ATTACHMENT 1

Significant Ecological Areas Biological Constraints Analysis and Biota Report for the Catalina Airport Solar Project on Santa Catalina Island County of Los Angeles, California

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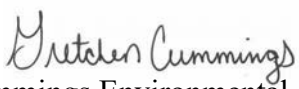

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Attachments:

Table 1 – Vascular Plants Observed During the Biological Survey at the Catalina Airport Solar Project Study Area Near the Buffalo Springs Significant Ecological Area on Santa Catalina Island
Table 2 – Wildlife Species Observed During the Biological Survey at the Catalina Airport Solar Project Study Area Near the Buffalo Springs Significant Ecological Area on Santa Catalina Island
Table 3 – Sensitive Plant Species Known to Occur on Santa Catalina Island
Table 4 – Sensitive Wildlife Species Known to Occur on Santa Catalina Island

Figure 1 – Solar Panel Impact Area Shown in Relation to the Buffalo Springs SEA on the U.S.G.S. 7½-min Santa Catalina North Quad Map
Figure 2 – Solar Project Study Area and Solar Panel Impact Area in Relation to Buffalo Springs SEA, Project Mitigation Area, and Catalina Airport Shown on an Aerial Photo
Figure 3 – Vegetation Map, Sensitive Species, and Native Tree Locations at the Catalina Airport Solar Project Study Area Shown on an Aerial Photo
Figure 4 – Photo Point Locations for the Following Photos in Figures 5 and 6 at the Solar Project Study Area and Solar Panel Impact Area Shown on an Aerial Photo
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Appendix A – Drawing No. PV-1.2 from Site Plans for the Catalina Island Conservancy Ground Mounted Solar Photovoltaic System Project
Appendix B – Catalina Island Mitigation Measures for the Airport Solar Project

I. Introduction

The Catalina Airport Solar Project is located between Avalon and Two Harbors on the east side of Catalina Island. Specifically, the proposed Solar Panel Impact Area is found on the north side of Airport Road just south of the Catalina Airport runway. The Solar Project Study Area extends out 200-feet from the edge of the Solar Panel Impact Area (see Figures 1 and 2). This Biological Constraints Analysis and Biota Report is being prepared by Gretchen Cummings of Cummings Environmental, Inc. due to the property's proximity to the Buffalo Springs Significant Ecological Area (SEA) – see Figures 1 and 2.

The Solar Panel Impact Area encompasses 0.36-acre of native habitat located on the surrounding grounds of the Santa Catalina Island's Airport in the Sky. The Airport in the Sky is a small private aircraft runway that hosts a public restaurant, nature center, and a visitor's center on the airport grounds which operates from 8:00 am to 4:00 pm. Through the leveling and blasting of the adjoining two peaks, the airport was constructed in 1941. The proposed impact area is 790-feet to the southeast of the Buffalo Springs SEA at its closest point. As can be seen on Figure 2, the Buffalo Springs SEA is situated on the north side of the airport runway while the Solar Panel Impact Area is on the south side of the airport runway. The Solar Panel Impact Area will be situated on the south-facing slope located south of the airport and north of Airport Road. This location is currently not accessible to the public. As can be seen in Figure 3, the Solar Project Study Area (approximately 6.3-acres) which is defined as the Solar Panel Impact Area plus 200-feet around the Solar Panel Impact Area contains development (1.3-acres) and native habitat (5.0-acres). No public trails pass through the Solar Panel Impact Area, and it is bounded on three sides by development. Outside of the developed airport envelope, the surrounding area is occupied by native habitats (see Figure 2).

The proposed project is a high-profile solar project highlighting the Catalina Island Conservancy's efforts and commitment to sustainable use of natural resources on the island. The project consists of a 10,400 square foot, non-invasive ground mounted (chosen method to allow for little to no grading at site), grid-tied solar photovoltaic (PV) system installation (see Appendix A for the site plans). The photovoltaic installation will be fenced around the perimeter of the panels. All materials for the project will be driven up to the site from Avalon along the existing Airport Road.

II. Methodology of Biological Survey

The Solar Project Study Area was surveyed by the author on 3 April 2023 (see Table A below). The entire Solar Project Study Area was walked with a specific focus on the Solar Panel Impact Area. One principal goal of the biological survey was to determine the

presence or absence of sensitive plant species. Prior to the on-site survey, a search was made of the on-line California Native Plant Society Electronic Database and the California Natural Diversity Database in order to create the sensitive plant species list in the attached Table 3. Another principal goal of the biological survey was the identification and delineation of populations of sensitive wildlife species. Prior to the on-site visit, a search was made of the California Natural Diversity Database in order to create the sensitive wildlife species list in the attached Table 4. During the field visit, the surveys focused on vegetation, sensitive plants, and wildlife species. Transects were walked during the vegetation surveys approximately 5-10 feet apart to allow for a visual inspection of all plants. A comprehensive plant species list was recorded, and habitats were mapped on an aerial photo. Sensitive plant species locations were recorded with a GPS unit. During the wildlife survey portion of the visit, all sign (including track, scat, and others), direct observation, and auditory inputs (such as songs and calls) were utilized to identify the species present. Habitat suitability for the thirteen sensitive wildlife species was assessed on-site. Suitable habitat occurs within the Solar Panel Impact Area for only the four sensitive snail species, and the Santa Catalina Island Fox The abandoned shed to the northwest of the Solar Panel Impact Area contains suitable habitat for the Townsend's Big-eared Bat and was searched for bats and signs of bats. The Solar Panel Impact Area and the rocky slope to the north of the Solar Impact Area was searched for signs of the Santa Catalina Island Fox. Searches for the potential snail species entailed looking under rocks and turning over deep leaf litter within the Solar Panel Study Area.

Table A. Field Visit Date and Weather Data

Survey	Date	Beginning of Observation Period				End of Observation Period			
		Time	Cloud Cover	Wind	Air Temp	Time	Cloud Cover	Wind	Air Temp
Vegetation and Wildlife	3 Apr 2023	0800	100%	8.2 – 15.1 mph	47.4°F	1015	25%	9.7 – 16.4 mph	53.6°F

III. Results

A. SEA and Project Location Description

The Solar Panel Impact Area is found approximately 790-feet to the southeast of the Buffalo Springs SEA. The Buffalo Springs SEA is an approximately 50-acre SEA containing two water reservoirs surrounded by native vegetation. A dirt road

winds along the northern section of the SEA, and the Trans Catalina Trail (a pedestrian trail) bisects the SEA in a northeasterly/southwesterly fashion (see Figure 2).

The Buffalo Springs SEA is separated from the Solar Panel Impact Area by the Catalina Airport runway. The runway is elevated above both the Buffalo Springs SEA and the Solar Panel Impact Area. The runway is on the northern edge of the airport facility. It is laid out in a northeast/southwest alignment. The land slopes down to the north from the runway into the Buffalo Springs SEA. The southern portions of the airport facility include a restaurant, visitor center, airplane storage/parking, and a native garden. The Airport Road occurs south of the airport facility and provides the vehicular access to the airport. The Solar Panel Impact Area is in between the airport and Airport Road on a gentle, south-facing slope occupied by native vegetation but surrounded on three sides by development (see Figure 3).

B. Description of Natural Geographic Features

The underlying geology mapped at the Solar Panel Impact Area is Serpentine from the early Mesozoic period (Rowland, 1984). This area has been identified as a location of convergent plate boundaries.

C. Vegetative Community Descriptions

There are two vegetation classifications within the Solar Project Study Area: Developed Area; and *Rhus integrifolia* Shrubland Alliance. Please see Figure 3 for a vegetation map of the Sawyer, Keeler-Wolf, Evans (2009) alliances, and Table 1 for a list of vascular plant species observed during the field survey. As described above, the Solar Project Study Area consists of the Solar Panel Impact Area plus 200-feet around the Solar Panel Impact Area. The Solar Project Study Area encompasses approximately 6.3-acres and the Solar Panel Impact Area encompasses 0.36-acre. Please see photo 5a in Figure 5 and the photo location on Figure 4 for a picture of the overall Solar Project Study Area taken from the Airport in the Sky patio.

1. Developed Area

Approximately 1.3-acres of the 6.3-acre Solar Project Study Area is currently developed (see Figure 3). These developed lands occur outside of the Solar Panel Impact Area and include Airport Road, a structure on the edge of the airport runway, a portion of the cleared airport grounds, non-native landscaping adjacent to the airport facilities, and an abandoned

utility road and shed (see photo location on Figure 4 and photo 5b in Figure 5).

2. *Rhus integrifolia* Shrubland Alliance

Approximately 5.0-acres of the 6.3-acre Solar Project Study Area contains the *Rhus integrifolia* Shrubland Alliance. The Solar Panel Impact Area is occupied by the *Rhus integrifolia* Shrubland Alliance, as is most of the Solar Project Study Area outside of the Solar Panel Impact Area (see Figures 3, 4, and 6). This alliance contains the following co-dominant species:

Rhus integrifolia	Lemonade Berry
Heteromeles arbutifolia	Toyon
Opuntia littoralis	Coastal Prickly-pear

It should also be noted that one Catalina Cherry (*Prunus ilicifolia* ssp. *lyonii*) was identified in this vegetation classification within the Solar Project Study Area but outside of the Solar Panel Impact Area (see Figure 3 for location). The Catalina Cherry tree was seen just to the south/southwest of the abandoned utility shed northwest of the Solar Panel Impact Area. This native tree species has three trunks measured at 5", 3", and 2.5" diameter at breast height (dbh).

D. Flora

During the field survey, forty-three plant species were documented within the Solar Project Study Area (see Table 1). Of the forty-three plant species identified, two of them were sensitive plant species. Those two sensitive plant species were the Nuttall's Island Bedstraw (*Galium nuttallii* ssp. *insulare*) and Palmer's Grapplinghook (*Harpagonella palmeri*). They are described as follows:

1. Nuttall's Island Bedstraw

The Nuttall's Island Bedstraw was observed as a single individual near a cacti patch nestled underneath a Lemonade Berry shrub on the edge of a cluster of Lemonade Berry and Toyon shrubs (see Figure 3 for location and top photo in Figure 7).

2. Palmer's Grapplinghook

Palmer's Grapplinghook was found on the west edge of the abandoned utility road, on the north side of Airport Road, and in the southwest corner of the Solar Panel Impact Area (see Figure 3 for locations). The two occurrences outside of the Solar Panel Impact Area but within the larger Solar Project Study Area totaled eighty-four individual plants. The occurrence of this species within the Solar Panel Impact Area totaled seventy-two individual plants (see bottom photo in Figure 7). Together, the total number of individual plants within the Solar Project Study Area is one hundred and fifty-six.

E. Fauna and Wildlife Movement

The Solar Panel Impact Area is located just south of Catalina Airport. The runway and airport layout form somewhat of a barrier between the Buffalo Springs SEA to the north of the airport and the Solar Panel Impact Area to the south of the airport. However, the water reservoirs within the Buffalo Springs SEA provide a water source for the wildlife in the area, such as the American Bison, other mammals, and bird species.

During the field survey, seven wildlife species were documented within the Solar Project Study Area (see Table 2). The seven wildlife species noted were American Bison, Catalina Ground Squirrel, Feral Cat, Common Raven, Bewick's Wren, House Finch, and Yellow-rumped Warbler. Evidence of American Bison were noted as dried droppings outside of the Solar Panel Impact Area to the east and south indicating that larger wildlife do move throughout the Solar Project Study Area but probably go around the Solar Panel Impact Area due to the steep, south-facing slope that occurs on the north side of the Solar Panel Impact Area. As such, the movement is forced around to the west and east of the Solar Panel Impact Area on more gently sloping terrain to get from the south to the water reservoirs north of the airport. In other words, given that the Solar Panel Impact Area is nestled up against the south side of the airport on a steep, south-facing slope, American Bison movement is not expected to occur north and south through the Solar Panel Impact Area, but rather around it to the east and west where there is more gently sloping terrain and more open vegetation. Smaller wildlife, such as the Santa Catalina Island Fox, would not see this steep, south-facing slope as a movement deterrent.

One of the principal goals of the biological survey was the detection of any sensitive wildlife species. A list of thirteen sensitive species known to occur on Santa Catalina Island was generated from a nine-quad search of the California

Natural Diversity Database prior to the on-site survey (CDFW, 2025). Once on-site, the Solar Panel Impact Area was assessed to determine if there was suitable habitat for any of these thirteen species. Suitable habitat does not occur within the Solar Panel Impact Area for the Sandy Beach Tiger Beetle, Globose Dune Beetle, Santa Catalina Garter Snake, Santa Catalina Shrew, American Peregrine Falcon, Bald Eagle, or Scripps's Murrelet. The six remaining sensitive species did contain suitable habitat and the Solar Panel Impact Area was searched for the presence of Townsend's Big-eared Bat, Santa Catalina Island Fox, Santa Catalina Lancetooth, Shepard's Snail, Catalina Mountainsnail, and San Clemente Island Blunt-top Snail. None of these six sensitive species were found during the site visit on 3 April 2023.

IV. Project Analysis and Project Consistency with the SEA CUP Compatibility Criteria

A. Project Analysis

1. Buffalo Springs SEA

The proposed solar project location is not located within the Buffalo Springs SEA but is found 790-feet to the southeast of this SEA. Given this proximity, an analysis of the Solar Project Study Area and the biological resources found at this location was conducted to see if there would be any impacts to the nearby SEA. As proposed, there will be no direct impacts to the Buffalo Springs SEA. The proposed location of the Solar Panel Impact Area is on the opposite side of the airport runway from the SEA approximately 790-feet at its closest point. All materials will be transported to the site via the Airport Road which is also located on the south side of the airport runway. As such, no additional vehicular traffic will pass through the SEA.

2. Sensitive Habitats

The installation of the solar photovoltaic system within the Solar Panel Impact Area will result in 0.36-acre of direct, permanent impacts and 0.09-acre of direct, temporary impacts to native vegetation near the Buffalo Springs SEA which will require mitigation. Specifically, the 0.36-acre of permanent impacts within the Solar Panel Impact Area and 0.09-acre of temporary impacts within the Solar Project Study Area contain native

vegetation consisting of a *Rhus integrifolia* Shrubland Alliance. As can be seen in Figure 3, the Solar Panel Impact Area has been situated adjacent to Airport Road and an abandoned utility road in an area with fewer shrubs and disturbed edges.

3. Sensitive Plants

Two sensitive plant species, the Nuttall's Island Bedstraw (*Galium nuttallii ssp. insulare*) and Palmer's Grapplinghook (*Harpagonella palmeri*) were identified within the Solar Project Study Area (see Figure 3). One individual Nuttall's Island Bedstraw will be directly impacted within the Solar Panel Impact Area but all of the Palmer's Grapplinghook plants have been avoided through project design and avoidance measures.

4. Sensitive Wildlife

A search was made of the California Natural Diversity Database in order to create the sensitive wildlife species list in the attached Table 4. A total of thirteen sensitive wildlife species was generated by this database search. Suitable habitat occurs within the Solar Panel Impact Area and the Solar Panel Study Area for six of these thirteen species. These six species were the Townsend's Big-eared Bat, Santa Catalina Island Fox, Santa Catalina Lancetooth, Shepard's Snail, Catalina Mountainsnail, and San Clemente Island Blunt-top Snail. On-site searches were made for these six species but none were found.

In addition to the on-site habitat analyses, the Los Angeles County Planning Department also requested that the California Department of Fish and Wildlife be contacted regarding the reintroduction programs of the Bald Eagle and the Peregrine Falcon. To address this request, the undersigned contacted Dr. Peter Sharpe of the Institute for Wildlife Studies and Julisa Portugal, Environmental Scientist for the California Department of Fish and Wildlife, regarding the reintroduction and monitoring of the Bald Eagle and Peregrine Falcon on Santa Catalina Island. Emails between Julisa Portugal and the undersigned occurred in March and April of 2023. In the most recent email exchange on 7 April 2023, Julisa stated that, "From my knowledge, there are no Bald Eagle and Peregrine Falcon reintroduction programs that CDFW is currently implementing. In the 1970's, there were reintroduction programs for these species, but I don't believe these are active programs." However, she went on to say that the CEQA document for the project should discuss impacts to these species. Following is an analysis of the data Dr. Sharpe emailed on 1 April 2023 for the nine Bald Eagle territories monitored by the

Institute for Wildlife Studies on Santa Catalina Island in 2022 and an analysis of Dr. Sharpe's paper on the monitoring results for the Peregrine Falcon on Santa Catalina Island in 2022. Per Dr. Sharpe's Bald Eagle data, the closest Bald Eagle nest to the Solar Project Study Area is 1.7-miles to the northeast at Twin Rocks. There are no suitable nest sites or foraging opportunities for the Bald Eagle within the Solar Project Study Area as it is located inland from the coastline just south of the Santa Catalina Island's Airport in the Sky and it does not contain tall trees or large rock outcrops. As such, there will be no impacts to the Bald Eagle. According to Dr. Sharpe's paper on the monitoring results for the Peregrine Falcon, two territories were observed on Santa Catalina Island in 2022. The closest Peregrine Falcon nest from the proposed project is 6.4-miles to the southeast at Lone Tree. As with the Bald Eagle, there are no suitable nest sites within the Solar Project Study Area. There are no cliff faces or tall trees. However, the Solar Project Study area does contain potential prey species, but as mentioned above, the closest nest is 6.4-miles away, so impacts to potential foraging habitat for this species are not expected.

5. Project Implementation

Implementation of the project at the Solar Panel Impact Area will temporarily impact 0.09-acre *Rhus integrifolia* Shrubland Alliance habitat outside of an SEA. The temporary impacts are due to trenching for the underground conduit which will be buried and a work buffer around the edge of the Solar Panel Impact Area during installation. The proposed trenches will be between 4-8 inches wide, 20-24 inches deep, and 120 feet in length. The volume of the excavated soil will be approximately 3-6 cubic yards. Once the electrical conduit is installed in the trenches, the trenches will be backfilled with the excavated soil. No spoils are anticipated to be exported.

The construction site will not be using buffalo tanks for its limited water needs. Instead, the project will utilize a water truck.

6. Project Maintenance

The maintenance of the solar panel project will require periodic vegetation removal within the fencing, fence repairs, and cleaning of the solar panels. The vegetation removal within the fencing is necessary to keep an access perimeter open around the solar panels. The chain link fence once installed is not anticipated to need frequent repairs but will be maintained by the Catalina Island Conservancy. Lastly, the solar panels are installed at a 15-degree tilt creating a near optimal self-cleaning situation utilizing

natural rain and condensation. In the event that additional cleaning is desired, pure deionized water shall be used. No chemicals or detergents will be used in order to protect the surrounding environment as well as the solar panel coating.

B. Project Consistency with SEA CUP Compatibility Criteria

1. The requested development is designed to be highly compatible with the biotic resources present, including the setting aside of appropriate and sufficient undisturbed areas.

The Solar Panel Impact Area is not located within an SEA. The closest SEA is Buffalo Springs SEA found 790-feet to the northwest on the other side of the Catalina Airport. The Solar Panel Impact Area has been positioned close to the existing airport on the south side next to existing development and an abandoned utility shed with an existing access road to minimize impacts and reduce edge effects.

Three other locations to the west of the current proposed Solar Panel Impact Area were considered but rejected. All three locations were west of the airport building comprising the Airport in the Sky restaurant, gift shop, and nature center, and were close the edge of the runway. These locations were rejected due to their proximity to the runway as they lacked a sufficient runway setback and they contained parts, vehicles, and equipment next to hangar. One location was the same distance away from the Buffalo Springs SEA as the current proposed location and the other two locations were closer to the Buffalo Springs SEA.

2. The requested development is designed to maintain water bodies, watercourses, and their tributaries in a natural state.

There are no water bodies, watercourses, or tributaries within the Solar Panel Impact Area.

3. The requested development is designed so that wildlife movement corridors (migratory paths) are left in an undisturbed and natural state.

The location of the Solar Panel Impact Area is situated on the south side of the existing airport property north of Airport Road. These existing developed areas already cause wildlife movement to divert around the airport. The proposed solar project will not change that movement pattern. The proposed fencing around the solar panels has been designed with 8-10 inch gaps along the bottom with a smooth bottom rail to allow for movement of the Santa Catalina Island Fox and other small wildlife through the area.

4. The requested development retains sufficient natural vegetative cover and/or open space to buffer critical resources, habitat areas, or migratory paths.

The Solar Panel Impact Area will be permanently impacting 0.36-acre of *Rhus integrifolia* Shrubland Alliance habitat outside of an SEA and temporarily impacting 0.09-acre of *Rhus integrifolia* Shrubland Alliance habitat outside of an SEA.

5. The roads and utilities serving the proposed development area located and designed so as not to conflict with critical resources, habitat areas or migratory paths.

The proposed project does not include any new roads. Equipment and materials will be transported to the Solar Panel Impact Area via the existing Airport Road. The abandoned utility road and shed will be used as the staging area. The abandoned conduit box associated with the abandoned utility shed will be used to minimize the temporary trenching that will be required.

V. Impacts, Avoidance Measures, and Mitigation Measures

A. Sensitive Habitat

1. Existing Conditions

The Solar Panel Impact Area contains 0.36-acre of *Rhus integrifolia* Shrubland Alliance habitat outside of an SEA.

2. Impacts

The Solar Panel Impact Area will permanently impact 0.36-acre of *Rhus integrifolia* Shrubland Alliance habitat outside of an SEA, temporarily impact 0.09-acre *Rhus integrifolia* Shrubland Alliance habitat outside of

an SEA. The permanent impacts are a result of the solar array and chain link fence around the solar array, 10-feet of brush clearing away from the solar array, and the installation of the utility disconnect. The temporary impacts are due to trenching for the underground conduit which will be buried and a work buffer around the edge of the Solar Panel Impact Area during installation.

