MSCP Rare Plant Monitoring Revision:
October 10-13 Scientific Advisor's Workshop Notes

Funded through USFWS/CDFG Local Assistance Grant Program

Monday, October 10, 2005
Mission Trails Regional Park Visitors Center
Morning Session, 8:30 a.m.-1:30 p.m.

Present:
Dr. Kathryn McEachern, USGS (Lead Project Scientist)
Dr. Bruce Pavlik, Mills College (Scientific Advisor)
Robert Sutter, TNC (Scientific Advisor)
Dr. Jon Rebman, SDNHM (Scientific Advisor)
Clark Winchell, USFWS
Keith Greer, City of SD
Lauren Hierl, SDSU
Melanie Johnson, City of San Diego

The workshop began with introductions and opening remarks by Kathryn McEachern. Keith Greer then gave an overview of the Multiple Species Conservation Program (MSCP), explaining that regional species mitigation planning began in the early 1990s when the City was planning a water recycling program. Because of the project's potential for growth inducement impacts, a regional mitigation program for federally and state listed species was needed. When the Natural Communities Conservation Planning program (NCCP) was created, local planning was given significant momentum, and although the water re-use program was never implemented, regional biological planning continued in the form of the MSCP. Keith explained the general structure of the program, its primary purpose of granting species 'take' authority to local agencies, and how the monitoring component was integrated into the program. The MSCP was adopted in 1997 by the City of San Diego, and 1998 regionally. Because the monitoring plan was one of the last components of the program created, it was written quickly and with somewhat limited knowledge of species' ranges and exact ecological requirements/life histories. Clark Winchell pointed out that this is a problem with many NCCP programs; the vast majority of NCCP planning goes into the plans and regulations, and monitoring is often an afterthought that is addressed quickly and often at the last hour.

The fundamental requirements of the MSCP monitoring program are: 1) Habitat gain/loss tracking, which sets forward the acreages of habitats that are acquired and protected through the program, as well as acreages of various habitats that will be impacted by development; 2) Habitat trend monitoring; 3) Rare plant monitoring; 4) Animal monitoring; and 5) Wildlife corridor monitoring. The biological monitoring plan, which addresses these items, was created by Ogden Environmental in 1996. In 2001 the Conservation Biology Institute (CBI) performed a review of the plan; however, the report was never finalized. Because the original monitoring plan was created quickly and without full information and without the local monitoring experience gained since its creation, and because the CBI report was never finalized and was also created using limited information from local monitoring efforts, local agencies have found the monitoring plan difficult to implement and question the utility of some of the directives. Keith Greer explained

that the City of San Diego has spent seven years collecting data, but its utility is unclear and he emphasized the need to ensure the usefulness of any future monitoring efforts and planning. He also discussed the importance of ensuring that all local monitoring results are integrated and analyzed together to portray the larger picture of regional species' and ecosystem health. Clark Winchell explained that the current efforts to revise the MSCP monitoring plan are especially important because it is likely that other plans will use the MSCP plan as a benchmark.

Next, the group discussed the issue of top down monitoring planning versus bottom up, e.g., conceptual modeling and working down to specific monitoring activities, versus creating a field-ready, precise manual for monitoring and using the monitoring results to examine larger issues. Bruce Pavlik explained that in his experience the two are not necessarily mutually exclusive, that sometimes the best approach is not 'top down' nor 'bottom up,' but some combination of the two. He explained that he believes the biggest consideration in planning monitoring activities should be *key management questions*, and that all monitoring should be aimed at answering such questions. He discussed the need to take all considerations into account in formulating a monitoring plan, such as the reasons for monitoring, management questions, monitoring concepts, etc.

The group discussed the fact that the original monitoring report was heavily focused on trend analysis, but that trends are not detectable in short time periods and that reliable trend analysis often requires upward of 20 years. Robert Sutter explained that his organization, The Nature Conservancy, has moved away from trends analysis and primarily employs presence/absence and threats analysis monitoring. Bruce Pavlik said that monitoring should be focused on decision-making, the question should always be, 'what decisions are going to be made using the data.' The primary focus of monitoring and management should be an analysis of the ecological needs of the species in question, and what is the status of the habitat being managed.

