Management Strategic Plan (MSP) 2014 Monitoring Protocol for Rare Plant Occurrences on Conserved Lands in Western San Diego County

Prepared by San Diego Management and Monitoring Program (SDMMP), 3-11-14

Introduction

A Management Strategic Plan (MSP) has been developed for western San Diego County to provide a biological-based foundation to support decision making and funding priorities for managing species and vegetation communities on Conserved Lands (San Diego Management and Monitoring Program 2013). There is a gap in our knowledge of the current status of many rare plant populations in the MSP area (MSPA) and an even greater deficit in our knowledge of the specific threats faced by each occurrence. In 2014 and 2015, a top priority of the MSP is to obtain rare plant status and threat data across the MSPA in order to identify needed management actions and to prioritize regional funding for management over the remainder of the five year planning horizon.

MSP Rare Plant Objectives to Conduct Baseline Surveys and Inspect and Manage Occurrences (IMG)

In 2014 and 2015, a MSP objective is to inspect rare plant occurrences and to conduct routine management (IMG). The objective is to survey existing occurrences for 17 species (see Appendix A) to document their status and assess threats in order to develop specific management recommendations. Surveys for these species will be implemented by a combination of land managers and contracted biologists in coordination with the San Diego Management and Monitoring Program (SDMMP). Fifteen additional species are also scheduled in 2014-15 to be monitored as part of regionally funded projects to establish baseline data, develop monitoring protocols, and to conduct management (Appendix A).

To ensure consistency in data collection, this protocol and associated data forms have been developed to document occurrence status and to assess habitat and threats for the 17 "IMG" species. Critical to the development of the monitoring methods are recommendations from a comprehensive review of rare plant monitoring in the San Diego Multiple Species Conservation Plan (McEachern et al. 2007, 2010a,b, Tracey et al. 2011). The MSP rare plant occurrence monitoring component was adapted from methods used by the City of San Diego since 2006 (City San Diego Plant Survey Form 2013, City San Diego Plant Field Form Instructions 2013, B. Miller pers. comm.). The habitat and threat assessment component incorporates covariates used by the Conservation Biology Institute and The Nature Conservancy in some of their projects (South County Grasslands Data Sheet 2011, Crestridge Qualitative Monitoring Data Sheet 2013, Habitat Assessment Form 2013, P. Gordon-Reedy, T. Smith, and J. Vinje pers. comm.). In addition, discussions with the County of San Diego (M. Hamilton and R. Humphrey, pers. comm.), Center for Natural Lands Management (CNLM; M. Spiegelberg and P. McConnell, pers. comm.), US Fish and Wildlife Service (USFWS; J. Martin, pers. comm.), AECOM (J. Dunn, T. Oberbauer, F. Sproul, L. Woolley, pers. comm.), and K. Greer (pers. comm.) have made significant contributions to the overall approach and development of covariates included in the 2014 monitoring protocol. A rare plant training session was held in February 2014 and participants offered additional suggestions for clarifying and improving the protocol and field forms.

Master Occurrence Matrix (MSP-MOM)

As part of the MSP, a Master Occurrence Matrix (MSP-MOM or MOM) database was developed to provide information on rare plant occurrences documented since 2000 on Conserved Lands in the MSPA. This database in Excel, GIS and KML format is available at http://sdmmp.com/monitoring/MSP_Rare_Plant_Monitoring.aspx

An occurrence is considered a unit of management and is similar to a "population" without regard to whether individuals interbreed (Figure 1). Following California Natural Diversity Database (CNDDB) definitions of an Element Occurrence (CNDDB 2011), two occurrences are generally considered unique if the distance between their closest parts is ≥0.25 mile. Where a CNDDB polygon encompasses an occurrence, the occurrence is assigned the corresponding CNDDB Element Number. An occurrence can include multiple plant locations that extend over different land ownerships. Occurrence data were obtained from the CNDDB, San Diego Natural History Museum's Plant Atlas (SDNHM), Consortium of California Herbaria (CCH), SANBIOS, and from rare plant monitoring reports and GIS shapefiles provided by land owners and land managers (e.g., CBI, City San Diego, County of San Diego, CNLM, USFWS). Preserve reports and resource

