CALIFORNIA NATIVE PLANT SOCIETY

SAMPLER

VEGETATION COMMITTEE NEWSLETTER **JANUARY 2002**

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It has been several years since the Vegetation Committee produced/mailed a Sampler to describe our projects, plans, and how we work to share the CNPS mission. During this time, our main effort has been to establish coordination with other groups, agencies, and with chapters within CNPS to gather, evaluate, and incorporate data into the framework provided by *A Manual of California Vegetation*. We have emphasized that the descriptions and classification in this first edition were best approximations using data available at time of publication, and that expanding and modifying the information was the essential next step. This proves an ongoing task, depending on many. With this understanding, we have asked eight individuals, each representing an aspect of the project, to write the following articles to describe their perspectives on vegetation mapping, classifying, describing, in California in 2001.

In this sense, then, this January 2002 Sampler indeed tries to report on the work of the Vegetation Committee, now integrated with the two other groups in the Plant Science Program. But left out of these reports is "news" of many other projects and events, involving chapter volunteers and work of other organizations. We want to compile some of these stories into another Sampler, drawing on plans, ideas, discoveries omitted here!

In her role as Vegetation Ecologist for CNPS, Julie Evens has extracted the articles printed here. It is to her credit that this *Sampler* is ready, on schedule, for distribution, and her persistence and editing skills are gratefully acknowledged by the Committee. We also thank Paul Maas, in the CNPS office, for coaching us through the production/ mailing processes. We hope you will take the time to read and think about the ideas each of these writers offer; how they relate to your work. Each has provided contact information, so please ask, comment, or offer to join the work of Vegetation Committee members.

The CNPS Plant Science Program

By Roy Woodward, CNPS Plant Science Program Director.

The CNPS Plant Science Program has recently been redesigned to better meet the Society's strategic goal to "create a scientific foundation to support the protection and appreciation of native plants and natural habitats". The Plant Science Program volunteer Director (Roy Woodward) coordinates three Committees that carry out plant science work. The three Committees, each composed of several Working Groups, are:

1) Local Flora Committee: Chair not yet selected. This Committee is new and still recruiting volunteer members. This Committee fills a gap by focusing on species other than those presently listed as threatened and endangered or vegetation types identified as rare. Issues this Committee (and its Working Groups which are yet to be formed) will address include:

a. Development of a database for what areas have local floras/species lists and what data they contain (do they contain: locations, counts of plants/populations, threats, and how current is the information);

b. Develop standards/ criteria for development of local floras/lists;

c. Identify where gaps exist in our knowledge about local flora and vegetation and prioritizing potential projects to fill those gaps;

d. Examine the condition of locally significant species and vegetation types that may not be rare statewide or protected by existing endangered species laws, and assessing the Society's role in identifying and protecting these resources;

e. Coordinate with Chapters to see that their highest rare plant and vegetation issues are addressed by the Society's Science Committees.

2) Rare Plant Science Committee: Chaired (temporarily) by Roy Woodward and supported by CNPS-staff Botanist David Tibor (Dave's part-time assistant is Esther Kim). Working groups under this committee include:

a. Support for Listing Packages (Dave Tibor = chair): Assistance will be provided for gathering data, writing, and submitting listing packages to the US. Fish & Wildlife Service or California Department of Fish & Game for threatened or endangered plants;

b. Rare Plant Monitoring (John Game = chair): This group identifies monitoring priorities for rare plant species, develops standards for data collection methods, and assists with data management;

c. Inventory (Dave Tibor = chair): The publication of the sixth edition of the CNPS Inventory of Rare and Endangered Plants of California was a significant event; however, it was recognized that there may be more timely methods to compile and distribute information about the status of rare plants. This working group will scrutinize the data assessment procedure followed by CNPS and determine what procedural and software/hard ware changes could improve that process;

d. Rare Plant Scientific Advisory Committee (chair): This standing working group has the critical task of assessing data about rare plants and assigning status designations (list 1A, IB, 2,3,4) for each taxa;

e. Several others including *Ex Situ* Genetic Conservation (the role of seed collections and botanical gardens), Mitigation Standards, and support to local Chapters.

