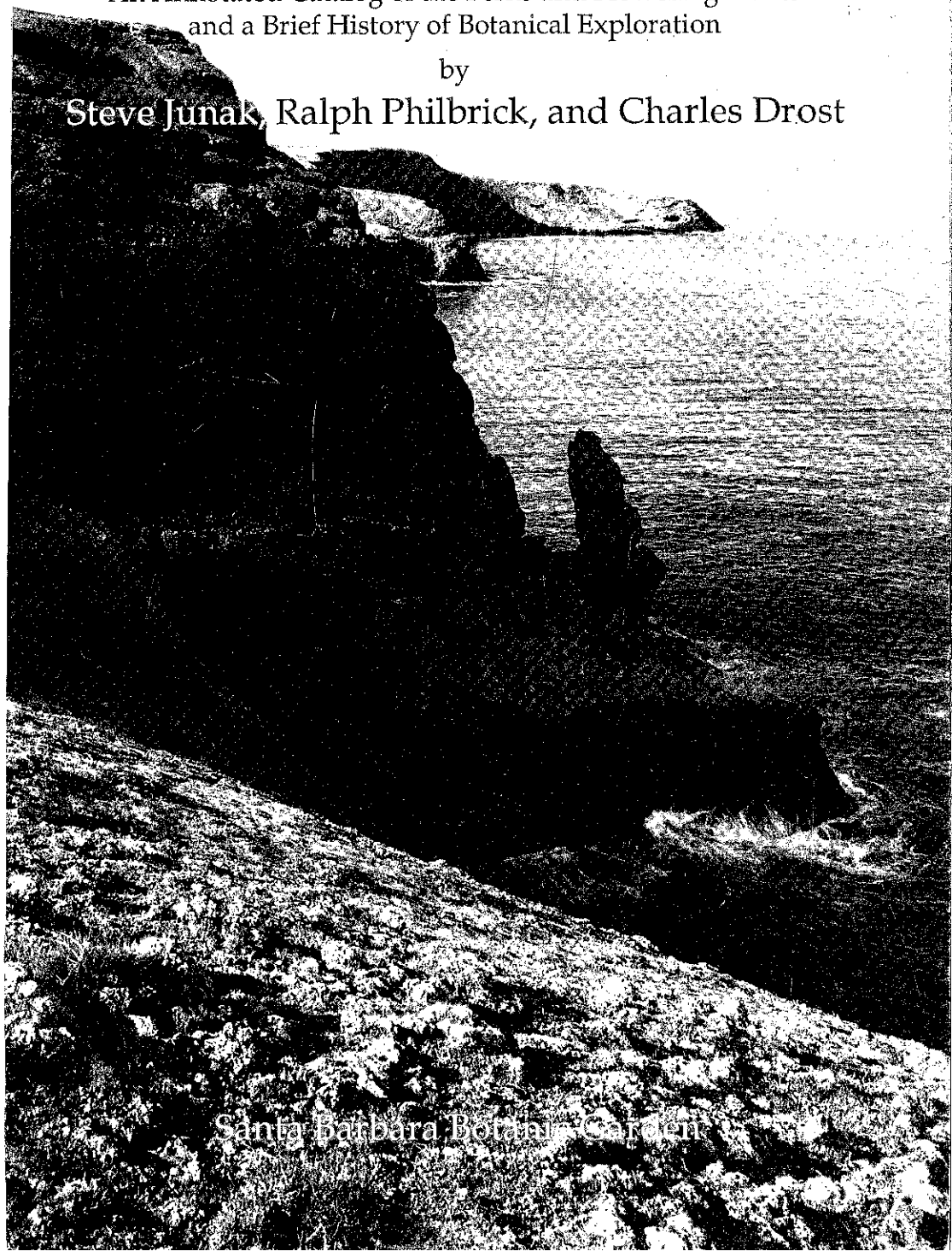


# A REVISED FLORA OF SANTA BARBARA ISLAND

An Annotated Catalog of the Ferns and Flowering Plants  
and a Brief History of Botanical Exploration

by

Steve Junak, Ralph Philbrick, and Charles Drost



Santa Barbara Botanic Garden

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Cover photograph: North end of Santa Barbara Island by Wm. B. Dewey

## PREFACE

The Santa Cruz Island Foundation was established by the late Dr. Carey Stanton to promote research on the California Channel Islands. This current work has been undertaken as part of a series of occasional papers which will contribute to this mission.

In 1993, the Santa Cruz Island Foundation co-sponsored the installation of a small museum on Santa Barbara Island in Channel Island National Park facilities. Occasional Paper Number 6, edited by Marla Daily, was published in conjunction with the opening of that museum on Santa Barbara Island.

Starting in 1914, Denton O. "Buster" Hyder's father leased Santa Barbara Island from the U.S. Government for farming and his family lived there until 1922. The first part of Occasional Paper Number 6 includes: (1) the history of the Hyder family on Santa Barbara Island as told by Buster Hyder, (2) additional stories about the other Channel Islands in the words of Buster Hyder, and (3) William B. Dewey's photographic documentation of Buster's return to Santa Barbara Island after an absence of almost 60 years.

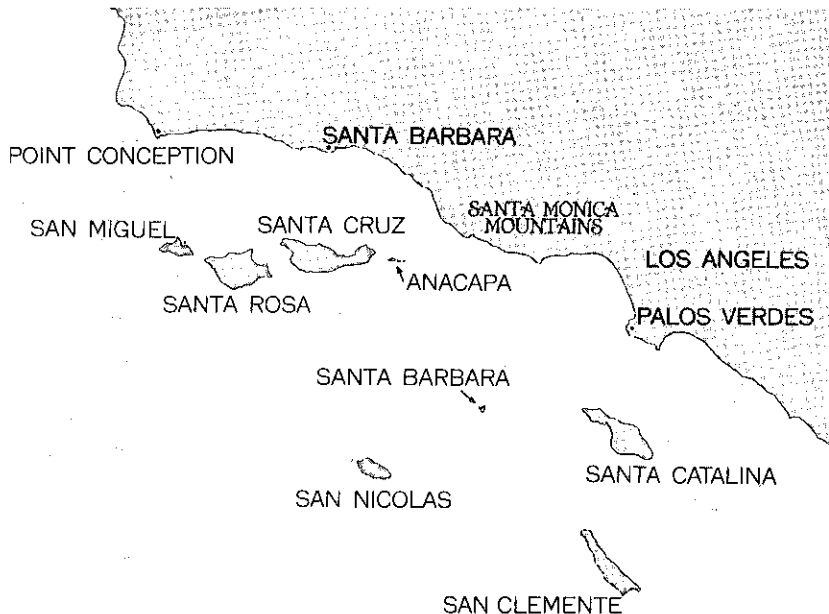
The second part of Occasional Paper Number 6 concerns the island's plant life and is reprinted here with the permission of the Santa Cruz Island Foundation. In 1972, Ralph Philbrick published a flora for Santa Barbara Island which also included information on the island's climate, fauna, geography, geology, and land-use history. In the following paper, the authors document the history of botanical exploration on the island, describe the numerous changes observed on Santa Barbara Island since the publication of the earlier flora, update information on the island's plant life, and provide photographs of some of the plant species found only on the California Channel Islands.

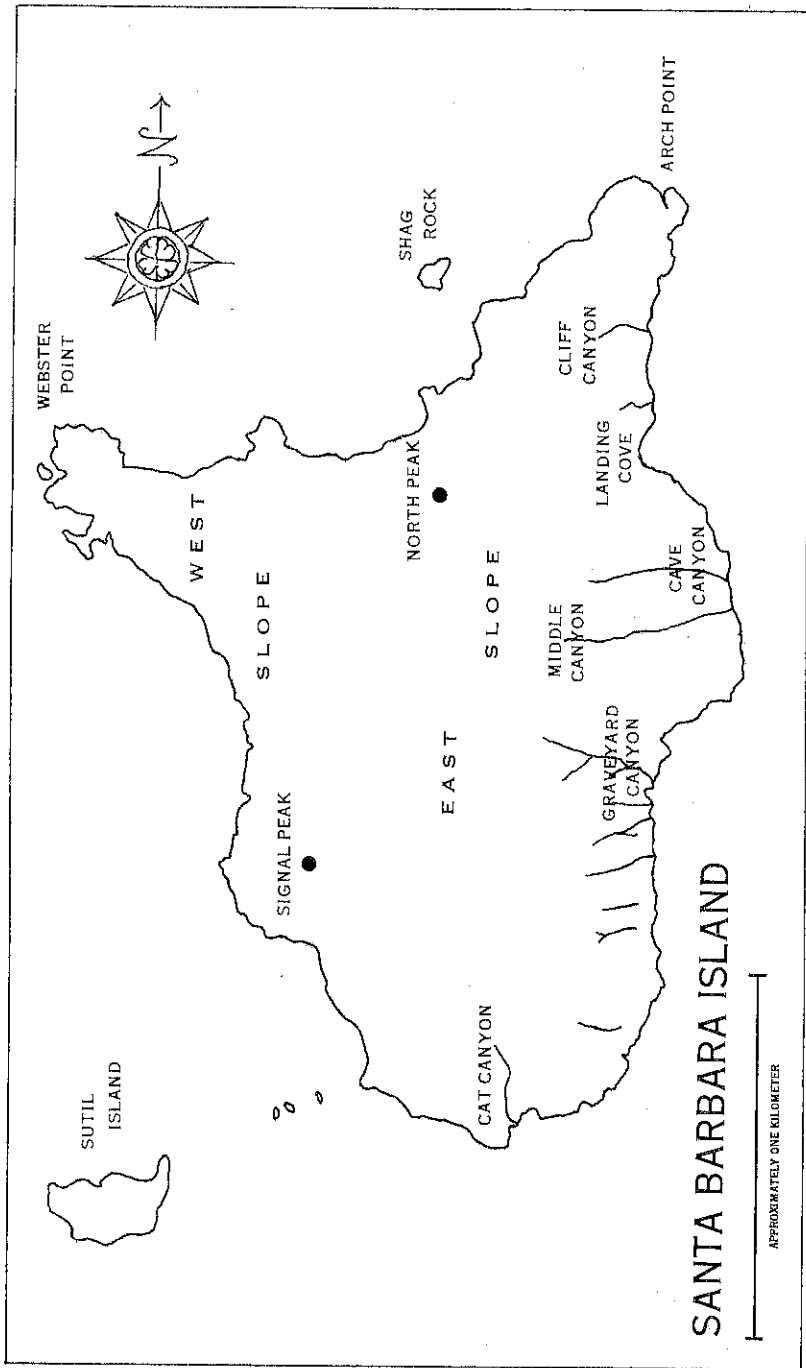
## INTRODUCTION TO SANTA BARBARA ISLAND

Eight islands sit off the coast of southern California (see map below). These islands, ranging in size from 1 square mile (2.6 square km) to 96 square miles (249 square km), are known as the California Channel Islands or Southern California Islands.

Santa Barbara Island is the smallest and one of the most isolated of the California Channel Islands. It lies 38 miles (61 km) offshore, southwest of the Palos Verdes Peninsula and the city of Los Angeles. Roughly triangular in outline, the island is about 1.9 miles (3 km) long and about 1.4 miles (2.2 km) wide at its widest point. The highest peak on Santa Barbara Island reaches an elevation of only 635 feet (194 m) and the island's topography is dominated by a precipitous coastline. Steep cliffs 200-590 feet (60-180 m) high surround much of the island.

Santa Barbara Island is situated in Santa Barbara County and has been managed by the National Park Service as part of the Channel Islands National Monument since 1938 and as part of Channel Islands National Park since 1980.





Map of Santa Barbara Island  
 Courtesy Santa Barbara Botanic Garden

# A REVISED FLORA OF SANTA BARBARA ISLAND

## An Annotated Catalog of the Ferns and Flowering Plants and a Brief History of Botanical Exploration

By

Steve Junak  
Santa Barbara Botanic Garden

Ralph Philbrick  
Santa Barbara, California

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National Park Service

Over 130 years ago, the first known botanical specimen was collected on Santa Barbara Island. Since then, the island's flora has been described and documented in several publications (Dunkle 1950, Philbrick 1972, Wallace 1985, Channel Islands National Park and Santa Barbara Botanic Garden 1987). The most recent comprehensive treatment of the island's flora (Philbrick 1972) comprised an annotated checklist of the island's vascular plants, and also included general descriptions of the climate, fauna, geography, and geology of the island. In addition, Philbrick documented the history of land use and the effects of man and introduced animals on the island's vegetation.