3. Avoidance Measures
There are no avoidance measures proposed.

4. Mitigation Measures
The Project Mitigation Area for these impacts will be located southeast of the Solar Panel Impact Area (see Figure 2). The mitigation ratio for the 0.36-acre of permanent impacts will be 2:1 ratio (0.72-acre), and the mitigation ratio of the 0.09-acre of temporary impacts will be 1:1 (0.09-acre) totaling 0.81-acre of required mitigation. The Catalina Island Conservancy has identified a 0.81-acre Project Mitigation Area owned by them containing disturbed habitatPlease note that the area shown in blue on Figure 2 is larger than the 0.81-acre of mitigation required. This is due to the presence of scattered Island Scrub Oaks (*Quercus pacifica*). The Catalina Island Conservancy is planning to restore this Project Mitigation Area by removing invasive plants through herbicide applications, installing fencing to keep out invasive Mule Deer, and seeding with a mix of *Rhus integrifolia* Shrub Alliance shrubs comprised of Lemonade Berry (*Rhus integrifolia*), and Toyon (*Heteromeles arbutifolia*), and to a lesser extent Coastal Prickly-pear (*Opuntia littoralis*), Coyote Brush (*Baccharis pilularis* ssp. *consanguinea*), Yarrow (*Achillea millefolium*), Channel Island Silver Lotus (*Acmispon argophyllus* var. *argenteus*), Island Broom (*Acmispon dendroideus* var. *dendroideus*), Saint Catherine's Lace (*Eriogonum giganteum* var. *giganteum*), Needlegrass (*Stipa* spp.), Bush Sunflower (*Encelia californica*), Coast Goldenbush (*Isocoma menziesii*), and Coastal Sagebrush (*Artemisia californica*) collected from native plants across Santa Catalina Island. The Project Mitigation Area will be monitored by staff from the Catalina Island Conservancy's Conservation Department for 5 years until the success criteria of > 40% of native plant species cover and < 5% of invasive plant species identified on the California Invasive Plant Council Inventory. Please see the attached Catalina Island Mitigation Measures for the Airport Solar Project prepared by the Catalina Island Conservancy Conservation Department dated November 2025 in Appendix B.

B. Palmer's Grapplinghook

1. Existing Conditions

Three occurrences of Palmer's Grapplinghook were found within the Solar Project Study Area. One of these occurrences consisting of seventy-two individual plants was found within the Solar Panel Impact Area. The other two occurrences consisting of eighty-four individual plants were found outside of the Solar Panel Impact Area. Together, the total number of individual plants within the Solar Project Study Area is one hundred and fifty-six.

2. Impacts

All impacts to the occurrences of Palmer's Grapplinghook within and outside of the Solar Panel Impact area have been avoided through project design and with the use of mitigation measures.

3. Avoidance Measures

The solar panel array has been reconfigured from its original design to avoid direct impacts to the Palmer's Grapplinghook within the Solar Panel Impact Area (see Appendix A).

4. Mitigation Measures

A small, permanent exclusionary fence around the Palmer's Grapplinghook population that could be impacted by vegetation maintenance within the Solar Panel Impact Area will be erected prior to construction with an educational sign posted nearby about this sensitive plant species (see Figure 3 for location).

To avoid impacts to the Palmer's Grapplinghook individuals outside of the Solar Panel Impact Area but on the edge of the roads being used for the proposed project, temporary construction fencing, and signs will be placed around the population at the edge of the pavement instructing vehicles to stay on the paved portion during installation of the solar panels (see Figure 3 and Appendix A).

C. Nuttall's Island Bedstraw

1. Existing Conditions

A single Nuttall's Island Bedstraw plant was observed within the Solar Panel Impact Area.

2. Impacts
One individual Nuttall's Island Bedstraw will be directly impacted.

3. Avoidance Measures
No avoidance measures are proposed.

4. Mitigation Measures
The mitigation for this impact is included with the habitat mitigation for the impacts to the *Rhus integrifolia* Shrubland Alliance habitat as discussed above.

D. Breeding Birds

1. Existing Conditions
There are a number of bird species protected under the Migratory Bird Treaty Act that could nest within the Solar Panel Impact Area.

2. Impacts
A variety of birds species could currently utilize the Solar Panel Impact Area for nesting including ground nesters and arboreal nesters. Ground disturbance or vegetation removal for the project could impact these species if they occurred during the avian nesting season.

3. Avoidance Measures
In order to avoid potential impacts to nesting birds, it is recommended that the installation of the solar panels be conducted outside of the breeding bird season. The breeding bird season generally occurs between 15 February and 31 August.

4. Mitigation Measures
If the solar panel construction occurs during the breeding season, then a qualified biologist will need to conduct a nesting bird survey to determine if there are any nesting birds within the impact area. If no nesting birds are found during the survey, then construction can continue. If nesting birds are found, then recommendations for construction buffers, monitoring, and/or other recommendations will be made with concurrence from the Los Angeles County Planning Department and the Catalina Island Conservancy.

E. Santa Catalina Island Fox

1. Existing Conditions
The Santa Catalina Island Fox has the potential to occur within the Solar Panel Impact Area. The mating season of the Santa Catalina Island Fox occurs from late January through March with young being born from mid-April through May. The young will spend the first two months in and around the den. By July, the pups have left the den.

2. Impacts
No impacts are proposed to the Santa Catalina Island Fox. No dens were observed within the Solar Panel Impact Area, nor were any foxes.

3. Avoidance Measures
Since the Solar Panel Impact Area has a medium probability of being occupied by the Santa Catalina Island Fox, an avoidance measure is recommended to ensure that no impacts occur to this species. It is recommended that the use of mechanical equipment be limited to outside of the mating and denning season (this season occurs from late January when mating begins through the end of July when the pups leave the den).

4. Mitigation Measures
Given the potential for the Santa Catalina Island Fox within the Solar Panel Impact Area, it is recommended that any pipes, trenches or holes should be covered with plywood when not being actively worked on OR are equipped with escape ramps for any animals that could fall into them. Additionally, the 6-foot tall chain link fence around the Solar Panel Impact Area will have 8-10 inch gaps along the bottom with a smooth bottom rail to allow for movement of the Santa Catalina Island Fox and other small wildlife through the area. The placement of a smooth rail along the bottom of the chain link fence will cover any protruding segments of the chain links to prevent any collared foxes from getting stuck or injured.

VI. Conclusions

The Solar Panel Impact Area is located on the surrounding grounds of the Santa Catalina Island's Airport in the Sky. The area is situated to the south of the airport and to the north of Airport Road. Most of the area is currently undeveloped except for a road, power poles, and an abandoned utility shed. This Solar Panel Impact Area will permanently impact 0.36-acre and temporarily impact 0.09-acre of *Rhus integrifolia* Shrubland Alliance habitat containing two sensitive plant species, the Nuttall's Island Bedstraw and Palmer's Grapplinghook. Only one individual Nuttall's Island Bedstraw will be impacted.

All the Palmer's Grapplinghook plants have been avoided by project design and through the proposed construction of a split rail fence prior to construction and posting of an educational sign as an avoidance measure. The 0.36-acre of permanent impacts to the *Rhus integrifolia* Shrubland Alliance habitat will be mitigated at a 2:1 ratio (0.72-acre) within the Project Mitigation Area shown on Figure 2. The 0.09-acre of temporary impacts to the *Rhus integrifolia* Shrubland Alliance habitat will be mitigated at a 1:1 ratio (0.09) within the Project Mitigation Area shown on Figure 2 for a total of 0.81-acre. As mentioned above, the Catalina Island Conservancy is planning to restore this Project Mitigation Area by removing invasive plants through herbicide applications, installing an exclusionary Mule Deer fence, and seeding with a native seed collected from native plants across Santa Catalina Island to create a 0.81-acre area of *Rhus integrifolia* Shrubland Alliance habitat.

Given the location of the Solar Panel Impact Area outside of the Buffalo Springs SEA, combined with the mitigation for the direct impacts to sensitive habitat, and the impact avoidance measures mentioned above for sensitive flora and fauna, the proposed Catalina Airport Solar Project will not have a significant environmental impact.

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Table 1

Vascular Plants Observed During the Biological Survey at the Catalina Airport Solar Project Study Area Near the Buffalo Springs Significant Ecological Area on Santa Catalina Island County of Los Angeles, California

Plant Family	*Scientific Name* Common Name	Native (N) or Introduced (I)	Occurrence at the Project Site and/or in the Vicinity
Anacardiaceae Sumac Family	*Malosma laurina* Laurel Sumac	N	Uncommon, individual shrubs scattered in the study area.
	Rhus integrifolia Lemonade Berry	N	Common, clustered in patches with Toyon.
	Toxicodendron diversilobum Western Poison Oak	N	Infrequent, but found growing as one large patch in the southern part of the study area.
Arecaceae Palm Family	*Washingtonia robusta* Mexican Fan Palm	I	Uncommon, but clustered in the southwest portion of the study area.
Asteraceae Sunflower Family	*Artemisia californica* California Sagebrush	N	Uncommon, scattered in the northern portion of the study area along the south-facing slope between the structure and the impact area.
	Baccharis pilularis Coyote Brush	N	Infrequent, a few individuals were noted within the study area.

Plant Family	*Scientific Name* Common Name	Native (N) or Introduced (I)	Occurrence at the Project Site and/or in the Vicinity
	Encelia californica California Encelia	N	Uncommon, scattered in the southwestern portion of the study area.
	Heterotheca grandiflora Telegraph Weed	N	Infrequent, a few individuals were noted in the more disturbed areas of the study area.
	Hypochaeris glabra Smooth Cat's Ear	I	Frequent, scattered within the study area in the open, herbaceous habitat.
	Isocoma menziesii Coastal Goldenbush	N	Frequent, scattered within the study area in the open, herbaceous habitat.
	Logfia gallica Daggerleaf Cottonrose	I	Frequent, scattered within the study area in the open, herbaceous habitat.
	Pseudognaphalium californicum California Everlasting	N	Occasional, scattered within the study area in the open, herbaceous habitat.
	Sonchus oleraceus Common Sow Thistle	I	Infrequent, scattered within the study area in the open, herbaceous habitat.
Boraginaceae Borage Family	*Amsinckia menziesii* Common Fiddleneck	N	Infrequent but concentrated along the road to the abandoned utility shed.

Plant Family	*Scientific Name* Common Name	Native (N) or Introduced (I)	Occurrence at the Project Site and/or in the Vicinity
	Harpagonella palmeri Palmer's Grapplinghook	N	Infrequent, but concentrated in a few patches in the southwest corner of the impact area and just outside of the impact area to the west within the study area.
	Pectocarya linearis ssp. *ferocula* Slender Pectocarya	N	Common, found within the herbaceous habitat.
Cactaceae Cactus Family	*Opuntia ficus-indica* Mission Cactus	I	Infrequent, but clustered in a large patch to the northwest of the abandoned utility shed.
	Opuntia littoralis Coastal Prickly-pear	N	Common, forming cacti patches within the study area.
Caryophyllaceae Pink Family	*Silene gallica* Windmill Pink	I	Uncommon, a few scattered individuals were noted within the herbaceous habitat.
Crassulaceae Stonecrop Family	*Aeonium haworthii* Kiwi Aeonium	I	Infrequent, but concentrated on the south-facing slope to the north of the abandoned utility shed.
	Crassula connata Pigmy Weed	N	Frequent, ground cover in certain areas of the herbaceous habitat.
	Crassula ovata Jade Plant	I	Infrequent, one or two individuals were noted near the abandoned utility shed.

Plant Family	*Scientific Name* Common Name	Native (N) or Introduced (I)	Occurrence at the Project Site and/or in the Vicinity
Cucurbitaceae Gourd Family	*Marah macrocarpa* Chilicothe	N	Uncommon, a few individuals were noted climbing over shrubs within the study area.
Fabaceae Legume Family	*Acmispon argophyllus* var. *argenteus* Channel Islands Silver Lotus	N	Uncommon, a few individuals were noted along Airport Road to the south of the impact area.
	Acmispon micranthus Small-flowered Lotus	N	Frequent, found scattered within the herbaceous habitat in the study area.
	Medicago polymorpha California Burclover	I	Infrequent, but concentrated along the road to the abandoned utility shed.
Geraniaceae Geranium Family	*Erodium botrys* Long-beaked Filaree	I	Frequent, seen within the herbaceous habitat.
	Erodium cicutarium Redstem Filaree	I	Common, within the herbaceous habitat.
Lamiaceae Mint Family	*Salvia mellifera* Black Sage	N	Infrequent, a few scattered individuals were noted within the study area.
Myrsinaceae Myrsine Family	*Lysimachia arvensis* Scarlet Pimpernel	I	Frequent, seen concentrated along the road to the abandoned utility shed, and scattered within the herbaceous habitat.

Plant Family	*Scientific Name* Common Name	Native (N) or Introduced (I)	Occurrence at the Project Site and/or in the Vicinity
Oxalidaceae Oxalis Family	*Oxalis pes-caprae* Bermuda Buttercup	I	Infrequent, but concentrated in the shaded areas near the abandoned utility shed.
Plantaginaceae Plantain Family	*Plantago erecta* Dot-seed Plantain	N	Common, forming dense patches within the herbaceous habitat.
Poaceae Grass Family	*Avena barbata* Slender Wild Oat	I	Frequent, forming clumps of 2-foot-tall stands within and along the periphery of the herbaceous habitat.
	Bromus diandrus Ripgut Grass	I	Infrequent, seen scattered within the herbaceous habitat.
	Bromus rubens Red Brome	I	Frequent, seen as a component of the herbaceous habitat.
	Digitaria sanguinalis Crab Grass	I	Frequent, seen as a component of the herbaceous habitat.
	Lamarckia aura Goldentop	I	Infrequent, a couple of small patches were noted around rocky outcrops.
	Stipa pulchra Purple Needle Grass	N	Infrequent, seen as scattered individuals within the herbaceous habitat.
Rosaceae Rose Family	*Heteromeles arbutifolia* Toyon	N	Common, clustered in patches with Lemonade Berry.

Plant Family	*Scientific Name* Common Name	Native (N) or Introduced (I)	Occurrence at the Project Site and/or in the Vicinity
	Prunus ilicifolia ssp. *lyonii* Catalina Cherry	N	Uncommon, one individual was noted to the southwest of the abandoned utility shed within the study area.
Rubiaceae Madder Family	*Galium nuttallii* ssp. *insulare* Nuttall's Island Bedstraw	N	Uncommon, one individual was noted near a cacti patch on the edge of a cluster of Lemonade Berry and Toyon.
Selaginellaceae Spike-Moss Family	*Selaginella bigelovii* Bigelow's Spike-Moss	N	Frequent, seen within the herbaceous habitat often forming patches on bare dirt and dirt with scattered rocks.
Themidaceae Brodiaea Family	*Dipterostemon capitatus* ssp. *capitatus* Blue Dicks	N	Infrequent, individuals were scattered within the herbaceous habitat within the study area.

43 Species

[:\1946PlantList.doc]

Table 2

Wildlife Species Observed During the Biological Survey at the Catalina Airport Solar Project Study Area Near the Buffalo Springs Significant Ecological Area on Santa Catalina Island County of Los Angeles, California

Common Name *(Scientific Name)*	**Vegetative Community in which the Species was Observed**	**Occurrence at the Project Site and/or in the Vicinity**
Mammals		
American Bison (*Bison bison*)	*Rhus integrifolia* Shrubland Alliance	Bison droppings were noted within the study area south and east of the impact area.
Catalina Ground Squirrel (*Otospermophilus beecheyi* ssp. *nesioticus*)	*Rhus integrifolia* Shrubland Alliance	Five California Ground Squirrels were observed within the study area. Four of the five were seen in a cacti patch in the impact area, and the other one was noted to the south of the impact area.
Feral Cat (*Felis domesticus*)	Developed Area	A feral cat was seen to the west of the study area at the Airport in the Sky Restaurant.
Birds		
Common Raven (*Corvus corax*)	N/A	One Common Raven was seen as an overflight on 3 April.
Bewick's Wren (*Thryomanes bewickii*)	*Rhus integrifolia* Shrubland Alliance	Two Bewick's Wrens were observed within the study area. One was heard singing on the southwestern edge of the study area, and the other one was heard scolding to the south of the impact area.

Common Name ***(Scientific Name)***	**Vegetative Community in which the Species was Observed**	**Occurrence at the Project Site and/or in the Vicinity**
House Finch (*Carpodacus mexicanus*)	*Rhus integrifolia* Shrubland Alliance	Heard singing and seen foraging within the study area.
Yellow-rumped Warbler (*Setophaga coronata*)	*Rhus integrifolia* Shrubland Alliance	Two Yellow-rumped Warblers were seen foraging in the shrubs in the impact area.

7 Species

[:\1946 Wildlife List.doc]

Table 3

Sensitive Plant Species Known to Occur on Santa Catalina Island

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Abronia maritima Red Sand-Verbena	Rank 4.2/S3?/-/-	Found on Coastal Dunes at elevations under 330 feet.	N	U	There are no Coastal Dunes within the study area. Also, this species is nearly extirpated in southern California (CNPS, 2023). The species was searched for but was not observed.
Acmispon dendroideus var. *dendroideus* Island Broom	Rank 4.2/S3/-/- CA Endemic	Grows on dry ridges, in woodlands, and on coastal bluffs within Closed-cone Coniferous Forest, Coastal Scrub, Chaparral, Coastal Bluff Scrub, and Cismontane Woodland habitats at elevations of 10 – 1,510 feet.	N	M	There is Coastal Scrub within the study area. However, the elevations within the study area are at the upper end of the known elevational range and higher. Island Broom has been documented within the Santa Catalina North quad (CNPS, 2023). The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Aphanisma blitoides Aphanisma	Rank 1B.2/S2/-/-	Found on bluffs and slopes near the ocean at elevations of 5 - 1,000 feet.	N	U	The study area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the species. The species was searched for but was not observed.
Aphyllon parishii ssp. brachylobum Short-lobed Broomrape	Rank 4.2/S3/-/-	Found on sandy soils near beaches at elevations of 10 – 1,000 feet.	N	U	The study area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the species. The species was searched for but was not observed.
Arctostaphylos catalinae Santa Catalina Island Manzanita	Rank 1B.2/S2?/-/- Santa Catalina Island Endemic	Found on volcanic soil within Chaparral habitat. Elevations range from 245 – 1,970 feet.	N	U	There is no Chaparral habitat mapped within the study area. The species was searched for but was not observed.
Arctostaphylos crustacea ssp. *subcordata* Santa Cruz Island Manzanita	Rank 4.2/S3/-/- CA Endemic	Found in Chaparral and Closed-cone Coniferous Forest habitats at elevations of 330 – 2,395 feet.	N	U	There are no Chaparral or Closed-cone Coniferous Forest habitats mapped within the study area. The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Atriplex coulteri Coulter's Saltbush	Rank 1B.2/S1S2/-/-	Found in Coastal Bluff Scrub, Coastal Dunes, Coastal Scrub, and Valley and Foothill Grassland habitats at elevations of 10 – 1,510 feet.	N	L	There is Coastal Scrub within the study area. However, the elevations within the study area are at the upper end of the known elevational range and higher. The species was searched for but was not observed.
Atriplex pacifica South Coast Saltscale	Rank 1B.2/S2/-/-	Found in Coastal Bluff Scrub, Coastal Dunes, Coastal Scrub, and Playas at elevations of 0 – 460 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the species. The species was searched for but was not observed.
Atriplex serenana var. *davidsonii* Davidson's Saltscale	Rank 1B.2/S1/-/-	Known from Coastal Scrub and Coastal Bluff Scrub at elevations ranging from 35 – 655 feet	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the species. The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Bergerocactus emoryi Golden-Spined Cereus	Rank 2B.2/S2/-/-	Found along the coast in Coastal Scrub, Chaparral, and Closed-cone Coniferous Forest habitats at elevations of 10 – 1,295 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the species. The species was searched for but was not observed.
Calochortus catalinae Catalina Mariposa Lily	Rank 4.2/S3S4/-/- CA Endemic	Found in Valley and Foothill Grassland, Chaparral, Coastal Scrub, and Cismontane Woodland habitats at elevations of 50 – 2,295 feet.	N	H	There is Coastal Scrub habitat in the study area within the known elevations of the species. The species was searched for but was not observed.
Calystegia macrostegia var. *amplissima* Island Morning-Glory	Rank 4.3/S4/-/- CA Endemic	Found at rocky sites within Coastal Bluff Scrub, Coastal Dune, and Valley and Foothill Grassland habitats at elevations of 35 – 900 feet.	N	U	The study area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the species. The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Ceanothus megacarpus var. *insularis* Island Ceanothus	Rank 4.3/S4/-/- CA Endemic	Found in Chaparral on slopes and canyons near the coast at elevations of 100 – 1,970 feet.	N	U	There is no Chaparral habitat within the study area. The species was searched for but was not observed.
Centromadia parryi ssp. *australis* Southern Tarplant	Rank 1B.1/S2/-/-	Found in mesic areas adjacent to marshes, in vernal pools, and in vernally mesic grasslands. The known elevations of the subspecies range from 0 – 1,575 feet.	N	L	There are a couple of dry drainages within the study area that may carry water during high rain events. However, the closest (and only) CNDDB record on Catalina Island is 6.1-miles to the southeast near Avalon (CDFW, 2023). The species was searched for but was not observed.
Cercocarpus betuloides var. *blancheae* Island Mountain-Mahogany	Rank 4.3/S4/-/- CA Endemic	Found in Chaparral and Closed-cone Coniferous Forest habitats at elevations of 100 – 1,970 feet.	N	U	There are no Chaparral or Closed-cone Coniferous Forest habitats within the study area. The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Cercocarpus traskiae Catalina Island Mountain-Mahogany	Rank 1B.1/S1/CE/FE Santa Catalina Island Endemic	Found in Chaparral and Coastal Scrub habitats on saussurite gabbro at elevations of 330 – 820 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the species. Also, this species is known to occur naturally only in Wild Boar Gully on the southwestern coast of Santa Catalina Island (CNPS, 2023). The species was searched for but was not observed.
Cirsium occidentale var. *compactum* Compact Cobwebby Thistle	Rank 1B.2/S2/-/- CA Endemic	Found in Chaparral, Coastal Dunes, Coastal Prairie, and Coastal Scrub habitats at elevations of 15 – 490 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the species. The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Cistanthe maritima Seaside Cistanthe	Rank 4.2/S3/-/-	Found on sandy sites within Coastal Bluff Scrub, Coastal Scrub, and Valley and Foothill Grassland habitats at elevations of 15 – 985 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the species. The species was searched for but was not observed.
Constancea nevinii Nevin's Woolly Sunflower	Rank 1B.3/S3/-/- CA Endemic	Found in Coastal Bluff Scrub and Coastal Scrub habitats on slopes and cliffs at elevations of 15 – 1,345 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the species. The species was searched for but was not observed. NOTE: *Eriophyllum nevinii* is a synonym.
Convolvulus simulans Small-flowered Morning-glory	Rank 4.2/S4/-/-	Found in Chaparral, Coastal Scrub, and Valley and Foothill grassland habitats at elevations of 100 - 2,430 feet.	N	H	There is Coastal Scrub habitat in the study area within the known elevations of the species. Small-flowered Morning-glory has been documented within the Santa Catalina North quad (CNPS, 2023). The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Crocanthemum greenei Island Rush-rose	Rank 1B.2/S3/-/FT CA Endemic	Found on rocky sites within Chaparral, Coastal Scrub, Cismontane Woodland, and Closed-cone Coniferous Forest at elevations of 50 – 1,610 feet.	N	H	There is Coastal Scrub habitat in the study area within the known elevations of the species. Also, the closest CNDDB record is ½mile to the southwest of the study area on the north side of Cottonwood Canyon (CDFW, 2023). The species was searched for but was not observed. NOTE: *Helianthemum greenei* is a synonym.
Crossosoma californicum Catalina Crossosoma	Rank 1B.2/S3/-/-	Found in Chaparral and Coastal Scrub habitats, Specifically, it is found on rocky sea bluffs, wooded canyons, and dry, open sunny spots on rocky clay at elevations of 0 – 1,640 feet.	N	H	There is Coastal Scrub habitat in the study area within the known elevational range of the species. The closest CNDDB record is 0.7-mile to the southwest of the study area along the El Rancho Escondido Road (CDFW, 2023). The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Cryptantha catalinensis Catalina Cryptantha	-/-/-/- Santa Catalina Island Endemic	Found in Coastal Sage Scrub at elevations of under 167 feet.	N	U	There is Coastal Scrub within the study area, but the known elevational range of the species if much lower than the elevations within the study area. The species was searched for but was not observed. NOTE: This is a newly identified endemic previously thought to be *Cryptantha wigginsii*.
Cryptantha wigginsii Wiggins' Cryptantha	Rank 1B.2/S1/-/-	Found in Coastal Scrub often on clay soils at elevations of 65 – 900 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the species. The species was searched for but was not observed.
Deinandra clementina Island Tarplant	Rank 4.3/S4/-/- CA Endemic	Found in Coastal Bluff Scrub and Valley and Foothill Grassland habitats at elevations of 50 – 655 feet.	N	U	There are no Coastal Bluff Scrub or Valley and Foothill Grassland habitats within the study area. Also, the known elevational range of the species is much lower than the elevations within the study area. The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Dendromecon harfordii var. *rhamnoides* South Island Bush-Poppy	Rank 3.1/S1/-/- CA Endemic	Found in Chaparral, Cismontane Woodland, and Coastal Scrub habitats at elevations of 490 – 1,705 feet.	N	H	There is Coastal Scrub habitat in the study area within the known elevational range of this variety. The closest CNDDB record is 1.0-mile to the southeast on the west side of Black Jack Mountain (CDFW, 2023). The species was searched for but was not observed.
Dichondra occidentalis Western Dichondra	Rank 4.2/S3S4/-/-	Found within Chaparral, Cismontane Woodland, Coastal Scrub, and Valley and Foothill Grassland habitats at elevations of 165 – 1,640 feet.	N	H	There is Coastal Scrub in the study area within the known elevational range of the species. Also, this species has been recorded within the Santa Catalina North quad (CNPS, 2023). The species was searched for but was not observed.
Diplacus traskiae Santa Catalina Island Monkeyflower	Rank 1A/SX/-/- Santa Catalina Island Endemic	Grows in Coastal Scrub habitat.	N	U	This species is presumed to be extinct in California (CNPS, 2023). The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Dissanthelium californicum California Dissanthelium	Rank 1B.2/S1/-/- CA Endemic	Found in Coastal Scrub habitat at elevations of 15 – 1,640 feet.	N	H	There is Coastal Scrub in the study area within the known elevational range of the species. The closest CNDDB record is 1.0-mile to the southwest on the north side of Cottonwood Canyon (CDFW, 2023). The species was searched for but was not observed.
Dithyrea maritima Beach Spectaclepod	Rank 1B.1/S1/CT/-	Found in Coastal Dunes and Coastal Scrub habitats at elevations of 10 – 165 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the species. The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Dudleya virens ssp. *hassei* Catalina Island Dudleya	Rank 1B.2/S2/-/- Santa Catalina Island Endemic	Found on rocky substrates within Coastal Scrub and Coastal Bluff Scrub habitats at elevations of 0 – 1,310 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the subspecies. The species was searched for but was not observed. NOTE: This subspecies hybridizes with *Dudleya virens* ssp. i*nsularis.*
Dudleya virens ssp. i*nsularis* Island Green Dudleya	Rank 1B.2/S3/-/- CA Endemic	Found on rocky substrates within Coastal Scrub and Coastal Bluff Scrub and Coastal Scrub habitats at elevations of 15 – 985 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the subspecies. The species was searched for but was not observed. NOTE: This subspecies hybridizes with *Dudleya virens* ssp. *hassei.*

