

**Santa Cruz Island Bushmallow
(*Malacothamnus fasciculatus* var. *nesioticus*)**

**5-Year Review:
Evaluation and Summary**



Photo credit: Denise Knapp, Santa Barbara Botanic Garden

**U.S. Fish and Wildlife Service
Ventura Fish and Wildlife Office
Ventura, California**

August 2025

5-YEAR REVIEW

Santa Cruz Island Bushmallow (*Malacothamnus fasciculatus* var. *nesioticus*)

GENERAL INFORMATION:

Species: *Malacothamnus fasciculatus* (Nutt. ex Torr. & A. Gray) Greene var. *nesioticus* (B.L. Rob.) Kearney

Date listed: July 31, 1997 (as *Malacothamnus fasciculatus* subsp. *nesioticus*)

Federal Register (FR) citation: 62 FR 40954

Classification: Endangered

Critical Habitat Designation: We have not designated critical habitat for Santa Cruz Island bushmallow.

State Listing: Listed by the State of California as state endangered (CNDDDB 2025a p. 15).

BACKGROUND:

Species overview:

Santa Cruz Island bushmallow (*Malacothamnus fasciculatus* var. *nesioticus*) is a shrub in the mallow family (Malvaceae; Morse 2023a, 2023b pp. 103-104). Synonyms include *Malvastrum nesioticum*, *Malacothamnus nesioticus*, *Sphaeralcea nesiotica*, *Sphaeralcea fasciculata* var. *nesiotica*, and *Malvastrum fasciculatum* var. *nesioticum*.

Santa Cruz Island bushmallow plants are up to 3 meters (m) tall, spread by rhizomes, and have obscurely to moderately lobed leaves. Flowers are in multi-branched inflorescences, with pinkish (rarely white) petals about 2 centimeters long. Flowering is April to July.

The plant is found in a variety of woody vegetation types at up to 250 m elevation. It occurs in relatively recently disturbed or burned areas, often at edges and or in gaps in vegetation.

Santa Cruz Island bushmallow is restricted to Santa Cruz Island and is the only taxon of *Malacothamnus* on Santa Cruz Island. Santa Cruz Island is in Santa Barbara County, California, about 32 kilometers from the mainland, and is 76% owned by The Nature Conservancy (TNC) and 24% by Channel Islands National Park (CINP). The land is managed for natural resource conservation.

Santa Cruz Island was ranched beginning in the mid-1800s (McEachern et al. 2016a pp. 759-760), with mostly sheep (*Ovis aries*) and cattle (*Bos taurus*). There were also thousands of feral pigs (*Sus scrofa*). When Santa Cruz Island bushmallow was listed in 1997, feral pigs and sheep were still present on Santa Cruz Island; sheep were eradicated by 2001, and pigs by 2006.

Most recent status review:

[Service] U.S. Fish and Wildlife Service. 2021. Santa Cruz Island Bush Mallow (*Malacothamnus fasciculatus* var. *nesioticus*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Ventura Field Office, Ventura, California. 9 pp.

In our 2021 status review, we recommended no status change from endangered for Santa Cruz Island bushmallow

FR notice citation announcing this status review:

[Service] U.S. Fish and Wildlife Service. 2024. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status Reviews for 59 Pacific Southwest Species. Federal Register 89:83510-83514.

ASSESSMENT:

Information acquired since the last status review:

The U.S. Fish and Wildlife Service's (Service) Ventura Fish and Wildlife Office (VFWO) conducted this 5-year review. We announced the review through a Federal Register notice on October 16, 2024 (89 FR 83510). We did not receive any information from the public in response to our Federal Register notice. We conducted a literature search and a review of information in our files, and also contacted botanists at CINP, U.S. Geological Survey, Santa Barbara Botanic Garden (SBBG), TNC, and other botanists to request any data or information we should consider in our review.

Distribution and abundance:

Distribution: The distribution of Santa Cruz Island bushmallow is unchanged since the last 5-year review (Service 2021 pp. 2-3; Figure 1, Table 1). There are six known naturally occurring sites; there are no known extirpated natural sites. There are an additional 17 recovery sites that have been planted between 2005 and 2015, and all these are extant. All the natural sites are on TNC property. Ten of the recovery planting sites are on TNC land, with the other seven on CINP. Few populations are entered into the California Natural Diversity Database (CNDDDB 2025b) and have an assigned Element Occurrence number; in general Channel Islands plant populations are underreported to CNDDDB and the Consortium of California Herbaria online database (CCH2 2025).

