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original staff report

W14a

Prepared February 10, 2015 for February 11, 2015 Hearing

To: Commissioners and Interested Persons

From: Dan Carl, District Director
Susan Craig, District Manager
Kevin Kahn, District Supervisor
Justin Buhr, Coastal Planner

Subject: STAFF REPORT ADDENDUM for W14a (ODSVRA Review)

Staff has coordinated closely with State Parks and other parties in the time since the staff report was distributed to ensure that the staff report is as accurate and representative of issues associated with the Oceano Dunes State Vehicular Recreation Area (ODSVRA) as possible. Toward this end, State Parks (DPR) has provided some new information and input that suggests some changes to both Dr. Laurie Koteen's air quality memo (Staff Report Exhibit 15) and Dr. John Dixon's scientific advisory panel memo (Staff Report Exhibit 14). Specifically, Dr. Koteen's memo distributed with the staff report is replaced in its entirety by her revised memo attached here (dated February 6, 2015), and one date typo in Dr. Dixon's memo is corrected. Because Dr. Koteen's memo is quoted in the body of the staff report, the staff report quotations are correspondingly modified as well (see below). In addition, Dr. Mark Johnsson's memo, which wasn't available at the time the staff report was distributed, is added to the staff report as Exhibit 16 (dated February 9, 2015, see attached). Finally, correspondence from both State Parks and Friends of Oceano Dunes (both received on February 9th) deserve some response as well.

1. Staff Report Changes

The staff report is modified as shown below (where applicable, text in underline format indicates text to be added, and text in ~~striktthrough~~ format indicates text to be deleted):

Modify text on staff report page 23 as follows:

The Phase 2 study concluded that OHV activity is a major contributing factor to the high particulate matter levels recorded on the Nipomo Mesa, and that the primary emissions cause was indirect impacts associated with OHV use. Indirect OHV-related emissions impacts are the devegetation, dune structure destabilization, and destruction of the natural dune surface ~~crust~~ caused by OHV use. The study determined that these impacts increase the ability of the wind to entrain sand particles from the dunes. Direct OHV-related emission impacts, meaning those impacts associated with fuel combustion exhaust or dust raised by the vehicle moving over the sand, were also found to be a significant, if lesser, contributor to

the elevated PM10 levels. DPR did not accept all of the findings or conclusions of the Phase 1 and 2 studies due to objections regarding the study's methodology. Nonetheless, based on the conclusions reached in the Phase 1 and 2 studies, and to address these air quality impacts, the District adopted Rule 1001 in 2011 (see Exhibit 10).

Replace Dr. Koteen's quotes on staff report page 26 with the following:

There exists a clear need to reduce the particulate emissions from the ODSVRA to levels acceptable for human health. Hopefully, by continuing to partner with individuals and organizations with expertise in dune processes, CDPR will be able to develop a plan for achieving compliance with state and federal air quality standards in the near term. Such a plan will necessarily need to include specific measureable criteria to be achieved and enforceable time tables in which to achieve them. APCD's rule and CDPR's pending CDP application may facilitate the development of an effective dust control plan.

Several mechanisms to reduce particulate emissions have been suggested (Zeldin 2015). One option is to restrict the areas open to riding; which may be necessary in the short term. Over the longer term, an effective option may be to establish large vegetation islands within the riding areas perpendicular to the direction of high winds that can act as barriers to particulates and prevent them from traveling to the Nipomo Mesa and other downwind areas. As with all revegetation efforts, measures must be put in place to ensure that vegetation that reestablishes naturally is native, and that any vegetation that is directly planted stem from local native propagules. Other options that could be evaluated include the use of environmentally safe soil binding agents in conjunction with fencing, and restricting OHV use in some areas to winter months the high winds that lead to particulate exceedance episodes most often occur in spring and late fall, and winter rains that wet the soils also prevent soil particles from entrainment.

Modify text on staff report page 27 as follows:

DPR is currently developing a programmatic EIR to support its current dust control CDP application, and it is clear that that process can provide an appropriate vehicle for evaluating dust control mechanisms and potential responses. Although the dust control issue is complicated, it is not going away, and it is imperative that measures be put in place to reduce particulate emissions as soon as possible. DPR is committed to this effort, including in partnership with CARB, APCD, and the Commission. As the EIR and CDP application process continues to unfold, staff believes that there will be ample opportunity for the kind of evaluation of alternatives that will prove critical for implementing a dust control program that can meet the requirements of APCD Rule 1001 and the Commission's CDP, and that will result in measurable air quality improvements. It will be important for such evaluation to study the air quality impacts associated with a variety of targeted controls, including analyzing the impacts of revegetating dunes, closing certain riding areas, ~~rebuilding the dune's protective biological crust,~~ and prohibiting riding seasonally. Staff remains committed to working with DPR to both perfect its CDP application and to provide whatever assistance it can to help address this significant public health problem. Ultimately, resolution of this issue will be tied to Commission action on the dust control CDP application at a later date.

Modify date typo in Dr. Dixon's memo on page 5 of Exhibit 14 as follows:

Recommendations of the ODSVRA Scientific Subcommittee re: Research and Management Questions and Priorities (~~January 30, 2015~~)(December 3, 2002)...

2. State Parks correspondence

Staff received a comment letter from DPR dated February 9, 2015 in which they respond to various points made in the staff report. The letter states that DPR is in general agreement with the staff recommendation, in that no specific action pertaining to a CDP amendment is necessary at this time, but rather that this review is an appropriate venue for discussion of pertinent Park management issues and potential next steps moving forward. DPR also states its concurrence with staff's positions on many of the issues discussed in the report, including agreeing that a primary Technical Review Team (TRT) function is to continually monitor and evaluate the impacts associated with the Park's vehicle use limits and potentially modify those limits accordingly, as well as acknowledging that the TRT/Scientific Subcommittee (SSC) review bodies may need to be restructured from their current makeup in order to best manage and protect the Park's coastal resources. DPR also agrees with the staff report regarding the basis for evaluating vehicle use limits, citing to the Commission's findings on these points that "the limits should not be viewed as the ODSVRA's carrying capacity; rather they serve as the starting points". However, DPR also disagrees with some of the report's findings. The following is a brief synopsis of some of DPR's comments, as well as staff's response to those comments.

Park Entrance Access and OHV Staging Area

DPR believes that a third study determining the appropriate permanent locations for the Park's access entry points and its riding staging areas is not necessary since DPR has already prepared two such studies, the first in 1991 and a second in 2006. DPR believes that the staff report's recommendation for an updated study addressing these issues is "excessive" and would not provide any new information, since there have been no capital improvements or significant changes made in the Park since these studies were last prepared.

Staff acknowledges on page 18 of the staff report that it is DPR's position that the two previous studies have appropriately identified the permanent access and staging area locations. However, staff does not agree with DPR in its position that there are no new significant changes or concerns that would affect the studies' conclusions. Further, as indicated in the staff report, staff is not suggesting a third study be conducted. Rather, staff is suggesting that DPR update its studies, including to reflect and acknowledge new issues that have emerged since the 2006 study, including those related to air quality and La Grande Tract ownership/management. These two issues have the potential to materially alter the basic framework by which to evaluate appropriate access and staging area locations. Furthermore, the assumptions and findings made in the two previous access/staging studies were never vetted or discussed by the TRT/SSC review bodies, and it is premature to definitively determine whether the two previous studies are an adequate basis from which to permanently resolve this issue. These prior DPR reports certainly may be used as the starting point for future discussion and analysis, but, again, should be updated in order to reflect all of the current issues facing the Park today. Thus, staff has identified an appropriate next step that these studies be updated, and that ultimately the Commission take an action to recognize final entrance access and staging locations and parameters at a future date. See staff report discussion starting on page 17.

Air Quality and Dust Control

With respect to air quality and dust control, DPR has had some pointed observations regarding Dr. Koteen's memo attached as Exhibit 15 of the staff report. As indicated above, DPR has provided additional information and data, including additional literature, and Dr. Koteen has issued a revised memo on the topic (see attached memo dated February 6, 2015). To be clear, however, although the revised memo makes some corrections, its conclusions remain largely the same. And to be equally clear, staff believes that it is imperative that measures be put in place to reduce particulate emissions as soon as possible. DPR, too, is committed to this effort, including in partnership with the California Air Resource Board, the San Luis Obispo County Air Pollution Control District (APCD), and the Commission. As the next set of processes unfold, including in relation to DPR's EIR and CDP application processes, staff believes that there will be ample opportunity for the kind of evaluation of alternatives that will prove critical for implementing a dust control program that can meet the requirements of APCD Rule 1001 and the Commission's CDP, and that will result in measurable air quality improvements. Staff remains committed to working with DPR to both perfect its CDP application and to provide whatever assistance it can to help address this significant public health problem.

Western Snowy Plover and California Least Tern Management

DPR disagrees with the staff report recommendation that it carry out a study documenting the effects of a year-round enclosure for Western snowy plover and California least tern, stating that such a study (and additional OHV-closure areas) are unnecessary since DPR's existing management program for Western snowy plover and California least tern "is one of the most successful programs in the State Park System and on the west coast". Further, DPR asserts that it consistently has met or exceeded the recovery criteria for these two species. While staff agrees that DPR's current management program has been successful in chick hatching and fledging (including as described on pages 28-29 of the staff report), staff disagrees with DPR's assessment that additional study and assessment are unnecessary. As discussed on pages 30-31 of the staff report, the CDP conditions require the TRT to study as part of its ongoing research and management program appropriate management techniques for plovers and terns, including evaluating how nest closure techniques affect their hatching and fledging success. The CDP also explicitly requires any such study to assess the impacts on recreational and economic concerns. Thus, the CDP envisions a process by which DPR assesses impacts associated with a wide array of Park management issues, all with an eye towards better understanding the environmental, recreational, and economic impacts associated with different Park management initiatives. Thus, staff concurs with the Scientific Subcommittee's continued recommendations to develop a year-round enclosure study, and that the study's parameters be agreed upon by the members of the TRT. Staff believes that the study will provide valuable information that will serve as a basis for better Park management.

Habitat Conservation Plan

DPR indicates that it is making progress on the Habitat Conservation Plan (HCP) and is having quarterly meetings with California Department of Fish and Wildlife and U.S. Fish and Wildlife regarding this effort. DPR also states that Commission staff has attended some meetings and is aware of the progress being made toward its completion. While that is all true, staff has not yet seen any drafts of the HCP, and staff is not entirely clear on how the HCP is even structured, including the potential mandates and requirements emanating from it, or how DPR envisions the HCP to affect its management decisions. While staff is aware that DPR has been working on this

document for the past 15 years, and staff has attended some meetings about it, staff knows very little about its contents. In any case, staff is ready and willing to work with DPR on the HCP, particularly if it is envisioned to potentially replace or augment the TRT and/or affect the CDP.

2. Friends of Oceano Dunes correspondence

Friends of Ocean Dunes (Friends) submitted comments (dated February 9, 2015) on the staff report that deserve some discussion and response, particularly to correct certain statements that are not in staff's view accurate. Friends raises issues related to State law, the Commission's role and authority, and a series of specific observations about the dunes and potential measures that might limit OHV use at ODSVRA.

PRC Section 5090

With respect to State law, the Friends contend that State Parks must comply with its legislative mandate under Public Resources Code (PRC) Section 5090 et seq, and that any further loss of riding area would not be in compliance with PRC Section 5090. PRC Section 5090, discussed in the staff report beginning on page 6, is the statute authorizing OHV recreation areas that was adopted in 1982. Although Friends agrees that "OHV riding and environmental concerns may be balanced", they contend that "the measures proposed in the Staff Report are focused solely on closing riding areas", that the staff report cites PRC 5090 as the "authority for allowing balancing OHV use and coastal resource protection", and that "any further reductions in the riding area would violate state law". Staff does not agree with the Friends' contentions or its characterization of the staff report.

PRC Section 5090 et seq supports and encourages recreational use, but it also envisions that recreational use must be balanced with environmental considerations, including addressing erosion control and rehabilitation of degraded areas, and including explicitly identifying that areas that cannot be maintained to established standards in this respect be closed to use until they can be restored (see PRC Section 5090.35(b)(3) "Upon a determination that the soil conservation standards cannot be met in any portion of any state vehicular recreation area the division shall close and restore the noncompliant portion pursuant to Section 5090.11"). In addition, PRC 5090 does not preempt other State laws, like the Coastal Act, with which it must be harmonized. As discussed in the staff report, the CDP and the Commission's role in implementing the Coastal Act have provided the vehicle for harmonizing these two statutes, and continues to do so to this day. The staff report did not and does not cite to solely to PRC 5090 as the authority for balancing resource protection and vehicular recreation, but rather paints a picture of the way in which the State laws are harmonized through the CDP process.

Toward that end, and to the Friends observations about closing riding areas, two things need be said. First, the staff report is not focused solely on measures designed to close the riding areas, as the Friends assert. On the contrary, the staff report identifies ongoing concerns and issues with respect to striking the type of balance identified in the base CDP as amended in this respect, and identifies next steps towards better understanding and addressing relevant concerns. While it is possible that measures to address erosion and habitat issues could lead to reduced riding areas, it is also possible that that won't happen. The staff report simply identifies issues and next steps toward addressing those issues, and does not advocate nor recommend closing riding areas. To suggest that the staff report is focused solely – or even at all – on closing riding areas is simply incorrect.

And second, even if there were to be a future decision to close some portion of the riding area, staff is not aware of any reason that such closure “would violate state law” as the Friends contend (and the Friends don’t provide anything past that assertion to explain why such a violation would exist). Again, as the staff report identifies, the issues at ODSVRA are complicated, they overlap, and they must be understood coherently so that the balance that was struck through the base CDP as amended continues to allow for adaptive and appropriate management at ODSVRA in light of vehicular recreation and dune and related coastal resource protection under State and Federal law.

Commission’s Role and Authority

The Friends contend that the Commission’s “annual review exceeds its authority under the California Coastal Act and under CDP 4-82-300, as amended”, that the “Coastal Act does not authorize the CCC to issue CDPs that create annual reviews of the effectiveness of State Parks in managing SVRA resources”, and that the “CDP contains an unlawful standard” associated with such reviews. To be clear, the appropriate time for challenging the CDP and its amendments have long since passed, and there is no question that it is an appropriate and legal instrument. The annual review does not exceed any Coastal Act parameters, and in fact the CDP as amended was found consistent with the Coastal Act, including *because* it included the annual review process. In addition, State Parks has been a willing and active partner in the review process, including proposing the TRT concept through the most recent amendment. Thus, there is no question regarding the legality of the Commission’s amended CDP and its authority to implement it under the Coastal Act.

More broadly, Friends appears to be suggesting that the Commission’s review authority is limited by virtue of the ways in which the CDP has been amended. It is clear to staff that the amended CDP presents a somewhat complicated history, but the CDP envisions adaptive management and, at its core, the Commission is empowered through the CDP to make changes to meet Coastal Act and LCP requirements. Clearly, the terms and conditions of the base CDP, as amended, are designed to provide for continued study and ongoing adaptive management of the Park related to core issues associated with striking an appropriate balance between facilitating vehicular recreation and protecting dune and related coastal resources consistent with the access, recreation, and resource protection policies of the Coastal Act and the LCP. The CDP and its review requirements provide the Commission with broad authority and discretion in determining whether Park management is or is not effective at meeting such objectives, as well as implementing changes to make it more effective.

Specific Issues

Friends makes a series of observations about the dunes and potential measures that might limit OHV use at ODSVRA, including that a year-round enclosure for terns and plovers is not needed, that APCD’s theory on dune crusts is not scientifically accurate, that vehicle use limits (including seasonal limits) should not be decreased in order to address fugitive dust emissions, and finally that APCD “has determined health risks from dust are not a substantial risk”.

With respect to plover and tern enclosures, the Friends are correct that State Parks manages a successful plover and tern program at ODSVRA. At the same time, and as explained in the staff report (starting on page 28), the amended CDP establishes a structure whereby the TRT, as informed by the Scientific Subcommittee, is meant to evaluate appropriate management techniques for plovers and terns, including an evaluation of how nest closure techniques affect

their hatching and fledgling success and an identification of additional studies for species protection. The exclosure study is a longstanding and specifically identified TRT and Scientific Subcommittee research priority, and such a study would develop exactly the type of information envisioned by the CDP terms and conditions, including with respect to the role of the Scientific Subcommittee and the TRT. These are threatened and endangered species, respectively, under the Endangered Species Act (ESA), and there is little question that it makes good ESA, Coastal Act, and LCP sense to continue to evaluate potential additional measures to protect and enhance their habitat and vitality. Of course, such evaluation needs to be understood in relation to impacts to recreational use, and the staff report both recognizes that, and suggests that DPR begin to develop the parameters for such a study moving forward.