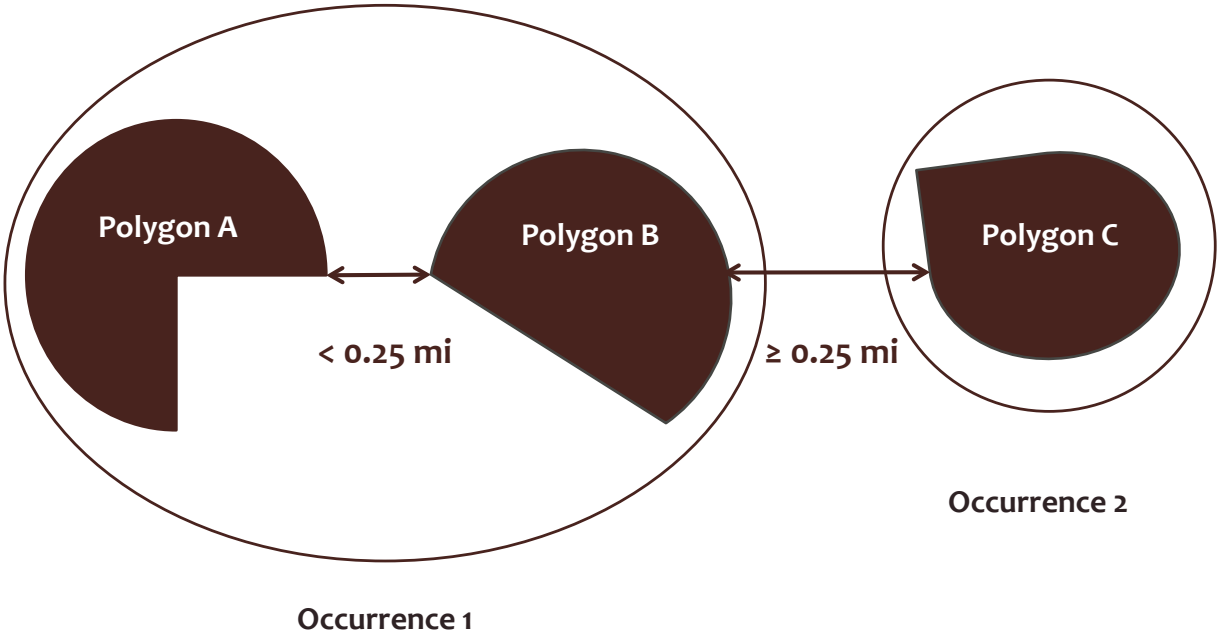


Figure 1. Example of how to determine what is an occurrence. An occurrence is a unit of management and similar to a population without regard to interbreeding. The definition follows a CNDDB Element Occurrence with two occurrences considered unique if their closest parts are ≥ 0.25 mile.

management plans were searched for additional rare plant occurrences. Personal communications and comments on the MSP by land managers and species experts also added more occurrences to the database.

MOM contains information on the general location of each plant occurrence, the occurrence name, management unit (MU), preserve, land owner and land manager. When available, there is information on population abundance, areal extent, threats, management recommendations and management actions that have been performed. The coordinates for an occurrence location may be general and approximated from the center of multiple point locations or from one or more polygons in a GIS shapefile. Where there is no available GIS information, occurrence coordinates are estimated from a map in a report or from a text description. Occurrence locations may also have precise coordinates representing a single GIS point within the occurrence. To provide more accurate location information for field surveys, separate GIS shapefiles can be provided by SDMMP that include all available point and polygon data for an occurrence.

Each occurrence in MOM has an Occurrence Identification Code that is comprised of the USDA plant code for the species or subspecies, followed by an underscored space and the MU number. This is followed by a 4 digit alphanumeric code representing the occurrence site. Typically, this site code designates the geographic area, feature or preserve where the occurrence is found. The site code is followed by a three digit number unique to that occurrence. If there are multiple occurrences with the same site name, then each occurrence is assigned a unique number. Following are examples of occurrence IDs with the information embedded in the ID:

ACPR_ 1DUTR005	*Acmispon prostratus*, MU1, Dune Triangle, 005
ACPR_7BALA020	*Acmispon prostrates*, MU7, Batiquitos Lagoon, 020
ARGLC4_6MAMI016	*Arctostaphlyos glandulosa* ssp. *crassifolia*, MU6, Manchester Mitigation Bank, 016
DUBLB2_6CMPR001	*Dudleya brevifolia*, MU6, Carmel Mountain Preserve, 001
LEGA_3OTMT003	*Lepechinia ganderi,* MU3, Otay Mountain, 003
LEGA_3OTMT004	*Lepechinia ganderi,* MU3, Otay Mountain, 004

The last two examples have the same site code as they both occur on Otay Mountain, but they are different occurrences as they are ≥0.25 miles apart. These different occurrences are distinguished by unique numbers.

IMG Monitoring Approach

All known rare plant occurrences on Conserved Lands are included in MOM. Of these occurrences, a *"significant occurrence"* is "defined by one of the following criteria: relatively abundant at a distinct location or site; sustainable as indicated by repeated observations over time or evidence of reproduction; important for ensuring connectivity; or represents the only known occurrence or one of only few occurrences remaining in the MSPA" (San Diego Management and Monitoring Program 2013). Significant occurrences are those that will be prioritized for management. The purpose of the IMG objective is to provide current information on the status of each occurrence in the MSPA and an assessment of threats and management needs. This information will be used to identify management actions that can be implemented by land managers and to identify significant occurrences requiring more extensive management actions and that may be prioritized for regional funding. This 2014 rare plant monitoring protocol will be evaluated for consistency in data collection, quality and utility of data collected, ease of use, and efficiency and cost effectiveness. Revisions may be made after the 2014 effort to improve the protocol for future monitoring efforts.

