MINUTES

Draft

Minutes
Arana Gulch Adaptive Management Working Group Meeting
Zoom Meeting
1:00 p.m. – 3:00 p.m. on Thursday, October 22, 2020

PARTICIPANTS:
Travis Beck, City of SC Dept. of Parks and Recreation
Blake Woessner, City of SC Dept. of Parks and Recreation
Kathy Lyons, Biotic Resources Group
Alison Stanton, Botanist
Bill Davilla, EcoSystems West
Lauren Garske-Garcia, CA Coastal Commission
Sylvie Childress, UCSC Greenhouses
Debbie Bulger, CNPS
Deanna Giuliano, CNPS
Frank and Teresa Locatelli
Members of the Public: Jean Brocklebank, Michael Lewis, Craig Dremann, John Pritchard

Meeting was held via a Zoom video call. Travis Beck facilitated the meeting, representing the City of Santa Cruz Department of Parks and Recreation.

Welcome and Meeting Objectives. Travis opened the meeting with a review of the project goals from the 2006 Arana Gulch Master Plan and the 2013 Arana Gulch Habitat Management Plan (HMP). There are broad management goals for sensitive habitat project wide, in addition to goals for the Santa Cruz Tarplant (SCT). Bill Davilla indicated that management actions for SCT are not always consistent with goals for coastal prairie restoration. Alison Stanton reminded the group the HMP was developed to satisfy the special conditions of the coastal development permit issued by the CA Coastal Commission and that the permit specified the broad management goals.

The minutes from the March 2, 2020 AMWG meeting were accepted without revision.

Review Monitoring Data, Grazing Activity and Observations from Field Visit

1. Census of SCT. Kathy Lyons presented results of the 2020 census for SCT. As of October 2020, one SCT (10" high, branched at 2 inches, 35 flower heads) was found in Area A. Area A supported 17 SCT plants in June 2020, but by July 2020, only one remained. The

mortality of the other 16 plants is attributed to low browsing by cattle. No SCT were found elsewhere on site. No SCT were found in the 10 experimental scrape plots created in November 2019 (3 plots in Area D, 6 plots in Area A and 1 plot in Area C) or in a molasses plot that was created in Area A in June 2019.

2. Outplantings of SCT. Kathy Lyons reported on the 28 nursery-grown SCT plants that were installed in Area C in January 2020. As of October 2020, 5 SCT plants remained and were flowering. Mortality of the remaining SCT plants were attributed to gophers and may have been exacerbated by initial watering of the seedlings. Cattle grazed the outplanted area through June; at June 10 plants were alive, yet they were cropped to 2". A cattle fence was installed in late June to exclude cattle from 80% of the plantings. The SCT seedlings were produced during seed germination tests conducted at UCSC. Sylvie Childress indicated that the nursery grown plants were grown from disk achenes only. She indicated some success in germinating ray achenes using gibberellic acid (24-hour soak), but has been unable to produce any plants. When seed was separated from chaff, she reported a 100% germination from disk seeds. Sylvie has limited time to pursue additional germination tests without seeking approval. The Arana Gulch SCT seed is stored at UCSC under temperature-controlled dry storage.
3. Grazing Activity. Teresa Locatelli reported on the 2020 grazing program. Cattle were brought on site in mid-March, which was later than anticipated due to contract/insurance issues with the City. 10 cattle were placed in Area A in mid-March. Additional animals were brought on site later in the season and moved periodically between Areas A and C until June 30. No grazing occurred in Area D. The maximum number of cattle in a pasture at any one time was 10.
4. Vegetation Assessment. Alison Stanton presented the findings of the vegetation assessment conducted May 7-8, 2020. She showed photos of site conditions in 2019 and 2020 obtained in the annual photo-monitoring. She presented a summary of vegetation data from scrape plots and control plots and also showed several representative photos of the plots. Vegetation height was the same in control and scrape plots in Area A. Scraping produced a greater amount of bare ground (approximately 40%) in Areas A and D, compared to control plots. There was no difference between the control and scrape plot in Area C; both areas had dense vegetation and no bare ground. Bill Davilla commented on the amount of fossorial turnover he observed in Area D leading to more friable soils and lack of soil compaction typical of SCT habitat. Blake Woessner indicated that the City mowed a portion of Area C to control the dense growth of radish.
5. Residual Dry Matter. Kathy Lyons presented the findings of the RDM measurements from September 2020. There were many similarities to 2019; however, there was more blue (high RDM) in the northern portion of Area A, due to high cover of mature radish. The southern portion of Area A was mapped as green and red, similar to 2019. The SCT

were found in a red zone in Area A and Alison noted that this pattern has been consistent during the grazing period. Cattle were brought on site later than other years after the radish had a chance to mature and the cows did not eat the more mature radish. Teresa Locatelli indicated that mineral blocks were placed by the water troughs.

Public Comments.

1. Jean Brocklebank. Jean expressed concern on use of prescribed fire in Area A and its damage to ray SCT seeds. She reiterated her concern about bikes using the grassland edge of the trail near Area B, causing bare ground. She repeated her request to the City to consider a barrier to keep bikes on the paved trail. She presented her concern on pruning oaks in the oak woodland and herbicide applications. She requested the oaks be left alone.
2. Michael Lewis. Michael agrees there are potential conflicts between management for SCT and restoration of the coastal prairie. He believes the City rationalized SCT enhancement for purposes of the trail construction. He stated that its time to look at Arana as a whole and to restore all of the area using an ecosystem based management approach vs. creating a SCT "Zoo". He questioned how the restoration goals of the project are specified. He thought looking at the Shaw property as an example could be informative.
3. Craig Dremann. Craig suggested seed testing with seed be sent to the New Mexico seed lab for a tetrazolium test for viability of disk and ray seeds and also test cold moist stratification with potassium nitrate. He expressed concern on the use of commercial potting mix for growing SCT seedlings because the soil may wick moisture away from the plant and stunt growth. He is concerned about the ongoing loss of SCT plants at Arana. Craig described his project on the Shaw property where the site increased in native cover from 1% to 95% in 5 years. He recommends taking cows off the site and doing monthly mowing, with grass height no less than 8 inches, not allowing non-native plants to create seed. He would like to do a sample study and take 1 sq. ft. of soil from each area and grow out the plants to evaluate the native and non-native seed bank.

Management Decisions. AMWG members discussed recommended management actions for the 2020-2021 growing season for SCT and the coastal prairie. Bill Davilla stated that the AMWG has reached a decision point regarding management direction. He expressed concern that the seeds in the seed bank have lost their viability, but the AMWG has been pursuing strategies to try and stimulate the seedbank. Alison confirmed that the seedbank data show a 100-fold decline in viable SCT density between 1999 and 2013. Bill further suggested that grazing is really a maintenance strategy aimed at reducing biomass and increasing light penetration to allow for germination; however, this strategy will not work if there is no seed.

Therefore, if strategies to recover the species from the seedbank are longer be achievable, then management needs to shift gears to focus on getting SCT seeds into the system. The group agreed that the red (low RDM) area in the southern part of Area A (mapped as coastal prairie) be used as the main experiment area to test different management strategies aimed at generating seed production on site.

Mark Ogonowski suggested that the SCT management/experiments be small and doable. Plots should receive management and seed/outplantings should not be irrigated, so as to reduce gopher attraction. He also suggested use of small mammal herbivory exclosures. He expressed optimism that SCT can still be grown on site. Alison Stanton indicated that the species is "cooperative" in that there has been success in growing the species in the greenhouse and we know that planted seedlings can survive to reproduce.

Alison reminded the group that a decision was needed on moving forward with greenhouse propagation of SCT. Sylvie Childress indicated that 500 plants were being considered for propagation but many more could be produced. She said that seedlings need 8 weeks development time before planting. Alison Stanton suggested experiments with staggered planting cycles to accommodate inconsistencies in weather and rainfall, which could affect seedling survival. Sylvie indicated the first batch of plants would likely be available in January 2021. Kathy Lyons suggested installation of SCT plants in some of the scraped areas and also suggested monitoring SCT recruitment in the scrape plots in 2021 since other site have shown SCT emergence in second year after seeding (Santa Cruz Gardens #12).

Mark Ogonowski and Todd Lemein indicated there could be some funding available from USFWS for recovery actions focused on experimental plantings Funds may be available for labor and materials for focused management and assistance with monitoring. Alison described her experience with designing endangered plant field experiments, specifically with Tahoe yellow cress, and her familiarity with the FWS Section 6 funding process. The group recommended moving forward with propagation and design of experimental plantings for 2021.

When the group returned to the topic of grazing, Kathy Lyons suggested cattle grazing be removed from the southern portion of Area A and off the Danthonia-dominated coastal prairie areas to allow the Danthonia to recover. Alison Stanton agreed that the mapped coastal prairie area should be managed differently and suggested that the northern portion of Area A and Area C can be managed similarly with grazing or mowing. She pointed out that 2x mowing in the past did not result in notable SCT recruitment and suggested monthly mowing in the non-coastal prairie areas. Blake Woessner indicated the City has a flail mower and it may be feasible to do some monthly mowing with the limited staff avaible. However, participating in

outplanting and maintenance of SCT experiments is not feasible and even thatch removal after mowing would be difficult.

Alison wondered if it was feasible to graze within the northern portion of Area A. Travis Beck indicated a desire to avoid new fencing and asked whether just grazing within Areas C and D would be okay. Teresa Locatelli responded that both options would be okay and also indicated that an electric cross fence across the northern part of Area A could be feasible but might require some training of the cattle.

Mark Ogonowski recommended that the extant plants in Area C be left alone and monitored; no additional plants should be added to this area. Todd Lemein indicated interest in installing some SCT outplantings in a grazing area. Mark suggested the actions be considered part of a 2-year study. Members also expressed interest in having a better understanding on ray achene germination. Sylvie Childress indicated that is possible but it would require funding and an agreement between the City and UCSC.

AMWG Recommendations

Pursue SCT propagation at the UCSC greenhouses as soon as possible. Start with 500 and consider an additional propagation cycle to accommodate a later planting.

Conduct experimental plantings of greenhouse-grown SCT in 2021. Alison said she is available to design and analyze the experiments if there is funding available.

Continue grazing in select pastures. Additional temporary fencing may be needed.

Pursue additional germination studies,as funding allows.

Allow Craig Dremann to do a sample study and take 1 sq. ft. of soil from each area and grow out the plants to evaluate the native and non-native seed bank.

Other Meeting Outcomes

The group expressed interest in visiting the Shaw Property where Craig Dremann has worked. Travis agreed to set up a field tour.

Next Meeting: Not yet determined.

REPORTS

Travis Beck

From: Biotic Resources Group <brg@cruzio.com>
Sent: Tuesday, June 15, 2021 6:38 PM
To: Travis Beck; 'Alison Stanton'; 'Sylvie Childress'; Blake Woessner
Subject: RE: Draft AMWG agenda
Attachments: Grassland Transects 2021 February Canopy Height Data, 2-25-21.pdf

Hi Travis:

Thanks for sending the agenda. I will miss the meeting since I will be out of town and will likely be out of cell range that day. But, I will try to connect into the virtual meeting if I can.

Tarplant Census: I do not have any data on SCT yet. I will do a site visit tomorrow to find any "natural occurrences" of tarplant and let you know, but it is a bit early to have a definitive census yet.

Invasive Plant Control: I did a site review of invasive weeds within the grassland in May, noting occurrences of thistles, re-growing Himalaya berry, and cotoneaster, etc. Also in the Arana Creek area, there are occurrences of poison hemlock acacia re-sprouts an French broom that need removal/control. Blake has this information. My recommendation is to get a better handle on the thistles earlier in the season (March-April) in 2022 with focused weed-whipping. The Himalaya berry and cotoneaster re-sprouts should also be weed-whipped, which can occur any time.

Canopy Height in Grassland: Canopy height measurements were taken in February in Areas A, C, and D. Average canopy height in Area A (no grazing) was 6.7 cm (2.6"), Area C (5 cows, gate open between C and D) was 6.8 cm (2.7"), and Area D (5 cows, gate open between C and D) was 16.9 cm (6.6"). Attached is data.

Survey Prior to Mowing: A pre-mow survey was conducted on May 28. No ground nesting birds in the mow area. Also, no locally unique plant species noted along the edge of the Prairie Loop Trail, as have been observed in previous years. Possible poor performance by bulb species due to drought or ?.

Let me know if questions.

Thanks,
Kathy

From: Travis Beck
Sent: Tuesday, June 15, 2021 11:27 AM
To: Kathy Lyons <brg@cruzio.com>; Alison Stanton <alisonestanton@sbcglobal.net>; Sylvie Childress <sylviechildress@ucsc.edu>; Blake Woessner <BWoessner@cityofsantacruz.com>
Subject: Draft AMWG agenda

Hi Kathy, Alison, Sylvie, and Blake,

Please review the attached draft agenda for our meeting next week.

Kathy, I don't know if you have tarplant count data you'd like to share.

FEBRUARY 2021 CANOPY HEIGHT MEASUREMENTS

Average canopy height in Area A is 6.7 cm (2.6").; average height in Area C is 6.8 cm. (2.7") and 16.9 cm. (6.6") in Area D. Target is 5-8 cm. (2-3.5:)

Arana Gulch Greenbelt Grazing Areas - Canopy Height Measurements, February 25, 2021 (in meters)

Transect	Latitude/Longitude			6m (19')		12m (39')		18m 62")		24m (78')	Mean	Standard Dev	
Area A -	No cattle on site, 9.74 inches inches rainfall to d												
AT1	N36 58.626 W122 00.150			0.1		0.25		0.11		0.22	0.17	0.076158	
AT2	N36 58.521 W122 00.023			0.18		0.07		0.12		0.1	0.1175	0.046458	
AT3	N36 58.522 W121 59.984			0.02		0.2		0.2		0.25	0.1675	0.101119	
AT4	N36 58.503 W122 00.027			0.01		0.02		0.01		0.06	0.025	0.023805	
AT5	N36 58.481 W122 00.005			0.05		0.01		0.08		0.02	0.04	0.031623	
AT6	N36 58.481 W122 00.022			0.01		0.01		0.01		0.04	0.0175	0.015	
AT7	N36 58.453 W122 00.043			0.01		0.01		0		0	0.005	0.005774	
AT8	N36 58.448 W122 00.012			0.1		0.1		0.02		0	0.055	0.052599	
AT10	N36 58.457 W122 00.019			0.05		0.01		0.01		0.02	0.0225	0.01893	
AT11	N36 58.462 W122 00.047			0.02		0.01		0.02		0.15	0.05	0.066833	0.04383
										Average	**0.067**		**6.7 cm**

AREA C - Cattle on site (5 in C and D, gate open)

Data Point	Latitude/Longitude			6m		12m		18m		24m	Mean	Standard Dev	
CT2	N36 58.661 W121 59.947			0.1		0.02		0.02		0.12	0.065	0.052599	
CT3	N36 58.658 W121 59.920			0.03		0.06		0.1		0.08	0.0675	0.029861	
CT5	N36 58.623 W121 59.935			0.02		0.1		0.1		0.05	0.0675	0.039476	
CT6	N36 58.629 W121 59.913			0.1		0.1		0.02		0.1	0.08	0.04	
CT7	N36 58.681 W121 59.916			0.1		0.1		0.02		0.02	0.06	0.041404	
													0.040668
										Average	**0.068**		**6.8 cm**

AREA D Cattle on site (5 in C and D, gate open)

Data Point	Latitude/Longitude			6m		12m		18m		24m	Mean	Standard Dev	
DT1	N36 58.538 W121 59.882			0.27		0.15		.0.15		0.15	0.19	0.069282	
DT2	N36 58.565 W121 59.901			0.02		0.07		0.2		0.18	0.1175	0.086554	
DT4	N36 58.543 W121 59.905			0.2		0.1		0.3		0.2	0.2	0.08165	
													0.079162
										Average	**0.169**		**16.9 cm**

FROM CRAIG DREMANN

Dear Travis,

Thanks for your email.

Do you have the means at the AMWG meetings to project a PowerPoint presentation in the future?

I NEVER am going to go back to "address the group during public comment" like what Noah did for three years, with his stopwatch on his Smart Phone clicking away?

As an Elder, and as a Native person, and after restoring 800 acres of native prairies back to 95% native cover or better, that was the most insulting thing anyone has ever done in my 50 year career.

And especially when my last three years of suggestions, are now been implemented by the AMWG, and then I get ZERO credit for coming up with the only solutions to restoring the tar plants, that have every started to work in 35 years?

Three years ago, I wrote a report that I presented at the 2018 AMWG meeting, of my analysis of the 56 soil tests that Susan Bainbridge ran in 2013, but those tests were just a set of raw numbers without any analysis explaining what those number meant, in terms of low or high levels in the soils.

Everyone looked at those 56 test numbers, and there was no understanding what each number in those 56 tests meant, because nobody at the table had ever used them to restore any grasslands in the past. Otherwise, if they understood that those numbers showed that the soil nutrient levels had dropped into Emergency-low levels, and then the cows would have been permanently removed in 2013.

The first 56 tests showed the nitrogen and phosphorus dropping below threshold needed by the tar plants to survive--and the pH had dropped far below 6.0, making the soil about 50x more acid than normal?

At the 2018 meetings, I pointed out that it would be important to start using testing by Waypoint Lab in Anaheim, whose reporting method attaches references for low and high levels to those raw numbers.

Then, within a few months of that 2018 meeting, the AMWG decided to run 26 new soil samples through the Waypoint lab and the results are on pages 49-51 of the 2019 Annual Report, confirming exactly what I told them at the meeting, right down to the number of parts per million for each nutrient that was low.

However, I got ZERO credit in that 2019 report for making that suggestion, of running a second set of soil tests through Waypoint so everyone could understand what the raw numbers mean, to show where there were highs and lows. And, also the second set of tests, confirmed that the

grazing is stripping out more nutrients, while nobody was monitoring the soil nutrients on an annual basis?