Significant changes have occurred on Santa Barbara Island since 1972. A number of plants, both native and non-native, have been added to the island's flora. Other plants have been spreading in recent years.

The purpose of this paper is (1) to summarize the botanical explorations which have contributed to the current knowledge of the island's plant life, (2) to itemize some of the changes in the composition and distribution of the island's flora which have occurred during the last two decades, and (3) to provide an updated checklist of the flora, including new discoveries and observations made during the last 20 years. Herbarium specimens for new additions to the island's flora since the publication of Philbrick (1972) are cited in an appendix.



James Graham Cooper (1830-1902), physician and field naturalist who was credited with the first known botanical specimen collected on Santa Barbara Island in 1863.

(Library, Academy of Natural Sciences of Philadelphia)



## HISTORY OF BOTANICAL EXPLORATION

Botanical specimens have been collected on Santa Barbara Island since 1863 by a number of naturalists and professional botanists. All known botanical collectors are listed below, with pertinent biographical information (if known to the authors), details concerning their visits to Santa Barbara Island, and information regarding their travels and publications on other relevant islands.

The first known botanical collection was made by **James G. Cooper** (1830-1902), a physician and field naturalist who stayed on the island from 24 May until 12 June 1863. Cooper collected a single known specimen of Island Snapdragon (*Gambelia speciosa*), which is labelled "Santa Barbara Island." This species has not been seen again on the island, and doubt was raised in Philbrick (1972) about the source of Cooper's specimen. Regardless of the controversy, it is known that Cooper visited Santa Barbara Island after a 48-hour trip from Santa Barbara on the sloop *Hamilton*, with a group of hunters seeking sea lions for their oil (Cooper 1863). He also visited Santa Catalina, San Nicolas, and San Clemente islands during June and July 1863 (Coan 1982).

**William G.W. Harford** (1825-1911) and **Albert Kellogg** (1813-1887) were both associated with the California Academy of Sciences. Harford was a naturalist especially interested in conchology; he served as director of the Academy from 1876 until 1886 (Jepson 1933, Ewan 1955). Kellogg was a physician and California's first resident botanist; the first plant described by Kellogg was the Island Tree Mallow (*Lavatera assurgentiflora*), a specimen of which had been collected on Anacapa Island prior to 1854 (Lenz 1986). Harford and Kellogg often travelled together, and one or both of them apparently visited Santa Barbara Island in about 1871. No specimens from their visit have been located, but Kellogg described the habitat of the Giant Coreopsis (*Coreopsis gigantea*) on the island in a paper presented in 1871 (Kellogg 1873). It is possible that Harford and Kellogg travelled to Santa Barbara Island with A. W. Chase during the first U. S. Coast Survey expedition to the island in February 1871.

Island explorer and field botanist **Blanche Trask** (Luella Blanche Engles, 1865-1916) visited Santa Barbara Island in May 1901 and again in May 1902. She lived on Santa Catalina Island from 1893 until 1912 (Cantelow & Cantelow 1957) and collected

extensively on the Southern Channel Islands during the late 1890s and early 1900s. She published notes on the floras of Santa Catalina and San Clemente islands (Trask 1899, 1904), and her collections formed the basis for the first checklist of plants for San Nicolas Island (Eastwood 1898). Unfortunately, her prime botanical specimens, deposited at the California Academy of Sciences, were destroyed during San Francisco's 1906 earthquake and fire (Millspaugh & Nuttall 1923, Cantelow & Cantelow 1957) and only type specimens saved during the fire can be examined today. Her personal herbarium collection was destroyed in a large fire at Avalon, Santa Catalina Island in November 1915 (Millspaugh & Nuttall 1923). Two plants growing on Santa Barbara Island (*Astragalus traskiae* and *Dudleya traskiae*) have been named in her honor.

Entomologist **Robert E. Snodgrass** (1875-1962) collected animals on several islands, including the Pribilof and Galapagos, while a student at Stanford University (Mallis 1971). He also collected plants on Santa Cruz Island in July 1901 and on Santa Barbara Island in August 1901.

**Henry Hemphill** (1830-1914) was a malacologist. His extensive collections of terrestrial, freshwater, and marine mollusks became the nucleus of the present holdings of the California Academy of Sciences and Stanford University (Coan & Roth 1987). Hemphill visited Santa Barbara Island at least once and collected two known specimens: Beach-primrose (*Camissonia cheiranthifolia*), a plant which has not been seen again on the island, and Goldfields (*Lasthenia californica*). The timing of his visit was listed as uncertain by Philbrick (1972), since the label data on his *Camissonia* specimen does not include a date. We can now confirm a date of 1905 for his *Lasthenia* collection (UC #174190). Hemphill also made several botanical collections on Anacapa Island in 1901.

**Barton W. Evermann** (1853-1932), well-published ichthyologist, was also interested in birds and plants (Ewan 1981). He became the director of the California Academy of Sciences in 1914, and collected plants on Santa Barbara Island in March 1918.

**William A. Bryan** (1875-1942), geologist and zoologist, was director of the Los Angeles County Museum of Natural History from 1920-1940. While a professor at the University of Hawaii, he published a book on the natural history of the Hawaiian

Islands (Bryan 1915) and several other papers. He visited Santa Barbara Island with his wife on 14 July 1922. They collected several specimens: the locoweed *Astragalus traskiae*; the buckwheat *Eriogonum giganteum* var. *compactum*; the island chicory *Malacothrix foliosa* subsp. *philbrickii* (collected as *Sonchus tenerrimus*); an introduced grass, *Phalaris caroliniana*; and a sow-thistle, *Sonchus oleraceus* (collected as *S. asper*). The Bryans were not included in the list of collectors in Philbrick (1972), and some of their collections were probably new discoveries for the island.

Well-known botanists **LeRoy Abrams** (1874-1956) and **Ira L. Wiggins** (1899-1987) of Stanford University visited Santa Barbara Island on 3 July 1931 and collected 27 numbers. They were on a cruise from Point Mugu aboard Chester Benson's yacht *Noname* (Abrams & Wiggins 1931, Raven 1963), and also collected plants on Santa Rosa, Santa Cruz, Anacapa, Santa Catalina, and San Clemente islands between 29 June and 7 July 1931.

**Norman E. Bilderback** visited Santa Barbara Island in April 1938. He also collected specimens on San Miguel, Santa Cruz, San Nicolas, and Santa Catalina islands between 14 April and 5 May 1938.

**Francis H. Elmore**, botanist for Allan Hancock Pacific Expeditions, visited Santa Barbara Island on 12 August 1938 aboard the research vessel *Velero III* and collected 16 numbers (Gentry 1949). Elmore also visited all of the other California Channel Islands (except San Nicolas) between August 1938 and April 1941.

**Richard M. Bond**, regional biologist for the U.S. Soil Conservation Service, collected plants on Santa Barbara Island during a biological survey conducted on 14-15 April 1939. He and **E. Lowell Sumner, Jr.**, regional wildlife technician for the National Park Service, also surveyed wildlife and plants on San Miguel and Anacapa islands on 16-19 April 1939 (Sumner & Bond 1939). Sumner collected botanical specimens on the three islands visited, but they were improperly dried and most were subsequently discarded (Mason 1939). Bond collected additional botanical specimens on Santa Barbara Island on 14 May 1940 and also revisited Anacapa Island (Bond 1940). Sumner was involved with the rabbit removal program on Santa Barbara Island in the 1950s (Sumner 1959).

**Meryl B. Dunkle** (1888-1969) collected extensively on the California Channel Islands, beginning with botanical specimens



Staff of the Los Angeles County Museum Channel Islands Biological Survey on Santa Barbara Island, 30 May 1939. Botanist Meryl B. Dunkle is second from the left. (Donald Meadows)



Meryl B. Dunkle (1888-1969) and Donald Meadows on Santa Barbara Island, 19 March 1940. (Sprong)

taken on Santa Catalina Island between February 1928 and May 1932, while he was employed as principal of the Santa Catalina Island School in Avalon. As field botanist for the Los Angeles County Museum Channel Islands Biological Survey, he visited the other seven California Channel Islands between April 1939 and September 1941. Dunkle collected 117 numbers during trips to Santa Barbara Island on 27-30 May 1939, 15-23 March 1940, 7 April 1941, and in September 1941. His descriptions of plant community structure on the Channel Islands (Dunkle 1950) are based largely on observations made on Santa Barbara Island.

**George P. Kanakoff** (1897-?), who later became curator of invertebrate paleontology at Los Angeles County Museum of Natural History, collected a single known specimen (*Lotus*) on Santa Barbara Island in August 1940. He also collected botanical specimens on San Nicolas Island on 12-24 April 1940 (Foreman 1967), and on Middle Anacapa Island on 20 August 1940.

**Reid V. Moran** (b. 1916), botanist for the Los Angeles County Museum Channel Islands Biological Survey, visited Santa Barbara Island on 25-27 April 1941 and collected 12 numbers.

Botanical collecting activities on all of the California Channel Islands were suspended with the onset of World War II. After the war, Reid Moran collected 7 numbers during a return trip to the island on 10 February 1949, on a cruise which also included Santa Catalina and San Nicolas islands. He visited the other California Channel Islands on trips between February 1941 and August 1975. Moran named *Dudleya traskiae*, and published a paper on its rediscovery on Santa Barbara Island in 1975 (Moran 1978). He also described the *Dudleya* taxa restricted to Santa Rosa and Santa Cruz islands.

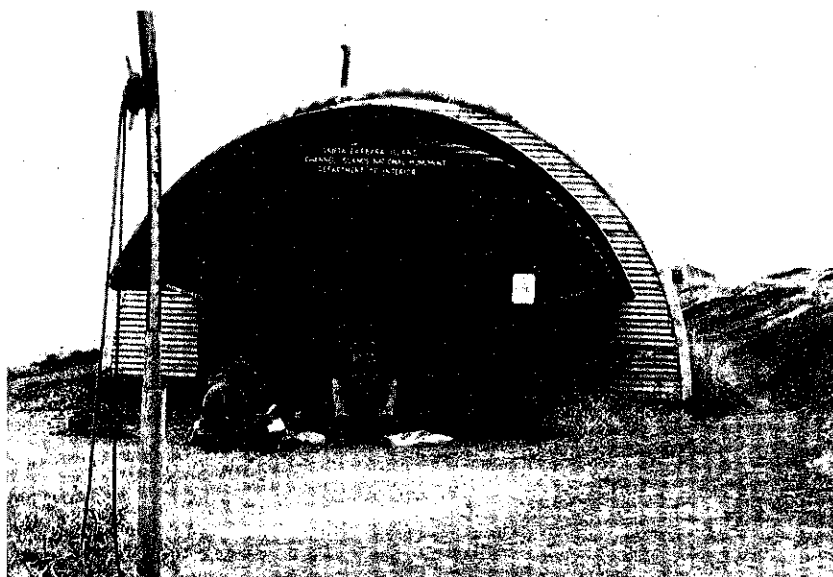
The staff at the Santa Barbara Botanic Garden began a study of the flora of the California Channel Islands in 1958. **E.R. Blakley** (b. 1924), Grounds Superintendent at the Garden, collected on all eight California Channel Islands between October 1958 and September 1964 as part of this program. Blakley pressed 37 numbers on Santa Barbara Island on 21-22 October 1961 while on a trip with the Sierra Club. He and **Martin A. Piehl** (b. 1932), Garden taxonomist, also collected more than 100 specimens from Santa Barbara Island on 4-5 May 1963 while on another similar trip.

**Ralph N. Philbrick** (b. 1934), taxonomist at the Santa Barbara Botanic Garden and director from 1974 until 1987,

continued and expanded the Garden's flora projects. He published a flora for Santa Barbara Island (Philbrick 1972) after making numerous trips to the island between February 1964 and March 1970, collecting over 340 numbers. He has collected extensively on all of the California Channel Islands and written several papers on their flora (Philbrick 1964, 1980, Philbrick & Haller 1977). The name of the island chicory restricted to Santa Barbara Island (*Malacothrix foliosa* subsp. *philbrickii*) will be published in his honor.

