment is exceptionally rich with nine of California's 124 Marine Protected Areas along its coast. Restoration on Catalina will reduce erosion and subsequent sedimentation entering nearshore waters, thereby improving habitat quality for native marine fish. Erosion is reduced and reversed through the recovery of vegetation cover on the landscape. Vegetation recovery and root stabilization bind roots to the soil, intercept rainfall, and slows ground cover runoff. Similar ecological responses have been seen on other islands that have removed nonnative ungulates. For example, after deer were removed from Santa Rosa Island, passive restoration resulted in 42.1 km2 of scrub, chaparral, and woodland vegetation recovery and a 31.2 km2 decrease in invasive grasslands and a 12.0 km2 of bare ground (Summers, Masukawa, & Hartman, 2018). Decreasing bareground and annual grasses, which lack stabilizing roots and canopy cover, help reduce erosion. Likewise, research on San Clemente Island, found that exotic herbivores dramatically altered the island's topography, increasing sediment yield, reducing infiltration, and heightening wind erosion (Longcore, MacDonald, & Wilson, 2020). Sedimentation from erosion directly affects kelp forests, reducing quality habitat of fish species (Foster & Schiel, 2010). Catalina's extensive kelp forests support the garibaldi (California's state marine fish), the critically endangered giant sea bass, and the California sheephead. By reducing erosion and sedimentation through island-wide restoration, Catalina's land and marine ecosystems will both benefit, fostering greater resilience and biodiversity across terrestrial and coastal habitats.

Native Wildlife

The Project will enhance native wildlife populations across Catalina Island through comprehensive restoration actions, including invasive plant and animal removal, active revegetation, and long-term ecological monitoring. These efforts will create and expand diverse native plant communities that provide critical refuge, foraging, and breeding habitat for wildlife. By restoring a more complex and resilient network of habitats, the Project will support a broader range of species and promote overall ecosystem biodiversity. Similar restoration initiatives on other islands have demonstrated measurable increases in wildlife diversity—particularly among invertebrates and birds—following the removal of non-native ungulates, underscoring the ecological benefits expected on Catalina .The Project will enhance bird abundance on the Island through expansion of critical habitat for certain species (Martin, Arcese, & Scheerder, 2011). Restoration efforts

will aid the recovery of bird species through more abundance of critical plant species such as the Island scrub oak which is the exclusive nesting tree for the Catalina Hutton's vireo. Additionally, management recommendations for two of Catalinas endemic birds, the Catalina California quail (*Callipepla californica catalinensis*) and the Catalina Hutton's vireo (*Vireo huttoni unitti*), recognize the invasive mule deer as an ongoing threat to these species due to the habitat destruction they cause and suggest removing the deer from the Island (Shuford & Gardali, 2008).

It is well known, that plant biodiversity and abundance positively effects insect species (Southwood, 1978). Active restoration efforts and invasive plant removal will improve plant biodiversity and thus improve insect populations, which is critical on Catalina Island. Catalina is home to over 45 endemic insect species and thousands of other native species that will positively benefit from restoration. Mammals are also affected by insect abundance. An example is the very rare Catalina Island Shrew, which relies on diverse insect populations for food. Reduced food resources and habitat will further threaten this cryptic species. Deer removal will benefit insect abundance as well. For example, invasive deer also reduced species density and abundance of insects on Haida Gwaii (British Columbia, Canada) through changing the quality of leaf litter from less plant diversity over time (Allombert, Stockton, & Martin, 2005).

The Catalina Island Fox will benefit from the Project. Recent research on the Santa Rosa Island Fox, which is closely related to the Catalina Island Fox, indicated they select for Island Chapparal over grasslands. The Project reduces invasive grasses through herbicide treatments and seeding with native plants. In addition, the Catalina Island Fox will benefit through the removal of deer since Island Chapparal will slowly be replaced by grasslands unless deer are removed (Jacobsen, Pratt, Alleman, & Davis, 2018; Ramirez, Pratt, Jacobsen, & Davis, 2012; Summers, Masukawa, & Hartman, 2018). Notably, after all of the invasive introduced mammals were removed from Santa Cruz Island, the endemic and endangered Santa Cruz Island fox (*Urocyon littoralis santacruzae*) experienced the fastest recovery and delisting of any mammal in the history of the Endangered Species Act (Morrison, 2023).