IMG monitoring involves 1) establishing permanent sampling areas for monitoring occurrence status; 2) mapping the perimeter of the current extent of the occurrence; 3) photo-monitoring; 4) conducting a habitat assessment within the sampling area; and 5) conducting a threats assessment within the maximum extent of the occurrence and an adjacent 10-m buffer. In many cases, the maximum extent is larger than the sampling area for an occurrence. Figure 2 shows the relationship between maximum extent, current mapped extent, and the sampling area.

The first time that an occurrence's perimeter is mapped will establish the current extent for that year and will also represent the maximum extent of the occurrence. In subsequent survey years, the occurrence may vary in size and the maximum extent will expand to include all areas occupied by the plant across survey years. Thus, the maximum extent is the cumulative area where the plant has been mapped over time and is the minimum area searched for the plant during each survey. If there is suitable habitat in the vicinity of the occurrence where the plant has not been searched for, this can also be surveyed and may result in an increase of the maximum extent. During each survey the current extent of the occurrence will be mapped so that the distribution of the plant can be tracked over time and areas for management can be identified.

Within the maximum occupied extent, sampling areas will be established for each occurrence. The size of the sampling area may vary for each species, but is generally a 10-m radius circle. If the occurrence is small, then the sampling area can include the entire mapped occurrence. When an occurrence is large (≥3 acres) at least three permanent sampling areas should be established within the occurrence perimeter. Sampling areas should be placed in locations where the plants are most likely to be found each year and that are similar in environmental characteristics. If there is substantial site variation within the occurrence perimeter (e.g. degree slope, aspect, vegetative community) or variation in plant densities, then the occurrence may need to be stratified into areas with similar environmental characteristics and plant densities. Ideally, three sampling areas will be placed within each strata. To minimize impacts to plants, sampling areas can be established so that the photo monitoring point is at the edge of the occurrence and faces into the plant population. The sampling area should be situated so that it encompasses as much of the occurrence as possible. SDMMP can provide assistance in establishing sampling areas and can provide GIS or kml files for making maps showing occurrence perimeters and sampling areas.

Because rare plant populations can fluctuate temporally and spatially, there may be times when the sampling area is no longer within the current mapped extent of the occurrence. It is important to continue collecting data at the established sampling area instead of moving it to encompass the new location of the occurrence. If it is moved, then differences in habitat attributes cannot be compared over time. The current mapped extent, number of plants, and threat assessment will still be recorded for the occurrence at its new location.

Data can be collected with pen and paper in the field and when back in the office can be entered into an Excel data entry form provided by SDMMP. Alternatively, data can be entered directly into the data entry form in the field using a tablet or

other portable computer that supports Microsoft Excel. All data collected during rare plant monitoring surveys should be submitted by August 1 of the year it was collected to the SDMMP (currently via email or on CD; future via the regional SC-MTX web portal accessed at www.sdmmp.com). Specific data to be submitted include:

- Completed Excel files that have been reviewed for errors (1 per occurrence sampling point)
- Photos
- Copies of field forms (if not entered electronically into a personal computing device in the field)