Ralph Philbrick began his visits to Santa Barbara Island on 6 and 9 February 1964 when he collected cacti. He made general plant collections on the island on 12 June 1964, 18-20 March 1968, 29-30 April 1969, 12-13 February 1970, 14-15 May 1975, and 17 September 1976.

Other researchers accompanied Philbrick on additional trips to Santa Barbara Island. Michael R. Benedict (b. 1940), research associate at the Santa Barbara Botanic Garden, made collecting trips to the island with Philbrick on 21-22 May 1966 and 21-22 March 1970.



Botanist Ralph N. Philbrick (b. 1934) and geologist J. G. Vedder on Santa Barbara Island, 15 May 1975. The Quonset hut was replaced by a ranger's residence in 1991.

(David Howell)

**Robert F. Thorne** (b. 1920), systematist and herbarium curator at Rancho Santa Ana Botanic Garden, and **James K. McPherson**, then a plant ecology student at the University of California at Santa Barbara, collected on the island with Philbrick on 27-28 April 1968. Thorne has collected extensively on the California Channel Islands; he has published a flora of Santa Catalina Island (Thorne 1967) and other papers on the Channel Islands (Thorne 1969a, 1969b).

Ralph Philbrick and **Donald W. Ricker** (b. 1929), research associate in the Department of Biological Control, University of California at Riverside, collected plants on the island on 15-16 March 1969. Ricker was involved in the biological control of prickly pear cacti (*Opuntia*) on Santa Cruz Island, which began in the 1940s (Goeden *et al.* 1967).

**Michael S. Astone** visited Shag Rock on a surfboard and collected ten specimens on 14 August 1975.

**Mary C. Hochberg** (b. 1952) and **Sherry Whitmore**, while graduate students at the University of California at Santa Barbara, collected a saltbush (*Atriplex pacifica*) on Santa Barbara Island on 26 August 1976.

Between May 1978 and April 1979, an interdisciplinary natural resources study of Channel Islands National Monument was organized by the Santa Barbara Museum of Natural History for the National Park Service (Power 1979). During field work for this study, **Steven A. Junak** (b. 1949), **Steven L. Timbrook** (b. 1938), Ralph Philbrick, and Mary Hochberg conducted a botanical survey of Santa Barbara Island while mapping the plant communities and the distribution of endemic plant taxa (Hochberg *et al.* 1979, 1980; Junak *et al.* 1980). Botanical specimens were collected by Philbrick, Junak, and Hochberg during research trips on 11-12 June 1978, 18-21 September 1978, and 3-4 April 1979. Timbrook and Hochberg also collected plants on several other islands.

**Steve Junak** collected 83 numbers during trips to Santa Barbara Island on 10-13 May 1982, 3 July 1982, 23-25 October 1986, 7-8 April 1990, 6-7 April 1991, 11-12 April 1992, and 2-5 March 1993, while on research trips or while leading field trips for small groups associated with the Santa Barbara Botanic Garden. Junak has collected extensively on all of the California Channel Islands, and has written a flora for San Nicolas Island (Junak & Vanderwier 1990).

## ADDITIONS TO THE FLORA AND CHANGES IN THE VEGETATION BETWEEN 1972 AND 1993

For more than a century, the plants of Santa Barbara Island have been heavily impacted by human activities. The introduction of non-native animals (especially sheep and rabbits) and non-native plants, along with disturbance caused by farming activities, has affected the composition and distribution of the native flora (Philbrick 1972). The island has been free of grazing animals for 12 years now, and the native flora has been slowly recovering. The last of the introduced rabbits, which represented a significant threat to the island's native flora, were eliminated by National Park Service staff in 1981.

Numerous changes in the flora of Santa Barbara Island have been observed during the last two decades. Previously unrecorded plant taxa, some native to California and others introduced from various parts of the world, have been found on the island. Other plant taxa, both native and non-native, have become more abundant or widespread.

### Native and Endemic Plants

Fourteen native plant taxa have been added to the known flora of Santa Barbara Island since 1972: *Apiastrum angustifolium*, *Baccharis emoryi*, *Conyza canadensis*, *C. coulteri*, *Encelia californica*, *Eucrypta chrysanthemifolia* var. *chrysanthemifolia*, *Filago californica*, *Gnaphalium bicolor*, *G. californicum*, *G. canescens* subsp. *microcephalum*, *Monolepis nuttalliana*, *Nicotiana clevelandii*, *Solanum douglasii* and *Spergularia marina*. Two additional species (*Atriplex pacifica* and *Nassella lepidota*) were not reported by Philbrick (1972), but were collected on the island prior to the publication of his flora. The checklist in this paper therefore includes a total of 16 native plant taxa not included in Philbrick (1972).

The island's native flora is slowly recovering from the effects of grazing animals, especially since the feral rabbit populations were reduced in the 1970s and the last animals were finally removed by October 1981. An abundance of *Coreopsis gigantea* seedlings were seen in the North Peak area in April 1982 (Junak *et al.* 1983). Recruitment of other native shrubs and perennials was noticeable by March 1984, especially on the southeastern sides of North and Signal peaks. Qualitative increases in the



abundance of *Achillea millefolium*, *Artemisia nesiotica*, *Hemizonia clementina*, and *Lycium californicum* were observed near North Peak, while *Artemisia californica* and *Astragalus traskiae* were becoming more abundant on Signal Peak (Drost 1984a). The endemic shrub *Lotus argophyllus* subsp. *ornithopus* became more widespread and more abundant between 1979 and 1983, with new populations spreading in Middle Canyon, Graveyard Canyon, and Signal Peak (Hochberg *et al.* 1979, Drost 1984a). The native clovers *Trifolium palmeri* and *T. willdenovii* have also spread.

Giant *Coreopsis* (*Coreopsis gigantea*), one of the dominant species in the coastal scrub on the island, has increased dramatically since the removal of feral rabbits in 1981. An isolated stand of *Coreopsis*, northwest of the eroded areas in the southeastern portion of the island, has increased to over twice its original size. On the eastern edge of the island, *Coreopsis* was confined almost exclusively to the north-facing slopes of the large canyons before 1981. Since the removal of the last rabbits, *Coreopsis* has increased in abundance and extent to cover much of the area on the terraces south of Cave, Middle and Graveyard Canyons. Despite this dramatic increase, large stands of *Coreopsis gigantea* declined after an unusually foggy summer in 1991, with die back from the branch tips. *Rhizoctonia* fungi were found in two samples taken from the island. This fungus is thought to have been involved in the *Coreopsis* decline (Trudy Ingram, pers. comm.; Vallier 1991). Since 1991, the *Coreopsis* stands have recovered.

The Santa Barbara Island Live-forever (*Dudleya traskiae*), once thought to have been eliminated by feral rabbits (Philbrick 1972), is once again thriving. As with the woody plants mentioned above, the increase in the populations of the *Dudleya* coincided with the reduction and removal of feral rabbit populations. Despite the common name, no live *Dudleya* plants could be located on the island in 1970 (Philbrick 1972). Rabbit numbers were reduced by the mid 1970s, and in May 1975 eight living plants were seen in two populations. Two additional populations were found in 1976. Five populations, including the large one west of Signal Peak, were mapped during survey work in 1978 (Hochberg *et al.* 1979). Since 1982, National Park Service personnel have been monitoring *Dudleya* populations on the island. By June 1984, 11 populations had been located, ranging in size from one plant to more than 420 individuals (Drost 1984b; Clark & Halvorson 1987, 1989; Halvorson *et al.* 1992).

## Non-Native Plants

Even though grazing animals have been removed from Santa Barbara Island, non-native plants continue to compete with native taxa for limited habitats, soil nutrients, water, and pollinators. Additional non-native plant arrivals have also colonized the island during the last two decades, and some of these have been spreading. Since 1972, 13 additional non-native plant taxa have been found on the island: *Agrostis viridis*, *Anagallis arvensis*, *Conyza bonariensis*, *Cotula australis*, *Cynodon dactylon*, *Gnaphalium luteo-album*, *Lolium multiflorum*, *Lycopersicon esculentum*, *Melilotus indica*, *Poa annua*, *Schismus arabicus*, *Spergularia bocconii*, and *Tropaeolum majus*. Another non-native grass (*Phalaris caroliniana*) was collected on Santa Barbara Island in 1922, but the specimen was not seen by Philbrick and was not included in his 1972 flora. The checklist in this paper therefore includes a total of 14 non-native plant taxa not included in Philbrick (1972).

The introduction of most of the plants listed above appears to be related to human activities on Santa Barbara Island. Two of the new arrivals (*Anagallis* and *Gnaphalium*) have only been seen near the helicopter landing pad just north of Cave Canyon. Five taxa (*Cotula*, *Melilotus*, *Poa*, *Schismus*, and *Spergularia*) were first collected at Landing Cove, the center for human activities. The tomato (*Lycopersicon esculentum*) has only been seen near the Ranger's residence at Landing Cove.

At least one of the recent plant arrivals (*Schismus arabicus*) has been spreading on Santa Barbara Island. It was first seen along the trail at Landing Cove in April 1990, and had spread to the trail at the south end of the island by April 1992. In addition, some non-native plants introduced prior to 1972 have also been spreading in recent years (e.g., *Bromus diandrus*, *Centaurea melitensis*, *Conyza bonariensis*, and *Phalaris minor*).

## Plants of Shag Rock

Plants of this offshore rock were not included in Philbrick (1972). Since then, two known collectors have visited Shag Rock off the north end of Santa Barbara Island. Michael Astone paddled out to Shag Rock on a surfboard on 14 August 1975. On 13 June 1978 Ralph Philbrick visited Shag Rock with National Park Service personnel. As a result of these two trips, the following 13

plant taxa have now been documented for Shag Rock: *Amblyopappus pusillus*, *Amsinckia menziesii* var. *intermedia*, *Atriplex semibaccata*, *Chenopodium murale*, *Eriogonum giganteum* var. *compactum*, *Eriophyllum nevinii*, *Erodium cicutarium*, *Hordeum murinum* subsp. *glaucum*, *Lycium californicum*, *Mesembryanthemum crystallinum*, *M. nodiflorum*, *Sonchus oleraceus*, and *Suaeda taxifolia*. This list is not thought to be all-inclusive, but it represents an important addition to our knowledge of the flora of Santa Barbara Island.

## CURRENT STATUS OF THE FLORA

A total of 127 plant taxa have now been found on Santa Barbara Island, representing 34 families and 94 genera. The largest families are Asteraceae (29 taxa) and Poaceae (25 taxa), followed by Chenopodiaceae (8 taxa) and Fabaceae (6 taxa). The following six genera are represented by three or more native and non-native species on the island: *Atriplex*, *Bromus*, *Conyza*, *Gnaphalium*, *Opuntia*, and *Spergularia*.

### Native and Endemic Plants

Only a limited number of plants have been able to colonize and flourish on Santa Barbara Island. The size and composition of the native flora have been affected by such factors as the island's isolated location, small size, limited topographic diversity, lack of surface water, lack of sandy beach habitats, and low annual rainfall (an average of less than 9 inches). At least 20 native plant species are found on all eight California Channel Islands except Santa Barbara. Especially notable in their absence are plants which occupy sandy beach habitats or coastal flats (e.g., *Abronia maritima*, *Ambrosia chamissonis*, *Atriplex leucophylla*, *A. watsonii*, *Distichlis spicata*, *Frankenia salina*, *Heliotropium curassavicum*, and *Salicornia virginicum*).

A total of 86 native plant taxa have been found on Santa Barbara Island to date (including plants endemic to one or more of the California Islands). There are no native trees and only 15 native shrub species. Nearly 60% of Santa Barbara Island's native plants are annuals, active for only a few months and then dying.

By comparison, Anacapa Island is roughly the same size as Santa Barbara Island, but is much closer to the mainland (13 versus 38 miles) and has more topographic diversity. Anacapa

Island has a much more diverse native flora with over 190 plant taxa, including 3 trees and 33 shrubs. Only about 40% of Anacapa's native plants have an annual life cycle.