Native Plants and Habitat

The Project will aid in further improving habitat and populations of native plant species. Seeding efforts include the following species which will improve their instance across the island while also improving wildlife habitat: Channel Island silver lotus, wild onion, Catalina manzanita, mugwort, island morning glory, Catalina mariposa lily, feltleaf ceanothus, Island bigpod ceanothus, Catalina mountain mahogany, summer holly, Catalina silverlace, island rush-rose, California rockflower, island bush poppy, blue dick, southern monkeyflower, giant wild rye, California fuchsia, Trask's yerba santa, Saint Catherine's lace, island buckwheat, golden yarrow, cliff spurge, Catalina bedstraw, island snapdragon, toyon, heartleaf penstemon, fragrant pitcher sage, giant coreopsis, southern honeysuckle, lupine, California boxthorn, Catalina Island bushmallow, laurel sumac, southern islands mallow, bladderpod, Lyon's pygmydaisy, island cherry, Engelmann oak, island scrub oak, island oak, Macdonald oak, island redberry, lemonade berry, Catalina

currant, white sage, black sage, Catalina figwort, purple needle grass, Catalina nightshade, and mission manzanita.

Invasive plant control will have a direct impact across the Island using the CIPP and additional invasive plant treatments at restoration sites. Reducing invasive grasses in restoration sites improves native chapparal recovery (Phillips & Allen, 2023). There is plenty of documentation that invasive plant species negatively affect native plant recruitment and increase type conversion (Dicknes & Allen, 2013; Weidlich, Florido, Sorrini, & Brancalion, 2020). The reduction of invasive plant species will allow for native habitat and plants to thrive. In our active restoration site, reducing invasive plant species (primarily invasive grasses) will improve overall restoration outcomes and improve native seed recruitment.

The removal of invasive mule deer will directly improve the Island's habitat and rare plant populations. A study on Catalina of post-fire regeneration for three woody resprouting plants (*Heteromeles arbutifolia, Rhus integrifolia,* and *Rhamnus pirifolia*) found that exposing these plants to mule deer resulted in an eight-fold increase in plant mortality. In plots protected by fencing only 11% of resprouts died, but in deer-exposed plots the die-off rose sharply to 88%. Deer browse also resulted in a greater than 93% reduction in canopy coverage among dominant shrub species, allowing for invasion by exotic species and vegetation type conversion (Ramirez, Pratt, Jacobsen, & Davis, 2012). Avalon Canyon, an area burned during the 2007 Island Fire, clearly displays how deer browse can alter landscapes post-fire. Areas outside of exclosures in the burned area are currently dominated by flax-leaved broom (*Genista linifolia*), a highly invasive Mediterranean plant that mule deer do not consume. In contrast, areas protected from deer browse with exclosurs after the fire supported native plants four times the size of those outside the exclosures (Jacobsen, Pratt, Alleman, & Davis, 2018). Island scrub oak recruitment is also hampered by deer. Island scrub oak (*Quercus pacific*) is thought to have covered a third of the Catalina as recently as the 1940s. In the intervening decades oak habitat has declined by 31%. This dieback is driven by several factors, but ongoing acorn predation by mule deer, is likely among the more significant impacts (Manuwal & Sweitzer, 2007).

The ecological damage that the mule deer cause to native plant populations on Catalina has been thoroughly documented (Manuwal & Sweitzer, 2007; Jacobsen, Pratt, Alleman, & Davis, 2018; Salladay & Ramirez, 2018; Stapp, Hamblen, Duncan, & King, 2022; Knapp, 2010; Dvorak & Catalano, 2016; Knapp, 2005; Ramirez, Pratt, Jacobsen, & Davis, 2012). The removal of livestock and feral animals from Catalina in the past has helped put the Island on a trajectory of recovery (Knapp, 2014) and the Conservancy has documented passive revegetation of the Island, but the species growing are deer-resistant species common across southern California, not the Catalina and Channel Islands endemic species that are necessary for the full biodiversity of Catalina to be represented. Native plants on Catalina have less chemical and physical defenses than closely related mainland taxa and are therefore more susceptible to deer browse (Orians & Ward, 2010). This is because island varieties of plants have evolved without the presence of herbivores such as deer and therefore have evolved to deter browse. In a forage palatability trial comparing plants from ten matched taxonomic groups comprising samples from the

mainland and Catalina, ungulates decisively favored island plants (Salladay & Ramirez, 2018).