3) Vegetation Science Committee: chaired by Todd Keeler-Wolf and supported by CNPS-staff including Vegetation Ecologist Julie Evens and part-time assistants Chris Clifford and Sau San. Working Groups include:

a. *A Manual of California Vegetation* Updating (Todd Keeler-Wolf = chair);

b. Status ranks of High Priority Vegetation (Todd Keeler-Wolf = chair);

c. Database development and management for the CNPS Vegetation databases (Julie Evens = chair);

d. Development of standards/ criteria for vegetation sampling and data analysis (Julie Evens = chair);

e. Training and support for Chapters (Julie Evens =chair);

f. Vegetation *Sampler* newsletter Julie Evens = chair);

g. Vegetation with rare plants (Julie Evens = chair);

h. Identification, monitoring, and conservation of rare and important vegetation (Todd Keeler-Wolf =chair);

i. Data and database integration for sharing local plant/vegetation data (chair).

In addition, four Working Groups that address issues common to the three Committees or that overlap with other CNPS Programs (such as Conservation and Education) report directly to the Program Director; viz. Database Revision, Scientific Standards, Research Needs, and Photography (chair = Duane Haselfeld). *There may be realignments for efficiency, but if you have an interest in serving on any of these committees or groups, please email Roy Woodward at rwoodw@parks.ca.gov.*

Advances in the California Classification since the Publication of *A Manual of California Vegetation*

By Todd Keeler-Wolf, Calif. Dept. of Fish and Game Vegetation Ecologist

Since the publication of *A Manual of California Vegetation* (MCV) in late 1995, the number of vegetation types identified and described for the state has approximately doubled. This increase is not just a re-dividing and reducing to minutiae what has been already well understood about California's vegetation, but is a careful analysis and examining of new types of vegetation that have never been understood before.

The common language and set of rules established in the MCV for developing the classification have been widely put to use in California over the past six years. Over this period, major efforts have been underway to classify and map the vegetation of the state, using the MCV classification as the basis. Detailed classifications based upon quantitative field sampling and data analysis have been accomplished through cooperative projects among state and federal agencies using the MCV as the basis for classification.

These projects have included mapping and classifying large regions in the California Deserts (Anza Borrego, Mojave, Northern and Eastern Colorado deserts) and most of California's national parks including Yosemite, Sequoia, Kings Canyon, Point Reyes National Seashore, Golden Gate National Recreation Area, Death Valley, Mojave National Preserve, Joshua Tree, and Santa Monica Mountains. Further efforts are now occurring in Los Angeles, Napa, Riverside, San Diego, and Santa Clara counties.

Field data collection using sampling protocols developed by CNPS has utilized over 5000 individual field plots over the past six years. Data describing these plots are used in analytical computer programs to develop the floristically based classification of associations and alliances. An ""association" is the most basic unit in the classification system -defined as a uniform group of vegetation stands that share one or more diagnostic species in the overstory and understory. The species and structure of each association occur repeatably across the landscape and are generally found in similar environmental conditions. An "alliance" is a uniform group of associations, which share one or more diagnostic species that are usually found in the uppermost layer of the vegetation.

At the time of publication of the first edition of the MCV, there were approximately 240 alliances (also called series) and 625 associations described from the state. Now we have 406 alliances and 1385 associations known. A rough estimate of approximately 2000 plant associations has been given as the potential total currently in the state. At this rate, in six years we have increased the number of associations by 2.2 times. If our estimate of 2000 associations of vegetation is correct, we may have comprehensive knowledge of the vegetation of California in another 5-6 years. What we can do with that knowledge is the topic of another article in this newsletter.

The value of the MCV has been primarily as a catalyst for the way vegetation can be systematically described. It has established the ground rules for the full development of the floristic classification of vegetation in California and the CNPS initiated vegetation sampling methods such as the releve, the rapid assessment, and the point intercept method. The second edition of the MCV, expected to be published in late 2002, will have descriptions of all the new alliances and will show all of the new associations. Currently the latest version of the California classification is available on the Department of Fish and Game's Wildlife and habitat data analysis branch website:
dfg.ca.gov/whdab/natcom2000.pdf

For further information, please call or email Todd Keeler-Wolf at 916-324-6857 or tkwolf@dfg.ca.gov

Significant Natural Areas in California and the Vegetation Program.

By Diana Hickson, Department of Fish and Game Associate Botanist

The Significant Natural Areas Program (SNAP) of the Department of Fish and Game was established by the Legislature to identify high-priority sites for the conservation of California's biological diversity. SNA designation does not have any regulatory implications; its purpose is to inform resource decision-makers about the importance of these sites.

Currently, SNA's are identified by selecting extremely rare species or habitat locations, and areas that support multiple rare species or habitats, as reported to the California Natural Diversity Data Base. Other factors, such as high diversity of common species, rapidly disappearing habitats, or important wintering or breeding grounds, are not addressed.