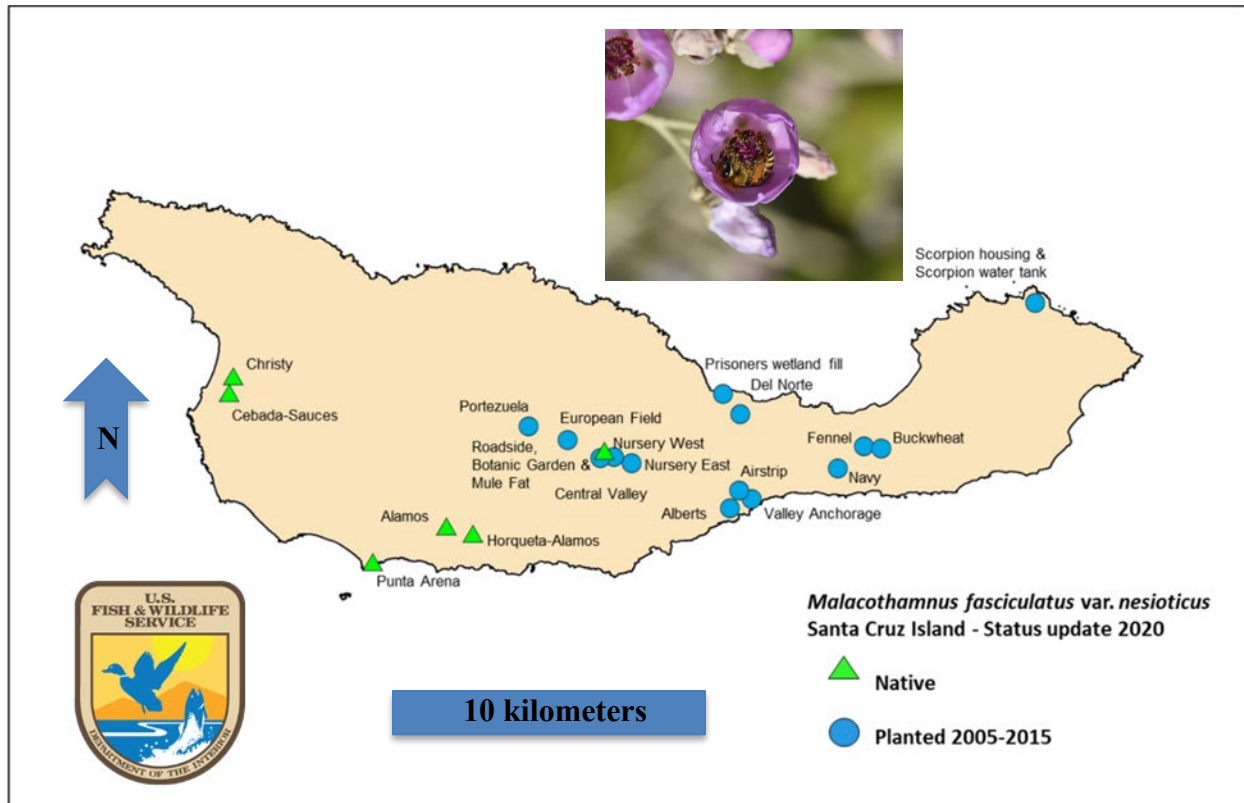


Figure 1. Distribution of Santa Cruz Island bushmallow (from McEachern 2020). Because they are so close, Roadside, Botanic Garden and Mule Fat are represented by a single point, as are Scorpion Housing and Scorpion Water Tank.

Table 1. Natural and planted populations of Santa Cruz Island bushmallow. Data are from Service (2012), CNDDDB (2019) and McEachern (2020). All populations are extant.