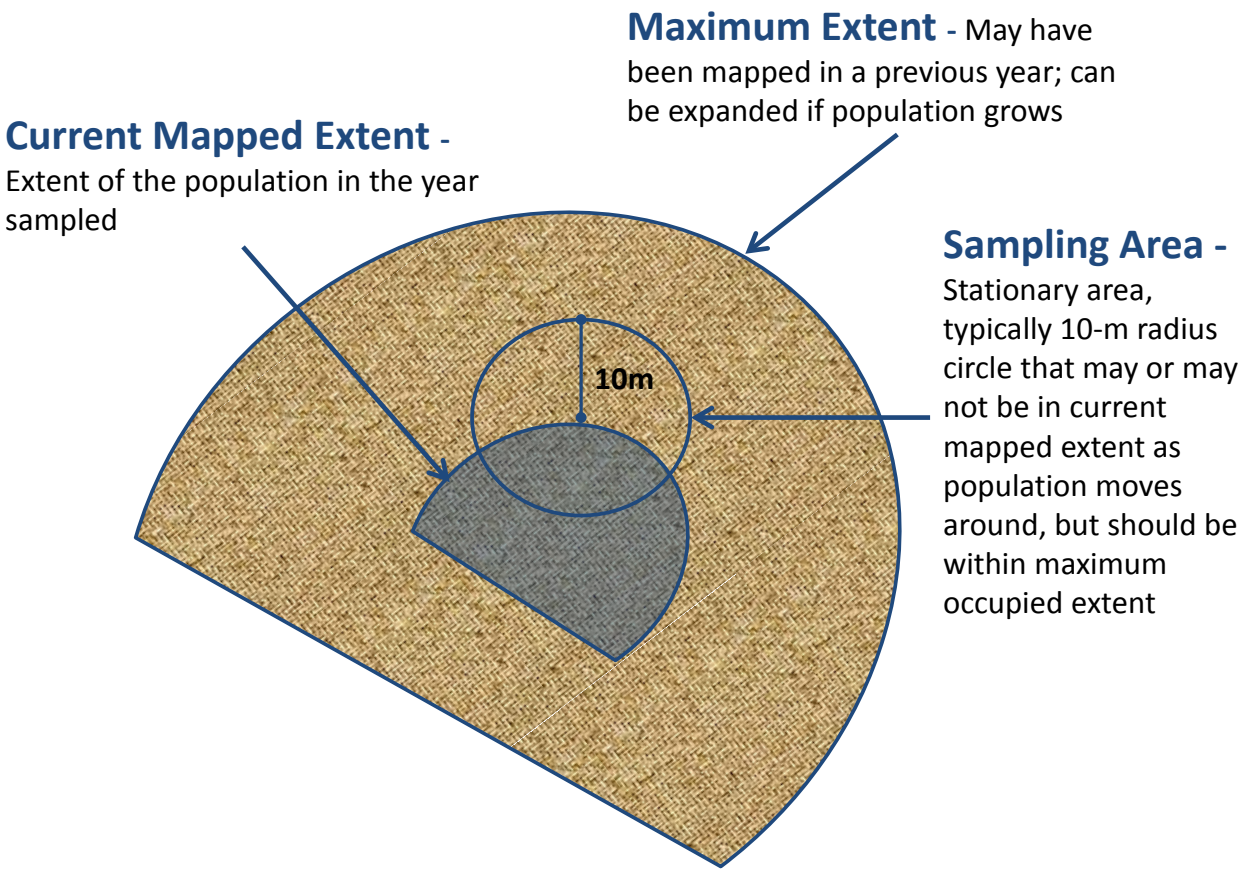


Figure 2. Diagram showing the relationship between maximum extent, current mapped extent, and sampling area.

Instructions for MSP Rare Plant Monitoring Forms

In preparing for 2014 rare plant surveys, surveyors should ensure they have all the required access permits and have been trained in the data collection protocol. It is assumed that the survey team has members experienced with identifying the rare plant species being inspected. Ideally, two to three people comprise a monitoring team as this can improve estimates and makes it easier to delineate occurrence perimeters. In general, surveys should be conducted from late March to early June when plants are flowering and annuals are most detectable. SDMMP will provide a calendar on the website with suggested survey periods for each species. For each species, the size of the occurrence sampling area can also be obtained from the SDMMP website.

Specific information for each rare plant occurrence is found in MOM (see previous section). Occurrences may also have additional GIS shapefiles with point coordinates and polygon perimeters that are linked to MOM records through the occurrence ID. MOM is available in ARCGIS shapefile, kml, and Excel spreadsheet formats and may be downloaded from: http://sdmmp.com/monitoring/MSP_Rare_Plant_Monitoring.aspx

An ArcGIS viewer is available at http://bit.ly/1bSAExs to view MOM occurrences and to create maps using various GIS layers. GIS shapefiles or kmls with available point coordinates and polygon perimeters can be obtained from SDMMP before going into the field. These files are helpful if the occurrence location is not familiar to the surveyor. Surveyors should prepare maps that identify access routes to rare plant occurrences. To improve efficiency and reduce data errors it is recommended that prior to going into the field any information in MOM that does not change from year to year be typed into the data sheet for each survey site. This includes scientific and common names, MSP Occurrence ID, CNDDB EO#, management unit, preserve, land owner, land manager, and occurrence location information. A data entry template is being developed that shows information that can be entered in advance of doing the survey.

The following is a check-list of equipment needed during rare plant surveys.

Field Equipment Needed for Surveys

☐ Global Positioning System (GPS) submeter unit with sampling location coordinates and polygon perimeters (if available) already entered
☐ Camera that can attach to tripod
☐ Tripod with camera mounting attachment (extendable to 5-6' and with bubble level, if possible)
☐ Compass
☐ Survey field forms & pens
☐ Cover estimate diagram (see page 4 of data form)
☐ Habitat and threat assessment category definitions (see page 2 of data form)
☐ Trudgen & Keighery habitat quality assessment (see page 4 of data form)
☐ Plant press and/or other plant collecting materials
☐ Aerial photograph (optional, for mapping population, threats, etc.)
☐ Ant Sampling Kit. *Please see USGS 2014 protocol: "Assessing the Presence of Argentine Ants Using the Bait Method" for additional supplies needed to survey for Argentine ants.*

Instructions for Completing the MSP - Rare Plant Occurrence Monitoring Form, Page 1

After arriving at the site, the surveyors should go to the occurrence location and identify the occurrence sampling area. The sampling area is generally a 10-m radius circle, unless specified otherwise for a species. The boundaries of the sampling area can be temporarily flagged if needed. If the occurrence has not been previously sampled using this protocol, then the monitoring location needs to be established (see pages 2 & 3). It is very important to minimize impacts to the plants as a result of monitoring activities. Try to avoid creation of paths or stepping on plants during the surveys. Biosecurity measures should also be undertaken to reduce transmission of invasive plant seeds, pathogens, etc. from one occurrence to the next.