However, when the 26 new soil test results came out in the 2019 report, and was compared with the earlier 56 test results, there still was no understanding by the AMWG that the grazing had created an Emergency in the soil nutrient levels. The tests showed that the cows needed to be removed immediately and permanently, before they could strip out the last few parts per million of nitrogen, phosphorus in the soil, and change the pH to be even more acid?

The real insult to me and really violates proper academic report writing, is that my idea was stolen, utilized without attributing or citation. And what is even worse, the 2019 Annual report is written as if the group came up with that idea all by themselves, by plagiarizing my work?

"5.2.3 Soil Testing. In 2018 the AMWG recommended that soil tests be conducted in the grassland.prairie. The soil tests were recommended to determine if soil properties were inhibiting prairie restoration and/or SCT growth."

I am really concerned that the 2021 Annual Report will state that the "AMWG recommended, to remove grazing animals from Area A for 2021, and instead mow at one foot high when the weed grass seeds were immature, to keep the weed grasses from producing more viable seeds in the future," --When that is how my method works, that I have been suggesting for the last three years at the meetings.

So instead of the AMWG using my methods, succeeding, and then not giving any credit, and claim that the AMWG somehow magically came up with all of the successful solutions, why not make a radical change right now? And hire the guy who is producing the answers, instead of stealing them and the AMWG calling them their own?

The AMWG right now, could take a very long and hard look at the last 35 years of horrible failures and the massive and permanent damages to the Arana Gulch meadow, mismanaged so badly that 99% of the Coastal Prairie is gone, and the tar plants have gone to ZERO in three of the last six year?

And even when the AMWG think they are going something good, like planting out the seedlings in Area A this spring--someone accidentally destroyed a piece of the best pristine example left of the Coastal Prairie at 94% cover, to put in some of those plots?

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HERE are snapshots of my three experiments--

1.) "ARANA GULCH, Santa Cruz, California, the Four Tarplant Critical Habitat Areas, results of Box Tests of soil, counting weed seedlings sprouting from one square foot."
 Soil samples from the four "Areas" put into one

square foot wooden boxes about 3-4 inches deep, and watered daily, and as seedlings appeared, removed and counted them.

This Ex-situ Box test, sprouting the dormant seeds in the soil from the four Areas, from November to June and watering daily. No native seeds appeared, and the weed seedlings came up in three separate phases, October to January, March and April. First to sprout were the Slender Wild oats, Broad leaved filaree, Bromus mollis, Vulpia bromoides, and the broad-leaved weeds. Then, the Perennial ryegrass sprouted, and last was the Poa annua.

These massive numbers of weed grasses, from one to 3.5 per square inch, all of those plants produce allelochemicals that suppress the native seeds from sprouting, and also inhibit and kill any native seedlings that are able to survive that initial allelochemical onslaught. See articles in the Journal of Chemical Ecology.

As a test, in January I planted 1/8 teaspoon of California poppy seeds in each box, and hundreds of seedlings germinated, but none survived by April.

AREAS	Weed grasses	Broadleaf weeds
A-1	139	17
A-2	374	15
A-3	129	8
B	451	29
C	464	45
D	**516**	**33**
	Per square foot	**Per square foot**

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2.) "ARANA GULCH SOIL from AREA-A--getting California poppy seedlings to survive by adding fertilizers". Copyright © 2021 by Craig Carlton Dremann. A second batch of soil from Area-A was shipped in spring 2021, and put into two square foot wood boxes, and 1/8 teaspoon of poppy seeds added and watered daily. Measured amounts of nutrients along with sawdust for organic matter and potting soil were gradually added until seedlings started growing properly. Results of this test, is that massive amounts of nutrients and organic matter will need to be added to Arana Gulch, wherever a self-sustaining and reproductive population of tarplants needs to be established.

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3.) "Arana Gulch Area-A native grass cover transects, west-east every 50 feet starting parallel to the southernmost fence, and the transect starting from the western fence line and going 200 feet eastward." Copyright © 2021 by Craig Carlton Dremann. Survey noted what plant was growing every two feet, using the Evans and Love (1957) Toe-Point method, and

the beginning of each transect is parked with orange and green survey flagging, and aim at the flagging on the opposite eastern fence.

Transect Number One starts closest to the southernmost fence, and runs parallel with that fence. Each transect start-point moves about 50 feet northward. There is a direct connection between the percentage cover of Coastal Prairie (with the exception of the Elymus triticoides area) and the thriving tarplant populations, with a minimum threshold percentage of prairie cover required. **Of the entire 70 acres of Arana Gulch Coastal Prairie, 99% is gone, with only 0.7 acre left.**

Craig's Transects	% Native grass First 100 feet	% Native grass 2nd 100 feet
1	18	0
2	64	24
3	68	0
4	94	12
5	70	28
6	40	0
7	4	2
8	0	0
9	2	0

PUBLIC COMMENTS RECEIVED SINCE OCTOBER 22, 2020 MEETING

My recommendation, is to cancel all contracts for the tar plant restoration work, and give those funds to me under a contract for the next four years? And the AMWG must pare down the expense of the Annual Report to only a dozen pages, so those funds could be utilized to buy the hundreds of pounds of organic fertilizers and organic matter that the 82 Waypoint soil tests are clearly showing what is critically needed, to produce a self-sustaining and reproducing tar plant population?

And then the whole project, producing hundreds or maybe thousands of self-sustaining tar plants, could be finished in only 3-4 years?

Feel free to share any of my emails with anyone.

Sincerely, Craig Dremann CELL (650) 441-9323

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--- tbeck@cityofsantacruz.com wrote:

From: Travis Beck <tbeck@cityofsantacruz.com>
To: "craig@ecoseeds.com" <craig@ecoseeds.com>, Blake Woessner <BWoessner@cityofsantacruz.com>
Subject: RE: ARANA GULCH--400-1,000 tar plants down to 200 and cats ears killing a lot
Date: Tue, 15 Jun 2021 18:06:06 +0000

Hi Craig,

I'm preparing the agenda packet for the Working Group meeting next week. Following up, would you like to share a written report on your soil block experiments? I will include your correspondence and you are welcome to address the group during public comment in any case.

Best,
Travis

From: Travis Beck
Sent: Monday, June 7, 2021 9:45 AM
To: craig@ecoseeds.com; Blake Woessner <BWoessner@cityofsantacruz.com>
Subject: RE: ARANA GULCH--400-1,000 tar plants down to 200 and cats ears killing a lot

Thanks for these details, Craig. Hopefully we're not killing our coastal prairie in the name of restoring it.

I wanted to let you know that we have a date set for our next meeting of the Adaptive Management Working Group. It will be June 22, with a field meeting from 9:00-10:30 and a

"ARANA GULCH SOIL from AREA-A--Getting California poppy seedlings to survive in Ex-Situ boxes by adding fertilizers". The Reveg Edge, P.O. Box 361, Redwood City, CA 94064. Office 650-325-7333 craig@ecoseeds.com.

A second batch of soil from Area-A was shipped in spring 2021, and removed from the top two-three inches and put into two one-square foot wood boxes, and 1/8 teaspoon of poppy seeds added and watered daily. Added measured amounts of nutrients along with sawdust for organic matter and potting soil, and were gradually added until seedlings started growing properly. Results of this test, is that massive amounts of nutrients and organic matter will need to be added to Arana Gulch, wherever a self-sustaining and reproductive population of tarplants needs to be established.

"ARANA GULCH, Santa Cruz, California, the Four Tarplant Critical Habitat Areas--Results of Box Tests of soil, counting weed seedlings sprouting from one square foot."
 The Reveg Edge, P.O. Box 361, Redwood City, CA 94064. Office (650) 325-7333 - craig@ecoseeds.com

Soil samples from the top 3-4 inches, from four "Areas" in November 2, 2020 were put into one square foot wooden boxes and watered daily. As seedlings appeared, they were removed and counted until June 2021. No native seedlings appeared, only weed grasses and broadleaf weeds.

This is an "Ex-situ Box test" to sprout the dormant seeds in the soil from the four Areas, from November to June and watering daily. The weed seedlings came up in three separate phases--October to January, March, and April. First to sprout were the Slender Wild oats, Broad-leaved filaree, Bromus mollis, Vulpia bromoides, and the broad-leaved weeds. Then, the Perennial ryegrass sprouted, and last was the Poa annua.

The broadleaf weeds were: Broadleaf filaree, bur clover, radish, red stem filaree, rose clover and wild geranium. A single lesser rattlesnake grass seedling came up in the Area A-2 soil.

These tests produced massive numbers of weed grasses, sprouting at the rate of one to 3.5 per square inch, and these plants were producing allelochemicals that have the action of suppressing native seeds from sprouting, and also inhibit and kill any native seedlings that are able to survive that initial allelochemical onslaught. See articles in the Journal of Chemical Ecology.

As a test of native seedling survival, in January, I planted 1/8 teaspoon of California poppy seeds in each box, and hundreds of poppy seedlings germinated, but none survived by April.

AREAS	Weed grasses	Broadleaf weeds
A-1	139	17
A-2	374	15
A-3	129	8
B	451	29
C	464	45
D	516	33
	Per square foot	**Per square foot**

The natives present in these Areas and their soil samples, should have produced a few seedlings in these Ex-situ box tests--the Brome grass, Danthonia grass, Stipa grass, Blue Eyed grass, California poppies, Coastal tarplant and Santa Cruz tarplants. However, these natives are only concentrated in two areas--a few hundred square feet in Area B and only 0.75 acre of Area A--and are mostly missing from 99% of the entire Arana Gulch Coastal Prairie acreage.

Since the weed grasses that sprouted in all of the Ex-situ box tests are all annuals in unirrigated sites in California--by cutting the seed heads off when the seeds are immature,

and mow once a month to one foot tall, stops their reproduction and removed their seeds from the soil seed-bank rapidly. The one-foot height protects native seedlings underneath.

Once the weed grass seeds are removed from the soil seed-bank, the broadleaf weeds will flourish--then each of those broadleaf weeds in turn will need to be mowed to keep them from producing any more viable seeds.

Area A conditions when soil samples taken November 2, 2020, severely overgrazed during a drought. Only a single tarplant survived on the entire 70 acre Arana Gulch Coastal Prairie meadow area, when in the 1980s, 100,000 tarplants grew there in four populations.

Weed seedlings sprouting in less than 2 weeks, on November 15, 2020.

January 2021, the sown 1/8 teaspoon of California poppy seeds producing hundreds of seedlings in each of the one square foot Ex-Situ Test Box. Sawdust added as organic mulch.

Mid-March 2021, all of the Ex-Situ Test boxes were full of hundreds of weed grass seedlings, at the rate of one to 3.5 per square inch. The poppy seedlings did not survive that massive amount of allelochemicals, produced by hundreds of weed seedlings.

Along with the allelochemicals being produced by the massive amount of weed grasses growing in a single square foot--were the effects of shading and the robbing of moisture and soil nutrients from the California poppy seedlings -- adding their own contributions to kill the poppy seedlings over time.

One of the worst grasses was *Vulpia bromoides* in the soil from Areas C and D, sprouting at 400-450 seedlings per square foot! Fortunately, was largely absent from Area A soil, but Area B soil produced 215 plants. This plant shows, that successful efforts could be made to reintroduce the native *Vulpia microstachys*, to replace this introduced species over time.

"Arana Gulch Area-A native grass cover transects, west-east every 50 feet starting parallel to the southernmost fence, and the transect starting from the western fence line and going 200 feet eastward." The Reveg Edge, P.O. Box 361, Redwood City, CA 94064 Office (650) 325-7333 craig@ecoseeds.com

Survey noted what plant was growing every two feet, using the Evans and Love (1957) Toe-Point method, and the beginning of each transect is marked with orange and green survey flagging, and aim at the flagging on the opposite eastern fence.

Area A tarplant locations

Transect Number One starts closest to the southernmost fence, and runs parallel with that fence. Each transect start-point moves about 50 feet northward. There is a direct connection between the percentage cover of Coastal Prairie (with the exception of the *Elymus triticoides* area) and the thriving tarplant populations, with a minimum threshold percentage of prairie cover required. **Of the entire 70 acres of Arana Gulch Coastal Prairie, 99% is gone, with only 0.7 acre left.**

Craig's Transects	% Native grass First 100 feet	% Native grass 2nd 100 feet
1	18	0
2	64	24
3	68	0
4	94	12
5	70	28
6	40	0
7	4	2
8	0	0
9	2	0

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Monday, October 26, 2020 12:35 PM
To: Travis Beck
Cc: craig@ecoseeds.com; mark_ogonowski@fws.gov
Subject: TAR PLANTS going extinct--Nobody has been in charge, who has actually restored any grasslands from scratch?

Dear Travis and Mark,

I was very concerned at the Zoom meeting about "Ishi" the last wild tar plant alive at Arana Gulch---**when I did not see any sweat-beads forming on either one of your foreheads, and everyone so calm at that wake/meeting?**

And that all of these years, during the time with the permit from the Coastal Commission, that the City never hired any consultants who have actually restored a single acre of California native grasslands? When the guy who has actually restored 800 acres back to 95% native cover, is only allowed five minute to complain about the decades of Arana Gulch failures? And then the fact, that nobody has even even driven five miles south to see a perfectly restored 70 acres at 300 Byers Lane in La Selva Beach?

It seems if the AMWG cannot come up with a workable solution themselves, for three years now, they have been totally resistant to hire anyone else who has a method, that can get your meadow back to close to 100% native grassland cover within 4-5 years?

Instead, the USFWS is allowing what little remains of the various SC Tarplant populations to be manipulated, grazed, burned, scraped, and improperly mowed by people who have no business doing that to the last remaining individuals of that species? Especially, when there exists very rapid solutions available that could recover hundreds, to thousands, to millions of tar plants EACH YEAR in each of those disappearing population?

I do not understand what the resistance has been for the last three years for being able to quickly save this species from extinction, and what are the reasons for not wanting to succeed--and instead fail over and over and over again, for decades?

Here are the total numbers each year from Arana Gulch:
2013 = 18
2014 = 4
2015 = 0
2016 = 34
2017 = 0
2018 = 267
2019 = 47
2020 = 1

Starting from 100,000 in 1986?

The "Tarplant Hill" population in Watsonville (part of the Unit I populations) has experienced an almost identical drop in the plant numbers in that population. The plant count in 1984, estimated 10,000 plants, 1985 100,000 plants, 1986 20,000 plants, 1989 400,000 plants, and in 1990, 38,000 plants were estimated.

Then in 1993, 1994, and 2003 only a single plant was found for that whole "Tarplant Hill" population. Then, counts in 2004, found 8 plants, 2005 60 plants, 2008 two plants, 2007 70 plants, 2008 59 plants, and the 2009 count found 189 plants. Cannot find any numbers after 2009, maybe extinct?

The Twin Lakes population, which is part of Unit D is on State Park property, and the naturally-occurring plant numbers were 16 in 1999, 7 in 2000, 19 in 2001, 7 in 2002 and only 5 plants in 2003 - Open-- 6AM-10PM --cannot find any numbers after 2003, maybe extinct? 831-331-6358

What were the annual "Tarplant Hill" and Twin Lakes tar plant population numbers, at tar plant hill from 2010 to 2020, and Twin Lakes from 2004-2020?

Really for the Arana Gulch population when you are down to a single plant, or ZERO plants in 2 of the last 6 years, isn't it time to give the current consultant her pink slip, and hire someone who has actually restored at least ONE acre of California grasslands from scratch, permanently back to 95% or better native cover?

This reminds me of the World Series right now? **This would be like a baseball team's pitcher playing so poorly for year, they need to be traded or retire? And get a replacement pitcher with the best stats. so your team can finally win?**

Feel free to share this email with anyone.

Sincerely, Craig Dremann CELL (650) 441-9323

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Monday, November 2, 2020 1:58 PM
To: Travis Beck
Cc: Blake Woessner; craig@ecoseeds.com
Subject: Soil samples--Areas A, C and D soil with lack of organic matter is CONCRETE! Vs. unglazed Area B, still has organic matter and native grasses!
Attachments: arana-tests-N-P.jpg

Dear Travis,

Blake and I went out and got the soil samples today. What we found was, wherever the cows have been grazing -- Areas A, C and D -- the soil has turned into concrete, vs the unglazed Area B that still has organic matter PLUS a beautiful 50 x 50 foot area of native coastal prairie with Bromus and Danthonia plants spaced about 4-12 inches apart .

My goal was to get about one inch deep of soil for each of my wood boxes measuring one by one foot, but it was an impossible task in Areas A, C AND D, since the cows had stripped out all of the organic mater,

With the hand-pick I brought, could only dig down about 1/4-1/2 inch where the weed grass roots were holding on to the remaining organic matter, and below that was nothing left for the future native plant and tar plant seedling's survival. Blake got GPS coordinates where each sample was taken, so if anything interesting pops up in my boxes, we will know exactly where they came from.

It might be useful, for someone to go out before the rains, and visit the other tar plant Critical habitat units, like Watsonville airport, the Armory, Tarplant Hill, Graham Hill, Twin Lakes, etc., and get a one-quart soil sample from 2 inches deep from around plants in each area, sift it through a 1/4 mesh screen to remove rocks and vegetable matter, and send them to the Waypoint Lab in Anaheim and have them run the organic matter tests. That way, you will know from these other existing stands, what the proper soil organic matter threshold is, that you need for SC tar plants to thrive?

Right now, in Areas A, C and D you are close to zero organic matter, and what happens then, then the nutrients have gone away with that organic matter/straw into the cow stomachs. Your nitrogen and phosphorus according to your 2013 and 2018 tests, show robbing of the soil nutrients by the cows in only a few years--details from the 2019 Arana Gulch tar plant report attached. The nitrogen went down from a mean of 86.5 PPM to only 13 PPM.

Between 2013 and 2018 your phosphorus went from a mean of 13.2 PPM to only 7 ppm. Native plants just cannot survive as seedlings at those low numbers, so eventually what nutrients AND organic matter that has been removed, will need to be replaced.