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Dudleya virens ssp. *virens* Bright Green Dudleya	Rank 1B.2/S2/-/-	Found on rocky substrates within Coastal Scrub, Chaparral, and Coastal Bluff Scrub and Coastal Scrub habitats at elevations of 15 – 1,310 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the subspecies. The species was searched for but was not observed.
Eriogonum giganteum var. *giganteum* Santa Catalina Island Buckwheat	Rank 4.3/S3/-/- Santa Catalina Island Endemic	Found at rocky sites within Chaparral and Coastal Scrub habitats at elevations of 35 – 1,755 feet.	N	H	There is Coastal Scrub in the study area within the known elevational range of this variety. Also, this variety has been documented within the Santa Catalina North quad (CNPS, 2023). The species was searched for but was not observed.
Eriogonum grande var. *grande* Island Buckwheat	Rank 4.2/S4/-/- CA Endemic	Found on dry rocky cliffs and bluffs within Coastal Bluff Scrub, Coastal Scrub, and Valley and Foothill Grassland habitats at elevations of 10 – 1,510 feet.	N	M	There is Coastal Scrub within the study area. However, the elevations within the study area are at the upper end of the known elevational range of this variety and higher. Island Buckwheat has been documented within the Santa Catalina North quad (CNPS, 2023). The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Eschscholzia ramose Island Poppy	Rank 4.3/S4/-/-	Found on steep canyon banks near the sea within Coastal Bluff Scrub, Coastal Scrub, and Chaparral habitats at elevations of 0 – 1,245 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the species. The species was searched for but was not observed.
Euphorbia misera Cliff Spurge	Rank 2B.2/S2/-/-	Found at rocky sites in Coastal Bluff Scrub, Coastal Scrub, and Mojavean Desert Scrub habitats at elevations of 35 – 1,640 feet.	N	L	There is Coastal Scrub in the study area within the known elevational range of the species. However, the closest CNDDB record (and only record on the island) is 3.3-miles to the southwest on the slopes to the northeast of Little Harbor (CDFW, 2023). The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Galium catalinense ssp. *catalinense* Santa Catalina Island Bedstraw	Rank 1B.3/S2/-/- Santa Catalina Island Endemic	Found in Chaparral and Coastal Scrub habitats at elevations of 15 – 1,445 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the subspecies. The closest CNDDB record is 2.1-miles to the southeast at White's Landing (CDFW, 2023). The species was searched for but was not observed.
Galium nuttallii ssp. *insulare* Nuttall's Island Bedstraw	Rank 4.3/S4/-/- CA Endemic	Found in Cismontane Woodland, Chaparral, Coastal Scrub, and Lower Montane Coniferous Forest habitats at elevations of 10 – 1,445 feet.	Y	Observed	One Nuttall's Island Bedstraw plant was found within the study area underneath a Lemonade Berry shrub.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Gambelia speciosa Showy Island Snapdragon	Rank 1B.2/S3/-/-	Found on rocky cliffs and canyons in Coastal Scrub habitat at elevations of 0 – 2,955 feet.	N	L	Although the study area contains Coastal Scrub habitat, the area is a gentle, south-facing slope, that does not contain rocky cliffs or canyons. The closest CNDDB record is 1.0-mile to the northeast in Little Gibraltar on a steep sea cliff (CDFW, 2023). The species was searched for but was not observed.
Gilia nevinii Nevin's Gilia	Rank 4.3/S4/-/-	Found in Coastal Scrub, Coastal Bluff Scrub, and Valley and Foothill Grassland habitats at elevations of 15 1,310 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the species. The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Graphis saxorum Baja Rock Lichen	Rank 3/S1/-/-	Found on volcanic rocks in moderately shaded, usually north-facing areas at elevations of 100 – 260 feet.	N	U	The study area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the species. Also, there are only two records of this lichen on Santa Catalina are at near Little Harbor and Isthmus Cove (CDFW, 2023). The species was searched for but was not observed.
Harpagonella palmeri Palmer's Grapplinghook	Rank 4.2/S3/-/-	Found in clay soils within Chaparral, Coastal Scrub, and Valley and Foothill Grassland habitats at elevations of 65 - 3,135 feet.	Y	Observed	Palmer's Grapplinghook was observed within the study area. There were 72 plants observed within the impact area of the solar project and 84 plants observed outside the impact area but within the larger study area.
Hordeum intercedens Vernal Barley	Rank 3.2/S3S4/-/-	Occurs in Coastal Dunes, Coastal Scrub, Valley and Foothill Grassland depressions, and Vernal Pool basins at elevations of 15 - 3,280 feet.	N	H	There is Coastal Scrub habitat in the study area within the known elevational range of the species. Also, Vernal Barley has been documented within the Santa Catalina North quad (CNPS, 2023). The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Isocoma menziesii var. *decumbens* Decumbent Goldenbush	Rank 1B.2/S2/-/-	Associated with Coastal Scrub and Chaparral habitats on sandy soils at elevations of 35 – 820 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the species. The species was searched for but was not observed.
Jepsonia malvifolia Island Jepsonia	Rank 4.2/S4/-/-	Found within Chaparral and Coastal Scrub habitats at elevations of 50 – 3,280 feet.	N	U	There is Coastal Scrub habitat in the study area within the known elevational range of the species. Also, Island Jepsonia has been documented within the Santa Catalina North quad (CNPS, 2023). The species was searched for but was not observed.
Juncus acutus ssp. leopoldii Southwestern Spiny Rush	Rank 4.2/S4/-/-	Found in mesic Coastal Dunes, Coastal Scrub, Meadows and Seeps, and coastal Marshes and Swamps at elevations that range from 10 - 2,955 feet.	N	U	Although there is Coastal Scrub habitat in the study area within the known elevational range of this subspecies, there are no areas that hold water long enough to anticipate this plant. The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Lavatera assurgentiflora ssp. *assurgentiflora* Island Mallow	Rank 1B.1/S1/-/- CA Endemic	Found in Coastal Bluff Scrub, and Coastal Scrub habitats at elevations of 50 – 805 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the subspecies. The species was searched for but was not observed.
Lavatera assurgentiflora ssp. *glabra* Southern Island Mallow	Rank 1B.1/S1/-/- CA Endemic	Found in Coastal Bluff Scrub habitat at elevations of 15 – 820 feet.	N	U	There is no Coastal Bluff Scrub within the study area. Also, the known elevational range of the subspecies is much lower than the elevations found within the study area. The species was searched for but was not observed.
Lepechinia fragrans Fragrant Pitcher Sage	Rank 4.2/S3/-/- CA Endemic	Found in Chaparral at elevations of 65 – 4,300 feet.	N	U	There is no Chaparral habitat found within the study area. The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Lonicera subspicata var. *subspicata* Santa Barbara Honeysuckle	Rank 1B.2/S2?/-/- CA Endemic	Found in Chaparral, Cismontane Woodland, and Coastal Scrub habitats at elevations of 35 – 3,280 feet.	N	M	There is Coastal Scrub habitat in the study area within the known elevational range of the Santa Barbara Honeysuckle. The closest CNDDB record is 2.4miles to the southeast on the west side of the canyon between White's Landing and Moonstone Beach (CDFW, 2023). The species was searched for but was not observed.
Lycium brevipes var. *hassei* Santa Catalina Island Desert-Thorn	Rank 3.1/S1/-/- CA Endemic	Grows on coastal bluffs and slopes in Coastal Bluff Scrub and Coastal Scrub habitats at elevations of 215 – 985 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of this variety. The species was searched for but was not observed.
Lycium californicum California Box-Thorn	Rank 4.2/S4/-/-	Found in Coastal Bluff Scrub and Coastal Scrub habitats at elevations of 15 – 490 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of the species. The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Lyonothamnus floribundus ssp. *floribundus* Santa Catalina Island Ironwood	Rank 1B.2/S2/-/- Santa Catalina Island Endemic	Grows on north exposures on rocky slopes and canyons in Broadleaf Upland Forest, Chaparral, and Cismontane Woodland habitats at elevations of 245 – 1,640 feet.	N	U	There are no Broadleaf Upland Forest, Chaparral, or Cismontane Woodland habitats within the study area. The species was searched for but was not observed.
Malacothamnus fasciculatus var. *catalinensis* Santa Catalina Island Bush-mallow	Rank 4.2/S2/-/- Santa Catalina Island Endemic	Found in Chaparral and Coastal Scrub habitats at elevations of 35 – 1,050 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of this variety. The species was searched for but was not observed.
Microseris douglasii ssp. *platycarpha* Small-flowered Microseris	Rank 4.2/S4/-/-	Found on clay soils in Cismontane Woodland, Coastal Scrub, Valley and Foothill Grassland, and Vernal Pool habitats at elevations of 50 - 3,510 feet.	N	H	There is Coastal Scrub habitat in the study area within the known elevational range of this subspecies. Also, this subspecies has been recorded within the Santa Catalina North quad (CNPS, 2023). The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Nemacaulis denudata var. *denudata* Coast Woolly-Heads	Rank 1B.2/S2/-/-	A species found in Coastal Dunes at elevations ranging from 0 – 330 feet.	N	U	There are no Coastal Dunes within the study area just south of the Catalina Airport. The species was searched for but was not observed.
Ophioglossum californicum California Adder's-tongue	Rank 4.2/S4/-/-	Found in mesic situations at the periphery of Vernal Pools, in Chaparral, and Valley and Foothill Grassland habitats at elevations of 195 - 1,725 feet.	N	M	There are a couple of dry drainages within the study area that may carry water during high rain events, but probably not enough water to anticipate this species. This species has been documented within the Santa Catalina North quad however (CNPS, 2023). The species was searched for but was not observed.
Pentachaeta lyonii Lyon's Pentachaeta	Rank 1B.1/S1/CE/FE CA Endemic	Found in Coastal Scrub, Chaparral, and Valley and Foothill Grassland habitats at elevations of 100 – 2,265 feet.	N	L	There is Coastal Scrub habitat in the study area within the known elevational range of this species. However, the one (and only) CNDDB record on the island is 4.0-miles to the northwest (CDFW, 2023). The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Phacelia lyonii Lyon's Phacelia	Rank 1B.2/S2/-/- CA Endemic	Occurs in Coastal Bluff Scrub, Chaparral, Coastal Dunes, and Coastal Scrub habitats at elevations of 0 – 1,510 feet.	N	H	There is Coastal Scrub habitat in the study area within the known elevational range of this species. Also, the closest CNDDB record is 0.8-mile to the southwest on the north slope of Cottonwood Canyon (CDFW, 2023). The species was searched for but was not observed.
Piperia cooperi Chaparral Rein Orchid	Rank 4.2/S3S4/-/-	Found in Chaparral, Cismontane Woodland, and Valley and Foothill Grassland habitats at elevations of 50 – 5,200 feet.	N	L	There are no Chaparral, Cismontane Woodland, or Valley and Foothill Grassland habitats within the study area. However, this species has been recorded within the Santa Catalina North quad (CNPS, 2023). The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Quercus pacific Island Scrub Oak	Rank 4.2/S4/-/- CA Endemic	Found in Chaparral, Closed-cone Coniferous Forest, and Cismontane Woodland habitats at elevations of 0 – 1,410 feet.	N	U	There are no Chaparral, Closed-cone Coniferous Forest, or Cismontane Woodland habitats within the study area. Also, the study area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of this species. The species was searched for but was not observed.
Quercus tomentella Island Oak	Rank 4.2/S3S4/-/-	Found in Chaparral, Closed-cone Coniferous Forest, Riparian Woodland, and Cismontane Woodland habitats at elevations of 50 – 2,395 feet.	N	U	There are no Chaparral, Closed-cone Coniferous Forest, Riparian Woodland, or Cismontane Woodland habitats within the study area. The species was searched for but was not observed.
Rhamnus pirifolia Island Redberry	Rank 4.2/S4/-/-	Found in Closed-cone Coniferous Forest, Chaparral, Cismontane Woodland, and Coastal Scrub habitats at elevations of 65 – 1,410 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of this species. The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Ribes viburnifolium Santa Catalina Island Currant	Rank 1B.2/S2?/-/-	Found in canyons within Chaparral and Cismontane Woodland habitats at elevations of 100 – 1,150 feet.	N	U	There are no Chaparral or Cismontane Woodland habitats within the study area. Also, the study area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of this species. The species was searched for but was not observed.
Scrophularia villosa Santa Catalina Figwort	Rank 1B.2/S3/-/- CA Endemic	Grows in rocky canyons in Chaparral and Coastal Scrub habitats at elevations of 150 – 1,675 feet.	N	M	Although the study area contains Coastal Scrub habitat, the area is a gentle, south-facing slope, that does not contain rocky canyons. However, the closest CNDDB record is 0.4-mile to the southeast near Black Jack Mountain (CDFW, 2023). The species was searched for but was not observed.
Senecio aphanactis Chaparral Ragwort	Rank 2B.2/S2/-/-	Found in Chaparral, Coastal Scrub, and Cismontane Woodland habitats at elevations of 50 - 2,625 feet.	N	U	Although there is Coastal Scrub within the study area, the only CNDDB record of this species on the island is at Avalon from a 1901 collection (CDFW, 2023). The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Sibara filifolia Santa Cruz Island Winged-Rockcress	Rank 1B.1/S2/-/FE CA Endemic	Grows on rocky, volcanic soil on shady slopes within Coastal Scrub habitat at elevations of 195 – 1,000 feet.	N	U	Although there is Coastal Scrub habitat within the study area, the area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of this species. The species was searched for but was not observed.
Solanum wallacei Wallace's Nightshade	Rank 1B.1/S2/-/-	Grows on rocky sites in canyons within Chaparral and Cismontane Woodland habitats at elevations of 10 – 1,345 feet.	N	U	There are no Chaparral or Cismontane Woodland habitats within the study area. The species was searched for but was not observed.
Suaeda taxifolia Woolly Seablite	Rank 4.2/S4/-/-	Found along the margins of Coastal Salt Marshes at elevations of 0 - 165 feet.	N	U	There are no salt marshes within the study area located just south of the Catalina Airport. The species was searched for but was not observed.

Scientific Name Common Name[2]	Sensitivity Code and Status[3]	Habitat Preference	Found On-site (Y or N)	Potential On-site[4]	Factual Basis for Potential
Tortula californica California Screw Moss	Rank 1B.2/S2?/-/- CA Endemic	A moss that grows on sandy soils in Chenopod Scrub and Valley and Foothill Grasslands at elevations of 35 – 4,790 feet.	N	U	There are no Chenopod Scrub or Valley and Foothill Grassland habitats within the study area. Also, there is only one CNDDB record for this species on the island, and it is located 2.2-miles to the southeast at White's Landing (CDFW, 2023). The species was searched for but was not observed.
Trifolium palmeri Southern Island Clover	Rank 4.2/S4/-/-	Found in Coastal Bluff Scrub and Valley and Foothill Grassland habitats at elevations of 35 – 590 feet.	N	U	There are no Coastal Bluff Scrub or Valley and Foothill Grassland habitats within the study area. Also, the study area is located just south of the Catalina Airport at elevations ranging between 1,490 – 1,560 feet which is higher than the known elevations of this species. The species was searched for but was not observed.

72 Species

[1] This plant list was generated by searching all four quads on Catalina Island using the search function of the on-line California Native Plant Society (CNPS) inventory. This list was augmented with plants from the search of the four quads on Catalina Island on the California Natural Diversity Data Base (CNDDB) and a newly identified plant not yet in either database, Catalina Cryptantha, was also added to the list.
[2] The Common Names were taken from Baldwin, B.G., Goldman, D.H., Keil, D.J., Patterson, R., Rosatti, T.J., and Wilken, D.H. eds. 2012. The Jepson Manual Vascular Plants of California, 2nd Edition. University of California Press, Berkeley, xxii + 1568 pp.
[3] The first line in the "Sensitivity Code and Status" column shows the California Rare Plant Rank with threat code extensions/the state ranking of the California Natural Diversity Database (CNDDB) with the threat rank extension/the California state threatened and endangered status code/the federal threatened and endangered status code. The second line in the "Sensitivity Code and Status" column identifies whether the species is a California Endemic as identified by the CNPS or a Santa Catalina Island Endemic as identified by the Catalina Island Conservancy or neither (blank second line). Following is a key to the codes in the table.

Key to the California Rare Plant Ranking System

Rank 1A — Presumed extirpated or extinct in California
Rank 1B — Plants rare, threatened or endangered in California and elsewhere
Rank 2A — Plants presumed extirpated in California but common elsewhere
Rank 2B — Plants rare, threatened or endangered in California but common elsewhere
Rank 3 — Plants about which more information is needed; a review rank
Rank 4 — Uncommon in California (a watch rank)

Key to the California Rare Plant Rank Threat Code Extensions

.1 — Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 — Moderately threatened in California (20-80% occurrences threatened/moderate degree and immediacy of threat)
.3 — Not very threatened in California (<20% of occurrences threatened/low degree and immediacy of threat or no current threats known)

Key to the State Ranking of the CNDDB

S1 — Critically Imperiled
S2 — Imperiled
S3 — Vulnerable
S4 — Apparently Secure
S5 — Secure
S#S# — Range rank used to indicate any range of uncertainty S?
— Inexact or uncertain numeric rank
SX — All sites in California are extirpated

State and Federal Threatened and Endangered Species Status Codes

CR — State of California listed as rare
CE — State of California listed as endangered
CT — State of California listed as threatened
PT — Proposed for listing as Threatened under the Federal Endangered Species Act
PE — Proposed for listing as Endangered under the Federal Endangered Species Act
FC — Candidate for listing under the Federal Endangered Species Act
FE — Designated Endangered under Federal Endangered Species Act
FT — Designated as Threatened under the Federal Endangered Species Act

[4] The "Potential On-site" column assesses the potential for the species to occur on the subject property given the known habitat preferences and distribution of that species. The codes used in this column are defined as follows:

Observed — Individuals of this species were found within the bounds of the site
H — The potential for occurrence is "high". Habitats on-site are considered suitable for the species, and the species is known from the immediate vicinity.
M — The potential for occurrence is "medium". Habitats and conditions on-site are considered possible for the species.
L — The potential for occurrence is "low". The habitats present on-site are marginal for the species and/or extremely limited in extent. In other words, the species is not anticipated, but its occurrence cannot be precluded.
U — The potential for occurrence is "unlikely". The habitat requirements of the species are not present on the subject property.