Mule deer directly threaten endemic and rare plant species on Catalina for this reason. The flora of Catalina contains sixty-nine species or subspecies included in the California Native Plant Society's California Rare Plant Ranking system. There are nine Catalina endemic plants and thirty-seven Channel Islands endemic plants (including the Catalina endemics). Four species (*Cercocarpus traskiae*, *Pentachaeta lyonii*, *Sibara filifolia,* and *Crocanthemum greenei*) are federally listed endangered or threatened species. Two of these species (*Cercocarpus traskiae* and *Pentachaeta lyonii)* are listed as endangered by the state of California.

The island rush-rose (*Crocanthemum greenei*) is a federally threatened species found only on the Channel Islands. Following the 2007 Island Fire, growth and reproductive success of the island rush-rose was measured across the Island, within and outside protective exclosures. Populations exposed to deer browse showed markedly lower reproductive success, with 58% of those populations failing to produce any seeds. However, populations protected by exclosures contained plants of significantly larger size, and 100% of plants in exclosed populations successfully fruited, regenerating the soil seed bank (Dvorak & Catalano, 2016).

In addition to achieving the Project's restoration objective, the Project is expected to yield important incidental benefits described below. These benefits are also detailed in HRMP Table 1-1.

Reducing the likelihood of 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 for protecting both the community of Avalon and the Island's unique flora and fauna. By promoting a more fire-resilient ecosystem through reducing the chance of ignition from invasive grasslands, the Project can help create a safer and more sustainable future for Catalina Island, reducing the likelihood of catastrophic wildfires and their devastating impacts. Mitigating wildfire risk to native plant communities also enhances the Island's overall resilience to increasingly frequent drought events driven by climate change.

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.

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. Increased carbon sequestration on the Island helps reduction of greenhouse gases in the atmosphere.

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

Proposed Take					
Common name/Scientific Name	**Protected Status**	**Proposed Authorized Take or Possession Limit**	**Proposed Authorized forms of Take or Possession**	**Method**	**Procedure**
Catalina Island Fox (*Urocyon littoralis catalinae)*	CESA threatened species Fish & G. Code, § 2050 et seq.	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; Vaccination; Tag, Passive Integrated Transponder (PIT), GPS collar, VHF collar, basic wound care; Chemical euthanasia
California Kingsnake (*Lampropeltis californiae)*	California Code of Regulations Title 14, Sec. 5.6	Whole Island Population	Capture; Procedure; Release; Salvage	Hand; Lasso; Cover Boards; Pitfall; Funnel trap; Net	Measure and Weigh; Non-invasive swabs; Tag, External Color Mark (Temporary)
California mountain kingsnake (*Lampropeltis zonata**)***	California Code of Regulations Title 14, Sec. 5.6	Whole Island Population	Capture; Procedure; Release; Salvage	Hand; Lasso; Cover Boards; Pitfall; Funnel trap; Net	Measure and Weigh; Non-invasive swabs; Tag, External Color Mark (Temporary)