Thanks for letting me get the six soil samples, and for Blake's help getting them out of the field today. I will be focusing on the wildflower seedlings if any come up, and will be removing the grass seedlings of both natives and exotics as they sprout, because I am not as concerned about them as the wildflowers and potential tar plant seeds that might still be there.

If you are able to get to visit Shaw's, it is only 10-15 minutes from Arana Gulch right off Highway One at 300 Byers Lane. And if either of you are able to travel to Woodside, let me know and I can give you a tour of my

15 acres that is in Year-5, and I usually work there on Saturdays from 9AM-4PM, or I can meet you there any other time, as long as I know a couple of days ahead.

Feel free to share my emails with anyone.

Sincerely, Craig CELL (650) 441-9323

Table 10. Summary of comparison of 2013 and 2018 soil sample data

Summary of Soil Sample Data, 2013 (Sue Bainbridge Study)				Change from 2013 to 2018
	All Sites (56 samples)			
	Minimum	Maximum	Mean	
ORGANIC MATTER				
Available N (ppm)	59	115	86.5	Decrease from mean of 86.5 (optimum) to mean of 13 (very low)
NUTRIENTS				
Phosphorus (P) – Olsen	3	38	13.2	Decrease from mean of 13.2 (medium) to mean of 7 (very low)

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Sunday, November 8, 2020 5:06 PM
To: Travis Beck
Cc: Blake Woessner; craig@ecoseeds.com
Subject: Re: FW: Soil samples--First seedlings popping out of Area C soil, a very early weed = ERODIUM
Attachments: Area-C-test-plot-seedlings-11-8-2020.jpg; mowing-grasslands-November.jpg

Dear Travis and Blake,

Attached is a photo of the first seedlings popping up in my boxes here, from the soil from Area C, *FILAREE* (Erodium) which is one of the first weeds introduced to California, based on seeds that Hendry and Kelly found in California Spanish era Mission adobe bricks, that you can read about at https://online.ucpress.edu/ch/article-abstract/4/4/361/30016/The-Plant-Content-of-Adobe-Bricks-With-a-Note-on?redirectedFrom=fulltext

Also photo from my crew mowing my grassland yesterday, to get everything low for the winter--the area is very close to 100% native cover now, after 5 years of monthly mowing at 8 inches tall.

Sincerely, Craig CELL (650) 441-9323

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Thursday, November 12, 2020 2:41 PM
To: craig@ecoseeds.com
Cc: Travis Beck; Blake Woessner; craig@ecoseeds.com
Subject: TAR PLANT Soil samples--Neew pictures of SC tar plant first leaves and second set of leaves, so can id early.
Attachments: tarplant-soil-test-11-12-2020.jpg

Dear Travis,

Attached is a flip phone snap of the weed grass seedlings coming up at about 10 per square inch today, and you can see near the middle of the pen two first leaves of a broadleaf plant of some sort.

If you can get me some pictures of the Santa Cruz tar plant first leaves and second leaves, that would be very helpful for me to be able to identify them very early! If the UCSC is going to sprout some now, or if they have any old pictures of the first and second leaves?

Already in only 10 days, many interesting things going on so far!

Sincerely, Craig CELL (650) 441-9323

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Sunday, November 15, 2020 7:05 PM
To: Blake Woessner; Travis Beck; craig@ecoseeds.com
Subject: NEW DROUGHT cycle--Planted tarplant seedlings may need to be watered weekly
Attachments: us-drought-monitor-map.png

Dear Travis,

To finish the sentence about the new drought cycle, expect if you plant out out seedlings of the tar plants, they may need watering at least once a week until June. The current US drought map attached.

Sincerely, Craig CELL (650) 441-9323

--- rwc-seed@batnet.com wrote:

From: "Redwood City Seed-Reveg Edge" <rwc-seed@batnet.com>
To: <BWoessner@cityofsantacruz.com>, <tbeck@cityofsantacruz.com>, <craig@ecoseeds.com>
Subject: Soil samples--Interesting results--Areas B and C have best potential, as areas to replant tar plant seedlings.
Date: Sun, 15 Nov 2020 18:58:45 -0800

Dear Travis,

Very interesting results so far.

Areas B and C have the best potential as areas to replant SC tar plant seedlings, and seedlings should be planted in rows spacing about 16 inches apart, and 3 feet apart between the rows for easy weeding, and monthly hand weeding with a serrated steak knife, but cutting the weed seedlings 8-10 inches away in each direction, and between the plants in the rows. Because we are entering a new drought cycle--

The weeds that grow in those Areas B and C sprout up and mature quickly, so unless you weed monthly from February to June the FILAREE that is coming up 10/sq. foot in area B or 25 per square foot in Area C, the tar plant seedlings could be quickly overwhelmed by the allelochemicals that the weeds produce. In addition, Area B has fine annual grasses, and Area C still has a lot of wild oats coming up.

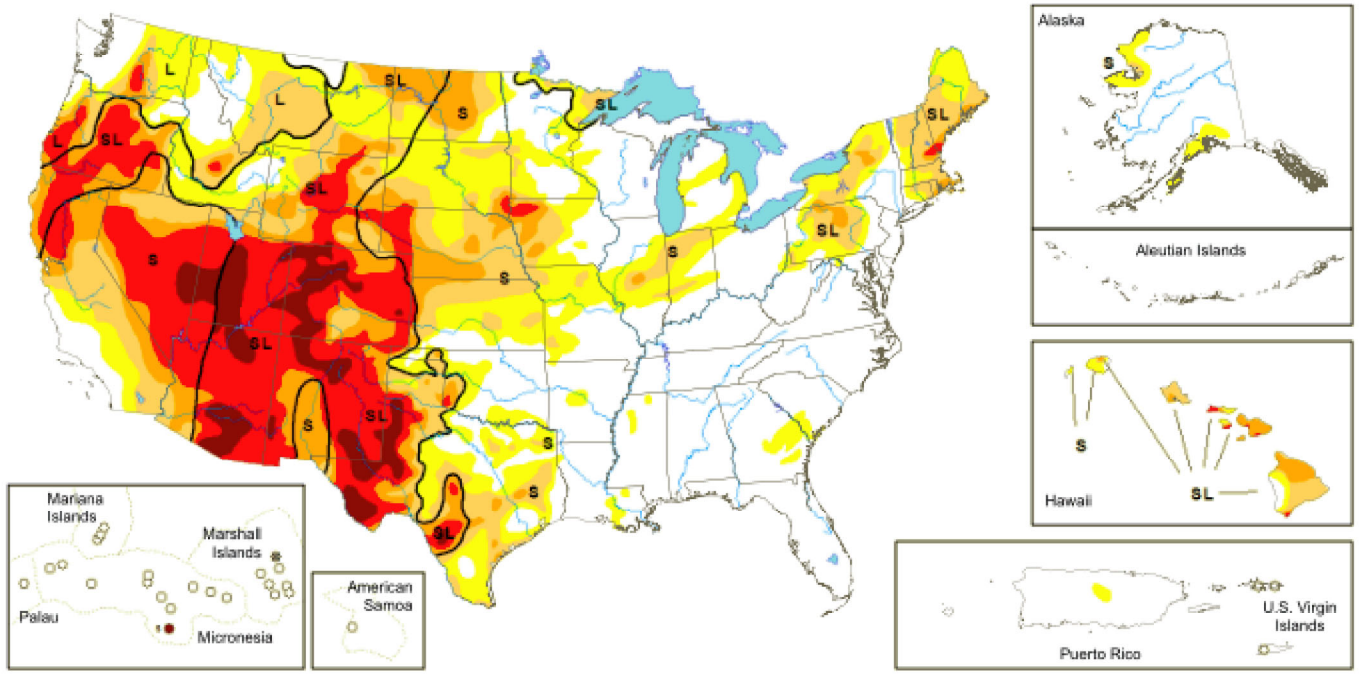
Areas A and D have been so hammered by the various methods of weed management over the last 30 years, that along with removing the weeds, the nutrients and organic matter has been so stripped out over time, that the soil is essentially sterile. Unless those soils have their nutrients and organic matter added back, it is unlikely that the SC tar plant will increase or recover in either of those two areas.

So far, what is coming up is three different weed grasses and 7 kinds of broadleaf plants, picture of the weed grasses today.

Sincerely, Craig CELL (650) 441-9323

Map released: November 12, 2020

Data valid: November 10, 2020



United States and Puerto Rico Author(s):
***Richard Tinker**, NOAA/NWS/NCEP/CPC*

U.S. Affiliated Pacific Islands and Virgin Islands Author(s):
***Anthony Artusa**, NOAA/NWS/NCEP/CPC*

The data cutoff for Drought Monitor maps is each Tuesday at 7 a.m. EST. The maps, which are based on analysis of the data, are released each Thursday at 8:30 a.m. Eastern Time.

Intensity and Impacts

- **None**
- **D0** (Abnormally Dry)
- **D1** (Moderate Drought)
- **D2** (Severe Drought)
- **D3** (Extreme Drought)
- **D4** (Exceptional Drought)
- **No Data**

~ - Delineates dominant impacts

S - Short-Term impacts, typically less than 6 months (e.g. agriculture, grasslands)

L - Long-Term impacts, typically greater than 6 months (e.g. hydrology, ecology)

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Sunday, November 15, 2020 6:59 PM
To: Blake Woessner; Travis Beck; craig@ecoseeds.com
Subject: Soil samples--Interesting results--Areas B and C have best potential, as areas to replant tar plant seedlings.
Attachments: weed-grasses.jpg

Dear Travis,

Very interesting results so far.

Areas B and C have the best potential as areas to replant SC tar plant seedlings, and seedlings should be planted in rows spacing about 16 inches apart, and 3 feet apart between the rows for easy weeding, and monthly hand weeding with a serrated steak knife, but cutting the weed seedlings 8-10 inches away in each direction, and between the plants in the rows. Because we are entering a new drought cycle--

The weeds that grow in those Areas B and C sprout up and mature quickly, so unless you weed monthly from February to June the FILAREE that is coming up 10/sq. foot in area B or 25 per square foot in Area C, the tar plant seedlings could be quickly overwhelmed by the allelochemicals that the weeds produce. In addition, Area B has fine annual grasses, and Area C still has a lot of wild oats coming up.

Areas A and D have been so hammered by the various methods of weed management over the last 30 years, that along with removing the weeds, the nutrients and organic matter has been so stripped out over time, that the soil is essentially sterile. Unless those soils have their nutrients and organic matter added back, it is unlikely that the SC tar plant will increase or recover in either of those two areas.

So far, what is coming up is three different weed grasses and 7 kinds of broadleaf plants, picture of the weed grasses today.

Sincerely, Craig CELL (650) 441-9323

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Friday, November 20, 2020 5:29 PM
To: Travis Beck; Blake Woessner
Cc: craig@ecoseeds.com
Subject: TARPLANT Seedlings--See at least three problems in photo that can be easily corrected.
Attachments: tarplant-soil.png

Dear Travis,

Thanks for the photo and glad to hear that you were able to visit Shaw's. **How many of the Arana Gulch AMWG were able to attend?**

The photo of the tar plant seedlings is indicating at least three future problems--*(closeup attached)*

1.) The potting soil is too light, looks like about 25% perlite along with peat and/or forest products and when planted out, in the summer that soil will wick moisture away from the roots of the plants.

A better choice would be some sterilized, sifted Arana Gulch soil from the site, either used alone or mixed 1:1 with a potting soil like SUPER SOIL brand potting mix, and NO perlite.

2.) The advantage of mixing the Arana Gulch soil that has been baked at 180-200 degrees F. for 30 minutes to kill any weed seeds, as part of the potting soil for the containers, means that the seedlings can be watched and whenever any nutrient deficiencies show up, they can be corrected before the seedling are planted. And then, when seedlings are planted out and the hole dug to plant, you can add whatever nutrients to the hole, the nutrients you found was too low for the seedlings when they were growing in the greenhouse in the containers.

3.) The light green leaves in the photo means that the potting mix is already running out of nitrogen, and one cup of Alaska brand liquid fish mixed with a gallon of water, and if the plants were fed now, that should fix them within a couple of week--Then, add more dilute liquid fish whenever the seedlings are planted out, and then, add the dilute liquid fish a third time next February. That will help the plants do a whole lot better, and produce maybe 5-10X as many flowers next summer.

Those seedlings in that photo, will all run out of nitrogen soon, and that means if that is not corrected right now and before planting out, they will not produce very healthy plants.

I just added 400 pounds of spot-fertilized dried blood meal to my 15-acre project in Woodside, and probably need another 500 pounds to get some of the wildflowers there up to speed.

Let me know if you and Blake or anyone else has time to visit, and I can meet everyone there and give you a tour.

Sincerely, Craig CELL (650) 441-9323

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Travis Beck

From: Jean Brocklebank <jeanbean@baymoon.com>
Sent: Thursday, November 26, 2020 11:35 AM
To: Travis Beck
Cc: Blake Woessner
Subject: Prescribed burns for coastal prairie
Attachments: Hyland 2007 report.pdf; Hyland 2008 report.pdf

Hello Travis ~

I am forwarding an article (Sentinel 11/25/20) on prescribed fire (see below), in case you did not have a chance to read it. This article shows that prescribed fire (correctly timed) can be a good tool for coastal prairie and tarplant.Contained herein is a quote from **Tim Hyland**, a senior environmental scientist from California State Parks.

Tim was contracted by the City of Santa Cruz for a couple of seasons. He filed a report for 2007 (including inventory correction) and one for 2008 (both attached and worth reviewing). I've also attached a picture I took of Tim on 17 August 2007, the day that we walked with him to show him what we were sure were *Holocarpha macradenia* that he had missed. He was quite pleased.

Note that in 2006, there had been mowing in some areas, and selected raking. The other picture attached was taken on 11 October 2006 -- our attempt to hand mow (as mentioned by Hyland in his 2007 report) an area where we would always find tarplant but that was not to be mowed in the fall of 2006.

I hope this will be of help as you go forward.

Sincerely,
Jean

Santa Cruz Sentinel 11/26/20

AMAH MUTSUN TRIBAL BAND REIGNITES CULTURAL BURNING

To prevent megafires and bring back native species, band wants to put fire back on landscape
By Hannah Hagemann
hhagemann @santacruzsentinel.com

DAVENPORT >> The morning light lifts above Cascade Ranch in Davenport and scatters across a thick blanket of ash and charred metal pieces — remnants of a historic building burned in the CZU August Lightning Complex fire.

Eight Native Stewardship Corps, a conservation crew made up of Amah Mutsun Tribal Band members, gather in a circle. They all wear yellow fireresistant work uniforms and start the day with a prayer, asking for safety and protection. The crew is preparing to light a prescribed burn on Año Nuevo State Park grounds.

But long before California State Parks existed, long before Cascade Ranch was erected,

the Mutsun peoples were lighting purposeful, methodical fires, across the Central California Coast.

“My ancestors were doing burns for thousands of years,” native steward Gabriel Pineida said. “They knew how to manage the land, they knew where to burn, and the right times when to burn.”

The Indigenous people of California practiced cultural burning for centuries to keep catastrophic megafires like the CZU Complex fire from igniting. The Mutsun peoples also lit these fires to manage the land, grow foods, medicines and materials.

Now, the Amah Mutsun Tribal Band is working to put fire back on the landscape, to heal it. The ancestors of the Tribal Band — the Awasas and the Mutsun-speaking peoples — lived across the greater Monterey Bay. They inhabited lands near Año Nuevo, west into the Santa Cruz Mountains, south in the Pajaro watershed, and east, in areas known today as San Benito and Santa Clara counties.

The Awasas and the Mutsun- speaking peoples would divide landscapes in up to seven segments based on the different species of plants, trees, and animals, explained Valentin Lopez, the Amah Mustun Tribal Band chairman. Those Amah Mutsun ancestors would burn one swath of land per year, sparking low intensity fires.

“When you burn at that frequency you avoid a huge buildup of fuels, that become so dangerous when those fires burn, they burn hot and sterilize and kill everything around them,” Lopez said. “That’s what happened in the Santa Cruz fires.”

Usually, flames don’t grow higher than a foot and a half in cultural burns and the fire moves slowly across the landscape. The practice creates a checkerboard of burned and unburned swaths of land, Lopez said. Indigenous burns prevent blazes from becoming disastrous and cultivate a more fire-resistant landscape.

Bringing fire back to where it once was Pineida and his fellow Native Stewardship Corps members are not only trained in wildland firefighting, but also in forestry and plant ecology. They gear up for the day, putting on hardhats, grabbing goggles, and gathering hoes and shovels.

The native stewards drive five minutes up Highway 1 to meet a California State Parks crew at Cascade Field, a coastal prairie north of Año Nuevo Point. Golden grass hisses and whips in the wind, as crews discuss burn plans.

This coastal prairie is one of the largest left untouched by farmers in Santa Cruz County, Tim Hyland said, a senior environmental scientist with California State Parks.

Natalie Pineida, a member of the Amah Matsun Land Trust, torches along the coastal trail of Cascade Field in Año Nuevo State Park during a prescribed burn on Nov. 19.

But centuries ago, grasslands were widespread throughout the Central California Coast. “Because of the traditional ways of our people burning, the whole Central Coast of California was a coastal prairie, one of the most biodiverse landscapes in North America,” Chairman Lopez said.

Today, less than 1% of California’s native grasslands remain, according to the National Park Service. These prairies are hotbeds for endemic grasses, plants and animals.

“When our people stopped burning, that coastal prairie was quickly encroached on by shrubs and trees,” Lopez said. “The prairie is hard to find now, and that biodiversity is practically gone.”

The ancestors of the Amah Mutsun Tribal Band endured three brutal waves of colonization.

From the late 1700s and into the 19th century the Indigenous people of California were forced off their lands and enslaved at missions and reservations. More than 16,000 Native Americans were killed in California during the mid 19th-century. Settlers also outlawed Indigenous burning.