[:\1946-Sensitive Plant List new.doc]

Table 4

Sensitive Wildlife Species Known to Occur on Santa Catalina Island[1]

Scientific Name Common Name	Sensitivity Code and Status[2]	Habitat Preference	Found On-site (Y or N)	Potential On-site[3]	Factual Basis for Potential
Mollusks					
Haplotrema catalinense Santa Catalina Lancetooth	-/-/-	A terrestrial snail found under rocks and, to a lesser extent, leaf litter.	N	U	The only CNDDB record has no observation date or location (CDFW, 2023). However, according to Magney (2016), there are no observation records in the vicinity of the study area. The species was searched for but was not found.
Pristiloma shepardae Shepard's Snail	-/-/-	Usually found in moist leaf litter of Coastal Scrub habitat.	N	U	According to Magney (2016), the only location on the island is in a canyon behind the Avalon Power Plant. The species was searched for but was not found.
Radiocentrum avalonense Catalina Mountainsnail	-/-/-	Found in Coastal Scrub habitat dominated by *Salvia* and *Opuntia*. Known only from the southeast end of Catalina.	N	U	The study area is located just south of the Catalina Airport near the middle of the island approximately 8-miles from the known occurrence of this species (CDFW, 2023). The species was searched for but was not found.

Scientific Name Common Name	Sensitivity Code and Status[2]	Habitat Preference	Found On-site (Y or N)	Potential On-site[3]	Factual Basis for Potential
Sterkia clementina San Clemente Island Blunt-top Snail	-/-/-	Found in Coastal Scrub habitat on the undersides of rocks or the soil beneath *Mesembryanthemum* sp.	N	U	The only occurrence of this species on Catalina Island is within the Santa Catalina South quad, not the Santa Catalina North quad in which the study area occurs. Also, no *Mesembryanthemum* sp. was identified within the study area. The species was searched for but was not found.
Insects					
Cicindela hirticollis gravida Sandy Beach Tiger Beetle	-/-/-	Found in Coastal Dunes in lightcolored sand in the upper zone.	N	U	There are no Coastal Dunes within the study area located just south of the Catalina Airport. The only CNDDB record on Catalina Island is a historical record. This species is considered to be extirpated on Catalina (CDFW, 2023). The species was searched for but was not found.
Coelus globosus Globose Dune Beetle	-/-/-	Found in Coastal Dunes in foredunes and sand hummocks where it is most common beneath dune vegetation.	N	U	There are no Coastal Dunes within the study area located just south of the Catalina Airport. The only CNDDB record is from a 1976 publication (CDFW, 2023). The species was searched for but was not found.

Scientific Name Common Name	Sensitivity Code and Status[2]	Habitat Preference	Found On-site (Y or N)	Potential On-site[3]	Factual Basis for Potential
Reptiles					
Thamnophis hammondii Santa Catalina Garter Snake	-/-/-	Associated with Marsh, Swamp, Riparian Scrub, Riparian Woodland, and Wetland habitats.	N	U	There are no wetland habitats within the study area. The closest CNDDB record is ½-mile to the southeast in Cottonwood Canyon (CDFW, 2023). The species was searched for but was not found.
Mammals					
Corynorhinus townsendii Townsend's Big-eared Bat	-/CC/-	Found in a wide variety of habitats, but it is most common at mesic sites. Roosts in the open, hanging from walls and ceilings.	N	U	The study area is not a mesic site. The closest CNDDB record is 1.5miles to the southeast at White's Landing from 1941 (CDFW, 2014). This species is highly sensitive to human disturbance due to its roosting habits. Given the location of the study area just south of the Catalina Airport, this species is not anticipated. The species was searched for but was not found.

Scientific Name Common Name	Sensitivity Code and Status[2]	Habitat Preference	Found On-site (Y or N)	Potential On-site[3]	Factual Basis for Potential
Sorex ornatus willetti Santa Catalina Shrew	-/-/-	Found in moist areas within larger, streambearing canyons with Riparian Scrub habitat. It uses stumps, logs, and leaf litter for cover.	N	U	There are no large, stream-bearing canyons with Riparian Scrub within the study area. The species was searched for but was not found.
Urocyon littoralis catalinae Santa Catalina Island Fox	FE/CT/-	Found in Chaparral, Cismontane Woodland, and Coastal Scrub habitats with a preference for layered vegetation with a high density of perennial fruiting shrubs and rocky places for cover.	N	M	There is Coastal Scrub habitat within the study area, but there are many open areas between the larger shrubs that lack cover. The species was searched for but was not found.
Birds					
Falco peregrinus anatum American Peregrine Falcon	FDR/SDR/-	Nests on ledges (commonly in areas with cliffs) near open areas for foraging.	N	U	There are no cliffs or other ledges within the study area that are suitable for Peregrine Falcons to use as a nest site. The species was searched for but was not found.

Scientific Name Common Name	Sensitivity Code and Status[2]	Habitat Preference	Found On-site (Y or N)	Potential On-site[3]	Factual Basis for Potential
Haliaeetus leucocephalus Bald Eagle	D/CE/-	Nests in large, old growth, or dominant trees with open branches near the ocean.	N	U	There are no trees large enough to support a Bald Eagle nest. In addition, all the active Bald Eagle nests and territories are coastal (Personal communication with Dr. Peter Sharpe of the Institute for Wildlife Studies, March 31, 2023). The species was searched for but was not found.
Synthliboramphus scrippsi Scripps's Murrelet	-/CT/-	Nests in rock crevices, under bushes, in old burrows, and among man-made debris.	N	U	Breeding Scripps's Murrelets were only observed along the northwestern coast of Catalina Island (CDFW, 2023). The species was searched for but was not found.

13 Species

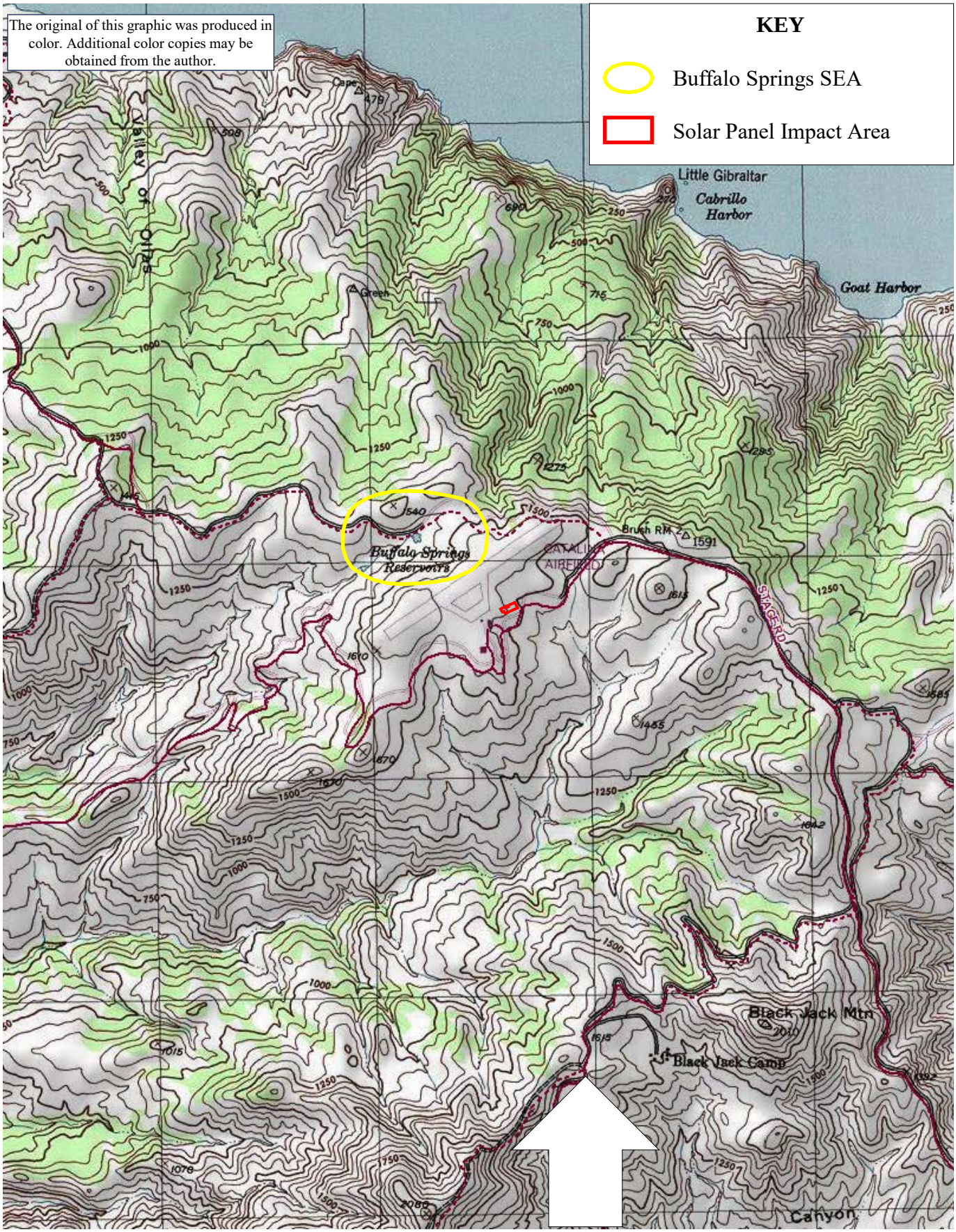
[1] This sensitive wildlife list is based on a search of the California Natural Diversity Data Base (CNDDB), and Fish and Wildlife, California Department of. 2023. California Natural Diversity Data Base: State & Federally Listed Endangered & Threatened Animals of California. The Author, Sacramento, California, 37 pp. [available at http://www.dfg.ca.gov/wildlife/nongame/list.html], edition of April 2023.

[2] The status codes are given in the sequence "federal/state/other". A "-" indicates no status at that level. The codes used are defined as follows:

FE — Federal Endangered
pFE — A petition for Federal Endangerment status has been submitted
FT — Federal Threatened
FC — Federal Candidate
FDR — Federally Delisted (Recovered)
D — Delisted from the Endangered Species Act
BCC — Birds of Conservation Concern on the BCC 2008 list within BCR 32
CE — State Endangered
CT — State Threatened
CC — State Candidate
SDR — State Delisted (Recovered)
CSC — California Special Concern species
WL — California Department of Fish and Game Watch List

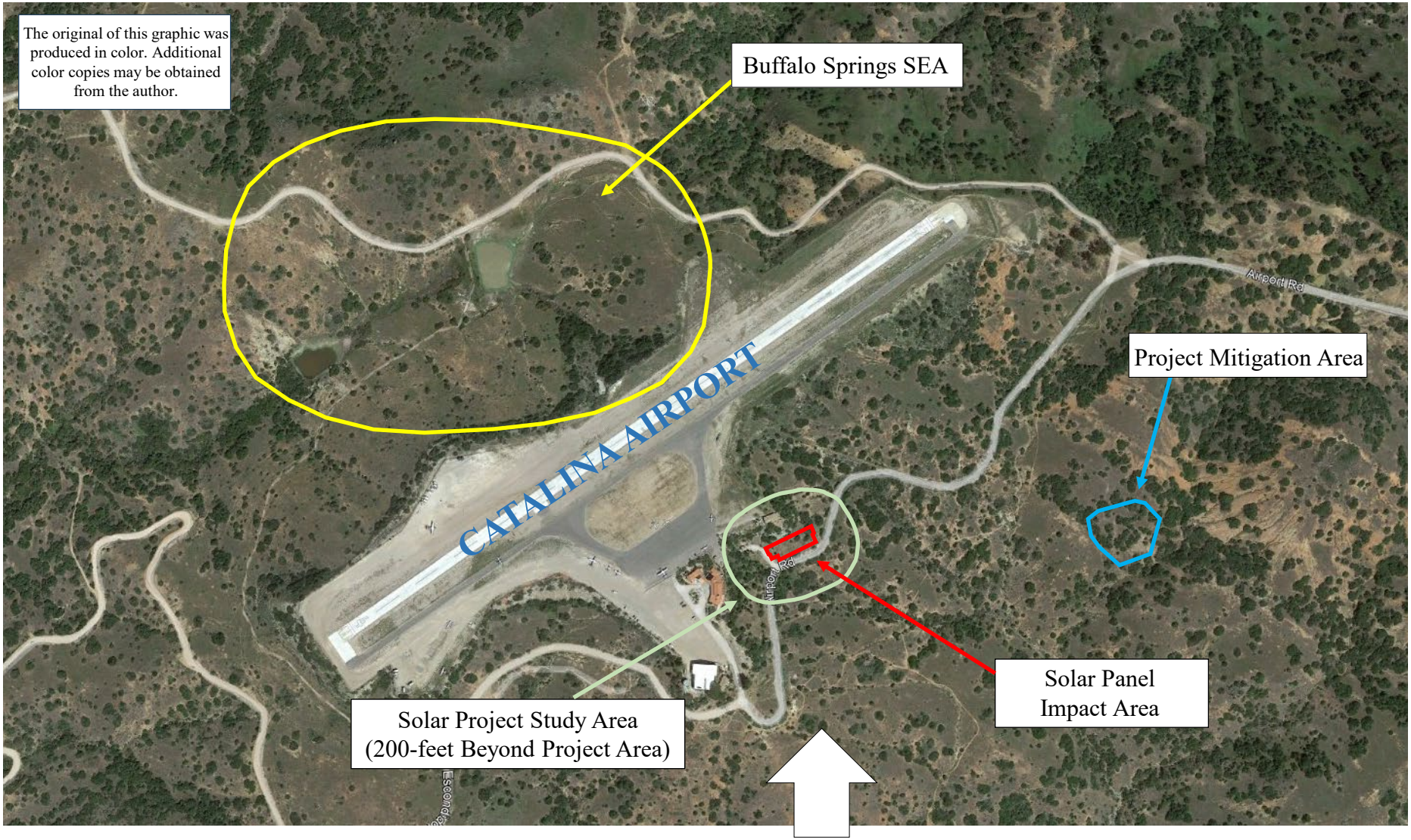
[3] The "Potential On-site" column assesses the potential for the species to occur on the subject property given the known habitat preferences and distribution of that species. The codes used in this column are defined as follows:

Observed — Individuals of this species were found within the bounds of the site
H — The potential for occurrence is "high". Habitats on-site are considered suitable for the species, and the species is known from the immediate vicinity.
M — The potential for occurrence is "medium". Habitats and conditions on-site are considered possible for the species.
L — The potential for occurrence is "low". The habitats present on-site are marginal for the species and/or extremely limited in extent. In other words, the species is not anticipated, but its occurrence cannot be precluded.
U — The potential for occurrence is "unlikely". The habitat requirements of the species are not present on the subject property.



Cummings Environmental Job Number 1946.CAT 28 May 2025 Scale: 1-inch = 2,000-feet [:\1946-Fig-1-rev.pptx]

Cummings Environmental	**Solar Panel Impact Area Shown in Relation to the Buffalo Springs SEA on the U.S.G.S. 7½-min Santa Catalina North Quad Map** [Base Map Created with TOPO!®© 2006 National Geographic; ©2005 Tele Atlas]	**Figure 1**

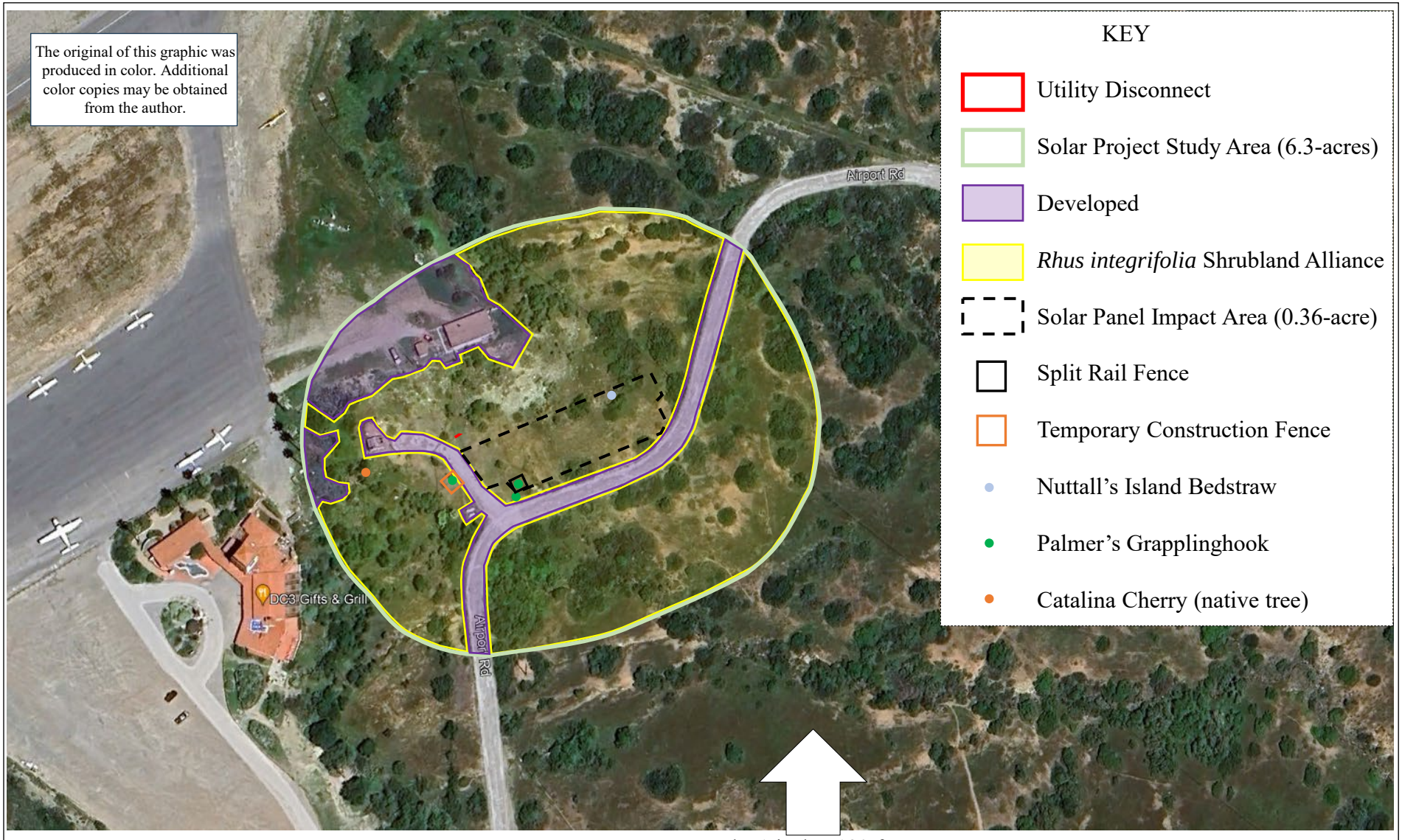


Cummings Environmental Job Number 1946.CAT 21 November 2025 Scale: 1-inch = 600-feet [:\1946-Fig-2-rev6th.pptx]

Cummings Environmental

Solar Project Study Area and Solar Panel Impact Area in Relation to Buffalo Springs SEA, Project Mitigation Area, and Catalina Airport Shown on an Aerial Photo [Base Photo © 2023 TerraMetrics; Imagery Date 4/2022]

Figure 2

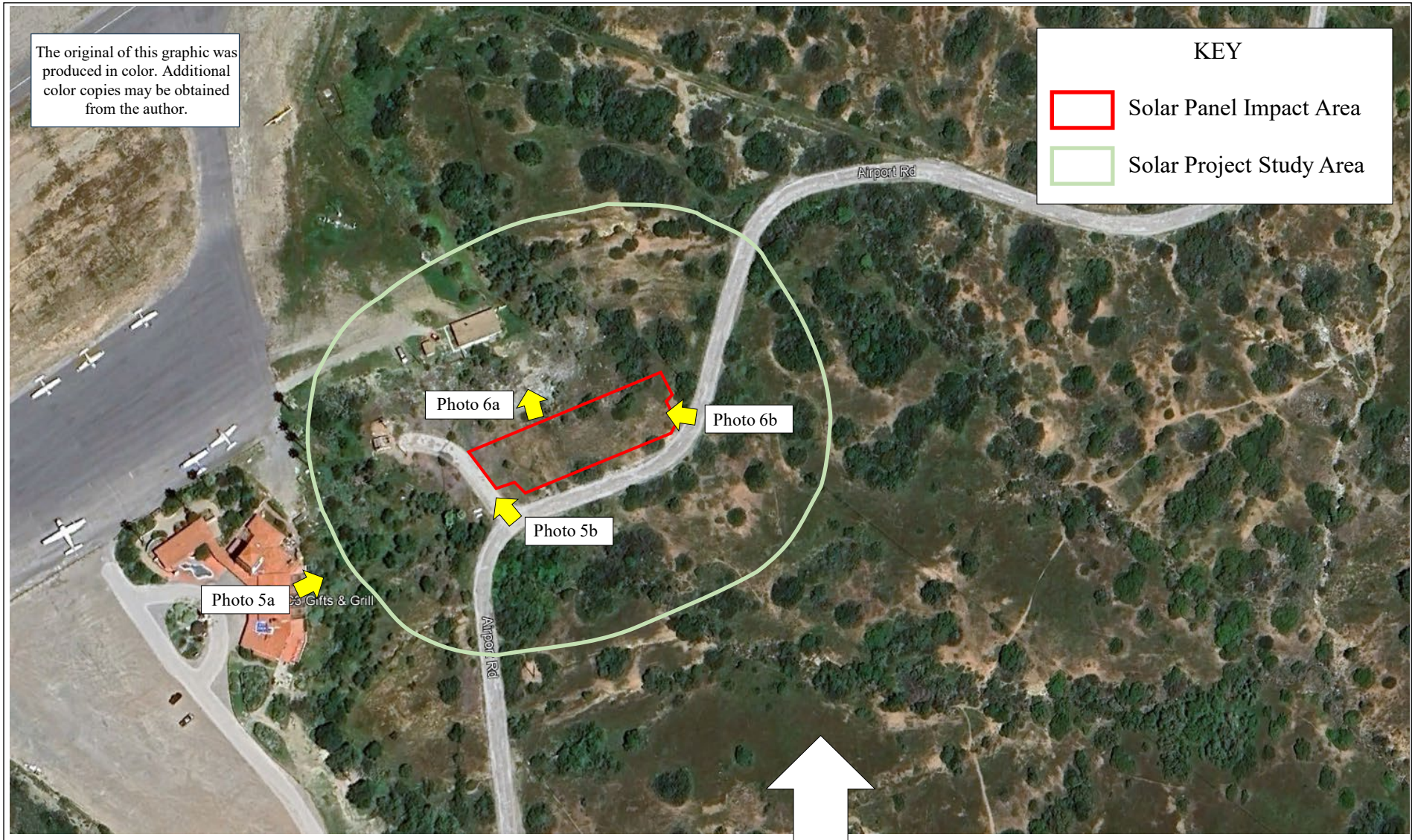


Cummings Environmental Job Number 1946.CAT 5 May 2025 | Scale: 1-inch = 180-feet | [:\1946-Fig-3rev5th.pptx]

Cummings Environmental

Vegetation Map, Sensitive Species, and Tree Locations at the Catalina Airport Solar Project Study Area Shown on an Aerial Photo
[Base Photo ©2024 Airbus; Imagery Date 4/18/2023]

Figure 3



Cummings Environmental Job Number 1946.CAT 28 May 2025

Scale: 1-inch = 180-feet

[:\1946-Fig-4rev3rd.pptx]

Cummings Environmental

Photo Point Locations For the Following Photos in Figures 5 and 6 at the Solar Project Study Area and Solar Panel Impact Area Shown on an Aerial Photo [Base Photo © 2024 Airbus, Imagery Date 4/18/2023]

Figure 4

The original of this graphic was produced in color. Additional color copies may be obtained from the author.