The Department is currently working with its regional staff to identify new criteria for SNA's that will encompass a broader definition of biodiversity. At the same time, the California Legacy Project of the Resources Agency is attempting to identify important natural resources that might be at risk but are overlooked by current conservation efforts. Both the SNAP and the Legacy Project recognize the need for a statewide, standardized vegetation map as a basis for identifying natural areas that support rare species, rare vegetation types, and common vegetation types that are underrepresented in protected areas.

A state map using the National Vegetation Classification System (see article by Hazel Gordon) for the state would be ideal. Although completion is a long way off, the Vegetation Program is building the foundations (and several geographical pieces) of this map. Along the way, vegetation sampling and classification work by the Vegetation Program and CNPS members will provide information on rare or otherwise important vegetation associations to both SNA and the Legacy Project.

For more information on SNAP, call or email Diana Hickson at 916-327-5956 or dhickson@dfg.ca.gov

The Links among Vegetation Classification, Mapping, and Native Plant Conservation

By Todd Keeler-Wolf and Julie Evens, CNPS Vegetation Program chair and staff

Species conservation and vegetation

Why should we use vegetation as a means for conservation? Even many ecologists agree that plant communities and vegetation are artificial constructs and not as concrete as individual plant species. Why not just focus on individual species as the building blocks for conservation?

The main reason is that it is inefficient. We have over 6000 taxa of native vascular plants in California. According to the latest California Native Plant Society (CNPS) Inventory (Tibor 2001), over 2000 of those taxa are in some way rare and worthy of conservation attention. For a completely representative conservation picture, all 6000+ taxa need to be considered. Each of those taxa is distributed in a unique way over the landscape. Some are common and easy to inventory, some are widespread, but may nowhere be abundant, while some are localized and rare. To inventory and map all the species of native plants in the state would be a huge task and one that we do not have the time and resources to do. Taken to its extreme, this would mean knowing the location and abundance of every species, including difficult ones like ephemeral annuals, whose distribution and abundance may radically change every year. With changing populations comes the need for monitoring and re-assessment. So just as we would finish this task for the first time, we would already have to revisit the changes in the populations of these species to keep the numbers current. The level of intensity of such an inventory has only been attempted at a very local scale, on the order of an area less than an acre in size.

Even if we did accomplish this for the state, ensuring successful conservation of all species on a one-by-one basis would require the analysis and integration of intricate patterns of population dynamics and distribution into a conservation design that incorporates all species - another hugely complex and difficult task. Such a task would likely take years and thousands of people and millions upon millions of dollars, and even then would likely be inadequate for many of the 6000 species. In the mean time, populations of species that were threatened by human and other impacts would continue to decline.

Further, the ecological setting of the species (the types of "habitat" or the "vegetation" it occupies) is often a very important predictor of the viability of the species. Without an understanding of the type and quality of the habitat or vegetation that a species occupies, we cannot make good decisions about the long-range conservation of those species.

Vegetation is not a substitute for species-level conservation planning. There are powerful reasons for using both techniques. However, we should always consider the best uses of each in the context of the needs for precision and accuracy of a conservation assessment. In general, vegetation assessments get at questions at the geographical level of watersheds, counties, ecoregions, and states that contain multiple species of concern.

Vegetation and Habitat

The terms vegetation and habitat have two separate meanings. Habitat is, in essence, the typical location or environment of a species, while vegetation is the consistent pattern of plants on a landscape, However, the vegetation patterns on the land are often the best surrogates for habitat. Since vegetation patterns are named by dominant and characteristic species, they can be reliably and repeatedly identified. For example, "Ponderosa pine-black oak woodland", or "Corn lily-arrowleaf butterweed meadow" are each names of distinct vegetation types. Each of those vegetation types connotes a distinct environment based on temperature, moisture, and nutritional requirements and tolerance of the component species. Other species that occur within those vegetation types share many of the same environmental requirements. Thus, wherever we see these certain vegetation types on the landscape we can be fairly certain of the presence of a group of associated species. In some cases, certain species may have broad environmental tolerances and may occur in many vegetation types. In other cases species may have narrow ecological requirements and only occur in one or a few vegetation types. If we have a reasonable understanding of a given species' environmental requirements and/ or the vegetation types it has been found in, the habitat of any species that grows in a vegetated part of the world can be identified based on the vegetation types it occupies.

How and why do we name vegetation?