First, Spanish colonists banned Indigenous peoples of California from the practice, because it impacted shrubs that cattle grazed on. But Indigenous peoples were still holding burns in some areas of the state, explained Alec Apodaca, a UC Berkeley anthropology graduate student and researcher. In the early 1800s Mexican settlers also outlawed cultural burning. But it wasn’t until later in the 19th century when American settlers colonized California that the practice was completely removed from the landscape, Apodaca said.

“Fire exclusion became more integrated into policy over time,” according to Apodaca.

When American settlers began to view to the forest as a resource, for logging and recreation, the banning of Indigenous burning was finalized. Forests in areas like Santa Cruz County became overgrown.

“There’s been a disruption in the knowledge and the stewardship practices — that’s a byproduct of these colonial enterprises,” Apodaca said.

Reconnecting to cultural burning

That means some native stewards working this prescribed burn, are learning, too.

All crew members have wildland firefighting training, but for some, such as Natalie Pineida, it’s their first time lighting a prescribed burn. Marcella Luna leads a line of firefighters with a drip torch. She’s a long-time fire practitioner. Other crew members follow

behind, using hand tools to dig into the earth. Carefully, she rotates her wrist slightly, pouring liquid drops of fire from the canister onto the ground. Every 6 feet, a drop of fire. It accumulates to form a line.

“I’m always thankful to put fire on the ground,” Luna said.

Through working as a native steward, Luna said she’s able to connect more deeply with her heritage.

“We’re relearning our culture, tradition and learning how our ancestors took care of the lands,” she said.

After the prescribed burn is finished, the area will resemble farther stretches of the park, where the CZU Complex fire crept down, leaving blackened scorched earth. But grasslands are adapted to fire, says Don Hankins, a fire researcher and professor at Chico State.

When set methodically, and scientifically, prescribed fires control which species flourish, and which are exterminated. Indigenous burns maintain native plants, grasses and animals, and keep invasive species at bay, Hankins explained.

Cultural burning is also a spiritual practice. Practitioners take a holistic view of the land, analyzing how different grass, plant, shrub, tree or animal species are faring.

“Can I do something for that plant or animal by tweaking it in this way?” Hankins said. “And if I set fire at this time, it’s going to correct that and make it better.”

But, it’s all about timing. Burns done in summer versus fall encourage different types of species to grow. If done at the wrong time, the benefits can evaporate, according to Hankins.

“I worry that if we’re not using fire in the same lens, with the same purposes that this landscape has evolved with, then perhaps we’re just creating another problem,” Hankins said.

There’s been a reckoning within fire agencies over the last decade that to prevent devastating wildland fires, prescribed burns need to be set more frequently. But Hankins wants to see Indigenous peoples leading the movement to put fire back on the landscape.

“How do we all get on the same page?” Hankins asked. “And wouldn’t it be awesome if that same page was written by Indigenous practitioners to say, ‘this is what this landscape needs and this is how we’re going to achieve it.’” Hankins said that would mean fire agencies working with local Indigenous communities on fire management plans, for example.

Native stewards look ahead

In the wake of the CZU Complex fire, the Amah Mutsun Tribal Band is working on securing some essentials for the native stewards.

Their housing at Cascade Ranch was damaged in the blaze, so for now the conservation crew is staying at the Butano Creek Girl Scout Camp, through an emergency grant from the Community Foundation of Santa Cruz County. Finding a permanent headquarters for the native stewards and housing is paramount, said Sara French, interim executive director of the Amah Mutsun Land Trust.

“Tribal members don’t have land, and don’t have financial support, and they live three or four hours away in the Central Valley, where it’s cheaper to live,” French said.

The native stewards are working to establish themselves as a crew that not only lights cultural burns, but also responds to wildland fires, and works prescribed burns, French said. The conservation crew is also working with California State Parks to down Douglas fir trees, and introduce native plants in the Quiroste Valley Cultural Preserve, a part of Año Nuevo State Park that’s Tribal Band ancestral territory.

At Pie Ranch, the native stewards are cleaning and restoring parts of the property that were damaged in the CZU Complex fire. French said they’re hoping to contract with more private land owners in Santa Cruz County to do this type of work.

Although the Amah Mutsun Tribal Band, which has approximately 600 enrolled members, is recognized by California as a tribal government, it does not currently have federal recognition. Through agreements with California State Parks and other agencies, the Mutsun peoples can access their ancestral lands for stewardship work and ceremony. But the Tribal Band does not officially hold any of their traditional territory.

For native stewards like Gabriele Pineida, it’s a far commute from Fresno to work in places such as Año Nuevo, 36 weeks of the year.

But he says, it’s worth it.

“Just being out here in the fresh air, away from the city, away from everybody, away from all the all the negativity, you’re out here being free,” Pineida said.

“This is where I belong.”

Susan Harris
Associate Planner
City of Santa Cruz
Department of Parks & Recreation
323 Church Street
Santa Cruz, CA 95060

RE: Corrections to 2007 Santa Cruz Tarplant, (Holocarpha macrodenia) report.

C12 Restoration conducted a 2007 survey for Santa Cruz Tarplant, (*Holocarpha macrodenia*) during the period from June 18th through July 5th after monitoring the adjacent population at Twin Lakes State Beach to determine the earliest reproductive peak. The entire coastal prairie area was searched.

Our survey was conducted using the recommendations prepared for the City of Santa Cruz by BMP Ecosciences. This document states the "Detection of the location of quiescent seed banks is a high priority." Due to this priority, equal search effort was afforded to the entire coastal prairie at Arana Gulch. Data was gathered using a Garmin Etrex legend. This allowed us to use a tracking feature, in addition to visual cues to keep track of our location and assure a consistent search pattern. Results of the survey are summarized in the table below and on the attached map.

Despite these methods some plants were missed and others were misidentified. I believe that the survey was conducted too early this year in part due to my concern for missing the peak flowering time. This was perhaps exacerbated by the fact that the plants at Twin Lakes appear to mature and brown out sooner.

After producing my report I met with Jean Brocklebank and Micheal Lewis on the site on Friday August 17th. They were kind enough to show me the plants that they had found which I had not. In addition to those plants we found still more plants that none of us had yet detected. Taken together these significantly increased the number of locations and individuals beyond what my initial survey had detected.

In addition to these missed plants there were misidentifications that account for significant changes in the numbers reported earlier. Santa Cruz tarplant and coastal tarweed are not difficult to distinguish and I have no excuse, to explain such a significant mistake. I regret the error and what appears below has been carefully rechecked. Though no surveyor can ever be sure that have found everything, I believe what is presented below is largely complete and without error.

Waypoint #	Number of Plants	Flower Head Number	Treatment
001	1	3	control
002	6	12	edge of treatment
063	2	173	edge of treatment
064	1	10	treatment
065	13	60	hand clipped
066	2	6	treatment
067	2	34	treatment

The most significant findings from this survey are the size and number of plants found on the edges of the treatment areas. This may result from a number of factors. They may have been subjected to a slightly different initial disturbance regime. Or perhaps they were not mowed this spring resulting in greater vigor.

The other significant bit of additional information in this report is that the site around point 065 was hand "mowed" by Jean Brocklebank and Micheal Lewis to encourage tarplant. And there was an increase in the number of tarplant found there this year. Given these results I feel continued active management of the area is warranted.

Respectfully,
Tim Hyland

Tim Hyland
1600 El Dorado Avenue
Santa Cruz, CA 95062
831.359.3722

Susan Harris
Associate Planner
City of Santa Cruz
Department of Parks & Recreation
323 Church Street
Santa Cruz, CA 95060

RE: 2008 Santa Cruz Tarplant, (Holocarpha macrodenia) surveys.

This report summarizes the findings of a survey for Santa Cruz Tarplant, (*Holocarpha macrodenia*) conducted for the City of Santa Cruz at the Arana Gulch property during the period from June 30th 2008 through July 12th 2008. During this survey plants were found in all stages of bud, flower and early seed set, and I believe that the timing included the reproductive peak for this population.

After discussions with city managers and other managers that work with this species, we decided it would be most reasonable to survey only those areas that had produced above ground plants within the last several years, or which were small enough to be quickly and efficiently searched. This area included all of sub population A, B, and C, as well as a significant buffer around each.

Data was gathered using a Garmin Etrex legend. This allowed me to use a tracking feature, in addition to visual cues to keep track of my location and assure a consistent search pattern. The total number of individuals found during this survey was 44. The location of these individuals is found on the attached map. Another measure of the reproductive success of the population, are the numbers of flower heads, these were recorded for all individuals and totaled 195.

Despite recent efforts by the city to mimic historic disturbance regimes the overall trend is not encouraging. Areas that had plants numbering in the hundreds in 2004 had numbers in the low teens or single digits. One bright spot is the detection of a slightly greater number of plants in the areas that were mowed and raked last year.

Something that may be of interest to managers of this species, is that while the greatest number of plants occurred in areas of compacted soils and low vegetation, often in the presence of Italian wild rye (*Lolium multiflorum*), these plants were of small stature and produced relatively few flower heads. In contrast while their numbers were low, plants found in areas of low soil compaction dominated by wild oats (*Avena spp.*) were more robust and produced significantly more flower heads. This suggests to me that once a certain level of development is passed, Santa Cruz tarplants that survive the competition with wild oats may then be favored by the conditions in which it thrives.

Respectfully,
Tim Hyland

Tim Hyland
1600 El Dorado Avenue
Santa Cruz, CA 95062
831.359.3722

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Sunday, January 3, 2021 12:02 PM
To: Travis Beck
Cc: craig@ecoseeds.com; Blake Woessner
Subject: TARPLANTS--There are 269 bags of organic fertilizers, that could help the tar plants grow better
Attachments: filaree sprouts.jpg

Dear Travis and All,

There are 269 bags of organic fertilizers, bone meal and blood meal at Hassett Hardware in Palo Alto, phone 650-327-7222 Elliott or Alex are in charge.

The two series of soil tests that the City conducted in 2015 and 2019--say that each of the four Tarplant habitats are missing soil nutrients, for the native plants to grow properly.

The two tests indicated that the tarplants soil only has about 1/3 or less of the nitrogen and phosphorus they need to grow and thrive.

The 137-8 pounds bags of blood meal and 132 - 20 pound bags of bone meal cost about $20 each could fix both of those problems---so would costs a total of only about $6,000--would probably be the best $6,000 investment made for the entire 30 years of work on those plants.

If I was hired to fix those Tarplant Area soils, I would divide those bags of fertilizers evenly between the four Areas, and set up some test plots and fertilize them at different rates to see what levels, each of the whole area would need in the future.

The results of the soil samples from the four Tarplant Areas A, B, C, and D at my place--and to get the weeds to grow properly is taking a LOT of fertilizers--because the grazing over time has removed so many of the soil nutrients.

Look forward to your reply.

Sincerely, Craig Dremann CELL (650) 441-9323


Office DEPOT

Travis Beck

From: Jean Brocklebank <jeanbean@baymoon.com>
Sent: Monday, January 18, 2021 8:24 PM
To: Travis Beck
Subject: Fwd: ARANA GULCH--Needs lots of pelletized lime, to fix the soil pH

Hi Travis ~

I realize that Craig Dremann is tenacious and persistent and that the City does not have the funds to pay this man to help restore tarplant at Arana Gulch. That said, I read the stuff he sends to me (as though I can make something happen) and I do think that, somehow, his ideas should be tried, since nothing else that has happened in the last 20 years seems to have worked. Can't the AMWG meet virtually and discuss this conundrum? And if not, why not?

All the best,
Jean

Begin forwarded message:

From: "Redwood City Seed-Reveg Edge" <rwc-seed@batnet.com>
Date: December 2, 2020 3:13:23 PM PST
To: "Jean Brocklebank" <jeanbean@baymoon.com>
Cc: <craig@ecoseeds.com>
Subject: ARANA GULCH--Needs lots of pelletized lime, to fix the soil pH
Reply-To: <craig@ecoseeds.com>

Dear Jean,

If you look at the attached soil tests that were done in 2018 at Arana Gulch, the nitrogen and phosphorus is VERY LOW.

Anyone doing organic gardening, knows that both nitrogen and phosphorus are critical for good plant growth, and both of those nutrients at Arana Gulch are very low and getting close to zero.

Then, if you look at the pH, it was bouncing between 4.4 and 5.3? Any gardner looking at those acid-soil numbers, would know there are very few plants that can grow well in soil that acid. The normal pH for most plants is between 6.0 and 6.5.

I added garden lime to my test boxes, and was able to get the pH back up to 6.5 but it will take a lot to fix the four Arana Gulch tar plant areas, so that the natives and the tar plants can grow back properly and replace the weeds over time.

It will require one pound of pelletized limestone for every 26 square feet. Or 1,600 pounds per acre or about 50 tons for the whole 70 acres. And you need to use pelletized limestone, not dolomite lime which has a lot of magnesium in it.

Now, I am working on getting the nitrogen, organic matter and potassium up to the normal levels needed for the tar plants, and that has been difficult because the weed grasses growing there for the last 30-50 years, stopped sequestering any carbon in the soil, so there is very little left now. And most of the nitrogen has been stripped out by the cattle grazing.

The annual weed grasses when we graze them, actually remove organic matter from the soil, the only plants at Arana Gulch that sequester organic matter in the soil are the perennial native grasses, and the only place they are still abundant is the Area-B brome plants.

Look at the soils in Area-B around those Brome plants, then look at the difference in the darkness of the soils in the other three areas. The fix for the tar plants, will also require adding a little organic matter, in the form of saw dust or municipal composted Green-bin mulch. Feel free to share these emails with anyone, especially the other "Friends of Arana Gulch".

I have done this work of restoring California native meadows since 1992, and am working on restoring my 800th acre right now. If you do not fix the nutrient, organic matter and pH issues in these meadows, none of the grassland experts in California, will ever be able to get the natives to come back properly.

Arana Gulch native grasslands in Areas A, C and D are "dead" in terms of organic matter, nutrients, and pH, and those three items are the foundations that the tar plants and other natives need to survive.

Sincerely, Craig Dremann CELL (650) 441-9323

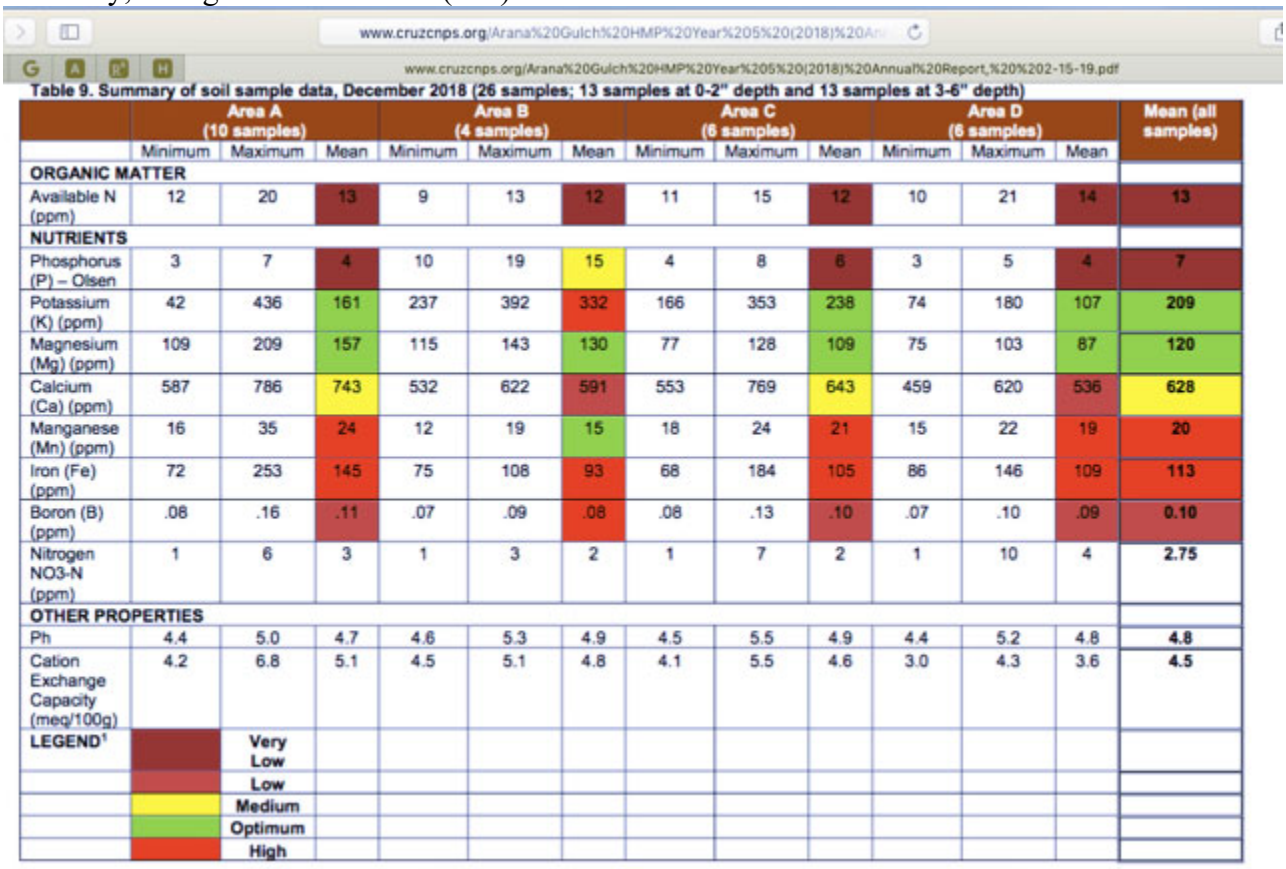
www.cruzcnps.org/Arana%20Gulch%20HMP%20Year%205%20(2018)%20Annual%20Report_%20%202-15-19.pdf

Table 9. Summary of soil sample data, December 2018 (26 samples; 13 samples at 0-2" depth and 13 samples at 3-6" depth)

	Area A (10 samples)			Area B (4 samples)			Area C (6 samples)			Area D (6 samples)			Mean (all samples)
	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	
ORGANIC MATTER													
Available N (ppm)	12	20	13	9	13	12	11	15	12	10	21	14	13
NUTRIENTS													
Phosphorus (P) – Olsen	3	7	4	10	19	15	4	8	6	3	5	4	7
Potassium (K) (ppm)	42	436	161	237	392	332	166	353	238	74	180	107	209
Magnesium (Mg) (ppm)	109	209	157	115	143	130	77	128	109	75	103	87	120
Calcium (Ca) (ppm)	587	786	743	532	622	591	553	769	643	459	620	536	628
Manganese (Mn) (ppm)	16	35	24	12	19	15	18	24	21	15	22	19	20
Iron (Fe) (ppm)	72	253	145	75	108	93	68	184	105	86	146	109	113
Boron (B) (ppm)	.08	.16	.11	.07	.09	.08	.08	.13	.10	.07	.10	.09	0.10
Nitrogen NO3-N (ppm)	1	6	3	1	3	2	1	7	2	1	10	4	2.75
OTHER PROPERTIES													
Ph	4.4	5.0	4.7	4.6	5.3	4.9	4.5	5.5	4.9	4.4	5.2	4.8	4.8
Cation Exchange Capacity (meq/100g)	4.2	6.8	5.1	4.5	5.1	4.8	4.1	5.5	4.6	3.0	4.3	3.6	4.5
LEGEND[1]		Very Low											
		Low											
		Medium											
		Optimum											
		High											

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Monday, January 18, 2021 10:54 AM
To: Travis Beck
Cc: Blake Woessner; craig@ecoseeds.com
Subject: TARPLANT test box results
Attachments: arana-2018-nutrient-tests2.jpg

Dear Travis and Blake,

The test boxes of soil here are producing interesting results. They are showing that Arana Gulch tar plant areas need a whole lot of fertilizer and organic matter to be added back, to replace what the cows have been taking away for the last few years.