Cummings Environmental Job Number 1946.CAT 5 May 2025 [:\1946-Fig-5-rev.pptx]

Cummings Environmental	**Site Photos: Photo 5a (top) of Solar Project Study Area From the Airport in the Sky Patio; Photo 5b (bottom) of Abandoned Utility Road**	**Figure 5**

The original of this graphic was produced in color. Additional color copies may be obtained from the author.

Cummings Environmental Job Number 1946.CAT 5 May 2025 [:\1946-Fig-6-rev.pptx]

Cummings Environmental	**Site Photos: Photo 6a (top) of Rocky Slope to the North of the Solar Panel Impact Area; Photo 6b (bottom) of Solar Panel Impact Area Taken From Airport Road**	**Figure 6**

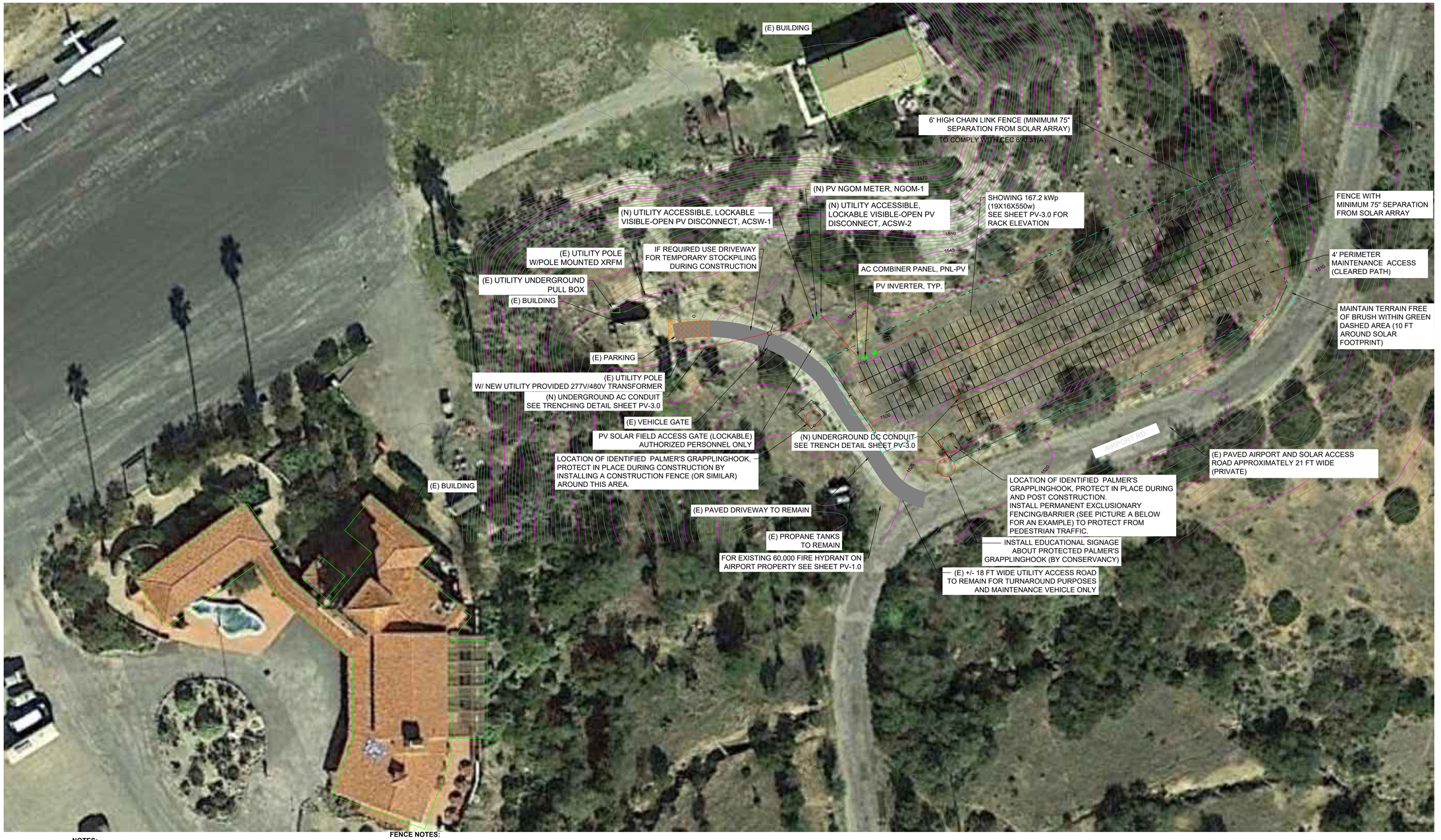
Cummings Environmental Job Number 1946.CAT 25 May 2023 [:\1946-Fig-7.pptx]

Cummings Environmental	**Site Photos: Top Photo of Nuttall's Island Bedstraw; Bottom Photo of Palmer's Grapplinghook**	**Figure 7**

Appendix A

Drawing No. PV-1.2 from Site Plans for the Catalina Island Conservancy Ground Mounted Solar Photovoltaic System Project

July 2025



NOTES:

1. SEE SHEET PV-1.1 FOR LOCATION OF EXISTING 60,000 GALLON FIRE HYDRANT ON AIRPORT PROPERTY WITHIN 1,000 FT OF SOLAR SITE.
2. SEE SHEET PV-3.0 FOR EQUIPMENT MOUNTING DETAILS
3. SEE STRUCTURAL SHEETS FOR GROUND MOUNT DETAILS AND FOUNDATION DETAILS
4. INSTALL (4) BOLLARDS IF THE NEW ELECTRICAL GEAR IS SUBJECT TO POTENTIAL VEHICLE DAMAGE. THE BOLLARDS SHOULD BE SPACED NOT MORE THAN 4 FT FROM EACH OTHER. IF PHYSICAL DAMAGE IS NOT A CONCERN DUE TO NATURAL BARRIERS SUCH AS GRADE CHANGE OR BOULDERS, BOLLARDS MAY NOT BE REQUIRED.
5. THE CONSTRUCTION SITE WILL UTILIZE A WATER TRUCK FOR ITS LIMITED WATER NEEDS. THERE WILL BE NO BUFFALO TANKS. ALL STORED WATER AT THE SITE MUST BE COVERED/LIDDED AT ALL TIMES TO AVOID DROWNING OF ISLAND FOXES OR OTHER WILDLIFE.

FENCE NOTES:

1. 6 FT HIGH CHAIN LINK FENCE TO BE INSTALLED AT NO LESS THAN 6 FT SEPARATION FROM NEAREST SOLAR PV PANELS PER LAYOUT ABOVE.
2. PROVIDE 8"-10" GAPS UNDER THE FENCE WHERE FEASIBLE TO ALLOW FOR MIGRATION OF FOXES. INSTALL A HORIZONTAL CROSS BAR AT THE LOWER EDGE OF THE FENCE TO PREVENT FOXES FROM GETTING CAUGHT AT THE LOWER FENCE HOOKS.
3. FENCE IS REQUIRED TO PROTECT UNAUTHORIZED PERSONNEL AND BISON FROM ENTERING THE SITE, DAMAGING THE SITE AND POSSIBLY CAUSING WILD FIRES (California Code CEC 690.31 (A)).
4. FENCE ALSO DELINEATES 10 FT BRUSH CLEARANCE DISTANCE FROM SOLAR INSTALLATION.
5. TOTAL AREA OF FENCED IN AREA: 15,615 sq.ft, TOTAL LENGTH OF FENCE 591 FT.

STOCK PILE NOTES:

USE EXISTING DRIVEWAY FOR TEMPORARY STOCKPILING OF SOIL OR ROCKS IF REQUIRED.

MAINTENANCE NOTES:

1. THE PROPOSED SOLAR PANELS ARE INSTALLED AT 15 DEGREE TILT CREATING NEAR OPTIMAL SELF CLEANING PROPERTIES UTILIZING NATURAL RAIN AND CONDENSATION. IN THE EVENT THAT ADDITIONAL CLEANING IS DESIRED, PURE DEIONIZED WATER SHALL BE USED AND NO CHEMICALS OR DETERGENTS ARE ALLOWED TO BOTH, PROTECT THE ENVIRONMENT AND THE SOLAR PANEL COATING.

LEGEND

- 5' WIDE CLEARED PERIMETER MAINTENANCE ACCESS
- PERMANENT 6' HIGH CHAIN LINK FENCE (typically also marking 10' brush clearance area)
- 10' BRUSH CLEARANCE
- EXCLUSIONARY FENCING TO PROTECT PALMER'S GRAPPLINGHOOK INSTALL PRIOR TO START OF CONSTRUCTION

SITE PLAN
Scale: 1"=20'

PROJET SITE PLAN
1" = 20'

PROJECT HOST:
Catalina Island Conservancy

CATALINA ISLAND CONSERVANCY
708 Crescent Ave.
Avalon, CA 90704

EPC
SATTLER SOLAR AND ELECTRICAL CONTRACTORS
4770 Del Mar Ave. San Diego, CA
TEL. +1 619.880.0445 www.sattlersolar.com
Lic # 1017484

DATED: 01/30/24
ERIK SATTLER, SATTLER SOLAR INC. LIC. # 1017484 (C10)

PERMITTING AND SOLAR CONSULTANT:
GSR ENERGY
HTTPS://WWW.GSR-ENERGY.COM/

CATALINA ISLAND CONSERVANCY
125 kW (AC) SOLAR PV
4550 U AIRPORT ROAD
AVALON, CA 90704

Revision	Date
90% CONSTRUCTION DOCUMENTS	10/23/2023
PLAN CHECK #4	1/30/2024
BIOLOGIST REPORT REVISION	3/15/2024
SCE REQUESTED REVISIONS	7/08/2024
FENCE ALIGNMENT REVISED	7/25/2024
MAX. SPAN BETW. POSTS UPDATE	11/21/2024
SOLAR PANEL & INVERTER UPDATE	12/01/2024
REVISED NOTES (SEATAC)	7/25/2025

Date	07/25/2025
Job No.	1511
Drawn By	LS
Checked By	ES
Scale	

CONSTRUCTION DOCUMENTS

Drawing Title

SOLAR INSTALLATION PROJECT LAYOUT

Drawing No.

PV–1.2

Appendix B

Catalina Island Mitigation Measures for the Airport Solar Project

Prepared by the Catalina Island Conservancy Conservation Department

November 2025

Catalina Island Mitigation Measures for the Airport Solar Project

Prepared by the Catalina Island Conservancy Conservation Department, with components from the Habitat Restoration and Monitoring Plan developed by Land IQ

November 2025

Contents

Executive Summary

Mitigation for the Airport Solar Project

There is a proposed project on Catalina Island that requires mitigation for impacts to biological resources: the Catalina Island Conservancy Airport Solar Project (Airport Solar Project) (Project No. PRJ2022-004233). The purpose of this report is to describe how one high priority restoration area initiated by the Catalina Island Conservancy (Conservancy) can serve as mitigation for the Airport Solar Project. The Airport Solar Project will be part of the larger Conservancy effort to restore the Island, the Catalina Island Restoration Project (Project). There are multiple benefits to linking the mitigation and restoration work:

1. A combined area will allow acreage beyond the bare minimum to be included;
2. Over time, the proposed 10-acre restoration area with 0.81 acres of mitigation is in this location can be connected to a much larger Conservancy restoration plan area, resulting in even greater restored habitat connectivity.

Introduction

The Conservancy proposes to create a 10-acre restoration area with 0.81 acres of mitigation that will provide mitigation for the Airport Solar Project and include an additional 9.19 acres of restoration area. The Conservancy's airport solar project requires a mitigation area of at least 0.81 acres (Exhibit 1). The Conservancy proposes to set aside a 9.19-acre area where preservation and landscape restoration efforts can be implemented within an SEA to enhance mitigation for the Airport Solar Project.

The 10-acre area proposed serves as restoration for the project as shown in Figure 1.

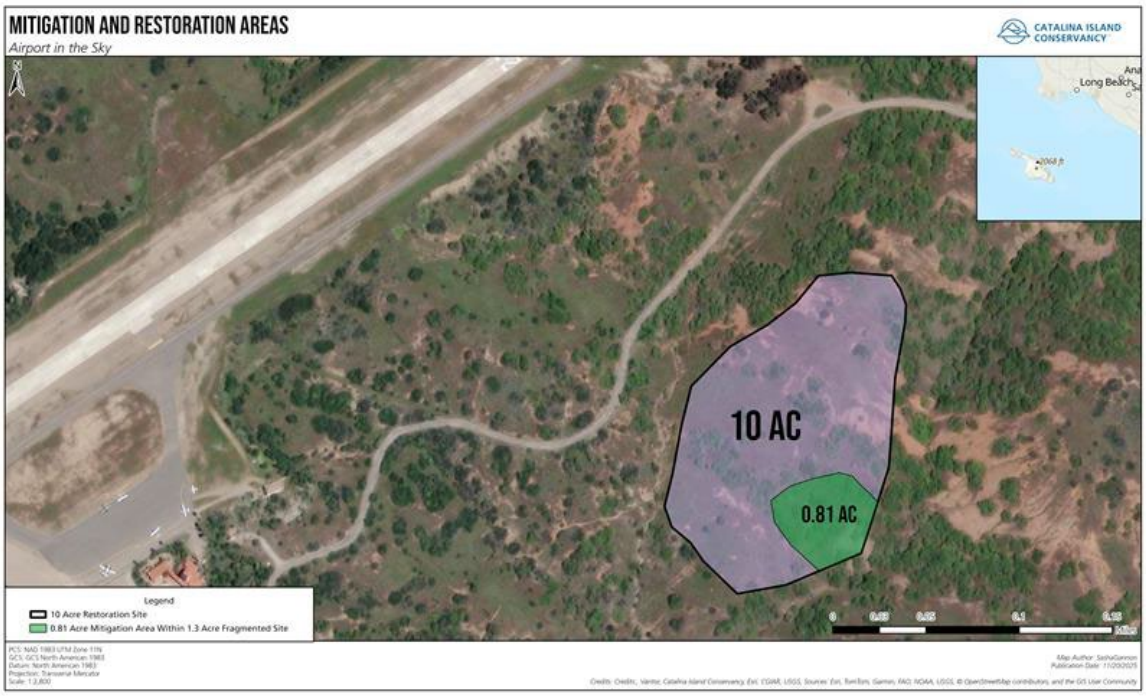


Figure1. Proposed 0.81-acre mitigation area (green polygon) withing a 10-acre planned restoration area (purple polygon). Note- the 0.81-acre site falls within a fragmented 1.3-acre area (green polygon) that contains mature island scrub oaks (*Quercus pacifica*).

Proposed restoration activities will be phased over time. The Conservancy will start by fencing 10 acres to start intensive herbicide applications to reduce the annual invasive grasses on the landscape. Activities needed to provide mitigation, and methods proposed are described below.

The Catalina Island Restoration Project (Project) aims to restore ecological integrity on Santa Catalina Island, 88 percent (42,135 acres) of which is owned and managed by the Catalina Island Conservancy (Conservancy) in Los Angeles County, California. The Project focuses on mitigating threats posed by invasive plant species, human-caused fire ignition, and a changing climate, which have collectively led to biodiversity loss, erosion, decreased water capture, and reduced habitat quality. The Conservancy plans to begin the Project in 2026 and is committed to continuing it through 2056. This document covers the first ten years of the Project and a new workplan will be developed in 2036. A report on the Project will be available in 2031.

The Project encompasses all the Conservancy land in unincorporated LA County, which is roughly 88% (approximately 17,000 hectares or 42,087 acres) of the island (approximately 19,400 hectares or 47,992 acres total). The City of Avalon has 1,409 land parcels comprised of public and private landowners, totaling approximately 700 hectares, or 1,809 acres. Outside Avalon, in addition to the Conservancy, there are five

other private landowners: Santa Catalina Island Company (15 parcels, including El Rancho Escondido and Two Harbors, totaling approximately 1,600 hectares or 3,986 acres); two private landowners (two parcels totaling approximately 30 hectares or 73 acres); Southern California Edison (11 parcels totaling approximately 10 hectares or 21 acres); University of Southern California (USC Wrigley Institute for Environment and Sustainability [WIES] Dornsife Wrigley Marine Science Center, approximately 5.6 hectares or 14 acres).

Existing Conditions and Project Impacts

Project Impact

The purpose of the Project is to restore the ecological integrity of Catalina Island by protecting and enhancing the biodiversity of native plants and wildlife habitats. The ecosystem of Catalina Island has been negatively impacted by a history of nonnative ungulates reducing vegetation cover and selectively browsing on rare and endemic plants, as well as the spread of invasive plant species that outcompete native plants in areas degraded by past ranching practices. These factors have led to a loss of biodiversity, extirpation of native species, diminished climate resiliency, increased soil erosion, decreased water capture, and reduced wildlife habitat quality.

Geology

Santa Catalina Island's geology dates back over 200 million years, composed mainly of metamorphic rocks formed by ancient geological events. Intense heat and pressure transformed surrounding materials, creating the island's unique foundation. Since its formation, the island has experienced significant erosion, volcanic activity, and changing sea levels, contributing to the diverse landscape we see today.

As summarized in the recent USDA Natural Resources Conservation Service (2008) Soil Survey of Catalina Island, around 65 million years ago, at the end of the Cretaceous period, the rate of subduction and uplift slowed significantly. In the following 40 million years, erosion outpaced any significant geological uplift, carving out the landscape and depositing silt and sandstones across other islands and along the California coast. Approximately 30 million years ago, in the Oligocene period, the California borderland's transform fault system emerged. As tectonic plates transitioned from a head-on collision to the lateral motion now parallel to the coast, numerous faults formed, causing extensive land repositioning. This period marked the beginning of another phase of volcanic activity, which lasted from about 23 million to 5 million years ago, during the Miocene period. During the Miocene Epoch, the portion of Catalina Island we see today was submerged beneath the ocean. Evidence of underwater andesite extrusion sits adjacent to a large quartz diorite pluton on the island's eastern end, labeled as map code “Tmqd” on Figure 2.

Catalina Island comprises two primary geological provinces: the igneous and metamorphic formations. The igneous province of rock extends from the eastern end to

the western slopes of Black Jack Mountain and Mount Orizaba, marked by the map codes "Tv" and "Tmqd" on Figure 2-1. This younger igneous layer overlies the basement metamorphic formation, spanning from Salta Verde Point in the south to the western end of the island.

The basement rock consists of a mélange of metamorphic components, such as Catalina schist (blueschist and greenschist), amphibolite, serpentinite, hornblende gneiss, muscovite, and talc (USDA 2008). This assemblage, known as the Franciscan Formation, is identified by the map code "Jcs."

The igneous province is further categorized into extrusive and intrusive regions (Rowland 1984). From east of Avalon to Thompson Reservoir, intrusive igneous rock, Catalina Island pluton, quartz diorite is represented by the map code "Tmqd." Moving westward, various andesite rock, a fine-grained extrusive igneous rock that is formed when volcanic magma erupts and crystallizes outside of the volcano, encompasses prominent landmarks like Mount Banning, Mount Orizaba, and Black Jack Mountain, signified by the map code "Tv."