Scientific Name: Record the monitored species' scientific name, including subspecies or variety, if applicable. Current scientific names are provided in MOM in the column "SName" field.

MSP Occurrence ID: The occurrence ID can be obtained from the "OccID" column in MOM (see previous sections for a description of the occurrence identification code).

Common Name: The species common name can be obtained from the column "CName" in MOM.

CNDDB EO#: If the occurrence has a CNDDB EO#, this will be listed in the "OtherID" column in MOM as "EOXX" (e.g., EO4, EO15).

Translocated?: Enter whether the occurrence is translocated or not. MOM has a "Transloc" field that can help to complete this field.

Preserve, Land Owner, Land Manager, and MU: This information can be found in MOM.

Occurrence Name: Record the occurrence name from the "OccName" field in MOM. The occurrence name represents the site where the occurrence is found and is often named after a preserve, geographic area or feature, road, etc. If there are two different occurrences with the same site name, then they are differentiated with a number. For example, MOST_3MAVA002 and MOST_3MAVA003 are two different occurrences of *Monardella stoneana* in Marron Valley and their occurrence names are Marron Valley #1 and Marron Valley #2, respectively.

Sample Point: There can be multiple sampling areas that are part of the same occurrence. These are designated in the occurrence name as "-Obs. #X" (e.g., Carmel Mountain - Obs. #1, Carmel Mountain - Obs. #2) or as unique names (e.g., Crest Canyon North, Crest Canyon South). For the sample point, enter an observation number or name only if there are multiple sampling areas for that occurrence.

Surveyors and Affiliation/Agency: Record names and agencies of all field personnel (use full names).

Date, Time Start, Time Finish: When in the field, record the date, time start and time finish of data collection for both the occurrence status and habitat/threat assessment portions of the data form. This information will allow us to track the time it takes to complete surveys for budgeting purposes and so we determine if changes to the protocol are needed to make it more efficient.

I. OCCURRENCE STATUS:

 # Plants/Sampling Area: Count or estimate the total number of plants in the sampling area. Use estimates for dense occurrences where it is not feasible to count every individual or where there is a risk of impacting the population by trampling. Estimates for the sampling area can be based on counting a portion of the sampling area and then extrapolating to a total number of plants for the sampling area. Criteria for classifying "individual plants" need to be specifically delineated for hard to count species. These criteria are being developed and will be available prior to the 2014 surveys. Describe the uncertainty of your estimate as very high, high, medium, low, very low. Selecting "very high" means you are very uncertain about the accuracy of your estimate.

 # Plants/Current Mapped Extent: If the mapped occurrence perimeter falls entirely within the sampling area, then this number is the same as that entered for "# Plants/Sampling Area". If this is the case, re-enter the number here. If the occurrence perimeter is larger than the sampling area, then count or estimate the number of plants within the entire occurrence perimeter. Round off estimates to the order of magnitude that you are most comfortable estimating. Describe

the uncertainty of your estimate as above. If the occurrence is so large that a numeric estimate is uncertain, give a "ball park" estimate and indicate in the "Uncertainty?" field that uncertainty is "very high".

Area of Current Mapped Extent: GPS the perimeter of the occurrence and enter the size of the area and specify units (e.g., square meters, square feet). The size will most likely be entered back in the office after GIS is used to calculate the area. If the occurrence perimeter is not delineated with GPS, then record an estimate of the occurrence size. Indicate whether the area was GPS mapped or estimated.

Is Sampling Area within Current Mapped Extent? Check yes or no to indicate whether the current distribution of the plant is outside of the sampling area.

Species Found? Check off whether or not the species was located. If the species is not found, note if there are potential explanations for why the species wasn't detected.

Phenological Stages and Evidence of Herbivory, Disease, and Stunted Growth: For each phenological stage (vegetative, flowering, fruiting, dead) and for evidence of herbivory, disease, stunted growth enter the number of the category representing the range in % of plants exhibiting the attribute being addressed. The categories are defined as:

1 (0%) 2 (>0% to <10%) 3 (10% to <25%) 4 (25 to <50%) 5 (≥50%)

Notes with additional details can be recorded on page 3.

Collection? Indicate whether a collection of plants within the sampling area was taken or has previously been done. If there is a collection, complete the section on collector, collection number, and museum/herbarium where the collection was submitted. SDMMP is currently checking into where collections can be submitted for identification.

II. SAMPLING AREA LOCATION & SITE PHOTOMONITORING

GPS Accuracy: Record the accuracy of the GPS unit and specify the units (e.g., meters, feet).

GPS Datum: Record the datum setting for the GPS unit (e.g., NAD83, WGS84). NAD83 is the preferred projection for submitting data to the regional SC-MTX web portal.