Western skink (*Plestiodon skiltonianus)*	California Code of Regulations Title 14, Sec. 5.6	Whole Island Population	Capture; Procedure; Release; Salvage	Hand; Lasso; Cover Boards; Pitfall; Funnel trap; Net	Measure and Weigh; Non-invasive swabs; Tag, External Color Mark (Temporary); Toe clipping; Tail tissue samples
San Bernardino ring-necked snake (*Diadophis punctatus modestus)*	California Code of Regulations Title 14, Sec. 5.6	Whole Island Population	Capture; Procedure; Release; Salvage	Hand; Lasso; Cover Boards; Pitfall; Funnel trap; Net	Measure and Weigh; Non-invasive swabs; Tag, External Color Mark (Temporary)
San Diego alligator lizard (*Elgaria multicarinata webbii)*	California Code of Regulations Title 14, Sec. 5.6	Whole Island Population	Capture; Procedure; Release; Salvage	Hand; Lasso; Cover Boards; Pitfall; Funnel trap; Net	Measure and Weigh; Non-invasive swabs; Tag, External Color Mark (Temporary); Toe clipping; Tail tissue samples
Two-striped gartersnake (*Thamnophis hammondii)*	California Code of Regulations Title 14, Sec. 5.6	Whole Island Population	Capture; Procedure; Release; Salvage	Hand; Lasso; Cover Boards; Pitfall; Funnel trap; Net	Measure and Weigh; Non-invasive swabs; Tag, External Color Mark (Temporary)
Southern pacific rattlesnake (*Crotalus oreganus helleri)*	California Code of Regulations Title 14, Sec. 5.6	Whole Island Population	Capture; Procedure; Release; Salvage	Hand; Lasso; Cover Boards; Pitfall; Funnel trap; Net	Measure and Weigh; Non-invasive swabs; Tag, External Color Mark (Temporary)
Western side-blotched lizard (*Uta stansburiana)*	California Code of Regulations Title 14, Sec. 5.6	Whole Island Population	Capture; Procedure; Release; Salvage	Hand; Lasso; Cover Boards; Pitfall; Funnel trap; Net	Measure and Weigh; Non-invasive swabs; Tag, External Color Mark (Temporary); Toe clipping; Tail tissue samples
Baja California treefrog (*Pseudacris hypochondriaca)*	California Code of Regulations Title 14, Sec. 5.05	Whole Island Population	Capture; Procedure; Release; Salvage	Hand; Lasso; Cover Boards; Pitfall;	Measure and Weigh; Non-invasive swabs; Tag, External Color Mark (Temporary)

				Funnel trap; Net	
Garden slender salamander (*Batrachoseps major)*	California Code of Regulations Title 14, Sec. 5.05	Whole Island Population	Capture; Procedure; Release; Salvage	Hand; Lasso; Cover Boards; Pitfall; Funnel trap; Net	Measure and Weigh; Non-invasive swabs; Tag, External Color Mark (Temporary)
Arboreal salamander	California Code of Regulations Title 14, Sec. 5.05	Whole Island Population	Capture; Procedure; Release; Salvage	Hand; Lasso; Cover Boards; Pitfall; Funnel trap; Net	Measure and Weigh; Non-invasive swabs; Tag, External Color Mark (Temporary)
Catalina Island ground squirrel (*Otospermophilus beecheyi nesioticus)*	Fish & G. Code, § 4150	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
Santa Catalina Island shrew (*Sorex ornatus willetti)*	Fish & G. Code, § 4150	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
Santa Catalina Island deer mouse (*Peromyscus maniculatus catalinae)*	Fish & G. Code, § 4150 & 472	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

Santa Catalina harvest mouse (*Reithrodontomys megalotis catalinae)*	Fish & G. Code, § 4150 & 472	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
Mojave dotted-blue butterfly (*Euphilotes mojave)*	California Code of Regulations Title 14, Sec. 650	No more than 5 per year	Capture; Possess; Release; Kill; Salvage	Spotlight; Night lights; Nets	Measure and Weight; Sample collection
Crotch bumble bee (*Bombus crotchii)*	CESA candidate species Fish & G. Code, § 2050 et seq.	No more than 5 per year	Capture; Possess; Release; Kill; Salvage	Spotlight; Night lights; Nets	Measure and Weight; Sample collection
Monarch butterfly (*Danaus plexippus)*	California Code of Regulations Title 14, Sec. 650	No more than 5 per year	Capture; Possess; Release; Kill; Salvage	Spotlight; Night lights; Nets	Measure and Weight; Sample collection
Catalina mountainsnail (*Radiocentrum avalonense)*	California Code of Regulations Title 14, Sec. 650	No more than 5 per year	Capture; Possess; Release; Kill; Salvage	Spotlight; Night lights; Nets	Measure and Weight; Sample collection
Santa Catalina lancetooth snail (*Haplotrema catalinense)*	California Code of Regulations Title 14, Sec. 650	No more than 5 per year	Capture; Possess; Release; Kill; Salvage	Spotlight; Night lights; Nets	Measure and Weight; Sample collection
Mule Deer (*Odocoileus hemionus)*	Fish & G. Code, § 3950	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/Nig	Anesthetize/Chemical Immobilization; Humanely Euthanize; Medical/Surgical Procedure; Sample, Blood; Tag, Ear; Tag, GPS Collar