Attached is the results from the 2018 City's Arana Gulch soil tests-- the nitrogen and phosphorus are already close to ZERO, and the removal of the calcium by the cattle is so low that the pH is getting very acid, and is currently 50 times more acid.

If you can take the cattle off *immediately and permanently*, then you can stop the destruction and removal of any more soil nutrients.

The more nutrients are removed from those soils over time, the more it will cost to fix those areas, so that tar plants can grow back and thrive in the future.

There are some interesting grass seedlings coming up right now, that could be our native annual Vulpia grass, so am allowing them to grow so I can id them in a month or two.

If it would be possible to do by Valentine's Day, is to get me two-one quart from somewhere in Area-A and put them in a box and mail them to me?

It does not need to be from the areas where the tar plants have been growing in the past--just some soil where there is a little weed cover growing right now? Take about 2 square feet of the surface thatch and weeds off the surface, and dig down no more than 2 inches deep, and fill two quart ziplock bags with soil? And note with the GPS where the soil was removed?

Mail to my P.O. Box in Redwood City.

Craig Dremann
P.O. Box 361
Redwood City, CA 94064

What I am going to do, is put that new soil in a new box, and fertilize with the amounts that I have calculated for the six boxes I already have been working on, and confirm that I have hit the mark?

Let me know if that is a possibility?

Sincerely, Craig CELL (650) 441-9323

Table 9. Summary of soil sample data, December 2018 (26 samples; 13 samples at 0-2" depth and 13 samples at 3-6" depth)

	Area A (10 samples)			Area B (4 samples)			Area C (6 samples)			Area D (6 samples)			Mean (all samples)
	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	
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Available N (ppm)	12	20	13	9	13	12	11	15	12	10	21	14	**13**
NUTRIENTS													
Phosphorus (P) – Olsen	3	7	4	10	19	15	4	8	6	3	5	4	**7**
Potassium (K) (ppm)	42	436	161	237	392	332	166	353	238	74	180	107	**209**
Magnesium (Mg) (ppm)	109	209	157	115	143	130	77	128	109	75	103	87	**120**
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Iron (Fe) (ppm)	72	253	145	75	108	93	68	184	105	86	146	109	**113**
Boron (B) (ppm)	.08	.16	.11	.07	.09	.08	.08	.13	.10	.07	.10	.09	**0.10**
Nitrogen NO3-N (ppm)	1	6	3	1	3	2	1	7	2	1	10	4	**2.75**
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LEGEND[1]		**Very Low**											
		Low											
		Medium											
		Optimum											
		High											

Travis Beck

From: Jean Brocklebank <jeanbean@baymoon.com>
Sent: Wednesday, January 20, 2021 11:46 AM
To: Travis Beck
Cc: Blake Woessner
Subject: Re: ARANA GULCH--Needs lots of pelletized lime, to fix the soil pH
Attachments: AMWG Shaw Property Visit 11.16.20.pdf

Thank you so much for this reply, Travis.

Yes, you have done quite a lot to move forward in this regard. Seeing it all in print makes that very obvious!

Attached is the pdf you requested.

Best regards,
Jean

On Jan 19, 2021, at 8:04 PM, Travis Beck wrote:

> Hi Jean,
>
> Blake and I are open to Craig?s ideas and I believe that, increasingly, the working group is too. As you know we visited his more frequently recommended project site, the Shaw property, in November. We are also in 2021 removing cattle from Area A and trying his timed mowing method. And we allowed him to collect soil samples to try growing out the seedbank there and experiment with his fertilization approach.
>
> So while I don?t think a special meeting is necessary at this point, I?m sure his ideas will continue to be discussed as we move forward.
>
> In immediate news, we have been working with the UCSC Greenhouses and the AMWG to plan an experimental outplanting of tarplants later this month and in February. We may have a need of assistance with weeding or watering per the eventual protocol if you are able to help out.
>
> And I don?t believe I ever answered your earlier offer of a pdf of our report on the Shaw property. I?d be happy to get a copy of that.
>
> Thanks for your continued involvement.
>
> Best,
> Travis
>
> ---
>
> **From:** Jean Brocklebank [mailto:jeanbean@baymoon.com]
> **Sent:** Monday, January 18, 2021 8:24 PM
> **To:** Travis Beck
> **Subject:** Fwd: ARANA GULCH--Needs lots of pelletized lime, to fix the soil pH

Hi Travis ~

I realize that Craig Dremann is tenacious and persistent and that the City does not have the funds to pay this man to help restore tarplant at Arana Gulch. That said, I read the stuff he sends to me (as though I can make something happen) and I do think that, somehow, his ideas should be tried, since nothing else that has happened in the last 20 years seems to have worked. Can't the AMWG meet virtually and discuss this conundrum? And if not, why not?

All the best,
Jean

Begin forwarded message:

From: "Redwood City Seed-Reveg Edge" <rwc-seed@batnet.com>
Date: December 2, 2020 3:13:23 PM PST
To: "Jean Brocklebank" <jeanbean@baymoon.com>
Cc: <craig@ecoseeds.com>
Subject: ARANA GULCH--Needs lots of pelletized lime, to fix the soil pH
Reply-To: <craig@ecoseeds.com>

Dear Jean,

If you look at the attached soil tests that were done in 2018 at Arana Gulch, the nitrogen and phosphorus is VERY LOW.

Anyone doing organic gardening, knows that both nitrogen and phosphorus are critical for good plant growth, and both of those nutrients at Arana Gulch are very low and getting close to zero.

Then, if you look at the pH, it was bouncing between 4.4 and 5.3? Any gardner looking at those acid-soil numbers, would know there are very few plants that can grow well in soil that acid. The normal pH for most plants is between 6.0 and 6.5.

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Now, I am working on getting the nitrogen, organic matter and potassium up to the normal levels needed for the tar plants, and that has been difficult because the weed grasses growing there for the last 30-50 years, stopped sequestering any carbon in the soil, so there is very little left now. And most of the nitrogen has been stripped out by the cattle grazing.

The annual weed grasses when we graze them, actually remove organic matter from the soil, the only plants at Arana Gulch that sequester organic matter in the soil are the perennial native grasses, and the only place they are still abundant is the Area-B brome plants.

Look at the soils in Area-B around those Brome plants, then look at the difference in the darkness of the soils in the other three areas. The fix for the tar plants, will also require adding a little organic matter, in the form of saw dust or municipal composted Green-bin mulch. Feel free to share these emails with anyone, especially the other "Friends of Arana Gulch".

I have done this work of restoring California native meadows since 1992, and am working on restoring my 800th acre right now. If you do not fix the nutrient, organic matter and pH issues in these meadows, none of the grassland experts in California, will ever be able to get the natives to come back properly.

Arana Gulch native grasslands in Areas A, C and D are "dead" in terms of organic matter, nutrients, and pH, and those three items are the foundations that the tar plants and other natives need to survive.

Sincerely, Craig Dremann CELL (650) 441-9323
<image001.png>

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Wednesday, January 20, 2021 9:41 AM
To: Blake Woessner
Cc: craig@ecoseeds.com; Travis Beck
Subject: TARPLANT test box -- New soil sample -- Permanently remove cows, mow monthly 8 inches high, never scrape, never burn, never rake! Set up Area fertilizer plots?
Attachments: 1-kite-hill-4-12-2020.jpg

Dear Blake,

Thank you very much for your help.

I am getting some very surprising results with the six boxes of soil we took earlier-- at the massive amounts of nutrients that will need to be replaced, so that the tar plant seedlings can thrive again at Arana Gulch--and want to confirm these first results, by fertilizing another soil sample.

Hopefully your Parks department this year can ---

1.) Get ALL of those cows of ALL of the Arana Gulch grasslands this month PERMANENTLY, and

2.) Start mowing high this month, (8 inches) and then, keep mowing MONTHLY for the next 4-5 years. and

3.) NEVER rake off the cut straw, and

4.) NEVER scrape because that also lowers the nutrient levels, and

5.) NEVER burn--and you should see a 10-20% increase in the native cover each year, as I am over here in Woodside across from 144 Alta Mesa on the 15 acres.

6.) Set up small scale FERTILIZER test plots, at least one in each Area--to add back the missing nutrients and organic matter and see if that benefits the native plants.

7.) Harvest seeds from the native Brome grass plants, and have it grown out in bulk under contract by Hedgerow farms, and sown in the other three Areas, to replace the weeds over time.

8.) If cow are permanently removed, change out the barbed wire for regular wire on the fencing.

I would do the first tests in the poppy patch that is located in the middle of Area A that we found, and in Area B, Area C and D where the tar plants used to live but went extinct.

For fertilized test plots--they will require extra mowing for the first two years--Mowed twice a month February to May to get rid of the extra weeds that the fertilizers will initially encourage to grow. Then, once the natives appear, then those soil nutrients will be handed off to them.

Area B's perennial native grass cover of native Brome plants, should have some seeds harvested, and be copied across the other three Areas once the cows are removed, and when they get established, they will start holding

the ground against the weeds, so that within 4-5 year, you could have close to 80-90% native cover, along with thousands to tens of thousands of tar plants, or perhaps millions of tar plants at Arana Gulch.

In 5 years working on the 15 acres here in Woodside, every summer have 5 million tar plants per acre. **Picture attached of the wildflowers blooming that did not exist when I started, that came up from dormant seeds in the soil.**

Once I have calculated what nutrients need to be added, let me know if the Park Department would be interested in funding me--to pay for the nutrients and my time to set up four small scale test plots, one in each Area--and see if the addition of the missing nutrients can quickly move the natives back in and permanently het rid of the weeds there?

Sincerely, Craig Dremann (650) 441-9323

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Wednesday, January 20, 2021 8:12 PM
To: Blake Woessner
Cc: craig@ecoseeds.com; Travis Beck
Subject: TAR PLANTS are in the Emergency Room--Fantastic potential at Arana Gulch, just need to invest in fertilizers instead of reports.
Attachments: kite-hill-mowing.png

Dear Blake,

Thanks for your reply. I just had to give you and Travis my perspective of the 30 years worth of attempts at ecological restoration disasters at Arana Gulch--and that is based on my 30 years years of restoring 800 acres of California grasslands so far--and "restored" means 95% or better native cover.

I can see the fantastic potential that exists at Arana Gulch, of getting the whole 70 acres at Arana Gulch back in that kinds of shape, and in only 4-5 years!

However, you need to stop the cow damages ASAP, and get people on the AMWG making the decisions who actually know how to get the job done in less than a decade? The last tar plant "Ishi" this summer, cannot wait much longer, for the help it needs.

And instead of making the annual $100K investment in the reports, cut the reports down to 4-5 pages, and pour the balance into the fertilizers the tar plant desperately need to survive?

Feel free to share my emails with anyone. Attached is a picture of the before-and-after from my Woodside project.

Sincerely, Craig CELL (650) 441-9323

--- BWoessner@cityofsantacruz.com wrote:

From: Blake Woessner <BWoessner@cityofsantacruz.com>
To: "craig@ecoseeds.com" <craig@ecoseeds.com>
CC: Travis Beck <tbeck@cityofsantacruz.com>
Subject: RE: TAR PLANTS are in the Emergency Room--Want treatment by doctors, who have succeed in actually restoring grasslands, instead of guessing?
Date: Wed, 20 Jan 2021 22:34:55 +0000

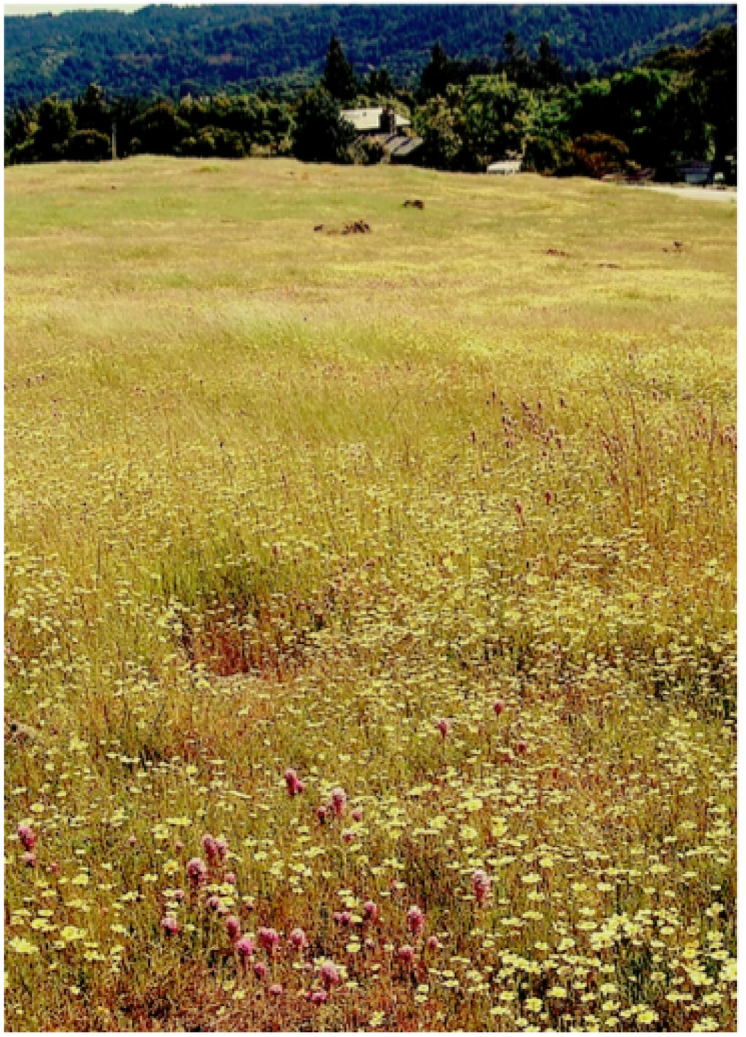
Hi Craig,

Thank you for the input, and I understand your concern. We'll certainly keep your perspective in mind as we move forward. Let's start with getting you those soil samples and refraining from having cattle on Plot A this season.

Respectfully,

-Blake

Below, (left) the beginning of a mowing project in Woodside, and then, three years later---



Kite Hill Open Space Preserve--at the Jane Drive gate, or park across from 144 Alta Mesa.

Travis Beck

From: Jean Brocklebank <jeanbean@baymoon.com>
Sent: Tuesday, March 2, 2021 10:02 AM
To: Travis Beck
Subject: Arana Gulch question

Hi Travis ~

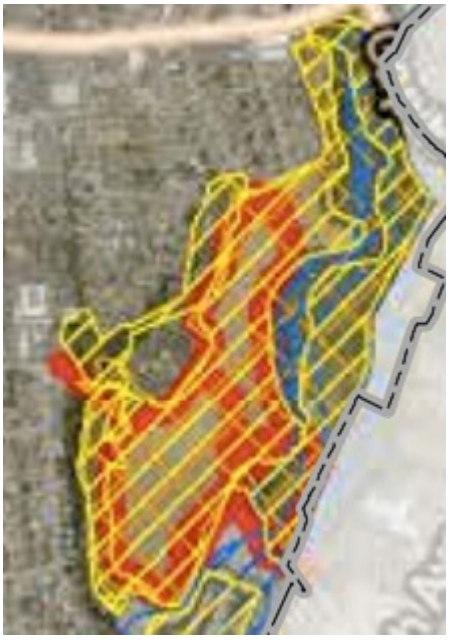
As you may know, NextDoor is rife with uninformed folks. Alas. Discussion about the proposed Temporary Outdoor Living ordinance is at the heart of confusion amongst the public now.

So I come to you for information.

I have been using the map (attached) that was included in the agenda packet to try to explain that, essentially, all of Arana Gulch is off limits. Taking into account the 75' from trails specification, creekside (both Arana and Hagemann), all fenced enclosures of Areas A, C and D (plus unfenced Area B) due to their listing since 2002 as **critical habitat** for the threatened (Federal) and endangered (State of California) tarplant. Add to that the fact that it was the entirety of Arana Gulch's 67 areas that is listed as critical habitat, not just the 30 acres of meadow.