Next, the group viewed maps compiled by Dr. McEachern that depict MSCP preserve areas, sites designated for monitoring in the original monitoring plan, and sites being monitored. The group discussed the need for a central repository for all monitoring information, results, etc. Robert Sutter discussed that regular monitoring workshops can be an effective method for sharing results as well as creating a regular date where monitoring information must be collected and analyzed. At such workshops, the individual in charge of each jurisdictions monitoring discusses progress made during the year (or multiple years), and ideally this information is reviewed by a panel with monitoring expertise that can provide feedback and suggestions to local managers.

Jon Rebman addressed the need for regular vouchering of monitored species in order to document their occurrence. He pointed out that for the vast majority of rare plant localities, no vouchers have been submitted; therefore many of the occurrences have not been verified. Vouchering can also be important in that specimens can be used for taxonomic analysis or review when species are re-classified.

Over lunch, the group viewed photos of some of the City of San Diego monitored species and monitoring sites. The group discussed issues associated with some of the species with monitoring and management.

Afternoon Session, 1:30-5:00 p.m.

Group same as above, with exception of Clark Winchell, and joined by:
Jerre Stallcup, CBI
Tom Oberbauer, County of SD

Jerre Stallcup and Tom Oberbauer provided the scientific advisors some additional background regarding the development of the MSCP and monitoring plan. Jerre Stallcup explained that she was hired in 1991 as a consultant for development of the MSCP. At that point, the covered species list was already near finalization. There was pressure both from the development community and from environmental groups to make the list inclusive of all species that with federal or state listing potential, but also to keep it at a manageable level. Generally, species that were selected for 'covered' status were federally or state-listed or candidate species; CNPS list I or II; and/or narrow endemics. In 1991, the primary information used to determine species' extent and distribution was from development proposal studies; therefore, knowledge of species' distribution was limited.

Tom Oberbauer explained how the County's target mitigation/preserve area (known as Pre-Approved Mitigation Area, or PAMA) was created. It was developed by reviewing the regional vegetation layer, soils layer, vernal pools layer, and areas considered by the agencies to be critical populations. He also explained that eight northern coastal cities are currently in the process of planning and implementation of the MHCP, a program similar to the MSCP. It also has a monitoring component, and most of the recommended monitoring includes quadrat sampling, similar to what is recommended in the MSCP monitoring plan. The plans share many covered and monitored species. The group discussed the idea of monitoring for the purpose of management and that monitoring should be aimed at developing management activities to protect species rather than strict trend monitoring.

The group discussed the monitoring results thus far, and Keith Greer pointed out that monitoring results thus far always come back to rainfall. Tom Oberbauer discussed the vegetation change project analysis that the County did using aerial photography, and pointed out that this can be a valuable tool in monitoring. He also discussed how the County creates management plans, and that their general rule is that when a contiguous preserved area is 300 acres or greater, an area specific management plan is created. Both the City and the County have management framework plans that include fundamental management requirements (the City of San Diego framwork management plan is included in its MSCP Subarea Plan Section 1.5, pp. 50-101). When an area-specific management plan is developed, all relevant components of the framework

management plan are incorporated with locally-specific information and management needs. Keith Greer explained that the City does not go by a specific acreage number, but does have management plans for nearly all of its large preserve areas and plans to create plans for all preserved lands. The primary issues that the management plans must deal with in the city are preventing and mitigating anthropogenic effects such as encroachments, trail planning, and invasive species.

Keith also explained that the intent of the current grant is to have the scientific group provide fairly specific monitoring recommendations. He also explained that the City hopes to acquire additional grant funds to have the group analyze a pilot monitoring year, if possible, and further improve the monitoring plan. The group discussed the fact that Lauren Hierl and the SDSU group are currently working on the species prioritization and that this information will feed back well into the scientific advisor's work.

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Tuesday, October 11, 2005
Mission Trails Regional Park Visitors Center
Morning Session, 9:00 a.m. -1:00 p.m.

