

UC Santa Barbara

Newsletters

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NCOS News - November 2022

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<https://escholarship.org/uc/item/4g84w0p1>

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Publication Date

2022-11-01

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UC SANTA BARBARA North Campus Open Space Restoration Project

NCOS NEWS

November 2022



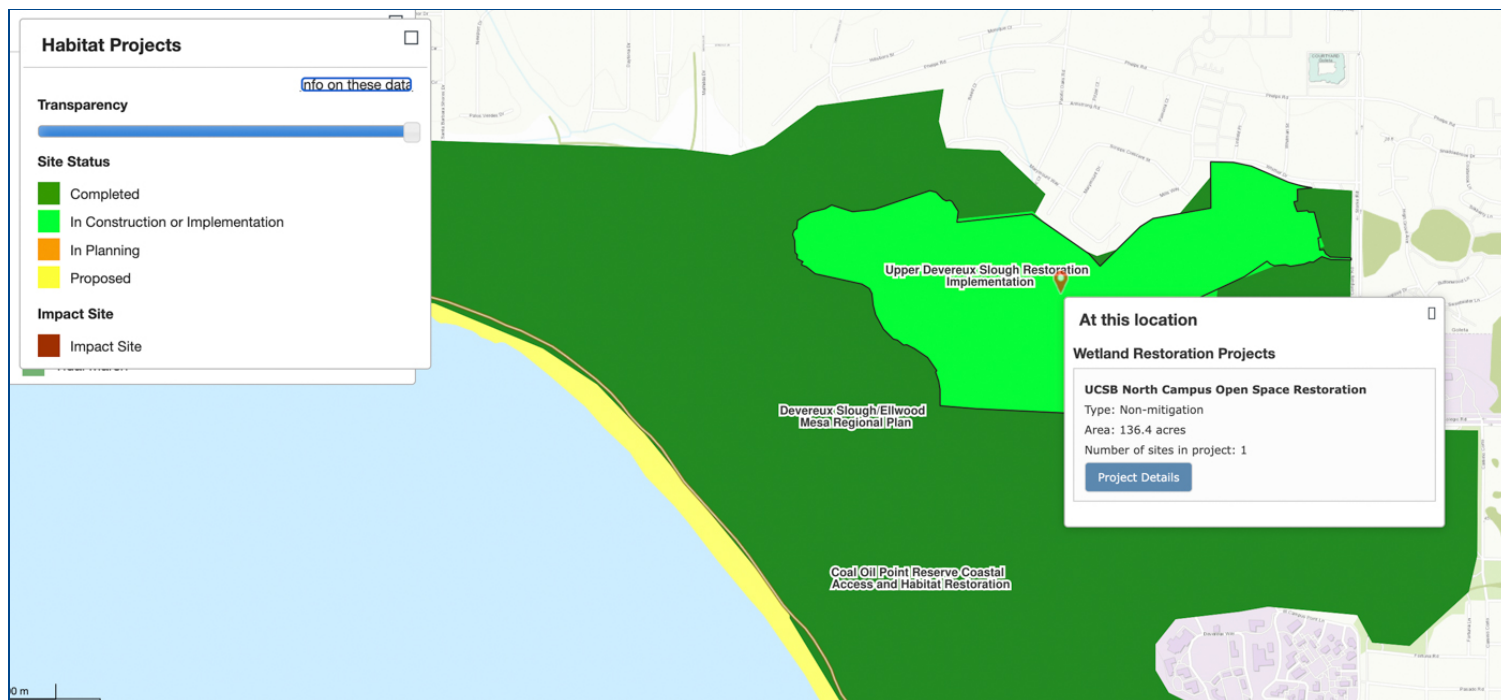
NCOS aerial photo taken on 11/18/22.

UPDATES

California Rapid Assessment Methodology (CRAM) Assessment

NCOS has made excellent progress in the before and after California Rapid Assessment Methodology (CRAM) assessments. Multiple agencies have selected CRAM as a consistent and reliable rapid methodology for assessing the quality of wetland habitats. The former golf course scored just 60% in 2016 before we broke ground and in our year 5 survey NCOS now scores 86%. This score reflects a comparison against intact ecosystem parameters. Some parameters such as the condition of the watershed (mostly urban in our case) cannot be improved by the restoration project, while other factors such as weed management, habitat structure/buffer condition, structural patchiness and reduction in stressors such as invasive plants, active recreation, pesticide use and wetland filling were all significantly

improved in the newest assessment. [Click here to view the results on EcoAtlas.](#)



Rain at NCOS

The recent storm on November 7-8 deposited approximately 0.6 inches in the project watershed and increased the water level more than 1.5 feet in Devereux Slough from 3.9 feet to 5.4 feet (NAVD 83). The salinity of the slough decreased from >70ppt to approximately 13ppt.



Newly available open water habitat will bring a greater diversity of wildlife to NCOS.

The rain has allowed for Cheadle Center field staff to begin a new set of restoration activities such as planting of native bulbs in the NCOS grassland.



Cheadle Center staff and student workers plant native bulbs such Common goldenstar (*Bloomeria crocea*) and Bluedicks (*Dipterostemon capitatus*).



A Common goldenstar (*Bloomeria crocea*) in bloom at NCOS.

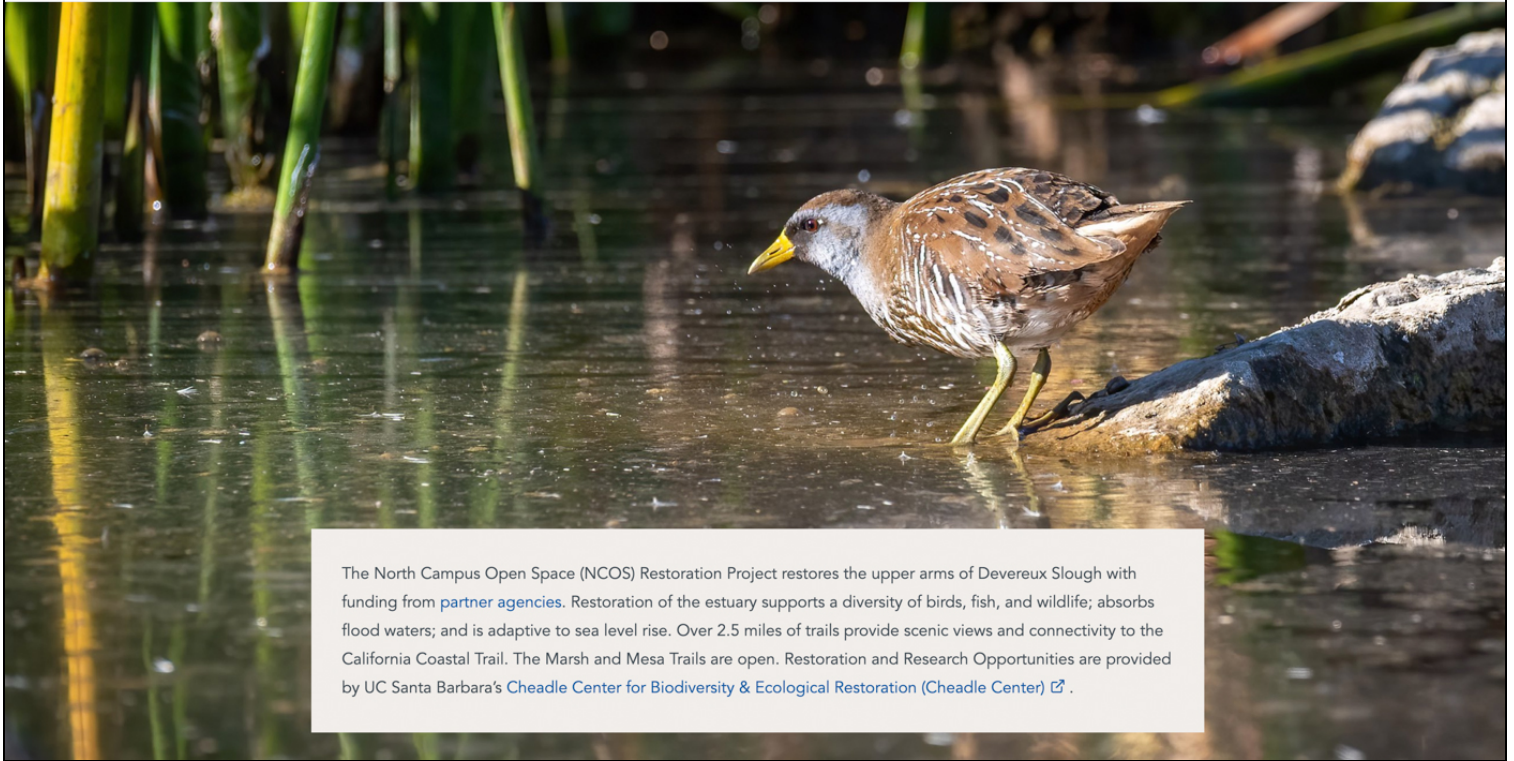
New NCOS Website

The new website for NCOS is now up and running at www.ncos.cber.ucsb.edu. Available features include the resources tab where visitors can access the all-terrain wheelchair, mobile and Spanish language versions of our signs, walking tour links and a virtual version of the [Cheadle Center Native Plant Book!](#)

UC SANTA BARBARA

North Campus Open Space

Cheadle Center for Biodiversity and Ecological Restoration

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The North Campus Open Space (NCOS) Restoration Project restores the upper arms of Devereux Slough with funding from [partner agencies](#). Restoration of the estuary supports a diversity of birds, fish, and wildlife; absorbs flood waters; and is adaptive to sea level rise. Over 2.5 miles of trails provide scenic views and connectivity to the California Coastal Trail. The Marsh and Mesa Trails are open. Restoration and Research Opportunities are provided by UC Santa Barbara's [Cheadle Center for Biodiversity & Ecological Restoration \(Cheadle Center\)](#) [↗](#).

Student Research Projects

Current research projects are focused on linking coverboard assessments of reptiles and amphibians to habitat qualities at the board locations, on-going assessment of the allelopathic effects of invasive plants on the germination of native species, aquatic invertebrate associations with algae and soil type, calibration of remote sensing data regarding soil salinity and plant cover, habitat parameters for multiple endangered and special status plants, and human use patterns.



Student researchers take soil cores in the NCOS salt marsh near Dilling's Link.

FEATURE STORY

Realizing ecologically meaningful Restoration "Success" criteria for NCOS



When you walk around the North Campus Open Space you see a landscape dominated by locally sourced native plants and an on-going pattern of targeted weed-control activities by the staff. In the soon-to-be-finalized Year 5 monitoring report you will see that all of the nine monitored habitats have reached all or most “success criteria”, but not all criteria in all habitats. Success criteria include the total absolute plant cover, relative percent cover of native plant species, the percent cover of listed high-priority invasive plant species, and the total native plant diversity. [This feature story is continued on page 15.](#)

VOLUNTEER OPPORTUNITIES

"Second Saturdays" at NCOS

Next month: December 10, 9-12

Please RSVP to ncos@ccber.ucsb.edu

Help us restore and create NCOS with plants and more! Meet at 6969 Whittier Drive at 9am. Bring water, sunscreen, and wear a hat, clothes and shoes that are suitable for outdoor work



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CCBER Greenhouse Associates

Come help transplant seedlings of native plants with the CCBER team from 9:00 - 12:00. To join, please send an email to ncos@ccber.ucsb.edu.



Nature Guide Tour

Next month: December 17, 9:30 -11

Come take a walk around NCOS and learn about native plants and animals with a trained Nature Guide.

COMMUNITY FORUM & PHOTOS

We are interested in any observations of wildlife activity on NCOS, as well as plants and landscapes. Please send your observations, with or without photos, to ncos@ccber.ucsb.edu. Thank you!



Palm warblers spend much more time on the ground than most warblers and have a distinctive tail bob as they walk.

Photo by Steve Hovey.



Wilson's snipes can be found in all types of wet, marshy settings and feed primarily on insect larvae. Photo by Steve Hovey.



Contrary to the name, Blue-grey gnatcatchers don't eat many gnats but seek out a variety of other small insects and spiders. Photo by Pamela Viale.



Great blue heron and changing leaves. Photo by Daniel Forseth.

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**For more information on the
North Campus Open Space Restoration Project, [Click here](#), or email ncos@ccber.ucsb.edu**

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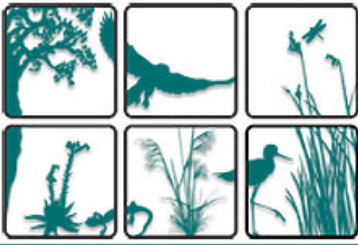
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REALIZING ECOLOGICALLY MEANINGFUL RESTORATION “SUCCESS” CRITERIA FOR NCOS

When you walk around the North Campus Open Space you see a landscape dominated by locally sourced native plants and an on-going pattern of targeted weed-control activities by the staff. In the soon-to-be-finalized Year 5 monitoring report you will see that all of the nine monitored habitats have reached all or most “success criteria”, but not all criteria in all habitats. Success criteria include the total absolute plant cover, relative percent cover of native plant species, the percent cover of listed high-priority invasive plant species, and the total native plant diversity. These criteria become more stringent each year with increasing expectations as the project progresses, see table below.

	Proposed Minimum Criteria					Monitoring Data				
	Year 1	Year 2	Year 3	Year 4	Year 5	2018	2019	2020	2021	2022
Native Perennial Grassland										
% Total cover	35	45	60	70	80	12	24	58	58	77
% Native Relative	50	60	70	70	70	19	65	79	51	51
% Invasive Relative	<5	<5	<5	<5	<5	0	0	0	0	0
Diversity (Native Species)	3	4	6	7	7	8	18	21	25	23
Peripheral Upland (Mixed Grassland/Shrubland)										
% Total cover	35	45	60	70	80	24	42	66	71	50
% Native Relative	50	60	70	70	70	43	61	50	39	70
% Invasive Relative	<5	<5	<5	<5	<5	0	0	0	0	0
Diversity (Native Species)	3	4	6	7	7	15	40	36	35	31
Salt Marsh										
% Total cover	30	40	60	70	70	15	50	62	68	73
% Native Relative	70	80	80	80	90	94	88	87	91	88
% Invasive Relative	<5	<5	<5	<5	<5	0	0	0	0	0
Diversity (Native Species)	4	6	7	7	8	11	15	30	14	17
Transitional/High Salt Marsh										
% Total cover	30	40	50	60	65	24	46	74	72	92
% Native Relative	50	60	65	70	80	55	86	79	80	77
% Invasive Relative	<5	<5	<5	<5	<5	0	0	0	0	0
Diversity (Native Species)	8	8	10	12	15	20	22	28	20	25
Fresh/Brackish Marsh (Seasonal Pond)										
% Total cover	50	50	60	70	80	8	20	43	39	96
% Native Relative	70	70	70	80	80	99	78	99	98	91
% Invasive Relative	<5	<5	<5	<5	<5	0	0	0	0	0
Diversity (Native Species)	7	7	10	12	14	6	7	17	16	16
Vernal Pools										
% Total cover	30	40	40	45	50	6	13	40	42	50
% Native Relative	70	70	70	80	80	83	84	91	69	60
% Invasive Relative	<5	<5	<5	<5	<5	0	0	0	0	0
Diversity (Native Species)	7	7	10	12	15	17	28	33	37	43
Sandy Dune Annuals										
% Total cover (variable by season)	20	25	30	35	40	16	38	86	56	44
% Native Relative	50	60	70	70	80	35	87	65	17	75
% Invasive Relative	<5	<5	<5	<5	<5	0	0	0	0	0
Diversity (Native Species)	3	3	4	5	5	2	7	5	3	6
Coastal Sage Scrub/Chaparral Mosaic										
% Total cover	30	40	50	60	65	30	7	66	79	77
% Native Relative	50	60	65	70	80	0	43	83	59	74
% Invasive Relative	<5	<5	<5	<5	<5	0	0	0	0	0
Diversity (Native Species)	8	8	10	12	15	0	3	16	16	24
Riparian										
% Total cover	50	50	60	70	80	13	53	90	88	81
% Native Relative	70	70	70	80	80	100	81	88	85	100
% Invasive Relative	<5	<5	<5	<5	<5	0	0	0	0	0
Diversity (Native Species)	7	7	10	12	14	4	6	12	12	12

Comparison of vegetation monitoring data with proposed minimum success criteria for target habitats/plant communities. Green highlight indicates that a criteria has been satisfied.

In designing the North Campus Open Space Restoration Project, the Cheadle Center worked with permitting agencies to delineate the ‘success criteria’ for each of the proposed habitat types. Because this was a grant-funded project spearheaded by the Cheadle Center, we aimed high, in some cases, inappropriately high. In fact, I postulate that, from an adaptive management perspective, we have met all meaningful success criteria for all plant communities. For example, the success criteria for the habitat we call “Peripheral upland” which borders the homes, has a criteria of 80% total plant cover in the 5th year, however, a set of the monitoring plots fall within the mulched fire break between the restoration area and the homes, which artificially lowers the mean total plant cover data. Since the vegetated portion of those transects exceed 80%, we consider that habitat to have met success criteria.



Mulched fire break separating coastal sage scrub habitat from adjacent homes.

The only other plant community that doesn't quite meet the total plant cover goal of 80% is the native perennial grassland (77%). It may be that we set that goal inappropriately high for this community. Native perennial bunch grass habitat, by definition, includes open interstitial space between the grass clumps where native wildflowers can germinate and bloom and where lizards and birds forage for seeds and insects, so the total cover goal of 80% is higher than it should be to support that function.



Cheadle Center staff have been planting native bulbs and spreading wildflower seeds in the spaces between Purple needlegrass (*Stipa pulchra*) bunches.

The target of 40% total cover for the sandy annual habitat, on the other hand, is appropriate since it, by definition, includes bare ground that allows annual plants to establish themselves. As such, at 77% total plant cover for the perennial grassland, we believe it has ecologically achieved a more realistic year 5 success criteria of 70% total plant cover for the grassland habitat.

There are four plant communities which did not quite hit the relative native plant cover goals: salt marsh (88% / 90%), vernal pool (60% / 80%), native bunch grassland (51% / 70%), and sandy dune annual (75% / 80%). In all cases the culprit non-native is invasive annual grasses, and, in particular, Italian wild rye grass (*Festuca perennis*). This grass, which can tolerate and thrive in dense clays, moist soils and in salty and sandy conditions, is considered by most ecologists to be a “naturalized” Mediterranean annual grass and most agencies have come to accept that annual grasses are a part of the California flora at this point.



Italian Wild Rye (*Festuca perennis*).

In setting our targets for percent relative native cover, we were including a goal of trying to keep annual grass cover low, despite this acceptance by permitting agencies of higher annual grass cover, but the drought facilitated annual grass success in vernal pools and salt marsh habitats, and the goal for native grasslands of 70% relative cover of natives may not be realistic given how difficult it is to selectively control annual grasses within a matrix of native grasses. The sandy annual site goal of 80% is reasonable, but requires on-going vigilance due to the open, disturbed nature of this habitat.

The third criteria for all habitats is to have less than 5% cover by species ranked as highly invasive by the California Invasive Plant Council (Cal IPC), which includes species like fennel and pampas grass. All of the North Campus plant communities have achieved this goal with zero percent cover by highly ranked (e.g. very) invasive plants.



Pampas Grass (*Cortaderia selloana*).

The fourth and final criteria is native plant species diversity and all of the North Campus plant communities meet that criterion which ranges from 7 to 15 species depending on the community. In fact, in 6 cases the plant community biodiversity is significantly higher than the target: Vernal pool native diversity is 43 where 7 is the target, native grassland is 23 where 7 were called for, coastal sage scrub is 24 where 15 were anticipated and the peripheral upland includes 31 species where 7 were anticipated!



Coastal Sage Scrub Habitat.

Many projects approved by permitting agencies use existing habitats as models for success criteria and many have come to accept non-native, naturalized annual grasses as a part of systems because of the challenges of controlling them. We chose to categorize non-native annual grasses as 'weeds' and to work towards continuing to reduce their cover because of the capacity of non-native grasses to reduce biodiversity by limiting the germination of native annual plants and regenerating native shrubs and trees with their thick thatch. This goal may have been set a little high, but it is still a goal of ours during this establishment stage to try to keep the annual grasses at bay so that the natives can build up a seed bank and have a fighting chance on site.

Date:

Friday, November 18, 2022 - 13:15

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