If what I write plus this map is true, then where would camping in AG be allowed? Do you have a more detailed map or description to share?

Thanks,
Jean



Travis Beck

From: Jean Brocklebank <jeanbean@baymoon.com>
Sent: Wednesday, March 3, 2021 12:34 PM
To: Travis Beck
Cc: Lee Butler
Subject: Re: Arana Gulch question
Attachments: Tarplant Critical Habitat.pdf

Hello Travis ~

Thank you very much for your timely response and diligence in answering my concerns.

In reviewing the three maps from the 2/23/21 City Council meeting, I realize now that I had not carefully noted that the second map said "potentially," so when combined with the "prohibited" map I thought the sensitive species (yellow) and the prohibited (red) meant Arana Gulch was all off limits entirely.

That said, I am requesting that the Parks Department inform Lee Butler that the City of Santa Cruz ***cannot make a unilateral decision to allow camping in areas of "critical habitat" of an endangered or threatened species without consultation and a permit from both CDFW and USFWS authorities.*** Probably the CA Coastal Commission also, since the development permit for The AG Master Plan was granted with the assurance that the City would manage the area specifically for restoration of the tarplant and other sensitive habitats. City staff should also be aware that you have planted 1,000 tarplant seedlings within the fenced area that would likely be obliterated if campers were allowed inside the fenced areas.

I have attached the Federal Register which shows the "critical habitat" listing. I have also included a listing of all sensitive species:

Sensitive, Threatened and Endangered Plants Living in Arana Gulch:

- Santa Cruz tarplant (*Holocarpha macradenia*)
- San Francisco popcorn flower (*Plagiobothrys diffusus*)
- Point Reyes horkelia (*Horkelia marinensis*)
- Maple-leaved checkerbloom (*Sidalcea malachroides*)
- Gairdner's yampah (*Perideridia gairdneri ssp. borealis*)

Sensitive, Threatened and Endangered Wildlife living in or known to use Arana Gulch:

• Merlin (*Falco columbarius*)
• Sharp-shinned Hawk (*Accipiter striatus*)
• Vaux's Swift (*Chaetura vauxi)*
• Yellow Warbler (*Dendroica petechia*)
• Dusky-footed Woodrat (*Neotoma fuscipes*)
• Tidewater Goby (*Eucyclogobius newberryi*)
• Red-legged Frog (*Rana aurora draytonii*)
• Southwestern Pond Turtle (*Actinemys marmorta pallida*)
• Steelhead trout (*Oncoryhnchus mykiss irideus*)

I think that given all of this information, plus the fact that the entire 67 areas is listed as "critical habitat" for the tarplant, when the ordinance comes back to Council for the second reading, Arana Gulch should be removed from consideration.

Sincerely,
Jean Brocklebank

On Mar 3, 2021, at 7:54 AM, Travis Beck wrote:

> Hi Jean,
>
> Lee confirmed with me that the description I gave below is correct. As I understand it the current plan is for staff to review the critical habitats as identified in the General Plan in relation to the camping question.
>
> Best,
> Travis
>
> From: Travis Beck
> Sent: Tuesday, March 02, 2021 1:53 PM
> To: 'Jean Brocklebank'
> Cc: Tony Elliot; Lee Butler
> Subject: RE: Arana Gulch question
>
> Hi Jean,
>
> Thanks for reaching out to seek clarification. I'm looping in Lee Butler here, who took the lead on drafting the ordinance and creating the associated maps. Lee, Jean Brocklebank has been involved with habitat preservation efforts at Arana Gulch for several decades.
>
> My understanding is that riparian and critical habitat areas are not automatically excluded from camping as the ordinance is currently drafted. The City would have the ability, however, to identify specific areas that are or could be closed to, for example, protect Santa Cruz tarplant or steelhead. Where those areas would be and how much room that would leave for potential camping remains to be determined.
>
> Lee, please correct me if I misstated things. Jean, please feel free to follow up with more

questions or concerns.

Travis

From: Jean Brocklebank [mailto:jeanbean@baymoon.com]
Sent: Tuesday, March 02, 2021 10:02 AM
To: Travis Beck
Subject: Arana Gulch question

Hi Travis ~

As you may know, NextDoor is rife with uninformed folks. Alas. Discussion about the proposed Temporary Outdoor Living ordinance is at the heart of confusion amongst the public now.

So I come to you for information.

I have been using the map (attached) that was included in the agenda packet to try to explain that, essentially, all of Arana Gulch is off limits. Taking into account the 75' from trails specification, creekside (both Arana and Hagemann), all fenced enclosures of Areas A, C and D (plus unfenced Area B) due to their listing since 2002 as critical habitat for the threatened (Federal) and endangered (State of California) tarplant. Add to that the fact that it was the entirety of Arana Gulch's 67 areas that is listed as critical habitat, not just the 30 acres of meadow.

If what I write plus this map is true, then where would camping in AG be allowed? Do you have a more detailed map or description to share?

Thanks,
Jean

<image001.jpg>

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Sunday, April 4, 2021 4:12 PM
To: Blake Woessner; craig@ecoseeds.com; Travis Beck
Subject: TARPLANTS--Native Vulpia grass sprouting out of 3 of the four Areas, but grazing eliminated the native in Area A. Come to see woodside?
Attachments: native-vulpia-microstachys.jpg; weed-vulpia-myuros.jpg; poppies-kite-hill.jpg; tidy-tips-kite-hill.jpg

Dear Blake and Travis,

Very good news from the Arana Gulch test boxes, and my project in Woodside across from 144 Alta Mesa.

Here is the protocol I have been using on the first six soil boxes--added fertilizers, then removed weeds and grasses as they could be identified and counting each one that was removed.

Once the big stuff sprouted and were removed like the wild oats, the small plants that were being suppressed by the allelochemicals produced by the larger, started sprouting, but I could not identify them until they started producing seeds this week.

Here is the really big surprise--large quantities of native grass seeds are still in the soil and as far as I could tell, this species has never been recorded in any of the vegetation survey done at Arana Gulch in the past -- Festuca/Vulpia microstachys!

I use "Vulpia" and if you could get the whole 70 acres back to close to 100% Vulpia microstanchys, that plant gives off strong enough chemicals, that are able to keep the other weed grasses out permanently, so the tar plants could have a chance.

The intensive grazing of Area A, has cause the extinction of the Vulpia microstachys there, and it has been replaced by Italian ryegrass that might have been brought into Arana Gulch in the manure of the animals--when they were grazing elsewhere in late summer wherever Italian ryegrass was ripening seeds, and then deposited this weed grass into Area A.

If the animals are not fed forage for three days that is free of ALL seeds, before they were put at Arana Gulch then you can easily introduce new weeds into the Arana Gulch meadows.

AREA B = 50% native Vulpia microstachys and 50% European weed V. myuros.

AREA C = 100% native Vulpia microstachys.

AREA D = 50% native Vulpia microstachys and 50% European weed V. myuros.

As I have been recommending for years now, please stop all future grazing, because now you are eradicating the important native seeds in the soil, that could naturally keep out the weed grasses in the future. The elimination in Area-A means that it will be the most difficult to restore out of the four areas in the future. Photo of the two grasses today.

Also, both of you and ALL of your AMWG should come in the next week, and view what six years of proper management can do, in the 15 acres of grasslands in Woodside, that in places are back to close to 100% native cover, two pictures attached.

I will be working there every day this week 4PM+ if you would like a tour. Vulpia microstachys probably covers 70% of the preserve right now!

Sincerely, Craig Dremann CELL (650) 441-9323

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Sunday, April 4, 2021 4:46 PM
To: Blake Woessner; craig@ecoseeds.com; Travis Beck
Subject: TARPLANTS--Lost 95% of my tar plant seedlings in Woodside, picture of the survivors this week--very few
Attachments: tarplant-4-3-2021.jpg

Dear Blake and Travis,

Also, adding a picture of my tar plants developing this week. Maybe missing 95% of the expected number of seedlings our to the dry weather in February, when seedlings were trying to sprout and did not have enough rain?

Sincerely, Craig CELL (650) 441-9323


LG

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Monday, April 19, 2021 8:16 PM
To: Travis Beck
Cc: craig@ecoseeds.com; Blake Woessner
Subject: TARPLANTS--PowerPoint slide show, on how I unearth the dormant tar plant seeds, over here in Woodside.

Dear Travis and All,

I put together a PowerPoint slide show of how I do my special mowing method over here on the 14 acres in Woodside, to unearth the dormant tar plant seeds if there is any interest by the AMWG -at

https://www.ecoseeds.com/craigs-restore-wildflowers.pptx

Sincerely, Craig CELL (650) 441-9323

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Thursday, April 29, 2021 7:34 AM
To: Travis Beck; craig@ecoseeds.com; Blake Woessner
Subject: TWO TARPLANT TALES from the other side of the Mountains--Opening the Treasure chest and Cows adding TWO new weeds to Area A.
Attachments: KH-tarplants-4-28-2021.jpg; KH-tarplants-close-4-28-2021.jpg

Dear Travis and Blake,

TARPLANT TALES from the other side of the mountains--

STORY One--Opening the treasure chest--

I just found a fantastic treasure chest opened yesterday in the most unexpected place. An area about one acre was resisting all of my efforts for the last six year, to make a dent in the wild oats that were persisting year after year, from their dormant seeds still in the soil. However, I has a feeling that those wild oats were hiding a massive treasure chest--that when we removed the final layer of wild oats, would be massive.

Earlier this spring, we only received 5 inches of rainfall and close to zero for the month of February when the summer blooming wildflowers were trying to sprout. They did sprout at that time, and were suffering until recently, when the daytime and night time fog started coming over the mountains, where the seedlings transitioned from rainfall fed, to dewfall fed a few weeks ago, that will continue all summer.

Then yesterday, when we removed the final wild oat layer, we found tar plant seedlings covering the site, at the rate of 22 per square foot, or one million seedlings per acre! Pictures attached.

These weed grasses like the wild oats, are persistent, once they get established, they do not want to let go, and their dormant seeds are the glue that keeps them there, despite all of your efforts, until you have unearthed every single one of them.

The tar plant seedlings for example, as well as many other wildflower seedlings, cannot stand weed grasses near the seedlings for at least three reasons--the allelochemicals that the weed grasses produce, stunt the wildflower seedling growth.

And for the summer blooming wildflower like tar plants, the weed grasses are pulling massive amounts of moisture out of the ground, at the same time that the tar plants need that last bit of moisture to survive, before the tar plants convert to "Dewfall-absorbed-through-their-leaves" for survival though the summer and fall.

Plus, the standing weed grass straw, interferes and intercepts the dewfall that the tar plant absorb through their leaves to survive.

STORY TWO--Cows from outside Arana Gulch, add TWO new aggressive weed grasses in their intestines and manure--

The results of the six soil boxes from last year, one each from Areas B, C, and D, and three from Area A. Adding the cows from outside and not feeding them weed seed free forage for at least four days before they are brought to Arana Gulch, has added two new very aggressive weed grasses to Area A. May kinds of weed

grass seeds can pass through a cows digestive track and still be viable and gets established very quickly with the nutrients in the manure.

In the past when Arana Gulch was a dairy operation, the weed component was very stable unless the cows were fed weed contaminated forage harvested outside of the preserve. However, there is evidence that the rancher did not decontaminate the cows intestinal tracks for weed seeds, four days before they were brought to Area A at some time in the past.

If you ask the ranchers, here is what happened--At some time between April and May, the cows were eating from an unirrigated rangeland that contained ripe seeds of the Soft chess grass (Bromus mollis) and those seeds were still in the cows, when they dropped them in their shot in Area A at some time in the recent past.

The, also in Area A, those cows were fed between May and July, from an irrigated pasture that was sown with a polyploid strain of perennial ryegrass, that is very aggressive with its allelochemical effects that it can wipe out other weed grasses along with the native seedlings. The addition of this aggressive polyploid ryegrass may be one of the main reasons why the tar plant numbers have dropped during the current grazing years.

I think you should ask your rancher buddy, and see if I am 100% correct about the current grazing adding those two aggressive weed grasses to Area A, because the cattle were not fed for four days with weed-seed-free forage, before they were brought there?

COME and visit the "Promised Land" in Woodside--See where if you used my methods, you could have One Million tar plants per acre in the future?

Your Arana Gulch AMWG really need to come and see my tar plant jungle over here. When you park across from 144 Alta Mesa, you walk down Jane Drive past the trails that go up the hill, and before you get to the house on the left side of Jane, you will see a one-acre bowl and that is where the thick tar plant seedlings are sprouting.
There are no trails and you are welcome to walk in to view. If anyone ask, tell them that Craig gave you permission.

There are tar plant seedlings everywhere on the preserve, but that is the densest location because I have been finally after six years, been able to get this area very close to being 100% weed-grass free. The rest of the preserve has a layer of annual ryegrass that still needs eradication.

You can see that the past measurement of the weed grass thatch at Arana Gulch is pretty useless for getting the tar plants back in place--you need to produce ZERO weed grass cover for the tar plants to thrive properly, and not be molested by the allelochemical produced by ANY weed grasses. Feel free to share this email with anyone.

Sincerely, Craig CELL (650) 441-9323

From:	Redwood City Seed-Reveg Edge
To:	Travis Beck; craig@ecoseeds.com; Blake Woessner
Subject:	ARANA GULCH--AREA "A" the introduction of the aggressive Perennial ryegrass, can wipe everything else out of that Area.
Date:	Thursday, April 29, 2021 11:19:05 AM

Dear Travis and Blake,

Here is a photo from Box 6 of the very aggressive polyploid perennial ryegrass, since it has been introduced into Area "A", can wipe out everything in its path with its strong allelochemicals, as you can see from the photo.

Sincerely, Craig CELL (650) 441-9323


6

Travis Beck

From: Jean Brocklebank <jeanbean@baymoon.com>
Sent: Wednesday, May 12, 2021 10:55 AM
To: Tony Elliot
Cc: Travis Beck; Martin Bernal
Subject: Fuel Breaks in Arana Gulch?

Follow Up Flag: Follow up
Flag Status: Flagged

Tony and Travis ~

I just read the City Manager's Report for May 11, 2021 https://mailchi.mp/cityofsantacruz/june-27-covid-19-update-4941236?e=a37e60f44a

Included is the following:

"Fuel breaks will soon be mowed in the grasslands at Delaveaga, Moore Creek, Pogonip, and **Arana Gulch**. With the help of numerous partners, including the California Conservation Corps, the City has treated more than 15 acres of open spaces in Pogonip, Delaveaga and Arroyo Seco."

I hope he is referring to the normal amount of mowing that occurs each year at Arana Gulch and not intrusion into other new areas. Hopefully there will be careful inventory for *Madia sativa* in Area B and along the perimeter trail just past the entrance to the greenbelt, to assure that this native species is not mowed.

Jean

Travis Beck

From: Jean Brocklebank <jeanbean@baymoon.com>
Sent: Monday, May 17, 2021 10:50 AM
To: Travis Beck
Cc: Tony Elliot; Martin Bernal; Blake Woessner
Subject: Re: Fuel Breaks in Arana Gulch?

Hi Blake et al ~

We took a walk to Arana last Saturday and checked both areas I mentioned (below). There is no *Madia sativa* at either this year. Unlike *Holocarpha* which isn't obvious until late June or early July, *Madia* is always visible by mid-May, sometimes a foot tall. While not unusual for Area B, it is quite unusual for the perimeter path (near the wetland). There has been a *Madia* forest at this location for years (see 2015 attached). There had to be a good *Madia* seed crop from the 2020 season, when we saw it. A guess would be that the seed somehow "knew" the ground was not soaked properly this rain season. Smart seed.

This is to say that mowing at Area B, as long as it is done soon, in case there is late germination of *Madia*.

Jean
P.S. To remind you, we worked for two years in a row to get rid of Scotch Broom and thistle in this area, so were pleased to get a picture in August 2015 of the results of our work ;o)


HIKING
TRAIL
Madia sativa areas

On May 14, 2021, at 3:39 PM, Travis Beck wrote:

Hello Jean,

You are correct. We plan on performing our typical annual mowing at Arana Gulch this year. No further fuel reduction work is planned. I'll check in with Blake about the tarweed.

We are working now on scheduling a date for our next meeting or meetings of the Working Group some time in late June or early July. I'll let you know once we have firm dates.

Best,
Travis

From: Jean Brocklebank [mailto:jeanbean@baymoon.com]
Sent: Wednesday, May 12, 2021 10:55 AM
To: Tony Elliot <telliot@cityofsantacruz.com>
Cc: Travis Beck <tbeck@cityofsantacruz.com>; Martin Bernal <mbernal@cityofsantacruz.com>
Subject: Fuel Breaks in Arana Gulch?

Tony and Travis ~

I just read the City Manager's Report for May 11, 2021 https://mailchi.mp/cityofsantacruz/june-27-covid-19-update-4941236?e=a37e60f44a

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"Fuel breaks will soon be mowed in the grasslands at Delaveaga, Moore Creek, Pogonip, and **Arana Gulch**. With the help of numerous partners, including the California Conservation Corps, the City has treated more than 15 acres of open spaces in Pogonip, Delaveaga and Arroyo Seco."

I hope he is referring to the normal amount of mowing that occurs each year at Arana Gulch and not intrusion into other new areas. Hopefully there will be careful inventory for *Madia sativa* in Area B and along the perimeter trail just past the entrance to the greenbelt, to assure that this native species is not mowed.

Jean

Travis Beck

From: Jean Brocklebank <jeanbean@baymoon.com>
Sent: Monday, May 17, 2021 12:20 PM
To: Blake Woessner
Cc: Travis Beck; Tony Elliot
Subject: Garbage and graffiti

Hi again ~

On Saturday (5/15/21), we also noted graffiti (black and blue painted Eucalyptus) and garbage under the Hagemann Bridge on its south side (including bottles not shown in the photo) near the Historic Roses.