site	CNDDDB Element Occurrence number	natural or planted	first discovered or planted	landowner
Christy	1	natural	1927	The Nature Conservancy
Central Valley	2	natural	1993	The Nature Conservancy
Horqueta-Alamos	3	natural	1997	The Nature Conservancy
Cebada-Sauces	4	natural	1997	The Nature Conservancy
Alamos	none	natural	2013	The Nature Conservancy
Punta Arena	none	natural	2015	The Nature Conservancy
Valley Anchorage	6	planted	2005	The Nature Conservancy
Alberts	none	planted	2005	The Nature Conservancy
European Field	none	planted	2005	The Nature Conservancy
Portozuela	8	planted	2005	The Nature Conservancy
Roadside	7	planted	2011	The Nature Conservancy
Nursery West	none	planted	2011	The Nature Conservancy
Nursery East	none	planted	2011	The Nature Conservancy

site	CNDDDB Element Occurrence number	natural or planted	first discovered or planted	landowner
Airstrip	none	planted	2011	The Nature Conservancy
Botanic Garden	none	planted	2011	The Nature Conservancy
Mulefat	none	planted	2011	The Nature Conservancy
Prisoners Wetland Fill	5	planted	2012	Channel Islands National Park
Del Norte	none	planted	2015	Channel Islands National Park
Navy	none	planted	2015	Channel Islands National Park
Fennel	none	planted	2015	Channel Islands National Park
Buckwheat	none	planted	2015	Channel Islands National Park
Scorpion Housing	none	planted	2015	Channel Islands National Park
Scorpion Water Tank	none	planted	2015	Channel Islands National Park

Abundance: It is difficult to assess the trajectory of the six natural populations of Santa Cruz Island bushmallow. Santa Cruz Island bushmallow is a clonally spreading shrub with individual above-ground stems living only several years, but it is unknown how long a genetic individual lives as it continues to produce more stems from underground runners. In the past, population size has been reported by number of plants, number of stems, and area, but not all these measures are consistently reported, and it is likely they have been interpreted differently by different observers. Most natural populations are difficult to access, and reporting has been infrequent. The most accurate summary of the natural populations is that at this time they all remain extant and, except for Cebada-Sauces, have very few genetic individuals. It is estimated that the Cebada-Sauces population has at least 100,000 stems and that other natural populations have on the order of dozens each (K. McEachern, pers. com. to K. Niessen 20 February 2025).

The 17 recovery sites are made up of plants derived from vegetative cuttings from four of the natural populations: Christy, Cebada-Sauces, Horqueta-Alamos, and Central Valley (Service 2021 pp. 3-4). The Christy, Horqueta-Alamos, and Central Valley sites probably each contain single clones, while the Cebada-Sauces population likely has several clones. Since the populations were planted, the areas and densities of the plantings have expanded, and, qualitatively, plants derived from the different natural populations have had different success at particular planting locations. It is not known how many stems are derived from particular natural populations in any one plot, or in aggregate among planting sites, but it is estimated that there are about 100,000 stems overall (K. McEachern, pers. com. to K. Niessen 20 February 2025). Future monitoring of planted populations is one of the tasks planned under an active Section 6 grant to SBBG (Schneider 2022, p. 5-10).

Conservation seed banking:

There has been an increase in seeds of Santa Cruz Island bushmallow in conservation seed banks in Center for Plant Conservation approved facilities since the last 5-year review (Appendix). For the most part, collections from natural populations are from 2008 or earlier (CaPR 2025), and the most recently discovered natural populations, Alamos and Punta Arena, are not represented at all. However, there have been recent collections from most of the planted sites (Appendix).

Future seed collecting of both natural and planted populations for conservation seed banking is one of the tasks planned under an active Section 6 grant to SBBG (Schneider 2022, pp. 5-10).

Seed germination:

There has been no observed natural germination of seeds or seedlings of Santa Cruz Island bushmallow. Therefore, there has been some research into which environmental or other cues could lead to germination. Taxa in the genus *Malacothamnus* are generally considered to be fire followers, and thus Santa Cruz Island bushmallow may be expected to respond to the mechanical cracking of seed coat by fire, or the chemical constituents of smoke. In one experiment, seeds were either left intact or had the seed coat nicked (McEachern et al. 2023 pp. 12-13). Within each group, some were unsoaked, soaked, or soaked with an aqueous culinary liquid smoke solution; liquid smoke is a standard treatment to simulate natural smoke, which some fire-following plants require. Almost no intact seeds germinated, while for nicked seeds about two thirds germinated, with no differences between unsoaked, pre-soaked, or liquid smoke treatments. This suggests that the seeds need mechanical cracking for successful germination. In another experiment (McEachern et al. 2023 p. 13), seeds that were nicked and kept dry for one year still had about 50% germination after planting, suggesting that even if cracked by fire, they could survive until future rains come.