Coordinates: Based on the GPS reading, record the easting and northing coordinates of the photopoint at the sampling area and check the coordinate system used (e.g., UTM, State Plane, Latitude-Longitude). The SDMMP prefers latitude-longitude coordinates in decimal degrees.

Photos should be taken from the exact same viewing location during each occurrence monitoring visit. Typically, this location is at the edge of the sampling area looking toward the rare plant population. Use a tripod with an elevation/bubble feature if possible, and avoid using camera zoom features unless exact zoom level can be recorded.

Camera Type: Record the type of camera being used for photo monitoring, including make, model, and lens type.

Location 1: The coordinates for this location are recorded above. If photos are taken from a secondary location, then the coordinates should be entered under "*Location 2*"

Direction: Using a compass, note the direction that photo(s) are taken using either cardinal directions and/or degrees.

Height: Measure the height of the camera (taken from the ground to the bottom of the camera body, unless otherwise noted).

Camera Angle: Record the angle that the photo(s) are taken, whether level or at an upward or downward facing angle. Include degree of angle, if possible.

File Location: Once monitoring photos are downloaded and filed, record the file location of photographs taken during monitoring visit (e.g., E:\Monitoring\Arct_gland\2006).

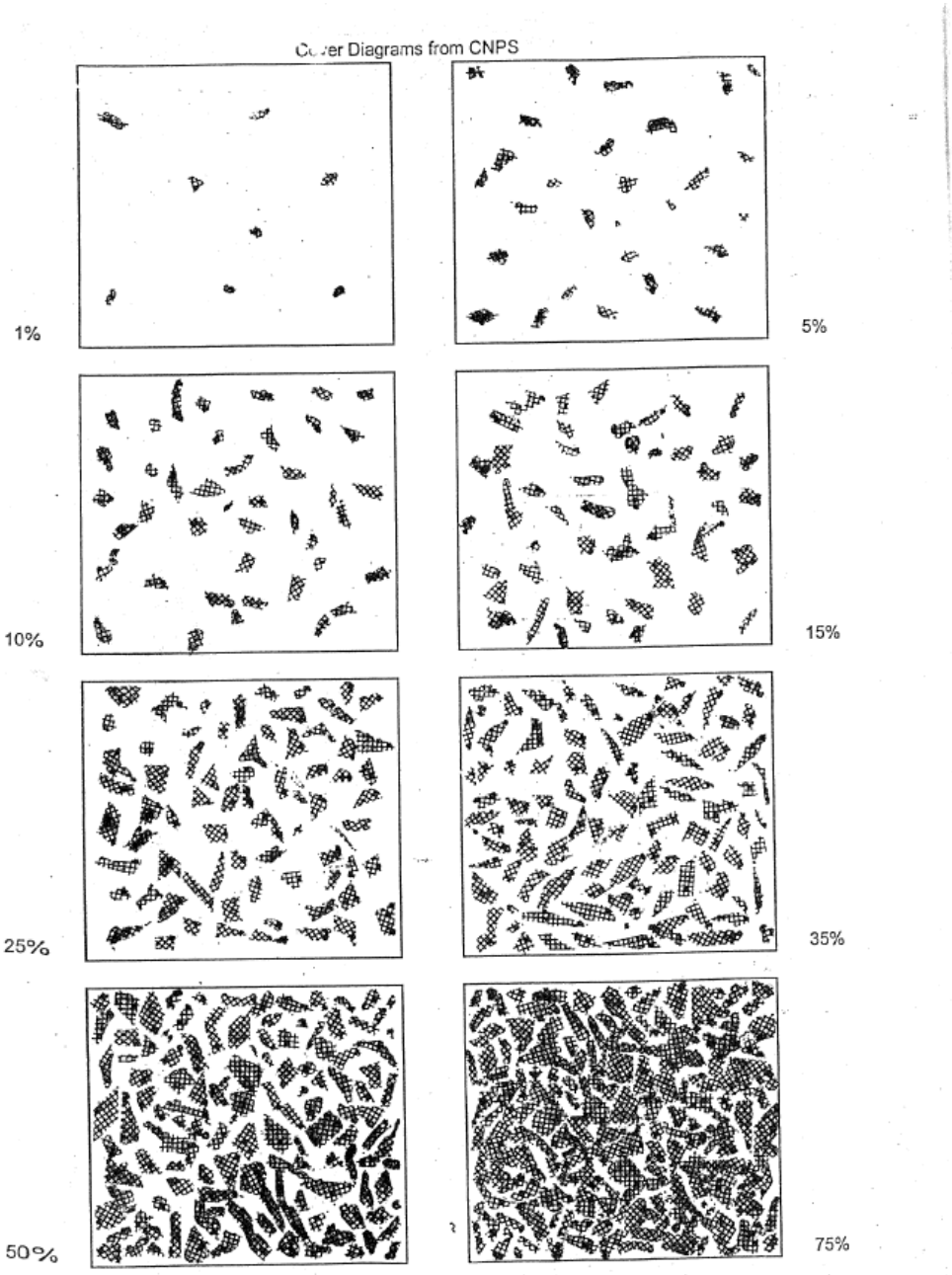
III. ASSOCIATED SPECIES IN SAMPLING AREA

List all *native* and *nonnative* plant species, bare ground, litter, and rock with estimates of percent cover within the sampling area. It is important to record *all* non-native plant species in order to identify if management actions are needed

Invasive: Check this column if the species is known to be non-native.