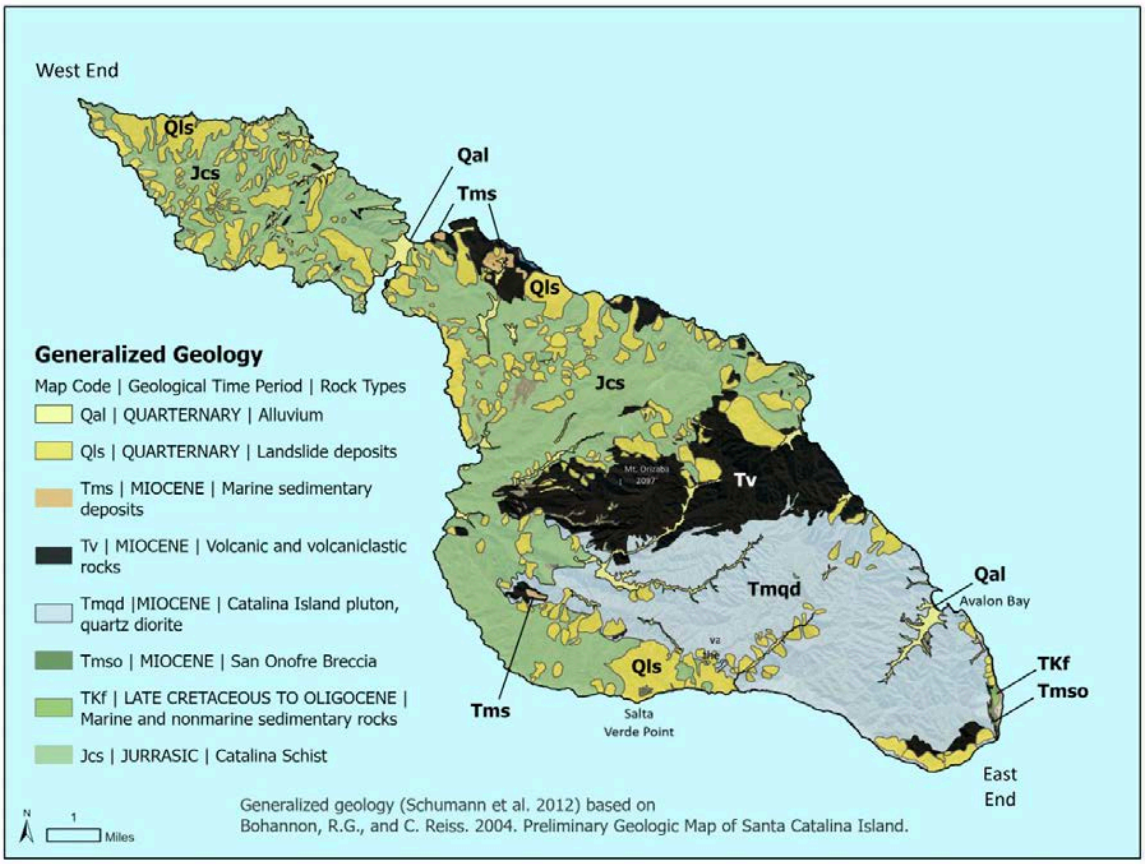


Figure 2. Generalized Geology Map for Catalina Island.

During the Quaternary Period, spanning the last 2.58 million years, numerous landslide deposits (Qal) and alluvium accumulations (Qls) formed. This period encompasses the Pleistocene and Holocene epochs, characterized by significant geological and climatic events. The Pleistocene was marked by multiple cycles of glacial growth and retreat, while the Holocene, which began 11,700 years ago, saw the final glacial retreat and the spread of humans across the globe, including to California and the California Pacific Islands. Alluvium (Qls) is found lower in the watershed in larger alluvial plains and at the Isthmus.

Less extensively found are marine sedimentary deposits (Tms), San Onofre Breccia (Tmso) (breccia is rock composed of large angular broken fragments of minerals or rocks cemented together by a fine-grained matrix), and marine and nonmarine sedimentary rocks (Tkf).

Topography

Santa Catalina Island's landscape is characterized by steep, dissected mountains, and hills, with watersheds that predominantly flow laterally towards the northeast and southwest. The island's highest point is Mount Orizaba, which reaches an elevation of 639 m (2,097 ft) while Silver Peak, located on the western end, stands at 550 m (1,804 ft) (Figure 3). The island's watershed structure exhibits an asymmetrical pattern, with longer, more gradual stream systems on the windward side, contrasting with steeper and shorter systems on the leeward side.

The topography of the island was first surveyed between 1853 and 1878 by the United States Coast Survey (USCS) and these maps are commonly referred to as “T-sheets” (see Figure 3 to Figure 5) (NOAA 2023). Land IQ used aerials from 1942 (Fairchild Aerial Surveys 1943) and 1953 (Pacific Air Industries 1953) to create historic georectified photo mosaics of the island: Figure 7 and Figure 8. These surveys and historical aerials do not predate the initial impacts by invasive herbivores and ranching practices on the island. Sheep (*Ovis aries*), cattle (*Bos taurus*), and goats (*Capra hircus*) were introduced in the 1820s. However, reconstruction of the historic topography from the T-Sheets and historic aerials when compared to recent surveys may elucidate areas that may have experienced change in the past 150 years, such as recently completed by Longcore and Ethington (2023) for selected indigenous village sites in southern California.

The north-facing, channel-facing side of the island is generally leeward, along with the north-facing slopes of Middle Canyon and Bullrush Canyon (Figure 9). These valleys bend westward due to active tectonic forces influencing the southeastern portion of the island (Legg et al. 2004). Major valleys on the windward side, such as Avalon Canyon, Middle Canyon, Cottonwood Canyon, Cape Canyon, Silver Canyon, and Bullrush Canyon, are characterized by significant alluvial deposits, narrow hillslopes, and flood deposits (USDA 2008).

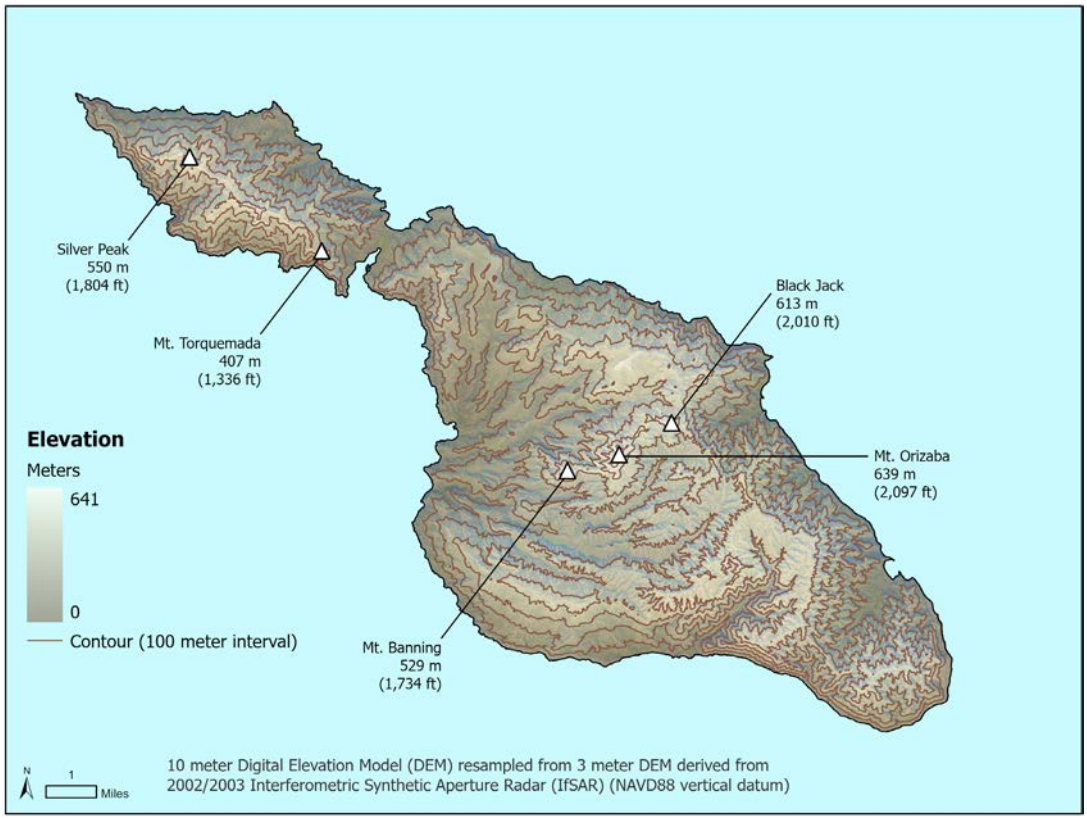


Figure 3. Elevation.

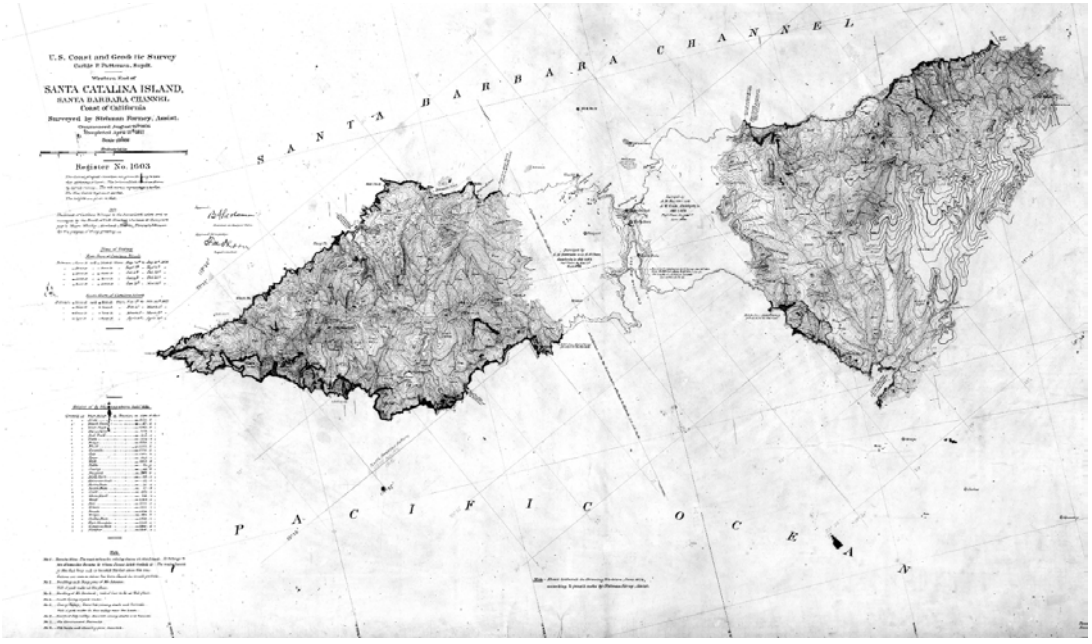


Figure 4. Western End of Santa Catalina T-Sheet 1603, Surveyed 1876 to 1877 (USDA 2023).

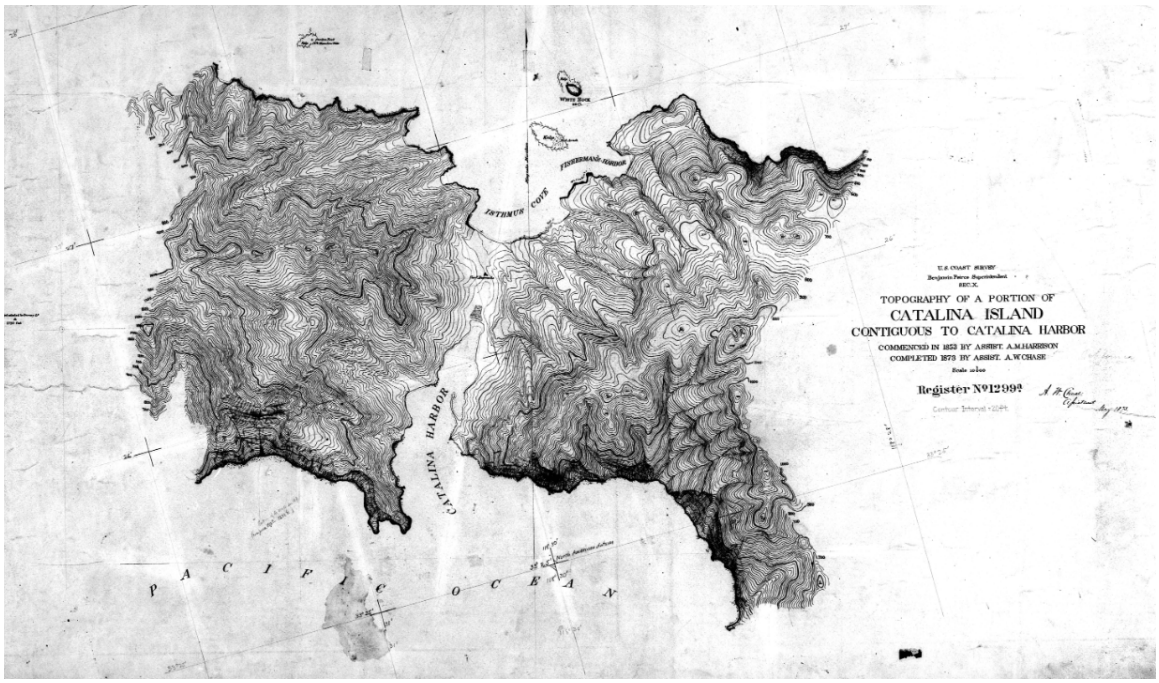


Figure 5. Western End of Santa Catalina T-Sheet 1603, Surveyed Between 1853 to 1873 (USDA 2023).

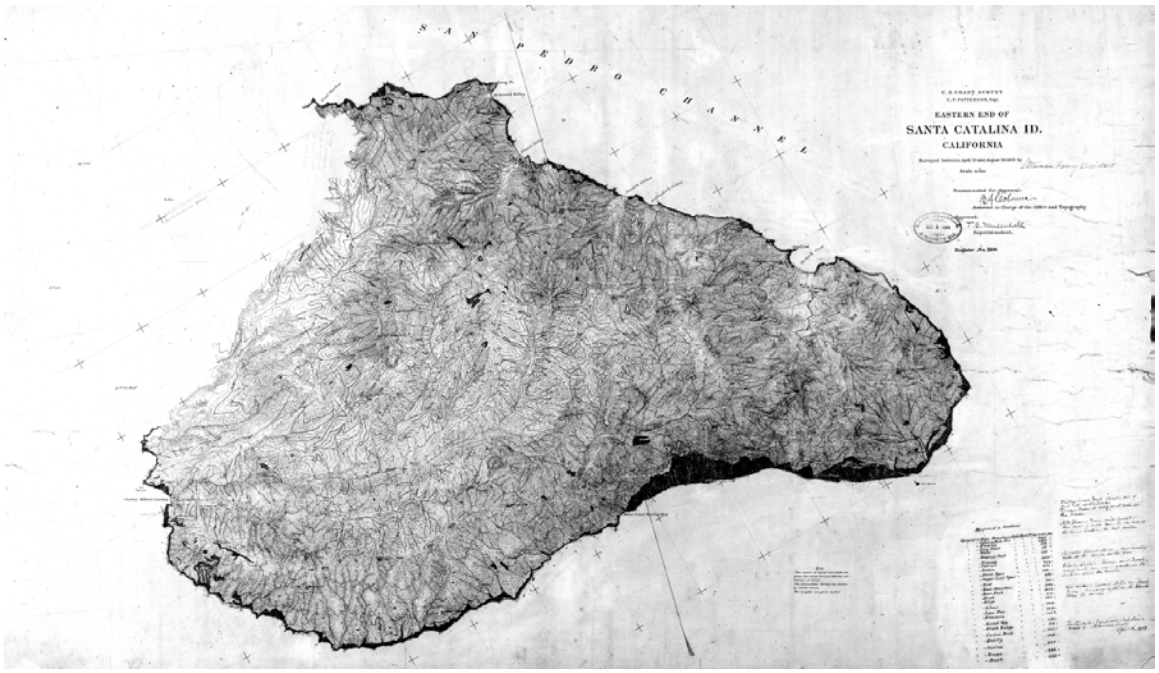


Figure 6. Eastern End of Santa Catalina T-Sheet 1603, Surveyed in 1878 (USDA 2023).

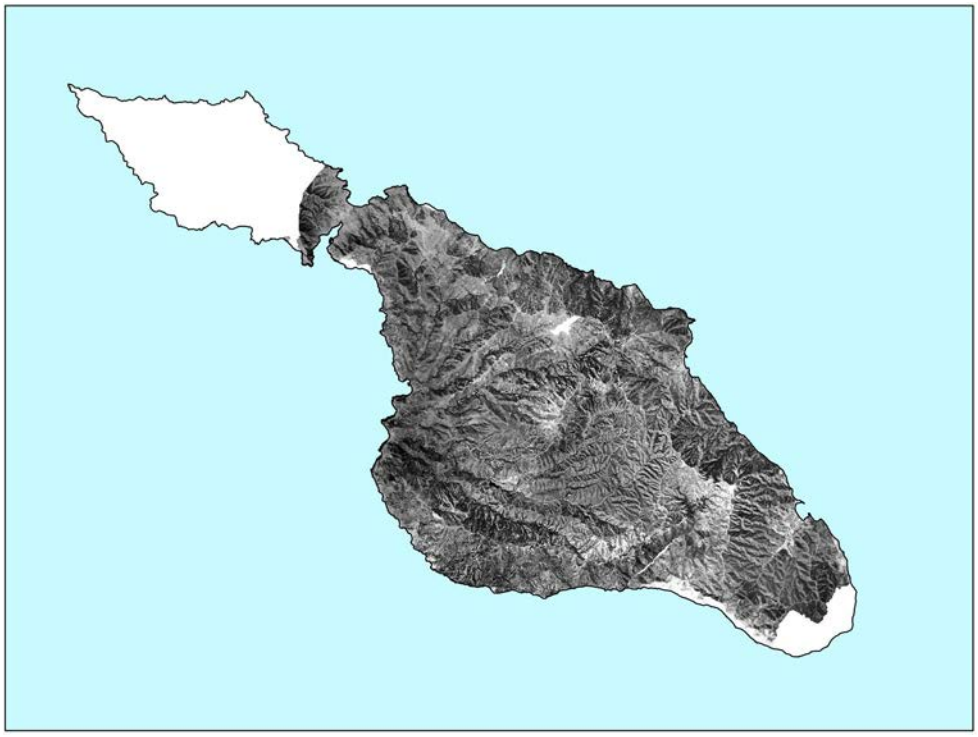


Figure 7. Aerial Photomosaic from 1943. The historic aerials (Fairchild Aerial Surveys 1943) are courtesy of UCSB Library Geospatial Collection.

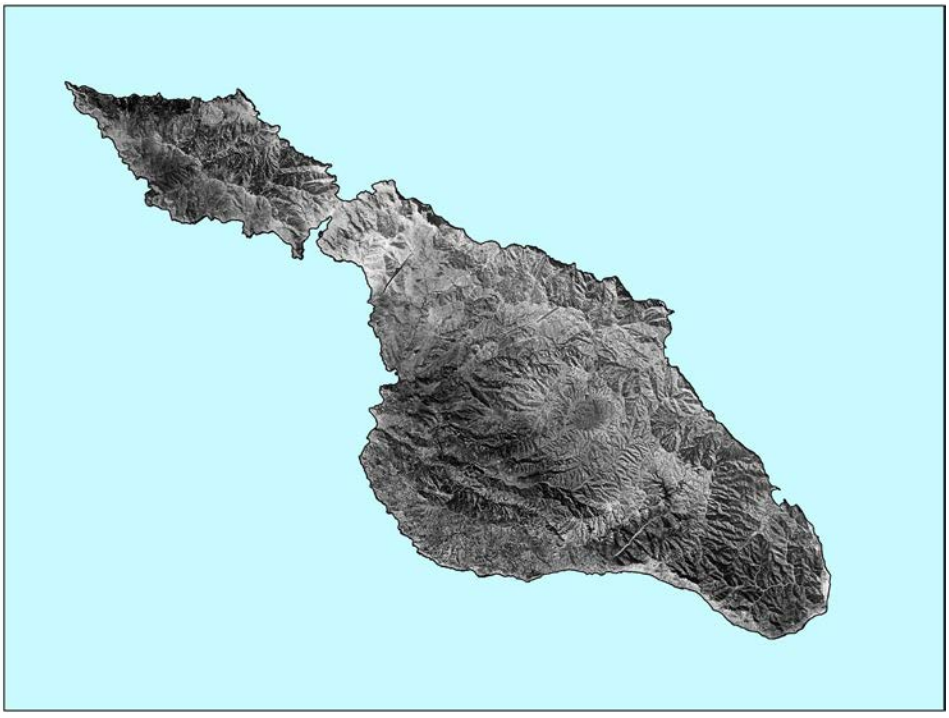


Figure 8. Aerial Photomosaic from 1953 (The historic aerials (Pacific Air Industries 1953) are courtesy of UCSB Library Geospatial Collection).

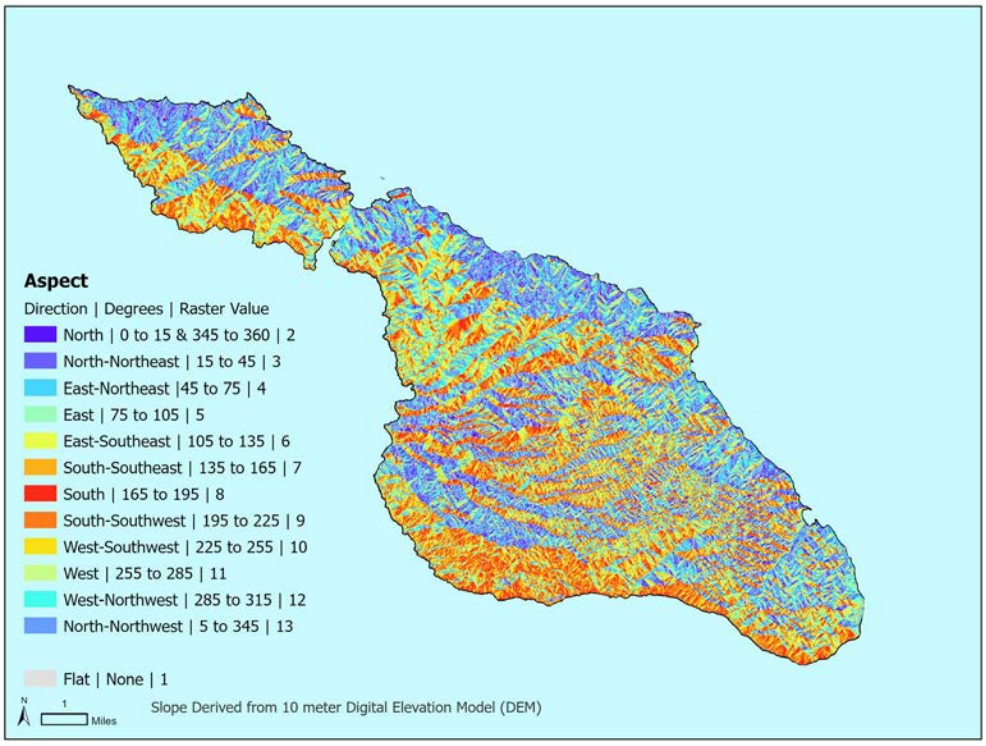


Figure 9. Aspect of Slope..

Steep side slopes (Figure 10) often terminate in narrow drainageways. In certain regions, particularly at the island's eastern end, these drainageways exhibit a distinctive pattern, forming curved, continuous S-shaped structures as they collect material from the side slopes. This unique curving feature signifies that the side slopes are eroding at a more rapid pace than the material being transported by the drainageways directly beneath them. Moreover, this characteristic is typical of the quartz-diorite parent material, which is more durable when compared to the metamorphic Catalina schist rock. Some of these drainageways are experiencing an increase in their base levels or a filling sequence, further contributing to the dynamic nature of the island's geological landscape. The northern coast has many large alluvial deposits that meet the shoreline (USDA 2008).