With respect to the dune crust issue, whether there is a “crust” or “dune laminae”, the research conducted in ODSVRA clearly indicates that the OHV use areas are more emissive than the non-riding areas. Further discussion of dune crust issue as it relates to ODSVRA can be found in Dr. Mark Johnsson’s geotechnical mem, attached here.

With respect to potential vehicle use limits to address dust emissions, the Friends correctly identify that it is not known if high ridership causes higher emissions or if prohibiting riding seasonally will result in measurable air quality improvements. That is why Dr. Koteen suggests in her memo that, as cited by the Friends, “A priority of future work should be to document the number of OHVs that frequent each region of the ODSVRA with the express goal of understanding if relatively high ridership explains higher particulate emissions in some regions of the park relative to others”, and “It will be important for such evaluation to study the air quality impacts associated with a variety of targeted controls, including analyzing the impacts of revegetating dunes, closing certain riding areas, and prohibiting riding seasonally.”

Overall, and Dr. Koteen’s analysis reflect this common thread, staff believes that there is a very basic premise at play here, namely that the intent is to develop data and analyses that can support and inform effective mitigation measures and management decisions. It is not to presuppose what the outcome of such evaluations might be, rather it is to have the science be an important part of that equation. Again, this is exactly the adaptive management and evaluation framework envisioned by the base CDP as amended.

Finally, the Friends state that APCD “has determined health risks from dust are not a substantial risk”. Staff believes that this statement significantly mischaracterizes APCD’s position, including as manifested in the APCD’s adoption of Rule 1001 (see Rule 1001 in staff report Exhibit 10). As far as staff understands it, APCD has never made any statement that health risks from dust are not a substantial risk, and especially long-term exposure to high levels of dust. In fact, staff believes that APCD has been on the record numerous times for strong statements exactly to the opposite. Staff expects APCD to be represented at the hearing, and APCD will obviously have an opportunity to provide the Commission their own take on this issue in their own words. For more detail on APCD and Rule 1001, see the staff report discussion of air quality and dust control starting on page 22, Dr. Koteen’s memo attached, and APCD’s comments in staff report Exhibit 11.

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**MEMORANDUM**

FROM: John D. Dixon, Ph.D.
Ecologist

TO: Justin Buhr

SUBJECT: Oceano Dunes Scientific Advisory Panel

DATE: January 29, 2015

The information in this memorandum is based on meeting agenda, meeting summaries, recommendations from the Scientific Subcommittee to the Technical Review Team, and other documents from the subcommittee. Paula Hartman of Thomas Reid Associates was contracted by the Department of Parks and Recreation to provide staff services and has supported the subcommittee from the beginning. She has kindly provided chronologies and many of the documents that I did not have ready access to.

On February 14, 2001, the Commission endorsed (via Coastal Development Permit Amendment 4-82-300-A5) State Park's proposal to establish a Technical Review Team (TRT)¹ to oversee monitoring of environmental and use trends in the Oceano Dunes State Vehicular Recreation Area (ODSVRA) and to advise the Superintendent on resource management issues. As a condition of Commission approval, the TRT was required to include a scientific subcommittee that was to identify, develop and evaluate the scientific information needed by decision makers to ensure that the natural resources are adequately managed and protected.

Specifically, Condition 4 of the Amendment required that

- A scientific subcommittee be created to identify, develop and evaluate the scientific information needed by decision-makers to ensure that the ODSVRA's natural resources are adequately managed and protected;
- The subcommittee be composed of resource experts representing the five government agencies (CCC, SLO County, USFWS, DFG, DPR) and at least two independent scientists with expertise in Western snowy plover, California least tern, steelhead trout or other species of concern, as well as ecological processes to analyze technical data and provide scientific recommendations to the TRT; and,
- The TRT submit a list of proposed members of the scientific subcommittee to the Executive Director of the Coastal Commission for review and approval.

The responsibilities of the Scientific Subcommittee, as directed by Condition 4, are to:

- Recommend to the TRT the scientific studies and investigations that may be necessary to develop information needed by resource managers;

¹ The Coastal Commission adopted Revised Findings in support of this action on May 7, 2001.

- Advise the TRT regarding the protection of the SVRA's natural resources by helping identify and review needed research measures and restoration efforts to rebuild or protect the ODSVRA natural resources;
- Evaluate monitoring results and reevaluate monitoring protocols contained in Oceano Dunes SVRA annual reports for the Habitat Monitoring System, reports on the breeding, nesting and fledgling success of the western snowy plover and California least tern populations in the SVRA, and other reports related to the environmental impacts of recreational activities;
- Provide comments on the adequacy of various scientific research studies and make management recommendations to the TRT; and
- Submit the full recommendations of the scientific subcommittee to the Commission and make them available to the public, as part of the annual review process.

These provisions were included in the adopted TRT Charter.

The TRT first met on October 30, 2001. Among other matters, they discussed the composition of the scientific subcommittee and reviewed a list of potential candidates presented by the staff of the Department of Parks and Recreation. On January 14, 2002 the TRT met and approved the scientific subcommittee membership², adopted criteria for appointing new members³, and adopted a process for prioritizing scientific subcommittee research and management questions⁴.

The scientific subcommittee⁵ met for the first time on January 18, 2001. The subcommittee met eight times during 2002. During this time they completed the following actions:

- reviewed the 2001 Point Reyes Bird Observatory report on snowy plovers and least terns and made recommendations to the TRT concerning management actions for the birds and for habitat enhancement in Oso Flaco
- reviewed a study of the effects of night riding on birds and recommended that a new study of the issue be conducted to correct flaws in the existing study

² Which included 3 independent ornithologists in addition to the agency biologists. The County contracted with a professor with botanical and dune processes expertise from California Polytechnic University at San Luis Obispo to be their representative.

³ The TRT adopted the following criteria to guide the addition of members to the Scientific Subcommittee:

- *That the appointment of an additional member to the Scientific Subcommittee would provide valued expertise that is not currently present on the Subcommittee;*
- *That changes in the existing membership of the Scientific Subcommittee result in the need for additional expertise that is no longer represented on the panel; and/or,*
- *That the Subcommittee itself identifies the need for additional expertise that is not currently represented on the Subcommittee.*

⁴ The TRT adopted the following process for use by the Scientific Subcommittee in prioritizing research and management questions:

1. *That timing of the research activity or management strategy is critical to restoration or protection efforts;*
2. *That the research question or management activity is directly related to the satisfaction of a permit condition imposed by the California Coastal Commission;*
3. *That the research question or management activity is directly related to the satisfaction of a permit condition imposed by another regulatory body;*
4. *That the research question or management strategy is in direct response to a question posed by the California Coastal Commission; and/or,*
5. *That the research question or management strategy is directly related to the identification or migration of a potentially significant environmental or resource impact*

⁵ ODSVRA (Laura Gardner, later Ronnie Glick), Coastal Commission (John Dixon), US Fish & Wildlife Service (Steve Henry, later Julie Vanderwier), Ca Department of Fish & Wildlife (Bob Stafford; CDFW ceased participating in 2007), County of San Luis Obispo (V. L. Holland; resigned in 2003 and was not replaced), Independent bird experts (Robert Patton, Elizabeth Copper, and Gary Page (Pt Blue Conservation Science))

- reviewed the ODSVRA Interim Predator Management Plan and made recommendations
- reviewed the ODSVRA Habitat Monitoring Methodology and made recommendations
- made recommendations regarding research and management questions and priorities (See Appendix)

Each year in the fall and early winter, the Scientific Subcommittee reviewed the annual report on the nesting of the California least tern and snowy plover at ODSVRA and made recommendations to the TRT. Most recommendations were implemented. However, beginning in 2003, one of those recommendations was to maintain a year-round closure of a portion of the nesting area to improve habitat quality. This recommendation was revised in 2005 to make a year-round closure part of a three-year study of alternative habitat treatment strategies. This recommendation has been repeated each year, but has never been implemented. However, those management actions that the park has implemented have generally been beneficial. Western snowy plover and California least tern reproductive success at ODSVRA is usually high relative to other sites in California.

Despite the broad scope of potential actions identified by the Scientific Subcommittee in the Appendix, the primary focus has been on the management of snowy plovers and least terns. This is largely because many of the management concerns identified would need studies that were not required of the ODSVRA. Since 2002, the subcommittee has only met once or twice in the fall or early winter by conference call to review the status of least terns and snowy plovers throughout the state and to review the annual nesting report and make recommendations. Occasionally, other reports are submitted by Parks for review and comment. Although this is a useful function, there are many other management questions that would benefit from scientific analysis. For example, a major issue that is currently facing the Park is the elevated emissions of fine particulates that result from off-highway vehicle use and that may affect the health of the neighboring community.

In order for the scientific subcommittee to function more affectively, it must be given clear direction by the TRT or other entity. The subcommittee ought not be expected or allowed to develop its own agenda. The charge to the subcommittee should be specific and related to actions that the Park is required to take. The tasks of the subcommittee would then be to evaluate the plan of action, to evaluate the effectiveness of those actions, to make recommendations for changes or additions, and to critically review data analyses and reports of the actions taken.

Different scientific questions require different scientific expertise. The current subcommittee includes bird specialists and has functioned effectively with regard to snowy plovers and least terns. However, determining where and how revegetation should take place requires botanical and dune processes knowledge, and devising mitigation strategies for fine particulate emissions requires yet a different suite of technical abilities. In essence, a separate advisory panel of three or four scientists in appropriate disciplines is needed for each group of related specialized problems.

Agency scientists could be used to identify and coordinate the activities of the specialists required, but no agency is likely to have all the needed specialists on staff.

APPENDIX

Recommendations of the ODSVRA Scientific Subcommittee re: Research and Management Questions and Priorities (December 3, 2002):

Introduction

As a part of identifying which research and management questions should be recommended by the Scientific Subcommittee, the members considered what they believe to be their charge from the Coastal Commission. They identified the following items as management concerns that the Sc. Subcommittee should address:

1. Understanding the biological potential of the ODSVRA area.
 - What species exist there now?
 - What could be there based upon alternative management regimes?
2. Estimate the Impact of ORV Use.
 - What has been the effect of off-road vehicular use on the natural dune habitats and associated aquatic habitats? What is known? What work needs to be done to make this determination for particular habitats?
 - What are the relative impacts associated with different levels of use (e.g., peak holiday periods vs. average use).
 - What are the mechanisms of impact (e.g., physical disruption of vegetated dunes, physical disturbance and increased turbidity of streams, compaction of beach habitat, impact injury to wildlife, etc)?
3. Identify Areas to Protect or Restore:
 - Which areas that are currently impacted by ORV use could potentially be restored to native vegetation?
 - Which areas serve, or could potentially serve, the needs of snowy plovers and least terns?
 - Are there conflicts between dune restoration and nesting activities? If there are conflicts, what is the optimal balance between the conflicting needs?
 - What other sensitive species should be part of a management plan? What are their restoration needs?
4. Recommend ORV Management Activities to Protect Natural Resources:
 - To which areas should ORVs be confined in order to protect natural resources?
 - During which hours of the day should vehicular use be allowed?
 - What uses should be allowed? Evaluate access routes and camping areas.
 - Should use restrictions have a seasonal component?
5. Review Natural Resource Management Activities and Make Recommendations:
 - Monitoring of snowy plovers and least terns.
 - Use of fencing and shelters.
 - Predator monitoring and management.
 - Vegetation restoration, including exotics removal and control.

Using the above list as a guide, the Sc. Sub. identified and ranked the research and management questions in this report.⁶ The Sc. Sub. members would not actually design any of these studies, but the members have drafted a

⁶ Page 7 of the permit includes the following direction to the TRT and Scientific Subcommittee:
The TRT should develop recommendations to the Superintendent regarding "additional monitoring studies, adjustments to day and overnight use limits, and management strategies." The Sc. Sub. will "identify, develop and

preliminary list of questions that these studies would address. The Sc. Sub. members could also review the proposed design once a study has been designed. The six topics are listed in order of priority.

1. Night Riding

The overall question that the Sc. Sub. identified as being the focus of such a study is: What are the impacts of vehicles on plovers, terns, and other shorebirds? Other shorebirds, such as sanderlings, should be included because the mandate of the Coastal Commission is not limited to listed species, plus observation of other shorebirds can provide insight into effects on plovers and terns. Carcass recovery could be one component. Additionally, reconnaissance work would need to be conducted prior to designing the study. The Sc. Sub. has identified the following questions and goals for such a study:

1. Define the area and amount of plover and tern use at night.
2. Define the area and amount of human use at night.
3. Determine what the birds are doing:
 - a. Does their location affect what they're doing, i.e., whether they are in or out of exclosures?
 - b. What are the differences between winter and summer use?
 - c. How do the tides affect their behavior?
 - d. How do various human activity levels affect their behavior?
 - e. How does motorized traffic affect winter flocks and breeding success?

2. Wintering Snowy Plovers and Other Shorebirds

1. How many snowy plovers are there?
2. Where are they?
3. Where have they come from?
4. What are they doing (e.g., foraging, roosting)?
5. How are they affected by human activity (e.g., pets, vehicles, pedestrians, equestrians)?
6. What other shorebirds are using the area? The same questions (i.e., how many, where, what are they doing, how are they affected) would apply to these other species.
7. What potential predators are present in the winter?

3. Invertebrates

Sandy beach invertebrates are of particular interest. Invertebrates are currently not monitored, but are critical to understanding plovers and terns, among other resources. Good baseline surveys of both terrestrial and intertidal species are needed. A study should determine what species are in ODSVRA. The study should include both open and closed areas.

evaluate the scientific information needed by decision-makers to ensure that the ODSVRA's natural resources are adequately managed and protected." Among other things, the Sc. Sub. will:

1. Recommend to the TRT the scientific studies and investigations that may be necessary to develop information needed by resource managers;
2. Advise the TRT regarding the protection of the SVRA's natural resources by helping identify and review needed research measures and restoration efforts to rebuild or protect the ODSVRA resources.

4. Vegetation/Soils Management

In 1999, the Off-Highway Motor Vehicle Recreation Division (OHMVRD) identified an issue Oceano Dunes needs to address.⁷ Accelerated sand movement caused by recreation patterns is contributing to loss of vegetation in and around Oso Flaco Lake, as well as the vegetated islands within the SVRA. This sand movement is contributing to loss of open water at Oso Flaco Lake (due to sand inundation). Within the Oceano Dunes complex there are small, vegetated areas that are unprotected by fencing and signage. The "OHMVRD Adopted Recommendation for Sandy Soil Areas" (1999) identified six alternative management options to slow the rate of sand movement and recommended all six options be tested and evaluated for one year.⁸ This work has not occurred. The big-picture question is: Can areas that are appropriate for restoration be identified? With this goal in mind, specific questions would include:

1. To what extent has the area of the vegetation communities changed?
2. To what extent have the communities been altered by invasions of exotics?
3. What areas have potential for restoration with appropriate vegetation?
 - a. Can they be restored? How?
 - b. Should they be restored (keeping in mind specific habitat needs of various species, e.g., plovers and terns)?

5. Fish Surveys

Tidewater goby and steelhead would be of particular interest. Grunion would also be of interest. Some data should already exist for Arroyo Grande Creek.

6. Water Quality

Water quality is especially relevant to juvenile least terns and gaining an overall understanding of the dunes. A watershed assessment may be underway soon.

⁷ This information is from the ODSVRA Wildlife Habitat Protection Plan, August 2001, p. 22.

⁸ The six options are:

1. Fence 1 to 5 acre foredune areas utilizing sand barriers/fences to trap the sand and gradually build up the dunes and actively revegetate with native plants.
2. Fence ¼ to 1-acre foredune areas utilizing sand barriers/fences to trap the sand and gradually build up the dunes and actively revegetate with native plants.
3. Fence ¼ to 5-acre foredune areas and allow both vegetation and sand to grow and /or move naturally.
4. Construct artificial sand dunes with heavy equipment between ¼ to 5 acres in size before fencing and revegetating.
5. Fence and revegetate a minimum ¼ acre utilizing sand barriers/fences to trap the sand and gradually build up the dunes to duplicates the original foredune system (aligned with the prevailing wind direction).
6. Use heavy equipment to reduce the height of existing sand dunes 1.5 feet in front of the slack dune vegetated islands. The sand would then be pushed north or south of the islands and allowed to move down-wind naturally away from the vegetated islands.

Three control/comparison areas were identified: the Dune Preserve north of pole 3, the protected foredune area south of pole 8, and areas of existing OHV use.

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**MEMORANDUM**

FROM: Laurie Koteen, Ph.D.
Ecologist

TO: Justin Buhr

SUBJECT: Oceano Dunes State Vehicular Recreation Area Air Quality Issues

DATE: February 6, 2015

Documents reviewed:

Allen, L.R. (San Luis Obispo Air Pollution Control Board). 2015. Response to January 12, 2015 letter requesting information from the California Coastal Commission.