Vegetation types are named by species that are most characteristic of a given environmental setting. determine which species are most characteristic of an environment by sampling the pattern of different environments in a given area. If an area consists of forests and meadows and creek side thickets, we will sample several repeated examples of those forests, meadows and creek side thickets. We will then compare all the samples statistically and determine which species are most often found (indicated by abundance and frequency of occurrence in the samples) in each of the main environments. We then select the most characteristic species (e.g., in a forest this would usually be a dominant overstory species and a characteristic understory species) and name the vegetation based on those species.

As we name vegetation, we develop means of unequivocally identifying the types we name. Keys are written based on threshold values for species composition developed in the analysis. Thus, we can say definitively that a certain vegetation type may be differentiated from another similar vegetation type by a certain minimum or maximum percentage cover of a certain species or by the presence or absence of another species. This makes the definition of vegetation "defensible", a very important concept in conservation, and mapping.

Scale and hierarchy

One of the great unifying concepts in science is that of scale and hierarchy. There is an appropriate level of effort for each level of investigation and these may be nested within a relatable hierarchy. A well-planned conservation effort takes advantage of the concepts of scale and hierarchy by selecting the appropriate scale of assessment for each major question and relating them to other more detailed or more generalized levels of investigation to come up with a unified plan. It is important to think practically about such things. Here's a simple conceptual example: If you want to know how many grains of sand there are on the beaches of California it is far easier to measure the acreage and average thickness of beaches in the state, the average number of grains in a small representative volume, developing from those measurements an estimate, than to count each and every grain individually. An estimate, as long as it is within acceptable margins of error, is just as useful. Likewise, if you wanted to do a conservation plan for native plants in California or a part of California larger than a small parcel in size, it is more reasonable to measure the extent and assess conservation need for the habitat of various plant species (vis-a-vis vegetation) than it is to actually count and locate each individual of the species.

A common, quantitative system for characterizing and describing vegetation is very important, and quite necessary for accomplishing ecosystem conservation and management across a diversity of locations and environments. The system of classification which CNPS designed in *A Manual of California Vegetation* (MCV) has established a standard set of floristic definitions and keys for vegetation types. The common sets of rules and descriptions established in the MCV have been used and improved in California over the past six years.

Moreover, the level of detail (or scale) for describing and classifying the many different types of vegetation can vary. For example, vegetation can be organized taxonomically and hierarchically just as species can, arranged in order from coarse to fine (e.g., alliances are at a coarser-scale than, and made up of a group of, associations). Having a standard, nested arrangement of vegetation classification allows for coarse scale or fine scale conservation analysis and ecosystem management.

Why map vegetation?

A map summarizes a physical situation, whether it is a city street map or a map of the continents and oceans of the world. It is not the same as a photograph or a picture, because a map categorizes information to make it more easily understood. For example, a street map shows the names of the streets, the addresses of the blocks and those names and addresses can be found in a legend or gazetteer so one can use the map. With the advent of computer-based Geographic Information Systems over the past 15 years or so, maps have become revolutionized. Not only can we now show a simple depiction of a physical situation like the names and patterns of streets in a city, but we can store information about the streets in that city (e.g., which streets were paved most recently, which streets are 1-way, which have multiple lanes, which are most heavily used at which times of day) and use that information in analyses. We can also relate the information about the patterns of streets to other physical information about the particular piece of land where the city lies. The streets can be compared to a topographic map of that area to show which streets might be too steep for propane powered buses, or to a map of the flood plains of a creek or river to show which streets are likely to be flooded during high water, or to a geological hazard map to pinpoint which streets are apt to have landslides.

A similar set of depictions and relationships can be made for vegetation because vegetation is relatively stationary (over short time periods) and vegetation is also generally discernable using aerial photographs, satellite imagery, or other remote sensing techniques. Depending on the type of resolution of the imagery, vegetation patterns can be mapped at various scales. For example, finer-scale mapping can be done using 1-m resolution aerial photos to map associations, and coarser-scale mapping done using 30-m resolution satellite imagery to map alliances and groups of alliances. These vegetation maps can then be used as surrogates for natural communities, habitats, or ecosystems. Thus, depending on the scale of assessment (individual parcels of land or small watersheds, or ecoregions or the entire state) we can map and classify them using the appropriate scale. The more detailed (finer-scaled) the vegetation classification and mapping process is, the more certain we can be that we have" captured" the full range of ecological variability. Ensuring some representation of each vegetation type in a conservation and management plan will go a long ways towards the ecological sustenance of a region, Since each vegetation type as it is mapped can also be sampled on the ground and compared to other vegetation quantitatively, it can become "defensible." Once we have a map made up of defensible units we can determine location, acreage, numbers and quality of vegetation types. We can compare these with the parcels of protected lands, the parcels of developed or disturbed lands and very quickly determine which vegetation types are rare, common, threatened, unthreatened, etc. We can compare the vegetation distribution with distributions for individual rare o threatened species and determine which vegetation types certain species are likely to occur in, which ones are likely to house the highest density of populations, etc.