On Santa Barbara Island, plant families with the highest number of native taxa include Asteraceae (17 taxa), Poaceae (8 taxa), and Chenopodiaceae (6 taxa.) The largest genera with native taxa are *Gnaphalium* and *Opuntia*, each with 3 taxa. It is remarkable that *Gnaphalium* was not known from Santa Barbara Island until 1981.

A total of 14 of the plant taxa found on Santa Barbara Island occur only on the islands off southern California and the west coast of Baja California. These taxa represent 14 genera and 8 families. Families with the highest number of endemic taxa include the Asteraceae (4 taxa), Fabaceae (3 taxa), and Papaveraceae (2 taxa). Although California Island endemics represent about 16% of Santa Barbara Island's native taxa, endemic shrubs account for 33% of the island's woody plants. The following 10 plants are found on more than one island, but not on the adjacent mainland: *Artemisia nesiotica*, *Astragalus traskiae*, *Calystegia macrostegia* subsp. *amplissima*, *Eriophyllum nevinii*, *Eschscholzia ramosa*, *Gambelia speciosa*, *Gilia nevinii*, *Hemizonia clementina*, *Lotus argophyllus* subsp. *ornithopus*, and *Trifolium palmeri*. Known distributions for these California Island endemics are included in the annotated catalog below. The following 4 plants are known only from Santa Barbara Island: *Dudleya traskiae*, *Eriogonum giganteum* var. *compactum*, *Malacothrix foliosa* subsp. *philbrickii*, and *Platystemon californicus* var. *ciliatus*.

### Non-Native Plants

A total of 41 plant taxa have apparently been introduced to the island, including 13 new additions during the last 20 years. The non-native plants on Santa Barbara Island represent just over 30% of the island's total flora. By comparison, percentages of introduced plants on the other California Channel Islands range from 19% (Santa Rosa) to 46% (San Nicolas).

Plant families with the highest number of non-native taxa on Santa Barbara Island are Poaceae (17 taxa) and Asteraceae (8 taxa). The genus with the highest number of non-native taxa is *Bromus* (3 taxa). Eleven non-native taxa have either been deliberately removed, or have not been seen in recent years. About 90% of the island's non-native taxa are annual herbs.

## ANNOTATED CATALOG OF PLANTS

Plants listed here are arranged alphabetically by family within related plant groups (i.e., ferns, dicotyledonous flowering plants, and monocotyledonous flowering plants). Plant taxa presumed to be introduced to California and/or Santa Barbara Island by human activities are preceded by an asterisk(\*). Voucher specimens for plants not documented by Philbrick (1972) are cited in the appendix at page 104.

Distributions for each plant are cited geographically, starting with Arch Point at the northeastern corner of the island and continuing more or less clockwise to Webster Point. Listings for Sutil Island and Shag Rock probably do not represent the total floras of these two offshore rocks, as they are seldom visited. Some plant taxa are listed with no definite location on the island, as most early collectors did not include specific locality data on their specimen labels. Place names cited on Santa Barbara Island correspond with names on the map shown on page 54, except for Elephant Seal Cove (which is located directly northwest of North Peak).

For most taxa, nomenclature follows Hickman (1993). Abbreviations of author names have been standardized according to Brummitt and Powell (1992). Family delineations for monocotyledonous flowering plants follow Dahlgren *et al.* (1985). Common names are mostly according to Smith (1976), with additions from Abrams (1923-1960), Channel Islands National Park and Santa Barbara Botanic Garden (1987), and Hickman (1993).

## FERNS

### Polypodiaceae (Polypody Fern Family)

- Polypodium californicum* Kaulf. CALIFORNIA POLYPODY.  
North-facing rock outcrops, Cave and Middle canyons.

## DICOTYLEDONOUS FLOWERING PLANTS

### Aizoaceae (Iceplant Family)

- \**Mesembryanthemum crystallinum* L. CRYSTALLINE ICEPLANT.  
Disturbed areas and open sites, scattered locations over much of the island; Sutil Island; Shag Rock. Very abundant.
- \**Mesembryanthemum nodiflorum* L. SMALL-FLOWERED ICEPLANT.  
Disturbed areas and open sites, scattered locations over much of the island; Sutil Island; Shag Rock. Less abundant than *M. crystallinum*.

### Apiaceae (Celery Family)

- Apiastrum angustifolium* Nutt. WILD CELERY.  
Rocky canyon slopes and open sites, Middle Canyon and terrace near Cave, Middle, Graveyard, and Cat canyons.
- Daucus pusillus* Michaux RATTLESNAKE WEED.  
Rocky slopes and open sites, Landing Cove area and terrace near head of Cat Canyon. Possibly introduced to Santa Barbara Island.

### Asteraceae (Sunflower Family)

- Achillea millefolium* L. [*A. borealis* Bong] YARROW.  
Open sites, scattered locations over much of the island.

- Amblyopappus pusillus* Hook. & Arn. PINEAPPLE WEED.  
Open rocky sites, scattered locations over much of the island; Shag Rock.
- Artemisia nesiotica* Raven [*A. californica* var. *insularis* (Rydb.) Munz] ISLAND SAGEBRUSH.  
Endemic to San Nicolas, Santa Barbara, and San Clemente islands. Terrace slopes and canyons, eastern portion of the island.
- Baccharis emoryi* A. Gray EMORY'S BACCHARIS.  
Open site in grassland, near head of Cat Canyon. Known from a single collection by C. Drost in 1983.
- Baccharis pilularis* subsp. *consanguinea* (DC.) C. Wolf COYOTE BRUSH.  
Previously known from a single shrub in Middle Canyon, now spreading in widely scattered sites over the entire island.
- \**Centaurea melitensis* L. TOCALOTE.  
Open sites, Landing Cove area, terrace near head of Cat Canyon, and northwest slope of Signal Peak. This taxon was spreading before eradication efforts began in 1984.
- \**Conyza bonariensis* (L.) Cronq. FLAX-LEAVED FLEABANE.  
Open sites, eastern portion of the island.
- Conyza canadensis* (L.) Cronq. HORSEWEED.  
Open sites and canyon bottoms, Middle and Graveyard canyons, and western portion of the island. Possibly introduced to Santa Barbara Island.
- Conyza coulteri* A. Gray COULTER'S CONYZA.  
Open sites, scattered locations in eastern portion of the island and near Signal Peak.
- Coreopsis gigantea* (Kellogg) H.M. Hall GIANT COREOPSIS.  
Open slopes on terrace, north-facing sea cliffs, and north-facing slopes in eastern canyons.



ISLAND SAGEBRUSH, *Artemisia nesiotica*, is one of the few woody plants on Santa Barbara Island. It has been spreading since the removal of feral rabbits in 1981. (Steve Junak)



\**Cotula australis* (Sieber) Hook. f. AUSTRALIAN BRASS BUTTONS.  
Disturbed site, top of Landing Cove trail.

*Encelia californica* Nutt. BUSH SUNFLOWER.  
South-facing sea cliff, south side of Signal Peak.

*Eriophyllum nevinii* A. Gray SILVER LACE.  
Endemic to Santa Barbara, Santa Catalina, and San Clemente islands. Steep rocky sea cliffs, between North Peak and Arch Point, between Landing Cove and Graveyard Canyon, and near Graveyard Canyon and Signal Peak; Sutil Island; Shag Rock.

*Filago californica* Nutt. CALIFORNIA FILAGO.  
Open sites, eastern portion of the island.

*Gnaphalium bicolor* Bioletti BICOLORED EVERLASTING.  
Associated with cactus patches, Graveyard Canyon area.

*Gnaphalium californicum* DC. GREEN EVERLASTING.  
Terrace at canyon edge and in canyon bottoms, Middle and Graveyard canyons.

*Gnaphalium canescens* subsp. *microcephalum* (Nutt.) Stebb. & Keil  
[*G. m.* Nutt.] WHITE EVERLASTING.

Open grassy sites, southeastern portion of the island, near heads of Graveyard and Cat canyons.

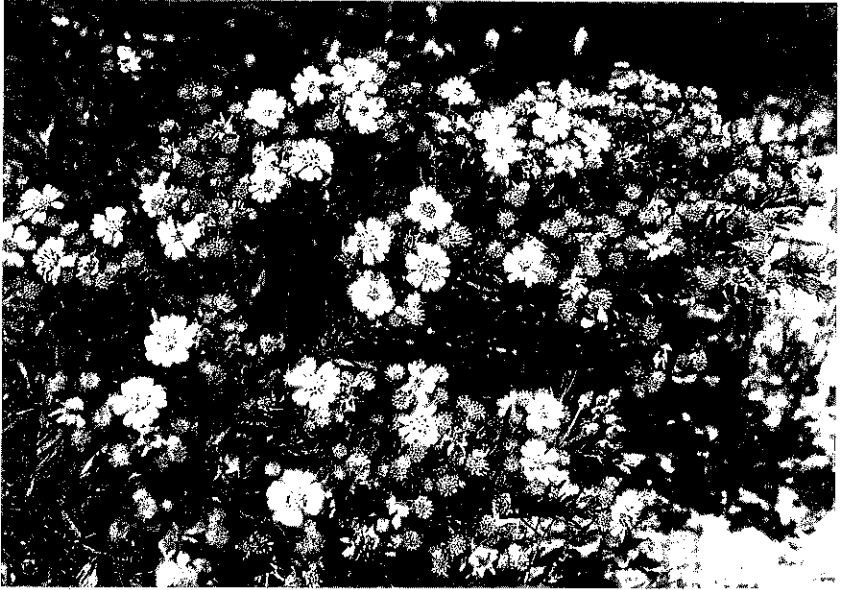
\**Gnaphalium luteo-album* L. WEEDY CUDWEED.  
Disturbed site, terrace north of lower portion of Cave Canyon. All plants seen were removed.

*Hemizonia clementina* Brandegees CATALINA TARWEED.  
Endemic to Anacapa, San Nicolas, Santa Barbara, Santa Catalina, and San Clemente islands. Grassy and rocky sites, scattered locations over much of the island.

*Hemizonia fasciculata* (DC.) Torrey & A. Gray COMMON TARWEED.  
Open grassy sites, eastern portion of the island.



SILVER LACE, *Eriophyllum nevinii*, is an attractive, yellow-flowered low shrub suitable for planting in home gardens. After seeing this species on Santa Catalina Island, Blanche Trask stated: "The foliage gleams like frost work on the cliff-sides." (Steve Junak)



CATALINA TARWEED, *Hemizonia clementina*, exhibits variability from island to island. Different but related tarweeds are restricted to other California and Baja California islands. (Steve Junak)



SANTA BARBARA ISLAND CHICORY, *Malacothrix foliosa* subsp. *philbrickii*, occurs only on Santa Barbara Island, where its yellow flowers carpet open terraces near Arch Point in the springtime. (Steve Junak)

*Lasthenia californica* Lindley [*L. chrysostoma* (Fischer & C. Meyer) E. Greene] GOLDFIELDS.

Open sites, scattered locations over much of the island.

*Malacothrix foliosa* subsp. *philbrickii* W. Davis (ined.) [*M. foliosa* of Philbrick 1972] SANTA BARBARA ISLAND CHICORY.

Endemic to Santa Barbara Island. Open sites, scattered locations over much of the island. This taxon is extremely variable with respect to habit and leaf shape. Two ecotypes can be seen on the island.

*Perityle emoryi* Torrey EMORY'S ROCK DAISY.

Rocky south-facing slopes, eastern portion of the island.

*Rafinesquia californica* Nutt. CALIFORNIA CHICORY.

Rocky slopes, Middle and Graveyard canyons.

\**Silybum marianum* (L.) Gaertner MILK THISTLE.

Canyon bottom, Cliff Canyon. Last collected in 1969 by R. Philbrick and D. Ricker, when all plants seen were removed.

\**Sonchus oleraceus* L. COMMON SOW-THISTLE.

Open sites, scattered locations over much of the island; Shag Rock.

\**Sonchus tenerrimus* L. SLENDER SOW-THISTLE.

Open sites, eastern terrace.