Bedrossian, T.L., and J. P. Schlosser (California Geological Survey). 2007. Review of Vegetation Islands, Executive Summary, Oceano Dunes SVRA.

California State Parks and Recreation. 2013. Oceano Dunes State Vehicular Recreation Area Rule 1001 Draft Temporary Baseline Monitoring Program: First Draft.

California State Parks and Recreation. 2014. Restoration Plan for Straw Bale Dust Control Area, Oceano Dunes SVRA. Spring 2014. Emergency CDP G-3-14-0007 (ODSVRA Dust Control Program).

Craig, J., T. Cahill, and D. Ono. (San Luis Obispo Air Pollution Control Board, The Delta Group and The Great Basin Unified Air Pollution Control District). 2010. South County Phase 2 Particulate Study. Oceano State Vehicle Recreation Area: San Luis Obispo Air Pollution Control Board.

Etyemezian, V., J. Gillies, D. Zhu, A. Pokharel, and G. Nikolich (Desert Research Institute). 2014. 2013 Intensive Wind Erodibility Measurements at and Near the Oceano Dunes State Vehicular Recreation Area: Preliminary Report of Findings. A report dated July 9, 2014 to The Department of Parks and Recreation.

Gillies, J.A., and V. Etyemezian. (Desert Research Institute). 2014. Wind and PM10 Characteristics at the ODSVRA from the 2013 Assessment Monitoring Network. A report dated January 14, 2014 to the Department of Parks and Recreation.

Gillies, J.A., V. Etyemezian, and C. Dugan. (Desert Research Institute and TRA Environmental Services, Inc.). 2014. Sand transport and dust reduction measures within and near the ODSVRA to reduce 24-hour average PM10 concentrations at the CDF ambient air quality monitoring station in San Luis Obispo County, CA. A report dated January 13, 2014 to the Department of Parks and Recreation.

Glick, R. (Department of Parks and Recreation). 2015. Application for Emergency Permit by California Department of Parks and Recreation, February 25, 2014.

Harris, W. (California Geological Survey). 2010. Letter dated March 18, 2010 to Daphne Green (California Department of Parks and Recreation) regarding: Evaluation of the San Luis Obispo County Air Pollution Control District Report, South County Phase 2 Particulate Study.

Harris, W. (California Geological Survey). 2011. Letter dated November 1, 2011 to Daphne Green (California Department of Parks and Recreation) regarding: In Consideration of Draft Rule 1001 Proposed by the San Luis Obispo County Air Pollution Control District: An Analysis of Wind, Soils, and Open Sand Sheet and Vegetation Acreage in the Active Dunes of the Callender Dune Sheet, San Luis Obispo County, California.

Lancaster, N., J. Gillies, V. Etyemezian, and G. Nikolich (Desert Research Institute). 2011. Oceano Dunes Pilot Projects. A report dated September 15, 2011 to the Department of Parks and Recreation.

Reid, T. (TRA Environmental Sciences, Inc.). 2010. Letter dated May 8, 2010 to the San Luis Obispo County Air Pollution Control District regarding: Published Phase 2 Report data does not support claims of association between Oceano Dunes State Vehicular Recreation Area visitor numbers and PM10 downwind.

San Luis Obispo County Air Pollution Control District. 2011. Fugitive Dust Emissions Standards, Limitation and Prohibitions: Coastal Dunes Dust Control Requirements, Rule 1001. Available from: <http://www.arb.ca.gov/DRDB/SLO/CURHTML/r1001.pdf>

San Luis Obispo County Air Pollution Control District. 2014. APCD Comments on January 14, 2014 DRI Report: "Wind and PM10 Characteristics at the ODSVRA from the 2013 Assessment Monitoring Network."

Zeldin, M.D. (Air Pollution Control Hearing Board). 2015. Letter dated January 21, 2015 to L. Allen (San Luis Obispo Air Pollution Control Board) regarding: Evaluation of efficiency and cost-effectiveness of ODSVRA mitigation measures.

History of the Ocean Dunes State Vehicular Recreation Area Air Quality Project

Historical monitoring of air quality in the area of the Nipomo Mesa has revealed repeated episodes where state and air quality standards for PM 10 and PM 2.5¹ have been exceeded (Tables 1 and 2). As a result, several research efforts were initiated with the goals of 1. identifying the source of excess particulate matter in local air masses, 2. understanding the physical processes that control and exacerbate particulate emissions, and 3. designing mitigation measures to reduce particulate emissions. Phase 1 and 2 studies were completed in 2004 and 2010 respectively by the San Luis Obispo County Air Pollution Control District (the APCD) and associated state agencies and academic entities. Their research directly attributes the excess particulate emissions to the open sand sheets of the Oceano Dunes State Vehicular Recreation Area (ODSVRA), which lie upwind of monitoring stations within the Nipomo Mesa. Several additional studies were commissioned by the California Department of Parks and Recreation (CDPR) and these studies largely confirm the APCD findings. These CDPR commissioned studies were completed by the Desert Research Institute (DRI) independently, or in cooperation with TRA Environmental, a private consulting company. These and the other documents listed above were reviewed in order to evaluate the particulate emission issues, including both implemented and proposed mitigation efforts that are intended to reduce particulate emissions from the ODSVRA.

Particulate Matter and Human Health

Several decades of research have now documented strong correlations between particulate emissions (PM 10 and PM 2.5) and a wide range of adverse health outcomes. These include increased rates of pulmonary and cardiovascular morbidity and mortality, adverse reproductive outcomes, and possible neurological effects². Adverse health outcomes have been found for short-term acute exposures to high particulate concentrations. Long-term health impacts can also result from sustained exposure to elevated particulate levels³ and result in premature death rates in locations where they

¹ PM 10 are particulate emissions with an aerodynamic diameter of 10 μm or less. PM 2.5 are particulate emissions with an aerodynamic diameter of 2.5 μm or less. Aerodynamic diameter is the diameter of an idealized particle that has the same aerodynamic properties as a given particle, but which is spherical in shape. 1 μm = 10^{-6} m.

² Dockery, D.W. 2009. Health effects of particulate air pollution. *Annals of Epidemiology*. 19:257–263.

Rueckert, R., A. Schneider, S. Breitner, J. Cyrus, and A. Peters. 2011. Health effects of particulate air pollution: A review of epidemiological evidence. *Inhalation Toxicology*. 23:555–592.

³ Puett, R.C., J. Schwartz, J.E. Hart, J.D. Yanosky, F.E. Speizer, H. Suh, C.J. Paciorek, L.M. Neas, and F. Laden. 2008. Chronic particulate exposure, mortality, and coronary heart disease in the nurses' health study. *American Journal of Epidemiology*. 168:1161–1168. Strak, M., N.A.H. Janssen, K.J. Godri, I. Gosens, I.S. Mudway, F.R. Cassee, E. Lebret, F.J. Kelly, R.M. Harrison, B. Brunekreef, et al. 2012. Respiratory health effects of airborne particulate matter: The role of particle size, composition, and oxidative potential-The RAPTES Project. *Environmental Health Perspectives*. 120:1183–1189.

occur. Particularly vulnerable populations include children, those with chronic ailments, such as asthma or cardiovascular disease, and the elderly.⁴

Table 1: State and National Ambient Air Quality Standards for Particulate Matter

	California Ambient Air Quality Standards for PM ⁵		National Ambient Air Quality Standards for PM ⁶	
Averaging Time	PM10	PM2.5	PM10	PM2.5
Annual	20 $\mu\text{g.m}^{-3}$	12 $\mu\text{g.m}^{-3}$	*	12 $\mu\text{g.m}^{-3}$
24 Hours	50 $\mu\text{g.m}^{-3}$	35 $\mu\text{g.m}^{-3}$	150 $\mu\text{g.m}^{-3}$	*

* Standards not set for these emission categories

Table 2: Number of State and Federal Exceedances of Particulate Air Standards at the CDF Station on the Nipomo Mesa (reproduced from Allen 2015)

Year	PM10			PM2.5	
	Federal 24-hr Exceedances	State 24-hr Exceedances	Annual Average*	Federal 24-hr Exceedances	Annual Average*
2014**	2	83	38.6	1	12.3
2013	2	93	39.9	3	12.5
2012	3	70	33.6	3	9.6
2011	0	63	34.4	0	11.9
2010***	1	53	32.4	0	9.5

* Annual average reflects the average daily particulate concentration for the CDF station.

** Unofficial, includes preliminary data.

*** Partial year, site operated 10 months.

⁴ Rueckerl, R., A. Schneider, S. Breitner, J. Cyrys, and A. Peters. 2011. Health effects of particulate air pollution: A review of epidemiological evidence. *Inhalation Toxicology* 23:555–592.

⁵ <http://www.arb.ca.gov/research/aaqs/caaqs/pm/pm.htm>.

⁶ <http://www.epa.gov/air/criteria.html>.

The Source Region for Particulate Exceedances on the Nipomo Mesa is the ODSVRA

As documented in the South County Phase 2 Particulate Study overseen by the APCD, the particulate emission concentrations on locations along the Nipomo Mesa regularly exceed state and national particulate standards. Based on their analyses, this study definitively established the source areas of particulate emissions to be the riding areas of the ODSVRA. To arrive at this conclusion, they investigated the meteorological conditions that are present during episodes of high particulate emissions, and performed chemical and particle-size analyses of the particulates present at nine candidate source locations and at the air quality monitoring stations during high emission episodes⁷. Element and air quality samplers were placed at each of these locations along north-south transects downwind of the ODSVRA riding areas, as well as along areas to the north and south of the ODSVRA where riding does not occur (Figure 1). They also collected numerous soil samples from regions upwind of the sampling sites along transects that extended west from these points to the ocean. In most cases, these sampling campaigns extended from March 2008 to March 2009. Through this analysis the research group determined that the air quality violations occurred primarily at the CDF and Mesa 2 monitoring stations, during periods of high northwest (290 – 310°) winds. In addition, they found that the materials collected by the elemental samplers at the CDF and Mesa 2 stations were composed primarily of crustal materials similar in size and elemental composition to the samples collected in ODSVRA riding areas. Moreover, the particulates captured at the CDF and Mesa 2 monitoring stations were dissimilar to the soil samples collected outside the riding areas (Craig et al. 2010).

These findings are substantiated by an additional study commissioned by CDPR. In this commissioned CDPR analysis, a series of transects were arrayed along areas both open and closed to riding in the sandy regions of the ODSVRA (Etyemezian et al. 2014). Transects were located approximately parallel to the prevailing wind direction or to the shoreline. Each transect location was subject to simulated winds by a device called the PI-SWERL, which stands for Portable in-situ wind erosion lab⁸. Subsequently, the size and number of particles entrained, or captured, by the air mass were assessed. An example of the results of this analysis for wind speeds of 32 mph, (14.3 m/s) are shown in Figure 2.

Direct and Indirect Factors Affecting High Particulate Emissions on the Nipomo Mesa

The goal of the third prong of the South Coast Phase 2 Particulate Study was to determine which mechanisms best explain differences in emissions between riding and non-riding areas and to confirm that sand flux measurements recorded within the ODSVRA corresponded to high PM 10 emission episodes documented at the CDF and Mesa 2 monitoring stations. This was accomplished through measurements performed by “sand catchers” located in riding areas on the ocean side of the fore dunes (Beach Dunes) and

⁷ The APCD study used TEOM, e-BAM and FRM PM 10 monitors to assess particulate concentrations, standard micrometeorological sensors to measure wind speed, wind direction, relative humidity and air temperature, and DRUM aerosol samplers to measure particle size and elemental composition.

⁸ <http://www.dri.edu/pi-swerl>

within the fore dune interior (Interior Dunes), as well as in non-riding areas in the Oso Flaco region (Natural Area – Oso) in sandy regions and vegetated areas. The threshold wind speeds from this investigation appear in Table 3, where the threshold wind speed represents the lowest wind speed required to cause entrainment of particulates in an air mass as it travels across the soil surface. A combination of Sensit and sand catcher sensors were used for the particulate flux measurements⁹.

Table 3: Comparison of Threshold Wind Speed for Different Areas Tested (from Table 4.3 in Craig et al. 2010)

Location	Threshold Wind Speed (at 10 meters above the ground surface for mobilization of particulates)
SVRA - Beach Dunes	7.7 mph (3.4 m.s ⁻¹)
SVRA - Interior Dunes	10.6 mph (4.7 m.s ⁻¹)
Natural Areas - Oso	13.3 mph (6.0 m.s ⁻¹)
Vegetated Natural Areas	No particulates captured at wind speeds that occurred over the measurement period

Given the clear evidence that the riding areas of the ODSRVA are the source of the particulate emissions recorded at the Nipomo Mesa stations, three plausible mechanisms present themselves. The first is the direct impact of OHVs riding across the sand sheets and causing sand particles to be kicked up into the air. The second is indirect and involves the loss of vegetation and the destabilization of dune structure caused by OHVs. In the absence of physical disturbance the dune surface develops some stability as a result of armoring¹⁰ and the development of a salt crust. Lastly, differences in emission profiles between riding and non-riding areas could result from a higher proportion of fine particles in the sand at the riding areas than in the non-riding areas.

Considering these mechanisms one by one, there is some evidence that heightened emissions in riding areas are caused directly by the OHVs injecting fine particulates into the air via movement of tires over sand. A significant relationship was found by the South Coast Phase 2 study by comparing particulate emissions at the Mesa 2 monitoring stations on the 50 highest vehicle days with the 50 days of lowest OHV use (Craig et al. 2010). Anecdotal evidence also suggests that the higher number of OHVs driving on the northern regions of the ODSVRA explains the higher particulate emissions from this area relative to other riding areas, (Etyemezian et al. 2014). Although data are lacking for ridership per area of the ODSVRA, most or all of the camping occurs in the northern La Grande Tract region, and higher vehicle use is associated with the camp sites. A priority of future work should be to document the number of OHVs that frequent each region of the ODSVRA with the

⁹ Sensits record the count and kinetic energy of sand particles that hit the sensing element. Sand catchers trap sand particles as they travel above the soil surface. These devices require daily collection of captured particles.

¹⁰ The development of a surface layer of relatively coarse particles after the wind removes the finer materials.

express goal of understanding if relatively high ridership explains higher particulate emissions in some regions of the park relative to others.

The second mechanism involves the destruction of vegetation and surface soil structure by OHVs. As is evident in Table 3, the presence of vegetation provides by far the most stability to sand dunes and the least amount of particulate generation. Unvegetated areas that are not subject to OHV use require higher wind speeds to mobilize particulates than do riding areas. The difference may be a result of OHVs disrupting the fine structure of the sand surface.

The idea that differences in emissions are the result of differences in substrate composition is refuted by the analysis of soil samples conducted by DRI, and which appear in Table 4. These values are all associated with different regions within the ODSVRA where different mitigation efforts were implemented in an attempt to reduce emissions. As is evident from the table, all regions supports similar particle size distributions¹¹.

Table 4: Percent soil particle sizes for different regions of the ODSVRA; Table 4 from (Lancaster et al. 2011)

Site	Average % Sand	Std. Dev. % Sand	Average % Silt	Std. Dev. % Silt	Average % Clay	Std. Dev. % Clay
Straw Bales	99.52	0.15	0.25	0.07	0.28	0.04
Vegetation	99.24	0.51	0.54	0.37	0.16	0.04
ATV	99.57	0.13	0.20	0.06	0.20	0.06
Exclosure	99.37	0.18	0.31	0.12	0.24	0.07

¹¹ It is important to note, however, that these are percentages by weight. Size designations by diameter are: sand: 63 – 2000 μm , silt: 2 – 63 μm , and clay: < 2 μm , and a single particle with a diameter of 100 μm weighs the same as 1,000 particles with a diameter of 10 μm . Therefore, there are many more individual silt and clay particles than sand particles at each of these locations.

Mitigation Measures to Reduce Particulate Emissions

The Department of Parks and Recreation commissioned a mitigation plan to reduce particulate emissions in the ODSVRA (Gillies et al. 2014), and this plan was implemented in the Spring of 2014 (CDPR 2014). The essentials of the plan were the fencing of a 30-acre area in the La Grande Tract within the northern portion of the area in which riding occurs (Region 1 in Figure 3), and the placement of straw bales in a uniform pattern on over 60 acres of bare sand along the eastern border of the park (Regions 2 & 3 in Figure 3). These activities were to have occurred in a phased approach, and were detailed as such in an emergency CDP (ECDP) proposal. According to the proposal, park managers were to have fenced Region 1 first, with straw bale placement occurring only if the desired particulate emissions reductions were not achieved in Region 2, and then in Region 3 if necessary. Initial discussions with CDPR involved the granting of the ECDP proposal for phase 1 (the wind fencing in Region 1) and an agreement to come back for another ECDP if necessary for the deployment of the straw bales in Regions 2 and 3. However, after further discussion with DRI, CDPR amended the original proposal and instead applied to fence a smaller 15 acre area in Region 1, along with the placement of 5,200 straw bales on 30 acres in Region 2 all at once in the spring of 2014 (Figure 4). Commission staff approved the ECDP for this modified proposal in spring 2014 based on the perceived immediate need for CDPR to address air quality concerns, and because the straw bales were a temporary measure that would provide scientific information for a longer term air quality abatement project.