				ht-Lighting, Detection dogs; Trap	
Catalina mountain-mahogany (*Cercocarpus traskiae)*	CESA endangered species Fish & G. Code, § 2050 et seq.	< 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 (*Pentachaeta lyonii)*	CESA endangered species Fish & G. Code, § 2050 et seq.	< 5% of each plant	Take (seed, and vegetative collection), Possession (micropropagation, grow, hydroponics/ aeroponics, and seed storage)	Hand	N/A
Beach Spectacle-pod (*Dithyrea maritima*)	CESA endangered species Fish & G. Code, § 2050 et seq.	< 5% of each plant	Take (seed, and vegetative collection), Possession (micropropagation, grow, hydroponics/ aeroponics, and seed storage)	Hand	N/A
San Clemente Island Lotus (*Acmispon dendroideus var. traskiae*)	CESA endangered species Fish & G. Code, §	< 5% of each plant	Take (seed, and vegetative collection), Possession (micropropag	Hand	N/A

	2050 et seq.		ation, grow, hydroponics/ aeroponics, and seed storage)		

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 lyonii*) occurring on Santa Catalina Island, Los Angeles County, California.

While researchers are exploring the benefits of sourcing seeds from bioclimatic regions that match future climate scenarios for habitat restoration (Ramalho, Byrne, & Yates, 2017; Vitt, et al., 2022), the Conservancy will only use the wild collection of seeds from Catalina Island itself (Garrambone & Saroa, 2020). This approach maintains local genetic integrity and ensures the use of plants adapted to the island's unique conditions, which is crucial given the Channel Islands' relative climatic stability and high rate of endemism.

During wild seed collection, best practices will be followed, such as collecting at the appropriate time for each species, limiting collection to a maximum of 5 to 10% of individual plants' seed production, and collecting from no more than 5 to 10% of individuals in a population. To ensure genetic diversity, seeds will be collected from a variety of plants within each population. The genetic integrity of plant populations will be preserved by bulk-producing seeds for restoration efforts from Santa Catalina Island populations, and potentially other Channel Islands populations if necessary. This approach will protect the unique genetics of Catalina Island populations and prevent the introduction of mainland genetics that could outcompete or overshadow the native genetics.

For all plant materials grown in nursery, the Conservancy will review and implement restoration design considerations and best management practices (BMPs) to help prevent pathogen contamination, as published by the "Working Group for Phytophthoras in Native

Habitats" (www.calphytos.org), when there is a risk of introduction and spread of plant pathogens in site plantings.

The Conservancy will review and implement decontamination protocols to prevent the spread of pathogens among amphibians or other aquatic animals when working in aquatic habitats that may support native amphibians. Gear and equipment that may contact water will be cleaned and decontaminated to prevent the spread of chytrid fungus, following protocols in Aquatic Invasive Species Disinfection/Decontamination Protocols, CDFW.

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 pentachaeta, 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 (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.