Present:
Dr. Kathryn McEachern
Dr. Bruce Pavlik
Robert Sutter
Dr. Jon Rebman
Lauren Hierl
Melanie Johnson

Dr. McEachern opened Tuesday's meeting by noting that the group is in general agreement that adaptive management is the direction to go. Dr. Pavlik gave a presentation that outlined the adaptive management strategy and included an example of a *Rorippa subumbellata* (Tahoe Yellow Cress) plan that he created. The group discussed the importance of having an oversight/enforcement group for monitoring and adaptive management and that this does not appear to be a strong component of the current MSCP.

The group discussed that it is important to note that science doesn't focus itself. If used for an adaptive management strategy, all research needs to be focused to answer specific management questions. A key question is, 'If I knew the answer to this question, then I would know the management action required.' If a key management question can't be answered with the research/monitoring being performed, it shouldn't be done as part of an adaptive management program.

Another important component of a successful adaptive management program is to have an adaptive management working group, with all stakeholders included. Dr. Pavlik stressed that it is very important to have all players involved so that the reasons as well as solutions are owned by all.

Robert Sutter discussed the fact that TNC uses a site specific analysis system for adaptive management. This system can also be used for single species with multiple populations. The first step in such an analysis is to assess key ecological attributes, or factors that determine viability, persistence, functionality of species or habitats. Size, condition, and landscape context are considered. Some of these areas require research, whereas some species and habitat are better understood. The 'desired ecological condition' should be considered throughout this process. The next step in the process is threat assessment. Here, stresses and source of stress are identified. These are ranked by severity and scope, e.g., how severe is the risk to the species? When determining threat, the extent of the population that the stressor/threat affects should be taken into consideration. Next, the source of the stressor is identified, e.g., why is there is an altered hydrologic or fire regime? Sources of stress are ranked. Next, key management actions

can be identified. At this point, specific goals should be set, for instance in a water quality case the Conservancy dealt with, the specific goal set was to close 50% of roads and implement best management practices at 70% of sites. The next step in the process is to identify strategies and rank each strategy by benefit to species or habitat, feasibility, cost, etc. Management response or effectiveness objective should be measured by specifically identified indicators. Goals must be specific, measurable, action-oriented, resource-based, and have a specific timeline (SMART).

Next, the group discussed the general components and contents of the revised monitoring plan. First, a working definition of adaptive monitoring will need developed, and a differentiation between adaptive management and status/trend monitoring should be described. The group also discussed the need to analyze current data sets in order to create recommendations regarding continuation of status/trend monitoring and methodologies. Robert Sutter suggested that the report include a discussion regarding effective conservation, and that true conservation occurs only at the intersection of: 1) land protection/acquisition; 2) threat abatement; and 3) land management. Threat abatement refers to immediate actions such as trail re-alignment, whereas management refers to ongoing biological management actions such as invasives control and restoration.

During the noon hour, the scientific advisors went for a hike in Mission Trails Park to view local ecosystems and species.

Afternoon Session

1:15 – 3:00 p.m.
Group joined by:
John Martin, USFWS
Maeve Hanley, County of SD Parks
Jeremy Buegge, County of SD MSCP

Maeve Hanley and Jeremy Buegge outlined the County's organizational structure for the group. Jeremy works for the MSCP, which is in the Planning and Land Use Department, and oversees MSCP preserve development, development review, etc. Maeve works for Parks and Recreation, who oversees land management and MSCP monitoring. The County has an additional group, Agricultural/Weights and Measures, which performs some invasives control. The long-term goal for the County is that the MSCP would be absorbed by Parks and Recreation.

Maeve outlined the creation of the MSCP, and explained that the County has been primarily focused on land acquisition since the creation of the plan. Parks and Recreation is the generally the lead on land acquisition. Implementation of the MSCP has allowed the County access to grant monies and other funds for land acquisition in addition to mitigation land acquired by various development permittees under the plan. The County has also been performing baseline

biological surveys. For plants, generally point data and GIS data are collected during the surveys. Maeve also discussed the creation of management plans for the County, and discussed the problem she sees with the monitoring directives of the MSCP Table 3-5 (aka 'Appendix A'; this table includes reasons each species was or was not included on the 'covered' species list and sets forth species-specific coverage conditions) being inconsistent with the MSCP monitoring plan.