It does not now appear that these measures were adequate to achieve the desired particulate reductions in the adjacent affected Nipomo Mesa community. High particulate concentrations are a problem across large swaths of the Nipomo Mesa, as indicated by repeated high emission episodes at both the CDF and the Mesa 2 monitoring stations. However, the mitigation measures were implemented in a relatively small area only upwind of the CDF monitoring station and primarily outside of riding areas. This may help reduce emissions in the vicinity of that monitoring station, and provide a test of the mitigation measures, but other areas in the ODSVRA also contribute to the high emission conditions that exist throughout the Nipomo Mesa. The implemented mitigation measures would have little effect on emissions from those other areas. Also, the text of the proposal (Gillies et al. 2014) suggests that the intent is to reduce emissions to a point where the federal air quality standard for PM 10 ($150 \mu\text{g m}^{-3}$) is met, and not the more stringent California PM 10 standard of $50 \mu\text{g.m}^{-3}$. There is also no mention of PM 2.5 emissions. However, this federal standard was also exceeded in each of the last three years (Table 2). In summary, the mitigation applied appears not to have been effective in reducing particulate emissions below all state and federal standards nor across all of the affected area, and so has not resolved the identified public health issue on the Nipomo Mesa.

The mitigation plan's stated reason for choosing Region 1 in the La Grande Tract is the higher emissions recorded in this area relative to other locations in the ODSVRA. Emissions do appear to be higher in this region, and reducing riding access to this area would be likely to lower emission rates on the Nipomo Mesa. However, the cause of the higher emissions in the La Grande Tract is assumed by the plan to be a smaller particle size distribution relative to other areas. No data are presented to justify this assumption and existing studies indicate little difference in particle size distributions in different areas.

Therefore, this mechanism should be treated as hypothetical until a focused study is conducted. Moreover, the plan's intent is to allow riding to continue in Region 1. The proposal states that, "The OHMVR Division would design the dust control treatment to provide required dust control effectiveness while supporting use of the treatment area for OHV training or other limited OHV activity". It is not clear how the plan will accommodate both particulate matter reductions and continued riding in this area, and the measures by which dust control would be achieved are not specified.

The assumptions behind the choice of regions 2 and 3 for straw bale placement are also problematic. In the proposal, the authors state, "if all other factors are equal, areas closer to CDF may contribute more to measured PM10 concentrations than areas farther away from CDF". While this is undoubtedly true, all other factors are not equal. A wealth of data definitively attributes the high particulate emission episodes to the riding areas within the ODSVRA, and specifically to the increased mobility of sand particles following the removal of vegetation and soil structure by OHVs. However, the areas where straw bales were placed were not within the riding areas of the ODSVRA.

The use of straw bales as a means of reducing particulate emissions is of limited effectiveness as a short term means for reducing particulate emissions. Whereas some reductions in sand fluxes were recorded during the 2011 pilot project at experimental straw bale locations, the effectiveness declined after the first few days, and monitoring was of short duration (Lancaster et al. 2011). Introducing straw bales to the landscape is not an effective long-term solution. As with any landscape feature, straw bales are acted upon by their environment, and are affected by wind, water, sand, sea spray, animals and humans (Figure 5). They are relatively quickly buried and over time will decompose, reducing their surface roughness properties. Much more detail is needed to properly evaluate this approach¹². In the absence of compelling evidence to the contrary, the straw bales currently located within the ODSVRA should be removed as required by Condition 3 of the ECDP (G-3-14-0007).

Potential Strategies for Reducing Particulate Emissions at the ODSVRA

There exists a clear need to reduce the particulate emissions from the ODSVRA to levels acceptable for human health. Hopefully, by continuing to partner with individuals and organizations with expertise in dune processes, CDPR will be able to develop a plan for achieving compliance with state and federal air quality standards in the near term. Such a plan will necessarily need to include specific measureable criteria to be achieved and enforceable time tables in which to achieve them. APCD's rule and CDPR's pending CDP application may facilitate the development of an effective dust control plan.

Several mechanisms to reduce particulate emissions have been suggested (Zeldin 2015). One option is to restrict the areas open to riding, which may be necessary in the

¹² For example: Will they be removed? Replaced? Disinterred? What is the cost effectiveness of this approach relative to other measures? How will they act upon their environment? How are the values of non-OHV recreationists affected by the placement of straw bales in this scenic habitat area?

short term. Over the longer term, an effective approach may be to establish large vegetation islands within the riding areas perpendicular to the direction of high winds that can act as barriers to particulates and prevent them from traveling to the Nipomo Mesa and other downwind areas. As with all revegetation efforts, measures must be put in place to ensure that vegetation that reestablishes naturally is native, and that any vegetation that is directly planted originates from local native propagules. Other options that could be evaluated include the use of environmentally safe soil binding agents in conjunction with fencing, and restricting OHV use in some areas to winter months because the high winds that lead to particulate exceedance episodes most often occur in spring and late fall, and winter rains that wet the soils also prevent soil particles from entrainment.

Unfortunately, there is no obvious simple fix that significantly reduces particulate emissions while accommodating the recreational use for which the park is known. However, CDPR's pending particulate matter control CDP application and its upcoming EIR may provide vehicles for developing such a solution.

Figure 1: Locations of sampling sites used in the South Coast Phase 2 Particulate Study (Craig et al. 2010). Sampling locations designated by yellow circles.

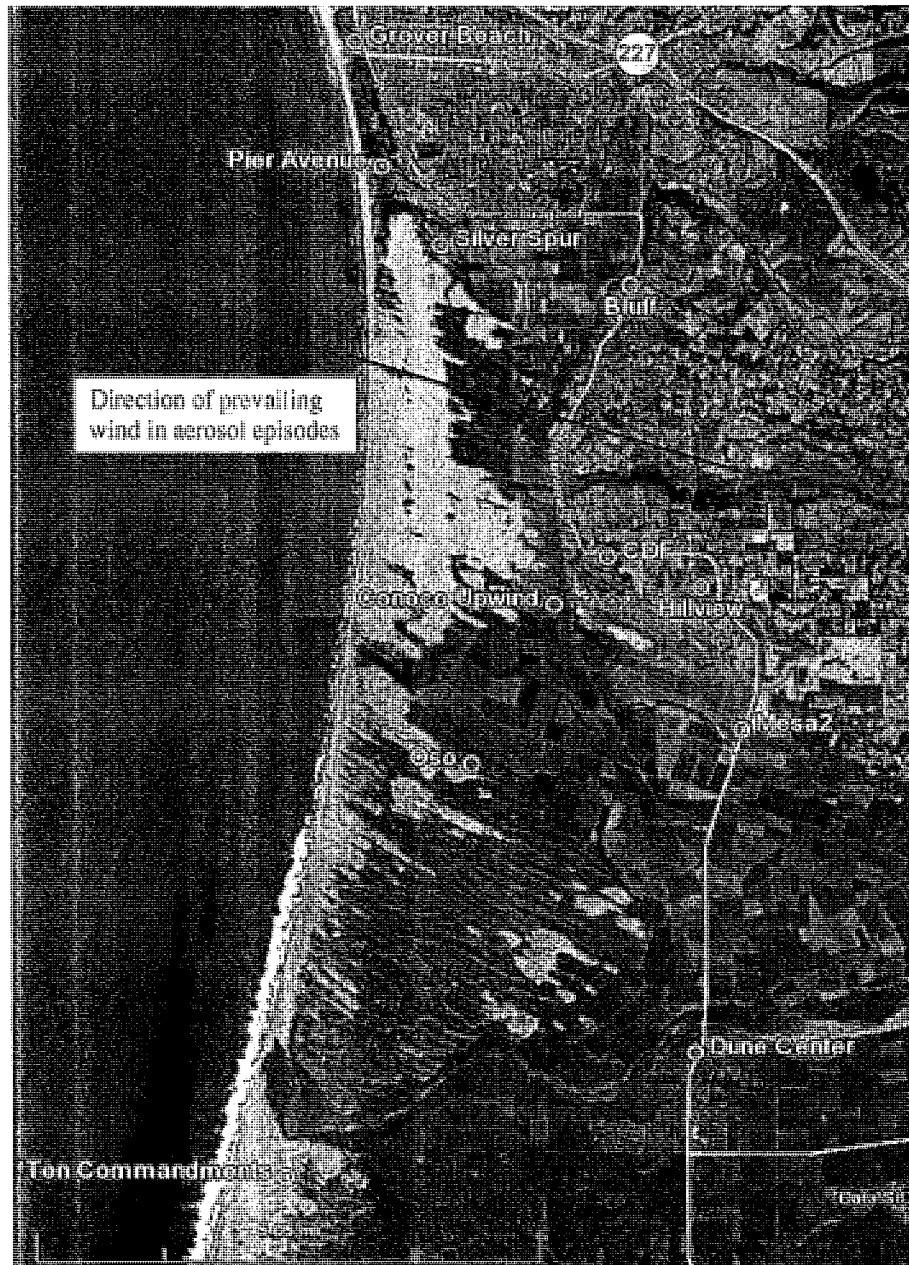


Figure 2: PI-SWERL measured emissions at 3000 RPM or 32 mph at a height of 10 meters above the surface in units of $\text{mg}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$ (from Figure 6 in Etyemezian et al. 2014).

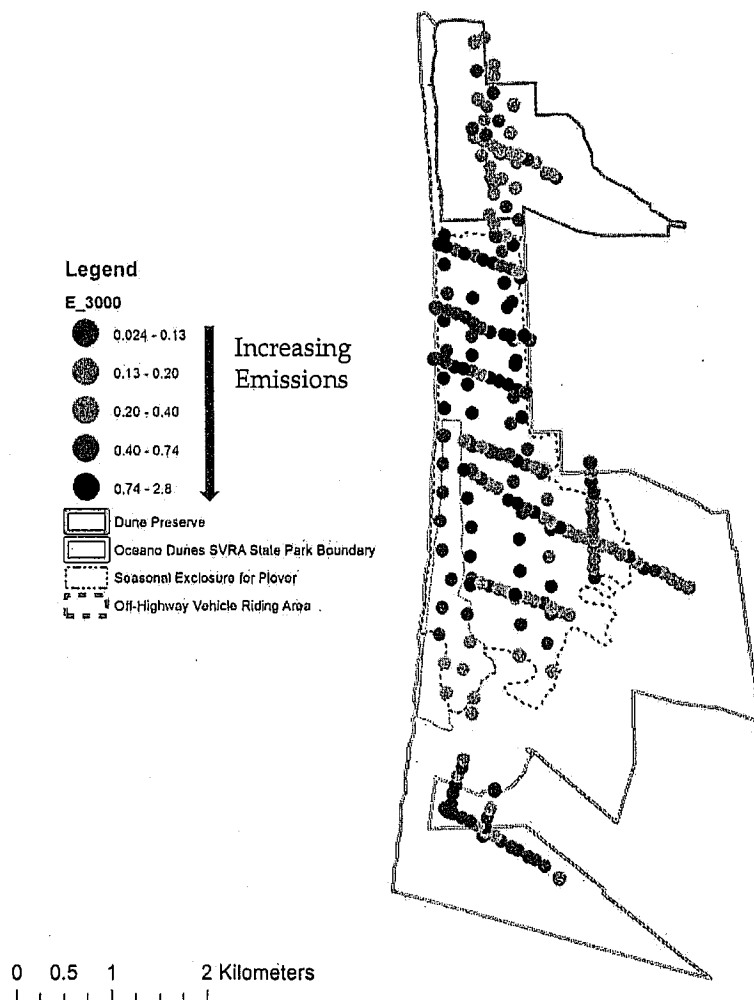


Figure 3: Locations of Mitigation Regions in the ODSVRA (adapted from Gillies et al. 2014)



Figure 4: Oceano Dunes Straw Bale Mitigation Treatment

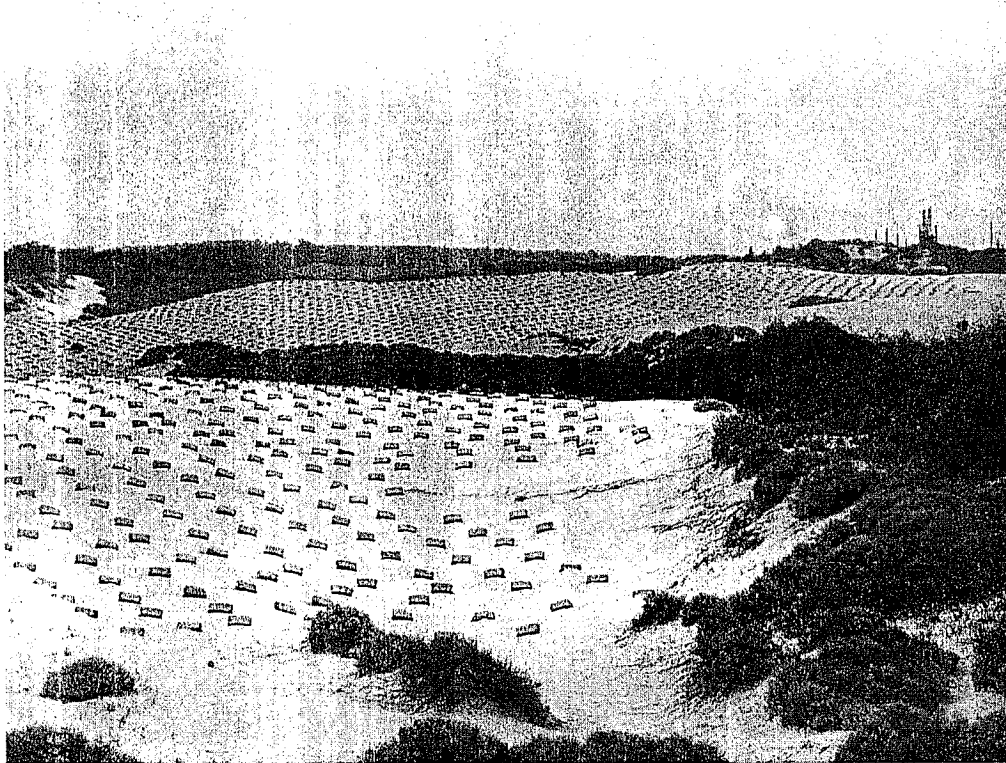
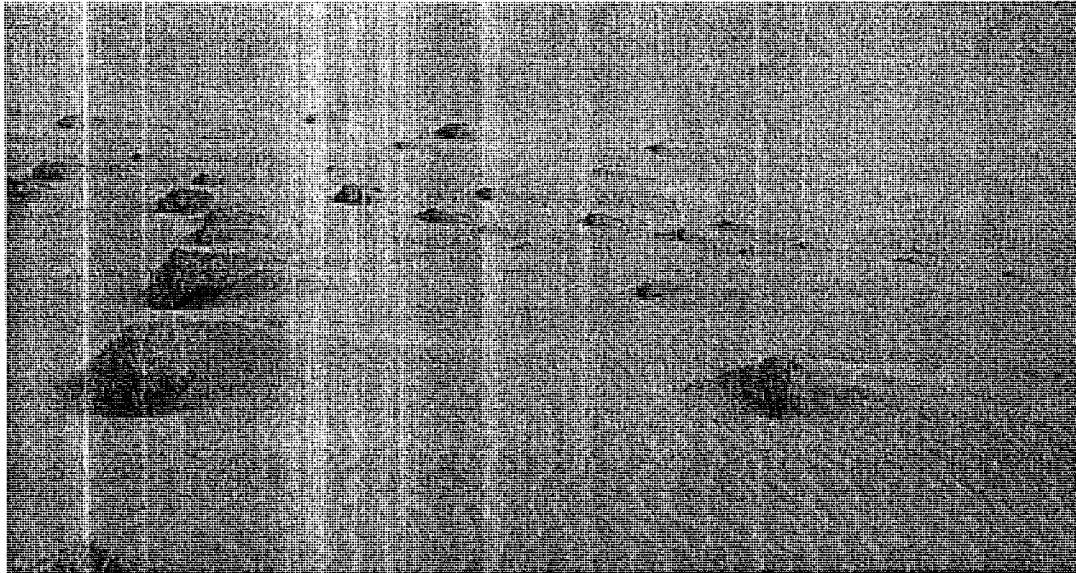


Figure 5: Straw Bales Buried by Sand in the ODSVRA (from CDPR 2014)