*Uropappus lindleyi* (DC.) Nutt. [*Microseris l.* (DC.) A. Gray, *M. linearifolia* (DC.) Schultz-Bip.]

North-facing slopes, Cave, Middle, and Graveyard canyons.

\**Xanthium spinosum* L. SPINY CLOTBUR.

Known from a single collection by L. Abrams and I. Wiggins in 1931, with no definite locality.

## Boraginaceae (Borage Family)

*Amsinckia menziesii* var. *intermedia* (Fischer & C. Meyer) Ganders  
[*A. i.* Fischer & C. Meyer] COMMON FIDDLENECK.

Grassy slopes, scattered locations over much of the island,  
especially on the terrace; Shag Rock.

*Amsinckia spectabilis* Fischer & C. Meyer var. *spectabilis*  
SEASIDE FIDDLENECK.

Open slopes, terrace near Arch Point.

*Cryptantha clevelandii* E. Greene [*C. c.* var. *florosa* I.M. Johnston]  
COMMON CRYPTANTHA.

Open slopes, eastern portion of the island.

*Cryptantha maritima* (E. Greene) E. Greene var. *maritima*  
GUADALUPE ISLAND CRYPTANTHA.

Open slopes, eastern portion of the island, especially at  
south end.

## Brassicaceae (Mustard Family)

\**Brassica nigra* (L.) Koch BLACK MUSTARD.

Trailside, Landing Cove. Known from a single collection  
by M. Dunkle in 1940.

*Guillenia lasiophylla* (Hook. & Arn.) E. Greene [*Thelypodium l.*  
(Hook. & Arn.) E. Greene]

Open sites, eastern portion of the island.

*Hutchinsia procumbens* (L.) Desv.

Open site, Landing Cove. Known from a single collection  
by R. Philbrick and M. Benedict in 1970.

*Lepidium nitidum* Torrey & A. Gray var. *nitidum* SHINING  
PEPPERGRASS.

Grassy sites, scattered locations over much of the island.

### Cactaceae (Cactus Family)

*Opuntia littoralis* (Engelm.) Cockerell COASTAL PRICKLY PEAR.  
Coastal and canyon slopes below 300 feet elevation,  
Landing Cove to Graveyard Canyon, Cat Canyon.

*Opuntia oricola* Philbr. TALL PRICKLY PEAR.  
Coastal and canyon slopes, Cliff Canyon to Cat Canyon;  
Sutil Island.

*Opuntia prolifera* Engelm. COASTAL CHOLLA.  
South-facing slopes, especially at lower elevations,  
southern and eastern portions of the island; Sutil Island.

### Cannabaceae (Hemp Family)

\**Cannabis sativa* L. MARIJUANA, HEMP.  
North-facing slope, lower portion of Middle Canyon.  
Known from a single collection in 1968, when all plants  
seen were removed by R. Philbrick.

### Caryophyllaceae (Pink Family)

\**Silene gallica* L. WINDMILL PINK.  
Open sites, Landing Cove area to Middle Canyon.

\**Spergularia bocconii* (Scheele) Merino SAND SPURREY.  
Disturbed sites, Landing Cove area.

*Spergularia macrotheca* (Hornem.) Heynh. var. *macrotheca* SAND  
SPURREY.  
Open sites, scattered locations over much of the island.

*Spergularia marina* (L.) Griseb. SALTMARSH SAND SPURREY.  
Open sites, northwestern portion of the island.

## Chenopodiaceae (Goosefoot Family)

*Aphanisma blitoides* Moq. APHANISMA.

South- and west-facing slopes, southern and eastern portions of the island, especially in canyons.

*Atriplex californica* Moq. CALIFORNIA SALTBUSH.

Open sites, widely scattered locations.

*Atriplex pacifica* Nelson SOUTH COAST SALTBUSH.

Open sites, eastern terrace and south side of Signal Peak.

\**Atriplex semibaccata* R.Br. AUSTRALIAN SALTBUSH.

Open and disturbed sites, scattered locations over much of the island; Sutil Island; Shag Rock.

*Chenopodium californicum* (S. Watson) S. Watson SOAP PLANT.

Shaded sites and canyon bottoms, eastern portion of the island.

\**Chenopodium murale* L. NETTLE-LEAVED GOOSEFOOT.

Open sites, scattered locations over much of the island; Sutil Island; Shag Rock.

*Monolepis nuttalliana* (Schultes) E. Greene

Disturbed sites, Landing Cove area.

*Suaeda taxifolia* (Standley) Standley [*S. californica* var. *pubescens* Jepson] WOOLLY SEABLITE.

Open sites, scattered locations over much of the island; Sutil Island; Shag Rock.

## Convolvulaceae (Morning Glory Family)

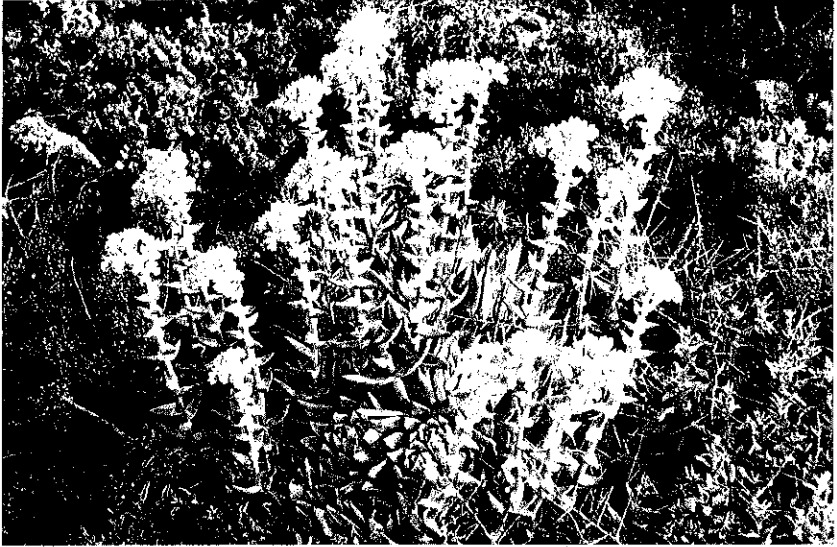
*Calystegia macrostegia* subsp. *amplissima* Brummitt [*C. m.* subsp. *m.* of Philbrick 1972] SOUTHERN ISLAND MORNING GLORY.

Endemic to San Nicolas, Santa Barbara, and San Clemente islands. Brushy slopes and canyon bottoms, in and near Cave, Middle, Graveyard, and Cat canyons.



SOUTHERN ISLAND MORNING GLORY, *Calystegia macrostegia* subsp. *amplissima*, is a white-flowered vine endemic to San Nicolas, Santa Barbara, and San Clemente islands. (Steve Junak)





SANTA BARBARA ISLAND LIVE-FOREVER, *Dudleya traskiae*, is found only on Santa Barbara Island. (Steve Junak)

### Crassulaceae (Stonecrop Family)

*Crassula connata* (Ruiz Lopez & Pavon) A. Berger [*C. erecta* (Hook. & Arn.) A. Berger] PYGMY WEED.

Open sites, scattered locations over much of the island.

*Dudleya traskiae* (Rose) Moran SANTA BARBARA ISLAND LIVE-FOREVER.

Endemic to Santa Barbara Island. Open rocky slopes in canyons and on steep coastal slopes, between Cliff and Graveyard canyons and between Cat Canyon and Signal Peak. This species has made a dramatic recovery since the removal of feral rabbits on Santa Barbara Island in 1981.

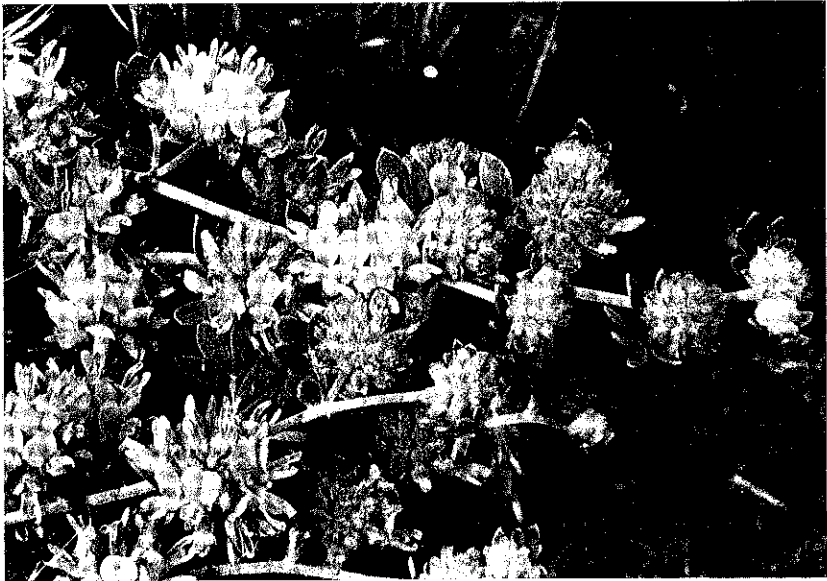
### Cucurbitaceae (Cucumber Family)

*Marah macrocarpus* var. *major* (Dunn) K.M. Stocking [*M. m.* of Philbrick 1972] WILD-CUCUMBER.

North-facing coastal slopes and in canyons, eastern portion of the island and west of North Peak.



TRASK'S LOCOWEED, *Astragalus traskiae*, is found only on San Nicolas and Santa Barbara islands. It is known for its conspicuous silver-gray foliage. (Steve Junak)



SILVER LOTUS, *Lotus argophyllus* subsp. *ornithopus*, is another pea family member known for gray foliage. Its yellow flowers quickly turn orange after pollination. (Steve Junak)

### Fabaceae (Pea Family)

*Astragalus traskiae* Eastw. TRASK'S LOCOWEED.

Endemic to San Nicolas and Santa Barbara islands. Rocky coastal slopes, area between North Peak and Arch Point and on east side of Signal Peak.

*Lotus argophyllus* subsp. *ornithopus* (E. Greene) Raven SILVER LOTUS.

Endemic to the four Southern Channel Islands and Guadalupe Island. Rocky slopes, Middle and Graveyard canyons, Signal Peak, and Webster Point area.

\**Medicago polymorpha* L. var. *polymorpha* BUR-CLOVER.

Disturbed and open sites, scattered locations at Landing Cove, Signal Peak, West Slope, and North Peak.

\**Melilotus indica* (L.) All. YELLOW SWEET-CLOVER.

Disturbed and open sites, Landing Cove area. All plants seen were deliberately removed.



SOUTHERN ISLAND CLOVER, *Trifolium palmeri*, grows in drier grasslands on Santa Barbara Island. It was first found on Guadalupe Island by Edward Palmer in 1875. Palmer (1831-1911) was a well-known physician and scientist who collected the first botanical specimens on Guadalupe Island, Mexico. (Steve Junak)

*Trifolium palmeri* S. Watson [*T. gracilentum* var. *palmeri* (S. Watson) L.F. McDermott] SOUTHERN ISLAND CLOVER.

Endemic to the four Southern Channel Islands and Guadalupe Island. Open grassy slopes and in openings between shrubs, scattered locations in eastern portion of the island.

*Trifolium willdenovii* Sprengel [*T. tridentatum* Lindley] TOMCAT CLOVER.

North-facing slopes and shaded grassy sites, scattered locations in eastern portion of the island.

### Geraniaceae (Geranium Family)

\**Erodium cicutarium* (L.) L'Her. REDSTEM FILAREE.

Disturbed and open sites, scattered locations over much of the island; Shag Rock.

\**Erodium moschatum* (L.) L'Her. WHITESTEM FILAREE.

Disturbed and open sites, scattered locations over much of the island.

### Hydrophyllaceae (Waterleaf Family)

*Eucrypta chrysanthemifolia* (Benth.) E. Greene  
var. *chrysanthemifolia*

Rocky slope, just south of Graveyard Canyon. Known from a single collection by C. Drost in 1982.

*Phacelia distans* Benth. WILD HELIOTROPE.

Rocky slopes and canyon bottoms, in and near the eastern canyons. Plants of Santa Barbara Island exhibit variable morphology, with some individuals approaching *P. floribunda* E. Greene of San Clemente and Guadalupe islands (see Philbrick 1972).