John Martin discussed the USFWS National Wildlife Refuge, which is currently about 8,000 acres. Much of the reserve land was acquired after development of the MSCP, which allowed leverage of funds for the regional preserve. The USFWS is currently in the process of writing a comprehensive conservation plan for the refuge. John also explained staffing issues at the refuge, and said that there were four staff at the refuge when he started; however, the assistant refuge manager has since moved to the coastal refuge area and the position is not expected to be filled. Several plant species have been monitored by refuge staff since 2000, including *Deinandra conjugens, Dudleya variegata,* and *Ambrosia pumila.* For *Dudleya variegata,* six 10m x 30m monitoring grids have been established. For *Deinandra conjugens*, they also have 10 x 30 grid monitoring scheme. For the 'Tri-Mark' population, *Dudleya variegata* extent has been mapped periodically. No monitoring has been done on refuges for Dehesa Bear Grass or Barrel Cactus.

John also discussed management activities. They are currently undertaking a large $800,000, five-year *Deinandra conjugens* and native grassland restoration on the 67-acre Tri-Mark property. The success criteria about 5% cover or less of non-native annuals and of perennials, but no success criteria for *Deinandra conjugens*. They are also performing other invasives control in along the Sweetwater River and are considering performing invasives control and vernal pool restoration in the S-series vernal pools.

3:00 p.m. – 5:00
Group joined by:
Dr. Doug Deutchman, SDSU
Heather Schmalbach, SDSU

Lauren introduced the monitoring grant that SDSU is working on concurently with the scientific advisor's rare plant work. The SDSU group is reviewing the entire monitoring program and their grant scope of work is roughly based on Atkinson's *Designing Monitoring Programs in an Adaptive Management Context for Regional Multiple Species Conservation Plans* (USGS, 2004). Helen Regan is heading up the species prioritization under the grant. Lauren explained that one problem associated with their work is the fact that MSCP is focused on 'covered species,' but that these may not always be best species to monitor, e.g., other potential umbrella or indicator species.

The group also reviewed what species have been quantitatively monitored to date. Robert Sutter discussed that power analysis should be done for some of the species for which there are datasets. The group reviewed the City's 1999-2005 data for *Dudleya brevifolia*. One potential monitoring method discussed for this species would be to use smaller, rectangular shaped quadrats and perform cover estimates rather than counts. The group also viewed USFWS data for *Dudleya variegata*. It was decided that *Dudleya brevifolia* would be a good focal species candidate based on its rarity and the ability to use City monitoring data to help devise a monitoring protocol.

The group also discussed the problems the city has had monitoring *Monardella viminea* due to its clumping nature. Point intercept method was discussed as a potential method to avoid such problems. It was decided that this species would also be a good focal species candidate to testing new methods.

Kathryn McEachern and Melanie Johnson agreed to work together to get existing monitoring data to Doug Deutchman for analysis.

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Wednesday, October 12, 2005
Mission Trails Regional Park Visitors Center
Morning Session, 9:00 a.m.-1:30 p.m.

Present:
Dr. Kathryn McEachern
Robert Sutter
Dr. Jon Rebman
Melanie Johnson
Heather Schmalbach (10 a.m.)
Lauren Hierl (10 a.m.)

Jon Rebman began the meeting by presenting a presentation regarding the San Diego History Museum records. He pointed out that the museum has vouchered specimens for very few of the plants being monitored under the MSCP, and none from the sites monitored. He explained the importance of vouchering both for species identification verification and for future species analyses. Many of the museums records that are many years old have been used for recent taxomonic analyses.

The group also discussed the current and potential funding of the MSCP's monitoring and management. Melanie Johnson explained that the MSCP program outlines the development of a regional funding source to be used for monitoring and management. A ballot measure is being developed by the San Diego Association of Governments (SANDAG), and is anticipated to be on a 2007 ballot. In the meantime, participating agencies are doing what they can on this front considering limited funding availability. The scientific advisors agreed that their recommendations should consider this situation, and tailor the program to achieve as much as possible given the current limited resources, but expand the program once a regional funding source becomes available.