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9 February 2015

GEOTECHNICAL REVIEW MEMORANDUM

To: Justin Buhr, Coastal Program Analyst
From: Mark Johnsson, Staff Geologist
Re: Oceano Dunes State Vehicular Recreation Area (4-82-300, as amended)

In connection with the above-referenced permit, I have reviewed the following documents:

- 1) San Luis Obispo County Air Pollution Control District, 2010, "South County Phase 2 Particulate Study", report dated February 2010 and signed by Craig, J., T. Cahill and D. Ono.
- 2) California Geological Survey, 2010, "Evaluation of the San Luis Obispo County Air Pollution Control District report "South County Phase 2 Particulate Study," dated February 2010", 13 p. memorandum dated 18 March 2010 and signed by W. J. Harris (CEG 2222 CHG 750) and T. L. Bedrossian (CEG 1604).
- 3) TRA Environmental Sciences, 2010, "Published Phase 2 report data does not support claims of association between Oceano Dunes State Vehicular Recreation Area visitor numbers and PM10 downwind", 7 p. memorandum dated 18 May 2010 and signed by T. Reid.
- 4) Desert Research Institute, 2011, "Oceano Dunes Pilot Projects", 55 p. report dated 15 September 2011 and signed by N. Lancaster, J. Gillies, V. Etyemezian and G. Nikolich.
- 5) California Geological Survey, 2011, "In consideration of Draft Rule 1001 proposed by the San Luis Obispo County Air Pollution Control District: An analysis of wind, soils, and open sand sheet and vegetation acreage in the active dunes of the Callender Dune Sheet, San Luis Obispo County, California", 10 p. memorandum dated 1 November 2011 and signed by W. J. Harris (CEG 2222 CHG 750).
- 6) Desert Research Institute, 2014, "Sand transport and dust reduction measures within and near the ODSVRA to reduce 24-hour average PM₁₀ concentrations at the CDF ambient air quality monitoring station in San Luis Obispo County, CA", 16 p. proposal dated 13 January 2014 and signed by J. Gillies, V. Etyemezian and C. Dugan.
- 7) Desert Research Institute, 2014, "Wind and PM₁₀ characteristics at the ODSVRA from the 2013 assessment monitoring network", 63 p. report dated 14 January 2014 and signed by J. Gillies and V. Etyemezian.
- 8) Desert Research Institute, 2014, "2013 Intensive wind erodibility measurements at and near the Oceano Dunes State Vehicular Recreation Area: Preliminary report of findings", 8 p. report dated 9 July 2014 and signed by V. Etyemezian, J. Gillies, D. Zhu, A. Pokharel and G. Nikolich.

- 9) San Luis Obispo County Air Pollution Control District, "APCD Comments on January 14, 2014 DRI Report", 14 p. comments by San Luis Obispo County Air Pollution Control District.
- 10) Desert Research Institute, 2014, "Sand transport and dust reduction measures within and near the ODSVRA to reduce 24-hour average PM₁₀ concentrations at the CDF ambient air quality monitoring station in San Luis Obispo County, CA: Revised", 3 p. proposal dated 18 February 2014 and signed by J. Gillies, V. Etyemezian and C. Dugan.
- 11) Zeldin, Marvin D., 2015, "Evaluation of efficiency and cost-effectiveness of ODSVRA mitigation measures", 4 p. letter dated 21 January 2015 and signed by M. D. Zeldin.
- 12) California Coastal Commission, 2015, "Oceano Dunes State Vehicle Recreation Area", 17 p. memorandum dated 29 January 2014 [sic] and signed by L. Koteen.
- 13) California Coastal Commission, 2015, "Oceano Dunes State Vehicle Recreation Area Air Quality Issues", 15 p. memorandum dated 6 February 2015 and signed by L. Koteen.

This memo should be viewed as a high-level overview of limited issues related to dust pollution at Oceano Dunes State Vehicle Recreation Area (ODSVRA), and not as a comprehensive review. Although I have visited ODSVRA on several occasions, I have seen only a small portion of the site and did not visit it with questions of air quality foremost in mind. This review is based on my knowledge of the physical processes that affect dune systems and on a critical assessment of the documents listed above. A primary purpose of my review was to evaluate references (12) and (13), prepared by the Commission's staff ecologist Dr. Laurie Koteen, from a geologic perspective. I have done so, and find that I concur with all of the principal conclusions contained therein. A few items, however, deserve further elaboration.

Although particulate emissions measured downwind of the ODSVRA frequently exceed State and Federal standards for both PM₁₀ (particles with an equivalent spherical diameter of 10 μ m and less) and for PM_{2.5} (particles with an equivalent spherical diameter of 2.5 μ m and less), much of reference (1), as well as the reviews of it in references (2) and (3), and the San Luis County Air Pollution Control District (SLOCAPCD) rule 1001 (see reference 5) and the mitigation measures described in references (4) and (6) through (11), focus on PM₁₀. Relatively little is known concerning sources, distribution, and fluxes of PM_{2.5}.

Dr. Koteen concludes that these studies have provided strong evidence that the source of PM₁₀ is the large, bare, sand sheets consisting of active Holocene dunes at ODSVRA, with which I concur. Agricultural fields and the coke stockpiles at the ConocoPhillips refinery do not match the temporal and compositional trends associated with PM₁₀ exceedances. Further, the sand sheets in the ODSVRA upwind of sampling sites CDF and MESA2 (which show the highest spikes of PM₁₀) appear to release substantially more PM₁₀ material than do those in other areas. The sand sheets upwind of CDF and MESA2 are subject to Off Highway Vehicle (OHV) use, whereas the other sand sheets are not. Reference (1) convincingly demonstrates that the grain size, and thus erodibility, of the sands in the areas subject to OHV use are nearly identical to areas that are vegetated and areas of open sand sheets that are not subject to OHV use.

Reference (1) and Dr. Koteen note a weak, but statistically significant, correlation between PM₁₀ exceedance and the mean of the 50 highest-OHV-use days as compared to the mean of the 50 lowest-OHV-use days, suggesting that there may be some direct impacts correlating OHV use

and PM10 emissions. However, these authors conclude that direct impacts from OHV use to air quality are very minor if they occur at all, and with that I concur. Reference (3) convincingly shows that the data are too sparse and were processed inappropriately to be able to establish a significant correlation between intensity of use and PM10 emissions.

Indirect effects are another matter. Review of aerial photographs makes clear that vegetation has become well established (largely through intentional plantings) in areas where OHVs are excluded, but has not become established in the OHV-use areas. The data in reference (1) shows that vegetated areas contribute very little PM10 material during exceedance episodes. Thus there is a strong correlation between areas that are subject to OHV use and PM10 exceedance episodes. It is my understanding that vegetation has not been able to be established in areas subject to OHV use. One possible mitigation measure, as recommended in reference (11), for example, is the creation of additional fenced-off "vegetation islands" in the current riding area.

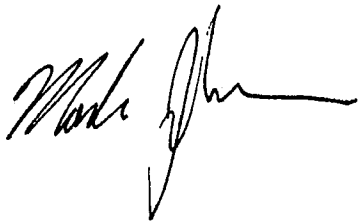
Another indirect effect of OHV use is the disruption of dune structure. Reference (1) describes "crusts" that may form on sand sheets that are not subject to OHV use. With OHV use, these crusts either do not form, or are continually broken up. It is my understanding that there is much debate about the existence and nature of these crusts. I do not have first-hand knowledge of the distribution of any crusts at ODSRVA, and their documentation in reference (1) is at best anecdotal. In her first memorandum, Dr. Koteen described biogenic crusts that are known to occur in similar settings, but in her revised memorandum she omitted that reference after discussions with State Park biologists, who maintain that there are no biogenic crusts at ODSRVA. Nevertheless, reference (1) does describe crusts 0.5 to 1 cm thick in the Oso Flaco Lake area, an area of open sand sheet not exposed to OHV use. Crusts can form on sand surfaces by at least two common geologic processes: through evaporative pumping of pore water (whether located in the vadose zone (mostly air-filled pores) or in the phreatic zone (water-filled pores) to the surface, and the precipitation of salts through evaporation. Such crusts, common in arid areas, are known as efflorescent crusts. A second mechanism for the creation of a crust is through the introduction of saline water to the sand surface, followed by evaporation and precipitation of salts. This mechanism is very common in areas (such as ODSVRA) adjacent to the sea. The saline waters could be introduced not only by precipitation, but also through deposition of marine aerosols and fog.

Other fine structure of the dunes could be disturbed by OHV use and lead to resuspension of fine material, resulting in PM10 exceedances. Given sufficient sediment supply, dunes will accrete upward as well as advance horizontally. This upward growth leaves a thin layer of grains parallel to the windward (or stoss) side of the dune, which will be preserved as thin laminae. These contrast with the bulk structure of the dunes, which are made up of laminae created by grains avalanching down the steep leeward face of the dune (see, for example, Kucurek, 1996; and Reading and Collinson, 1996). The subhorizontal laminae impart directionality to hydrologic properties in dune deposits. Further, these laminae may be winnowed of fine material, leaving a lag of coarser material that cannot be transported by average wind conditions. This "armor" layer of coarse material protects the material beneath it, which may contain material that could be transported by the prevailing wind conditions if not for the armor layer. Such fine structure would be easily disrupted by OHV use, and would not be able to reform if OHV use was more or less continuous.

In summary, I concur that there is strong evidence that the areas of ODSVRA that are subject to OHV use are a primary source of PM10 material leading to exceedances at stations CDF and MESA2. It is most likely that OHV use itself is a contributor. Although there is no compelling evidence for direct effects, indirect effects such as preventing the establishment of vegetation and the disruption of fine dune structure and, perhaps, efflorescent and other crusts, are likely important in the creation of PM10 dust.

I hope that this brief review is helpful. Please do not hesitate to contact me with any further questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark Johnsson', with a long horizontal flourish extending to the right.

Mark Johnsson, Ph.D., CEG, CHG
Staff Geologist

Other References Cited

Kocurek, G.A., 1996, "Desert Aeolian systems" *in* Reading, H.G. (ed), *Sedimentary Environments: Processes, facies and stratigraphy*: Osney Mead: Blackwell, p. 125-153.

Reading, H.G. and Collinson, J.D., 1996, "Clastic coasts" *in* Reading, H.G. (ed), *Sedimentary Environments: Processes, facies and stratigraphy*: Osney Mead: Blackwell, p. 154-231.

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W14a

Prepared January 30, 2015 for February 11, 2015 Hearing

To: Commissioners and Interested Persons

From: Dan Carl, District Director
Susan Craig, District Manager
Kevin Kahn, District Supervisor
Justin Buhr, Coastal Planner

Subject: Review of overall effectiveness of methods being used to manage vehicle impacts in relation to coastal resources at the Oceano Dunes State Vehicular Recreation Area (ODSVRA) as required by coastal permit 4-82-300 as amended, in the Pismo Beach, Grover Beach, and Oceano Dunes areas of San Luis Obispo County

EXECUTIVE SUMMARY

Oceano Dunes State Vehicular Recreation Area (ODSVRA, or Park), formerly known as the Pismo Dunes State Vehicular Recreation Area, is located on the central California coast in southern San Luis Obispo County. ODSVRA is operated by the California Department of Parks and Recreation's (DPR) Off-Highway Motor Vehicle Division, and encompasses nearly 3,600 acres and approximately six linear miles of sandy beach. Approximately 1,500 acres of ODSVRA are currently available for off-highway vehicle (OHV) use. ODSVRA provides important public recreational access opportunities, including primarily the unique opportunity to recreationally drive vehicles and OHVs on a sandy shoreline and dune environment. These same sandy resources that make the Park attractive for OHV use also mean that the Park is a resource area, and it has been called out as an environmentally sensitive habitat area (ESHA) by the Coastal Commission, including in the San Luis Obispo County certified Local Coastal Program (LCP). In fact, ODSVRA is part of a larger and significant and sensitive ecological system, the Nipomo-Guadalupe dunes complex, that has been identified as critical habitat for the threatened Western snowy plover, and supports endangered species including the California least tern, steelhead trout, and tidewater goby. As a result, there has historically been a tension over how to strike an appropriate balance between facilitating vehicular recreation and protecting dune and related coastal resources.

Since its inception the Commission has been an active partner with DPR, the County, and interested parties in addressing these competing interests, including both through LCP certification as well as the coastal permitting process. It is the latter process that gives rise to this review. Specifically, back in 1982 the Commission approved coastal development permit (CDP)

4-82-300 to allow DPR to construct fencing to delineate use and restricted areas, to establish interim Park access control (via the construction of two interim kiosks), to designate an interim OHV staging area, and to address the carrying capacity of the Park by setting vehicle use limits. The terms and conditions of that CDP were designed to provide for continued study and ongoing adaptive management of the Park related to these core issues and consistent with the access, recreation, and resource protection policies of the Coastal Act and the LCP. CDP 4-82-300 was amended several times, the last of which occurred in 2001. Each of the amendments altered the terms and conditions in a variety of ways, but the base premise continues to be one on understanding issues and providing a means of addressing them through continued Commission review and adaptive management.

Most recently, the CDP was amended in 2001 to add the requirement that there be a Technical Review Team (TRT) to help study and provide recommendations on vehicular use and resource management within ODSVRA (CDP amendment 4-82-300-A5). The TRT is an interagency/stakeholder group that is required to identify and prioritize research and management questions and projects, including to help define appropriate management techniques for the Western snowy plover, California least tern, steelhead trout, and tidewater goby; for protection of water quality and dune habitats; for revegetation efforts; and for a comprehensive, long-term monitoring and comparative analysis of the resource impacts associated with varying levels of OHV use, including with respect to peak-use attendance periods. In addition, the 2001 CDP amendment required the formation of a Scientific Subcommittee to help guide the TRT. The TRT then prepares annual reports for the review of the Park Superintendent and the Commission. Per the terms of the CDP, the Commission is to annually review the reports, and, if the Commission finds that the TRT has been effective at managing vehicular impacts at the Park, to allow the TRT to continue to be the primary CDP implementation mechanism for that purpose for another year. If the Commission is not satisfied, it may, through this review process, institute alternative approaches to resource management or institute a new set of management measures. In short, the CDP, as amended, provides the Commission a vehicle for evaluating management measures at the Park in terms of addressing the overall balance between vehicular recreation and dune and related coastal resource protection.

Although the Commission performed six annual reviews in the early 2000s, the Commission has not undertaken the CDP-identified review since 2007. The reasons for this gap in reviews are many, but are primarily a result of limited staff resources. It has become clear more recently, however, that it is an appropriate time to reinvigorate the review process, not only because interested parties have requested same, but also as a result of the changing context for such a review at ODSVRA. Although many of the issues associated with balancing OHV use and resource protection remain the same, more recent developments include issues related to dust and air quality impacts associated with the Park, and how these are best addressed (including in relation to a pending DPR dust control project CDP application). There are also ongoing questions about the base CDP's TRT framework and process, as well as other CDP related requirements that remain outstanding (e.g., recognizing permanent as opposed to temporary access and staging locations, etc.) and other issues not completely resolved (e.g., disposition of the La Grande portion of the ODSVRA currently owned by San Luis Obispo County, and DPR's ongoing efforts to finalize a Habitat Conservation Plan (HCP) under the Endangered Species Act (ESA) for the Park). In addition, the membership of the Commission itself has changed almost

completely in the time since the last review, and this review is an opportunity to bring the Commission up to speed on the context, issues, and potential next steps related to overall Park management under the CDP.

This report provides the CDP required review, and it provides an overview of ODSVRA, describes various requirements of the CDP, summarizes some of the primary issues facing ODSVRA today, and includes a discussion of potential next steps to address these issues, all with the goal of addressing the fundamental tension and balance associated with providing for the unique public recreational opportunity that the Park provides at the same time as respecting and protecting Park resources. Staff's intent with this report is not that the Commission take specific actions at the February review hearing, but rather that the Commission consider and discuss the various ODSVRA issues and potential next steps as a means of providing guidance to Parks moving forward. That is not to say there are not actions to be taken related to the Commission's CDP obligations, but rather that these actions are probably best understood as future actions pending further study, evaluation, and coordination with DPR. Staff already works very closely with DPR on these management issues, and is fully committed to that ongoing partnership and dialogue at ODSVRA moving forward.

As further discussed in this report, the primary issues and potential recommendations related to ODSVRA management include a series of next steps towards: 1) designation of permanent Park entrance and staging areas; 2) identification of appropriate use limits and carrying capacities, including related to special events; 3) identification of measures to address dust control and air quality, including completion of the pending CDP application process; 4) resolution of ownership and use issues associated with the La Grande property; 5) implementation of a study that provides information on the effectiveness and impacts associated with a year-round enclosure for Western snowy plover and California least tern, including its impacts on recreational vehicular activity; 6) steps necessary to complete an HCP in conjunction with the United States Fish and Wildlife Service (USFWS); and 7) transitioning and/or restructuring the TRT function. All of these necessarily involve potential modifications to the CDP, the LCP, and/or potentially new vehicles to implement such management measures in as clear and straightforward a manner as possible (e.g., a the potential for an ODSVRA Public Works Plan).