In an incomplete experiment (McEachern and Chaney 2025), in January 2025, 30 plots at each of three sites (at Valley Anchorage, Airstrip, and Del Norte) were seeded with 40 Santa Cruz Island bushmallow seeds per plot, with half the plots having intact seeds and the other half with nicked seeds. Three months later, the sites were visited to count seedlings. There were almost no seedlings; over all the plots, only three seedlings from intact seeds and three from nicked seeds were found. The plots have not been visited since. The reason for the equally low observed germination remains unknown.

Living collections:

The planted populations of Santa Cruz Island bushmallow are made up of vegetatively propagated plants from four of the six known natural populations (Christy, Cebada-Sauces, Horqueta-Alamos, and Central Valley). However, the two remaining natural populations, Punta Arena and Alamos, did not have living material collected and propagated until recently (Schneider and Hernandez 2024a). Beginning in 2020, collecting trips brought plant material to the mainland, followed by successful nursery propagation, and planting on SBBG grounds. Interestingly, propagation was much more successful for the Punta Arena plants than for the Alamo plants, and a future trip to the Alamo site may be needed to establish a more secure number of individuals. Lessons learned on the mainland can be used to more successfully propagate plants at the Santa Cruz Island TNC nursery, with an ultimate goal of planting Punta Arena and Alamos plants in mixed origin stands on the island.

Threats:

At listing (Service 1997), we identified the following threats to Santa Cruz Island bushmallow: habitat alternation, soil loss, feral pig rooting, grazing by sheep, over-collection, the inadequacy of existing regulatory mechanisms, extinction from random naturally occurring events due to the species limited distribution and small population sizes, and competition with introduced plants. In the 2012 5-year review (Service 2012), we added climate change effects as a threat. The 2021

5-yr review (Service 2021) identified no additional threats, and we identify no additional threats now. The current importance of threats is summarized below.

Habitat alternation, soil loss, feral pig rooting, grazing by sheep: The major direct threat to Santa Cruz Island bushmallow, activities by non-native ungulates, is gone. Because feral pigs and sheep were eradicated, the 2012 and 2021 5-year reviews considered these threats to be eliminated, with remaining residual indirect effects to soil and vegetation. However, the condition of the Santa Cruz Island vegetation and soils is in general gradually improving through passive restoration (Beltran *et al.* 2014), and indirect effects are lessening.

Over-collection and the adequacy of existing regulatory mechanisms: In the 2012 5-year review we determined that over-collection of specimens is no longer a threat. Because Santa Cruz Island is jointly managed by TNC and CINP for resource conservation, the 2012 5-year review considered regulatory mechanisms to be adequate. We agreed with these conclusions in the 2021 5-year review, and agree in this 5-year review.

Extinction from random naturally occurring events due to the species limited distribution and small population sizes: As discussed in the 2021 5-year review, stochastic extirpation of small populations, leading to species extinction, remains a threat. Of the six known natural occurrences, five have fairly few above-ground stems, and there is a lack of observed recruitment by seed in both natural and planted populations. However, planted populations persist well through clonal spreading, and it is unknown how long underground seeds and stems can last without above ground expression. Little is known about natural soil seed banks, or soil seed banks around planted populations. It is the opinion of the expert on the genus (K. Morse, pers. com. to K. Niessen 20 February 2025) that a widespread fire on Santa Cruz Island could lead to the germination of long-lived soil seed banks and the establishment of new populations. Currently there is enough uncertainty about biology of Santa Cruz Island bushmallow that the threat of extinction from random natural events remains.

Competition with introduced plants: As discussed in the 2021 5-year review, competition with non-native plants remains an uninvestigated threat to Santa Cruz Island bushmallow. There may also be an unquantified negative effect of unmeasured competition with passively recovering native plant species.

Climate change: In our last 5-year review (Service 2021), we continued to recognize that climate change may have important potential effects on Santa Cruz Island bushmallow and its habitat. A recent synthesis applicable to the northern Channel Islands (Langridge *et al.* 2018, pp. 10-33) predicts increasing temperatures under all scenarios, and greater likelihoods of extreme storms, drought, and wildfire. While adequate biological information to make accurate predictions regarding the effects of these and other aspects of climate change on Santa Cruz Island bushmallow is lacking, we expect that an increase in temperatures, storm severity, and drought may all have an overall negative effect on the species in the future. Wildfire could possibly have negative or positive effects on existing populations and stimulating seeds at unknown locations, depending on fire severity, duration, and return interval.