Next, Lauren Hierl outlined SDSU's species prioritization scheme they are beginning to implement under the concurrent Local Assistance Grant. The group used the prioritazation scheme to analyze a currently monitored species, *Ambrosia pumila* (see scanned sheets, following). This was a very useful exercise and the advisors provided some good input about the species and a few suggestions for including in the prioritization. Rob Sutter shared his organizations threat listing, and agreed to send it to Lauren so that SDSU can use it in their work.

Step-Down Prioritization Approach

We echo the recommendations of Andelman et al. (2001), Wisdom et al (2001) and Hilty and Merlender (2000) and synthesize them into the following step-down approach for selecting focal species for consideration for MSCP monitoring purposes:

1. Apply a risk-based classification process as outlined above (or similar to that proposed by Lambeck 1997). Separate species at risk due to small population size from those at risk from other environmental factors. Environmental risk factors relevant for the MSCP include habitat loss and fragmented due to urban expansion, decline in habitat quality, introduced species, adverse fire regime, and environmental contaminants. Note that we have subsumed human induced risk factors into environmental factors because most, if not all, risk factors have a human origin.

2. For each at-risk group, allocate species to categories based on the nature of the risk factor. Species at risk from habitat loss should be subdivided into major habitat categories (e.g. based on vegetation associations). Wisdom et al. (2001) recommend that an initial prioritization of focal species be based on macrohabitat use (including vegetation type and structural stage combinations).

3. The spatial scale of risk factors and habitat associations should be given careful consideration to ensure representation across the MSCP region. Using information on home ranges (or a surrogate such as body size REF) further classify species in each group according to their spatial scale of response to environmental factors. (3 categories: low – localized, medium – 25-75% of range, high – 75-100% of range)

4. Using information on life span or age at first reproduction, further classify species in each group according to their temporal scale of response to environmental risk factors. (plants – life history types, e.g. annual obligate seeder)

5. Rank species in each group according to those that best satisfy the pragmatic issues of sampling and measurement outlined above.

6. Select one or more focal species from each group that best represent the rest of the group.

7. Apply a stopping rule. Examples of stopping rules are:
   Stop when each discrete vegetation community type is represented by at least one focal species;
   Stop when all risk factors have been associated with at least one focal species.

Data to collate:

- Risk classification – State list; NatureServe; Federal list. Rank according to risk classification. (This has already been compiled)
- Identify risk factor and its spatial scale: small population size? Threats? Make a list of all short- and long-term threats.
- Generation time or life span of species.
- Home range of species.
- Habitat associations.
- Data for pragmatic issues:
    - Their dynamics parallel those of the larger environmental component or system of ultimate interest.
    - They show a short-term but persistent response to changes in the state of the environment.
    - Their dynamics can be accurately and precisely estimated.
    - The likelihood of detecting a change in their value is high given a deterministic change in the system (changes in their values can be distinguished from background variation).
    - Differences in the status of the species is known to be able to discriminate among sites and ecological gradients.
    - It is known how the species responds to the known risk factor/s.
- Population dynamics
- Low variability in population dynamics (e.g. annual plants have high variability)

Information sheet for species prioritization

Species name: Ambrosia pumila

1. At-Risk Category: (1 = highest category; 2 = 2nd highest category etc.)

Small Population? yes
Environmental Risk? ~~??~~ yes

2. Risk Factors:

Degree to which risk factor contributes to overall risk (1 = high; 2 = moderate; 3 = low)

Spatial Scale of risk factor (SS 1 = wide spread across species distribution; SS 2 = moderate spread; SS 3 = low spread of risk)

Invasives = high, SS 1
Lack of Seed set = high SS = unknown, possibly SS1
(Altered demographic structure) Type Conversion

3. Spatial scale of species and Habitat Associations

Once fairly widespread, now very restricted
Open Grassland

4. Functional Group (plants); Generation time or life span (animals)

~~Rhizomatous perennial~~
Long-lived herbaceous perennial (rhizomatous)

Notes:

see fact Sheets
threats list - back

Sources:

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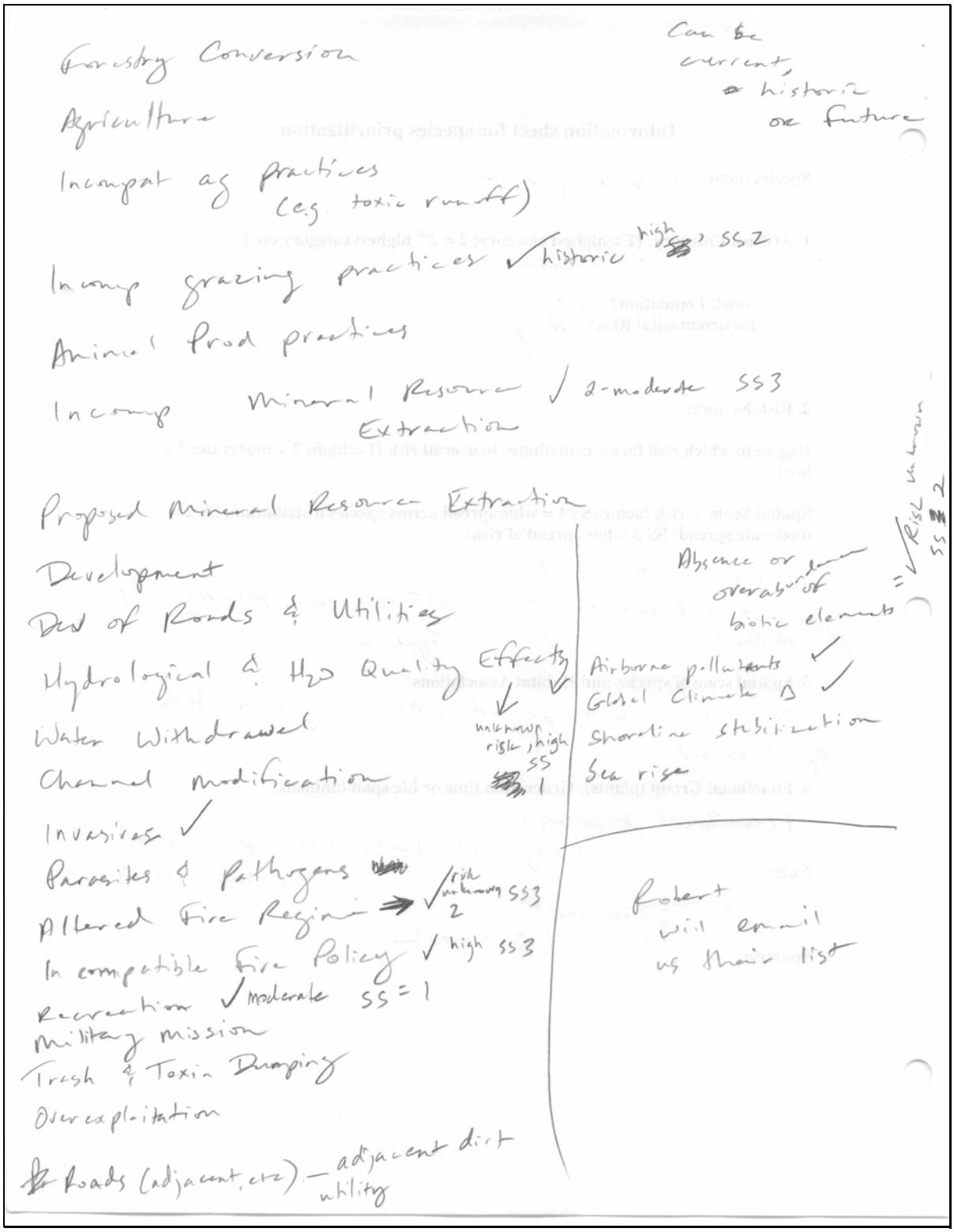

Afternoon Session, 1:30 p.m.-5:00 p.m.

Present:
Dr. Kathryn McEachern
Robert Sutter
Dr. Jon Rebman
Melanie Johnson

During the afternoon, the group laid out the outline for their report and discussed what should be included in the report and who would be responsible for each section. It was tentatively decided that the report outline would be as follows:

Executive Summary

I. Introduction
   A. Background
   B. Objectives
   C. People
   D. Effective Conservation

II. Current Status
   A. Database
   B. Coordination

III. Summary of Review Comments

IV. Detailed Review and Recommendations

V. Revised Rare Plant Monitoring Program
   A. Surveys
   B. Voucher Specimen Collection
   C. Adaptive Management Framework for Monitoring

Evening Session, 5:00 p.m.-7:00 p.m.