Nearly all of the issues identified in this report interrelate with one another, and all have significant impacts on the Park's public recreational access and sensitive habitat protection mandates. ODSVRA is a publicly-owned, nearly 3,600-acre piece of California's coast that supports important public recreational opportunities (including day-use visitors, OHV riders, campers, and hikers) as well as sensitive habitats, including coastal dunes and threatened and endangered species. Thus, almost by definition ODSVRA management is a complicated balancing of various uses and users, and will continue to be into the future. This report provides an overview of those issues, and offers a platform to both further the discussion and provide for potential next steps moving forward.

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EXHIBITS

- Exhibit 1: ODSVRA Location Map
- Exhibit 2: ODSVRA Maps and Figures
- Exhibit 3: ODSVRA Photos
- Exhibit 4: CDP 4-82-300 through CDP Amendment 4-82-300-A5 Conditions
- Exhibit 5: CDP 4-82-300, as amended through 4-82-300-A5
- Exhibit 6: ODSVRA TRT 2014 Annual Report
- Exhibit 7: ODSVRA TRT Scientific Subcommittee 2014 Report
- Exhibit 8: DPR/Point Blue Conservation Science Least Tern and Snowy Plover Report
- Exhibit 9: DPR's Straw Bale Project Photos
- Exhibit 10: San Luis Obispo County Air Pollution Control District (APCD) Rule 1001
- Exhibit 11: San Luis Obispo County APCD Air Quality Recommendations
- Exhibit 12: Correspondence Received
- Exhibit 13: Commission Staff 2007 La Grande Property Comments
- Exhibit 14: Dr. John Dixon 2015 Memo Regarding Scientific Advisory Panel Issues
- Exhibit 15: Dr. Laurie Koteen 2015 Memo Regarding Air Quality Issues

I. BACKGROUND

A. PARK LOCATION AND DESCRIPTION

Oceano Dunes State Vehicular Recreation Area (ODSVRA, or Park), formerly known as Pismo Dunes State Vehicular Recreation Area, is located on the central California coast in southern San Luis Obispo County (see Exhibit 1). ODSVRA is part of the much larger 18-mile-long Guadalupe-Nipomo Dunes complex. The cities of Pismo Beach and Grover Beach form the northern border of the Park. To the east are the Phillips 66 Refinery (formerly ConocoPhillips Refinery), the unincorporated community of Oceano, and private lands that consist of dunes, coastal scrub, and agricultural fields. The southern border of the Park abuts the Guadalupe-Nipomo Dunes National Wildlife Refuge. ODSVRA is mostly owned and entirely operated by the California Department of Parks and Recreation's (DPR) Off-Highway Motor Vehicle Division. The Park is a very popular visitor destination, with annual attendance in the millions and vehicular use in the hundreds of thousands.¹

ODSVRA encompasses 3,590 acres and includes approximately six linear miles of sandy beach. Approximately 1,500 acres of ODSVRA are currently available for off-highway vehicle (OHV) use. The Park varies in width from a few hundred yards along its northerly boundaries near the Pismo Dunes Natural Preserve to up to three miles wide along its southerly portion. The ODSVRA is divided into different regions based upon allowable activities, including areas set aside strictly for resource protection and preservation, street-legal vehicle use, and a combination of street-legal/OHV use. The separation and delineation of these specific areas was developed through past cooperative efforts of DPR, the Coastal Commission, San Luis Obispo County, and the California Department of Fish and Wildlife (CDFW). The entire ODSVRA has been identified by the Commission as an environmentally sensitive habitat area (ESHA). Furthermore, the entire ODSVRA is mapped as a sensitive resource area (i.e., ESHA) in the San Luis Obispo County LCP (see Exhibit 2). ODSVRA is part of a significant and sensitive ecological system, the Nipomo-Guadalupe dunes complex. In addition, the area has been identified as critical habitat for the threatened Western snowy plover, and supports other sensitive species including the endangered California least tern, steelhead trout, and tidewater goby.

There are two interim² vehicular entry points for the ODSVRA. The northernmost entrance (and the northern boundary for allowed vehicular use of any kind on the beach) is at West Grand Avenue within the City of Grover Beach (see Exhibit 2). The second entrance is located about one mile south of West Grand Avenue at Pier Avenue within the unincorporated community of Oceano. From both entry points, street-legal vehicles then drive approximately two miles south along the lower beach towards the interim³ OHV staging and allowed riding areas (see staging and riding areas noted on Exhibit 2). In order to get to the OHV staging riding areas, vehicles must cross Arroyo Grande Creek where it empties into the Pacific Ocean, approximately one-half mile south of Pier Avenue. Arroyo Grande Creek supports steelhead trout and tidewater goby, both of which are Federally-endangered species. Typically, the only time the Creek has

¹ DPR's numbers from 2013 show the Park was visited by an estimated 1.6 million persons, and was accessed by some 264,042 street-legal vehicles and 142,376 off-highway vehicles (over 400,000 vehicles all told).

² These access points were established as interim through CDP 4-82-300, in part to allow consideration of potential alternatives for vehicular access and staging for the Park to avoid adverse impacts.

³ Id (the staging areas are interim under CDP 4-82-300).

significant flows is during the rainy season. However, when it is flowing, the Creek presents an obstacle to vehicular travel, including to get to the OHV riding and staging areas, and has been the site of problems in this respect as vehicles attempt to navigate through and across the Creek to access the riding areas further south.

Continuing south, vehicles reach the interim OHV staging area, which is one-half mile south of Arroyo Grande Creek at Post 2⁴ (see location of marker posts in Exhibit 2). This staging area is the designated area where OHVs that have been trailered in by other vehicles can be off-loaded. OHVs may be off-loaded in other areas south of the staging area, but the staging area at Post 2 is the location where OHV use is first allowed as one heads south from the entrance points. OHV riding is allowed in most of the Park area south of the staging area. The riding area consists of the sandy beach located between the staging area to the fencing constructed north of Oso Flaco Lake, a distance of approximately three miles, as well as the back dunes from approximately Post 4 to Post 8. The back dunes extend in some areas almost two miles inland. Included in the riding area between approximately Post 4 and Post 7 is the La Grande property (see Exhibit 2). The La Grande property occupies 584 acres of the Park, and this area is owned by San Luis Obispo County and currently leased to DPR on a month-to-month basis.

A portion of the Park is closed to OHV use for 7 months out of the year for habitat purposes. Specifically, DPR installs and maintains fencing restricting OHV use to protect nesting California least terns and Western snowy plovers (Federally-designated endangered and threatened species, respectively) along the shoreline and covering an area of approximately 300 acres from March 1st to September 30th each year. This seasonal nesting enclosure area is referred to as the Southern Enclosure (see Exhibit 2). Approximately 250 acres of the enclosure is within an area that is otherwise open to OHV use the other 5 months of the year, extending from approximately Post 6 south to Post 8 to the Oso Flaco Lake area. Although the basic configuration of the Southern Enclosure has remained relatively consistent since 2004, changes in dune topography and public safety issues impact the placement of the eastern fence, resulting in small variations in acreage from year to year.

Just south of the Southern Enclosure area and the open riding area is the Oso Flaco Lake area (see Exhibit 2). The Oso Flaco Lake area was historically open to riding prior to the creation of the ODSVRA, but was closed off to OHV use due to severe degradation. This area now supports a healthy system of distinct habitats, including freshwater lakes and marsh, a significant riparian system, dune vegetation, and coastal sage scrub. A pedestrian-only access point to the Oso Flaco Lake area is located at the end of Oso Flaco Lake Road.

See site location maps, ODSVRA maps and figures, and ODSVRA photos in Exhibits 1, 2, and 3. In addition, DPR provides access to an interactive virtual tour of the site that is available at <http://www.regal360.com/clients/ohv/index.html>.

B. PUBLIC RESOURCES CODE 5090

The statute authorizing Off-Highway Vehicle Recreation Areas (Public Resources Code (PRC) 5090 et seq.) was adopted in 1982. The statute recognized the increasing popularity of OHV use

⁴ The marker posts are located approximately one-half mile apart and are used as riding reference points within ODSVRA.

and the importance of such use but also recognized that “[t]he indiscriminate and uncontrolled use of those vehicles may have a deleterious impact on the environment, wildlife habitats, native wildlife, and native flora” (PRC Section 5090.02(3)). Thus this enabling legislation provides for a balancing of recreational and environmental factors, mandates an Off-Highway Vehicle Commission composed of a variety of interest groups to oversee the designated vehicular recreation areas, and specifically allocates funding to both recreation and conservation projects. The original legislation identified six existing OHV areas, including ODSVRA (then called out as Pismo Dunes). Land proposed for OHV facilities was selected primarily on the basis of its ability to provide satisfactory recreational opportunities for OHV enthusiasts. Natural and cultural elements of the selected lands were considered secondary, and it was identified that they could be managed or modified to enhance their primary recreational value.

Subsequent PRC Section 5090 amendments in 1987 were aimed at balancing recreational use with environmental considerations. For example, Section 5090.35 was greatly expanded to require DPR’s OHV Division to adopt erosion standards adequate to provide for the successful rehabilitation of degraded areas, to prepare an inventory of wildlife habitats, to develop a wildlife protection program, to monitor impacts on soils and habitat, to close and rehabilitate degraded areas, and to fund only those programs that comply with the state conservation standards for erosion control and wildlife habitat protection. The OHV Commission was also then authorized to recommend that sites with natural or cultural values be set aside as sensitive areas and managed in accordance with regulations applicable to other preserves in the state system, including that they could be fenced off if necessary to protect them from OHV activities.

C. SAN LUIS OBISPO COUNTY LOCAL COASTAL PROGRAM

The San Luis Obispo County Local Coastal Program (LCP) Land Use Plan (LUP) was originally adopted by the County in 1981. At that time, the County’s proposed LUP proposed to close the entire Park to vehicle use and camping until a management plan was submitted by DPR and approved by the County. The identified management plan was intended to be the vehicle to address resource management in relation to vehicle impacts at the Park. However, in considering the proposed LUP, the South Central Regional Coastal Commission⁵ found that the LUP’s proposed policies and standards related to OHV use within the Pismo Dunes/Oso Flaco area raised a substantial issue with regard to their effect on ESHA, and thus the LUP was not approved at that time. A main area of concern at that time was appropriately locating Park access points and OHV staging areas in order to reduce negative resource impacts. At the LUP hearing, the Commission directed Commission staff, the County, and DPR to develop a solution for the access and staging area issue. Thereafter, the agencies worked together with other interested parties to evaluate and develop alternative strategies that would allow for continued OHV and camping uses, while also providing appropriate levels of resource protection, including in relation to access entrances into the Park and associated staging locations. The parties agreed that the proper vehicle to address these issues was via the CDP process in order to ensure that these Park management concerns would not delay the rest of LUP certification (the LUP was subsequently certified in 1984, and the overall LCP certified in 1988). The results of the joint

⁵ As part of Proposition 20 (The Coastal Initiative of 1972) and the Coastal Act (of 1976), there were originally six separate regional Coastal Commissions in addition to a statewide Commission. The regional Commissions were ultimately phased out to leave just one statewide Coastal Commission in 1981.

Commission staff, County, and DPR effort to address the competing vehicular recreation and resource protection objectives are reflected in CDP 4-82-300.

D. COASTAL DEVELOPMENT PERMIT 4-82-300

CDP 4-82-300

On June 17, 1982, prior to certification of the LCP LUP, the Commission approved CDP 4-82-300 to allow DPR to construct fencing to delineate use and restricted areas, to establish interim Park access control (via the construction of two interim kiosks at entry locations), to designate an interim OHV staging area, and to address the carrying capacity of the Park by setting vehicle use limits. The fencing, interim staging and access areas, and use limits were permitted as the initial phase of what was seen as a longer term program to manage OHV use within the ODSVRA consistent with the access, recreation, and resource protection policies of the Coastal Act.

CDP 4-82-300 Special Condition 2 required the temporary access kiosks to be located at West Grand Avenue in Grover Beach and Pier Avenue in Oceano (see Exhibits 4 and 5).⁶ Per Special Condition 3, the kiosks were to be manned with DPR representatives giving OHV users information about the new CDP conditions, including restrictions on riding within fenced-off areas, prohibitions on riding within the Oso Flaco Lake area, and restrictions on riding within any other areas designated as private property or that were vegetated, regardless of fencing or signage. Special Condition 3(C) also established that only street-legal vehicles were allowed to drive on the section of beach from these access entrance points south to the start of the Sand Highway,⁷ and designated the area south from the start of the Sand Highway to the fencing north of Oso Flaco Creek for OHV use. Special Condition 3(D) required that the number of OHVs allowed at any given time within ODSVRA must be limited to a specified number of users, and directed DPR, San Luis Obispo County, and the Commission's Executive Director to consult with each other to identify the appropriate number of users. Per Condition 3(B), camping units,⁸ defined as one camper vehicle per camping unit, were also restricted to a maximum number of 500 units per night to be reserved through the State Park Reservation System.

As part of the CDP 4-82-300 decision, the Commission denied DPR's proposal to place a third interim access kiosk and entrance at the causeway across Oso Flaco Lake. It was determined that, while the entire dune complex is unique and valuable, the biological significance of the Oso Flaco Lake area is comprised of an interrelated system of distinct habitats that needed immediate protection. Historic OHV use had removed the natural vegetation and resulted in the lakes beginning to fill up with sand from the destabilized dunes. The Commission's finding also note that policing and enforcing appropriate use of this third entrance point would require additional commitments of limited DPR personnel needed at the other, more popular entrance locations.

⁶ Exhibit 4 shows the conditions of CDP 4-82-300 and its five amendments in order, including in strikethrough and underline format to show the ways in which subsequent amendments altered previous conditions. Exhibit 5 contains a clean copy of the conditions of the CDP as amended through and including 4-82-300-A5. These latter conditions are the conditions currently in effect.

⁷ The Sand Highway is a series of marker posts that head inland from the beach to the backdune area and then run south through the backdunes. The purpose of the Sand Highway is to provide reference points for vehicles traveling through the back dunes.

⁸ ODSVRA does not include defined camping spaces, rather camps may be established anywhere within that portion of the Park open to OHV use.

Special Condition 3(E) also required the placement of approximately 35,000 linear feet of fencing around a subset of sensitive resource areas within ODSVRA to protect them from further degradation due to OHV use. The areas that were left open to riding were the open sand sheets that were generally devoid of vegetation at that time, either as a result of OHV use or otherwise. The fencing was to be placed along the boundary of ODSVRA, along the eastern boundary of the Sand Highway, and around vegetated islands and archeological resources located within ODSVRA open riding areas (see Exhibit 2). Special Condition 4 required a dunes restoration program to help restore dune vegetation within the fenced-off areas that had been degraded over time.

Finally, Special Condition 1(A) established a temporary OHV staging area on the beach north of the Sand Highway. The staging area's location was intended to be interim until a permanent location was identified. Pursuant to the terms of Special Condition 1(B), and reflecting the importance the Commission placed on establishing a permanent staging area, a failure to establish and construct a permanent staging area within three years of the date of certification of the County's LUP or LCP would result in the CDP's review, and modification of use parameters at ODSVRA by the County or the Commission. Furthermore, Special Condition 6 required that, until a permanent staging area is operational, a formal review of the effectiveness of the conditions of the CDP shall take place annually, undertaken by the Commission, County, DPR, CDFW, and the community of Oceano. Special Condition 6 also states that, if after each annual review pursuant to this condition, or after the three-year review required pursuant to Special Condition 1(B), it is found that OHV use is not occurring in a manner which protects environmentally sensitive habitats and adjacent community values consistent with the County's LUP, then OHV use may be further limited.

Essentially, CDP 4-82-300 initiated what was seen as a long-term program to manage OHV use. The permit created an annual review process to evaluate the effectiveness of DPR in managing ODSVRA resources. Based on the effectiveness of DPR in managing ODSVRA resources, OHV use within the ODSVRA could be modified as required to further protect ODSVRA resources. However, if ODSVRA resources were found to have been effectively managed, OHV use could be increased to a level not to exceed the enforcement and management capabilities of DPR. Again, see CDP 4-82-300 conditions of approval in Exhibits 4 and 5.

CDP 4-82-300-A1

CDP 4-82-300 was first amended on August 26, 1982, just a couple of months after it was initially approved. The amendment delayed the effective date of implementing the 500 camp site daily limit from Labor Day 1982 to September 15, 1982, or by approximately two weeks. It also moved the location of the interim staging area north approximately $\frac{3}{4}$ of a mile to the two mile post (Post 2, where it is still located today) and provided more specific fencing requirements. This amendment was the result of a resolution of a dispute between DPR and the County that arose during the original permit as to the appropriate locations for the interim staging area and protective fencing.