Human activities have significantly altered numerous drainageways across the island's valleys. Historically, various check dams and water reservoirs were constructed to support ranching operations, with many of these retaining water year-round. Examples include Cape Canyon, Buffalo Springs, and the Upper and Lower Buffalo Corral Reservoirs. There are several more unnamed dams in Middle and Cape Canyons. Middle Canyon was dammed to help maintain sufficient hydrostatic pressure in the interior aquifer, to increase the reliability of the groundwater supply for the island's municipal needs (USDA 2008). Potable water is also provided through a desalination plant.

Perennial streams and seeps can be observed throughout the island for several weeks following the rainy season, with some areas in Bullrush, Cottonwood, and Middle Canyons with surface water throughout the year, except in periods of extended drought. Echo Lake, the island's only natural lake, sits at an elevation of approximately 396 m (1,300 ft) (USDA 2008) (Figure 11).

Climate

Santa Catalina Island exhibits a Mediterranean climate featuring warm, dry summers and cool, moist winters, often accompanied by year-round fog. This climate is primarily influenced by ocean currents and mainland pressure gradients. The prevailing northwesterly winds and subtropical storms drive the ocean currents, which flow south around Point Conception and follow the California coast as it curves eastward. During summer and fall, subtropical storms push warm air and water northward over the mainland (USDA 2008).

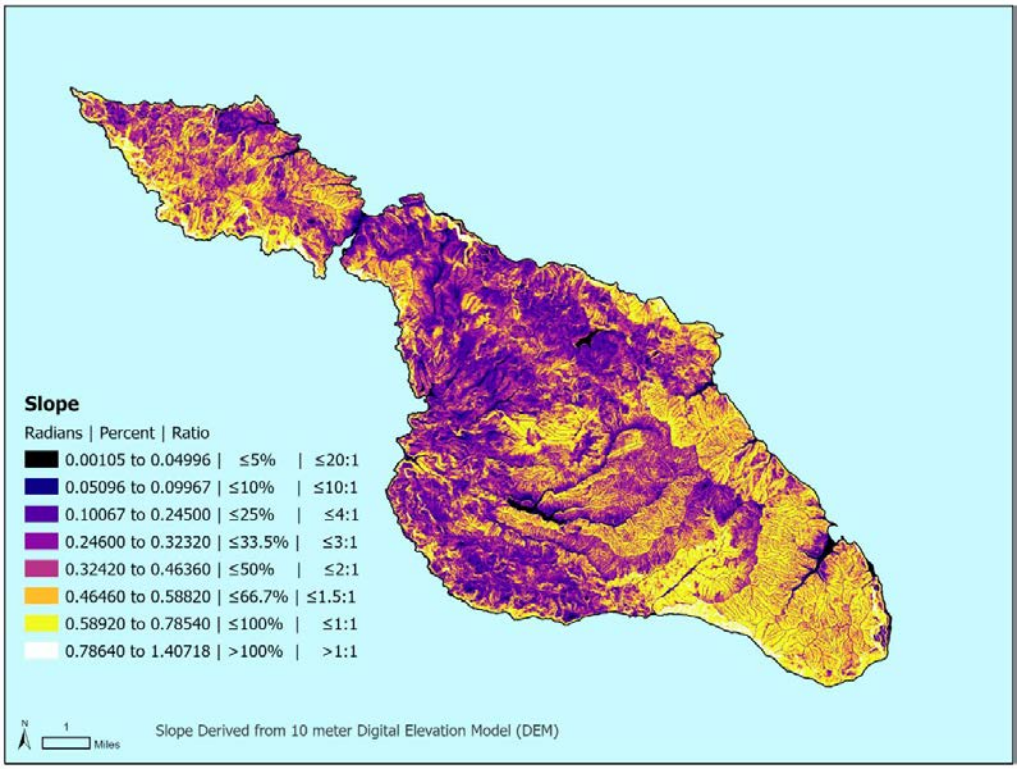


Figure 10. Slope Steepness.

Figure 11. View of Echo Lake.

The island's southern coast is often shrouded in fog as prevailing fog banks sweep in from the Pacific Ocean, while the northern leeward side remains clear. Fog layers can occur at limited elevations, creating diverse weather conditions at different altitudes. The island's topography also influences the amount of solar radiation reaching the surface, resulting in notably more mesic conditions on north-facing slopes (Paudel et al. 2016). North-facing slopes receive less sunlight and solar radiation than south-facing slopes, leading to cooler air temperatures (15 to 17°C or 59 to 63°F) and isothermic soil temperature regimes. Isothermic regimes can also be found on south-facing slopes where island woodland, island scrub oak chaparral or island chaparral provide adequate shade and cooling, creating more stable temperature conditions like those found in areas with less direct sunlight exposure. Remaining areas of the island experience thermic temperature regimes with warmer and more variable annual air temperatures (16 to 22°C or 61 to 72°F) (USDA 2008).

The interplay of topography, coastal profile, and large atmospheric pressure gradients generates the regional "coastal eddy" phenomenon, which is more pronounced around Point Conception and the northern Channel Islands. Santa Catalina Island is affected by strong northwest winds that drive onshore airflow. Thick, low fog often accompanies periods of heating and cooling when the eddy effect weakens and stabilizes under the influence of high-pressure systems over the nearby Mojave Desert (Clemesha et al. 2021).

The Channel Islands, including Santa Catalina, are subject to offshore Santa Ana winds from the northeast. These winds arise from a relative low-pressure system over the eastern Pacific Ocean near southern California and a high-pressure system over the Great Basin (Muhs et al. 2007), producing northerly and northeasterly winds across the Mojave Desert, southern California coast, and Baja California.

Santa Catalina Island has a warmer and less windy climate compared to San Miguel Island, the coolest, windiest, and foggiest of the Channel Islands. Frost occurs on all the Channel Islands but is short lived. On Santa Catalina Island, frost occurs on a few days annually, typically during brief morning periods in interior valleys, such as Bullrush Canyon, Middle Ranch Valley, and Escondido Ranch. Each winter, freezing temperatures briefly occur in these valleys and deep drainageways. Fog, although more common along the coast, can also form in low interior valleys due to local temperature inversion layers. Frost-free periods span from 355 days in interior valleys and higher peaks to 365 days in coastal areas, making the latter less susceptible to frost (USDA 2008).

Like rainfall, wind is significantly influenced by the topography of the island. Weather stations on the leeward side had average windspeeds of 0.8 to 1.1 meters per second, m/s (1.8 to 2.5 miles per hour, mph), while those on the windward side were as high as 3.1 m/s (6.9 mph) average. The location of mitigation is near the airport. The airport location, although technically on the leeward side, is located at the exposed ridge of the island and has higher average windspeeds than typical leeward location.

Soil

The soils of Santa Catalina Island are a result of the interplay between diverse geological, topographical, and climatic factors. The island's geology, which includes volcanic, metamorphic, and marine sediments, sets the stage for the formation of distinct soil types through the process of soil genesis. In combination with the island's steep topography and contrasting microclimates on its leeward and windward sides, these factors contribute to a rich mosaic of soil characteristics and properties.

Soils, coupled with geologic condition and landscape position, are critical in determining the appropriate target vegetation type and treatments for restoration especially in areas of California that have been historically disturbed and may lack clear indications of pre-European native plant communities. Soil texture is a soil characteristic that is especially valuable for understanding soil behavior and management of the land (Brady and Weil 2002).

Soil genesis is the process of soil formation and development over time, which involves the transformation of parent material into a complex and dynamic mixture of minerals, organic matter, and living organisms (Soil Survey Staff 1999). This process is driven by various soil-forming factors, including parent material, climate, topography, biological activity, and time. These factors interact in unique ways to influence the physical, chemical, and biological properties of the soil, ultimately shaping the characteristics of the resulting soil profile. The distribution and diversity of soil types found in different environments and is essential for understanding the functioning of terrestrial ecosystems and their response to environmental change.

Since 1975, the United States National Cooperative Soil Survey Program has used a systematic approach to classifying soils based on their properties and characteristics called Soil Taxonomy. This soil taxonomy framework was used to prepare the Soil Survey of Santa Catalina Island, published in 2008 (USDA 2008). There was also an unpublished Soil Survey of the island prepared by the US Soil Conservation Service in 1955, which is presented in Appendix D. The 2008 Soil Survey is a more useful document than the 1955 Soil Survey because the pre-1975 classification system could not be consistently applied by soil scientists (Ditzler and Ahrens 2006). And for the development of potential island plant species distribution models in Appendix D, the 2008 Soil Survey had more explanatory value than the 1995 Soil Survey. Out of 94 plant distribution models, the 2008 Soil Survey Map Units were a significant explanatory variable for 84 models, whereas the 1955 Soil Survey Map Units were only significant for 2 models.

Using the USDA Soil Taxonomy (Soil Survey Staff 1999), soils can be classified into several levels: order, suborder, great group, subgroup, family, and series. There are 12 soil orders, but not all occur on Catalina Island. Soil orders are frequently defined by a single dominant characteristic affecting soils in that location—for example, the prevalent vegetation (Mollisols, Histosols), the type of parent material (Andisols, Vertisols), the climate variables such as lack of precipitation (Aridisols), or the presence of permafrost (Gelisols). Also significant in several soil orders is the amount of physical and chemical weathering present (Oxisols, Ultisols, Alfisols, Inceptisols, Entisols) and/or the relative amount of soil profile development that has taken place. These soil

orders can be subdivided into suborders and great groups. Great groups are a midlevel classification point in the hierarchy of soil taxonomy.

Plant Available Water

Soil types and environmental factors play a crucial role in determining plant-available water, which in turn influences the composition of plant communities within specific ecosystems. Key soil characteristics, such as organic matter content, restrictive layers (e.g., bedrock, calcic horizon, or argillic horizon), soil depth, texture, and porosity, interact with various environmental factors to shape the distribution and composition of vegetation communities. Organic matter content affects water retention and nutrient availability, while restrictive layers can impede water infiltration and root growth. Soil depth and texture influence water storage capacity, and porosity affects water movement and drainage. These factors together determine the overall water availability for plants. Environmental factors also play a significant role in shaping plant communities. Solar radiation affects evapotranspiration rates, while slope steepness influences water runoff and erosion. Position in the watershed impacts water accumulation from stormwater runoff, horizontal water movement, or upwelling from the vadose zone due to fractured rock holding water. Fog and wind contribute to water input and moisture redistribution, while orographic influences on rainfall result in spatial variations in precipitation patterns. All these factors, in conjunction with soil characteristics, create a complex and interconnected system that defines the plant communities found in different landscapes. Understanding these relationships is essential for the effective management and conservation of ecosystems and their associated plant communities.

The extensive gulling and the infestation of invasive annual grasses in areas like at the mitigation site indicate that natural vegetative cover has been lost, which is likely to have at least impacted the topsoil, including organic matter content.

Active Restoration

The Catalina Island Restoration Project (Project) aims to restore ecological integrity on Santa Catalina Island, 88 percent (42,135 acres) of which is owned and managed by the Catalina Island Conservancy (Conservancy) in Los Angeles County, California. The Project focuses on mitigating threats posed by invasive plant species, human-caused fire ignition, and a changing climate, which have collectively led to biodiversity loss, erosion, decreased water capture, and reduced habitat quality. The Conservancy plans to begin the Project in 2026 and is committed to continuing it through 2056. This document covers the first ten years of the Project and a new workplan will be developed in 2036. A report on the Project will be available in 2031.

The first ten years of the Project aim to refine broad invasive plant treatments followed by seeding native species within an enclosed 10-acre site (proposed mitigation site). That site will be broadened to 105 acres before starting a second major restoration location. Critically, to reduce detrimental impacts from the high rate of dispersal of invasive species, active restoration will be paired with extensive biosecurity measures, such as invasive plant treatments and mortality tracking and a vaccination program for the Catalina Island fox. The Project is built on a foundation of adaptive management with two scales of monitoring occurring: 1) Island-wide and 2) active restoration focused. Together all aspects of the Project will ensure a safer and more biodiverse Catalina Island for all Landscape-Level Active Restoration

Introduction

Starting in 2026, the Conservancy plans to prepare for landscape-level restoration by beginning with its top-of-watershed approach. Restoring the upper reaches of a watershed allows for natural processes such as gravity and water and wind flow to disperse seed downhill. For any species recovery or habitat restoration work that begins while invasive Mule deer are still present, an exclosure will be necessary. The Conservancy will begin testing the application of herbicides at a landscape scale to test the efficacy of invasive seed bank reduction on the landscape. The Conservancy will then collect and begin bulking of native seeds for a low diversity cover crop plant palette, develop protocols for rare plant propagation, and continue invasive plant management.

Fence building

Since invasive Mule deer will remain on the landscape in the early stages of the Project, it will be necessary to install fencing to exclude them from mitigation and active restoration areas—particularly in areas where native seeds are expected to germinate following invasive plant treatment. This is especially important for rare endemic species that have lost their natural defenses against herbivory. If a fence is not constructed, the native seed bank could begin to

germinate and could inadvertently deplete many native plants above ground as well as in the soil seed bank. As part of the site preparation phase for long-term native habitat restoration, a targeted herbicide application strategy will be implemented across the fenced 10-acre site identified in Figure 1. This site has been selected because it is a high priority top of a watershed location identified in our internal habitat restoration analysis that would positively impact restoration efforts both downstream and Island-wide. The fence will allow for the Santa Catalina Island fox (fox), the largest native mammal, to pass through the open cells of the fence. The spacing of the cells is consistent with other fences on the island that allow collared or uncollared foxes to pass through unimpeded.

The aim is to complete the construction of the fence within the first quarter of 2026 so herbicide applications can begin afterward.

Initial Herbicide Application

The 10-acre active restoration location has a high density of invasive annual grasses, which severely limits native species recruitment and contributes to elevated wildfire risk, erosion, and degraded ecological function. Many of the planned active restoration sites have a high cover of invasive annual grasses which makes this location ideal to refine the Project's invasive plant treatment methodology. The initial herbicide treatment will consist of broadcast applications of Poast® (active ingredient: Sethoxydim), a monocot selective, post-emergent herbicide registered for use on wildland and restoration sites to control weedy C4 and C3 annual grasses, including *Brachypodium* spp., *Bromus* spp., *Avena* spp., and *Schismus* spp. All of these species have benefited from the presence of invasive Mule deer on the Island. Applicators may shift herbicide use to a similar monocot specific herbicide if needed. Poast® herbicide specifically targets grass species without significantly impacting broadleaf plants or native forbs. These monocot selective herbicides, do not contain a surfactant and will be mixed with a crop oil concentrate such as Agridex® (active ingredient: Paraffinic oil, ethoxylated sorbitan fatty acid ester, sorbitan fatty acid ester) or a methylated/modified seed oil such as Glacier-EA® (active ingredient: Methylated seed oil, Polyoxyethylene polyol fatty acid ester and Butyl lactate) as necessary based on the herbicide label instructions.

- Application Method: Herbicide will be applied using a UTV-mounted boom sprayer for efficiency and even coverage over large areas. Spray rigs are calibrated to ensure application rates are consistent with the label rates. All herbicides will be applied by trained applicators and in accordance with all California Department of Pesticide Regulation and County of Los Angeles Agricultural Commissioner regulations.
- Frequency: two or three applications per growing season, depending on precipitation timing and target species phenology, will be implemented for three consecutive years. Variable precipitation could result in fewer or greater applications if necessary. Intervals

will follow best practices to align with invasive grass emergence and seed set stages. Application will not occur during conditions that are not conducive to application (high winds, high temperatures, etc.)

- Timing: Treatments are expected to occur between February and May, depending on seasonal rainfall and grass growth stages.

To address the possible post-treatment issue of secondary invasion by non-native forbs, a randomized experimental plot design will be implemented within the 10-acre site. In plots where invasive forbs establish dominance following grass suppression (e.g., *Brassica nigra*, *Hirschfeldia incana*, *Erodium* spp., etc.), a broad-spectrum herbicide, such as glyphosate, or a broadleaf specific herbicide, such as triclopyr, may be used in accordance with label guidelines and under appropriate environmental conditions.

To evaluate the effectiveness of different herbicide treatments in controlling invasive plant species within a 10-acre exclosure, the Conservancy will use a randomized block design with replication. The experiment will compare a monocot-specific herbicide, a broad-spectrum herbicide, and a no-treatment control over three years to determine the most effective approach for site preparation in large-scale restoration.

Design Overview

- Design Type: Randomized Block Design
- Location: 10-acre exclosure
- Number of Treatments: Three
    1. Treatment A – Monocot-specific herbicide (e.g. Poast, active ingredient Sethoxydim)
    2. Treatment B – Broad-spectrum herbicide (e.g. Rodeo, active ingredient Glyphosate)
    3. Treatment C – No-treatment control
- Number of Blocks: 20
- Replication: Each treatment will be applied once per block, resulting in 20 replicates per treatment.

The 10-acre site will be divided into 20 equal-sized blocks arranged in a grid pattern, with each block measuring approximately 0.5 acres. Each block will contain three treatment plots, randomly assigned to Treatments A, B, or C. This layout ensures that environmental variation

(e.g., soil type, slope, moisture) is accounted for by distributing treatments evenly across the site. The treatments are listed below.

1. Treatment A – Monocot-specific herbicide
    - Product: Sethoxydim (Poast)
    - Application Rate: 1%–1.5% in solution
    - Adjuvant: Crop oil concentrate or methylated seed oil at 1%
    - Potential for two separate application rates (1% and 1.5%) if differences are expected to be meaningful.
2. Treatment B – Broad-spectrum herbicide
    - Product: Glyphosate (Rodeo)
    - Application Rate: 2% solution
    - Adjuvant: Approved surfactant at label rate.
3. Treatment C – Control
    - No herbicide application.
    - Standard monitoring for natural changes in vegetation cover.

Herbicide will be applied via UTV-mounted spray rig to ensure consistent coverage. Applications will follow label instructions and be conducted under suitable weather conditions to minimize drift. All applicators will hold a Qualified Applicator License (QAL) or have been trained by a Conservancy QAL holder.

Example of treatment rotation within blocks:

Block	Plot 1	Plot 2	Plot 3
1	A	B	C
2	B	C	A
3	C	A	B
…	…	…	…
20	A	C	B

All herbicide applications will be monitored annually and will rely on the monitoring plan outlined in the monitoring section of this document. The herbicide program will be monitored annually for efficacy, plant community response, and soil disturbance. Data collected will inform adaptive adjustments to:

- Application frequency and rates
- Need for subsequent herbicide treatments
- Timing of native seed introduction

All applications will comply with label requirements, pesticide handler safety standards, and reporting obligations to the LA County Agricultural Commissioner.

Collect Low Diversity Cover Crop Plant Palette for Application

Low diversity cover crop plant palette native seed collection and bulking will be implemented to support the re-establishment of native vegetation following invasive species removal and to provide a genetically appropriate, island-adapted seed source for restoration seeding.

Wild seeds collected during this phase will be used to implement native seeding at the fenced 10-acre site identified in Figure 1. Following invasive species treatment, this site will serve as the first application area for early colonizer native species selected for their ability to rapidly establish on degraded soils, suppress invasive annual grasses, and initiate early-stage recovery processes. These species function as short-term native cover while longer-term successional dynamics reestablish. However, some late successional species, such as endemic buckwheats, toyon, manzanita, lemonade berry, and prickly pear cactus colonize sites early after ungulates are no longer a threat, as observed in past exclosures.

Seeds will be sourced from native plant populations across Santa Catalina Island to preserve the genetic diversity and ecological specificity of the Island's flora. Collected material will be used for both direct broadcast seeding and propagation. Seedlings will be grown at the Conservancy's Ackerman Native Plant Nursery to support container-based outplantings. To meet volume needs for restoration seeding, wild-collected seed may be bulked through professional seed bulking contracted off-Island. Seeds will be collected according to phenology. Table 1 highlights the anticipated periods when seeds of various species will be ripe for collection.

Low Diversity Cover Crop Plant Palette Seed Collection Calendar								
								=Species bloom period

								=Seed collection period
								=Bloom and collection

Species	J	F	M	A	M	J	J	A	S	O	N	D
Achillea millefolium												
Acmispon argophyllus var. argenteus												
Acmispon dendroideus var. dendroideus												
Arctostaphylos catalinae												
Artemisia californica												
Baccharis pilularis ssp. consanguinea												
Encelia californica												
Eriogonum giganteum var. giganteum												
Heteromeles arbutifolia												
Isocoma menziesii												
Opuntia spp.												
Rhus integrifolia												
Stipa pulchra												

Table 1. Seed collection phenology calendar.

Seed collection will follow established permitting and access requirements. The Conservancy will follow ethical collection protocols aligned with guidance from the Center for Plant Conservation and California Botanic Garden (CPC, 2019).

Seed Mix Composition: The restoration mix will include a standardized blend of disturbance-adapted species. All taxa are native or endemic to Catalina Island and selected based on

functional traits such as rapid establishment, regenerative ability, and ecological compatibility with early post-treatment environments. Some species establish quickly in the absence of deer browsing and are also considered late successional stage dominants such as: *Heteromeles arbutifolia, Opuntia littoralis. O. oricola, and Rhus integrifolia.*

- *Achillea millefolium* – yarrow
- *Acmispon argophyllus* var. *argenteus* – Channel Islands silver lotus
- *Acmispon dendroideus* var. *dendroideus* – island broom
- *Artemisia californica* – coastal sagebrush
- *Baccharis pilularis* ssp. *consanguinea* – coyote brush
- *Deinandra fasciculata*- tarplant
- *Diplacus puniceus*- monkeyflower
- *Encelia californica*- brittlebush
- *Eriogonum giganteum* var. *giganteum* – Saint Catherine's lace
- *Eriogonum granda* var. *Grande*- island buckwheat
- *Heteromeles arbutifolia*- toyon
- *Isocoma menziesii* – Coast goldenbush
- *Opuntia* spp.- prickly pear cactus
- *Rhus integrifolia*- lemonade berry
- *Stipa* spp. – Needlegrass

Seed Phenology Tracking: Collection timing will be based on species-specific bloom and seed maturation periods using Calflora records and Conservancy staff observations. A working phenology calendar is maintained by the Conservancy team and used to guide seasonal scouting and harvest planning (Table 1).