Evaluation of Recovery Criteria:

We list recovery criteria in the Recovery Plan (Service 2000 pp. 66-67).

Downlisting criteria for Santa Cruz Island bushmallow (Service 2000, p. 66) include:

- Establish five viable populations on Santa Cruz Island.
 - Six known natural populations and 17 outplanted populations currently exist. Plants within the outplanted populations are often spreading clonally, seem to have sufficient pollinators, and produce viable seed; there are no reported seedlings. However, seeds may only germinate after disturbance events, such as fire. This criterion has likely been met.
- Maintain populations as stable or increasing with evidence of natural recruitment for a period of 15 years that includes the normal precipitation cycle.
 - Monitoring of natural populations is irregular, and numbers are difficult to interpret. Again, we are not aware of evidence of natural recruitment from seeds; however, seeds may germinate only after fire or other disturbance. Planted populations have persisted and expanded with subterranean runners for more than or approaching 15 years. This criterion has been partially met.
- Seed stored in CPC (Center for Plant Conservation) cooperating facilities.
 - Conservation seed banking is still incomplete for natural populations, but is improving for planted populations. There are plans to increase the completeness of conservation seed banks. This criterion been partially met.
- Seed germination and propagation techniques understood.
 - While propagation techniques from cuttings are successful, seed germination and seedling survivorship is less well understood (K. Morse, pers. com. to K. Niessen 20 February 2025). There is little evidence for natural recruitment from seed; however, the conditions for seed germination may be very infrequent. This criterion has been partially met.
- Successful outplanting techniques developed.
 - Outplanting techniques are well understood (McEachern et al. 2016b). This criterion has been met.
- Life history research conducted.
 - Many aspects of the life history of the species are understood; however, the lack of seedling recruitment is not. This criterion has been partially met.
- Weed management plan developed and implemented.
 - TNC has an active invasive plant management strategy (Ball et al. 2017 entire). This criterion has been adequately met.
- If declining, determine cause and reverse trend.
 - Because of irregular monitoring, it is unclear whether natural populations are declining. However, planted populations are increasing. This criterion has likely been met.

Delisting criteria for Santa Cruz Island bushmallow (Service 2000, p. 67) include:

- Establish or find five additional populations.
 - A sufficient number of outplanted populations have been established, and they are persisting. This criterion has been met.
- No decline after downlisting for 10 years.
 - Not currently applicable.
- All potential habitat surveyed.

- There is a consensus among island botanists that there are still locations on Santa Cruz Island where currently unknown populations of Santa Cruz Island bushmallow might be found. This criterion has not been met.

Conclusion:

After reviewing the best available scientific information, and the evaluation of threats affecting the species under the factors in 4(a)(1) of the Endangered Species Act, and analysis of the status of the species, we conclude that at this time Santa Cruz Island bushmallow remains an endangered species. Although there are 6 extant natural populations and 17 plantings, the genetic make-up of the populations remains unknown, and natural recruitment has not been observed, leaving the species vulnerable to existing threats including stochastic extirpation of small populations and effects of climate change.

RECOMMENDATIONS FOR FUTURE ACTIONS:

The following list is similar to that of the previous 5-year review (Service 2021), with the addition of recommendation 5.

1. Survey for additional natural populations.
2. Increase monitoring frequency and regularity of natural and planted populations using consistent monitoring methods.
3. Increase natural population conservation seed banking at CPC approved facilities, especially for the recently discovered Punta Arena and Alamos populations.
4. Determine why seedling recruitment is low/non-existent.
5. Conduct studies of seed (on plant and in soil) genetic diversity at natural and planted populations.
6. Augment natural populations with seeds or plants from within those populations, and augment planted populations with plants derived the Punta Arena and Alamos populations.

Supervisor, Ventura Fish and Wildlife Office

Approved _____

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Appendix. Santa Cruz Island bushmallow conservation seed banking as reported by CaPR (2025) and Schneider and Hernandez (S&H, 2024b, pp.15-16). All collections are housed at the Santa Barbara Botanic Garden. CNDDDB = California Natural Diversity Database, EO = Element Occurrence. Question marks indicate collection locations that have different names than the established site names of Figure 1 and Table 1.