Cost-benefit analysis

Although it takes less time and money to develop a simple vegetation map - the simplest having no field work and using a simple de facto system of classification that is not defensible - you end up with very little information upon which to base wise conservation decisions. However, these types of maps are currently being used in many vital conservation areas such as south coastal California. Using such minimal information, conservation planners and agencies purchase land, which may or may not be valuable ultimately for protection of species and habitats.

For example, a large parcel may be labeled coastal sage scrub on the map but may be the wrong floristic composition for target species like California gnatcatchers and may contain very poor quality vegetation, heavily invaded by non-native species, Using this short-sighted approach, we spend millions of dollars developing a plan and purchasing land only to find that much of it is inadequate for conservation. We then need to go back and either purchase more land at higher prices or spend much additional money to try to restore and upgrade the land that we got, to account for the inadequacies of the first plan. At the same time we infuriate landowners and governments who gave time and money up for the first "fix", expecting it to be adequate. In the long run, it is far more efficient to spend a reasonable amount of time and money up front to achieve a reasonable and widely usable and relatable vegetation map which may take a year or two to produce, than it is to spend a little money and time up front to get a poor map and end up spending vast amounts of money and time (not to mention incalculable losses in species and habitat) on the mistakes that a poor map can generate,

Conclusion

In summary, the need to map and inventory vegetation patterns arises from a practical need to identify natural ecological units beyond individual species for the purposes of resource assessment and conservation, A means of biological assessment broader than individual species data is critical for balanced management of landscapes, watersheds, and ecoregions. The patterns across the land all of us see, such as forests, woodlands, meadows, chaparral, and grasslands may be formalized into different types of vegetation based on characteristic floristic composition. By identifying the full array of these patterns in any area we can assess the range of biological diversity of that region without getting into the morass of detail required to assess individual species abundance and composition, Vegetation types have many of the same characteristics as species. They can be common or rare, threatened by various impacts or secure, highly localized and unique or ubiquitous. If we know where each type is, how much area it covers, and something of its ecological integrity, we can use this information to effectively and strategically identify biologically based areas in an integrated conservation plan.

The CALVEG System

By Hazel Gordon, US Forest Service Ecologist

The CALVEG vegetation classification and mapping system was initiated in January, 1978 by the USDA Forest Service's Pacific Southwest Region Ecology unit. The acronym (Classification and Assessment with Landsat of Visible Ecological Groupings) refers to the development of existing, rather than potential, vegetation communities with the use of color infra-red remotely-sensed satellite (Landsat) imagery. CALVEG was one of the earliest statewide vegetation classification systems easily adaptable to computerized mapping efforts. It is considered useful for landscape, watershed level, or coarser applications such as national forest or regional level planning and analysis.

Current Protocols and Status

CALVEG is a system derived from upper canopy-level data, which are aggregated into nine spectral lifeform and land cover classes (conifer, hardwood, mixed conifer and hardwood, shrub, herbaceous, agriculture, surface water, urban or developed, and barren). These classes are extensively verified and corrected with the use of aerial photographs.

The original Landsat pixel-based data composed of 30-meter square grids, is aggregated into polygons with a resolution of 2.5 acres (one hectare) or larger during these procedures. Polygons are finally given CALVEG "alliance" labels according to the one or two dominant (or mixed) species that are derived from ground-based field and plot data. Field data are typically collected over the course of a year. CALVEG "alliances" are modeled for any un-sampled or erroneous map areas according to environmental parameters expected to influence vegetation distribution in selected areas. These include elevation, slope aspect, slope steepness, soil or surface geology, distance to riparian areas and local or regional precipitation patterns.