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Exhibit 1

Map depicting Catalina Island and various ownership

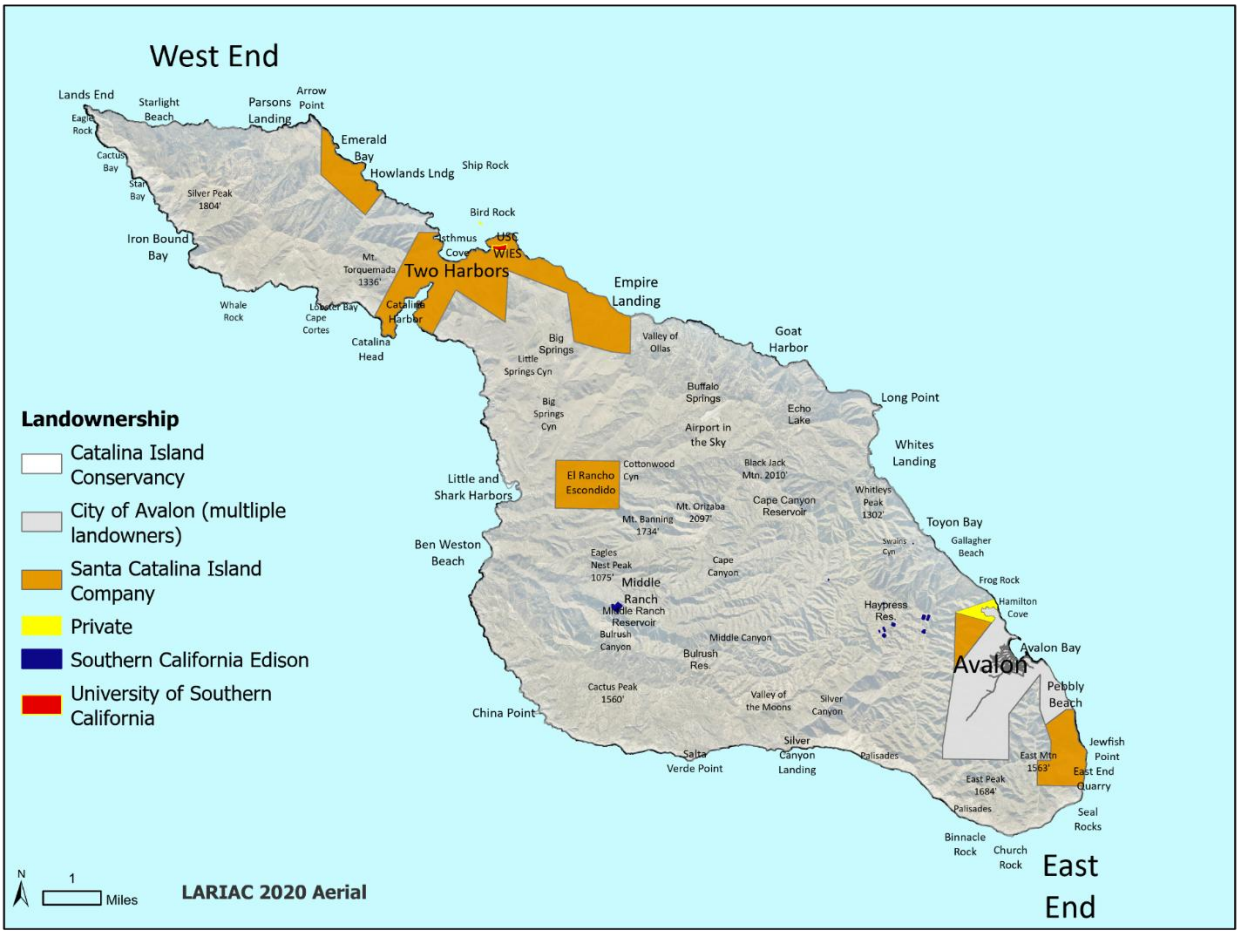


Exhibit 2

First and second location of most intensive restoration work.