The roses are looking bad and it might be best to at least prune the dead bits and use a stake to give them some support.

Pictures attached.

Jean


DEAD
Growing sideways
IN NEED of HAND WEEDING

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Thursday, May 20, 2021 1:31 PM
To: Travis Beck
Cc: craig@ecoseeds.com; Blake Woessner
Subject: 400 planted tarplant seedlings --are they all together somewhere in Area A? Any more recent photos? Are they surviving?
Attachments: 16-tarplants-one-million.jpg; santa-cruz-tarplanting-2021.jpg

Dear Travis and Blake,

Have not been out yet to see Arana Gulch--are the 400 tar plant seedlings shown on the City's website (attached), planted together somewhere in Area A?

Any more recent photos of them, and are they surviving?

Picture of my Hayfield tar plants this week, coming up in places at the rate of one million per acre. That is a slide from a PowerPoint presentation I did for the San Mateo County Weed Management meeting this week, at https://www.ecoseeds.com/WMA-talk.pptx

Sincerely, Craig CELL (650) 441-9323

Arana Gulch Experimental Outplanting of Santa Cruz Tarplant

The Parks & Recreation Department's Open Space & Greenways team, in collaboration with the Arana Gulch Adaptive Management Working Group, the UCSC Greenhouse, and UCSC volunteers, has successfully implemented an experimental outplanting of 400 Santa Cruz tarplant. Santa Cruz tarplant (*Holocarpha macradenia*) is an endangered plant species endemic to Northern California and ensuring its persistence is a key goal of the Arana Gulch management plan. An additional 400 tarplants are scheduled to be planted in February. The short-term goal of this experimental outplanting is to identify the best outplanting methods. The long-term goal is to increase the seedbank of the tarplant at Arana to a level that will ensure a high probability of persistence for 100 years, or in perpetuity. This planting is something of a landmark in that it exceeds the targeted population goal for the Santa Cruz tarplant management program.

The City's contracted biologists will monitor the tarplant, and have implemented several experimental treatments: mowing, sheet mulching, grazing, and no treatment. The questions we hope to answer are whether or not planted seedlings survive to reproduce with no management, if mowing is an effective management strategy, how plants survive under grazing pressure, and if sheet mulching improves seedling survival and reproduction.

A huge thank you to everyone involved!!

Return to full list >>

Travis Beck

From: Jean Brocklebank <jeanbean@baymoon.com>
Sent: Friday, May 21, 2021 11:53 AM
To: craig@ecoseeds.com
Subject: Re: Tar plant seedlings at one million per acre are in Woodside, not at Shaw's in La Selva Beach

Thank you for the picture you attached. When was that taken? This year?

I agree with you, Craig, on 1 and 4 (as below). I cannot see the City ever mowing monthly (3), alas, but they should do so in a control area. I am equivocal on the artificial fertilizer application but it should also be tried in a control area. Just not sure whether Area B is the place to begin for tarplant.

> **1.) The cow must be permanently removed, 2.) the fertilizers and organic matter the cows removed over time returned, and 3.) all of the four areas MUST be mowed monthly at 8 inches high, to not allow a single weed-seed to ever ripen again, and 4.) NEVER burn or scrape, or mow low and rake off the thatch. Skipping any of these four steps, will never get a self-sustaining SC tar plant population established at Arana Gulch.**

Unfortunately the City unwisely tied its AG Master Plan (the paved bike routes) to recovery of the endangered tarplant, not other native grassland species. Area B probably never had much of a tarplant population and now that it is bifurcated from the rest of the critical habitat it is like an island. Sure we might consider making Area B the bestest little tarplant area of the lot and I would be willing to give that a go, with its better soil conditions. But the city would have to fence off that area or else it will continue to be hammered by bicyclists, walkers, dog owners (oh goody, a place for my dog to defecate!) and those seeking hidden camping spaces. So far, the City has not acted on our years long request to install a fence to keep pavement users from cutting a short cut through Area B.

I look forward to the next AMWG meeting to discuss Area B possibilities as a legitimate place to do restoration work.

Jean

On May 20, 2021, at 2:32 PM, Redwood City Seed-Reveg Edge wrote:

> Dear Jean,
>
> The hayfield tar plant seedlings in Woodside are Slide #16 of the PowerPoint, and yes there where no tar plants of any kinds on the Shaw property.
>
> All of those millions of hayfield tar plants coming up in Woodside are from seeds that have been dormant for decades to hundreds of years. The photo is of an area that was the most weed-infested when I started six years ago, and was never expecting for it to spring back to life at Year-Six with such dense native cover.

What I am doing, is compare the 25 years of attempts to restore ANYthing at the four Areas of Arana Gulch on 70 acres of grasslands, and has failed to get even 1% native cover established in any of the three grazed Areas--whereas only 5 miles south on the same 70 acres, able to unearth 100 different native species, that now cover 95% of the Shaw property.

The paradox at Arana Gulch, is that the ungrazed Area B has the best native cover, from my transect last year was 41% native cover, Area A=7%, Areas C and D=3%.

Since Area B is technically the "control" for the other three grazed Area, it is reasonable to conclude that the grazing has wiped out the natives.

Using Area B as the baseline, any scientist could tell you that Area A has lost 83% of its native cover, and Areas C and D have lost a massive 93% amount of their native cover.

Meanwhile, while I have been attending the SC tar plant meetings for several years now, and able to unearth natives on every property I work on, and in only 5-6 years, get those native areas back to 95% native cover also--At what point does the "Catastrophic" conditions of the permit start to be implemented? When there are zero plants for a decade in Area A, like what has already happened in Areas B, C, and D.

When does one single plant NOT begin to fix the "Catastrophic" conditions--so that other methods could be tried--like my monthly mowing method and fertilizing?

Also, to give you a sneak preview about the 400 seedlings that got planted earlier this spring, they may make it to flower and produce seeds, but they will not thrive and produce seedlings next year.

I made exactly that same mistake myself several years ago, when I planted 35,000 seedlings over a four year period in only 40 x 40 foot area at Arastradero Preserve in Palo Alto--and today there is no evidence that I was ever there? If you plant these native seedlings the wrong way, it will be like planting a petunia bed each spring, and your great grandchildren will be out each spring, doing it over, and over, and over again...

1.) The cow must be permanently removed, 2.) the fertilizers and organic matter the cows removed over time returned, and 3.) all of the four areas MUST be mowed monthly at 8 inches high, to not allow a single weed-seed to ever ripen again, and 4.) NEVER burn or scrape, or mow low and rake off the thatch. Skipping any of these four steps, will never get a self-sustaining SC tar plant population established at Arana Gulch.

I am quite surprised all of these years, that your Friends of Arana Gulch group has never posted any of my emails on your site?

After restoring 800 acres of grasslands, and when I say "restored" I mean back to 95% native cover or better, could I be right? And the last 30 years of work at Arana Gulch, maybe not only be a huge waste of time, but those projects actually helped the extinction of the plant in three of the four Areas?

I think that none of the members of the SC Tarplant AMWG want to hire me for the 3-4 years needed to test my methods at Arana Gulch, because nobody putting the annual management plans together want to admit and be responsible for destroying the Arana Gulch populations? Failure and causing the extinction of a species that was under someone's

management is a very tough pill to swallow, but that is the results of all of the other methods that have been used so far.

Look forward to this and my other emails to be posted on your website, so that others can know that there exist other successful and rapid methods to get the SC tar plant growing back at Arana Gulch? And within only a few years, and hopefully we can get started before the species is extinguished at its Last Stand in Area A, as it did everywhere else?

Sincerely, Craig Dremann (650) 325-7333
The Reveg Edge, P.O. Box 361, Redwood City, CA 94064 -- Inventing licensed grassland ecological restoration technologies since 1992.

--- jeanbean@baymoon.com wrote:

From: Jean Brocklebank <jeanbean@baymoon.com>
To: craig@ecoseeds.com
Subject: Re: FoAG Contact Form
Date: Thu, 20 May 2021 12:06:25 -0700

Hello Craig ~

You wrote that your PPT shows how you "*can unearth one million tarplants per acre"* on your *"14 acres project in Woodside*." I looked at every slide of the PPT but I see no pictures of tarplant. Can you send pictures of former tarplants that provided such an enormous seedbank at your property that are identifiable as being at that site?

I know there is no tarplant (other than maybe dormant seed) at Byers Lane or I'm sure you would have provided pictures of any.

Thanks,
Jean

On May 19, 2021, at 10:08 PM, no-reply@weebly.com wrote:

Submitted Information:

Name
Craig Dremann

Email
craig@ecoseeds.com

Comment
I just presented a PowerPoint showing how I can unearth one million tar plants per acre over here on my 14 acre project in Woodside across from 144 Alta Mesa at https://www.ecoseeds.com/WMA-talk.pptx

Since the tar plant population dropped to a single plant last summer, under the plan that runs to 2025, the population is officially in the "Catastrophic" mode.

I am hoping that your group can encourage the City to start trying my method that has completely restored 70 acres at 300 Byers Lane, La Selva Beach only 5 miles south, back to 95% native cover? Someone should come and see my one million tar plants per acre that I have been able to produce over here in Woodside across from 144 Alta Mesa, just by mowing monthly?

No grazing, no burning, no seeding, no planting of seedlings?

Travis Beck

From: Parks and Rec
Sent: Monday, May 24, 2021 8:52 AM
To: Travis Beck
Subject: FW: Fire Hazard Concerns Adjacent to Arana Gulch

Follow Up Flag: Follow up
Flag Status: Flagged

-----Original Message-----
From: Julie Almquist [mailto:jjalmquist@aol.com]
Sent: Saturday, May 22, 2021 2:04 PM
To: mike.demars@centralfiresc.org; Amy Miyakusu <Amy.Miyakusu@santacruzcounty.us>; Donna Meyers <dmeyers@cityofsantacruz.com>; Parks and Rec <parksandrec@cityofsantacruz.com>
Cc: Edna Elkins <ednautah@msn.com>; Hannah Carpenter <hannah@kingmanagement.net>; Toni Danzig <tonidan@comcast.net>
Subject: Fire Hazard Concerns Adjacent to Arana Gulch

Dear Fire Marshall DeMars, Ms. Miyakusu, Mayor Meyers, and Parks and Rec Members,

My name is Julie Almquist and I'm writing to ask for your help in assessing and addressing the fire danger in my Arana Gulch neighborhood, Harbor Knolls. We are doing what we can on HOA property, but we need your support to mitigate the wildfire risk on the slopes of the gulch near our condo complex. I hope that someone can do an inspection of this slope and do some clearing as soon as possible.

I'm including all of you because I'm not sure where the city and county boundaries intersect - our property is in the county, but most (or all?) of the gulch is in the city. Please share this with any other relevant persons or entities I may have missed.

I am copying our HOA president, Edna Elkins, our HOA property manager Hannah Carpenter, and our landscape board member, Toni Danzig.

I've already been in touch with Mr. DeMars and he has been helpful in sending materials about fire safety and clarifying some points about the gulch.

I'm surprised to find out that our condo property is NOT considered to be part of the Wildland Urban Interface (WUI), since it seems to fit any criteria I would assume to be part of that designation: "areas where wildland vegetation meets residential development".

I totally understand (and appreciate!) that some brush/tree clearance or removal within the gulch is restricted to protect the natural habitat, and that you are not allowed to disturb the natural habitat at all within 30 feet of the seasonal waterway. Thank you all for being stewards of this precious and beautiful area; and, I think we can also agree that fire mitigation is essential when we live so close to nature.

Our HOA is being proactive in doing what we can to create and maintain a defensible space around our buildings. We just met with Lewis Tree Service for our annual inspection and we are focusing on fire safety. We will remove some

undergrowth to create vertical spacing between shrubs and trees and also thin some branches and trees to create safer horizontal spacing. But we still need your help with the gulch.

From our property, there is a steep slope dropping down to the creek. This slope is totally overgrown with poison oak, nettles, dry grass, English ivy, oak shrubs, and trees. According to CalFire materials, the vertical and horizontal spacing between grass, shrubs, and trees is crucial to reduce the spread of wildfires, and a steep slope with larger plant life requires greater spacing than level property. It is far from the creek, so it should be okay, even desirable, to do some clearing and maintenance on this slope.

Thank you all for your service to our community. I look forward to hearing from you and I hope you are able to help us be better prepared for wildfires.

Take care,

Julie Almquist
1643 Taylor Lane
Santa Cruz
831-332-8991

Travis Beck

From: Jean Brocklebank <jeanbean@baymoon.com>
Sent: Friday, June 4, 2021 1:22 PM
To: Blake Woessner
Cc: Travis Beck; Kathy Lyons
Subject: Native tarplant

Hi All ~

Michael and I perused Area A on Wednesday (6/2). We were looking at the various plantations. We took photos of all of them, which we will share soon.

Meanwhile, we were surprised to accidentally find tarplants growing outside the tarplantations, as we call them. They varied in size from one to several flowerettes.

Attached are pictures of two of six we discovered. More to come soon. Just wanted to get this to you on Friday. We'll send more pictures and details by Monday or Tuesday.

Jean

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Sunday, June 6, 2021 8:31 PM
To: Travis Beck; Blake Woessner; craig@ecoseeds.com
Subject: ARANA GULCH--400-1,000 tar plants down to 200 and cats ears killing a lot
Attachments: 1-tarplant-infested-cats-ears.jpg; 1-tarplant-unmolested.jpg; 1-arana-gulch-2021-plantings.JPG

Dear Travis and Blake,

Went out last week, and today for a couple of hours to look at the tar plants.

Attached is an approximate map of the nine locations, and saw many interesting things:

1.) Within Area "A" the planted tar plant seedlings in Plots marked as A, B and C on my attached map, unfortunate destroyed three areas of pristine Danthonia-Stipa Coastal Prairie, that were 96% native cover before those three test plots were put in, and thousands of those plants destroyed.

SUGGESTION: Any person setting up future test plot, should be able to recognize the Coastal Prairie habitat, before they destroy one of California's rarest grassland habitats, and one of the oldest ecosystems that exists in North America?

2.) My transect today of the undisturbed coastal prairie around Plot A, showed 64% Danthonia cover and 32% Stipa pulchra cover, with only 4% weed cover.

These three plots destroyed habitat in the densest native prairie area within Arana Gulch, that I have seen so far. You rarely find any Coastal Prairie left in Santa Cruz County, that is that high in native cover.

COMPARISON: Going west from the three oaks, and running 10 feet from the fence and parallel to it, I ran a transect today, and the Coastal Prairie in that area is 62% Danthonia, but you lose the Stipa component and it drops to only 1%, and the balance of 34%-cover is made up of weed grasses and filaree.

COMPARISON: When you measure the Coastal Prairie cover, from "Area A" fence post nearest the bridge about 500 feet to the bird house, you are up to 98.6% weed cover, and only 1.4% native.

SUGGESTION: Have someone run annual North-south transects and west-east transects, and space them every 200 feet, within each of the four "Areas" to map the percentage Coastal Prairie cover that exists each year.

Being aware of where the Coastal Prairie resources are located, and where it is still in good shape and pristine and should not be dug up and destroyed--would be a very good start in getting the whole of Arana Gulch restored over time.

The very first order of business, when doing Ecological Restoration, is being aware of your surroundings.

Proper Ecological Restoration at Arana Gulch, could easily increase the amount of Coastal Prairie cover by 10-20% per year--so by Years 5-10 the whole area is restored back to native, like Shaw's at La Selva Beach, or like my current 14 acres in Woodside.

However, you really need a detailed annual survey of the percentage cover of native grasses for the whole Arana Gulch area, then can be used as a benchmark-- to determine if whatever annual management project you conduct there, is actually helping the Coastal Prairie, or may be destroying it?

3.) Obviously the plots have been watered, and however much is given, and at whatever frequency--keep doing that until the plants set seeds!

4.) Most plots have been hand-weeded, but Plots B and C are full of Cats Ears, and those weeds are strongly allelopathic--and they are killing and suppressing the poor tar plant seedlings there. If you could get someone out there right away, and remove the cats ears, that will really help the survival of the tarplant in those two plots.

And Mowing in the next couple of weeks, of AREA B to one foot tall, will really help the native grasses that are still growing underneath those four foot tall wild oats.

5.) "COMMON GARDEN" study-- The Park Department should get a native plant geneticist to look at all of these seedlings in all of these plots, because a study of the diversity of the Arana Gulch populations could be the most important study since Clausen, Keck and Hiesey were studying the genetics of the tarplants back in the 1940s at Stanford's Carnegie Institution!

If Dr. Stebbins was still alive, he would be the person to call. What I saw in the various plots today, was the most diversity in a single native plant population of any native species, that maybe exists anywhere in California.