*Pholistoma auritum* (Lindley) Lilja FIESTA FLOWER.

North-facing slopes and canyon bottoms, Cave and Middle canyons.

*Pholistoma racemosum* (Nutt.) Constance

Open slopes and canyon bottoms, Landing Cove and Cave, Middle, and Graveyard canyons.

### Malvaceae (Mallow Family)

\**Malva parviflora* L. CHEESEWEED.

Disturbed and open sites, scattered locations over much of the island.

### Nyctaginaceae (Four O'clock Family)

*Mirabilis californica* A. Gray var. *californica* [*M. laevis* (Benth.) Curran] WISHBONE BUSH.

Open coastal slopes and rocky bluffs, southern portion of the island.

### Onagraceae (Evening Primrose Family)

*Camissonia cheiranthifolia* (Sprengel) Raim subsp. *cheiranthifolia* BEACH-PRIMROSE.

Known from a single collection by H. Hemphill in 1905 (?), with no definite locality. No suitable beach habitat can be found on Santa Barbara Island at present.

### Papaveraceae (Poppy Family)

*Eschscholzia ramosa* E. Greene ISLAND POPPY.

Endemic to Santa Rosa, Santa Cruz, San Nicolas, Santa Barbara, Santa Catalina, San Clemente, Los Coronados, Todos Santos, San Martin, Guadalupe, San Benito, Cedros, and Natividad islands. South- and east-facing slopes, Cave, Graveyard, and Cat canyons, and coastal bluffs between Graveyard and Cat canyons.



ISLAND POPPY, *Eschscholzia ramosa*, is the most widespread plant endemic to the California and Baja California islands. It is found on Santa Rosa, Santa Cruz, San Nicolas, Santa Barbara, Santa Catalina, San Clemente, Los Coronados, Todos Santos, San Martin, Guadalupe, San Benito, Cedros, and Natividad islands. (Steve Junak)



SANTA BARBARA ISLAND CREAM CUPS, *Platystemon californicus* var. *ciliatus*, is one of four plant taxa found only on Santa Barbara Island. This white-flowered annual occurs in restricted areas near Arch Point, where it is mixed with the yellow island chicory in spring.

(Steve Junak)

*Platystemon californicus* var. *ciliatus* Dunkle SANTA BARBARA ISLAND CREAM CUPS.

Endemic to Santa Barbara Island. Open sites in grassland, area of Arch Point and upper Cliff Canyon. This variety is only subtly distinct in an extremely variable species.

*Stylomecon heterophylla* (Benth.) G.C. Taylor WIND POPPY.

North-facing slopes, upper Cliff Canyon and Landing Cove.

### Plantaginaceae (Plantain Family)

*Plantago ovata* Forsskal [*P. insularis* Eastw.]

Open slopes and rocky sites, southern portion of the island. Possibly introduced to Santa Barbara Island.





ISLAND GILIA, *Gilia nevinii*, occurs in dry grasslands. It was named for Joseph Cook Nevin (1835-1913), who was one of the first botanists to visit San Clemente Island in April 1885. (Steve Junak)



SANTA BARBARA ISLAND BUCKWHEAT, *Eriogonum giganteum* var. *compactum*, has a smaller stature than its closest relatives on Santa Catalina and San Clemente islands. (Steve Junak)

### Polemoniaceae (Phlox Family)

*Gilia nevinii* A. Gray ISLAND GILIA.

Endemic to Santa Rosa, Santa Cruz, Anacapa, San Nicolas, Santa Barbara, Santa Catalina, San Clemente, and Guadalupe islands. Open and grassy sites, in and near the eastern canyons and near the head of Cat Canyon.

### Polygonaceae (Buckwheat Family)

*Eriogonum giganteum* var. *compactum* Dunkle SANTA BARBARA ISLAND BUCKWHEAT.

Endemic to Santa Barbara Island. Coastal bluffs, canyon slopes and adjacent terrace, primarily in scattered locations around the perimeter of the island, and in Graveyard and Cat canyons; Sutil Island; Shag Rock.

*Pterostegia drymarioides* Fischer & C. Meyer FAIRY MIST.

Shaded sites, primarily in northern portion of the island, in eastern canyons, and on northwest side of Signal Peak.

### Portulacaceae (Purslane Family)

*Calandrinia ciliata* (Ruiz Lopez & Pavon) DC. [*C. c.* var. *menziesii* (Hook.) J.F. Macbr.] RED-MAIDS.

Grassy areas and disturbed sites along trails, scattered localities in eastern portion of the island.

*Calandrinia maritima* Nutt. SEASIDE CALANDRINIA, SEA KISSES.

Open slopes, eastern portion of the island and on coastal slopes west of Cat Canyon.

*Claytonia parviflora* Hook. var. *parviflora* [*C. perfoliata* of Philbrick 1972] MINER'S LETTUCE.

Shaded slopes, Landing Cove.

*Claytonia perfoliata* var. *mexicana* (Rydb.) John M. Miller & Chambers [*C. perfoliata* of Philbrick 1972] MINER'S LETTUCE.

Shaded slopes, eastern canyons, western terrace, and North Peak.

### Primulaceae (Primrose Family)

\**Anagallis arvensis* L. SCARLET PIMPERNEL.

Disturbed site, terrace just north of lower Cave Canyon. Known from a single collection by C. Drost in 1983, when all plants seen were removed.

### Resedaceae (Mignonette Family)

*Oligomeris linifolia* (M. Vahl) J.F. Macbr. MIGNONETTE.

Open sites, scattered locations over much of the island.

### Rubiaceae (Coffee Family)

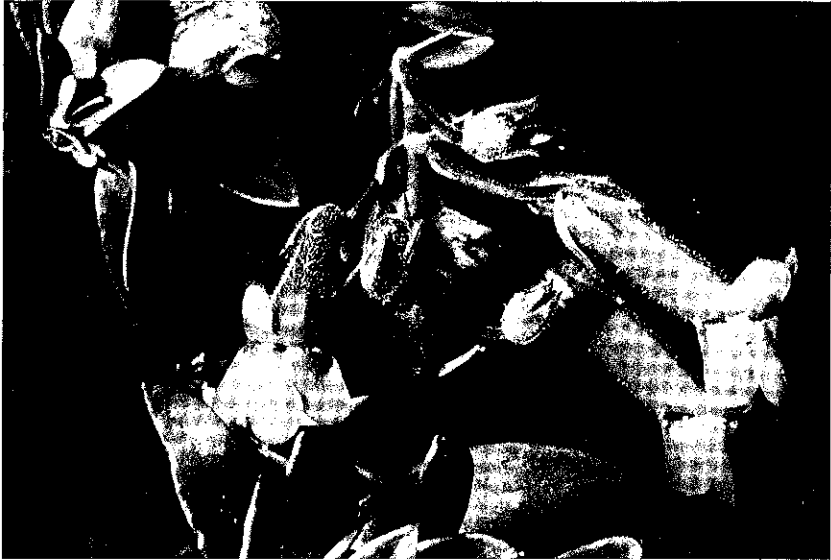
*Galium aparine* L. CLEAVERS.

Terrace and canyons, scattered locations over much of the island. Possibly introduced to Santa Barbara Island.

### Scrophulariaceae (Figwort Family)

*Gambelia speciosa* Nutt. [*Galvezia* s. (Nutt.) A. Gray] ISLAND SNAPDRAGON.

Endemic to Santa Catalina, San Clemente, Guadalupe and presumably Santa Barbara Island. Known from a single collection by J. Cooper in 1863, with no definite locality. Philbrick (1972) questioned the source of this specimen. Cooper visited Santa Barbara, Santa Catalina, San Nicolas and San Clemente islands in 1863, and it is possible that the specimen was mislabelled.



ISLAND SNAPDRAGON, *Gambelia speciosa*, is now found only on Santa Catalina, San Clemente, and Guadalupe islands. It is thought to have been collected on Santa Barbara Island by J. G. Cooper in 1863, but has not been seen on the island since then. (Steve Junak)

### Solanaceae (Nightshade Family)

*Lycium californicum* Nutt. CALIFORNIA BOXTHORN.

Terrace and open slopes, scattered locations over much of the island; Sutil Island; Shag Rock.

\**Lycopersicon esculentum* L. TOMATO.

Disturbed site, near ranger's residence above Landing Cove. Plants were observed in the early 1980s.

*Nicotiana clevelandii* A. Gray CLEVELAND'S TOBACCO.

Along trail, west side of Cat Canyon. Known from a single collection by C. Drost in 1991.

*Solanum douglasii* Dunal DOUGLAS NIGHTSHADE.

Open site, western terrace. Known only from a photograph taken by A. Bellamy in June 1980.

## Tropaeolaceae (Nasturtium Family)

\**Tropaeolum majus* L. GARDEN NASTURTIUM.

Near trail, on west side of saddle between North and Signal peaks. Known from a single collection by S. Chaney in 1993 when the only plant seen was removed.

## Urticaceae (Nettle Family)

*Hesperocnide tenella* Torrey WESTERN NETTLE.

Shaded site, Cave Canyon. Known from a single collection by M. Piehl in 1963.

*Parietaria hespera* B.D. Hinton WESTERN PELLITORY.

Shaded rock outcrops, primarily in northeastern portion of the island.

## MONOCOTYLEDONOUS FLOWERING PLANTS

### Alliaceae (Onion Family)

*Dichelostemma capitatum* Alph. Wood [*D. pulchellum* (Salisb.) Heller] BLUE DICKS.

Open sites and grassy slopes, scattered locations, primarily in the eastern portion of the island.

### Poaceae (Grass Family)

\**Agrostis viridis* Gouan. [*A. semiverticillata* (Forsskal) C. Chr.] WATER BENT.

Open flats, western terrace. Known from a single collection by C. Drost in 1986. All plants seen were removed.

\**Avena barbata* Link SLENDER WILD OATS.

Open sites, scattered locations, primarily Landing Cove, eastern terrace, and north slope of Signal Peak.

\**Avena fatua* L. WILD OATS.

Open slopes, dominant over much of the eastern portion of the island.

*Bromus arizonicus* (Shear) Stebb. ARIZONA BROME.

Open grassy slopes, primarily in northeastern portion of the island.

\**Bromus diandrus* Roth RIPGUT BROME.

Disturbed areas along trails, Landing Cove and Signal Peak area.

\**Bromus hordeaceus* L. [*B. mollis* L.] SOFT CHESS.

Open sites, scattered locations over much of the eastern terrace.

\**Bromus madritensis* subsp. *rubens* (L.) Husnot [*B. rubens* L.] RED BROME.

Dry open slopes, scattered locations over much of the island.

*Bromus trinii* Desv. CHILEAN CHESS.

Rocky slopes, northeastern portion of the island. Possibly introduced to Santa Barbara Island.

\**Cynodon dactylon* (L.) Pers. BERMUDA GRASS.

Disturbed site, along trail on north side of Webster Point. Known from a single collection by C. Drost in 1983.

*Hordeum intercedens* Nevski [*H. pusillum* of Philbrick 1972] LITTLE BARLEY.

Disturbed sites and grassy flats, terrace near eastern canyons. This taxon has been confused with *H. pusillum* Nutt., which is not found in California (von Bothmer *et al.* 1982).

\**Hordeum murinum* subsp. *glaucum* (Steudel) Tzvelev FOXTAIL.

Disturbed sites, scattered locations over much of the island; Shag Rock.

\**Lamarckia aurea* (L.) Moench GOLDENTOP.

Open and disturbed sites, eastern portion of the island.

\**Lolium multiflorum* Lam. ITALIAN RYEGRASS.

Disturbed site, along trail on eastern terrace, north of Cat Canyon and east of Signal Peak. Known only from two collections by R. Philbrick *et al.* in 1978, when all plants seen were eradicated.

*Melica imperfecta* Trin. COAST RANGE MELIC.

North-facing slopes, Cave and Middle canyons.

*Muhlenbergia microsperma* (DC.) Kunth LITTLESEED MUHLY.

Primarily on rocky south-facing slopes, eastern portion of the island.