Species/Substrate: Record species' scientific name. If plants cannot be identified in the field with certainty, a collection should be made for later identification and/or verification. If a specimen is submitted to a herbarium, note the collection number in the third column and the herbarium name. Three substrates: bare ground; litter; and rock should also be recorded in the designated rows.

Cover: Record absolute % cover of species/substrates listed. A cover diagram (see below) should always be used for this analysis; estimates without such a guide tend to be inflated. Copying the diagram onto a clear plastic sheet (like an overhead) is recommended for field use. Additionally, it is recommended that two surveyors make individual estimates, then compare estimates and come to agreement on a final cover estimate. Provide overall estimates of % total cover, % herbaceous cover, % shrub cover, and % tree cover.



Instructions for Completing the MSP - Rare Plant Habitat and Threats Assessment Form, Page 2

IV. HABITAT ASSESSMENT IN SAMPLING AREA

The habitat assessment is conducted within the sampling area, which is typically a 10-m radius circle (as described above). However, for some plant species, the configuration and dimensions of the sampling area may differ. Species-specific sampling areas are being developed by the SDMMP in collaboration with those experienced in monitoring these species and will be available on the website.

SANDAG 2012 Vegetation Alliance/Association: At the sampling point determine the vegetation alliance/association based upon the data collected in "Associated Species" and using the vegetation key at (http://rdw.sandag.org/file_store%5CEcology/ECO_VEGETATION_WSD_2012.pdf). This is typically done in the office after the fieldwork is completed.

Surrounding Land Use: Record the land use surrounding the observation area (e.g., residential, road, open space, etc), using approximate distances from the monitoring population/subpopulation if possible.

Cryptogamic Crust Cover, Thatch Cover: Record the number of the % cover class for cryptogamic crust and thatch cover within the sampling area. Cover classes are defined as:

1 (0%) 2 (>0 - <10%) 3 (10% to <25%) 4 (25% to <50%) 5 (≥50%)

Thatch Depth: Estimate average and maximum thatch depth in cm within the sampling area. Thatch consists of dead dry grass that lays over on the ground or is not attached, and can build up over years.

Dead Standing Biomass: Record whether there is dead standing biomass and if it is present, record the dominant species and cover class (above) and average height in cm. Standing biomass is typically larger dead forbs, such as fennel, mustard, dock, and even taller oats (*Avena* spp.).

Mammal Species Activity Categories: Assign the number of the appropriate activity category for feral pigs, ground squirrels, and pocket gophers. Activity categories numbered from 1-4 are defined as:

Feral pig activity within sampling area:

1 = No feral pig activity (rooting, wallowing, vegetation destruction, tracks, scat, pig) detected.

2 = Signs of pig activity (rooting, wallowing, vegetation destruction) in sampling area appear months old.

3 = Signs of recent pig activity (rooting, wallowing, vegetation destruction, tracks, scat, pig) in adjacent area but not within sampling area.

4 = Recent signs of pig activity (rooting, wallowing, vegetation destruction, tracks, scat, pigs) within sampling area.

Ground squirrel activity within sampling area:

1 = No ground squirrel burrows detected.

2 = Burrows and/or ground squirrels observed adjacent to sampling area but not within sampling area.

3 = Single squirrel or burrow seen within sampling area.

4 = Multiple burrows and/or squirrels seen within sampling area.

Gopher activity within sampling area:

1 = No pocket gopher mounds detected.

2 = Mounds or gophers observed adjacent to sampling area but not within sampling area.

3 = <10 mounds observed within sampling area.

4 = ≥10 mounds or one or more gophers seen within sampling area.

Sampling Area Representative? Indicate whether the sampling area appears representative of the maximum extent. If the sampling area encompasses the entire maximum extent of the occurence, then enter yes. If the sampling area appears to differ substantially from the maximum extent, then note the differences in the notes on page 5. Be sure to specify which covariates differ and how they differ.

V. THREATS ASSESSMENT IN MAXIMUM EXTENT

The threats assessment includes the maximum extent of the occurrence plus a 10-m buffer. The area may be substantially larger than the sampling area, depending on the size of the occurrence.

Argentine Ant Bait Station – See Separate USGS 2014 Protocol ""Assessing the Presence of Argentine Ants Using the Bait Method"

Disturbances: There are a number of disturbances that may threaten rare plant populations, such as invasive plants, soil disturbance from a number of activities, altered hydrology, etc. For all disturbances detected within the occurrence's maximum extent and adjacent 10-m buffer, rank the level of disturbance and enter the numeric category code (1-6) using the following criteria:

Disturbance categories within the maximum extent:

1 = No sign of disturbance within maximum extent or in adjacent 10 m buffer.