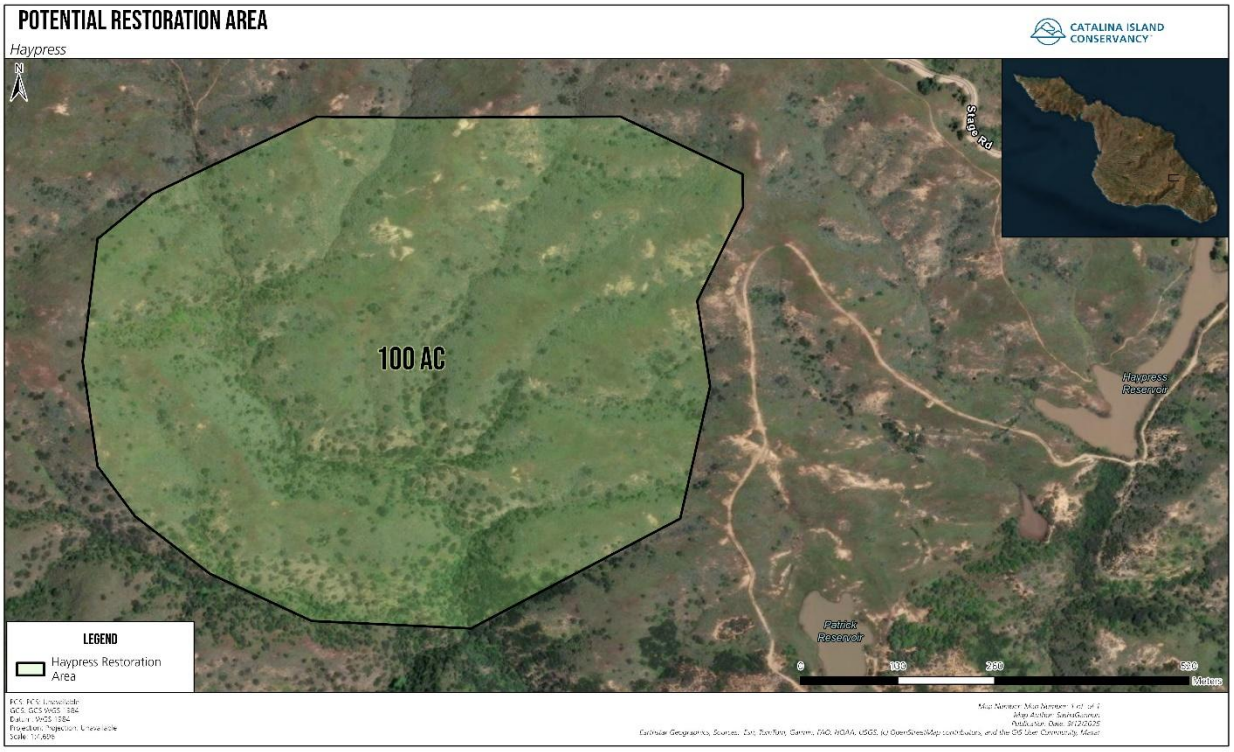
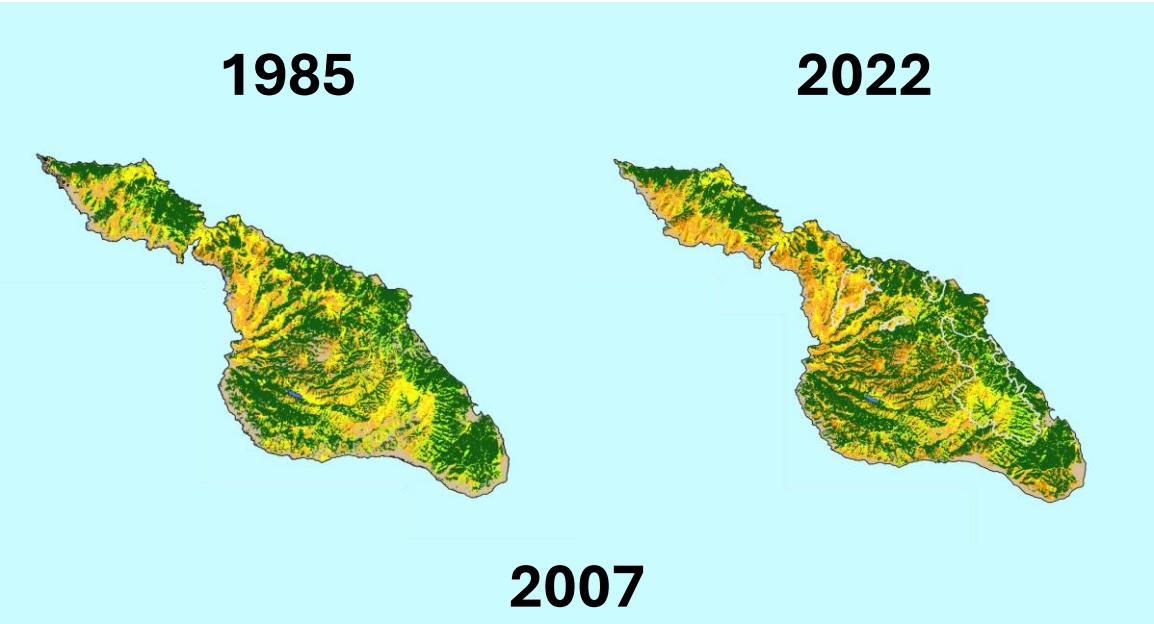