*Nassella lepida* (A. Hitchc.) Barkworth [*Stipa l.* A. Hitchc.] SMALL-FLOWERED NEEDLEGRASS.

Known from a single collection by M. Dunkle in 1939, from "head of canyon, south side" [Cat Canyon?].

*Nassella pulchra* (A. Hitchc.) Barkworth [*Stipa p.* A. Hitchc.] PURPLE NEEDLEGRASS.

Open slopes, near the heads of Middle and Graveyard canyons. Also reported by Philbrick (1972) from near saddle, where it has not been seen in recent years.

\**Parapholis incurva* (L.) C.E. Hubb. SICKLE GRASS.

Northwest-facing slope, north base of Webster Point peninsula. Known from a single location.

\**Phalaris caroliniana* Walter

Known from a single collection by Bryan and Bryan in 1922, with no definite locality.

\**Phalaris minor* Retz. MEDITERRANEAN CANARY GRASS.

Disturbed grassy sites, eastern portion of the island between Landing Cove and Graveyard Canyon.

\**Poa annua* L. ANNUAL BLUEGRASS.

Disturbed sites along trail, Landing Cove.

\**Polypogon monspeliensis* (L.) Desf. RABBITSFOOT GRASS, ANNUAL BEARD GRASS.

North-facing slopes, Landing Cove area.

\**Schismus arabicus* Nees MEDITERRANEAN GRASS.

Disturbed sites along trail, Landing Cove and at south end of island.

\**Vulpia myuros* var. *hirsuta* (Hackel) Asch. & Graebner [*V. megalura* (Nutt.) Rydb.] FOXTAIL FESCUE.

Disturbed grassy sites, eastern portion of the island.

*Vulpia octoflora* var. *hirtella* (Piper) Henrard SIX-WEEKS FESCUE.

Open slopes, eastern canyons, southern portion of the island, and North Peak area.

### Zosteraceae (Eel-Grass Family)

*Phyllospadix scouleri* Hook. SURF-GRASS.

Tidal pools, mouth of Graveyard Canyon and Webster Point peninsula. Distributions of this and the following species are uncertain because most collections have been sterile.

*Phyllospadix torreyi* S. Watson SURF-GRASS.

Intertidal zone, Webster Point peninsula.



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## APPENDIX

This appendix includes field observation data and herbarium specimen citations to support changes in the distributions reported by Philbrick (1972) or new vascular plants records for Santa Barbara Island. In addition, incorrect reports in the scientific literature not cited in Philbrick (1972) are listed and indicated by brackets.

Plant taxa are arranged alphabetically by family within related plant groups (i.e., dicotyledonous and monocotyledonous flowering plants). Specimen citations for each taxon are listed chronologically, and then geographically within a given year if more than one location is cited. Geographic locations are listed in the same order established in the annotated catalog above (i.e., starting with Arch Point at the northeastern corner of the island and continuing more or less clockwise to Webster Point).

Each entry includes data on abundance, habitat, locality, elevation (in meters), date of collection, collector's name, and collection number, if such data were recorded. Associated species are also listed for a few collections. Specimens without collection number are cited as "s.n."

Herbarium specimens have been deposited at the Santa Barbara Botanic Garden (SBBG) unless otherwise indicated. Note that all specimens cited by Philbrick (1972) from the collection of the Los Angeles County Museum of Natural History (LAM) have been transferred to Rancho Santa Ana Botanic Garden (RSA). Specimens from the Santa Barbara Museum of Natural History (SBM) have been transferred to SBBG.

### FIELD OBSERVATION DATA AND SPECIMEN CITATIONS

#### DICOTYLEDONOUS FLOWERING PLANTS

##### AIZOACEAE

MESEMBRYANTHEMUM CRYSTALLINUM L. Now also known from Shag Rock. Half-way up east slope, Shag Rock, 13 June 1978. *Philbrick* B78-355.

MESEMBRYANTHEMUM NODIFLORUM L. Now also known from Shag Rock. Half-way up east slope, Shag Rock, 13 June 1978. *Philbrick* B78-358.

##### APIACEAE

APIASTRUM ANGUSTIFOLIUM Nutt. Known from the eastern portion of the island. Scattered along the north rim of the middle portion of Middle Canyon, 25 February 1982, *Drost* 151; common at this location in April 1983. One clump noted along the north rim of the middle portion of Cave Canyon in May 1983. Scattered individuals seen on terrace just north of the mouth of Graveyard Canyon and north-northeast of the head of Cat Canyon in May 1983.

DAUCUS PUSILLUS Michaux Now also known from the southern portion of the island. Locally common about 120 m south of benchmark "Santa Barbara South Base", north-northeast of the head of Cat Canyon, 23 May 1983, *Drost* 339.

## ASTERACEAE

*AMBLYOPAPPUS PUSILLUS* Hook. & Arn. Now also known from Shag Rock. Seen but not collected by R. Philbrick on 13 June 1978.

*BACCHARIS EMORYI* A. Gray Known from a single collection. Lone staminate shrub, one m tall, on the terrace northeast of the head of Cat Canyon, 18 November 1983, *Drost 351*. The plant soon started to decline on the windward side, and had apparently died by October 1986. A search was made at that time by S. Junak, and no live plant could be located. This is the second record from the California Channel Islands; otherwise known from Santa Catalina Island, where it has been collected only once (Thorne 1967).

*BACCHARIS PILULARIS* subsp. *CONSANGUINEA* (DC.) C. Wolf Previously known from a single shrub in Middle Canyon (Philbrick 1972). One additional shrub about six dm high was seen along the trail between Arch Point and Cliff Canyon in May 1982; four shrubs on slope west of campground at Landing Cove, 12 May 1982, *Junak et al. SB-23*. In 1983, other individual plants were noted on the terrace just north of the head of Cat Canyon, on the northwest-facing slope of Signal Peak, and on the upper west slope of the ridge near North Peak. Lone shrub, 5 dm high, on east side of main ridgeline between Signal and North peaks, north of saddle, elevation about 130 m, 24 October 1986, *Junak SB-42*; ten shrubs, from 3 dm to 7.5 dm high, in grassland on terrace north-northeast of head of Cat Canyon, elevation about 80 m, 24 October 1986, *Junak SB-37*. Additional isolated individuals were seen near the middle of the western terrace and on the west slope of North Peak by C. Drost in April 1988.

*CENTAUREA MELITENSIS* L. Now also known from the Signal Peak area. A large patch, 15 square m in size, was seen in April 1983 on the terrace between the head of Cat Canyon and the lower slope of Signal Peak. Another large spreading population on the northwest side of Signal Peak, 11 June 1978, *Philbrick et al. B78-352*. National Park Service personnel began eradication efforts in 1984.

*CONYZA BONARIENSIS* (L.) Cronq. Known from the eastern portion of the island. In September 1978, only three plants were seen in two locations. Two plants were seen along the trail on the south side of Landing Cove; a single plant was collected along the north side of Graveyard Canyon, elevation about 135 m, 18 September 1978, *Junak et al. SB-2*. Well-established near the campground on the south side of Landing Cove, 3 July 1982, *Junak & Drost SB-28*; four plants, north-facing slope in bottom of Middle Canyon with *Coreopsis gigantea*, *Calystegia macrostegia amplissima*, *Marah macrocarpus major*, and *Achillea millefolium*, elevation about 30 m, 24 October 1986, *Junak SB-34*; locally common at bluff tops between Middle and Graveyard canyons, 24 October 1986, *Junak SB-35*; single plant, in grassland on terrace north-northeast of head of Cat Canyon, elevation about 80 m, 24 October 1986, *Junak SB-39*.

*CONYZA CANADENSIS* (L.) Cronq. Known from Middle Canyon and from the western portion of the island. One plant on the west side of the island, halfway between North Peak and Signal Peak, elevation about 145 m, 18



September 1978, *Junak et al. SB-1*; one additional plant was seen in Middle Canyon on the same day. Two plants, north-facing slope in bottom of south fork of Graveyard Canyon, elevation about 50 m, 24 October 1986, *Junak SB-36*.

*CONYZA COULTERI* A. Gray Known from scattered locations in the eastern portion of the island and near Signal Peak. Two individuals on slope below trail, north side of Landing Cove, 21 August 1983, *Drost 344*. Also seen in grassland along north rim of Cave Canyon, northeast of the head of Cat Canyon, on top of Signal Peak, and near top of knoll south of North Peak by C. Drost in 1983 and 1984.

*COTULA AUSTRALIS* (Sieber) Hook f. Known from only one location. Small population around base of flagpole at Quonset hut on the south side of Landing Cove, 28 January 1983, *Drost 222*; localized population at flagpole north of Ranger residence, at top of Landing Cove trail, sandy flats with *Amsinckia menziesii intermedia*, *Spergularia bocconii*, *Malva parviflora*, *Mesembryanthemum crystallinum*, and *M. nodiflorum*, elevation about 65 m, 2 March 1993, *Junak SB-73*.

*ENCELIA CALIFORNICA* Nutt. Known only from Signal Peak. Two spreading clumps, one about 2.5 m<sup>2</sup> and the other just under one m<sup>2</sup>, on small basalt shelf on cliffs on south side of Signal Peak, 3 July 1982, *Drost 214*. A second population, consisting of two to three nearly contiguous mats and covering an area of about 20 m<sup>2</sup>, was also noted at the top of the main shelf below Signal Peak on the same day.

*ERIOPHYLLUM NEVINII* A. Gray Now also known from Shag Rock. Four plants seen, Shag Rock, 14 August 1975, *Astone s.n.*

*FILAGO CALIFORNICA* Nutt. Known from the eastern portion of the island. Scattered just north of the head of Graveyard Canyon, 14 April 1982, *Drost 195*; scattered on south-facing slope of the middle portion of Middle Canyon, 12 April 1983, *Drost 334*.

*GNAPHALIUM BICOLOR* Bioletti Known from small populations in the Graveyard Canyon area. About eight plants just north of the head of Graveyard Canyon, 17 September 1981, *Drost 147*. This population expanded quickly, with 13 flowering individuals, five large non-flowering plants, and 80-100 seedlings observed in October 1983; one large flowering individual was also noted about 100 m south of the main population and a solitary seedling was seen on the north rim of Graveyard Canyon. A small population of 60-65 individuals was seen with *Opuntia* along a shallow gully on the northeast slope of lower Graveyard Canyon by C. Drost on 18 December 1983. Single individual, 1 m high, on southeast-facing slope, in center of *Opuntia littoralis* patch just north of head of north fork of Graveyard Canyon, elevation about 100 m, 23 October 1986, *Junak SB-30*; at least 14 individuals up to 1 m high, in large clump of *Opuntia oricola* and *Artemisia nesiotica*, 100 m north of north fork of Graveyard Canyon, elevation about 100 m, 23 October, *Junak SB-32*.

GNAPHALIUM CALIFORNICUM DC. Known from Middle and Graveyard canyons. Top of the north-facing slope of lower Middle Canyon, about 80 m from the canyon mouth, 6 June 1982, *Drost 209*. Two individuals were also seen with *G. bicolor* in lower Graveyard Canyon by C. Drost on 18 December 1983.

GNAPHALIUM CANESCENS subsp. MICROCEPHALUM (Nutt.) Stebb. & Keil Known only from the southeastern portion of the island. Seventeen scattered individuals in grassland with *Opuntia oricola* and *O. prolifera* on terrace just north of the north fork of Graveyard Canyon, 21 March 1984, *Drost 382*; southeastern bluffs with *Eriogonum giganteum compactum*, *Atriplex semibaccata*, *Lycium californicum*, and *Opuntia littoralis*, 16 September 1985, *McCluskey s.n.* Also seen on terrace east of the head of Cat Canyon.

GNAPHALIUM LUTEO-ALBUM L. Known from only one location. A few plants on terrace just north of lower Cave Canyon, 27 September 1983, *Drost 348*. All plants seen were removed.

{SONCHUS ASPER (L.) Hill Reported erroneously by Wallace (1985) on the basis of two specimens [14 July 1922, *Bryan & Bryan s.n.* (LAM) and an unspecified collection at SBM]. The only Santa Barbara Island specimen in the SBM collection (14 April 1939, *Bond 378*) and the *Bryan & Bryan* specimen are *S. oleraceus* L.}

SONCHUS OLERACEUS L. Now also known from Shag Rock. Uppermost portion of east slope, Shag Rock, 13 June 1978, *Philbrick B78-364*.