If time permits, CALVEG labels are assessed for correctness in a second field season prior to completion of the project. Maps are generally updated for changes in a five-year cycle and accuracy assessments are produced for each lifeform and "alliance" from an independent data set. Currently, over 60% of the state has been mapped by these procedures, both on federal and non-federal lands, through the use of partnerships with state and county agencies. Most California desert and Central Valley areas have not yet been classified using CALVEG protocols. CALVEG "alliance" categories increase in number as technology improves and image resolution becomes finer. Currently, there are over 100 "alliances" already mapped in the state. Most of these are comparable to the "series" described in the first edition of *A Manual of California Vegetation*, discussed elsewhere in this *Sampler*.

GIS Attributes and Products

CALVEG products are databases, and (if plotted) hard-copy maps within Geographic Information System (GIS) formats. In addition to polygon identification and area information internally generated by GIS software, other basic attributes of the database include

1. structural information on tree sizes and densities based on derived (modeled) data
2. lifeforms
3. CALVEG "alliances" with primary (i.e., upper canopy) and secondary (i.e., lower canopy labels)
4. California Wildlife Habitat Relations type
5. Identification and labeling of conifer plantations

Databases available without cost

to the recipient are available for downloading of specific areas in their entirety at a USFS web site upon request. They are also available without cost for the whole state, but not in their entirety, on a set of five packaged compact discs. The self-contained "Geobook" in the package functions as an introduction to CALVEG and Arcview-type viewing of databases with a direct application to the USFS' concept of ecological units (geophysically determined sections and subsections) of the state.

CALVEG and the proposed National Vegetation Classification System

The multi-agency Federal Geographic Data Committee and its partners the Ecological Society of America, and NatureServe (formerly Association for Biodiversity Information) have proposed to develop a National Vegetation Classification System (NVCS) based solely on ground-level (plot) data at the level of the multi-strata "association". "Alliances" in this system are to be derived from dominant or diagnostic species of comparable "associations". The CNPS's classification system in *A Manual of California Vegetation* is parallel to and is being incorporated into this National system.

As the national project is long-term and decadal, land management agencies without a large or dedicated vegetation classification budget often must short-circuit this approach because of time constraints in their mapping projects. In addition, mapping of finer-scale associations is often not practical or even needed on standard, quad-based 1:24,000 maps. The CALVEG classification and mapping approaches fill this need for rapid watershed-level assessments using consistent statewide standards for polygon delineation. In addition, consistently developed regional and more local dichotomous vegetation species keys are developed to assign plot or other field data into CALVEG "alliances" for each mapping project. Due partly to the longevity of CALVEG and its mapping within one agency, diverse areas of the state have been mapped and classified in a consistent pattern, based on 10% canopy cover rules for conifers and other lifeforms, similar to that used by the California Wildlife Habitats Relations system. This allows for ease of analysis between areas of the state and for rapid turn-around of mapping products.

For additional information, please email Hazel Gordon (Sacramento Chapter, CNPS) at hgordon@fs.fed.us

The Habitat Classification Scheme For the California Wildlife Habitat Relationships (CWHR) System

By Monica Parisi, Calif. Dept. of Fish and Game CWHR Program Coordinator

The CWHR habitat classification scheme has been developed to support the CWHR System, a wildlife information system and predictive model for California's regularly-occurring birds, mammals, reptiles and amphibians. When first published in 1988 as "A Guide to Wildlife Habitats of California" (Mayer, K..E. and W.F. Laudenslayer), the scheme had 53 habitats. At present, there are 59 habitats as "Cropland" and "Orchard-Vineyard" have now been replaced with eight agricultural habitats. The scheme in total has 23 tree-dominated, 12 shrub, 4 desert, 6 herb, 4 aquatic, and 9 agricultural or developed habitats as well as 1 barren habitat.

Stages are defined for virtually all habitats. A stage is a combination of size and cover class for tree-dominated habitats, age and cover class for shrub habitats, height and cover class for herb habitats, and depth and substrate for aquatic habitats. A field sampling protocol is well-established for determining stages in all vegetated habitats, as well as determining the presence or absence of 124 special habitat elements. Special habitat elements include live and decadent vegetation elements such as snags, physical elements such as banks and burrows, aquatic elements, vegetative and animal diet elements and human-made elements.

The habitat classification scheme with its stages and special habitat elements was designed for use with a predictive model for wildlife species. The predictive model for each species has expert-applied suitability ratings for three life-requisites - breeding, cover and feeding. For each species, each habitat and all of its stages are rated as high, medium, low or unsuitable for each of these life requirements. The CWHR System also has life history text accounts, species drawings, and GIS distribution data for 675 of California's approximately 1000 terrestrial vertebrate wildlife species.