CDP 4-82-300-A2

The CDP was amended again a little less than a year later on June 21, 1983. The recently created California Off-Highway Vehicle Commission, created pursuant to PRC 5090, conducted

hearings and a joint review of the effectiveness of the resource management requirements outlined in the base CDP as then amended through 4-82-300-A1, and concluded that Parks had effectively controlled OHV use and had made positive gains in resource protection and restoration. Based on these findings, DPR proposed an amendment to the CDP requesting an increase in the maximum number of allowed campers from 500 to 1,500 per day. The Commission at that time noted and recognized such progress, including: significant areas of protective fencing had been established; the dunes by Oso Flaco Lake had stabilized, vegetation restoration efforts had begun, and the area was once again being used by fishermen, hikers, birdwatchers, and picnickers; a barrier fence was established at Oso Flaco Creek to prevent OHV use; volunteer OHV groups established an effective patrol force to help park staff; and DPR budgeted more seasonal and permanent employees.

However, the Commission also noted that other resource protection measures were not being implemented, including that the Oso Flaco Creek fence took a long time to install, resulting in some degradation of the dune system south of the creek. Therefore, the Commission found that camping spaces should only be increased incrementally, and increased the maximum number of allowed camping units to 1,000 per day. This amendment also changed Special Condition 6 to specify that, if after any required review of Park management, it is found that OHV use is not occurring in a manner that protects ESHA and community values consistent with the LUP, OHV use and the maximum number of camping units allowed can be further limited by the Executive Director with concurrence by the County Board of Supervisors. If the reviews find OHV use is consistent with such standards, then OHV use and maximum camping units may be increased.

CDP 4-82-300-A3

On August 24, 1984, the CDP was amended for a third time. This amendment adjusted the fence lines to allow for OHV use in areas which were historically unvegetated open sand, or which had become so extensively damaged by past vehicle use that revegetation was deemed unlikely. The Commission found that while the proposed amendment would result in the opening of additional dune area to OHV use, the additional areas did not contain sensitive vegetation or wetland habitats and that opening these areas to vehicular use would not result in habitat damage. The new fence alignment would continue to protect existing vegetated areas and wouldn't restrict OHV use on large areas of open sand suitable for such use.

CDP 4-82-300-A4

On September 10, 1991, the CDP was amended a fourth time. OHV use in the Oso Flaco Lake area was prohibited under the base permit in 1982 in order to protect sensitive resources in the area. However, the absence of OHVs and the associated recovery of the dune and related habitats in this area also resulted in increased interest from pedestrians and equestrians. This increased use created a negative cumulative impact in the form of trampling of vegetation. To reduce these trampling impacts, the amendment modified Special Condition 1(C) by prohibiting equestrians in the Oso Flaco Lake area.

CDP 4-82-300-A5

Condition compliance reviews initiated by the Commission in 1994, partly in response to concerns expressed by the County regarding the intensity of recreational use from camping unit vehicles, resulted in a renewed effort to understand the carrying capacity of the Park and regulate

the types and levels of public use accordingly. Special Condition 3(D) of the base CDP required that, by January 1983, DPR would establish limits on the number of OHV day users, in consultation with the County and Commission. Similar to other conditions, this condition envisioned that DPR, the County, and the Commission would cooperatively work together to identify the carrying capacity of the Park, meaning the maximum number of OHV users the Park can handle while meeting all of the CDP's resource protection standards.

The final draft of DPR's ODSVRA OHV Day-Use Carrying Capacity Study was completed on June 30, 1998. The study described how, through a combination of management measures (e.g., fencing, ranger patrols, dune restoration, user education, etc.), DPR believed that OHV impacts on ODSVRA's ecosystems were now confined to existing bare sand areas. DPR's conclusions included: there was strong evidence that the balance between vegetated and non-vegetated portions of the dune system is being maintained; there was an acceptable visitor safety trend; sanitation problems had been resolved; and that non-OHV visitor use was not precluded. However, Commission staff concluded that the study did not adequately define the ecological systems to be protected, and that it did not contain sufficient evidence to determine if, because of OHV use, adverse impacts were occurring in areas that might otherwise normally be vegetated dune or Western snowy plover nesting areas. Impacts on some wet beach fauna, such as grunion, were also not considered. More importantly, the study revealed the difficulty in establishing a fixed vehicle use limit in light of the dynamic environmental management issues at the ODSVRA, and the difficulty in establishing whether adverse impacts are occurring in areas that might otherwise normally be vegetated dune or plover nesting areas.

Nonetheless, Commission staff brought forward a CDP amendment with a recommendation to accept the study and adjust the CDP's vehicle use limits. The item was to be heard before the Commission on August 13, 1998. Commission staff recommended the establishment of an interim limit on vehicle day use at a non-holiday maximum of 4,300 vehicles per day, including off-highway vehicles. The decision to use these numbers was based on historic use numbers. The interim limit reflected the maximum amount of OHV day use that DPR believed it could manage without significant degradation of coastal resources. Commission staff also recommended that further research and monitoring be conducted to determine actual impact thresholds with respect to ecosystem carrying capacity. Finally, Commission staff recommended that the acceptance of the study and establishment of use limits be conditioned on DPR's agreement to a periodic review process, and establishment of a advisory group that could monitor ODSVRA resource management and vehicle impacts and provide recommendations on Park management issues, including in relation to Park carrying capacity. However, the item was postponed and discussions continued between DPR, the County, and the Commission to determine how to establish vehicle use limits as a resource management technique within ODSVRA.

Subsequent to those discussions, DPR applied for CDP amendment 4-82-300-A5 to implement another means to manage vehicle impacts within ODSVRA. The amendment proposed by DPR included the establishment of a Technical Review Team (TRT) as an alternative to the carrying capacity analysis approach. The implementation of the TRT was a shift to a different type of adaptive management, the intent being that the TRT would serve as an advisory board to oversee monitoring of environmental and use trends at ODSVRA and then advise the ODSVRA Superintendent, and ultimately the Commission through the annual review process, on resource

management issues. The TRT would include an independent Scientific Subcommittee whose role would be to identify, develop, and evaluate the scientific information needed by decision makers to ensure that natural resources are adequately managed and protected. The TRT and the ODSVRA Superintendent would be required to prepare annual reports summarizing recreational use and habitat trends in the ODSVRA, as well as the TRT's major accomplishments, projects, correspondence, and recommendations. The amendment also requires the Commission to annually review the TRT's overall effectiveness in managing vehicle impacts at the ODSVRA, and allows for the Commission to institute alternative resource management approaches through this review process if it determines that the TRT's management is ineffective.

The TRT is to be comprised of no less than nine and no more than 13 voting members.⁹ The TRT's role is to, at a minimum: 1) assist the ODSVRA Superintendent in the protection of natural resources by developing recommendations regarding additional monitoring studies, adjustments to day and overnight use limits, and management strategies; and 2) create a Scientific Subcommittee to identify, develop, and evaluate the scientific information needed by decision makers to ensure that the ODSVRA's natural resources are adequately monitored and protected. The Scientific Subcommittee's role is to ensure that the TRT's recommendations to the ODSVRA Superintendent and the Commission are scientifically sound. The Subcommittee is to consist of resource experts representing the five government agencies on the TRT¹⁰ and at least two independent scientists with expertise in Western snowy plover, California least tern, steelhead trout, tidewater goby and other species of concern, as well as with expertise in ecological processes to help analyze technical data and provide scientific recommendations. Specifically, the Scientific Subcommittee's required tasks include: 1) recommend to the TRT the scientific studies and investigations that may be necessary to develop information needed by resource managers; 2) advise the TRT regarding the protection of ODSVRA's natural resources by helping identify and review needed research measures and restoration efforts to rebuild or protect those resources; 3) evaluate monitoring results and reevaluate monitoring protocols contained in ODSVRA annual reports, reports on the breeding, nesting and fledgling success of the Western snowy plover and California least tern populations, and other reports related to the environmental impacts of recreational activities; 4) provide comments on the adequacy of various scientific research studies and make management recommendations to the TRT; and 5) submit full recommendations to the TRT, and make them available to the public, as part of the annual review process.

Special Condition 5 of CDP amendment 4-82-300-A5 also required the TRT to identify and select initial priority research and management questions and projects, including: 1) appropriate management techniques for the Western snowy plover, California least tern, steelhead trout, and tidewater goby; 2) appropriate management techniques for protecting water quality and dune habitats from pollutants associated with OHV use; 3) the potential need for continuing or expanding revegetation efforts within the ODSVRA, including expansion of vegetation exclosures; and 4) a comprehensive, long-term monitoring and comparative analysis of the

⁹ The TRT is to be made up of representatives from: the Coastal Commission, San Luis Obispo County, USFWS, CDFW (currently not participating due to budget constraints), DPR's OHV Division, the OHV Community, the Environmental Community, the Business Community, and the Residential Community. The ODSVRA Superintendent is a non-voting member of the TRT.

¹⁰ The represented agencies are the Coastal Commission, San Luis Obispo County, USFWS, CDFW, and DPR.

resource impacts associated with varying levels of use, including in relation to peak-use attendance periods.

While the Commission accepted the TRT's formation and role in studying Park issues and developing appropriate recommendations on resource protection, it also decided that interim vehicle use limits needed to be established. The amendment thus includes separate use limits for street-legal vehicles, OHVs, and camping units. Those interim limits were determined to be 2,580 street-legal vehicles per day, a total of 1,720 OHVs at any given time, and 1,000 camping units per day (defined as one street-legal vehicle that enters the ODSVRA under its own power). In the interim, to allow for historic use patterns, vehicle limits were allowed to be exceeded for Memorial Day, 4th of July, Labor Day, and Thanksgiving weekends.¹¹ Again, however, these use limits were specifically described as being interim, with the goal being that the TRT, as part of its ongoing research and management program, would study and recommend to the ODSVRA Superintendent and Commission appropriate vehicle use limits that fundamentally reflect an analysis of vehicular impacts and overall carrying capacity.

The Commission ultimately approved CDP amendment 4-82-300-A5 in 2001. Special Condition 1 of this amendment replaced Special Conditions 3(B) (that restricted camping to a maximum of 1,000 units/vehicles), 3(D) (that required Park use limits to be established by January 1983), and 6 (that required an annual review of OHV use impacts on ESHA and community values). Special Condition 2 of the amendment requires the Commission to annually review the overall effectiveness of the TRT in managing vehicle impacts at the ODSVRA, including evaluating the findings of the TRT's annual review. Special Condition 3 sets forth the Park's vehicle use limits. Special Condition 4 established the formation of the TRT, including requirements that it monitor and recommend adjustments to use limits and other resource management measures, and set up a Scientific Subcommittee that will advise the TRT on those resource management measures. Finally, Special Condition 5 requires the TRT and the ODSVRA Superintendent to prepare and submit to the Commission annual reports (covering the period from October to September) summarizing annual recreational use and habitat trends at the ODSVRA, highlighting the TRT's major accomplishments (including progress made towards meeting the objectives of the TRT), projects, correspondence, and recommendations on park management issues, as well as a summary of subcommittee, working group, and task force activities. Thus, the Commission's ability to require modifications to current management measures was initially established by Special Condition 6 of 4-82-300, and retained by Special Condition 2 of CDP amendment 4-82-300-A5.

Current CDP Status

As indicated above, CDP 4-82-300 has thus been amended five times (see Exhibits 4 and 5 for the Special Conditions). The CDP, as amended through 2001's 4-82-300-A5, currently authorizes and requires the following:

- The use of the TRT to study Park management issues and recommend appropriate resource protection measures, and to prepare an annual report summarizing such efforts and recommendations. The Commission is to annually review the effectiveness of the

¹¹ Although these holiday exceedance limits have not been adjusted through a permit amendment, DPR no longer allows exceedances on these holiday weekends due to a litigation settlement agreement.

TRT in terms of its effect on ODSVRA management, and to potentially recommend alternative management approaches if warranted to best address vehicular use impacts.

- The designation of an interim staging area south of the Two Mile Post. No non-street legal vehicle is allowed to be operated north of the Two Mile Post, and therefore must be trailered to the staging area from the West Grand Avenue and Pier Avenue entrances.
- A permanent staging area is to be selected based upon a review of at least four sites via an environmental impacts analysis. Until a permanent staging area is selected, the Commission or the County may review and modify the CDP as necessary. The Oso Flaco Lakes area cannot be used for the staging area, and equestrian use there is prohibited.
- West Grand Avenue and Pier Avenue are the two designated interim entrance points, which shall be manned with a Public Information Program that both counts vehicles and also explains where riding is and is not allowed. These access points will remain “interim” until a permanent staging area is selected.
- OHV use is off-limits within vegetated dune areas, the area south of Oso Flaco Creek, and any other fenced-off areas.
- An ongoing program for dune restoration, and protecting via fencing (and therefore prohibiting OHV use within) known archaeological resources.

Each of the amendments altered the base CDP’s terms and conditions in a variety of ways, but the base premise continues to be one of understanding Park issues and providing a means of addressing them through continued Commission review and adaptive management. One of the most important components of the CDP as amended is the concept of using the TRT to help in this effort. The TRT is meant to be an interagency/stakeholder review team responsible for providing ongoing management recommendations to the ODSVRA Superintendent and the Commission.

In short, the CDP, as amended, provides the Commission a vehicle for evaluating management measures at the Park in terms of addressing the overall balance between vehicular recreation and dune and related coastal resource protection. The primary review focus and springboard is meant to be the TRT’s annual report, and the Commission’s annual review of it. Using the data and recommendations coming from the annual report, as well as all other relevant and known information pertaining to Park issues and general resource management, the Commission can then review the TRT’s overall effectiveness in managing vehicle impacts at the ODSVRA. If the Commission is satisfied with the annual review and the overall effectiveness of the TRT in managing vehicle impacts, the Commission can leave the amendment (i.e., the fifth amendment establishing the TRT and the Park’s interim vehicle limits) in effect for another year. If the Commission is not satisfied, it may, through this review process, institute alternative approaches to resource management or a new set of management measures. Specifically, Special Condition 2 of the fifth amendment states (see also Exhibit 5):

Renewal of Permit. Annually, the Commission shall review the overall effectiveness of the Technical Review Team in managing vehicle impacts at the ODSVRA. If the Commission is

satisfied with the review, this amendment will remain in effect for an additional year. A longer permit may be requested in the future. Otherwise, an alternative approach to resource management, or set of management measures, may be instituted through this review process.

In addition to the Commission's review authority identified in that condition, Special Condition 1(B) of the base CDP allows for Commission and/or County review or modification of the CDP for failure of DPR to establish a permanent entry staging area, stating:

1B. A permanent staging area site shall be selected as expeditiously as possible but in no case later than 18 months from the effective date of the County's LUP certification consistent with the following standards. Construction of this permanent staging area shall begin no later than three (3) years from the date of certification of the County's LUP or its LCP. If construction and operation of a permanent staging area cannot be accomplished within the above time limits, this permit shall be subject to review and modification if necessary or appropriate by the County or the Commission or either in consultation with the other...

As discussed subsequently, while DPR has performed studies to determine where the permanent staging and access points should be located, none have been adopted via the requisite LCP or CDP amendment. Therefore, the staging area located at Post Mile 2 continues to be categorized as "interim" per this condition, and thus the Commission retains the authority to review and modify the CDP as appropriate.

Neither condition is specific with respect to what the Commission is to base its decision on when determining whether it is satisfied with overall Park management. Special Condition 2 uses the term "satisfied", and Special Condition 1(B) the terms "necessary or appropriate" when discussing whether the Commission should recommend modifications to the CDP and/or the TRT. In addition, neither condition specifies what the Commission can or cannot do with respect to modifying the CDP's terms and conditions. Special Condition 2 says that the Commission may institute an "alternative approach" or "set of management measures", and Special Condition 1(B) uses the term "modification" when discussing allowable Commission-initiated changes.

Overall, though, it is clear that the terms and conditions of the base CDP, as amended, are designed to provide for continued study and ongoing adaptive management of the Park related to core issues associated with striking an appropriate balance between facilitating vehicular recreation and protecting dune and related coastal resources consistent with the access, recreation, and resource protection policies of the Coastal Act and the LCP. The CDP and its review requirements provide the Commission with broad authority and discretion in determining whether Park management is or is not effective at meeting such objectives, as well as implementing changes to make it more effective.