UROPAPPUS LINDLEYI (DC.) Nutt. Now also known from Graveyard Canyon, with a few scattered individuals seen below the fork in April 1983.

#### BORAGINACEAE

AMSINCKIA MENZIESII var. INTERMEDIA (Fischer & C. Meyer) Ganders Now also known from Shag Rock. Uppermost portion of east slope, Shag Rock, 13 June 1978, *Philbrick B78-361*.

#### CARYOPHYLLACEAE

{POLYCARPON DEPRESSUM Nutt. Cited by A. Gray [Synoptical flora of North America 1 (1): 255. 1895.] as "also on Sta. Barbara and Sta. Catalina Ids., Brandegee." Brandegee is not known to have collected on Santa Barbara Island. The only pertinent sheet located (UC #174791) was collected by T. S. Brandegee in 1886 [?] from "near Santa Barbara." It is probable that the citation for Santa Barbara Island is in error.}

SPERGULARIA BOCCONII (Scheele) Merino Known only from the Landing Cove area, where it is slowly spreading. Small localized population around base of flagpole at Quonset hut on south side of Landing Cove, 10 May 1982, *Drost 205*; scattered on disturbed north-facing slope, about one-third of the way up the Landing Cove trail, elevation about 25 m, 7 April 1991, *Junak SB-61*.

SPERGULARIA MARINA (L.) Griseb. Known from the northwestern portion of the island. Scattered clumps on north edge of slope between upper and lower terraces of Webster Point, 22 May 1983, *Drost* 337. Also noted as small scattered populations with *Suaeda taxifolia* and *Mesembryanthemum crystallinum* on upper west terrace on the same day.

#### CHENOPODIACEAE

ATRIPLEX PACIFICA Nelson Known from the eastern terrace and the south-east side of Signal Peak. First noted at the Signal Peak location by M. Hochberg and S. Whitmore in 1976. Forming mats, scattered, east terrace, 21 October 1961, *Blakley* 4810, previously reported as *A. californica* by Philbrick (1972); southeast side of Signal Peak on shale outcrops, elevation about 180 m, 26 August 1976, *Hochberg & Whitmore s.n.*; about 30 plants on the south side of Signal Peak, 3 April 1979, *Junak et al. SB-4*; locally common at top of sea cliffs, along trail just southeast of Signal Peak, elevation about 165 m, 24 October 1986, *Junak SB-41*.

ATRIPLEX SEMIBACCATA R. Br. Now also known from Shag Rock. Shag Rock, 14 August 1975, *Astone s.n.*; uppermost part of east slope, Shag Rock, 13 June 1978, *Philbrick B78-359*.

CHENOPODIUM MURALE L. Now also known from Shag Rock. Shag Rock, 14 August 1975, *Astone s.n.*; uppermost part of east slope, Shag Rock, 13 June 1978, *Philbrick B78-360*.

MONOLEPIS NUTTALLIANA (Schultes) E. Greene Known only from the Landing Cove area. Rare in disturbed soil along trail at the western end of Landing Cove, elevation about 50 m, 3 April 1979, *Junak et al. SB-3*; locally common along trail, northwest side of Landing Cove, elevation about 60 m, 6 April 1991, *Junak SB-48*.

SUAEDA TAXIFOLIA (Standley) Standley Now also known from Shag Rock. Shag Rock, 14 August 1975, *Astone s.n.*; half-way up east slope, Shag Rock, 13 June 1978, *Philbrick B78-356*.

#### CONVOLVULACEAE

CALYSTEGIA MACROSTEGIA subsp. AMPLISSIMA Brummitt Now also known from the southern portion of the island, with large patches seen on the terrace just north and northeast of the head of Cat Canyon in 1981, 1982, and 1983.

#### CRASSULACEAE

CRASSULA CONNATA (Ruiz Lopez & Pavon) A. Berger Widespread over most of the island in April 1979.

DUDLEYA TRASKIAE (Rose) Moran Now known from the eastern and southwestern portions of the island. Reported as possibly extinct in the wild in 1970 (Philbrick 1972), this endemic taxon has made a dramatic comeback in recent years. Five living plants were seen by ornithologist Molly W. Hunt in May 1975 (Moran 1978). Eight plants (in Middle Canyon and south of Signal Peak) were counted by R. Philbrick in that same month. Perhaps the most important discovery was made in May 1976, when a large and vigorous colony was discovered on the west slope of Signal Peak by M. Hunt, while she was searching for Xantus' Murrelet nests (Hunt 1976). An additional 29 rosettes were counted on a south-facing slope in lower Cave Canyon with *Opuntia prolifera* by M. Hochberg in August 1976; the plants were healthy and had flowered that year. Small populations are now known from the coastal bluffs between Arch Point and Cliff Canyon, Cave Canyon, Middle Canyon, coastal bluffs north of Graveyard Canyon, and coastal bluffs west of Cat Canyon. Two large populations are on the steep coastal bluffs south and west of Signal Peak. Junak *et al.* observed both glabrous and glaucous rosettes in Middle Canyon in April 1979.

#### CUCURBITACEAE

MARAH MACROCARPUS var. MAJOR (Dunn) K.M. Stocking Now also known from the western portion of the island. One plant seen on north-facing slope west of North Peak in March 1983.

#### FABACEAE

LOTUS ARGOPHYLLUS subsp. ORNITHOPUS (E. Greene) Raven Now also known from Graveyard Canyon, where it is quite common. In October 1983, 52 individual plants were observed in the north fork.

MELILOTUS INDICA (L.) All. Known only from the Landing Cove area. Rare at top of trail on south side of Landing Cove, 9 May 1982, *Drost 204*. This taxon slowly spread along the trail near Landing Cove, but plants were deliberately removed.

#### GERANIACEAE

ERODIUM CICUTARIUM (L.) L'Her. Now also known from Shag Rock. Upper west slope, Shag Rock, 13 June 1978, *Philbrick B78-368*.

#### HYDROPHYLLACEAE

EUCRYPTA CHRYSANTHEMIFOLIA (Benth.) E. Greene var. CHRYSANTHEMIFOLIA. Known from a single collection. Single plant on basalt outcrop near top of steep slope just south of Graveyard Canyon, 14 April 1982, *Drost 195*.

## LAMIACEAE

(LEPECHINIA CALYCINA (Benth.) Epling Erroneously reported by Wallace (1985), who cites a specimen at SBBG. We know of no such specimen. *Lepechinia calycina* has not yet been documented for any of the California Channel Islands.)

## PAPAVERACEAE

ESCHSCHOLZIA RAMOSA (E. Greene) E. Greene Now also known from the southeastern portion of the island. Single plants were noted near the top of the coastal bluffs south of Graveyard Canyon in May 1982 and on the east-facing slope of lower Cat Canyon in March 1982.

## POLEMONIACEAE

GILIA NEVINIA. Gray Also seen on the east side of upper Cat Canyon in April 1979 and with *Lycium californicum* on terrace northeast of the head of Cat Canyon in 1982 and 1983.

## POLYGONACEAE

ERIOGONUM GIGANTEUM var. COMPACTUM Dunkle Now also known from Shag Rock. Loose, unattached piece that may have been brought by bird, Shag Rock, 14 August 1975, *Astone s.n.*

PTEROSTEGIA DRYMARIOIDES Fischer & C. Meyer Also seen on disturbed slope on the northwest side of Signal Peak in June 1978.

## PORTULACACEAE

CALANDRINIA CILIATA (Ruiz Lopez & Pavon) DC. Now also known from the southeastern portion of the island. West-facing slope at the head of Cat Canyon, 3 April 1979, *Philbrick & Junak s.n.* Also seen in middle Cliff Canyon at trail crossing, north of the mouth of Graveyard Canyon, and along the trail at the top of sea bluffs in southeastern portion of the island, where it was quite common in April 1979. Also scattered along the north rim of Middle Canyon in April 1983.

CALANDRINIA MARITIMA Nutt. Now also known from the southern portion of the island. Common on south-facing slope west of Cat Canyon in 1982.

## PRIMULACEAE

ANAGALLIS ARVENSIS L. Known from only one location. Two plants on terrace just north of lower Cave Canyon, 27 September 1983, *Drost 345*. Both plants seen were removed.

## SOLANACEAE

LYCIUM CALIFORNICUM Nutt. Now also known from Shag Rock. A few cascading plants, Shag Rock, 14 August 1975, *Astone s.n.*; uppermost part of east slope, Shag Rock, 13 June 1978, *Philbrick B78-365*.

LYCOPERSICON ESCULENTUM L. Known only from the Landing Cove area. Plants were observed by both A. Bellamy and C. Drost near the water drain for the ranger's residence above Landing Cove, but no specimens were collected.

NICOTIANA CLEVELANDII A. Gray Known from a single collection. Single individual, along trail on west side of Cat Canyon, 15 April 1991, *Drost 395*.

SOLANUM DOUGLASII Dunal Known only from a photograph taken on the western terrace of the island by A. Bellamy in June 1980. No specimen has been located.

## TROPAEOLACEAE

TROPAEOLUM MAJUS L. Known from a single collection. Single plant, west slope, along trail to Webster Point, 100 m below saddle between peaks, 9 April 1993, *Chaney s.n.* The only plant seen was removed.

## MONOCOTYLEDONOUS FLOWERING PLANTS

### POACEAE

AGROSTIS VIRIDIS Gouan. Known from a single collection. Localized near Elephant Seal Cove, 140 m south of cliff on upper west terrace, with *Suaeda taxifolia*, *Mesembryanthemum crystallinum*, *Amblyopappus pusillus*, and *Hordeum murinum*, 15 May 1986, *Drost 391*. All plants seen were removed.

BROMUS DIANDRUS Roth Now known from the Signal Peak area. Abundant in patches on upper west slope of Signal Peak, 8 April 1982, *Drost 188*; localized population on north flanks of Signal Peak, along trail between saddle and west side of island, with *Amsinckia intermedia*, *Hordeum murinum*, *Malva parviflora*, and *Sonchus oleraceus*, elevation about 100 m, 5 March 1993, *Junak SB-101*.

CYNODON DACTYLON (L.) Pers. Known from a single collection. Small clump along trail on the north side of Webster Point with *Mesembryanthemum crystallinum* and *Suaeda taxifolia*, 7 June 1983, *Drost 342*.

LOLIUM MULTIFLORUM Lam. Only one location known. Two clumps along trail on the eastern terrace, north of Cat Canyon and east of Signal Peak, 12 June 1978, *Philbrick et al. B78-349* and *B78-350*. All plants seen were removed.

NASSELLA LEPIDA (A. Hitchc.) Barkworth Known from a single collection. Head of canyon [Cat Canyon?], south side, 28 May 1939, Dunkle 8109 (RSA, SBBG). Previously reported as *Stipa pulchra* by Philbrick (1972).

PHALARIS CAROLINIANA Walter Known from a single collection. No definite locality, 14 July 1922, *Bryan & Bryan s.n.* (RSA).

PHALARIS MINOR Retz. Also seen north of Graveyard Canyon in April 1979.

POA ANNUA L. Known only from Landing Cove. Locally common on north-facing slope, in disturbed area along Landing Cove trail, above switchback in trail, elevation about 40 m, 6 April 1991, *Junak SB-49*.

SCHISMUS ARABICUS Nees Known from Landing Cove and the south end of the island. Localized on disturbed flats at top of Landing Cove trail, near flagpole in front of Quonset hut, elevation about 50 m, 7 April 1990, *Junak SB-46*; uncommon, south-facing slope along trail west of Cat Canyon, elevation about 75 m, 12 April 1992, *Junak SB-66*.

VULPIA OCTOFLORA var. HIRTELLA (Piper) Henrard Now also known from Cat Canyon area and North Peak, as well as from the eastern canyons. South-facing slope just east of the middle portion of Cat Canyon, 11 June 1978, *Philbrick et al. B78-351*; slope of North Peak facing Shag Rock, elevation about 170 m, 11 June 1978, *Philbrick B78-346*.