Present:
Dr. Kathryn McEachern
Robert Sutter
Melanie Johnson
Jim Rocks, biologist

The group took a field visit to Torrey Pines State Park to examine the habitat of several MSCP species, including *Dudleya brevifolia, Arctostaphylos glandulosa* var. *crassifolia, Lessingia filaginfolia,* and *Pinus torreyana.*

MSCP Rare Plant Monitoring Revision:
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Thursday, October 13, 2005
USFWS Field Monitoring Sites
Morning Session, 9:00 a.m.-1:00 p.m.

Present:
Dr. Kathryn McEachern
Robert Sutter
Clark Winchell
John Martin
Jeremy Groom, Biologist, USFWS
Keith Greer
Melanie Johnson
Betsy Miller, City of San Diego

Kathryn McEachern and Rob Sutter stayed on Thursday in order to visit some of the current MSCP rare plant monitoring sites. The group first visited an area south of McGinty Mountain to see *Nolina interrata* (Dehesa Bear Grass) and *Satureja chandleri* (San Miguel Savory). Based on views of a large *Nolina interrata* population from an adjacent hillside, Robert Sutter suggested that this species may be a candidate for photo monitoring due to its easy detectability among the relatively open shrub layer.

The group also visited the "Par Four" USFWS *Ambrosia pumila* monitoring site. This area is immediately west of a housing development, and is also west and immediately adjacent the Sweetwater River. The golf course is on the other site of the river. Clark explained the methodology that has been used for the species. The group discussed management and monitoring issues associated with this species. Because it inhabits areas immediately adjacent streams or rivers, and in many cases these streams and rivers no longer flood and deposit sediment in the *Ambrosia pumila* habitat, this species may require special management. A potential problem with the lack of flooding is type conversion, both with potential upland shrub species coming in, and invasion by non-native species such as non-native grasses.

Next, the group viewed the S-series vernal pools near the Sweetwater Reservoir. Much of the area is inhabited by non-native grasslands, but John Martin explained that the Reservoir area immediately west of the site supports vernal pools that are being restored, and the area appears to have mima mound topography based on aerial photo interpretation. City staff agreed to help with vernal pool species surveys next spring.

The group also visited the USFWS Tri-Mark *Deinandra fasciculata* (Otay Tarplant) restoration site. The service was court-ordered to reduce invasive plant cover (primarily non-native grassland) at the site. The entire site was mowed and/or weed-whacked (around Tarplant and other natives), and all material was removed from the site. In the areas with maritime succulent

scrub, John Martin reported observing Coastal California Gnatcatcher and Coastal Cactus Wren in areas that no observations had been made in previous years.

City of San Diego Field Monitoring Sites
and Otay Truck Trail
Afternoon Session, 1:00 p.m.-6:00 p.m.

Present:
Robert Sutter
Keith Greer
Melanie Johnson
Betsy Miller

In the afternoon, City staff showed Robert Sutter some of their southern monitoring sites, starting with Otay Lakes. Both *Dudleya variegata* and *Muilla clevelandii* are monitored at this site, and vernal pools also occur at the site. The group discussed the belt transect monitoring method used to date, and problems associated with it (e.g., monitoring time in heavy Muilla bloom years). Robert suggested that frequency monitoring may be adequate in this area, which would involve randomly distributing 200 $1m^2$ plots, and noting presence/absence of each species within each plot, as well as noting any invasives within the plot. If no monitored species are detected in the plot, the next meter in each cardinal direction is checked for presence/absence of the species.

Next the group went south and near the City's Marron Valley monitoring area, which is monitored for *Monardella stoneana* and *Dudleya variegata*. The group took the Otay Mountain Truck Trail west and viewed *Cupressus forbesii* (Tecate Cypress) populations in the area. Several burned areas were viewed and fire-adapted species colonization was noted.