2 = Disturbance does not occur within maximum extent but is detected within the surrounding 10 m buffer area.

3 = Disturbance present in >0% to <10% of area within maximum extent.

4 = Disturbance occurs in 10% to <25% of area within maximum extent.

5 = Disturbance occurs in 25% to <50% of area within maximum extent.

6 = Disturbance occurs ≥50% of area within maximum extent.

Provide additional information into the designated fields on the data form if trails or recent fire are detected in the occurrence or buffer area. Record and rank if there are other potential threats that are not listed on the form.

Overall Site Quality: Record the biological quality of the monitoring site, based on Trudgen & Keighery assessment, as follows:

Very Good-Excellent	• 80-100% Native Flora Composition • Vegetation Structure intact or nearly so • Cover /abundance of weeds < 5% • No or minimal signs of disturbance
Fair to Good	• 50-80% Native Flora Composition • Vegetation structure modified or nearly so • Cover/abundance of weeds 5-20% any number of individuals • Minor signs of disturbance
Poor	• 20-50% Native Flora Composition • Vegetation structure completely modified • Cover/abundance of weeds 20-60% any number of individuals • Disturbance incidence high
Very Poor	• 0-20% Native Flora Composition • Vegetation Structure disappeared • Cover/abundance of weeds 60-80% any number of individuals • Disturbance incidence very high

Instructions for Completing the MSP – Management Needs and Notes Form, Page 3

VI. MANAGEMENT RECOMMENDATIONS

Based on disturbances and threats noted previously, provide management recommendations for the site.

VII. MANAGEMENT ACTIONS IN LAST YEAR

Record any known management actions that have been implemented at the rare plant occurrence over the last year.

VII. CNDDB SPECIES DETECTED & NOTES

Record detailed notes and any other useful field comments that have not been previously addressed, e.g., other sensitive species sightings.

References

CNDDB. 2009. *California Natural Diversity Database (CNDDB) Data Use Guidelines*. http://www.dfg.ca.gov/biogeodata/cnddb/

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Tracey, J., K. McEachern, and K. Greer. 2011. *San Diego Rare Plant Monitoring Plan: Fiscal Year 2011*.

Appendix A. Rare plant species that were identified for monitoring in 2014-15 by the Management Strategic Plan (MSP).

Scientific Name	Common Name	MSP Starting Year
Acmispon prostratus	Nuttall's acmispon	2014
Agave shawii var shawii	Shaw's agave	2014
Aphanisma blitoides	Aphanisma	2014
Bloomeria clevelandii	San Diego goldenstar	2014
Brodiaea filifolia	Thread-leaved brodiaea	2014
Brodiaea orcuttii	Orcutt's brodiaea	2014
Chloropyron maritimum ssp maritimus	Salt marsh bird's-beak	2014
Dicranostegia orcuttiana	Orcutt's birds-beak	2014
Dudleya blochmaniae	Blochmann's dudleya	2015
Dudleya brevifolia	Short-leaved dudleya	2014
Dudleya variegata	Variegated dudleya	2014
Erysimum ammophilum	Coast wallflower	2014
Fremontodendron mexicanum	Mexican flannelbush	2014
Hazardia orcuttii	Orcutt's hazardia	2014
Monardella stoneana	Jennifer's monardella	2015
Nolina cismontana	Chaparral nolina	2014
Rosa minutifolia	Small-leaved rose	2014

Surveys to be Conducted as Part of 2014-15 Funded Monitoring and Management Projects

Scientific Name	Common Name	MSP Starting Year	Organization Conducting Survey
Ambrosia pumila	San Diego ambrosia	2014	AECOM
Baccharis vanessae	Encinitas baccharis	2014	AECOM
Brodiaea santarosae	Santa Rosa brodiaea	2015	AECOM
Chorizanthe orcuttiana	Orcutt's spineflower	2014	Chaparral Conservancy
Clinopodium chandleri	San Miguel savory	2014	AECOM
Dudleya viscida	Sticky dudleya	2015	AECOM
Euphorbia misera	Cliff spurge		AECOM
Lepechinia cardiophylla	Heart-leaved pitcher sage	2014	AECOM
Lepechinia ganderi	Gander's pitcher sage		AECOM
Monardella viminea	Willowy monardella	2014	AECOM
Nolina interrata	Dehesa nolina	2014	CBI, AECOM
Packera ganderi	Gander's butterweed	2014	AECOM
Tetracoccus dioicus	Parry's tetracoccus	2014	AECOM

Potential Baseline Surveys in 2015

Scientific Name	Common Name	MSP Starting Year	Organization Conducting Survey
Acanthomintha ilicifolia	San Diego thornmint	2015	?