Exhibit 3 – Exclosed herbicide testing site

Exhibit 4 - Vegetation Cover in 1985, 2007 after two large fires, and 2022.



Tree Cover Increased and Barren Cover Decreased Between 1985 and 2022 Following Feral Goat and Pig Removal beginning in the 1990s. However, Tree Cover Has Not Fully Recovered in the 15 Years Since the 2006 and 2007 Due to Drought and Mule Deer Browsing Impacts. See HRMP Appendix C for more detail.

Exhibit 5 - Tree Cover has not recovered in Watersheds that Burned in the 2006 Empire and 2007 Island Fires, see HRMP Appendix C for more details.

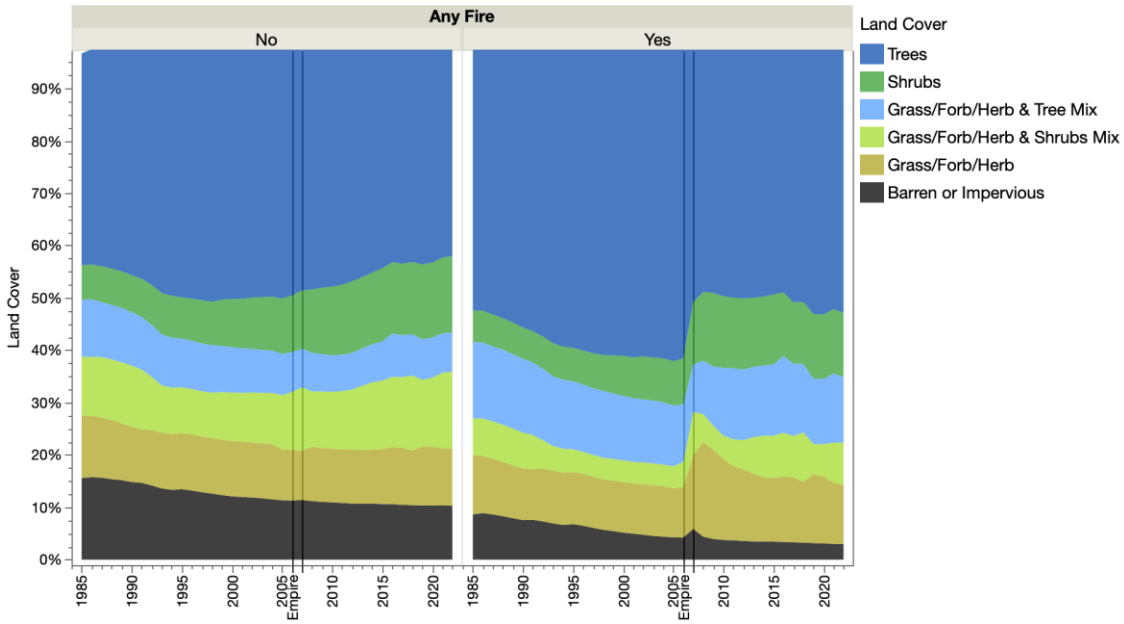


Exhibit 6 - An Island Scrub Oak plant is unable to recover after the 2003 Airport Fire because of mule deer browsing basal resprouts (May 19, 2003 after Airport fire).