CNDDDB EO #	collection date	location	by maternal line, bulked, or unknown	# maternal lines	# seeds	source
1	11/18/1993	Christy	unknown	5	30	CaPR 2025
1	6/30/1995	Christy	bulked	1	20	CaPR 2025
1	7/1/2006	Christy	bulked	1	30	CaPR 2025
1	7/29/2007	Christy	bulked	12	100	CaPR 2025
2	5/16/1993	Central Valley	bulked	6	30	CaPR 2025
2	5/16/1993	Central Valley	bulked	8	30	CaPR 2025
2	5/19/1994	Central Valley	maternal line	7	125	CaPR 2025
2	6/14/1995	Central Valley	maternal line	8	150	CaPR 2025
2	7/5/1997	Central Valley	bulked	16	30	CaPR 2025
2	7/8/1998	Central Valley	bulked	9	30	CaPR 2025
2	8/1/2007	Central Valley	bulked	8	50	CaPR 2025
3	5/16/1993	Horqueta-Alamos	unknown	5	30	CaPR 2025
3	5/18/1994	Horqueta-Alamos	bulked	1	100	CaPR 2025
3	7/31/2007	Horqueta-Alamos	bulked	18	50	CaPR 2025
4	7/9/1996	Cebada-Sauces	unknown	1	NA	CaPR 2025
4	7/9/1996	Cebada-Sauces	unknown	3	30	CaPR 2025
4	7/10/1996	Cebada-Sauces	unknown	unknown	25	CaPR 2025
4	7/5/1997	Cebada-Sauces	bulked	1	50	CaPR 2025
4	7/5/1997	Cebada-Sauces	bulked	1	50	CaPR 2025
4	7/5/1997	Cebada-Sauces	bulked	1	50	CaPR 2025
4	7/29/2007	Cebada-Sauces	bulked	3	50	CaPR 2025
4	7/15/2008	Cebada-Sauces	bulked	4	100	CaPR 2025
4	7/15/2008	Cebada-Sauces	bulked	4	100	CaPR 2025
4	7/22/2023	Cebada-Sauces	unknown	unknown	959	S&H 2024b
none	9/27/2023	Valley Anchorage	unknown	unknown	1,148	S&H 2024b
none	8/08/2024	Valley Anchorage	unknown	unknown	5,038	S&H 2024b
none	7/22/2024	Valley Anchorage	unknown	unknown	1,497	S&H 2024b
none	7/23/2023	Alberts	unknown	unknown	127	S&H 2024b
none	8/08/2024	Alberts	unknown	unknown	3,250	S&H 2024b
none	7/19/2023	European Field	unknown	unknown	295	S&H 2024b
none	7/22/2024	European Field	unknown	unknown	123	S&H 2024b
none	8/09/2024	European Field	unknown	unknown	1,752	S&H 2024b
none	7/19/2023	Portezuela	unknown	unknown	352	S&H 2024b
none	8/09/2024	Portezuela	unknown	unknown	1,941	S&H 2024b
none	7/21/2024	Portezuela	unknown	unknown	66	S&H 2024b
none	7/21/2023	Roadside	unknown	unknown	171	S&H 2024b
none	7/21/2024	Roadside	unknown	unknown	480	S&H 2024b

CNDDDB EO #	collection date	location	by maternal line, bulked, or unknown	# maternal lines	# seeds	source
none	7/21/2023	Nursery West	unknown	unknown	173	S&H 2024b
none	7/19/2023	Nursery East	unknown	unknown	20	S&H 2024b
none	9/27/2024	Airstrip	unknown	unknown	1,692	S&H 2024b
none	8/09/2024	Airstrip	unknown	unknown	13,499	S&H 2024b
none	7/21/2023	Botanic Garden	unknown	unknown	152	S&H 2024b
none	7/21/2023	Mule Fat	unknown	unknown	79	S&H 2024b
none	7/21/2023	Del Norte	unknown	unknown	220	S&H 2024b
none	7/22/2024	Del Norte	unknown	unknown	1,117	S&H 2024b
none	7/21/2023	Navy	unknown	unknown	160	S&H 2024b
none	8/9/2024	Navy	unknown	unknown	11,677	S&H 2024b
none	7/22/2024	Navy	unknown	unknown	293	S&H 2024b
none	7/21/2023	Fennel	unknown	unknown	276	S&H 2024b
none	7/22/2024	Fennel	unknown	unknown	155	S&H 2024b
none	9/27/2024	Field Station?	unknown	unknown	809	S&H 2024b
none	08/09/2024	FS/Lyndal?	unknown	unknown	19,219	S&H 2024b