Collection Methodology: Seeds will be collected from wild populations across Catalina Island, prioritizing healthy, phenologically ready stands with sufficient seed yield. A maximum of 10% of available seed will be collected per population. Cut tests will be used to assess viability prior to collection, and maternal lines will be tracked using field forms and ArcGIS Field Maps.

Labor and Training: Seed collection efforts will draw on a combination of Conservancy staff, contractors, volunteers, and workforce development partners. All labor sources will support field planning, wild collection, and transport of materials to the nursery or off-Island facilities. Training will be scaled to experience level and will include field safety, collection ethics, plant identification, phenology, seed handling and transport, and species-specific collection methods. Safety instruction will cover radio use, wildlife awareness, equipment handling, PPE, and working in heat. Ethical training will emphasize low-impact practices—limiting the percentage of

seed collected, avoiding trampling, and protecting plant populations. Pre-field instruction may include educational workshops, naturalist training, and review of standard procedures. In-field learning will be supported by ID guides, herbarium specimen collection, and staff supervision. Teams will practice manual and mechanical collection techniques, data recording, and follow protocols for safe handling of species that require collection at height. The Conservancy is also in discussion with Native Seed Group to provide additional field services and expertise. Their team is experienced in wildland seed collection and can bulk material off-Island to support large-scale application and supply the on-Island seed farm.

Bulk Low Diversity Cover Crop Plants

Processing and Storage: Most target species produce orthodox seeds suitable for mid-term storage in dry, shaded environments. Collected seed will be air-dried and processed using species-appropriate methods (e.g., sieving, air-blowing, rubber mat separation). *Baccharis pilularis* will be used immediately due to limited viability in storage.

Cleaning the seed of inert material reduces the chances of rotting or molding of the seed. The amount of seed cleaning that is needed will depend on the harvesting method for the seed, how much inert material is present, the desired purity of the seed, and the seeding method to be used with some methods requiring a higher degree of cleaned seed. For optimal cleaning, a seed cleaning machine should be used.

Threshing to dethatch the seed from any flower stalks or seed heads will be conducted. Many different tools can be used for this process such as mechanical threshers or hammer mills, or threshing can also be done by hand methods for smaller quantities of seeds using creatively produced, handheld implements that can remove the seed from stalks. The second step is winnowing or sieving the seed through a series of screens to remove chaff, other plant material, weed seed, and empty seed hulls.

Seed processing equipment includes a Clipper Office Tester, an Oregon seed blower, a brush deawner, a dissecting scope, a Mettler scale, storage space for seed being processed, and miscellaneous equipment for seed processing, tracking, and propagation including vacuum desiccators, silica, sieves, mesh screens, and plant tags. Other equipment includes precision hand tools (I.e. scalpels, brushes, tweezers, scribers), a rock tumbler to prep seeds for sowing, a blender, a dough roller to break down tough shells, and wooden blocks with rubber attached to remove fleshy portions of the fruit. A dehumidifier to reduce relative humidity down to ~20% assists with desiccation of seeds being processed.

Seed Bulking Strategy: Collected seed will be used for both direct application and propagation. Container plants will be grown at the Conservancy's Ackerman Native Plant Nursery and will be used for both on-Island seed bulking and for landscape installations of taxa that do not

reproduce as effectively from seed. Off-Island contractors will lead bulk seed increase over multiple years starting from small wild collections that will follow California Native Plant Society standards (no more than 10% of seed from a given population collected in a given season and <5% for rare plants), as the implementation of Conservancy seed bulking operations will occur on a separate timeline form the initiation of the 10 acre exclosure in Exhibit 1. Partners will be critical to building the volume needed for restoration-scale application, including future seeding phases beyond Exhibit 1.

Seed bulking will be completed in conjunction with the implementation of adaptive invasive plant management. Once weed management thresholds have been assessed through monitoring and determined to meet the criteria for seed application, the low diversity cover crop plant palette in Table 1 will be applied to the landscape.

Apply Low Diversity Cover Crop Plant Palette Natives to Landscape

Seeding Rates and Quantities: The average target seeding rate is 35 lbs/acre, yielding approximately 100 seeds/sq ft. All final application rates will be adjusted using pure live seed (PLS) calculations based on lab testing. PLS metrics will be matched to individual species and composition of the low diversity cover crop plant palette seed mix can be varied to best achieve desired germination and landscape representation.

Seed installation can be achieved by several methods, including drill seeding, imprint seeding, broadcast seeding, hydroseeding, and seed ball technique (HRMP Appendix F 6). The determination of seeding methods will be dependent upon site conditions and accessibility. Larger sites that are accessible by equipment can be efficiently seeded mechanically with a drill seeder, imprint seeder, hydroseeder, or broadcast seeder. Smaller sites, sites with a high density of native species, or with unavoidable populations of sensitive species can be seeded (optimally during the fall season) by hand broadcast (either by hand or with a hand operated seed disperser) or the seed ball technique.

The application will be done in conjunction with precipitation cycles to best facilitate the germination of applied low diversity cover crop plant palette seed mixes (HRMP Appendix F 6.7). Germination on the site will be monitored for desired species and compositional outcomes, and composition and application methodology will be varied if initial results are not desirable for appropriate vegetation community progression.

High Diversity Seed Mix Bulk and Application

In 2032, within the 10-acre exclosure (mitigation areas), a high-diversity seed mix will be added to the area. To prepare for this application, the high diversity seed mix will start being collected and bulked in 2029 using the same methodology outlined in the low diversity seed mix above. The seed mix may contain any of the plants in Table 2. Some plants which prove to be too

difficult to bulk can instead be planted in strategic nodes that are easily accessible for watering. Seeds that may be susceptible to genetic admixture off-Island will be bulked on-Island at the Conservancy's seed farm, but for other species with low risk of genetic admixture, the Conservancy will bulk off Island.

Plant Identification	
Scientific Name	**Common Name**
Acmispon argophyllus var. argenteus	Channel Island silver lotus
Allium praecox	wild onion
Arctostaphylos catalinae	Catalina manzanita
Artemisia douglasii	mugwort
Calystegia macrostegia	island morning glory
Calochortus catalinae	Catalina mariposa lily
Ceanothus arboreus	feltleaf ceanothus
Ceanothus megacarpus var. insularis	Island bigpod ceanothus
Cleomella arborea	bladderpod
Cercocarpus traskiae	Catalina mountain mahogany
Comarostaphylis diversifolia ssp. planifolia	summer holly
Constancea nevinii	Catalina silverlace
Crocanthemum greenei	island rush-rose
Crossosoma californicum	California rockflower
Dendromecon harfordii	island bush poppy
Dichelostemma capitatum	blue dick
Diplacus puniceus	southern monkeyflower
Elymus condensantus	giant wild rye
Epilobium canum	California fuchsia
Eriodictyon traskiae	Trask's yerba santa
Eriogonum giganteum var. giganteum	Saint Catherine's lace
Eriogonum grande var. grande	island buckwheat
Eriophyllum confertiflorum	golden yarrow
Euphorbia misera	cliff spurge
Galium catalinense	Catalina bedstraw
Gambelia speciosa	island snapdragon
Heteromeles arbutifolia	toyon
Keckeillia cordifolia	heartleaf penstemon
Lepechinia fragrans	fragrant pitcher sage
Leptosyne gigantea	giant coreopsis
Lonicera subspicata var. subspicata	southern honeysuckle
Lupinus spp. (albifrons, bicolor etc.)	lupine
Lycium californicum	California boxthorn
Malacothamnus fasciculatus var. catalinensis	Catalina island bushmallow

Malosma laurina	laurel sumac
Malva assurgentiflora ssp. glabra	southern islands mallow
Opuntia spp.	prickly pear cactus
Pentachaeta lyonii	Lyon's pygmydaisy
Prunus ilicifolia ssp. lyonii	island cherry
Quercus engelmannii	Engelmann oak
Quercus pacifica	island scrub oak
Quercus tomentella	island oak
Quercus x macdonaldii	Macdonald oak
Rhamnus pirifolia	island redberry
Rhus integrifolia	lemonade berry
Ribes viburnifolium	Catalina current
Salvia apiana	white sage
Salvia mellifera	black sage
Scrophularia villosa	Catalina figwort
Stipa pulchra	purple needle grass
Solanum wallacei	Catalina nightshade
Xylococcus bicolor	mission manzanita

Table 2. High diversity seed mix.

Application will also follow the same methodologies outlined in the low-diversity section. The only difference being that nodes of plants to difficult to seed will be added to the landscape in nodes. These nodes will be watered for the first two years after planting when rain isn't present. Plantings will be monitored for survivorship within these nodes.

Biosecurity Measures in Place to Reduce Threats to Ecosystem

High Priority Invasive Plant Removal

Through the Catalina Invasive Plant Program (CIPP), a twenty-plus year-old program that has supported intensive high priority invasive plant management across Catalina, the Conservancy will continue to manage, mitigate, and work to prevent introductions of invasive plants. TThe goals of the CIPP are as follows (Knapp, 2007):

1. Prevent the reduction or loss of native Catalina flora and fauna, due to the direct or indirect impact(s) caused by invasive plants, by actively managing invasives with the safest, most effective and economical methods available.
2. Increase the Conservancy's and partner agencies' knowledge regarding invasive plant distribution, impacts and management strategies.

3. Stop invasive plant introductions, establishment and spread on Catalina by increasing invasive plant awareness in staff, contractors, residents, and visitors through education programs, and improving cultural practices and partnerships.

Effectively managing well-established invasive species populations through long-term programs requires substantial financial investment and resource allocation, underscoring the importance of strategic prioritization in selecting which species to target for control efforts. To allocate limited resources effectively, the Conservancy focuses on species that pose the most significant threats to native ecosystems and have the greatest potential for successful management (Mullin et al., 2000).

Efficient management of invasive plants relies on accurately predicting susceptible species and locations, while employing robust control tools. This strategic prioritization requires understanding each species' ecological impact, distribution, and control potential. By focusing on high-impact, rapidly expanding species, land managers can effectively allocate resources to protect native habitats. A well-informed, data-driven prioritization process ensures efficient use of limited conservation resources, enabling professionals to make targeted decisions that preserve native ecosystems and promote long-term environmental health (APRS Implementation Team, 2000).

The goal of active invasive plant management species is currently achieved through four objectives:

1. Early Detection and Rapid Response (EDRR) to detect, monitor, and eradicate new invasive plant introductions before it can spread.
2. Eradication of all known populations on the Island, or from natural areas, of species that have significant ecological impacts and are feasible to eliminate.
3. Control of widespread invasive species too common to be eradicated will be reduced in high priority watersheds, restoration areas, and high use areas.
4. Control of widespread species too common to be eradicated that occur along dispersal corridors, such as roadways and trails that have the potential to spread invasive plant propagules.

Invasive Mule Deer

The presence of invasive Mule deer on the Island necessitates the need for fencing the mitigation area (Figure 1). This exclosure will ensure that the benefits of restoration activities are not impacted by targeted browsing by invasive deer on native plant species. Several of the species selected for seeding are endemic to the island and have lost their defenses to large herbivorous animals. The integrity of the exclosure will be monitored when conducting restoration activities. In months when no activities occur, the exclosure will be monitored once per month to ensure invasive deer have not breached the perimeter.

Monitoring and Documentation

Monitoring is a cornerstone of the Conservancy's Project. It allows the Conservancy to evaluate progress, adapt management actions to real-time ecological responses, and ensure long-term ecosystem resilience. This plan outlines four key monitoring initiatives: Island-wide vegetation, herbicide applications, and wildlife monitoring and site-specific restoration monitoring at the 10-acre Exhibit 1 restoration site.

Monitoring will be led by the Conservancy's Conservation Department staff Managers in conjunction with support from experts with taxa specific expertise from Catalina and Channel Islands as follows:

Vegetation, Restoration and Herbicide Application Monitoring- Co-led by the Conservancy's Senior Conservation Scientist, John Knapp, and Native Plant Manager, Kevin Allison working with Travis Brooks of Land IQ and Steve Junak (co-author of the Flora of Santa Catalina Island *in press*). All individuals have specific experience working with the listed and endemic flora of the Island and neighboring mainland vegetation communities. Mr. Knapp is a qualified applicator and holds a degree in weed science.

Bird Acoustic Surveys- Led by the Conservancy's Wildlife Program Manager, Katie Elder, who will be accompanied by her Wildlife Technicians Emily Kreisberg and Destiny Saucedo.

Deer Surveys- Led and conducted by the organization White Buffalo, Anthony DiNicola, Ph.D.

Measure changes to active restoration sites

The 10-acre fenced exclosure outlined in Figure 1 will serve as a pilot site for intensive invasive species control and passive restoration which will be expanded to a larger area. Monitoring here will guide adaptive herbicide use and determine readiness for native seeding. Once native seeding begins, the Conservancy will use this methodology throughout to measure the effectiveness of native seeding.

Monitoring will use line-belt transects (typically 10 m x 1 m) placed systematically throughout sites. The sites will be monitored before and after treatments to establish a baseline. Within each transect, the percent cover of native vs. non-native species will be recorded, alongside species richness and dominance.

Data will be linked to specific treatment areas (e.g., selective vs. broad-spectrum herbicide plots) in a randomized block design, allowing for evaluation of treatment efficacy over time.

Permanent photo points and drone imagery will be used to document visible changes in vegetation structure and bare ground cover over time.

Soil Conditions: Optional assessments may include soil compaction, organic matter, or erosion metrics if funding and staffing allow.

Report on Key Findings on Restoration Project

All monitoring data collected through this Project will be integrated into a robust adaptive management cycle to ensure restoration strategies remain effective, efficient, and scientifically defensible. This cycle will include annual data review, adjustments to restoration methodology, public and agency reporting, and curation of all monitoring records.

Every five years, data from vegetation surveys, wildlife monitoring, and site assessments will be analyzed in detail to evaluate progress toward restoration targets. This review will compare results against baseline conditions and identify any emerging trends or challenges.

Based on the findings, restoration practices will be refined as needed. This may include modifying herbicide application rates or timing, shifting seeding schedules earlier or later in the season, integrating erosion-control measures, or introducing supplemental plantings. In cases where restoration targets are exceeded, certain management activities may be scaled back to avoid over-intervention.

Results and management changes will be communicated to key stakeholders, including the California Department of Fish and Wildlife (CDFW), funding partners, and the public. Reporting tools will include detailed technical memos, GIS-based dashboards for spatial visualization of results, and annual summary presentations tailored to different audiences.

All monitoring records—raw data, processed datasets, spatial files, and interpretive reports—will be archived in the Conservancy's central data repository. This secure and well-organized archive will ensure that information is readily accessible to agency partners, collaborators, and researchers upon request.

A centralized annual summary document will synthesize the year's monitoring results, highlight conclusions, outline adaptive management adjustments, and capture key lessons learned. Over time, this record will serve as both a scientific resource and a practical guide, allowing the Conservancy to share insights and strategies with the wider conservation community, supporting restoration efforts beyond Catalina Island.

Bird Acoustic Surveys

As part of the Project, the Conservancy has developed a long-term monitoring strategy for measuring the response of bird species to restoration activities.

Ground- and mid-story nesting species are expected to show the most rapid population response to invasive Mule deer management 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 et al. 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.

The Conservancy will monitor up to 35 core acoustic stations, supplemented by additional stations in areas with current or planned habitat restoration activities. Sites were selected using stratified random sampling from a pool of locations with past or planned vegetation monitoring, ensuring coverage of multiple habitat types and restoration stages. Some sites will be located near exclosures to provide direct comparisons of vegetation and avian community structure. To reduce noise interference and potential recorder theft, stations will be placed at least 20 m from secondary roads and 50 m from primary roads, positioned to face the most open habitat available.

Acoustic Recorder Deployment: At each site, a single Audiomoth recorder will be mounted on an expandable pole approximately 1.8 m (6 ft) high. Recorders will be positioned away from trees to avoid leaf rustling and aimed toward the most open area. Recorders will be programmed to run between 0500–0900 hours (peak morning chorus) and 1900–0000 hrs (evening activity), aligning with breeding season vocalization peaks while optimizing battery life. All units will be deployed in early May and remain in the field for a four-week sampling period.

Habitat Data Collection: At each site, the Conservancy will collect vegetation structure and cover data annually during the acoustic deployment period. Metrics will include canopy height, understory density, shrub cover, and ground vegetation cover to link bird responses to habitat structure changes over time.

Target Species and Guilds: The Conservancy will analyze occurrence patterns for 4–6 focal species from each nesting guild:

- Ground nesters – e.g., San Clemente spotted towhee (*Pipilo maculatus clementae*)
- Mid-story nesters – e.g., Chipping sparrow (*Spizella passerina*)
- Canopy nesters – e.g., Catalina Hutton's vireo (*Vireo huttoni unitti*)
- Guild-level analysis will allow detection of differential responses to restoration and invasive Mule deer removal based on nesting height and habitat reliance.

Data Processing and Analysis: Audio files will be processed using BirdNET (Kahl et al. 2021), a machine-learning platform that identifies species from acoustic recordings. Data outputs will include species richness, species-specific occurrence rates, and guild-level presence/absence.

Five year maintenance, Reporting, and Success Criteria

All monitoring data collected through this program will be integrated into a robust adaptive management cycle to ensure restoration strategies remain effective, efficient, and scientifically defensible. This cycle will include annual data review, adjustments to restoration methodology, public and agency reporting, and curation of all monitoring records.

Every five years, data from vegetation surveys, wildlife monitoring, and site assessments will be analyzed in detail to evaluate progress toward restoration targets. This review will compare results against baseline conditions and identify any emerging trends or challenges.

Based on the findings, restoration practices will be refined as needed. This may include modifying herbicide application rates or timing, shifting seeding schedules earlier or later in the season, integrating erosion-control measures, or introducing supplemental plantings. In cases where restoration targets are exceeded, certain management activities may be scaled back to avoid over-intervention.

Results and management changes will be communicated to key stakeholders, including the California Department of Fish and Wildlife (CDFW), funding partners, and the public. Reporting tools will include detailed technical memos, GIS-based dashboards for spatial visualization of results, and annual summary presentations tailored to different audiences.

All monitoring records—raw data, processed datasets, spatial files, and interpretive reports—will be archived in the Conservancy's central data repository. This secure and well-organized archive will ensure that information is readily accessible to agency partners, collaborators, and researchers upon request.

A centralized annual summary document will synthesize the year's monitoring results, highlight conclusions, outline adaptive management adjustments, and capture key lessons learned. Over time, this record will serve as both a scientific resource and a practical guide, allowing the Conservancy to share insights and strategies with the wider conservation community, supporting restoration efforts beyond Catalina Island.

Restoration Success Criteria

After five years of restoration, the following will be used as success criteria to evaluate this project:

- >40% native plant species cover, and

- <5% of the invasive plant species identified on the California Invasive Plant Council Inventory.

Outreach, Education, Engagement, and Workforce Development

The Project is not undertaken in isolation—it thrives through the active involvement of many communities, each contributing through education, workforce development, recreation, and volunteerism. The Conservancy has intentionally scaled these efforts to match the scope of island restoration, creating opportunities for engagement at every level. By connecting people to the Island's beauty and biodiversity, the Project will foster a shared sense of stewardship while building lasting partnerships that strengthen the restoration process.

Volunteer Events

The Conservancy hosts weekly volunteer events for both local residents and mainland visitors, providing meaningful opportunities to participate in hands-on conservation. Every Thursday, volunteers gather at the Ackerman Native Plant Nursery, where community members assist with transplanting, seeding, and managing native plants for restoration work across the Island including those within Exhibit 1. The Conservancy also runs "Restore and Explore" events, which bring volunteers to various locations for activities ranging from trail maintenance to beach cleanups. As part of island restoration, many of these "Restore and Explore" events will now also focus on wild seed collection and processing and invasive plant treatment that will be directly applied to the mitigation site (Figure 1).

Volunteer groups form a major component of the Conservancy's restoration workforce. In the first three months of 2025 alone, 13% of invasive plant removals on the Island were completed by volunteer groups staying at one of two dedicated camps—Laura Stein Volunteer Camp or Black Jack Volunteer Camp. During the first half of 2025, the Conservancy hosted 18 different groups, including Toyota, Farmers & Merchants Bank, Armanino CPA Group, the American Hiking Society, Daughters of the American Revolution, Keene State College, and California State University–Long Beach. These groups receive complimentary camping accommodations and a front-row seat to large-scale conservation in action, gaining a unique and immersive experience in island ecology.

Workforce Development

The Conservancy's partnership with the conservation corps has grown substantially in recent years. The Conservancy relies on the corps for critical restoration work, including wildlife surveys, nursery enhancements, invasive plant removal, and—soon—seed collection.

In 2025 alone, conservation corps removed 32% of all invasive plants cleared from the Island's landscape, making them an essential part of the Conservancy's restoration success. This partnership has also expanded to include on-Island internships.

Public Outreach

Continued public outreach is a vital part of the Conservancy's mission. Each month, the Conservancy hosts the Catalina Island Speaker Series, a free event available both in person and virtually, featuring scientists who share their expertise and experiences with the public. The Conservancy also holds Community Conversations—an in-person forum where community members can engage directly with Conservancy leadership and ask questions.

In addition, the Conservancy organizes special events such as a recent community event around wildfire resilience, which included a new fox mascot serving as an Island ambassador and posting fire danger levels at the local museum. This free program gave local schoolchildren the opportunity to suggest a name for the fox mascot, interact with Conservancy scientists, and enjoy a documentary about the Island fox. These events create meaningful opportunities for learning, dialogue, and connection between the community and the conservation work happening on Catalina. The work in the mitigation area will be highlighted at these events.

Education

The Conservancy's education team offers multiple pathways for the public to learn about restoration and conservation on Catalina. This includes the free, online Naturalist 1 course, as well as the more advanced Naturalist 2 and California Naturalist (CalNat) courses. In the first quarter alone, the Conservancy's team educated more than 400 TK–12 students both on- and off-Island through youth and science programs. So far this year, the Conservancy has hosted 41 public programs, engaging over 385 participants. All of these educational offerings will continue, with the Catalina Island Restoration Project featured prominently as part of the Conservancy's broader community engagement efforts.

SUMMARY

The Conservancy's restoration project area serves as an appropriate site for island mitigation needs. The investment in this area and the lessons learned will apply to the entire Island through the broader Integrated Restoration Project. The Conservancy has completed the planning for its restoration project which is "shovel ready" for implementation in 2026. Combined, these efforts will yield a greater positive impact for the Island than they would

alone. The fencing of the site ensures that invasive mule deer will not impact the improvements made through active restoration.

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