Parameters for determining CWHR stages recently became part of the CNPS Rapid Assessment Protocol as estimates of these are extremely useful in validating mapping efforts. Originally, CWHR habitats and stages were to be determined in the field and then used with the CWHR System to make predictions about wildlife species. More recently, the CWHR classification has also been used in several statewide mapping efforts using remotely sensed data such as satellite images and aerial photography. Data collected in the field to determine habitat and stage is invaluable in determining the accuracy of these mapping efforts. Many estimates taken in the field, such as estimates of vegetation cover, are common to several classification schemes. Defining common data needs is part of an ongoing effort to coordinate vegetation and habitat mapping throughout California. *For more information, please email Monica Parisi at mparisi@dfg.ca.gov*

Update on the Rapid Assessment Method and its Use across California

By Julie Evens, CNPS Vegetation Ecologist

The CNPS Vegetation Committee has recently updated and approved the "Vegetation Rapid Assessment" protocol. Within the past three years, the Vegetation Program has used and refined this methodology in sampling efforts of various locations, including " Point Reyes National Seashore, Sequoia and Kings Canyon National Parks, Los Angeles and San Gabriel River watersheds, and serpentine North Coast Ranges. Further, the Program is using this method in CNPS Chapter projects, such as the San Diego-San Dieguito River watershed and Santa Clara Valley-Coyote Ridge projects that began in 2001.

As part of these local and regional efforts, the Program has conducted a number of highly successful training sessions for the rapid assessment method. Now that the method is available to the public as a standard protocol for vegetation and habitat surveys, it is expected that the majority of users will attend a training session for using/ applying this method accurately. CNPS training sessions are being planned for Chapter members as well as for agencies and other organizations in 2002. Please see the CNPS website (www.cnps.org) for the methods and training dates.

The intent of the rapid assessment protocol is to maximize the amount of information collected about all vegetation types and habitats across broad regions, with limited resources. Using the one-page field form, you can collect and compile the following information:

- -Type, location, and distribution of vegetation types
- -General species composition and abundance of dominant, characteristic, rare, and exotic plant species
- -General environmental factors
- -Wildlife habitat stage
- -Validated vegetation mapping delineations
- -Site quality and intensity of disturbance

Other modules of the rapid assessment method can be added, depending on the intent of your project, such as additional wildlife-habitat and fire-fuels data.

It is the hope of the Vegetation Program that CNPS will be a storing house of vegetation information collected across California. We have formulated a database to enter the data from the rapid assessment forms and to analyze the data for future efforts, and we already have the California Vegetation Information System database for storing transect and releve data. The information can help build a stronger State classification and map of vegetation as well as build a larger picture of the rarity, quality, and historical record of California's vegetation.

In the San Diego and Santa Clara County Chapter projects, CNPS staff and members are learning and using the method to collect baseline vegetation and site quality information in a range of landscapes and biodiversity. We have had numerous training and sampling sessions, where members have learned to use both the rapid assessment and releve methods and have completed nearly l50 surveys in 2002. Program staff has entered the data into our standardized database, and we are using the data as reference information for mapping the vegetation at a fine-scale resolution (minimum mapping unit of 1 acre, using about 1-m resolution imagery). Map-making involves collaboration with California Department of Fish and Game (CDFG) staff to use detailed color aerial photography to draw boundaries around the individual stands of vegetation in the study area.

With the data collected this year and next, we will produce defensible definitions and a map of the many rare and common vegetation types. We also will create rankings of land parcels by comparing the vegetation diversity/rarity and habitat quality information of the different parcels, to prioritize open space for land acquisition and land management activities. Thus, we can provide local and regional agencies/organizations with a scientific basis for protecting, restoring, or regulating habitats, especially those of high conservation priority.

For further information, please call or email Julie Evens at 916-327-0714 or jevens@cnps.org

Results of Sept 2000 Veg-Fest Releve Training: VEGGING OUT!!! One Woman's Adventure Learning How to Releve

By Lyn McAfee, San Gabriel Mountains Chapter of CNPS.

It was cold and stormy driving up the mountains on a Friday evening in September. The fog was thick, and I was not sure if I would make it up to the Discovery Center at Big Bear Lake where Veg-fest was about to begin. Despite the near-zero visibility I managed to avoid disaster while maneuvering around the curves, and made it in time to hear Todd Keeler-Wolf introduce the purpose of the CNPS Veg-fest meeting to train CNPS chapter members in releve methodology.