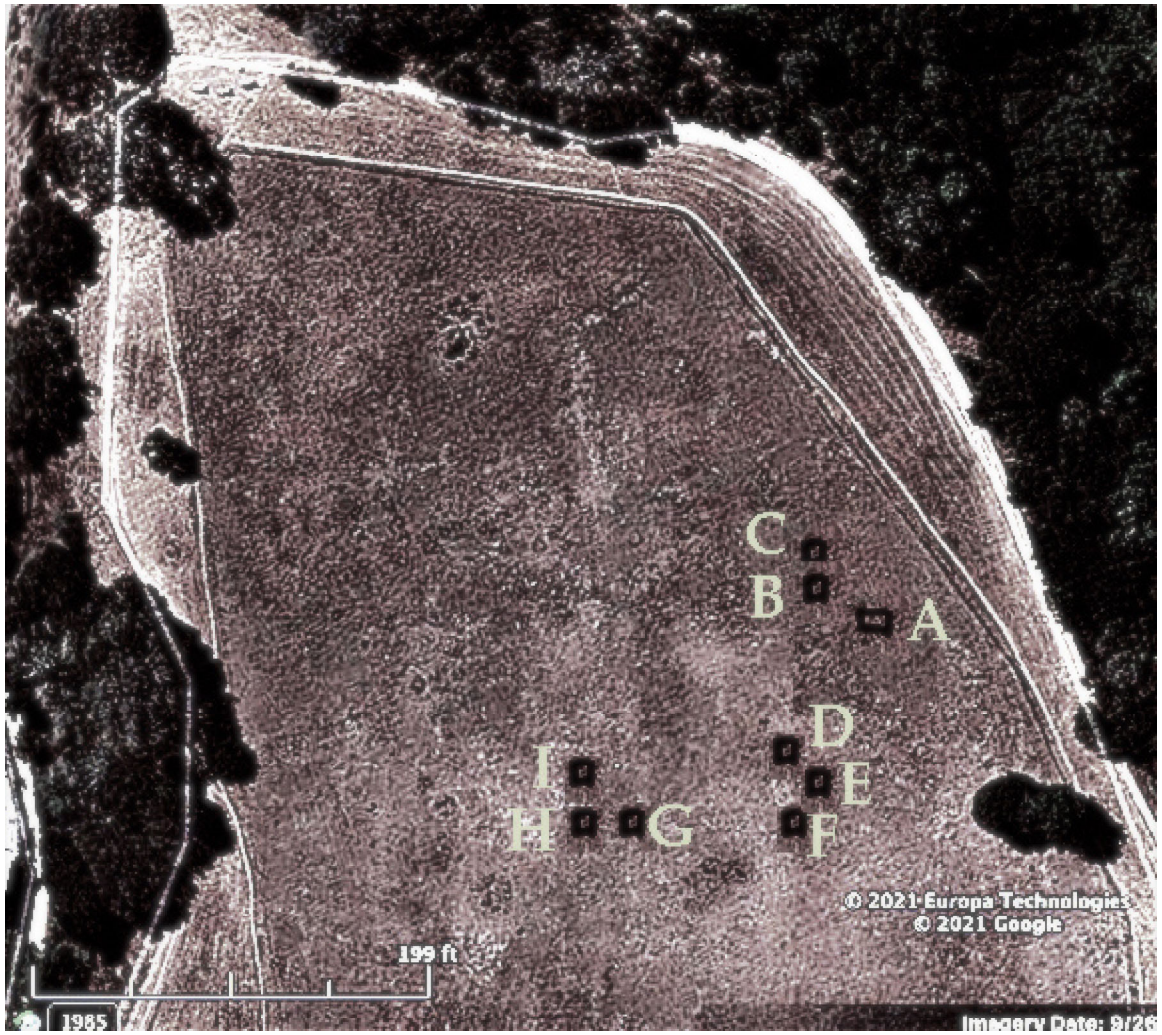
There at least 5-6 very distinctive forms and shapes of the tarplants, and they all develop their flowers in different manners. Some shoot up a single flower first from the center, whereas others bloom at the ends of all of the branches at the same time. Some are tightly clustered, whereas others have a widespread branching habit.

6.) Below, are the approximate tarplant seedlings count per plot:

A = 50, B = 11, C = 16, D = 23, E = 17, F = 20, G = 30, H = 15, and I = 16.

Hope these details are useful.

Sincerely, Craig CELL (650) 441-9323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Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Monday, June 7, 2021 10:46 AM
To: Travis Beck
Cc: craig@ecoseeds.com
Subject: ARANA GULCH--Are there only 9 plots? Someone needs to write up the "Common garden" study aspect of those plots!

Dear Travis,

Thanks for trying with my rwc-seed email. On my map, did I find all of the planted seedling plots--are there only the nine I put on the map?

Has anyone else noticed the genetic diversity of the tar plants that is showing up in the plots?

What you and UCSC have done this year, is a study of the genetics of a species called a "Common garden study" where you grow plants as seedlings all at the same time, give them the same environmental conditions, and see if you see any genetic differences pop out, or are they all the same--looking like Johnny Appleseeds sowed them all from the same seed sack.

I was going common garden studies with Connie Milar, the USFS geneticist, of the native grasses of the nine counties of the Bay Area back in 1991, that you can read about at https://www.ecoseeds.com/juicy.gossip.three.html -- but in all of the studies we did, we never saw as much diversity in a single population ever. For an individual native plant population, that diversity might be a World Record.

That is why someone with a degree in native plant genetics, should write a paper on those dozen or so variations that are being expressed in that population right now, in those Common garden plots. This is a once in a lifetime opportunity, to look deep into the genetics of such a variable plant population, and the chance might not come along for another 100 years. I have been doing this work for 50 years now, and never saw anything like that.

Sincerely, Craig CELL (650) 441-9323

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--- tbeck@cityofsantacruz.com wrote:

From: Travis Beck <tbeck@cityofsantacruz.com>
To: "rwc-seed@batnet.com" <rwc-seed@batnet.com>
Subject: FW: ARANA GULCH--400-1,000 tar plants down to 200 and cats ears killing a lot
Date: Mon, 7 Jun 2021 16:50:43 +0000

Hello Craig,

Microsoft let me know that my earlier message was rejected so I'm trying again with your Redwood City Seed address.

Travis Beck

From: Jean Brocklebank <jeanbean@baymoon.com>
Sent: Thursday, June 10, 2021 12:09 PM
To: Blake Woessner
Cc: Travis Beck; Kathy Lyons
Subject: The other three tarplant growing outside a plot

Here are the other three tarplant individuals (a total of 5) we discovered outside the plantations on June 2nd. Sorry for the delay.

Jean

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Saturday, June 12, 2021 7:20 PM
To: Travis Beck; Blake Woessner
Cc: craig@ecoseeds.com
Subject: TARPLANTS--Went out today and marked the two native meadows in Area B. And also flagged where I ran vegetation transects across Area A.
Attachments: area-B-meadows.jpg; creeping-wild-rye.jpg; flagging.jpg

Dear Travis and Blake,

Went out today to Arana Gulch to do some vegetation transects, and found two pristine native meadows in Area B that I flagged with orange and green survey flagging tape, picture attached. The picture of the green flagging photo, has the Danthonia meadow in the back ground. The orange flagged area is the native Brome meadow.

Also, ran some vegetation transects across Area A in six areas, that are also flagged with orange and green survey flagging tape, picture attached.

The native Brome seed that is being produced and is ripe right now in Area B, should be collected and grown as seedlings and planted in all of the Tarplant seedlings plots this fall, spaced about 3 per square foot. You do not need to remove the redwood bark mulch, just move the mulch aside, dig a hole and plant the Brome seedlings.

You start the Brome in flats in August,so you can plant the seedlings out in December.

Mowing Area B at about a foot high, will help conserve all of those native grass plants coming uno in that area, and the 2-8 inch tall native grass leaves can get some sunlight that way too.

In the middle of Area A, is a very nice solid acre of another native grass, the Creeping Wild Rye, picture attached.

Sincerely, Craig CELL (650) 441-9323

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Saturday, June 12, 2021 8:47 PM
To: Travis Beck; Blake Woessner
Cc: craig@ecoseeds.com
Subject: ARANA GULCH--Remove cattle, mow @ one foot high 2x a year, add fertilizers and lime, add native brome seedlings, and you are DONE!

Dear Travis and Blake,

Here are the emails I have been trading between Jean, because I wanted you to know-- if you pull off ALL of the cattle, and mow ALL four Areas twice a year at one foot high, then that Coastal Prairie will grow back itself.

Also, add the native brome seedlings anywhere you plant tar plant seedlings at the rate of three per square foot, and you will be good to go.

If you want to speed up the process, you add the fertilizers and lime that the cattle walked away with. I am making these suggestions, so they can be discussed at your upcoming Arana Gulch AMWG meeting.

Sincerely, Craig CELL (650) 441-9323

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Dear Jean,

Hopefully they will allow you to go very soon.

That cats ears are really stunting the tar plant seedlings, wherever they are growing in the plots with the tar plants were planted.

The results of my transects today, show that instead of cattle, ALL of the areas were mowed twice at one foot high in spring, plus the native Brome seeds harvested right now, and seedlings planted at the density of 3 per square foot, around any tar plants, then all four areas could be brought back to a very high level of native plant cover, in only 3-4 years.

What has been happening with the grazing, is that when the weeds start drying out in late March and early April, the natives are still green and tender, so the cattle focus on the natives instead of the weeds that they are supposed to be eating.

Sincerely, Craig CELL (650) 441-9323

--- jeanbean@baymoon.com wrote:

From: Jean Brocklebank <jeanbean@baymoon.com>
To: <craig@ecoseeds.com>
Subject: Re: WEEDS still attacking tar plant seedlings in Plots B and C. Area B has two native meadows, and Area A has one acre of creeping wild rye.
Date: Sat, 12 Jun 2021 19:53:52 -0700

We were prepared to go out at 11 am on 6/10. I emailed Travis and Blake at 8 am on 6/10 asking for permission. I never heard back. I emailed again 0n 6/11. Still no answer.

On Jun 12, 2021, at 6:56 PM, Redwood City Seed-Reveg Edge wrote:

> Dear Jean,
>
> Went out today to Arana Gulch to do some vegetation transects, and found two pristine native meadows in Area B that I flagged with orange and green survey flagging tape, picture attached. The picture of the green flagging photo, has the Danthonia meadow in the back ground. The orange flagged area is the native Brome meadow.
>
> Also, ran some vegetation transects across Area A in six areas, that are also flagged with orange and green survey flagging tape, picture attached.
>
> Looked at the two cats ears-infested tar plant plots, and those weeds are still killing those plants in this drought? Were you going to be able to get them pulled soon?
>
> In the middle of Area A, is a very nice solid acre of another native grass, the Creeping Wild Rye, picture attached.
>
> Sincerely, Craig CELL (650) 441-9
> ==========

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Sunday, June 13, 2021 1:25 PM
To: Travis Beck; Blake Woessner
Cc: craig@ecoseeds.com
Subject: ARANA GULCH--TIDBIT for upcoming meeting--My transects suggest that SC tar plants need a threshold of native grass cover to thrive.

Dear Travis and Blake,

Been looking over my vegetation transects done this month in Area A, and if you overlay the locations of the individual tar plants over the last decade with the amount of native grass cover of the Danthonia, Stipa and Brome plants--the tar plant appears to need a threshold-percentage of native grass cover to be able to sprout and grow each year.

Once Areas B, C, and D dropped below that threshold, then the plants we unable to keep going in those areas.

The two wild cards: would be the fourth native grass in the Coastal Prairie, the Creeping wild rye, plus, the other Arana Gulch grassland plant that makes solid cover, the rushes. The tar plant cannot live in those areas, because both plants produce strong allelochemicals that would keep tar plants from surviving there.

Plus, another wild card will be the cats ears that grow and develop at the same time as the tar plants, and could probably be eliminated by fertilizing.

Feel free to share any of my emails with anyone.

Sincerely, Craig CELL (650) 441-9323

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Tuesday, June 15, 2021 9:30 AM
To: Travis Beck
Cc: craig@ecoseeds.com; Blake Woessner
Subject: ARANA GULCH--SURVEY in AREA A indicates tar plant requires a threshold of Coastal Praire to survive, and 99% of prairie is gone already?

Dear Travis and Blake,

Some more interesting details for your meeting on the 22nd.

Went out yesterday to Area A to do detailed foot-by-foot transects, using the flagging along the Western fence as transect start-points, and going towards the flagging on the opposite Eastern fence, and found that the main Coastal Prairie of Area A is down to 3/4 of an acre!

Travis, when you were managing native plant habitats on the East Coast--you probably saw very clearly that you cannot focus on one individual native plant that you want to save, and expect it to successfully do that, when that plant is surrounded by 99% exotic plant cover?

I am sure you encountered that situation in the natural areas in the East?

So why was the focus on this one plant for 35 years, instead of the whole Coastal Prairie health--and making sure that whatever you did in those four Areas, would include monitoring the percentage cover and restoring the Coastal Prairie at the same time?

That is what all of the managers of Arana Gulch have been doing for 35 years--focus on one species, and not be concerned at all, that the rest of the Coastal prairie that was disappearing--not realizing that the tar plant was along with it, at the same time?

One of the other main issues, is if the restoration of the Coastal prairie WAS required to save the tar plant, nobody who were the consultants or made suggestions about the restoration of the tar plants for the Parks Department for the last 35 years, have ever known how to do that either?

The evidence of the lack of knowledge of the Coastal Prairie, is in establishing those seedling plots this year, destroyed the best examples of that Coastal Prairie at Arana Gulch, because they did not recognize what they were destroying?

Each of those plots could have been moved a few feet to the left or right, where there were open gaps in the coastal prairie--so the person planting the seedlings could have avoided destroying the best examples of what little remains of the Coastal Prairie at Arana Gulch?

There are only three people in this part of California who have actually restored any Coastal Prairie--on a scale of 10 acres or more, and back to 95% native cover or more--and none of them have ever been employed by the Park Dept. to do the professional ecological restoration work that is needed there?

And the proof of the connection between the tar plants requiring dense Coastal Prairie for its survival, is in the last 20 years of tar plant occurrences in Area A have been limited to the places where the Coastal Prairie was still in place, and at a particular threshold of percentage cover.

Overlaying the current Coastal prairie densities, with the last 10 years of natural occurrences, could very easily produce that threshold percentage of Coastal Prairie number, that could help guide all future work on the four Areas.

Everything north of the three oaks located along the western fence, is a Tarplant-Coastal Prairie dead-zone, with the exception of the Creeping wild rye patch. But the creeping wild rye does never allows the tar plant to grow there, so that area only counts as Coastal Prairie, but not as an area where the tar plant can live in the future.

Unless the amount of Coastal Prairie gets much better in Areas C and D, then overall, the entire Arana Gulch Coastal Prairie is 99% gone--

Which makes sense--as the Coastal prairie disappeared over the last 35 years in the four Areas--nobody in the past, put two and two together, that the tar plants were a locked-in part of that ecosystem--and the tar plants disappeared with the rest of that biome.

Sincerely, Craig CELL (650) 441-9323

Travis Beck

From: Redwood City Seed-Reveg Edge <rwc-seed@batnet.com>
Sent: Wednesday, June 16, 2021 10:25 PM
To: Travis Beck
Cc: craig@ecoseeds.com; Blake Woessner
Subject: ARANA GULCH--Attached PDF for reply in detail, with outlines of the three projects completed.
Attachments: Dear-Travis-6-16-2021.pdf

Dear Travis,

Thanks for your email and invite. I will not be attending because of how I have been treated in the past, and as you are telling me in your email, will still be treated at these AMWG meetings.

However, I have attached a detailed reply, and am very concerned that my last three years of suggestions, emails and reports that I have made for the group, will be utilized, and I get ZERO credit? Like the Waypoint Lab tests conducted in 2018--the AMWG used my working and I get ZERO credit in the 2019 Annual Report?

Now I am concerned the 2021 Annual Report will not cite my work or give me credit for any of my many contributions--that so far, have been the only methods that are starting to work, to help save the tar plants.

This week, after doing the ten, 200 foot long and noting what-plant-grows-every-two-feet linear transects--Going west to east and spaced about 50 feet apart--my original suggestion was spacing those linear transects 200 feet apart--But now would suggest spacing them 50 feet apart instead. It only took two hours to run those 10 transects, so running them every 50 feet northward to end of the grasslands would be 50 transects from south to north, and take about 10 hours.

What I discovered, is that the tar plants need a minimum percentage of Coastal Prairie cover. And since all of the previous permanent transects were tiny specks, they did not pick up that big picture-- the tight connection between the thriving tar plants and the percentage cover of the Coastal Prairie.

My guess is between 85% and 95%. And as the Coastal Prairie disappeared in the past 35 years, since the tar plants are tightly tied to that Prairie, it disappeared along with the prairie.

In the attached PDF, I gave outlines of the results of my three projects:

1.) Soil in box tests and count the dormant seeds that sprout. No natives, the grass I though was native, turned out to be a European Vulpia, that when immature looks very much like the native V. microstachys.

2.) That second batch of Area A soil was put into a couple of one-square-foot boxes, I sowed 1/8 teaspoon of poppy seeds and added fertilizers and organic matter until the seedlings thrived--and it is going to translate to be many, many pounds per acre if you want a self-reproducing tar plant population.

I just finished putting 2,000 pounds of organic fertilizers plus 100 cubic feet of potting soil on one acre at my Woodside serpentine grassland project, to get rid of the weeds, and help the natives get established.

3.) Ten 200 foot long linear transects in Area A, starting at the western fence running west to east, starting parallel with the southernmost fence and each new transect moving about 50 feet north. Orange and green survey flags, mark the start points and where you aim across the prairie.

Feel free to share any of my emails or any part of the attached PDF.

Sincerely, Craig CELL (650) 441-9323

--- tbeck@cityofsantacruz.com wrote:

From: Travis Beck <tbeck@cityofsantacruz.com>
To: "craig@ecoseeds.com" <craig@ecoseeds.com>, Blake Woessner <BWoessner@cityofsantacruz.com>
Subject: RE: ARANA GULCH--400-1,000 tar plants down to 200 and cats ears killing a lot
Date: Tue, 15 Jun 2021 18:06:06 +0000

Hi Craig,

I'm preparing the agenda packet for the Working Group meeting next week. Following up, would you like to share a written report on your soil block experiments? I will include your correspondence and you are welcome to address the group during public comment in any case.

Best,

Travis

From: Travis Beck
Sent: Monday, June 7, 2021 9:45 AM
To: craig@ecoseeds.com; Blake Woessner <BWoessner@cityofsantacruz.com>
Subject: RE: ARANA GULCH--400-1,000 tar plants down to 200 and cats ears killing a lot

Thanks for these details, Craig. Hopefully we're not killing our coastal prairie in the name of restoring it.

I wanted to let you know that we have a date set for our next meeting of the Adaptive Management Working Group. It will be June 22, with a field meeting from 9:00-10:30 and a virtual meeting from 11:00-12:30. The field meeting will begin at the west end of the Arana Gulch Trail opposite the Santa Cruz Bible Church. The link for the virtual meeting is: