# Sensitive Natural Communities Webinar, December 7th, 2021

# Hosted by CDFW, VegCAMP and the CNPS Vegetation Program

## Section 1 - Rachelle Boul, CDFW VegCAMP: Welcome, introductions, and overview of vegetation and sensitive natural communities

**Slide 1 (00:00): Introduction**

Hello everyone and welcome to the Sensitive Natural Communities webinar.

We're just really pleased that so many people have expressed interest in this training and webinar, and I do want to let you know that we will be recording these presentations and that we will likely be posting the recordings online. Although that process could take a while, so we'll be sure to let you all know if and when that does happen.

Also, please be aware that you will be remain muted for the webinar, but you'll be able to type questions in the Questions field. At the top of the MS Teams App there's a little Question bubble and you can type your questions in there. The questions will be moderated though, so if our moderator determines that a question needs to be addressed directly following a specific talk, and we have a little extra time will answer the question then, but otherwise it would be great if everyone can hold questions to the end of the webinar. We will have at least 15 minutes to answer questions then, so I'd like also like to point out that if you accidentally pause the webinar content, you'll no longer be in the live event and then you won't have the ability to ask questions. So just try not to pause, but if you accidentally do, or you need to for whatever reason, I believe if you quickly leave and then rejoin us, you can be back with the live event.

This Sensitive Natural Communities Webinar is Co-hosted by the California Department of Fish and Wildlife, Vegetation Classification and Mapping Program, otherwise known as VegCAMP, and the California Native Plant Society (CNPS)'s Vegetation program. Together VegCAMP and CNPS vegetation program, develop and maintain California's expression of the National Vegetation Classification. Using the state standards that are embodied in the survey of California vegetation.

**Slide 2 (02:23): Agenda**

Here's the agenda for today. We have made a few tweaks to it since we sent out the announcement. I do want to note that most of our talks today will highlight examples from Northern California. However, much of what you'll hear is applicable statewide.

I am Rachelle Boul, the senior vegetation ecologist for VegCAMP. I'm joined here today by my colleagues from VegCAMP and the CNPS Vegetation program, as well as several guest speakers from outside of our two programs. A few people that will be behind the scenes today include Rosie Yacoub, who's the is the

vegetation GIS data manager and the webinar orchestrator for the day. And Jamie Ratchford. She's a vegetation ecologist with VegCAMP and she will be our question moderator.

I'm going to start us off today with a little background about why we're offering this webinar and also some fundamentals about vegetation classification and mapping. And then at about 9:15, Julie Evens, who's the CNPS Vegetation Program Director and lead vegetation ecologist who will go over how we define and rank natural communities. At 9:35 Betsy Herbert, a vegetation ecologist with VegCAMP, will orient you on how and where to access vegetation information for your area of interest.

Then we'll have about a 15-minute break at around 10:30 this morning and then when we get back at 10:45, Greg O'Connell with CDFW Region one will talk to us about addressing vegetation in environmental review. At 11:05 about Laurie Koteen will then talk to us from the California Coastal Commission about how they treat sensitive natural communities. And then Allison Schichtel with Sonoma County agricultural preserve and Open Space district will give us a county's perspective on protecting sensitive natural communities. And then we will wrap up at 11:40 and will close with two examples of successful outcomes for sensitive natural communities. The first from Shelley Benson, A seasoned vegetation ecologists, but a recent addition to the CNPS vegetation program team. She'll talk to us about mapping sensitive natural communities and grassland settings. And then, last but not least, Teresa Sholars with the Mendocino College will be talking to us about Mendocino Cypress communities. And then we'll end with some questions from you also. We do hope you find the content informative.

**Slide 3 (05:18): Just the beginning**

For those of you who are unable to stay for the whole webinar, or want to repeat this, do not fear. We do hope to repeat similar webinars and trainings in the future. Perhaps will be breaking it into smaller audiences and offering something to CDFW regional staff, or CNPS chapters, or possibly do more webinars like this to a broader audience.

We will want your feedback at the end of today's webinar so that we can continue to improve the content. So we will follow up with the questionnaire. ultimately our goal is to improve your understanding of the uses of vegetation information in general, and more specifically for conservation and also just to encourage the continued improvement to vegetation information statewide.

**Slide 4 (06:19): Introduction to Natural Communities**

OK so I'm going to now just go into my little vegetation overview talk which will briefly go over what vegetation is, why we care about vegetation or why we should care about it, and why we're having this webinar. I will also give you a little brief history of vegetation and conservation. How we build a vegetation classification and how it applies to mapping. I'll also go into a bit about utilizing vegetation data for conservation planning.

**Slide 5 (06:56): What is Vegetation?**

So let's step back for a second and start at the beginning and answer for you all what is vegetation and why should we care about it. Vegetation, simply put is what covers the landscape. Vegetation communities are groups of species that tend to co-occur and repeat in consistent patterns in specific environmental settings. And when we talk about patterning and vegetation, we say vegetation is arranged into individual stands.

**Slide 6 (07:33): What is Vegetation?**

Specifically, a stand of vegetation is a spatially continuous unit of vegetation with uniform species composition, structure and environmental conditions.

So what we do in a typical regional vegetation classification and mapping project is collect field data in all potential vegetation community types using our standard sampling protocols. Where we record species cover values and strata covers like tree, shrub and herb. And we also collect important environmental data such as slope, aspect, rockiness and elevation. And then we analyze these data which then allow us to give the Community types names and definitions. This is how we build our statewide classification, right? So once we then have these clear definition for vegetation communities or natural communities, a vegetation map can be made using aerial imagery as shown on the right in ArcGIS. Where mappers will correlate what was seen on the ground to what is seen in the imagery.

**Slide 7 (08:50): What is Vegetation?**

So that's kind of the process, and this is like a little schematic of the process that CNPS and VegCAMP go through in a typical veg project. At the top is the data collection phase...let me get my little laser pointer... the data collection phase that feeds into the multivariate statistical analysis to develop the classification. And the classification is then used to create that fine scale vegetation map. Sometimes there's more data collection, more analysis or mapping. Right?

**Slide 8 (09:25): Why Vegetation?**

So why should we care about vegetation? Why should we go to all this effort to sample, classify, and map vegetation? Well, as I said, vegetation communities are what cover the landscape, and because they can be measured, defined, classified, mapped, and monitored, as I just described, vegetation communities often are considered to be the single best surrogate for habitat and ecosystems. And because of this, vegetation science plays a crucial role in wildlife and natural lands conservation and management and is now among the principal tools involved in wildland management and planning.

**Slide 9 (10:12): Why This Webinar?**

So we're offering this webinar today because we all know that vegetation data is so important and we'd like to make utilizing vegetation data as easy as possible. We know that there's a lot of veg information out there and depending on your intended use and area of interest, you might need to access different pieces of the data. For example, our statewide vegetation classification is available to you through the Manual of California Vegetation online. And region-specific find-scale vegetation information or association level descriptions are on our website through project reports. And the spatial data, survey points in vegetation maps, are available online through the Biogeographic Information and Observation System, or BIOS, that is hosted by CDFW. So in other words, we offer a lot of information and data in different places, and we want to help you determine what vegetation community types might be in your area and what is defining those community types and what might be sensitive.

So today we want to give you a good introduction to vegetation classification nomenclature. What are and where do you find our standards and guidelines? And how to know what is in your area of interest and how to answer your natural communities questions in general. And because I know that all of you here play important roles in conservation and Land Management, it is crucial that we're all able to

access the same natural communities data and know how to use it. And are all speaking the same language so we can all work together to conserve and manage our landscape more effectively. So hopefully the content of this webinar today starts to demystify natural communities data for you a bit.

**Slide 10 (12:27): History: How Did Natural Communities Come to be Used For Conservation?**

OK, so now I want to go into a little bit of history about how natural communities came to be used for conservation. In 1972, Bob Jenkins had just recently started with The Nature Conservancy and he introduced this idea of a state and national trinity of conservation that included protecting biodiversity through conserving rare plants, rare animals, and natural communities. And these natural communities, they proposed, would be the coarse filter that would catch and allow for conservation of all other species that are not considered rare.

**Slide 11 (13:13): Evolution of Tracking Natural Communities**

And in 1979, in order to track this Trinity of conservation, the California Natural Diversity Database, otherwise known as CNDDB, was established where, along with rare plants and animals, rare natural communities data was also tracked. And this is where the general framework for natural communities took off and concepts for community types, from Cheatham and Haller, and Bob Holland set the stage for us to build off of. At this time, though, these rare natural community concepts were identified utilizing an ecological knowledge about California's landscape that these natural communities founders possessed. But there was still an ad hoc approach to it that didn't include comprehensive data analysis. Nonetheless, uh, these rare or sensitive natural communities did become elements of conservation. Then in 1981, the CNDDN was transferred to the state level and has been maintained by the California Department of Fish and Game since then. But in 1995 the tracking of sensitive natural communities split off from CNDDB and since then all natural communities have been defined and tracked independently within its own natural heritage program, within CDFW. That program now is called VegCAMP. And this new program at the time was necessary in order to support a more rigorous approach to classifying and mapping natural communities for the state. Because it was realized that this ad hoc approach to vegetation communities had its downsides.

**Slide 12 (15:19): What is wrong with the *ad hoc* approach?**

So what was wrong with this ad hoc approach? Well. Because the natural communities concepts were so broad there was really no way to determine how common, or not, communities are. In addition, there was no mechanism for creating new types, so we would shoe-horn everything into these corse-scale buckets. And the course filter or large bucket concepts was making it difficult to specifically identify sensitive natural communities. And also, the membership characteristics or membership rules of community definitions were not being rigorous defined, meaning they were not based on data analysis. And as you might know, natural community definitions need to be data driven so as not to be debatable, because if there is ambiguity there in their definitions then we have trouble identifying them, and mapping and conserving them. And then the use of natural communities data loses its credibility as a management tool, which results ultimately in the diminished importance of vegetation community conservation in regional planning. Which in turn demotes the intent of the original course filter concept.

**Slide 13 (16:52): Value of having defensible definitions**

So by having data driven standardized definitions for all community types we can get a clear picture of which communities are common and which are not. And you can more easily determine when you encounter a new community type that doesn't fit an existing definition. Also, since we have definitions for these things, we can all consistently apply the concepts across the state through mapping or on the ground management and, of course, the definitions are less debatable when they're backed by data.

**Slide 14 (17:36): Comparison of 2005 & 1995 vegetation maps**

So take this comparison of Engelmann oak Woodlands mapping as an example of utilizing a standardized versus Non standardized vegetation classification. The mapping on the left was completed in 1995 using a non-standard classification and non-standard mapping rules and the map on the right was created in 2005 utilizing the Manual of California vegetation in conjunction with our state standardized mapping rules. And if you look closely at these two maps, you can see how different they are and how the definition of vegetation types and mapping rules can drastically change how the landscape is divided. For example, you can see here that in the nonstandard mapping on the left the narrow riparian corridor is completely missed. And also, the difference between the oak woodland and the adjacent chaparral is completely different due to not having distinct rules for determining the community type and not clearly defining the mapping rules.

**Slide 15 (18:57): Realizing a quantitative California classification**

So starting in the early 1990s. The virtues of quantification were really being recognized in the conservation community. And in response to this, in 1990, CNPS formed the Plant Communities Committee and then in 1995 they published the First Manual of California vegetation. In 1996, the Ecological Society of America formed the Vegetation panel, which included members from California, and it still does. And then in 1997, NatureServe, which is the science-based program that sprung from TNC, compiled the first National Vegetation Classification. And then in 1998, CDFW's Natural Heritage division (At the time, that's what it was called) completed the first defensible definitions of California sensitive natural communities, starting with the Sycamore alluvial Woodlands in the Central Valley, and then quickly thereafter, also in 1998, the National Park Service and state parks completed the classification and mapping of Anza Borrego Desert State Park. And both of these two efforts, in 1998, included field data collection and classification analysis.

**Slide 16 (20:35): Standards for mapping and classification**

And it quickly became apparent that the state needed to document and give guidelines for these more rigorous classification and mapping standards. So in 2007 the state legislature required the Department of Fish and Wildlife to develop and maintain a vegetation mapping standard for the state. So the state developed standards for vegetation data collection, classification, mapping and reporting. And all of these standards can be found on the VegCAMP website. Survey of California Vegetation, or the SCV, embodies the state standards for vegetation classification and mapping. The Vegetation Classification and Mapping Program, or VegCAMP, is the program within CDFW that manages the data and content for the SCV. And the CNPS vegetation program co-develops the content with VegCAMP and they also host the online Manual of California Vegetation, where we offer our statewide classification definitions to the public. And both VegCAMP and CNPS have websites that have much of the same content that is downloadable or links to other resources. Don't worry about keeping up too much with this because

Betsy Harbert with VegCAMP will go into the sources of vegetation data a little bit more in a bit here. So just hang on.

**Slide 17 (22:23): SCV vegetation classification and mapping progress**

So, in tandem with the standardization of our classification and our data and our development of standards, there was a whole lot of vegetation work happening in the state. And as I mentioned previously that fine-scale vegetation classification and mapping utilizing these standards, or the SCV standards, started in California in 1998 with the sampling, classification, analysis and mapping of Anza Borrego State Park all the way down here in Southern California. Then ten years later, there were upwards of 22 projects completed that doubled the mapping acreage for the state. And then ten years after that, in 2018, we had completed classification and mapping for over 45 million acres of the state. And then within just the last three years, we've added nearly 10 million acres of new or in progress, classification and mapping projects for the state, closing in on that 60-million-acre mark. And I have to say that all of this work is being done by many different collaborators, including California State parks, who has started a framework to support the mapping of the vegetation of all their lands, including their state vehicular recreation areas. And they are working closely with VegCAMP and CNPS so that it's done right. There's a whole lot of collaborative vegetation work happening in the Greater Bay Area that is being coordinated at the county level by various groups, including OneTam, Kass Green and Danny Franco, and San Mateo RCD. And also the East Bay Regional Park District in Alameda and Contra Costa counties and so many others. CalFire and BLM have been huge supporters of vegetation work statewide and then VegCAMP will be focusing new efforts for the next several years in Northeastern California to finish the classification and mapping in the Modoc and Lassen Counties in the Modoc Plateau, including the Warner Mountains. And also we are planning work in Northern California Coast, which I'm sure most of you have at least heard inklings of, which is very exciting since it this has been a really big data gap in the statewide vegetation classification. I have not included the North Coast work on this map, though, since the details are still being worked out, but keep an eye out for that. It's really exciting. And I just wanted to thank everyone who's working so hard to get the state classified and mapped. And it's really, truly a collaborative effort.

**Slide 18 (25:39): Why does the classification change?**

OK. So some of you, I know, are wondering, if things are so standardized, then why does the darn classification keep changing? The vegetation classification and maps are not static products. The standards that we establish set rules for the framework (and I'll go into that framework in a little bit), but our standards allow for refinement of existing types and discoveries of new types through new data collection or through reanalysis with a statewide or ecoregional context. You can't go from 2008 to 2021 without making changes to the classification. We just have collected so much more data to make more informed decisions about how to define our types. So sampling, classification, and mapping continue at a statewide level. And in order to fill in the data gaps where we have little or no vegetation data or where we might now have more data than we originally did, so we can improve upon existing concepts. Also mapping is a continuous process because remote sensing techniques are continuously upgraded and refined, allowing for finer resolution and higher accuracy for vegetation maps. So therefore, we don't define a standard technique for mapping, but rather our standards outline a product that meets standardized mapping rules and attributes and, of course, utilizes our standardized vegetation classification. Also, the classification of maps need to keep evolving to keep up with the constant

changes to the landscapes. For example, post-fire early successional communities look very different than old growth or late successional stands, right? So we need to sample those early successional types and perform data analysis to understand how those systems fit into the statewide classification. Uhm, additionally changed landscapes will need to be remapped to reflect those changes.

**Slide 19 (28:15): Hierarchical Classificaiton**

OK, so now I'm gonna go over the structure of the statewide classification for you all. And as I have alluded to, the California and National Vegetation Classification is organized hierarchically. And that means that the lower levels, nest under the upper levels and the upper levels are broader concepts than lower. So we work primarily with the finer floristic levels, or of the classification, or the alliance and the association levels. These are the levels of the hierarchy that are sampled in the field and also where community rarity is determined. This example here shows all of the hierarchical levels for the Quercus douglasii or Blue Oak alliance. And you can see that the Blue Oak alliance nests under the Californian broadleaf forest and woodland group, which nests under the even broader California forest and Woodlands Macro group. Uhm, and so on all the way up to the top, or the class level, which this case, is the very broad Forest and Woodland Class that this alliance fits under. There are many groups that nest under this macrogroup. And there are other alliances.  that nest under this group and there are many associations that fall under the Blue Oak Alliance. This is just listing a few right here. But in this way, the hierarchy shows the relatedness of the types to each other. And the hierarchical structure of the classification, right, means that narrow concepts nest under the broader concepts, right? So this means that the statewide classification is actually fairly complete at the alliance level, and even more so at the broader group level. Our data gaps are more commonly at this finest level at the hierarchy, the association level, which as I mentioned, is also the level of the hierarchy that Community rarity or regional variation is identified.

**Slide 20 (30:46): Regional Data: Quercus douglasii (Blue Oak) Alliance divided into Associations**

So take a look at this example of the Blue Oak Alliance again. We know it's statewide distribution despite having some data gaps within its range. This grey area on this map is its statewide distribution for the alliance level. Those gaps in our data though, mean that we don't necessarily fully know the regional variation of this alliance. In other words, we may not know all of the association level distinctions. So by sampling individual stands in different areas and comparing them to the broader statewide classification, we can define the salient qualities of the finest level of the classification and describe their relationship to the upper levels of the hierarchy. So back to this Blue oak alliance. An association level concept in the foothills, for example. On the right, the blue oak - Live Oak association. Is not going to have Juniper associated with it because it's just it's too hot and dry and this association will never have higher cover of shrubs in general in the understory when compared to the South Coast Association that has blue oak with Juniper and Tucker oak in the understory. And because of these distinctions, for example, Pinon mice will never be present in the Foothills Association but might be present in the one in with Juniper and the shrubby understory in the South Coast. And it's also of note that the blue oak - juniper - Tucker Oak Association is considered a sensitive natural community, and the blue oak Live Oak Association is not. So this example kind of highlights why regional variation, which is typically association level data, is so important to capture.

**Slide 21 (32:57): Vegetation Descriptions and key**

So once we have sampled regionally, we can analyze the data and to find the communities and write descriptions for each one. So this is an example of a description for a Juniperus occidentalis alliance, and we have summary tables within those descriptions. Then we can also write vegetation keys to each vegetation type for a region that can be utilized in the field or for mapping to in order to determine vegetation type. And all the while keeping the broader statewide classification and hierarchy in our minds. So how are these regional variations relating to the statewide classification and fitting into that hierarchy?

**Slide 22 (33:50): Vegetation mapping**

Now that we have a vegetation classification, it can be utilized to create a fine-scale vegetation map that characterizes and delineates the vegetation types covering the landscape for an entire region.

**Slide 23 (34:13): Vegetation mapping**

And what this means is that highly trained vegetation mappers will translate what is seen on the ground to what is seen in aerial imagery and create polygons around all the vegetation communities following the SCV standards. So here is a zoom-in of a vegetation map from the Modoc Plateau. The state standards suggest mapping, excuse me, to the alliance or association level where possible. This highlighted Polygon, for example, is mapped at the association level you can see here at the top the Juniperus occidentalis / Artemisia tridentata – Purshia tridentata association that falls within the Juniperus occidentalis Alliance. But as you can see, there are all sorts of other attributes listed here for this polygon. For example, although this polygon is mapped to the association level, the upper levels of the hierarchy are also embedded within the map, and they included as an attribute for each polygon. So this enables users to utilize the maps at whatever scale makes sense for their purpose.

And in addition to vegetation type our mapping standards also call for including strata covers. So right here it shows total, conifer, hardwood, total tree, shrub, herb and total veg cover. Also, height of the dominant vegetation type and tree size are included. Often regional, or project specific, attributes like presence of Juniper expansion, presence of isolated tree, or restoration, as we did in the Modoc, are also included as map attributes. So are disturbances such as clearing, development, and roadedness. And also crosswalks to other classification systems like Cal Veg and CWHR. And then for each polygon we also list the global and state rarity ranks for the finest level that was mapped for each polygon here. All of these attributes are outlined in our standards on the VegCAMP website and are included in SCV compliant maps because we know that vegetation community type in combination with these structural attributes and other environmental information is a very powerful tool for land managers.

And I know, I keep saying that, right? But now I actually want to go into a few potential uses of vegetation data. Keep in mind, though, that there are so many applications I could have included here today, but I could only just go over a few. So really this is just a tip of the ice burg.

**Slide 24 (37:29): Summary of uses for vegetation data in conservation planning**

So now that we have our comprehensive, standardized vegetation classification and also a fine-scale vegetation map with all our attributes...What can we do with that? Uhm, so applications of vegetation community information for conservation planning efforts include things like: Determining locations, and creating an inventory of, sensitive natural communities and species; vegetation data can be used as a tool for adaptive management for recreational use; it’s also a very powerful tool for change detection.

Assessing changes to the landscape where there are regular vegetation map updates, as we've done in Suisun Marsh;

**Slide 25 (378:39): Summary of uses for vegetation data in conservation planning**

Community data can be used for impact analysis utilizing mappable vegetation related attributes like roadedness or other disturbances; A map data can be used with related data layers in fire risk planning and assessment; And then of course field data collected, field plot data, can be used for long term monitoring.

**Slide 26 (39:09): Multiple attributes for fuels and fire prediction**

This example shows how multiple attributes can be used in tandem for various management planning for. So for example, this shows how fuel loading is so diverse in the foothills, right? The image on the right shows how cover attributes on a NE facing slope with emergent conifers, and dense shrubs, low tree layer is very different than an open South-facing slope with short grasses, few shrubs, and scattered trees as shown on the left.

So you can combine the powers of multiple attributes to direct management, for example, you can identify where fire fuels might be highest by selecting the vegetation polygons from the maps where attributes indicate high cover of large trees and also high cover of shrub and herbs.

**Slide 27 (40:14): Wildland/suburban interface**

And then you can take those same attributes and intersect them spatially with areas of dense development to identify where there might be the highest potential for fire near the wildland / urban interface.

**Slide 28 (40:30): Habitat suitability modeling and identifying wildlife corridors**

And in addition, vegetation maps are the backbone of habitat suitability modeling and identifying wildlife corridors. Habitat type and structure are usually the most important variables in determining where you will find animals on the landscape.  And habitat type is defined by the vegetation type and structure is defined by tree or shrub size and vegetation density. All of these attributes can be found in a vegetation map that follows the SCV standards. This table here is a snapshot of the habitat relationships for Gray fox, where the vegetation type, Blue Oak - Foothill Pine, is broken down into a number of categories of tree size and cover class and each of those is ranked as low, medium, or high suitability for Gray fox reproduction, cover, and feeding. This information is used to develop species habitat models. The species habitat models are then used together with landscape permeability and barriers, such as roads, to identify corridors for wildlife. And once we have identified suitable habitat for wildlife and their corridors of movement, we can work to preserve those areas in order to keep the corridors intact. Which ultimately helps to maintain the state's biodiversity.

**Slide 29 (42:09): Natural communities rarity ranking**

And then of course VegCAMP and CNPS utilize vegetation data, including survey data and vegetation maps, to give rarity ranks to natural communities at the alliance and association levels. And remember, that association level ranking is where sensitive natural community distinctions should be considered for conservation purposes. But these natural communities rarity ranks are only as good as the data that we

have. Which means, that in order to rank natural communities well, it is best if we have comprehension regional and statewide vegetation sampling followed by standardized vegetation classification analysis and community definitions and then mapping of all vegetation community types. Julie Evens, very shortly here, with CNPS, will go into a deeper dive of the methodology for this process that we go through for ranking natural communities and how we determine sensitive natural communities.

**Slide 30 (43:27): Standardization id critical!**

But if I have stressed anything today to you, I hope it's that the standardization of vegetation data is one of the most crucial aspects for the conservation of natural communities, and therefore, the California landscape in general. Because of this, I do want to point out that it's very important to not map or name natural communities without coordinating with VegCAMP or CNPS so that we can help you fit new concept into the statewide perspective. Because we really do want to encourage collaboration with as many people and entities that are willing to collaborate and do vegetation work, but we just all need to make sure we're speaking the same language.

**Slide 31 (44:24): Contacts**

So please don't hesitate to reach out to us about anything. Here is all the VegCAMP and CNPS veg program contact information. There's quite a few of us that you could contact if you have questions, so really there's no excuse not to reach out.

And that is what I have to give to you guys today. And Julie Evens now will speak to us about ranking sensitive ranking natural communities in general. So if Julie wants to try to steal the show and unmute yourself and take it away...

## Section 2 – Julie Evens, CNPS Vegetation Program: Sensitive Communities Definition and Ranking

**Slide 1 (45:12): Sensitive communities definition & ranking**

Thank you, Rachelle. Hi, I hope can you hear me? Yes, we can hear you. Thank you, Julie, wonderful. Well, thank you so much, Rachelle, for that wonderful talk. Great summary! And now what I will talk about is.... The collaborative work we do to define and rank sensitive natural communities. First off, I'd like to thank a few people for the talk that I'm going to give, including Tom Reyes, CNPS Associate Vegetation Ecologist, who helped provide some content figures in the presentation as well as Rachelle Boul, Jennifer Buck Diaz, and Jeffrey Cox who helped to refine the content in the talk that I'll be giving today.

In general, as Rachelle mentioned, both the California Native Plant Society or CNPS in California Department of Fish and Wildlife vegetation programs collaborate on defining and ranking sensitive natural communities along with input from others including California Natural Diversity Database (or CNDDB) staff, as well as local and regional experts, so it's a collaborative process that we take.

**Slide 2 (46:28): Ranking vegetation types**

In general, I will give an overview of what I'll be including in my talk for ranking of vegetation types. In general, the first part of my talk will go over what the primary ranking criteria we use for defining and categorizing Sensitive Natural Communities, or sensitive vegetation types, are. Next, I will give a brief overview of this State and Global rankings, in which we utilize to produce the ranks and or to re-evaluate the ranks overtime. And then I will give an example of the ranking process and where we are right now.

**Slide 3 (47:17): Classification/mapping**

So in general, as Rachelle so eloquently denoted, the first thing we need to do is define the units – to find the vegetation types on the ground, for example, through vegetation sampling and then extrapolating that information into mapping across the landscape.

In our programs, whether that be here in California or across the nation, the units that we use to define vegetation floristically at the lowest level of classification, as Rochelle mentioned, is at the Alliance and Association levels. So once we define those units, and as we continue to define those units (uh), we can utilize that information to evaluate the rankings vegetation. An example here in this picture is my colleague Kendra Sikes who was reviewing the field key to vegetation types out on Santa Rosa Island, where the National Park Service and many other partners recently inventoried and mapped plant communities on the Northern Channel Islands. So whether you're on the Islands or the Mainland, the first, the important thing is we need to determine the units. In this example we defined there: *Arctostaphylos confertiflora* Association that nests within the Maritime Chaparral Alliance of *Arctostaphylos (crustacea, tomentosa)* – a grouping of maritime chaparral manzanitas within that broader unit – that alliance, is the first step to defining the units.

**Slide 4-6 (48:55)**

I guess I have a question to ask all of you all in this before I go on – Do you all remember where you were in August of 2017? … Well, I I remember that event distinctly, and I imagine many or all of you remember that, you know, the Total Solar Eclipse – where somewhere you went in to experience that event. Well, I also ask you if you all remember, maybe the first time you were out in the field to see or document in a rare and endangered plant species, or maybe even a plant community. When I was first hired at CNPS, one of the things I was charged with is to work with CNPS local chapters such as the San Diego chapter, pictured here in the early 2000s, where we went out to document in a region and or specifically specific vegetation types to gather and gain more information about the location, the extent, and the threats to specific plant communities – This being an Englemann Oak Woodland. Whether it's a specific vegetation type in a certain area or across an entire area, as Rachelle mentioned, or whether it be in one project area across a county, or in a general region.

Here we are where we sampled and map, for example, in Marin County – Serpentine Bald vegetation and Mount Tamalpais Manzanita Chaparral where this was in this project was the first instance where we documented and defined and mapped on Serpentine, the Serpentine Bald Alliance and the Serpentine Manzanita Chaparral. So the first step in the process is just getting on the ground collecting data, whether that's in a specific project area in a designated area, or for a specific particular vegetation type.

**Slide 7 (50:56): Synthesize – 2 primary factors for assessing rarity**

Once we have that information, we then synthesize the information to determine a couple of factors. Typically, when we're assessing rarity, the first factor is to estimate the extent of a vegetation type across, typically, we're doing this across the state, though you could also do it globally in this instance of the Maritime Chaparral Alliance of *Arctostaphylos (crustacea, tomentosa) A*lliance. We initially brought together data, including vegetation survey data as being shown here in the pink dots. Or otherwise, we brought in data when we initially were estimating the vegetation rarity, we brought together information on the survey data and the map data to estimate the range of a vegetation type – This being the *Arctostaphylos (crustacea, tomentosa)* Maritime Chaparral Alliance.

We also look at estimating the number of occurrences or the acreage of that vegetation type across the state. For example, when we synthesize this information across the state, to estimate the extent in the range and the number of occurrences, that's One of the main factors that we use for determining vegetation ranking for how rare or common a vegetation type is.

When we maybe add more projects on, though, we might also notice that we're improving on the process, so we're always providing an estimate. And then as we work on additional projects, we might extend our knowledge base and extend our knowledge on what the range and extent is, whether that be on this example across the state or in individual projects such as the snapshot shown within here in the Channel Islands where we've gotten this specific acreage within a study area or across the entire state.

**Slide 8 (53:07): Evaluate – threats and treads**

Those are some of the main factors that we use, and then the additional factors that we use in the ranking process for sensitive natural communities is to evaluate Threats and Trends – if that information is available. We obtain that information through any number of data sources, though typically that includes our vegetation survey information, where we have information that we collect on the ground, not just on the vegetation type itself, but also if there are disturbance factors, we denote those in our vegetation surveys. We also have other ways of collecting vegetation Threat information, including other modules of our vegetation sampling, where we might collect information on Mortality or Trends as we collect monitoring data over time. We also consult with local biologists and experts – To get their input on Trends. And another place that we obtain information is through mapping data when Impacts are attributed, or other sources such as the California Natural Diversity Database or CNDDB – this is especially when we are ranking the rarity of a vegetation type whose diagnostic species also include rare species.

So this is just an example: I extracted out a couple of examples from the *Arctostaphylos (crustacea, tomentosa)* Maritime Chaparral Alliance, and in particular for *Arctostaphylos crustacea or A. confertiflora* Chaparral Association, here are some of the examples of Threats that we compiled together upon doing that ranking.

**Slide 9 (54:28): Factors for assigning ranks**

In general, overall, that is the methodology that we use to assign ranks for all elements of biodiversity. The method that we utilize was originally developed by The Nature Conservancy and is now maintained and codified by NatureServe nationally and each State in the Nation through the National Heritage programs utilize the same methodology to define and rank vegetation. NatureServe developed this resolved methodology in 2009 with the 2012 update. This methodology provides us a standard and

repeatable process for ranking all biodiversity elements, whether they be vegetation types like alliances and associations or species or ecosystems in a standard and repeatable process. And the three factors that we mainly use are, as I discussed previously: the Range and Distribution and the Abundance or Number of Occurrences, and then the Threat information and Trends, if we have that information. So those are the three factors that are inherent in the methodology that we use.

**Slide 10 (56:02): Global and State Ranks – Definitions/examples**

I'm just going to give you a quick snapshot of an example of when we've developed the rarity ranks, then what results in a State ranking and or a Global ranking. We typically in California focus on the State rankings for compiling data and determining the ranks for vegetation classification units and the 1st three levels of ranking, the S1, S2 and S3. Those are the rankings that we deem as sensitive natural communities or sensitive vegetation types, and I'll give you just some examples here, and I don't need you to read this in detail, but just to know that the top three rankings are what we designate as sensitive, and I give an example of each one -- the S1 being the highest degree of rarity or critically imperiled and at most risk of extinction and then S4 and S5 are rankings at the State and Global level that are more secure or demonstrably secure -- And all these levels of rarity ranking we do for vegetation across the state.

Previously in our Manual California Vegetation and even the National Vegetation Classification, the definitions included primarily just the Rarity factors -- the Number of Occurrences and the Total Acreage, and now we not only use those factors, but also the condition of the occurrences and current Threats and or Trends in the vegetation types --Two factors into these rarity rankings, so it's not so specific anymore as the number of occurrences or the number of acres, and so the rarity rankings that we have of State rank S3 and below, or even as S5, for any of those rankings can also be modified by other information, such as the condition, the viability, the threats and the trends. So it's not so specific as the number of occurrences in acreage anymore.

**Slide 11 (58:16): NatureServe explorer**

Another thing that I just want to say is that online through our national partners at NatureServe, the ranking definitions are provided online. There are also other sources, such as even locally, in the state through the CNDDB database. The rankings are provided, whether that's at the Species level that we're doing these rankings or for the Natural Communities of vegetation (Alliances are Associations) -- We're using the same ranking methodology of State and Global ranks.

There are also other modifiers that we use, and I'm not going to go into detail, but there are definitions for those such as modifiers, such as we might have a range in rankings S2 to S3 as an example, or we might have other rankings such as SNA and SNR, and those are provided and utilized standardly across the across the State and Nation in general.

**Slide 12-14 (59:10): NatureServe rank calculator**

But I want to go into a little bit more detail on is just that we utilize the Rank Calculator as a rigorous and standardized process, and it provides flexibility when we're using this methodology to assign rankings, and I don't want you to pay a lot of detail of this worksheet here, but I just want to say that we have two worksheets that we utilize when we assess the ranking.

This is the first worksheet that provides us information to denote the factors of Conservation Status including: Two main core factors and then a variety of other factors. There are 10 total that we can utilize and as long as we have two factors, we can begin to do the rarity ranking process, and that inherent in this is that there's also flexibility, because within any given ranking factor there is a range of factors that we select within each in each individual factor.

So whether we're looking at the number of occurrences, or the range of a vegetation type, each of those have a list of different criteria under each of those main factors that we select from within. Really, what I want to say is that if we have information, typically we have information on the range or the overall area and distribution of a vegetation type, and we assess that information and then we also typically assess the abundance or the number of occurrences, and those are the kind of the two main factors that are within what we call the "Rarity" portion of the ranking methodology. And if we just have that information, then we can develop a rarity rank as long as we've got two factors.

However, if we have additional information such as Threat information and or Trends, then those two factors also provide information for us to designate in the rarity ranking beyond just the main rarity factors. And with each of those factors, when we have rarity information and Threats or Trends, then there's weightings of those. So the weightings include 70% ranking weight ranking when we have Rarity and 30% of the weighting goes to the Threats and Trends, when we have that information combined together.

But I would also say is that the Threat information, when we do have that information, is in ranking for the vegetation community types or species, and we often will designate not just the type of Threat but also the Scope and Severity. When we have that information, the Scope and Severity often are most easily gleaned when we have information across a general region or across this area, such as across the State. Though we usually take any information that we can. The main point that I want to say is that the Threat information is now included in the ranking process. It used to be a separate value. If you might remember, we have or have had ranks with, for example, S state rank 3.1, 3.2, or 3.3. That information now is getting collapsed together and combined within the rarity ranking. And then here are the Threat factors. There are eleven criteria that we utilize, and when we're assessing the threats.

And I guess, I just ask all of you is: How many of you have ever submitted a Natural Diversity Database Species Survey to document and map an element occurrence of a rare plant, and how many of you have ever submitted a vegetation survey to CNPS or CDFW that is of a sensitive natural community?

What we really need to do is get information from all of you -- information that we've collected maybe in-house and information from all of you all who might also be collecting information, because how do we rank a sensitive natural community?

**Slide 15 (01:03:45): Summary – How do we rank how sensitive a vegetation type is?**

We need to determine the classification units that we do here at CNPS and CDFW. We define those units which we also need to synthesize and extract information from all across the State. And as I discussed, we need to estimate the vegetation type's range and estimate the number of occurrences, and then evaluate threats. And that information that we combine together in-house through our programs at CNPS and CDFW, together we work in tandem at this, and also through peer review. And this information is only based on what is currently available. And so as we go, then we define those ranks,

typically at the State level and sometimes at the Global level. And we can evaluate and re-evaluate rankings when more information becomes available.

**Slide 16 (01:04:39): Current extent of fine-scale vegetation mapping**

So I'm going to give just a really quick overview of an example of how we do that. In the vegetation mapping at a fine-scale, as Rachelle said, is that we've got about 60% or thereabouts of the state mapped already and new information is coming in all of the time. The best case scenario is that we've got good information available and right now we're re-assessing rarity rankings in three particular regions of the state – Northeastern California, the Greater Bay Area, and in the Mojave Desert – because new information has become available to us to reassess the rarity rankings.

**Slide 17 (01:05:21): What questions do we ask when doing SNC ranking?**

So what questions do we assess and do we ask ourselves when we're doing sensitive natural community ranking? Do we have enough information to do the rankings? If so, we begin their ranking process. If no, we have to obtain more data through ground-based data, map information, or other sources, and then refine information through local experts.

When we do, we also ask ourselves: What data gaps do we have? And we factor in those data gaps into the ranking. And then we also ask ourselves: What limitations do we have with the data at hand? For example, if an area has been mapped at an Alliance level, but we intend to rank at the Association level, then we need to extrapolate that information, and know what our limitations are.

**Slide 18 (01:06:06): Vegetation description and mapping**

So I'm going to get a little bit of a deeper dive, and just say, that we have more recently gained vegetation mapping data across counties now, as well as ecological regions. And so because of that we are able to extract out information when we have a wall-to-wall coverage. As Rachelle discussed earlier, the best way to be able to assess a sensitive natural community is that we have all vegetation types identified, no matter whether they are common or uncommonly occurring.

So this is what I did; I extracted data from Sonoma and Marin County, extracted information about three types, three vegetation types that occur on Serpentine landscapes, and then I not only extracted information from the vegetation maps, but I also extracted information from other data sources that are at the species level, whether that be species within the vegetation types that were mapped that we are trying to define to re-rank the vegetation rarity for.

**Slide 19 (01:07:13): Fine-scale vegetation map from Sonoma Co.**

And then here, I'm going to just kind of zoom in, and just say that the vegetation being mapped in a standard way with classification units where we have this wall-to-wall coverage, then we can better query and analyze the specific vegetation types for ranking through the rank ranking methodology. This is just a snapshot of the querying that I did.

Now that we have a lot of all coverage and the querying that I did – Here is Serpentine alliances. And so what we do again, the steps that we take are: We evaluate the range and acreage of whatever that we have available to us at the time, and then based on that information we might realize that we need to get other data, such as existing data sources of the diagnostic species of the vegetation types at hand.

So this is an example, of points in pink, is the *Arctostaphylos (bakeri, montana)* Alliance that I'm giving an example of. And that information, sorry, I'm going to use my laser pointer so the Arctostaphylos alliance and then in pink, here's an extraction of that, though we also extrapolate and in and pull together other existing data sources such as California Consortium Herbarium and the California Natural Diversity Database species information, if there. If the vegetation type that we're doing the ranking for, especially from the end dot, the diagnostic species are included within those data sources. So we might extract other information -- to help gather data before we do the ranking -- and then, if necessary, we might need to collect other ground-based data.

**Slide 20 (01:08:56): Expression of *Arctostaphylos (bakeri, montana)* Alliance and *A. bakeri* Association along North Coast in Sonoma County and *A. montana* in Marin County**

But, in general, we use the data at-hand and then we look at that expression of the plant communities on the landscape.

**Slide 21 (01:09:07): General ecological range of *Arctostaphylos bakeri* Association**

This is the example extracted from the map of the *Arctostaphylos bakeri* Association where we queried the map data that was done at the alliance level, and then we queried the survey data for the Association level detail to get a better understanding for that association. Before developing the rarity ranking, we had to pull together all those different data sources that I discussed for the mapping data. And then the vegetation data that we might have and or any other given sources, whether that be information from species collections and otherwise, when we pull together all that data for the *Arctostaphylos* association, we found that in the mapping, there were 262 polygons. But then when we looked at number of occurrences, for assessing the element occurrences for the vegetation association of *Arctostaphylos bakeri*, we determined that there were seven, seven occurrences, and in those seven occurrences of the area that we're assessing for across the State of *Arctostaphylos bakeri*. It was found just within Sonoma County, and in a rarified area of 386 hectares or 3.8 kilometres squared.

**Slide 22 (01:10:30): Step 4: Assessing ecological integrity and threats**

The other piece of data that we bring together or evaluate as we assess is the ecological integrity, the threats, and indirectly have information on trends. When we did this for *Arctostaphylos bakeri* association and or the *Arctostaphylos (montana and bakeri)* Alliance, we pulled together data, especially from the Natural Diversity Database, a little bit from the Sonoma County vegetation map, the California Consortium of Herbaria, and our vegetation surveys that we have on-the-ground. And what we found is that there were low to moderate threats for at least 85 of the known stands of not only the *Arctostaphylos bakeri* Association, but also for that given alliance. But we found upon assessing the threats as well, is that there is some missing information, but with the information that we have brought together, that information to define the ranking and reevaluate the ranking of not only the Association of *Arctostaphylos* b*akeri*, but also the more newly defined and combined Alliance of *Arctostaphylos (bakeri, montana*).

**Slide 23 (01:11:35): Arctostaphylos (baker, montana) Alliance**

So when we have assessed the ranking, what we found is that we determined the number of occurrences for this Serpentine vegetation alliance is there are at least 21 known occurrences of this Alliance, and we selected then in the criteria for number of occurrences, the range of 21 to 80

occurrences for this alliance. Then we also assessed a direct estimate of the acreage, overall, for that alliance being 7 kilometres-squared overall and then that fit within the 5 to 20 kilometres-squared for the area of occupancy. And then with the Threats that we brought together, we determined a high Threat level, because we had at least one medium impact and at least three low impacts. So the Rank Calculator form that we use, that I showed you before, with all of that information got factored into doing this rarity ranking.

**Slide 24 (01:12:44): Natural communities list**

And then what I'm going to end with is that all the information for the rankings that we've done to-date over the State rankings that we have, and Global rankings, can be found both on the Manual California Vegetation online for Alliances. But also for Association level detail, you can glean that information from the Natural Communities list, and Betsy will go a little bit more into detail about that list, and then also extracted from the main list is a the list of sensitive natural communities.

**Slide 25 (01:13:19): Where are we toward ranking vegetation with the NatureServe rank calculator?**

So in summary, what I want to say is: Where are we at towards ranking vegetation using the NatureServe Rank Calculator? We have generalized ranks for all those Alliance Vegetation types, though now that we've got this standardized way of ranking vegetation types, we have ranked around 100 of the over 450 alliances so far since 2017, or on average around 20 to 25 per year. We recognize that we need to ramp this up over the next, hopefully three years. We intend to ramp this up, to re- evaluate the ranks through the NatureServe Rank Calculator, to do at least 100 per year, so that we can get through the rest of alliances. And then similarly we need to ramp this up for the Association level, since most of the Associations right now are denoted with a ranking of Yes or No. Yes, meaning that a state ranking of at least S1, S2 or S3 ranking for Yes. And no as S4 or S5.

**Slide 26 (01:14:28): Closing**

Then, in general, I just want to say that many of you have ground-based data -- and that we need information, so we recognize that we've got gaps, and hopefully there's a two-way communication stream. We provide information, and then you can provide us information.

I just want to thank everyone who were involved in providing content for the rankings that we do, including CNPS CDFW staff, and volunteers, and everyone who contributes data to us.

## Section 3 – Betsy Harbert, CDFW VegCAMP: Sources of Data & Tools & Online Information: Where to find them, how to use them

**Slide 1 (01:15:00): Online tools**

Alright thank you Julie, that was great. Next up is Betsy Harbert with CDFW VegCAMP. She is a vegetation ecologist. She's going to go into sources of vegetation data, tools, online information and where to find them, and how to use them. I do want to note that we are about 10 minutes behind, so will probably push everything forward about 10 minutes. If we don't get to our Q&A session at the end,

we will address your questions in writing and get back to you with those answers. So just so you know, we won't ignore your questions even if we can't talk about them Live Today. All right, Betsy, go for it.

Hello, my name is Betsy Harbert. I'm a vegetation ecologist with CDFW and the VegCAMP program. Thanks for Rachelle and Julie for your talks. I'm going to jump into online tools that are available to really investigate sensitive natural communities in your area. I also want to thank Jennifer Buck-Diaz, a vegetation ecologist with CNPS for developing content for this talk as well. Let's jump in. There's a lot of material to cover.

**Slide 2 (01:16:19): Online tools: sensitive natural communities (SNCs)**

So I've structured this talk to really look at questions that you might have that are project and spatially driven. You might have an area of interest, or area that you manage, that you want to investigate the sensitive natural communities that occur in that area of interest. So the questions I'm going to address in this talk are: which natural communities are sensitive natural communities in my area of interest? What is a potential list of sensitive natural communities that I may encounter? Do I have sensitive natural communities in my area of interest? That's more of a spatial question of --what are documented locations of sensitive natural communities to date? And what is the community composition of the sensitive natural community? So how do I know if I encounter a sensitive natural community? So those are some questions that you might be approaching sensitive natural communities with.

**Slide 3 (01:17:13): Accessing information on sensitive natural communities: knowing your tool kit**

And we're going to go through your toolkit, and Rachelle and Julie have touched on some of these resources, but we're going to walk through the Manual of California Vegetation online, as well as the CDFW BIOS website where a lot of our biogeographic spatial data is housed, and also the VegCAMP website where we can investigate sensitive natural community lists for the state.

**Slide 4 (01:17:40): Which natural communities are SNCs in my area of interest? - Introduction**

So we'll go through each of these questions, so you know which natural communities, or SNC's, are in my area of interest. The final output that you're going to want for your area of interest is a list of potential SNCs. Here's your toolkit running along the bottom where you'll investigate products that can help you eventually develop your list of potential SNCs. I've sort of color coded the products and where they come from...let me make sure I have my little highlight laser pointer... for example, our statewide list of SNCs is coming from the VegCAMP website. So you'll use this set of products from your different tools in your toolkit to hone in on a list of potential sensitive natural communities. I will walk through how to access that data and how to sort of investigate the interaction of those different products together to get your final desired output.

**Slide 5 (01:18:38): Do I have SNCs in my area of interest? - Introduction**

For that second question, do I have an SNC? Let me pause. "Sensitive natural communities" is quite a mouthful and I'll try to use it when possible, but I am going to be abbreviating it to SNC, so you'll see that a lot in the discussion, and I mean sensitive natural communities when I say SNC.

So the second question, "do I have sensitive natural communities in my area of interest?" The final product that you want is known spatial locations of SNCs. Primarily, you're going to be pulling from BIOS tools. And we'll go through how to get and download that data and query that data. And I also want to

mention that we are working on a sensitive natural community layer for the whole state that will synthesize the data that I'm going to show you in this talk. So be aware of that. We are hoping to roll that out in the next year or so. And so we will have done a lot of the work that I'm showing you here in this step and hopefully just make it available to you for the state.

**Slide 5 (01:19:44): What is the community composition of an SNC? - Introduction**

And finally, what is the community composition of a sensitive natural community? How do I know if I encounter a sensitive natural community and what the heck do these names mean? Ultimately, you're going to want Alliance and association descriptions to determine if you're encountering a sensitive natural community or to better understand what a sensitive natural community is. And so we will go through how to get these various resources in this talk as well.

So here's a sort of schematic workflow, of the discussion and how you'll probably approach our sort of recommending investigating these different tools to get at your ultimate product that you want. We are going to be walking through a scenario where your area of interest overlaps with a mapping and classification project initially to get you comfortable with these toolkits. I do want to say if you're in one of those data gaps where we don't have a classification mapping report, I will be covering additional resources. But we're just going to focus on an area of interest that overlaps with a mapping and classification project initially to get you familiar with our tools as sort of a best case scenario.

**Slide 5-7 (01:20:59): Which natural communities are SNCs in my area of interest? - SNC list**

Let's focus first on building a list of potential sensitive natural communities. So the first thing you're going to want to start with is downloading a statewide list of sensitive natural communities, and that's available via the Vegcamp website. The sensitive natural communities list that I'm going to direct you to is the most up-to-date list statewide list of sensitive alliances and associations. We do update it periodically, so you'll want to be checking this website, you know, when you're starting to work on your project area, you want to get the most recent list downloaded. Here's the website link. We'll just walk through what that looks like when you click on this website. There's a list of different topics covered. You're going to want to focus in on this natural communities list link. We do have some discussion of what sensitive natural communities are available if you want to read more about that, but for the purposes of our potential species list, we're focusing on this natural communities list. And then we do have lists of all the natural communities in California, but we have created, pardon me, a sensitive natural communities only list that you'll want to download. And again, this is a statewide list of all sensitive alliances and associations. Here's a zoom in after you've downloaded what this looks like. The lists are arranged by life forms, so tree, shrub, herb...then listed alphabetically. And what I've pulled out is the Quercus agrifolia alliance. A couple things I want to bring your attention to. This alliance itself is not ranked as sensitive, it's an S4. But it does have sensitive associations within it. So this sensitive natural community list pulls out all sensitive alliances, so S3 S2 S1, but also all alliances that contain sensitive associations. And Julie mentioned that we're getting going through the process of using that ranking calculator for alliances and associations-- if we don't have a ranking for a particular association or alliance yet, we do mark it as a sensitive “yes” or “no”. So what you can see is there are some ranks for some of these associations, but at least the subset of associations within the Quercus agrifolia alliance are all sensitive. The other thing I want to show you is this “provisional”. This occurs when we have a, you know, a small enough sampling of this vegetation type that we really want to get a better idea of its occurrence across the landscape. So another little plug if you are out there surveying, you

know, be aware of these provisional types and if you do encounter them, we would relish the opportunity to get more data on the occurrences of this type across the landscape.

**Slide 8 (01:24:11): Which natural communities are SNCs in my area of interest? - MCV online**

OK, you have your sensitive natural community list that statewide though, and you are probably, you know, working in a defined area that does not include the whole state. So how can we hone in and refine that list of potential sensitive natural communities? I'm going to bring us next to the MCV online and I'm going to walk you through how to get a regional list of alliances. So just a way to subset the potential alliances that you want and associations you want to be thinking about. Again, the MCV online is where the most up-to-date descriptions, classification descriptions of vegetation for the state of California are housed, and we will talk more about the alliance descriptions, but right now I'm going to focus in on showing you how to do a regional search so we can get that refined list of potential sensitive natural communities. So here's the landing page of the MCV online. We're going to jump to the map search. And let's say we're interested in alliances that are known to occur or expected to occur in the Northern California coast range. We're going to go ahead and click that, press the search button. And that's going to pull up all the alliances thought to occur or known to occur in the North Coast of California, and we can see there's 160 results found. And here if you Scroll down, this is what you see and you can certainly click on one of these to get at the alliance description. We're not going to do that now, because we're focused on getting that potential list of sensitive natural communities. So we're going to go ahead and download the results, and we can use this list of alliances to compare against our statewide list of SNC's to sort of, refine and hone in on what alliances we want to be aware of. You can see the rarities running along this column here. And you might be tempted, and it might be useful to you at some point too-- You can filter by rarity, but I'm just going to caution you with that Quercus agrifolia example. There that was in alliance that itself was not sensitive, but contained sensitive associations, so I would say in this approach don't refine by whether it's a sensitive alliance or not, because you won't pull up those types of alliances that contain sensitive associations but are not sensitive themselves. So just to caution there, you're really just going to want to refine by regional ecoregion.

**Slide 9 (01:27:01): Which natural communities are SNCs in my area of interest? - BIOS**

OK, so we're comparing our regional list of alliances to our state list to refine it. But we also want to, you know, the eco regional level is still very broad and I'm going to point out some outputs of BIOS that are going to help us maybe further refine our list of sensitive natural communities and associations that you might encounter based on your area of interest. So we're going to head on over to BIOS to check whether there is a mapping and classification project that overlaps with our area of interest and heads up in this scenario, there is going to be, but we'll talk about those times when that isn't the case and will walk through how to download a classification report and the relevant information for honing in on your list of potential sensitive natural communities. BIOS is the CDFW biogeographic information and observation system. And it is where VegCAMP houses it and its partners vegetation data along with our survey points layer as well. So that's a very handy resource and it's spatially based. So in this scenario we are really going to look at BIOS as a way to spatially search for relevant mapping products so that we can get at a classification report that's appropriate for our area of interest. BIOS has spatial data of sensitive natural occurrence occurrences as well, and we will cover that when we get into our second question. So we will be revisiting BIOS. So I'll show you how to get there. You can link to BIOS from our vegcamp website. In our web page vegetation classification reports and maps, there's a link to this BIOS map

viewer. So you can go ahead and click on that and it'll pull up our BIOS map viewer with all of our vegetation maps preloaded. The Mojave Desert is really large so we have a separate BIOS map that you can open if you click on this one, but we're going to go ahead and click on this guy. This available vegetation maps here for this scenario, so if you click on that link. All of our vegetation maps other than Mojave are going to be preloaded. And this layer, which is a really important layer in our first step, the vegetation mapping projects layer is already clicked on and viewable. And what this layer is, you may have seen this in, you did see this in some other slides from Rochelle and Julie. It is a layer that shows are completed and ongoing mapping and classification, vegetation mapping projects. And there is a classification report for these mapping projects that is available as well and that's what we're going to be looking to download. Here we're going to zoom in on Northern California. Maybe our project area is Sonoma County, and so we can see, based on the cartography here, that indeed there is a complete map for Sonoma County, so we're going to want to investigate and download the associated classification report so we can help refine our sensitive natural community list. So there are attributes for each of these mapping footprint areas that I want to make you aware of, because that's where you're going to find the classification report. Just a little mechanics of this viewer app. To get at the attributes of the polygons displayed here, you'll want to click this text. It will highlight in pink when it is the active layer, so clicking on it makes it the active layer. You can see that it's active because it's highlighted in pink and then I can come over to the particular mapping footprint that I am interested in learning more about and click on it and these attributes pop up. For the attributes that you're going to want to be aware of and for our purposes, is this classification report. There's some additional data you can download. This is the mapping report that's going to be sort of important in understanding the vegetation map data, and also this link field that allows you to directly download the vegetation map itself, and those will come become important later on when we're looking at our second and third questions. But for now, we just want the class report and to open up the classification report. You don't have to remember what each of these fields mean if you come in here and you're like “now which one did I want again? I know I want the classification report.” You can click on this and the metadata for this field will pop up and that essentially defining what is contained, what data is contained within this field, and that's available for any one of these fields.

**Slide 10 (01:32:25): Which natural communities are SNCs in my area of interest? - Getting Association descriptions**

What information do we want? Actually I just wanted when you press open here, that's going to initiate a download of the classification report. So I just wanted to be explicit. But now we've downloaded our classification report. We want to check this report for surveyed alliances and associations, so again, this is an example from Marin County. In this scenario, your area of interest overlaps or is at least ecologically similar enough to the mapping footprint where the survey data was collected, that it's appropriate to use this report as a way to hone in your list of potential sensitive natural communities. So in this scenario, maybe your project area or area of interest overlaps with Marin County map. So this is a product you'll want – a table within these classification reports you'll want to reference-- it is a list of all sampled alliances and associations within the mapping footprint. It does in this case include associations that are expected to occur, but that were not sampled. This row is how many surveys were collected of these different vegetation types. Again, these classification and mapping reports have association descriptions, and we're going to circle back to that alliance and association description. We're going to circle back to that when we get to our third question on what are sensitive natural communities. So just

be aware we'll circle back and revisit this report as well. The other thing I want to highlight is the hierarchy lists that are often available in these classification reports. Rachelle touched on how we group associations and alliances that are ecologically similar and you'll, you'll want to be aware of the hierarchy as you further investigate our mapping products. So I just wanted to highlight that as a resource that's also available in these reports.

**Slide 11 (01:34:40): Which natural communities are SNCs in my area of interest?**

So we have our potential list of sensitive natural communities that we've honed in by we have the state list that we started with. We've refined it by the regional search and in this scenario our area of interest overlapped a regional mapping project so we could further potentially refine the alliances and associations that are sensitive that we want to investigate. The second question we want to address is do I have sensitive natural communities in my area of interest? So what are known spatial locations of sensitive natural communities? And we're going to focus on learning how to download our vegetation mapping data as well as our survey points layer to look at documented occurrences of SNCs. Again, plugging that keep your eyes out for this sensitive natural community layer, because we will have essentially done this querying for you with this SNC layer. Eventually, that's the hope.

**Slide 12 (01:25:42): BIOS – Accessing and assessing available maps and reports**

So the general process we're going to go back to BIOS, we're going to load our existing projects and survey points to determine if they overlap with our area of interest, and I'm going to show you how to download the spatial data and how to query the data for sensitive natural community occurrences. So we'll talk through the attributes that you're going to want to be aware of when you're looking at that data.

So again, I've clicked the link for with all our maps preloaded our mapping projects in California are loaded. If you do end up getting BIOS without following that link, you can always pull in this layer by going in the search box here and typing in “vegetation mapping projects”, or, if you're like me and remember numbers for some reason, you can type in DS515, that'll pull it up as well, but just so you know, if you don't follow that link, you can always search for it in the toolbar and then double click it and it'll add it to the map. So in this scenario, we're going to focus again on Marin County. We see that there our area of interest overlaps with this area of Marin County that's been mapped. And so we want the vegetation map that was produced by this project. One way to access the vegetation data that I've already highlighted is making this the active layer. Clicking on it, making it pink, selecting the project area, it pulls up the attributes associated with this layer, and you can press this link button and that will either initiate a download of the vegetation map data or it's going to bring you to a collaborator’s website where you can directly download that vegetation map data. I'm going pull, so typically what I do is I download the data and then pull that spatial data into an ESRI application like ArcGIS, or if you use a different software that manages geospatial data, that might be a little easier than going through the querying that's available on BIOS. But I am going to walk you through that anyway so that you can see the attributes that you'll want to look at when you do query this data for sensitive natural community occurrences. So in this scenario I have found that OK, the name of this project area is Point Reyes. Now if I have preloaded you know click that link with the preloaded maps from the vegcamp website, I can find this map in my table of contents and click it on. Alternatively, if you haven't done that you can type in “vegetation Point Reyes” here and it'll pull up that map. You can double click it and it'll add it to the table of contents. All of our vegetation data has a keyword “vegetation”, so if you get to BIOS without

this preloaded table of contents, just start off with that keyword “Vegetation” in your search and that's going to just pull up a list of vegetation maps that we and our partners have produced that you can add to BIOS.

**Slide 14 (01:38:56): BIOS – Getting spatial occurrences of SNC’s; maps**

So here I've added the Point Reyes or I've clicked on the Point Reyes vegetation map. And I've made it the active layer by clicking on it. It's pink now. And I've clicked on some, I've selected some polygons to sort of to pull up the attributes that you're going to want to be aware of when you're querying this data for sensitive natural communities. So first off, I want to make you aware of this NVCS name that reflects the name of the alliance or association. Maybe it's mapped at group or Macrogroup level that is standardized for the classification of California, the survey of California Vegetation Classification, so this is the standardized name of what is mapped within that polygon, and then the level of that name. So how does it fit in the hierarchy? And you can see that a couple of these polygons have been mapped at the alliance level. A couple have been mapped to the association level. We don't always, we are not always able to map at the association level, and Rachelle pointed out that often times, and we've been seeing through looking at the sensitive natural community lists, that we aren't always able to map at the association level, so you'll want to be aware of embedded sensitive associations within alliances, especially if your map, if your polygons are at the alliance level. So something to keep in mind when you're querying this data, you'll need to be thinking about those alliances that are not sensitive themselves, but contain sensitive associations in your area of interest. Some additional attributes if you're going to be querying this data, we do provide the state rank just for the alliances in our vegetation maps currently, but we also have this “rare”, so that's really saying “is the community sensitive or not?” and that's just a yes, no, and that's available when we do map associations, that is noted a yes or no.

**Slide 15 (01:41:10): BIOS – Getting spatial occurrences of SNC’s; survey points**

OK, so that's the kind of attributes you'll want to be thinking about and looking into when you're trying to subset the data for potential sensitive natural community occurrences. And then we're also going to look at the survey points layer. So the survey points layer is, you've heard a lot of the sample data that we collect for classification purposes. A lot of this survey data are our standardized approaches to surveying plant community natural communities in California. Our rapid assessment and releve standard surveys are included in this data set as well as surveys that we use to refine and determine the accuracy of vegetation maps. But all of these are based in, you know, percent cover estimates of species within a natural community. So we've already talked a little bit how often we map at the alliance level. We do map at the association level when we can, but because these survey points are on the ground surveys, there's a lot more potential to have association level data within these survey points. So also a great resource for finding sensitive natural community locations. Particularly because a lot of these points are at the association level. The goal of the surveying is often to build a classification report that we look at later on. So we're trying to sample as many areas as possible that gives us a broad suite of potential community types in the area. It's not a systematic survey for sensitive natural communities, so while there might be some locations, it's not going to tell you where all the sensitive natural communities are by any means. So how to download the data? You can click on this metadata button and it'll pull up the metadata for the survey points layer and you can download the data. This layer itself is data for the whole state, so I typically download the data and then I'm going to again query it, subset it in like an

ESRI application or some other geospatial software, but you can also dig into the data on BIOS itself, and I'm going to again show you the attributes you're going to want to think about when you're querying this data for sensitive natural communities. So here again, I've made it the active layer. I've selected a point here. You can't see it because it's selected now, but it was a releve, one of our standard sampling protocols. So the attributes you're going to want to be aware of when you're building your sensitive natural community known occurrences are the again the NVCS name, that is the current name in the California's classification system. So in this scenario, this is a *Bromus carinatus* stand and this is the level and Association level. If we scroll over, we can see there's also a state rank. We do, when ranks are available, have state ranks applied to association level surveys, and then we also have whether it's sensitive or not. So this point is surveying a stand of *Bromus carinatus* at this particular location. There are some points that are just at the alliance level, so again, you'll want to think about that embedded association when you're querying this data so you don't miss any potential occurrences, but that is what you need for generating your known occurrences of sensitive natural communities.

**Slide 16 (01:45:21): What is the community composition of an SNC?**

Finally, we're going to shift over to what is the community composition of a sensitive natural communities. So we have our list of potential SNCs. We also understand what occurrences have been documented in your area of interest. What do these sensitive natural communities actually mean? How do I know if I encounter them? And to that end, we're going to go through the MCV Online and investigate alliance descriptions that are going to help us distinguish types from other sensitive natural communities and other natural communities. We'll investigate classification and mapping reports and again just highlighting we have multiple ways to get at classification and mapping reports. I've already highlighted one via BIOS that is more of a spatial way to download relevant classification mapping reports, but we can also determine relevant classification mapping reports just by investigating the MCV online. Also I'll be highlighting that there's also existing scientific literature outside of our classification and mapping reports that can provide alliance and associations, also available via some resources on the MCV online.

**Slide 17 (01:45:21): What is the community composition of an SNC? - MCV online**

Let's jump on over to the landing page of MCV Online and again this is the most up-to-date resource for alliance descriptions across the state. So this is going to be a resource you go to a lot when you're trying to understand your sensitive natural communities. We're going to jump to an advanced search. And in this scenario, I'm still interested in Quercus agrifolia, so I'm going to type Quercus agrifolia in the alliance name. I'm going to press search and I end up with three results where Quercus agrifolia is a diagnostic species. I'm interested in this Quercus agrifolia alliance because I want to get you to what an alliance description looks like on this website. So here's what that looks like. You have a list of characteristic species, obviously Quercus agrifolia, and what species it likely to codominates with. You have some information on the structure, how this stand looks, and whether there are shrubs or what the shrub and herbaceous layer looks like. In addition, we have these membership rules and this is a quantitative rule on how to distinguish this type from other types that might contain characteristic species. So Quercus agrifolia might occur in other alliances, but to be in a Quercus agrifolia alliance it has to meet these quantitative values for percent cover. And you'll see there's a number of membership rules. This is all regionally based currently while we are continuing to sample across the state, so you'll want to

investigate these resources and find out which one might be relevant to you for your particular area of interest.

The other thing I want to highlight here is you know you can expand any one of these fields and learn more about the alliance concept and the primary the principal species that are within this alliance. But I'm going to expand the regional status if you're sort of approaching this again as sort of a place based inquiry, you can learn more about what references might be appropriate for your project area by looking at the references that are associated with each region. This sort of talks about where stands have been documented and the references that support where they've been documented. So let's say we're in the Northern California Coast Ranges, then we might want to check out this Thorn et al. reference. So I'm going to walk you through how to navigate the references as well shortly, but that's just sort of a resource that I like to use when I do have a particular area of interest that I'm investigating.

The other thing I want to highlight is this associations tab, so I've expanded it here and we can see right away that we do not have associations descriptions within the MCV online. Currently, there are only alliance descriptions for our state classification. So you'll have to go to a classification and mapping report or the existing scientific literature to learn more about the association concept and where it occurs or where it's been described spatially. And sort of determine whether that is relevant to your area of interest. In this scenario, we're thinking about our project areas in Marin County. We already know that there's a classification report, so we'll likely encounter that, but I just want to highlight every association has references that justify and describe the concept, so that's what these little numbers are referring to, and I'm going to expand the references here. And you can see those numbers correspond to the reference list here, and all of the references that are used to develop association concepts are always going to be at the top of this reference list. So for example, maybe we want to investigate the reference 24 for this Quercus agrifolia- Quercus kelloggii type. That corresponds to this "Buck Evens 2010" product. This is an abbreviated reference, so we are going to want to go to the MCV bibliography to see what that refers to. Before we do a search in Google Scholar or go to our CNPS or CDFW website for the report.

So here's the bibliography. This is the landing page again at CNPS. If you click on this you can see the bibliography and here is that Buck and Evens, 2010 report. This is a classification report. Going to say again, there's lots of ways to get at this. I've already shown you the BIOS route. But we can also, just search for this classification report or go into the CNPS website and download it, but we're going to say we've downloaded the classification report and I'm going to sort of show you the information in there that you're going to want to look at to answer that third question, which is what?

**Slide 20 (01:52:23): What is the community composition of an SNC? - Classification reports**

What are these associations that are sensitive natural communities? What do they mean and how do I tell them apart? So the first thing that's in these classification reports is the vegetation key, and you can think about this as a similar to like a Jepson key in the Jepson manual that allows you to determine based on characteristics of the species that you have. This key walks you through characteristics of different natural communities to determine which natural community you may be standing in. And it is based on quantitative percent cover data as well as associated species and characteristic species you may encounter. In this example it just keys to alliance level and then has associations below it. So we'll have to go to the alliance and Association, we'll have to go to the association descriptions to learn more how these types are different from each other. So let's look at the Alliance and Association descriptions

in this report. In this one, this is for Marin County again, we have a statewide description but also a local vegetation description. And indeed if your AOI overlaps with this mapping project, you'll want to look at this because there are sort of regional differences to how these types may be expressed, and so you'll want to be aware of that, especially if this report overlaps with your area interest. We also have a membership rule, the Veg key and the membership rules are pulled from these reports and put on the MCV online, so that's sort of where those membership rules are developed from these more localized classification reports. There's also local environmental conditions where it was sampled as well as a list of associations that were sampled in Marin County. And we've just sort of scrolled down to an association within this type. The coast Live Oak Madrone California Bay Association here is that local vegetation description. How you'll be able to distinguish this association from others, local environmental conditions, as well as the state rank, and some additional references that were used to develop this concept.

**Slide 21 (01:54:48): Tool kit**

So that's the overall schematic. Hopefully you have a general idea of your toolkit. The products that are available from that tool kit and how to get them and how you're going to use them to get your ultimate resource that you want. The list of potential sensitive natural communities, known locations of SNC's, and Alliance and Association descriptions. Before I move on, I just want to mention if a classification report isn't available, or even if it is, there is existing scientific literature that's available in the Alliance references or the association references that are outside of the classification mapping reports that you can also use as reference.

Alright, so yeah, so next two topics we're going to cover are some subtleties and data uses and abuses for are spatial data that I want to make sure you're aware of when you're querying not data, and then we'll wrap up with some additional resources if you're in a data gap. If we haven't done a mapping and classification project in your particular area. So will cover some additional resources.

**Slide 22 (01:56:02): Map data uses and limitations**

So some map data uses and limitations. We map natural communities because it's part of biological inventory and we believe they are elements of conservation so, but there are some translation and scale issues that come up when we go from on the ground natural communities to the mapping scale. So there are limitations sometimes to the scale of the imagery: what we can detect versus what we see on the ground. There's also this issue of the minimum mapping unit. We set a standard minimum mapping unit, so a size of a polygon for projects, mapping projects, and that may influence whether an SNC is detected in the map. We've already touched briefly on these embedded, sensitive natural associations under non-sensitive alliances, and we're often mapping at the alliance level. And then also our maps have a level of accuracy that we accept. We accept 80% accuracy or greater with our vegetation maps, so you're going to want to definitely read the mapping report to understand the accuracy of various mapped vegetation types, if you're going to be relying on a vegetation map within your area of interest.

**Slide 23-26 (01:57:25): the importance of scale: Balance of efficiency and representation**

So just speaking briefly, on the minimum mapping unit, we set standards for a minimum mapping unit at the state level, but the balance is we want to map at as fine a fine scale as possible when that patterning is evident. But there's always a balance between mapping efficiency and accuracy and trying to balance

that with fine scale mapping. So there may be different minimum mapping units in the vegetation map that you are utilizing. Again, you'll want to look at the mapping report to understand that. Another, so just walking through examples of that long list that I showed you in the slide or two back. This is sort of an example showing how we have on the ground patterning that we can see when we're walking around, but it may not be visible at the, we often use NAIP imagery, but may not be visible with the imagery that we have available. So here's an example. We have three different distinct vegetation types. This is in Table Mountain outside of Chico, and they are distinct floristically, and they're also distinct environmentally, but they do have some ecological similarity, and we can't necessarily distinguish these at the scale of mapping. We will use the hierarchy, so will group these associations into alliance or maybe even to group level, depending on the quality and timing of the imagery. And they're ecologically similar, but they get mapped as a much larger polygon. I'll just show you really quickly what I mean. Here's that same area zoomed out the Table Mountain area zoomed out. We can see that yellow patterning, so you know potentially that is a vegetation type that we can detect at the time of this imagery, but we certainly can't see the lupine or the selaginella type that was in that last picture, so we'll potentially map this, you know, if we can figure out an alliance that works for this, we might map it alliance, but this was taken in April. Very easily distinguishable. In June, we really don't know potentially even the alliances that are occurring within this broad area. So we're going to utilize this California annual Herb Grass Group, which is in the hierarchy, contains you know all the potential alliances that we suspect in this area, and that gets mapped to the very broad level. So particularly if you're working with herbaceous, sensitive natural communities, but really just to be aware of in general, that you're encountering, you'll want to know the hierarchy and how that how your sensitive associations fit within that hierarchy, so you know that-- OK, maybe I want to look at California annual forb group because there may be sensitive natural communities within that really broad polygon. This is just a zoom out of the same area and how it ended up being mapped in the vegetation map.

**Slide 27-30 (02:00:47): Accessing information on SNCs – Operating in a data gap**

So that's the list of your tools and sort of the subtleties of interacting with that data. Hopefully you have a good idea of the toolkit now and the products that are available. I'm going to walk you through this next scenario where maybe you're in a data gap like up here or something like that. Obviously if you are maybe if you feel that like a classification report, you'll have to have your ecological cap on. But if you're adjacent to a mapping area and your knowledge of your area as it compares to already mapped area seems sufficient, you can still use, you know the classification reports that are available as a sort of supplement, but if you're really outside of a range of a classification report, you might want to investigate these other tools. One thing I want to mention is we do have a classification and Rachelle mentioned this. We have a classification for the whole state, so just because there isn't a mapping project in your area doesn't mean we don't have any information for that. We have existing scientific research that we've reviewed to develop the Manual California Vegetation. These mapping projects really help us more understand association level expressions of vegetation of natural communities. So if you're in a data gap, you're really going to be looking. You're not without information, and in fact that first step of getting a regional list of alliances and comparing it to the sensitive natural community list is going to be stuff that you take if you're in a data gap, regardless. That's going to help you refine and get at your potential SNC list. But what you're not going to necessarily have available if you don't have a classification project, a more recent classification project that follows our standards, is association descriptions that are readily available, so you're going to want, as I've shown you already, go onto the

MCV online and investigate the association references and the existing scientific literature. And so I won't re-show you that, but that is a resource. And then I'm also going to walk you through some additional habitat specific reports that are available on the Natureserve Explorer, which is a web app that allows you to look at association descriptions and then also the CDFW document library. And then we'll jump on over to spatial distribution of sensitive natural communities. Which again, if you don't have a mapping project in your area, you won't be able to query, so there will be some additional resources you can investigate that we will go through.

**Slide 31-34 (02:03:58): Operating in a data gap – Association descriptions from habitat specific reports**

So association descriptions from habitat specific reports. So that would be say, CNPS has a number of these habitat specific reports that they have available on their website. Here's the link here, and so this is more of an approach of, OK, for example, fens have been surveyed across the state, so it's not necessarily based on a mapping footprint, it's more focused on these unique vegetation types. And so you might be able to get association descriptions from these reports it's just a different perspective and a focus more on looking at communities in these particular environmental conditions. So that's a resource you should investigate and then also Natureserve Explorer for association level descriptions. This is houses alliance an association descriptions for the National Vegetation Classification System, which is a system that we, the Manual California Vegetation is working to be in line with. So I'm going to walk you through how to get to association descriptions using this service, with the caveat that this is a houses national data. We're really going to want to make sure the association description that you're looking at is appropriate for your area of interest. So definitely check the references and make sure it makes ecological sense to use the reference that you have available. So here I've put in Quercus agrifolia in the search term. I'm limiting it just to ecosystems, that's interchangeable on this website with natural communities. I'm going to subset the location to California and I'm only interested in tree types where Quercus agrifolia is the characteristic species. So these are ways to just sort of hone in that search here, getting associations relevant to California. And 26 records were found. We have 20 association records and then you can just click on this link. I'm going to click on the Quercus agrifolia – Umbellularia link. And you can see it has a global, because this is a national, it has a global ranking and as well as a summary and a floristic summary. And again it looks like this type is really just known from the Santa Monica Mountains region, so you'll want to think critically about whether this association description is useful for where you're working or whether you would suspect this type occurs. Obviously, if you're working in the Modoc area, maybe you can feel comfortable with this association maybe not being one you need to worry about. Finally, the CDFW document library has come classification and mapping projects that may, or at least classification projects or reports that include vegetation classification descriptions that may not be associated with the mapping footprint, so also worth checking this document library for additional reports.

OK, so there's association descriptions, where to more fully investigate what associations mean if you're in a data gap and then also we're going to talk about how to find maybe some additional information on spatial distributions of sensitive natural communities if you're in a data gap. So we're visiting. Oops, sorry, I'll just walk you through. We're going to go back to BIOS. We'll briefly touch on the natural communities layer in CNDDB and we'll talk about CalVeg and the National Wetland inventory Data Mapper.

**Slide 35 (02:07:48): Operating in a data gap – BIOS**

So this is again more habitat based, so you'll have to sort of have an understanding of you know what habitats might have sensitive natural communities. Here I've highlighted aspin and you can see there are a number of spatial data sets that note aspen stand locations, or at least Aspen species locations. So again sort of more of a habitat specific approach. Next, the natural communities layer in CNDDB, Rachelle, already touched on this, but this layer hasn't had any new occurrences added in over 20 years. But if in you're in a data gap, still worth checking for CEQA review, so that's available via BIOS and you may already be aware of this layer. This is just sort of to hit home. Again, we're talking about data gaps, so still a good resource for now. How about 20 years of not being updated impacts the data availability? This is an area of the northern Great Valley and the yellow is highlighting Great Valley oak riparian forest. We did end up mapping that area in the Great Valley map and here's a zoom in on that same area and you can see how much more detailed and how many more occurrences are available all in yellow through our Great Valley map. So just sort of hitting home why you really want to investigate our vegetation maps for sensitive natural community occurrences.

**Slide 36-37 (02:09:26): Operating in a data gap – CalVeg and NWI**

Another available resource if you're in a data gap is CalVeg. This is a both a classification system and a map that is produced by the Forest Service. It does, it is in line with the National Vegetation Classification and the system that we're working to be in line with as well, but just be aware it's not as fine scale as our maps, so some types may approximate to alliance level. Others might be more group or macro group level, but still a good resource if you were wanting to get an idea of what vegetation might be out there. You can follow this link to understand the classification and download vegetation map as well. And you'll want to use it in tandem with the MCV online crosswalk tool to sort of understand, because it is a different classification system, you'll want to use this crosswalk tool to understand how the mapped types in the CalVeg map relate to our standard California vegetation classification. So here's how to do that. We are back at the MCV online landing page. We're using this classification conversion tool. And this is what pops up, so if you're coming from the CalVeg map, you're going to want to specify that as the classification system, you have some coast Live Oak mapped in your area of interest, and then you press search and it's going to pull up the relevant MCV, Manual California vegetation, alliances that fit within that Cal Veg concept. So just be aware that there may be a one to many relationship between CalVeg mapped types and the manual of California vegetation classification. Finally, we're going to look at this national wetlands inventory Mapper, so that's this is again more of a habitat based approach because wetlands, typically, you know, are a limited resource in California, so they often also have sensitive natural communities within them. This data comes with its own set of uses and abuses that you should definitely read up on, but it is a nice resource for seeing if there's any wetlands in your area that could potentially house sensitive natural communities?

**Slide 38 (02:11:13): Surveying for SNCs and natural communities**

Finally, just wanted to touch really briefly on approaches for surveying for sensitive natural communities. We do have protocols or let's see, let me find my little tool here. OK, we do have protocols for serving and evaluating impacts to natural communities. This is more of a project based approach and recommendations for ensuring adequate disclosure. So just some recommendations there. And then if you're in the field surveying there are protocols for how to determine a stand vegetation and the data that you'll need to collect to use those like vegetation keys that I walked you through, or those membership rules, or the classified association descriptions. So those protocols are available for

download on the VegCamp website as well. I've generated a list of resources here that Rachelle is going to talk with you guys on how to make more readily available to you so you can use all these links. And if you're hitting a wall with any of this, just let me know. I just want to let you guys know that we are available for questions if you're really hitting a wall in trying to determine what your sensitive natural communities are, we are happy to answer your questions. And that is my talk, I think I've gone way over. I apologize.

No worries, no worries Betsy. It was a lot of information. Thank you so much. So let like Betsy mentioned, we are over time a little bit, but we'll start our break right now. I'm going to share the agenda for you all to see. We kind of will just push everything a little forward, so we're studying the break now at 10:45.

**(02:14:30): Agenda and 15-minute break**

Greg O'Connell will come on right after the break at 11, so hopefully we can still answer some questions for you at the end, we'll do what we can with what time we have, but we will answer questions via email afterwards if nothing else. So thank you all. That's the first half of our webinar. Please join us back at 11 AM. And if you have questions during the break, somebody might be able to answer them. Or if you're having issues, please let me know. OK, see you in 15 minutes. Thanks everyone.

## Section 4 – Greg O'Connell, CDFW Region 1: Addressing Vegetation in Environmental Review

**(02:29:03): Agenda and welcome back from break**

Hi everyone, welcome back. Hope you had a good break. We're just gonna move right along here and try to get make up some time if we can. Greg O'Connell now will talk to us. He's with CDFW region 1, he's going to be talking to us about addressing vegetation in environmental review.

Greg, are you there?

I sure am.

Great. I see your slides thanks, good luck.

Alright thanks.

**Slide 1 (2:29:31): Addressing Vegetation in Environmental Review**

As Rachelle mentioned, my name is Greg O'Connell. I'm an environmental scientist with the California Department of Fish and Wildlife in the Northern region. I work on the coastal conservation planning team and the Habitat Conservation program, and I review and comment on proposed projects in Humboldt and Del Norte counties.

So I've got an outline here. Slide of topics covered. The first is just what is environmental review? What do we mean by that? Vegetation considerations and environmental review. This talk primarily focuses on sensitive natural communities. There's also the topic of individual rare plant populations that some of this pertains to, but the general focus of my talk is sensitive natural communities. The importance of

baseline studies and impact assessments. Mitigating impacts. Pitfalls to avoid, and I'll also offer some advice on some good practices as well.

**Slide 2 (2:30:33): Environmental review**

So environmental review. What does that mean? I think a simple explanation could just be the process of reviewing a project and its potential environmental impacts. Some common ways that this is done are through the California Environmental Quality Act (CEQA). Additionally, there's a national version, the national Environmental Policy Act (NEPA). There's differences between the two, but there's a lot of similarities as well.

These are often triggered by some type of a permit that may be needed, and each of these permits could also be considered some type of an environmental review as well: The state and federal Endangered Species Act. The Clean Water Act administered by the Army core of engineers, and in California, the Water Boards also. Streambed alteration agreements, a permit issued by the department Fish and Wildlife. Coastal development permits. Local conditional use permits from the city or county. Uh, and other types of permits as well. And again, the focus of my talk is really going to be about CEQA and the implications of CEQA and how to address sensitive natural communities in the CEQA process.

**Slide 3 (2:31:49): Environmental review**

It's good to start off with the legislative intent of CEQA. The statues were originally passed in 1971 and the legislature included some intent as well, and I've got a few examples of that intent that's in code. The maintenance of a quality environment for the people of this state, now and in the future is a matter of statewide concern. There is a need to understand the relationship between the maintenance of high quality ecological systems and the general welfare of the people of the state, including their enjoyment of natural resources of the state. The capacity of the environment is limited, and it's the intent of the legislature that the government of the state take immediate steps to identify any critical thresholds for the health and safety of the people of the state, and to take all coordinated actions necessary to prevent such thresholds as being reached.

**Slide 4 (2:32:49)**

Additionally, it's the intent of the legislature to preserve for future generations representations of all plant and animal communities.

**Slide 5 (2:33:02): Environmental review - CEQA**

The California Department of Fish and Wildlife could play one of several roles in a CEQA process. Most commonly we'll act as a trustee agency which has jurisdiction by law over natural resources affected by a project which are held in trust for the people of the state of California. That source comes from Fish and Game Code Section 1802, which states that CDFW has jurisdiction over the conservation, protection and management of fish and wildlife, native plants, and the habitat necessary for biologically sustainable populations of these species. Cal Fish and Wildlife may also play a responsible agency role, which is a public agency other than the lead agency, which has discretionary approval power over the project, and that typically occurs when an agency is issuing a permit for projects such as a lake or streambed alteration agreement or an incidental take permit. Frequently, at least in the area that I work in, the department could act as a lead agency, which is a public agency that has principal responsibility for

carrying out or approving a project. Most examples that I see in the region I work in, cities or counties who have land use authority in the region are most often the lead agency, and the Department of Fish and Wildlife would always play trustee agency role, and play a responsible agency role if we're issuing the permit.

**Slide 6 (2:34:29): Environmental review - CEQA**

So. What's the purpose of CEQA here? And so I've got a couple of examples of that as well. CEQA serves to disclose significant environmental effects of proposed projects for the preparation of secret documents, such as an initial study, a negative declaration, a mitigated negative declaration, or an environmental impact report. Prevent or minimize damage to the environment through development of project alternatives, mitigation measures, and mitigation monitoring. To disclose the lead agency's decision making process. To enhance the public participation through scoping meetings, public notice, review and hearings. And to improve interagency coordination with early consultations, scoping meetings, notice of preparation and State Clearinghouse document review.

**Slide 7 (2:35:26): Environmental review - CEQA**

The CEQA guidelines Appendix G is a checklist that's often used to meet the requirements for an initial study to determine if a project would have a significant impact on the environment. As you'll see here, there's 21 different categories that need to be analyzed into CEQA process and biological resources are just one.

**Slide 8 (2:35:47): Environmental review - CEQA**

Within that CEQA checklist, there are specific questions that are posed, and they're often used to meet the requirements of an initial study. I've got section B highlighted in red here, it asks the question: Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the Department of Fish and Game or the US Fish and Wildlife Service?

**Slide 9 (2:36:20): Environmental review - CEQA**

So how would you know if a project might impact a rare plant or sensitive natural community? Well, you can use the Department of Fish and Wildlife protocols for surveying and evaluating impacts to special status native plant populations and sensitive natural communities. This was referenced by another presenter earlier on. In this document it states that botanical surveys, field surveys, provide information used to determine the potential environmental effects of proposed projects on special status plants, and sensitive natural communities as required by law. It goes on to state that CDFW's list of California terrestrial natural communities is based on the best available information and indicates which natural communities are considered sensitive at the current stage of the California Vegetation Classification.

**Slide 10 (2:37:15): Environmental review - CEQA**

Again, how would you know if a project might impact a sensitive natural community? As was explained earlier on the California Department of Fish and Wildlife's VegCAMP Program, maintains a statewide list that's updated regularly and this is the most current example of it. So going back again to. Asking Appendix G checklist questions: Would the project have a substantial adverse effect on any sensitive natural community identified by CDFW? Well, this is the list, and as you can see I've got some of the

heritage ranks listed below. Let's see if I can put my cursor on over here. As far as some of the definitions or descriptions of these from S1 being critically imperiled all the way down to S5 being secure, that's been the state level of analysis.

**Slide 11 (2:38:07): Environmental review - CEQA**

There's a couple of other sections in CEQA guidelines that get more specifically at some of the requirements of the analysis in the CEQA process. Guidelines section 15125 C gets into the environmental setting portion and it states that special emphasis should be placed on environmental resources that are rare or unique to that region and would be affected by the project. I'll talk about a couple of examples here with these photos. The top photo here is the Astragalus purshii species, the woolly pod milkvetch. This species is common in higher elevation portions of the Sierra Nevada, but in Humboldt County where I work, there's really just one or two occurrences throughout the whole county at higher elevations in rocky substrates and the plant community that occurs here may also be locally rare. So certainly the species is locally rare, and this vegetation type may be as well. So, this should receive a consideration, in the CEQA process. Additionally, Dudleyas. This is Dudleya farinosa that grows on rocky bluffs kind of above the salt spray of the ocean. It occupies a very narrow range of ecological conditions, and it's also suffered impacts from poaching and folks collecting this plant. So, both of these species which may not be individually listed as rare, statewide or a sensitive natural community, at least within the region that I work, these should receive consideration in the CEQA process.

**Slide 12 (2:39:40): Environmental review - CEQA**

There's also a section in CEQA guidelines about mandatory findings of significance. In those cases that, if the project may impact one of the subcategories of a mandatory finding of significance, the lead agency shall determine that it may be a significant impact, and they'll produce an environmental impact report. The full version of CEQA analysis. And one of the sections within the statement, I'm sorry the mandatory finding of significance, is it includes if a project would threaten to eliminate the plant community.

**Slide 13 (2:40:22): Environmental review - CEQA**

CDFW considers all S1 through S3 rank natural communities who meet the criteria in CEQA Appendix G Section 4B and may meet the criteria of CEQA guidelines sections 15065(a), mandatory findings of significance, and 15125(c), the environmental setting, with locally rare things. Therefore, project impacts to S1 and S3 sensitive natural communities may be significant and should be addressed and avoided or mitigated if potentially significant.

**Slide 14 (2:41:01): Local ordinances and laws**

It's important to also consider local ordinances as well. General plans, zoning ordinances, and things like that. Those are also project impacts and the project effects need to be compared to those as well at the local level. In this example in Sacramento County, they've got sections within their general plan that states that they need to ensure no net loss of wetlands, riparian woodlands, and oak woodlands. To ensure mitigate mitigation occurs if any loss of or modification to the following types of acreage and habitat functions, such as vernal pools, wetlands, riparian, native vegetative habitat, and special status species habitat.

**Slide 15 (2:41:55): Local ordinances and laws**

Santa Cruz has some language in their ordinance as well that defines what sensitive habitats are, including things like coastal scrub, chaparral, oak woodlands, native pines, and ancient forests.

**Slide 16 (2:42:14): Local ordinances and laws**

And that these habitats shall be protected against any significant disruption of habitat values, and that any proposed development within or adjacent to these areas must maintain or enhance the functional capacity of the habitat. And to reduce in scale, redesign, or if other if no other alternative exists, deny a project which cannot sufficiently mitigate adverse impacts on sensitive habitat.

**Slide 17 (2:42:40): Local ordinances and laws**

Humboldt County also defines sensitive habitats in their general plan, including habitat for federally or state listed species, certain types of wildlife habitat for deer, elk and avian rookeries, aquatic habitats, such as streams and wetlands, and additionally, vascular plant communities identified by the Department of Fish and Wildlife and other sensitive habitats.

**Slide 18 (2:43:08): CEQA cumulative impacts**

I wanted to talk a little bit about cumulative impacts. It's an important part of the CEQA process to look at cumulative impacts as well. There are instances where an individual project may not appear to have a significant impact, but when you take the totality of all projects combined, there may be potentially significant impacts. This slide is an example of a wildlife comment letter from a development project in Santa Barbara area for an Environmental Impact Report dealing with raptor foraging habitat, grasslands, and other habitat types which may also be sensitive natural communities. Cumulative impacts may be significant when incremental effects are cumulatively considerable in connection with the effect of past current and probable future projects.

**Slide 19 (2:43:58): CEQA mitigation**

Mitigation is also an important part of CEQA to mitigate significant impacts. The term mitigation is defined in code that includes avoiding the impact altogether, minimizing the impact, restoring the impacted environment, to reduce or eliminate the impact over a time, preservation or maintenance operations during the life of the action, similar to avoiding or minimizing the impact, and also by compensating by replacing or providing substitute resources, including permanent protection, this is compensatory mitigation.

**Slide 20 (2:44:43): Avoiding pitfalls in environmental review process**

Lastly, I wanted to talk about some pitfalls to avoid in the environmental review process. One would be relying solely on previously mapped records without current field surveys. An example would be the natural communities described on the California Natural Diversity Database. CNDDB is a positive occurrence data set. As mentioned earlier, the veg program funding halted in the 90s or so and that updates to mapping of sensitive natural communities will occur after statewide mapping is complete, so there's some potential uses and abuses of that data set.

Another is using vegetation descriptions that are too broad, such as the California Wildlife Habitat Relationships which were discussed earlier. Some examples include descriptions of vegetation types, such as coastal scrub or perennial grasslands, which are in the California Wildlife Habitat Relationships.

Those are generally too broad to determine if a vegetation type is a sensitive natural community, we need finer descriptions of vegetation types that utilize the current classification and list provided by VegCAMP.

Another potential problem would be proposing new vegetation types without prior coordination with VegCAMP staff. They go through a pretty rigorous process of describing natural communities and classifying them through statistical analysis, and it's possible that a project you're working on may have an undescribed alliance or association or vegetation type, but it would be inappropriate to just start proposing things on our own. We would need to vet them through VegCAMP staff and provide data to them for their consideration so that it might be included as a unique vegetation type.

Another potential pitfall is not using VegCAMP's current Natural Community list. The current version has been shown a few times throughout the day here, and it's updated periodically, so make sure you keep tabs on that and figure out when the updates come out and use the current version of that list. There's been the reorganization of natural communities over the year or last several years, including some lumping where things that were previously described at the alliance level have been lumped with other alliances, and are now at the association level, so you need to use the current list.

Another potential pitfall is minimum mapping units that are too large. There's been a few examples of this already today, particularly for herbaceous communities. There are some descriptions and protocols talking about minimum mapping units on the scale of acres. That's generally not sufficient for projects that are being reviewed in the CEQA context. We're talking about stands of vegetation and communities, which particularly for herbaceous things, can be quite small. You know, 1/10 of an acre or less in some cases.

Another potential pitfall is mitigation. If there's deferred study or analysis that can be a big problem. Occasionally I'll see a mitigation measure for a CEQA project that says we haven't done botanical surveys yet, but we're going to do our plant surveys and that's mitigation measure #1. If you have a deferred or incomplete survey and analysis, you can't assess the adequacy of the surveys, and therefore you can't assess the impacts, and therefore you can't tell if the mitigation is feasible or effective. So avoiding deferred studies and analysis is really important. And deferring mitigation is a potential pitfall as well. Saying that you know, we know that there are sensitive natural communities that will be impacted and we will develop a mitigation plan, that's not adequate. We need specific details of how mitigation will occur. Will it be feasible? Are their performance standards for success of mitigation? And what are the monitoring methods so that we know how those performance standards will be met? How will we know when it's successful?

**Slide 21 (2:49:02): Good practices**

I wanted to talk about some good practices as well. Robust disclosure of the environmental setting and project impacts, disclosure is the is the heart of CEQA. You need to describe the environmental setting (what's there currently before the project?) so that you can analyze projects, effects, and have this before and after comparison to really describe what the impacts may be.

Having an appropriate study area is important, this term the whole of the action. Somebody may be trying, the project may be to build a single family home, but in a lot of cases that shouldn't be the study area of the project. Will they build a new driveway or road to get there? If construction occurs where

will the heavy equipment be parked and staged, accessed? If there's soil or stockpiling of other materials, where will that occur? So you really need to take the whole of the action into consideration for your area.

Floristic surveys are important. That means to get out there as many times as necessary to to figure out what's out there. Going out to a project site one time is usually not sufficient in most cases to characterize the vegetation that's out there. It can change seasonally, and especially for individual rare plants as well. So often times two or more site visits are needed to really capture the floristics of a site.

Another good practice is to map vegetation types at the association level. This was mentioned earlier today that most of the sensitive natural communities occur at that level and mapping at the alliance level is insufficient, mostly.

Another good practice is to include relevé or rapid assessment data sheets in your process. These forms are fairly simple, they're not too hard to fill out. Folks should be keeping a species list anyway, which is a big part of this data sheet, and you can include these as an appendix to your botanical reports. It'll add credibility to your report and transparency, and then if there's any questions about you know rules of membership or things like that, you've got the data to back it up.

It's important to submit your data. It's required as part of a CEQA process. If you're finding individual rare plant populations, submit that to the California Natural Diversity Database. If you are mapping sensitive natural communities, send your relevé or rapid assessment data sheets to VegCAMP.

Also to check VegCAMP's website for updates and guidance. There's new information that comes out all the time, but not so much super all the time, but occasionally so it's good to keep track of that and to check that website from time to time and look for information. New and better information is coming out all the time.

And lastly, it's good to coordinate early with local CDFW staff that may be reviewing a CEQA project. If you have any questions at all, or if you think a project may be complicated or there's a gray area. It's way easier to deal with things and work out potential issues before a biological report is finalized or before your CEQA document is in public circulation. It's really nice to pre-consult on things and to get potential issues out of the way before we're in a public process.

**Slide 22 (2:52:24): Thank you!**

Okay I would like to thank you for your time.

Thank you, Greg. Up next is Lori Koteen coming to us from the California Coastal Commission. Lori, if you could unmute and share your presentation. Yes, hi, can you see my presentation? Yes thanks Lori great.

## Section 5 - Laurie Koteen, California Coastal Commission: Treatment of Sensitive Natural Communities by the California Coastal Commission-

**Slide 1 (02:52:47): Treatment of Sensitive Communities By the California Coastal Commission**

Hi, I'm Laurie Koteen and I am a senior ecologist with the California Coastal Commission. I'm also the ecologist for the North Coast region, including Mendocino, Humboldt and Del Norte counties, as well as San Diego County and San Luis Obispo County in the South.

**Slide 2 (02:53:11): California Coastal Commission Approach to Protecting Sensitive Habitats and Species within the Coastal Zone**

For those who may not be aware, the Coastal Commission is a State Regulatory agency that overseas development along the coast pursuant to the Coastal Act, which was passed by the legislature in 1976. Today the coastal zone is delineated by a politically drawn boundary that marks the regions under Coastal Commission jurisdiction. Here I showed two examples of the coastal zone. The coastal zone boundary which you can see meanders inland or clings to the coastline depending on coastal features and decisions made on the county level, about which areas should receive an added layer of coastal protection.

**Slide 3 (02:53:56): Coastal Act Policy 3017.5 - Definition of what constitutes an ESHA**

At the Coastal Commission, the Coastal Act is the basis for all our policies and practices. The Coastal Act defines sensitive species in communities as environmentally sensitive habitat areas which we refer to as ESHA. Specifically, the Coastal Act defines in environmentally sensitive area as any area in which plant or animal life or their habitats are either rare or specially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments. There are three important parts of this definition that I will flesh out in the next few slides, and these are species and habitats that are rare, areas that are considered especially valuable because of their special nature or role in an ecosystem, and areas that are easily disturbed or degraded.

**Slide 4 (02:54:57): Rarity**

For this next slide, I'm very thankful that Julie and Betsy did their presentations before mine as they were able to describe the Nature Server rarity rankings. At the Coastal Commission we define rarity according to state and federal designations and these include any plant or wildlife species listed as endangered or threatened by the federal government, including candidate species. Any plant or wildlife species listed as endangered or threatened by the state, including candidate species. Any CDF, wildlife species of special concern, or fully protected species. And any plant species or habitats with a ranking of S1 through S3 or a global ranking of G1 through G3 and any plant species ranked by the California Native Plant Society as 1B or 2. So where several of these lists referred to species, an ESHA is an area delineated on the landscape, therefore, any area that supports these recipes, or which constitutes a rare community on its own, is considered an environmentally sensitive habitat area.

**Slide 5 (02:56:26): ESHA**

The especially valuable part of the definition is a little less tangible and amounts to a judgment call on the part of the ecologists overseeing the project; however, it must be defensible on ecological grounds, and ultimately, the Commission, which is the panel of 12 appointed Commissioners that approve or deny coastal Commission permits are the final arbiters of what is ESHA. Some examples of it, and especially valuable habitat are, a community at the southernmost portion of its range with population level genetic differences important for community adaptation to climate change. Another example would be an intensely used riparian area embedded in a dry or urban landscape that serves as an

important local resource for wildlife. And another example, would be a native grassland or other community that is especially pristine given the history of non native invasion of California grasslands, or a corridor linking one sensitive habitat with another, or which enables species or community migration as the climate changes.

Regarding the easily disturbed part of the ESHA definition, I believe that the status of being classified as rare in and of itself implied that a species or habitat is easily degraded or disturbed, given that has been reduced in abundance and distribution by human activities already. Also, at present, especially in highly urbanized regions of the state where habitats have been reduced in size, isolated, and are subject to numerous ongoing human impacts, habitat do not require extensive impacts to be further degraded. These impacts include species invasion, noise, excessive light, pesticides, altered hydrological regimes, development pressures, and many others. Further, the impacts of climate and other anthropogenic changes in population and development pressure make virtually all sensitive habitats and species vulnerable to further decline.

**Slide 5 (05:58:51): Types of development allowable**

Types of development that are allowable in environmentally sensitive habitat areas are few, and these are defined under Coastal Act section 30240, which states that environmentally sensitive habitat areas should be protected against any significant direct disruption of habitat values and only uses dependent on those resources should be allowed within those areas. Some examples of allowable activities or for development in ESHA include habitat restoration, construction of coastal trails for enjoying coastal habitats, or research would be another allowable use. The Coastal Act places restrictions on development that occurs adjacent to ESHA stating development in areas adjacent to environmentally sensitive habitat areas in Parks and Recreation areas shall be cited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitats and recreation areas. Uhm, typically what this means is that a buffer is required to be placed between the ESHA and the development, and these buffer distances are established by individual local coastal plans, which are kind of like mini coastal acts, that are adopted by various governmental entities, usually cities and counties. Buffer distances to be erected between ESHA and the development are usually 50 feet. However, that can vary depending very much on the project and the type of community that's being protected. And, you know, if an argument can be made for a larger buffer, we attempt to do that and also in some cases, you know, a smaller buffer may be justified, as well.

**Slide 6 (03:00:59): Wetland protection**

And there are a separate set of policies that govern allowable developments in wetlands, and these are listed in Coastal Act section 30233, which states the diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division where there is no feasible less environmentally damaging alternative. And where feasible mitigation measures have been provided to minimize adverse environmental effects. Examples of allowable uses in wetlands include coastal dependent industries, examples of which are energy generation, desalination, marine agriculture, or port operations or judging of previously dredged waters. However, as stated here, the development must be the least environmentally damaging and impacts must be mitigated.

**Slide 7 (03:01:57): Development proposed in ESHA or wetlands**

When development is proposed in environmentally sensitive areas and wetlands, our primary tool is avoidance for all uses that are not dependent on that resource. For impacts that are allowable under the Coastal Act, projects are required to mitigate further impacts to sensitive resources, primarily through creation of those resources in another location. Do the temporal loss of resources that are impacted and the uncertainty of success, impacts must be mitigated at multiples of the areas impacted. Usually this is 4:1 for impacts for wetlands and 3:1 for impacts to ESHA. And the next set of slides I decided I would introduce two case studies from significant projects. One is example of the permit conditions required for avoidance of sensitive communities and the second is an example of an extensive mitigation effort, and these are both projects which I've been directly involved in.

**Slide 8-14 (03:03:17): Case Study – Avoidance of Mussel Bed at the Dr. Fine Bridge**

So a good example of a project where the Coastal Commission permit conditions require avoidance of a sensitive community is the replacement of the Dr. Fine Bridge by Caltrans. This is a bridge that spans this Smith River all the way to the north in Del Norte County and it will be replaced by Caltrans due to safety concerns. And this project is gearing up right now with construction and anticipated to begin next year.

In this case, the main ESHA requiring protection from construction activities associated with replacing the bridge is a large muscle bed that runs from east to west below the bridge outlined here in red. And the western pearlshell muscle, which is the muscle that resides within the muscle bed, is an increasingly rare freshwater mussel species that has established within this Smith River, with the main, very large, mass muscle bed spanning the bridge as is visible in the photo. So in order to ensure survival of the muscle beds to the extent possible, we've established numerous conditions to protect the muscle bed through our permitting process, and I'm going to go over what those conditions are here.

Uhm, some of these conditions include pre-construction monitoring to determine the condition, size, and density of muscles within the muscle bed for comparison with conditions during the project, and also after the project has been completed. Monitoring throughout the construction phase for observation of behavioral or physiological change in the muscles and possible causes of those changes, some of which include excessive vibration. Very high or very low temperatures, or the water velocities that would cause the muscles to be dislodged from the bed. Another effort involves tagging of many individual muscles to track their movements within the water column into the soil substrate or downriver. And also, in addition, we require post construction monitoring for comparison with the pre-construction muscle bed.

Uhm, other monitoring and reporting requirements are pretty extensive and require pre-construction monitoring. In late spring, the time of reproduction, to determine the period when muscles complete reproductive activities so that the construction project can avoid any interruptions to the reproductive cycle. Or if it's absolutely impossible to avoid the reproductive cycle so that we can know that impacts are occurring during the timing of reproduction and mitigate for those.

And we also require other types of pre-construction monitoring to determine the timing when muscles borough in the streambed substrate. Because during that time period they do not necessarily need to be directly observed because they will not be impacted by construction. As it turns out, with this species in this location, they all tend to borough in the substrate, you know, beginning in the late fall. Uhm, and another part of the monitoring requirements, or actually pre-construction requirements, that involves investigation and establishment of possible relocation sites if the muscles are impacted despite, you

know, all precautions, all efforts to really try and avoid impacting muscle bed, which in this case is kind of inconveniently located, you know, right beneath the bridge.

In in another example of, a, another measure involved is alteration of the gravel berm that's created to facilitate construction in each year of this project. So the project is only able to go forward when water levels are lower and water velocities are less high and so there are seasons of construction and each year of the project a gravel berm will be installed across the river. As you can see in this figure, I've kind of drawn it in there. And the result of berm establishment would be to increase the velocity of the stream flow through the narrowed opening created by the berm. So in order to reduce the stream velocity, and thus, potential scouring of the muscle bed there, the construction requires culverts to be cut through the berm to increase the volume of flow through locations other than those just adjacent to the muscle bed and reduce the water velocity caused by the berm construction.

**(03:09:02): Mitigation of Project Impacts**

OK, that was my example of all the steps that we can take in order to avoid impacts to sensitive resources and communities. And now I'm going to shift and talk to you about a mitigation project. So The second case study is an example when impacts are unavoidable but can still be found to be allowable under the Coastal Act and in those cases the remedy for impacts to sensitive communities is mitigation. One of our largest projects, by far, involves mitigation for the operation of the San Onofre Nuclear Generating Station. A project that was constructed by Southern California Edison. Mitigation in this case is for the intake of seawater for cooling of the nuclear reactor and discharge of heated water to the oceans resulting from the loss of sea life.

As I said, this is a very large mitigation project with two primary components to offset project impacts. These are the creation of the San Dieguito wetland in San Diego County, a wetland of 150 acres, and also creation of the Wheeler North Reef, which is an artificial reef created offshore of San Clemente. This project is so large that it requires three contract scientists with large staffs overseeing monitoring of the projects. In addition to the contract scientists and their staff, there is a scientific advisory panel with three additional scientists who advised the Coastal Commission on the success of the mitigations and together Commission staff and this group of scientists meet approximately monthly to analyze the success of the project and also to advise Southern California Edison how to adaptively manage them. In addition, the contract scientists, they give annual public workshops for the mitigation projects, for both the reef and the wetlands. And all the data, and the analysis scripts of how they analyze the data, and also the metadata are actually stored for public access at the Environmental Data Initiative repository.

Here I'll give a little bit of detail about our monitoring approach and how we determine if mitigation project is successful. The overall evaluation framework requires that the restored wetland achieve a set of absolute success criteria or standards, and also that it meets a number of success criteria in comparison to three reference wetlands.

So the absolute performance standards, or success criteria, applied just to the restored wetland, and there are requirements related to the title prism that's entering and leaving the wetland, and also the wetland topography, that the topography be maintained consistently overtime. And if not, that it be adaptively managed. And then there are also requirements that the area of three wetland types are represented and these are subtitle areas, mudflat, and title marsh. And that these are representative with certain acreages. So it's not enough that there's mudflat and there's tidal marsh. You must have

certain amounts of each habitat types. Also required as part of the absolute standards, the plants are adequately reproducing and that exotic species are kept below established thresholds.

There are also numerous relative performance standards or success criteria, and these criteria are measured in relation to three regional, naturally occurring, reference wetlands, so the whole idea is to ask the question if the mitigation project is performing similarly to natural wetlands and how they perform in terms of ecosystem functioning structure. You can see here that the list of a list of performance standards and also on the map on the right you can see the location of the reference wetlands, including Carpinteria Salt Marsh, Mugu Lagoon and the Tijuana Estuary, and these are all, as you see, located, you know, fairly near to the San Dieguito Lagoon restoration.

**(03:14:25): Artificial Reef Mitigation: Wheeler North**

So lastly, I'll go into less detail about the artificial reef, but the Wheeler North Reef has very similar monitoring criteria to the wetland and also must meet both absolute and relative standards measured relative to two natural, regionally located reefs. Both mitigation projects must meet success according to the permit conditions ror a full 30 years, which is the duration of the impacts associated with the operation of the San Onofre Nuclear Generating Station facility. So as you can see, this is a very large and dedicated mitigation project with lots of complicating and interesting factors, and that's what I have. So thank you very much and I'm happy to answer any questions at the end if there's time.

## Section 6 - Allison Schichtel, Sonoma Ag + Open Space: Vital Lands Initiative & Protecting Sensitive Natural Communities in Sonoma County

**Slide 1 (03:15:31): Vital Lands Initiative & Protecting Sensitive Natural Communities in Sonoma County**

Thank you, Lori. That was great. Up next is Allison Schichtel with Sonoma County. Allison, If you can unmute yourself and share your screen that would be great. OK, you should be able to see my slides now. Yep great thanks great. So I'm coming from Sonoma County. The Sonoma County Agricultural Preservation and Open Space District and today just wanted to share briefly some of the work that we're doing as we look towards implementing our long term strategic plan.

**Slide 2-3 (03:15:51): Sonoma Ag & Open Space**

But first a little bit of background for those who aren't familiar with AG and Open Space (which is the short name). We have a mission of permanently protecting the diverse agricultural natural resource and scenic open space lands of Sonoma County for future generations. We are a special district of the County of Sonoma, and we use funds from a county wide quarter cent sales tax to conserve farms and ranches, scenic landscapes, natural resource areas, greenbelts around cities and land for public access and recreation.

So we were founded in 1990 and we've since protected over 123,000 acres of land in Sonoma County. So what you're seeing on the map here, primarily we protect lands through the purchase of conservation easements--the olive green here on the map.  and these are a voluntary legal agreement between a landowner and AG and Open Space that restricts the amount and type of development that

can take place on their property. So across the county, we've protected properties that support old growth, redwood forests on the coasts, working farms and ranches outside of cities and communities like Petaluma and Sebastopol, we've protected parks and preserves on Sonoma Mountain and along the southern Mayacamas Range, and many of the head water areas for streams that are critical for natural and human systems.

**Slide 4-6 (03:17:26): Fine-scale Vegetation Map**

So today I want to share how AG and Open Spaces is integrating information about vegetation rarity with our county wide vegetation data to prioritize our conservation work based on the presence of sensitive natural communities. Want to acknowledge that this work is made possible through the work of the Sonoma County vegetation mapping and LIDAR program. This program was initiated and led by AG and Open Space and Sonoma Water in 2013, with the goal of updating our foundational countywide land use and land cover data and would not have been possible without the support and partnership from those folks we see here on the right, including the Veg camp team from CDFW and with support from CNPS as well as other funders including a grant from NASA through their carbon monitoring system program and led by University of Maryland.

So through the Sonoma Veg map program, in addition to generating a full suite of data relevant to topography, hydrology, vegetation structure across the county of Sonoma, the kind of crown jewel of this work was the development of the fine scale vegetation map that was released in May of 2017. So the fine scale vegetation map includes 82 classes, primarily representing vegetation communities at the alliance level with mapping units that range from a quarter acre for ag classes and herbaceous wetlands and riparian areas up to a minimum mapping size of 1/2 an acre for upland woody and herbaceous classes. And just to zoom in and share some of the detail that's captured in this fine skill vegetation data set here. Up in North County you can see along the Russian River corridor the alluvial floodplains that are primarily in vineyard and a smattering of different oak and chaparral species in this area.

The fine scale vegetation map was developed based on vegetation descriptions as have been discussed earlier this morning. Per a manual put together by CDFW and CNPS with authors Anne Klein, Todd Keeler-Wolf and Julie Evans, and in the development of the vegetation descriptions, also the team worked to create a classification system and dichotomous key for mapping the vegetation alliances in Sonoma County and this information is described both in the report from the Veg camp team as well as the Sonoma Veg Map final report, which provides some examples of what these communities look like from field plots as well as aerial imagery and information about the accuracy of the vegetation data themselves.

**Slide 7 (03:20:40): Vital Lands Initiative**

So wanted to first share the Sonoma veg map data recognizing it's been foundational as AG and Open Space has worked over the past few years to develop and update our long term strategic plan for focusing our conservation work. In January of this year, the board approved our document, the Vital Lands Initiative, which is a long term vision for land conservation in Sonoma County that's guiding the work of AG and Open Space from now through 2031. We went through a pretty robust community engagement process and heard from the community about what they value across the landscape and helped us identify priority areas and strategies for protection. And this work spans across multiple goal areas. We are a multi-benefit organization tasked with protecting both the agricultural lands in Sonoma

County but also important natural resource areas. And house within this document our objectives and strategies for achieving goals, recognizing that we have limited time and funds.

**Slide 8-9 (03:21:57): Protecting Sensitive Natural Communities**

So, to focus really specifically on sensitive natural communities, specifically, vegetation communities within the Vital Lands Initiative document, we have an objective to protect the highest priority old growth and mature conifer and conifer-hardwood forests, as well as priority oak Woodlands, shrublands grassland and nonwoody vegetation. Really broad, general language protecting priority vegetation communities.

When we look at specifically what that means, we took direction from the statewide classification system and from CDFW to map and identify priority vegetation communities according to both the state rarity rank, per the survey of California vegetation, and also looked at local rarity. So may have elevated in priority a vegetation community due to it not being very common within that county of Sonoma. So looking at what's shown on the right here, drawing from the fine scale vegetation map, which is at the alliance level, we mapped vegetation communities as high priority if they were considered to be critically imperiled, so the S1 ranking or locally very rare, so less than .1% cover in Sonoma County-- being a million acre county, less than 1000 acres. For medium-high priority, looked at state rank S2, and considered if it was locally rare so it was considered S3 or four but was relatively uncommon within the county, then we kind of bumped it up in priority; down to medium priority for S3 and lowest priority for protection of vegetation communities that are considered apparently secure or secure per the state rarity ranking system.

**Slide 10 (03:24:05): Sonoma County Sensitive Natural Communities**

Just to show here in Sonoma County, specifically the vegetation communities that are considered to be sensitive, include the Mount Tamalpias chaparral, that Julie shared earlier, is associated with Serpentine geology. Interestingly, the Monterey pine stand, while recognized as being very rare within the state in the county of Sonoma. These are all planted, they don't occur naturally and so we wanted to recognize their rarity. At the same time, we're sort of wrestling with you know, how to approach to conservation of those stands and evaluate priority. But other sensitive vegetation, communities: hazelnut scrub, grand fir forest. I won't go into detail here, but just to share with you kind of the lay of the land in Sonoma County and those vegetation communities that we're prioritizing for protection.

**Slide 11 (03:25:14): Vital Lands Initiative Priority Vegetation Communities**

To share with you what this looks like on a map, I wanted to highlight a couple things. This is the information that we're presenting to the Community as we map priority vegetation communities. Again, the classification for something being high, medium-high, medium, or low has to do with the state rarity ranking at the alliance level and considering whether it's locally rare. I'll note for looking at priority conifer forests, we also used information developed through the Sonoma Veg Map program, looking at forest structure and modeled old growth or late seral growth characteristics in conifer forests and where we detected that signature, mapped those areas as high priority as well. So it might be a Doug fir forest, which Doug Fir is quite common in Sonoma County, but we mapped it as high priority if it had old growth character. And hopefully you can see my cursor here, but I'll describe in the northeastern kind of corner of Sonoma County. This is an area that's dominated by Pacific Modrone Woodland, Oregon

white oak woodland.  Also what you see is high priority, we've mapped the interior Live Oak woodland as higher priority, given the fact that it is not so common in Sonoma County despite it being fairly common across the state.  Then, also throughout the Santa Rosa plain, as we work down Hwy 101, the presence of Valley Oak woodland, which we've indicated as a high priority for protection as well as along Knights Valley. And wanted to highlight some of those old growth stands of Conifer on Sonoma Mountain. Here in the sort of the southern Mayacamas area and then throughout West County we have some remnant old growth. In addition, we've incorporated information where available for native grasslands and so, across the coastal Prairie you can see in this darker burnt orange color where information was captured in the coastal Prairie Mapping project about dominance of native species we've incorporated that into this data set as well.

**Slide 12 (03:27:55): Protecting Sensitive Natural Communities**

So as we think about prioritizing and protecting sensitive natural communities. What we're looking to do primarily is acquire conservation easements over properties which support sensitive natural communities, and these conservation easements restrict both residential development but also conversion of land to more intensive uses. We are currently updating our project evaluation framework as we look towards sort of reactive land conservation so the ranking criteria, the maps and all the other information that staff used to evaluate applications that are submitted by a landowner. And we're prioritizing properties again, which supports sensitive natural communities among other contribution values. Something that we're really looking forward to as we look to implement vital lands initiative is flipping this model towards a more proactive approach to land conservation, whereby we're identifying targets and priority focus areas. We're reaching out to land owners to solicit their interest in working with us, to protect the conservation values on their property. And in support of this, we are tracking our progress by establishing performance metrics, setting up internal and external facing dashboards which will operate as a sort of real time gap analysis so we can evaluate where protection is needed and develop an outreach and landowner engagement strategy to ensure protection of sensitive natural communities.

I wanted to highlight as Betsy and others have noted in previous presentations, we are recognizing that communities may be sensitive at the association level despite being mapped as not sensitive or classified as not sensitive at the alliance level. And the information in the fine scale vegetation map is predominantly at the alliance level, so we'll be updating our site assessment process when we actually get boots on the ground to further evaluate whether or not we want to pursue a conservation easement over property. Updating that process and training staff to refine our maps to understand and document occurrences of sensitive natural communities both at the association level. Or where there's occurrences of individual rare plant species. And then kind of lastly. When we talk about protection of sensitive natural communities, yes, primarily conservation easements work to restrict residential development. But we can also design and negotiate our conservation easements,  recognizing sensitive natural communities as a conservation value to protect, and these protections can either come through blanket protections through language in the conservation easement, saying that a landowner must minimize or have no impact to some listed vegetation, community or in using the fine scale vegetation map to support this work, we can explicitly map sensitive vegetation communities, classify them as natural areas, and tie specific restrictions and permitted uses to those mapped areas within the body of the conservation easement. And this is kind of an approach that's customized for every individual transaction. Depending on our goals for their property, the landowner’s goals for their property, and

how they intend to use it, and ultimately it's a bit of a give and take but as we recognize the value and importance of sensitive natural communities are incorporating that into our easement templates and the negotiation process. And then finally I want to note that we do document the location of rare, threatened and endangered species, but also update vegetation maps at the property scale, document current land uses and other property features in our baseline documentation, which serves as a reference as we monitor properties for compliance with the easement in perpetuity as part of our long term stewardship program.

**Slide 13 (03:32:28): With Gratitude**

So just a few highlights, kind of where we are as an organization and how we're using the fine scale vegetation map and the state rarity rankings to support our work. We're really looking forward to this next chapter as we implement Vital Lands Initiative, learning from others and incorporating this good thinking into our work. We're really grateful to be one in a 60 million acre effort to map vegetation in California, and this work certainly has informed our thinking about priorities for land conservation, so I'm grateful to the veg camp team who developed the descriptions and classification for Sonoma County to the Tukman geospatial team for their work to develop the fine scale Veg app and then others who've contributed in a multitude of ways to this project and looking forward to any questions when we get to the discussion period. Thank you. Thank you so much Allison.

## Local Perspectives: Examples of successful projects and outcomes using sensitive natural communities (Guest Speakers)

**(03:33:37)**

Up next we have two examples of successful projects and outcomes for sensitive natural communities starting with Shelly Benson.

## Section 7 - Shelly Benson, CNPS, Vegetation Program: Mapping Sensitive Natural Communities in Grassland Habitat

**Slide 1 (03:34:02): Hidden Treasure in California's Golden Hills; Mapping Sensitive Natural Communities in Grassland Habitats**

Shelly are you able to unmute and share your screen. Yes, I am up. Let's see here, one second. Great, OK, alright I'm all set. Thank you very much. So, hello everyone. My name is Shelly Benson and in addition to working for the California Native Plant Society, I am also a biological consultant. And today I'm going to present to you the grassland mapping work that I do as a biological consultant, and the first several slides in my talk show these beautiful backdrops of Native California grasslands. And I don't have much time to comment on them, but as you enjoy the scenery, you'll be able to tell what you're looking at because they're all labeled. So look in the bottom corner for the label. So OK, here we go.

**Slide 2 (03:24:50): Grassland Mapping Projects Funded by...**

The projects I'm going to talk about today were funded by East Bay Regional Parks District, the Wildlands Conservancy, and Marin County Parks and Open Space District.

**Slide 3 (03:35:05): Overview**

So I've been mapping grasslands in the Greater Bay Area for the past six years and today I'm going to share with you some of my experiences and challenges in mapping grasslands. I'll touch on some of the threats to grasslands. I'll talk about why it's important to map grasslands at a fine scale and how I do that. And then I'll summarize some of the results from some mapping projects.

**Slide 4 (03:35:28): The Golden Hills of California**

So, California grasslands are spectacular, their species rich, and they support diverse native grass and forb communities.

**Slide 5 (03:35:40): Threats to Grasslands**

Grasslands are threatened by urbanization; agriculture, including conversion of grasslands to vineyards; fire suppression, which results in tree and shrub encroachment into grassland habitat; and invasive species. Most of our grasslands have been invaded to some degree by non native annual grasses and forbs, like the wild oats shown in this picture. So, as a result of these threats, much of the historic grassland habitat in California has been lost or degraded. And that's why most of our native grassland communities are designated as sensitive natural communities.

**Slide 6 (03:36:29): Challenges Mapping Grasslands**

So there are a number of challenges to mapping grassland. First, remote sensing isn't effective at mapping grasslands at a fine scale. As a result, most maps treat grasslands as a generic category called something like grassland. California grasslands are not a uniform group. There are diverse communities hidden within this generic grassland map class. This is the hidden treasure in our grasslands. All of these types shown here are sensitive natural communities. Grassland communities are undersampled because many projects don't prioritize mapping grasslands at a fine scale. One reason is that it takes extra effort to do it, since remote mapping techniques don't get us there. Another challenge is that some communities have not been defined. This is because grasslands are undersampled. We just don't have the data. So the solution is to get out there and sample your grasslands. A big logistical challenge in mapping grasslands is the temporal variability in species composition and cover, which can can change a great deal from the beginning of the season to the end of the season. And from year to year.

**Slide 7 (03:37:57): Why Map Grasslands?**

So why map grasslands? The land managers that I work with want to know what communities they have and where they occur on their lands so they can more effectively manage their grassland resource. Protect sensitive natural communities. And plan projects to minimize impacts to native habitats.

**Slide 8 (03:38:21): Classification System**

So when I map grasslands, I use the National Vegetation Classification System and the MCV to identify vegetation types. And as we've heard earlier, this system takes a hierarchical approach to categorizing vegetation. And the reason why I'm showing you this slide, here, is that when I create finescale

grassland maps, I identify and map vegetation at the two finest levels of the classification, at Alliance and Association.

**Slide 9 (03:38:52): Mapping Techniques**

So there are two techniques for making veg maps, remote mapping and ground-based mapping. Remote mapping is used for large projects because it's efficient in time and costs at the large scale. Uhm, mappers use a number of tools to help them detect unique vegetation signatures, and then they put names on them and you can get a sense of the vegetation signatures in this image. So this is a portion of the new Marin County Fine scale vegetation map, and I'm not showing a legend because I want you to focus on the detail in the map without getting distracted by the vegetation types. So using remote techniques, mappers were able to accurately map woody vegetation at a fine scale at the alliance or association level; you can see the detail and diversity in the map polygons. Grasslands on the other hand, can't be reliably mapped at a fine scale using remote techniques because mappers can't detect unique signatures. So here grasslands are mapped at the macro group level. That's two levels above the finescale target of alliance. So ground based based techniques are used for fine scale mapping of grasslands and herb dominated communities. Uhm, basically ground based techniques involve walking around with the GPS unit. This is a fine scale map I created using ground-based techniques. So just for comparison, here's grasslands mapped at a coarse scale--macro group--and a fine scale. The diversity in our grasslands always amazes me. It's just that you have to look close and you have to be on the ground to find it.

**Slide 10 (03:40:43): Fine-scale Grassland Mapping Projects 2015-2021**

This map shows the six parks and preserves where I map grasslands. The purpose for doing these projects range from grazing management at Jenner Headlands Preserve up north in Sonoma County; Uhm, understanding rare plant habitat at Ring Mountain and Old Saint Hilary's preserves, they're on the Tiburon Peninsula in Marin County; and at all the parks, park managers needed this map for project planning.

**Slide 11 (03:41:22): How Much Grassland Habitat is Left?**

So how much native grassland habitat is left? This table shows the proportion of grassland area occupied by native and non-native communities. So at three of the preserves, native types occupied more area than non-native types. At Mount Burdell and Old Saint Hilary preserves the proportion of native and non-native types was roughly equal. At Pleasanton Ridge, 89% of the grassland was occupied by a single, non-native annual grassland type, the Avena-Bromus type. The land use history in this area includes dry land farming of wheat. So much of the area was likely tilled and seeded at some point.

**Slide 12 (03:42:11): Rarity & Diversity of Grassland Communities**

This table shows the number of grassland communities in each of the parks by conservation status. Overall, grasslands are pretty diverse and sensitive. Natural communities outnumbered types that don't have conservation status. I want to point out Pleasanton Ridge here because we just saw previously that the non-native Avena-Bromus type covered 89% of the project area. However, Pleasanton Ridge supports a diverse mix of grassland types. Only one of the 13 types map here was non-native.

**Slide 13 (03:42:50): Sensitive Natural Communities in - Grasslands**

OK for sake of time I can't go into much detail on this table, but I wanted to give you a glimpse of the sensitive natural communities documented in these mapping projects. So this table shows just the sensitive communities that are grass types, and one thing I'll draw your attention to you in this table is the Nassella-Melica alliance, which was diverse in the number of associations documented and in its abundance on the landscape.

**Slide 14 (03:43:523): Sensitive Natural Communities in –perennial forbs and grasses**

So this table lists the sensitive communities for forb and grass-like plants. And here I want to highlight Pleasanton Ridge, again. I map that grassland this year and it was a good year for poppies and the poppy stands typically had diverse mixes of native perennial forbs and grasses.

**Slide 15-16 (03:43:48): Pleasanton Ridge Regional Park Grassland Map**

So here's the map I created for Pleasanton Ridge Regional Park. This is a zoomed in extent so that you can see the detail of the many small polygons. And we've talked about minimum mapping units already, and usually for my projects I set the minimum mapping unit at 30 meters diameter. For doing on the ground mapping, that's really based off of an efficiency measure. Anything smaller than that, it's just not efficient. Uh, So what does this map tell us? Well, the vast majority of the grassland was occupied by the non-native Avena-Bromus alliance, shown here in the cream color. But within that non-native grassland matrix, a diverse mix of native communities were found scattered across the project area. The native communities included both grass types and form types, and the grass types are shown in this map in the colors of Blues Reds and oranges. And the forbs are shown as purples and greens. So the native grass types, they were typically found on north and east facing slopes associated with mesic microsites and the forb types were mostly found on Stanol Ridge and associated with thin soils in rocky areas. One exciting thing about this project is that we potentially found a new vegetation type, Viola pedunculata. And that's shown here in this map in the shades of purple.

So stands of *Viola* were strikingly obvious at Pleasanton Ridge this year, and this type doesn't match any of the descriptions in the MCV, so that's why I'm thinking it's potentially a new type that hasn't been described yet. And it was behaving like vegetation. It had a distinct assemblage of species that seemed to characterize this community, and it repeated across the landscape.

**Slide 17 (03:45:55): Take-ways**

So, takeaways: generic or coarsely mapped grasslands hold hidden treasures--basically, a trove of sensitive natural communities. We need fine-scale grassland maps to protect sensitive natural communities. And ground-based mapping is required to make these maps. And also, discoveries abound like *Viola pidunculat*a in this overlooked and under sampled habitat. So, I hope that this talk has inspired you to fund sampling and mapping efforts in your grasslands and thank you for your time.

Thank you Shelly. That was great.

## Section 8 - Teresa Sholars (CNPS, Mendocino College): Mendocino cypress in Mendocino and Sonoma counties

**Slide 1 (03:47:07): Mapping and Vegetation Classification of Mendocino Cypress Woodlands as the Path Toward Effective Conservation**

Coming up next, and last but not least, is Treasa Sholars. Can you unmute and share your content? I think I did. Can you hear me? I hear you. I don't see your thing yet. OK, let me go back and try again. Sure, OK. I'm going to do this again. OK, here we go. Let's see, everybody awake for the last one? I am. I'm excited. Yeah, OK, so I'm Teresa shoulders and I am a retired biologist from College of the Redwoods and basically volunteer for CNPS and our local chapter, and I work also from Mendocino College, where I am right now.

**Slide 2-3 (03:47:45): the Problem**

So I want to talk about the pygmy Forest, AKA the Mendocino cypress Woodlands. So you know, the pygmy forest has been long recognized as a rare plant community filled with rare plants. But our conservation efforts were totally stopped because nobody could figure out what the pygmy was and what it wasn't. I did my master's thesis on it in 1975. My late husband did his PhD thesis on it, and yes, we focused on why plants were short, not what is the pygmy forest.

When we got around to trying to protect the pygmy forest, the county basically had to be sued and the lawsuit got settled in 1988. So we started this in 1975, in 1988 they said, sure, we'll protect the pygmy forest. But then it got very complicated because look to the left, you've got the short Mendocino cypress on poor soil and big Mendocino cypress on good soil. So one was called the pygmy cypress, the other Mendocino cypress. But of course they're the same species.

**Slide 4-5 (03:48:59): Defining the Pygmy Forest**

So the classic definition was that because this pygmy forest occurred on these old terraces with highly acidic, poor soils they created this community of dwarfed plants known as the pygmy forest. And so, we for years, you know, would define it by being dominated by the pygmy cypress and the Bolander pine. But the problem is the growth in the stature of these species is totally a response to soils and we did not have black and white. We had lots of gray.

**Slide 6-7 (03:49:39): Oligotrophic Soils**

So we kind of came up with trying to look at soil types, and at first we only focused on these two soil types. The Blacklock in Aborigine that produced this kind of short stature stuff and then we had to really broaden our search to something we called oligotrophic or nutrient poor soils because it all looked like pygmy to people. So we went out there, and there's my dog who goes with me on all the field surveys, and she's demonstrating what that Soil looks like.

So when talking to planners and consultants they were out there and they said, well this all looks like pygmy and, you know, what you're looking at here, none of those actually even have the cypress or the Bolander pine. So it was clear we needed work on this.

So first thing, basically, the local CNPS group, kind of headed by myself and others, would try to work with people in the Humboldt County Fish and Wildlife Office to look at nutrient poor soils--all these different soils. And map those in general. So that was first.

**Slide 8 (03:50:51): Sampling and Defining the Pygmy Mendocino Cypress Woodland**

We got together with the VegCAMP program and with California Department of Fish and Wildlife and with CNPS and then gathered a large group of volunteers and land owners to help figure out what exactly was this Mendocino cypress woodland--really, the pygmy forest.

**Slide 9-10 (03:51:15): Needing to Map the Pygmy Mendocino Cypress Woodland**

Now this is driven because politically what the county decided after they got sued was the people who had jurisdiction in looking at the pygmy forest would be the Coastal Commission staff because they wanted to classify it as an environmentally sensitive habitat area. But there is a huge problem with that. So I made that line of the coastal zone really thick and it's a little bit hard to see, but you can see some of the mapped pygmy forest. Most of it is on the other side of that. So because of the way Mendocino County decided to handle it, any of the protection was not given because most of it was not in the coastal zone.

So obviously what needed to happen is we needed to try to map the pygmy forest. So we did a lot of talking on the phone, with my past experiences of field trips and soil types to try to look at the polygon types, vegetation signature and access. We obviously could only map things that we had access to, so the data could be used.

I worked first with Linda Miller up in the Eureka office to try to look at what something actually looked at, what it looked like on the maps and to get possible areas that we could all get together and go out and map.

**Slide 11-12 (03:52:43): Vegetation Sampling using CNPS/CDFW protocol**

So I was really lucky because we had a large teams of volunteers and we used the protocol from CNPS and Fish and Wildlife to look at, of course, the vascular plant composition and cover, and all those things that are on the rapid assessment sheet that others--Julie went over specifically (previously in this seminar)--to go out and start mapping.

Uhm, we did the mapping with rapid assessments and then polygons with similar vegetation signatures that we hadn't yet ground truth, we came back and ground truthed those. Obviously, this is a community where a lot of times you're literally crawling on the ground.

**Slide 13-14 (03:53:33): Changing the name from “Pygmy” and Mapping**

And one of the big challenges, locally, is changing the name from pygmy because I had both people who were involved in regulation and the botanical consultants who, you know, didn't want to look at anything as pygmy that wasn't short. So we needed to change the name from pygmy to Mendocino cypress woodlands and these associated oligotrophic soils.

The most amazing and cool thing, and you've already gone through this whole BIOS website (previously in this seminar), but then we have actually mapped in Mendocino and Sonoma County, not only the alliance, but all of these associations. So it's very exciting that this is really, in our county, in Mendocino County, the only thing that's truly mapped. So all of the mapping, of course, as you've already heard, has had the attributes below, and you can find out a lot about every single one of these. Now, I want to make sure people do know that nothing that is mapped is 100% accurate. I mean, I've already found a few slight boundary adjustment, which is going to happen when you go out there and do a lot more ground truthing.

**Slide 15-21 (03:54:49): Six New Rare Associations**

So what was totally exciting is that in the original hardback version of the Mendocino vegetation classification that was put out in the books, the pygmy forest was really only divided into lichen and tree types, which didn't make sense, and so we actually resulted from our project with six new rare associations within four alliances. So, one of the alliances was named Mendocino Cypress Woodlands Alliance, which look, this whole alliance has G1 and S1. Some of the associations were with the Bishop Pine Forest Alliance and another within the glossy leaf manzanita and chinquapin Alliance, and we have one provisional association within the Redwood Forest Alliance.

So, one thing you start doing when you're out there is you start, you know, saying OK this is, you know, the HEPY-PIMU-ARNU. Well, I'm sure anybody who hasn't been doing much of this, you can't understand a word anybody's saying until you learn these acronyms of the genus and the specific epithet, but this was one brand new alliance that we created from the mapping project.

Second one was a Mendocino Cypress Bolander pine Labrador tea alliance. Now this alliance is really interesting because this is, this is truly where you have these inert soils with hard pans and you have wetlands dominated by wetland species like what is now *Rhododendron colombianum* and Labrador tea, which was used to be Ledum.

And one sad part of making sure that something is mapped and valid is having enough sample sizes. Well, I convinced Fish and Wildlife to actually recognize the fen variant but we only had nine acres in just a few parcels, or not parcels, places left that had not been filled and dredged, but, so we only have 9 acres of this and this is just a variant on one association. But it's one that we have the sphagnum in that variant and unfortunately, you know, due to digging up, and horticulture, and logging quite a bit of the original distribution of this association is disappearing.

Another alliance, another association that I'm kind of embarrassed after living here my whole adult life, I really didn't understand the differences in this pygmy forest until I went actually out there and sampled. Which just goes to show how important mapping is. I think I went from not really wanting to supporting the new alliance and association scheme because I loved Holland and I was a professor that taught people who didn't know anything about botany to being a huge advocate. Because the only way to see diversity is to go out there and really map it. And life will be revealed. It's pretty amazing. So here is another association that resulted, the Mendocino cypress/Bolander pine/rhododendron.

This one this doesn't even have the Bolander pine or cypress, but it's even, you know, it's what people thought of is pygmy 'cause it's scrubland: Bishop Pine/Chinquapin/Fort Bragg manzanita or, you know, there's been lots of common names for *Arctostaphylos nummularia*.

Here's another one with just 55 acres with the Chinquapin/huckleberry Association, off of the Alliance of the manzanita-chinquapin.

And, uhm, the sixth one that we came up with out of our mapping was the Fort Bragg manzanita (Arctostaphylos nummularia), only 473 acres. All of these slides had the total acreage that you can also get off of the BIOS mapping.

**Slide 22 (03:59:08): Redwood Alliance**

One really exciting provisional association that didn't grow on the oligotrophic traffic soils, but I was very intent on including it is because this was a Redwood alliance that had the Mendocino cypress, uhm, as a codominant and I convinced everybody it just wasn't succession from logging. Because you can determine the original distribution of redwoods by looking at their old growth stumps. That's rare that the stumps are gone. So within areas you have redwoods dominating, you have these large, large Mendocino cypresses. And this association, sadly, is where a lot of Fort Bragg is, a lot of Mendocino is, a lot of areas, not the town of Mendocino but inland across the road, across Highway 1. So it's provisional because we have a very hard time finding public land that we can actually map, and the private land is just people's houses.

**Slide 23-24 (04:00:11): Collaborative Science**

This was really this whole project was collaborative science from Fish and Wildlife to CNPS to local botanical consultants, the State Parks, Coastal Commission, and Mendocino Lands Trust rate TNC, you know, the timber companies, botanical gardens, Cal Fire. So I mean, all sorts of people. We had 35 people from 14 groups and were actually able to do it with no funding and lots of people stayed at my barn. But it was very exciting.

Julie wanted me to make sure I noted that they probably will be changing the name to the Mendocino cypress alliance to Mendocino and other co-cypress alliances to try to go with the National Vegetation Classification System. And I want to make a big plug for people understanding that names change. I mean, you know, the alliance name is changing, probably won't change until February. The pygmy cypress name has changed. If you go down below you can see all the different names and we have to understand that all of these names are changing as a result of science and I have a huge plea for people who are either reviewing botanical surveys in sensitive natural communities or writing them. You need to absolutely update everything you're doing, constantly, because you never know, even though that regularly things get updated, sometimes they get updated often. Yeah, specifically at another time that you don't know about.

**Slide 25-26 (04:01:47): Conservation Success**

So one of our biggest conservation successes was a local public land Mendocino Coast Recreation and Parks District proposed an off road vehicle park on there 400 and some odd acres, out on Hwy 20. And luckily, we were just finishing up our surveying, and so we did surveys on their land. And we kind of convinced them that, you know, they wouldn't have to hire a botanical consultant who would go out and do it. And so when we went out to do that, and the surveys, we found that most of the land was sensitive natural communities. So we wrote the local group, who were the board that ran this public land, that it was not a good idea because 89% of this land was sensitive natural communities.

So this map to the right. Basically, is a map that was done by VegCAMP before we got the mapping up on BIOS because we, as according to CEQA you have to have public meetings, so we had a public meeting and I think Todd presented this map and I talked about this map and just tell people--here's public land that most of this is sensitive natural communities and it was not really appropriate for an off road vehicle project. And we were very lucky in that they agreed. And we weren't against OHVs we were against OHV parks in, you know, 89% sensitive natural communities.

**Slide 27-28 (04:03:27): Challenges for Conservation**

So it is, I think it's a challenge for people at the local level. You've already had a lot of information on these talks on how to find things. I go back and go through it a little bit differently. I think it's easier just to go right to the reports and maps. There's so few of them, go to your area, look at what reports and maps are there, and then you can if there is a report or map you can go into it and find the keys and descriptions of the associations. And that is really straight forward to somebody. I'm not a Luddite, but I really like getting to the answers quickly. You can go on BIOS for the Mendocino cypress woodland, but pretty much not for anything else yet in our county.

There's part of the key that I just pulled out of the report. And to me, an easy way to go into BIOS is just to go to the vegetation, and you can see there I checked off where the cypress was. And I'm just going to re-say what everybody else has said. You have to continually go through that sensitive natural community and natural community list. Botanical consultants seem to want to have templates, at least in our county, and they reuse the same templates over and over, and I have found that they're constantly using out of date protocols and out of date lists,

So I kind of ran through that quickly and I think I will let other people take over.

## Thank You's!

**(04:05:07): Webinar Wrap-up**

Thank you, Teresa! That was great. Amazing, thank you. It's now 12:36, which is 6 minutes past when we were scheduled to offer Q&A for you also, unfortunately we don't have time to answer questions. I do want to first, though, thank all of our speakers for today. We really appreciate the informative presentations, especially from our guest speakers. We really value you know other agencies perspectives and we hope to continue to engage with you all in the future. I also want to of course thank all of our attendees. It really is great to know that so many people are seeking out information about natural communities and so we thank you all for being here today, and thank you for all the great and important questions that we received, and we will be answering all those questions in writing and following up with you all individually.

And we also do want to follow up with you all with a questionnaire requesting feedback about the webinar and with that will also be sure to pass along that list of resources for natural communities' data that Betsy mentioned. And, uh, I will also let you know where you might be able to view contents from this webinar. And unfortunately, we had a technical difficulty, and it was not recorded, but we're going to see what we can do moving forward to get it to you guys, you know, some information about the content of the webinar, um, I also though do want to mention that, again, that we will be offering this webinar again in the future and CNPS and veg camp do offer other natural communities' trainings and workshops including how to sample vegetation using our rapid assessment and relevant protocols vegetation mapping workshops, as well as a full day, or half day I think, webinar on expanding on online resources and tools that basically Betsy kind of gave us a little bit of today. But there's a half day training for that. So if you're interested in those, please refer to the CNPS website and see when those might be happening next.

Julie, did you want to say anything to wrap up or close this out? Yeah, I just wanted to **thank everyone** for their attendance, and there has been some posting of some replies on some of the questions that we've been able to post. Though. Yes, we will work towards wordsmithing and answering the questions, and just want to thank everyone who was a part of the webinar, and we'll see about either redoing the presentations another time and or personally recording them and putting them out on YouTube, so we'll figure something out. Yeah, thanks everyone. Yeah, thank you everyone. Have a great day, and please don't hesitate to reach out if you have any questions. Alright, signing off. Bye.