As I was before Veg-fest, you may be clueless about releve (pronounced re-le-vay). Simply put, it is a quick way of classifying and quantifying vegetation in large areas through visual estimation. Releve sampling is a project of the Vegetation Committee of CNPS. Members trained in the method will be able to classify and quantify vegetation in areas that might not otherwise be documented. This will give an important historical record for the diversity of plant cover, particularly in areas slated for development.

At the end of the Friday introductory session, Veg-fest attendees were divided into two groups for the next day's fieldwork. Each group was to study either forest or shrub communities in the San Bernardino National Forest (SBNF), working with professional botanists and a Scott Eliason, SBNF biologist. Heading off to the Tanglewood group campground, we jounced over the washboard dirt roads in the dark with a gale blowing, and awakened Saturday morning to ice on our tents and vehicles. But it turned into a beautiful sunny day.

I was a member of the forest team. At the direction of Todd Keeler-Wolf, co-author *of A Manual of California Vegetation*, we started the releve process. First, we did reconnaissance by walking through the forest area to identify a 'stand[1], which is a basic vegetative unit characterized by its compositional and structural integrity. A stand has a similar combination of species throughout, mostly-uniform site history and environmental features, and a boundary that distinguishes it from adjacent stands.

After identifying the stand, we began the process of selecting a representative plot to study within the stand. Guidelines have been established to determine plot size depending on community type. The shape of the plot can vary. Forest community plots are standardized at 1000 square meters, and our team set up a 50 by 20 meter plot within a stand of Jeffrey Pine with a sage understory.

We then started recording data about the vegetation in the plot using forms supplied by CNPS. The location of the plot was documented, and all species within the plot were identified and listed. Vegetation was described and categorized according to the releve protocol. When the data collection was complete, the forest and shrub teams traded plots to get a sense of the releve method applied to a different type of plant community. We wrapped up with a discussion of our adventures in the field, and various problems encountered along the way. The day ended with a group dining experience in town, and later a campfire sing-along.

On Sunday, we Veg-festers applied the method learned the day before. Five groups used the relevé methodology to sample vegetation in areas defined by the forest biologist. Data collected will be used to evaluate and monitor vegetation in the forest. I found the releve training at Veg-fest to be valuable, interesting and fun. It was time well spent, and I contemplate future participation in this CNPS program.

Author's disclaimer: My description of the releve training is that of a lay member of CNPS, not a professional botanist. *For definitive information, check out the CNPS web site: www.cnps.org and click on Vegetation, then Vegetation Sampling Project & Protocols.*

Developing a Conservation Strategy for Plant Communities

By David Chipping, CNPS Conservation Director

The CNPS Vegetation Program is well on its way to achieving one of its objectives, which is the identification of the state's significant plant associations. This is somewhat analogous to the production of a "flora" for California. While floras merely catalog, the CNPS Rare Plant Program goes beyond that by providing information on rarity and threats, and hence in turn begets a conservation program. It is that second step, already taken at the species level, that is the second great objective for the Vegetation Program.

We can approach the subject of rarity in many diverse ways. First are those plant associations that are geographically extremely limited, such as those of serpentines and vernal pools. Second are those communities that are almost pristine representatives of otherwise common plant associations that elsewhere have become weed infested and degenerate through human activity. Third are those communities that, although common in some other areas, represent a locally highly unusual or rare assemblage. These last may be fragments of something largely destroyed by urbanization and agriculture. Fourth are communities that support one or more rare species, and will serve as a crossover to the Rare Plant Program and to the concept of Critical Habitat. We should also consider those communities that serve in a broader ecological role of animal protection that is dependent on the intact nature of the ecosystem.

That may seem like a lot of criteria, but a lot of it comes down to "Dang! This place looks interesting!". So we are turning to the chapters and membership of CNPS to help us make a list of exceptional places and plant associations. We are going to be scientific about this, so it would be nice if some plant lists, photographs and other information came along with the suggestions, but don't be shy, so just a description and a locality will do. I will start off as keeper of the list. As time goes on we will work toward something like the "Inventory", only based on the associations.
Think *A Manual of California Vegetation* meets *California's Wild Gardens*. Because, folks, we are going to have to do a hard sell to the politicians that they should support conservation at greater than the species level. We can do this.

To be a part of the new CNPS working group "Identification and Conservation of Rare and Important Vegetation" or to add your information on important places and plant associations, please contact David Chipping at 805-528 -0914 phone and fax, or 805-756-1695 work phone, or dchippin@calpoly.edu