II. ODSVRA REVIEW

This ODSVRA review represents the seventh annual review since the 2001 amendment that established the TRT. Although the Commission performed six annual reviews in the early 2000s, the Commission has not undertaken the CDP-identified review since 2007. The reasons for this

gap in reviews are many, but are primarily a result of limited staff resources. It has become clear more recently, however, that it is an appropriate time to reinvigorate the review process, not only because interested parties have requested same, but also as a result of the changing context for such a review at ODSVRA. Although many of the issues associated with balancing OHV use and resource protection remain the same, more recent developments include issues related to dust impacts associated with the Park, and how these are best addressed (including in relation to a pending DPR dust control project CDP application). There are also ongoing questions about the base CDP's TRT framework and process, as well as other CDP-related requirements that remain outstanding (e.g., recognizing permanent as opposed to temporary access and staging locations, etc.) and other issues not completely resolved (e.g., disposition of the La Grande portion of the ODSVRA currently owned by San Luis Obispo County, and DPR's ongoing efforts to finalize a Habitat Conservation Plan (HCP) under the Endangered Species Act (ESA) for the Park). In addition, the Commission itself has changed members almost completely in the time since the last review, and this review is an opportunity to bring the Commission up to speed on the context, issues, and potential next steps related to overall Park management under the CDP.

This section summarizes some of the primary issues facing ODSVRA today, and includes a discussion of potential next steps to address these issues,¹² all with the goal of addressing the fundamental tension and balance associated with providing for the unique public recreational opportunity that the Park provides at the same time as respecting and protecting the Park's significant ecological resources. Part of the review is based on the TRT's most recent annual report covering 2014 in which the TRT identifies key issues for further discussion and review (see Exhibit 6). Since 2008, four issues have been carried over nearly every year, and were again included in the 2014 report: 1) a desire to have a draft of the HCP submitted to the USFWS for their review; 2) issuance of an incidental take permit by the USFWS; 3) an analysis of the effectiveness, costs, and adaptive nature of management and monitoring activities within and adjacent to the ODSVRA; and 4) to conclude the efforts of the TRT with tangible and useful outcomes responsive to its assigned purpose. Other key issues identified include the balance of protections for endangered and protected species with legislative directives for OHV access and use, the resolution of ownership issues as they pertain to the County-owned property known as the La Grande Tract, and, since 2012, air quality and particulate matter emissions.

In identifying research and management priorities, the item of highest priority in each annual review since 2008 is the completion of the HCP. The other research and management priorities have fallen within the following categories: an alternative access study, Arroyo Grande Creek water quality, vegetation islands management, avian predator management, soil and water quality sampling, air quality studies, and operational and management measures implemented by the ODSVRA Superintendent. Primary issues facing ODSVRA in this respect today follow.

¹² Previous actions taken by the Commission as a result of prior annual reviews were letters to DPR recommending particular studies be made. In this report, staff recommends a series of next steps to begin to address identified issues and bring them to resolution. Staff's intent with this report is not that the Commission take specific actions at the February review hearing, but rather that the Commission consider and discuss the various ODSVRA issues and potential next steps as a means of providing guidance to Parks moving forward. That is not to say there are not actions to be taken related to the Commission's CDP obligations, but rather that these actions are probably best understood as future actions pending further study, evaluation, and coordination with DPR. Staff already works very closely with DPR on these management issues, and is fully committed to that ongoing partnership and dialogue at ODSVRA moving forward.

A. ENTRANCE AND OHV STAGING AREAS

As detailed above, CDP 4-82-300 as amended identifies the current Park entrance and staging system as interim, and subject to further review and study to designate this system (or alternatives to it) as permanent. To date, the Commission has not yet reviewed and approved final entrance and staging area locations and provisions. As described above, the conditions of the CDP require DPR to prepare an environmental impacts analysis adequate to enable the selection of a permanent staging area location determined to be the least environmentally damaging. While any number of sites could be studied, the condition lists four sites that are required to be analyzed: the Calendar Road area; the stables/agricultural lands area south of Arroyo Grande Creek; agricultural lands north of Oso Flaco Creek adjacent to the Union Oil property; and the interim staging area. In addition to the selected site being the least environmentally damaging, the CDP requires that the site reduce OHV-related impacts to the residential character of the community of Oceano, that it facilitate the successful separation and regulation of recreational uses within ODSVRA, and that it be able to be developed expeditiously. Because the location of any identified permanent staging areas would necessarily affect the way in which they are accessed via entrances to the Park, the CDP designates the two existing entrance locations at West Grand Avenue and Pier Avenue as temporary as well. Thus, the CDP requires that DPR evaluate and present options for a permanent Park entrance and staging system for Commission consideration.

The route by which vehicles access the recreational riding area is a long-standing issue that has significant implications on resource protection and access management. Currently, street legal vehicles, with or without OHVs in tow, access the beach from either West Grand Avenue in Grover Beach or Pier Avenue in Oceano. Vehicles then traverse the beach in a southerly direction to access the riding area. This involves driving along a stretch of shoreline used by pedestrians and general beachgoers, many of whom are residents and visitors of nearby residential areas. This mix of vehicles, pedestrians, and other beachgoers has resulted in user conflicts and public safety issues. Vehicles heading to the OHV riding area must also drive through the mouth of Arroyo Grande Creek, which provides habitat for endangered steelhead trout and tidewater goby. Typically, the only time the Creek has significant flows is during the rainy season. However, when it is flowing, the Creek presents an obstacle to vehicular travel, including to get to the OHV riding and staging areas, and has been the site of problems in this respect as vehicles attempt to navigate through and across the Creek to access the riding areas further south. OHVs are currently off-loaded from street legal vehicles at the interim staging area which is located south of Arroyo Grande Creek.

The current entrance and staging areas were designated as interim under CDP 4-82-300, with the goal of potentially locating a permanent access and staging area to the south that would avoid conflicts between more passive recreation type use and OHV use, as well as to eliminate the need for vehicles to cross Arroyo Grande Creek. Special Condition 1(B) contains further requirements for the selection and development of permanent entrance and staging areas. It requires that a permanent staging area shall be selected no later than 18 months after certification of the County's LUP, with construction to begin no later than three years after certification of the County's LUP or LCP. Prior to construction, the County's LUP and the State Parks General Development Plan must be amended to designate the selected site as the permanent staging area. Obviously, all of these deadlines have long ago passed.

DPR has studied the access and staging area issue. Specifically, DPR released a Final Environmental Impact Report (EIR) in 1991 designed to identify the least environmentally damaging staging area and entrance points. The EIR evaluated the potential impacts associated with five alternative access corridors: West Grand Avenue; Pier Avenue; Calendar Road; Railroad Avenue; and Silver Spur Place. Ultimately, the EIR determined that the West Grand Avenue and Pier Avenue sites were the least environmentally damaging and that they should be designated permanent. However, as part of the process to establish them as permanent access entrance sites, Special Condition 1(B) requires DPR to update the State Parks General Development Plan *and* submit an amendment to the LCP for review by the Commission. While DPR updated the State Park General Development Plan to reflect the West Grand and Pier Avenue accesses as permanent, DPR never applied to San Luis Obispo County for the requisite LCP amendment, and the Commission has yet to weigh in on the question of the appropriate permanent entrance and staging area alternatives.

In 2006, DPR completed a second alternative access study. This 2006 study evaluated a total of eight potential accessways: West Grand Avenue; Pier Avenue; Ocean Street; Creek Road; Silver Spur Place; ConocoPhillips; Little Oso Flaco Lake; and Oso Flaco Lake. Ultimately, the study again concluded that continued use of West Grand Avenue and Pier Avenue is the environmentally preferred alternative. The study was presented to the TRT for discussion, but the TRT never formally reviewed the document or made recommendations on the study. Although DPR went through the process of completing the access study, DPR never pursued amendments to the CDP or LCP to remove the interim nature of the staging area and West Grand Avenue/Pier Avenue entrance access points and to establish them as permanent. Thus, all three areas remain classified as interim, and the conditions of the CDP remain unfulfilled.

The TRT identified its intention to review the results of the 2006 study as a research priority in 2007 and continued discussion of the issue as a research and management issue in 2008 and 2009. However, neither the TRT nor the Scientific Subcommittee has formally reviewed or commented on the study. Since the 2010 annual report, the TRT has not taken any action to resolve the interim status of the entrance access and staging areas, and the issue has no longer been a topic of discussion. It has now been over eight years since the completion of DPR's last study. While DPR has indicated that the two previous studies have appropriately identified the proper locations and therefore does not believe additional study is necessary, new issues have emerged that could affect the access and staging locations, particularly with respect to the County's La Grande property and dust control/air quality issues. Both of these topics are discussed in more depth later in this report, but suffice to say that the ultimate disposition of the La Grande property (including ownership and allowed use of it) and the potential need to implement dust control and air quality measures in ways that could affect Park entrance and staging point to the need to update past studies in light of current issues and context.

More broadly, the fact that the CDP identifies Park entrance access and staging as interim and subject to further study only leads to a lack of certainty and clarity for DPR, the Commission, the County, and other interested agencies and parties with respect to Park operations. In addition, the fact that this issue was intended to be resolved decades ago only and remains incomplete only serves to fuel debates amongst competing interests about what *should* be designated as

permanent entrance and staging locations. It also means that DPR is not in compliance with the CDP, which does not serve to further the Commission's or DPR's objectives for effectively managing the Park.

As a means of resolving this issue moving forward, staff believes that it makes the most sense for DPR to update their access and staging analyses,¹³ including in light of new and different facts and context related to the La Grande tract and dust control issues. Per the terms and conditions of the CDP, such analyses must include an evaluation of alternatives across a similar environmental impact framework taking into account all relevant and current impacts and issues, including the now-recognized dust hazards and the disposition of the La Grande property. Once such analyses are complete, the next step would be for the Commission to take an action to recognize final entrance access and staging locations and parameters.

B. USE LIMITS

Special Condition 3 of CDP 4-82-300-A5 established interim vehicle use limits. As detailed in the original permit findings, the determination of interim vehicle use limits for ODSVRA lacked rigorous supporting information because determining appropriate use numbers would require extensive study and analysis and is dependent on a variety of factors. The limit of 4,300 day-use vehicles had historically been accepted absent any compelling evidence that it should be some other number. Interim vehicle use limits were subsequently redefined through CDP amendment 4-82-300-A5 as follows:

3. *Interim Vehicle Limits.*

- a. *Interim Day-Use Vehicle Limits.*** *Except as qualified by 3d¹⁴, interim limits on motor vehicle use on the beaches and dunes of Oceano Dunes SVRA shall be no more than 2,580 street-legal vehicles per day. This limit does not include off-highway vehicles, or street-legal vehicles attributable to allowed overnight camper use within the ODSVRA.*
- b. *Interim Camping Limits.*** *Except as qualified by 3d, interim limits on overnight motor vehicle use on the beaches and dunes of Ocean Dunes SVRA shall be no more than 1,000 camping units (i.e. 1,000 street-legal vehicles) per night. This limit does not include off-highway vehicles or street-legal vehicles attributable to allowed day-use within the ODSVRA.*
- c. *Interim Off-Highway Vehicle Limits.*** *Except as qualified by 3d, interim limits on off-highway vehicle use on the beaches and dunes of Oceano Dunes SVRA shall be no more than 1,720 off-highway vehicles at any given time. This limit does not include the street-legal vehicles used to tow or trailer the OHVs into the ODSVRA.*

¹³ Or possibly to provide for an independent third party (e.g., approved by the Executive Director) to update DPR's entrance access and staging analyses to address potential perceptions that an independent evaluator might be better equipped to ensure an impartial evaluation and recommendation.

¹⁴ Special Condition 3(D) allowed for the exceedance of the vehicle use limits prescribed in CDP 4-82-300-A5 during selected holiday periods. These exceedance periods are no longer allowed based on a settlement agreement entered into by DPR.

ODSVRA vehicle use numbers are provided to the Commission every year as an element of the TRT annual report. The 2014 annual report states that “Oceano Dunes District staff continues to meet and/or exceed key management and monitoring issues that have been identified in the TRT report. These measures are similar to those of 2013 and include: Enforcement of camping and day use capacity limits consistent with the CDP...” (see page 9 of Exhibit 6). Thus, DPR believes that use limits, including in terms in both the CDP’s specified numbers and the process by which DPR staff counts and enforces these limits, are being effectively managed.

However, there remain unaddressed issues pertaining to the Park’s vehicle use limits. Special Condition 3(C) limits the number of OHVs to 1,720 “at any given time.” There are several difficulties involved with both accurately counting OHVs entering the Park and accurately tallying how many OHVs remain at any given time. First, DPR does not keep a tally of the number of vehicles leaving the Park. As a result, there is not a means of knowing how many vehicles may be present at any one time. Second, the entrance kiosks close at night and thus Parks staff is not there to tally the number of OHVs that come in or out. In order to account for OHVs that come into the ODSVRA after the kiosks are closed, DPR multiplies the number of vehicles entering the ODSVRA after the kiosks are closed by a set number that represents an average number of OHVs that come in per vehicle.¹⁵ Thus, it is not clear that the current system can effectively provide accuracy in use counts.

More broadly, in addition to the logistical difficulties involved with counting users, the limits themselves also underscore a significant unresolved Park management issue. Since the adoption of CDP 4-82-300-A5 in 2001, which both created the TRT and set the interim vehicle use limits, the limits have never been adjusted. These interim use limits were never anticipated to establish the carrying capacity for the ODSVRA. Instead, a primary function of the TRT is to “develop recommendations to the Superintendent of the ODSVRA regarding...adjustments to day and overnight use limits...” and, as part of its ongoing research and monitoring efforts, “conduct a comprehensive, long-term monitoring and comparative analysis of the resources impacts associated with varying levels of use, including the highest (peak-use) attendance periods.” Essentially, the condition’s interim vehicle use limits were seen as starting points from which the TRT could recommend adjustments over time based on what was learned through their ongoing research. The CDP anticipated that the TRT would be continually monitoring vehicle use numbers and their corresponding impacts on Park resources, and would then recommend scientifically based limits to be adopted. However, these additional studies have not been conducted, and the TRT does not currently consider use limit monitoring as a primary research or monitoring focus anymore.

In addition, special events at the Park raise similar use and carrying capacity concerns. For example, “Huckfest” is an event that has taken place informally within the ODSVRA for over ten years, and has recently grown in size and formality. The event is an exhibition of vehicles jumping (or hucking) off of sand dunes (see Exhibit 3). While impacts of the vehicles jumping off of the dunes are generally no different from what occurs on a daily basis, the CDP does not currently account for special events. In addition, as the Huckfest event has grown in size it has resulted in other impacts. The 2014 event included a vendor area, event stage, and a ramp for a

¹⁵ DPR states that this is a conservative number and most likely results in a higher OHV count than the number of OHVs that actually enter the ODSVRA after the kiosks are closed.

motorcycle exhibition. The ticket prices for Park entrance were also increased for the Huckfest weekend to \$35 for day use and \$100 for camping. This was a significant departure from the typical \$5 day use fee and \$10 camping fee.

The 2013 event had a host of issues as the event drew many more spectators than expected. Some of the issues included traffic congestion in and around ODSVRA entrance points, spectators standing in fenced-off dune vegetation protection areas, and an exceedance of the daily vehicle use limits. Based on the problems associated with the 2013 event, and in anticipation of the 2014 event, Commission staff sent a letter to DPR regarding ensuring that vehicle use limits and resource protection requirements were adhered to. Staff recently received vehicle use numbers from the 2014 event. While the vehicle use limits were exceeded again, there were no reports of spectators or vehicles entering the vegetated islands, which speaks to DPR's ability to adapt management measures to address these kinds of concerns. In any case, if these types of special events are going to continue, it will be important that use limits are followed and sensitive resources are protected, including through specific special event provisions. The growth in size of the Huckfest event, the portion of the ODSVRA it occupies and puts off limits to other types of coastal recreation, and the increase in price to enter the ODSVRA also raise potential issues that should be considered.

It is clear that use limits, including explicit special event parameters, that are based on the relationship of use intensity to resource protection are envisioned by the base CDP as amended, but this has not occurred. It is possible that the current use limits are the correct limits, but it is also possible they are not. Until the matter is ultimately addressed through evaluation and evidence, it remains an area of concern, including in terms of the ways in which it affects compliance with the permit and its expectations associated with the TRT and adaptive management. In addition, the Park is faced with ongoing issues related to dust control (see also discussion that follows), and the correlation between use numbers and dust control and the carrying capacity of the Park in this regard could be affected. In fact, vehicle use rates may significantly impact the rate at which fugitive dust emissions are released. A study conducted by the Desert Research Institute determined that portions of the riding area are emitting up to eight times more PM10 than areas of the park not open to riding.¹⁶ The identification of appropriate vehicle use numbers may help with identifying necessary air quality protection measures.

Therefore, a potential strategy to meet CDP requirements to both address the Park's vehicle use limits and ensure that the TRT is operating consistent with its research mandates is for the TRT to implement a carrying capacity study that identifies the number of vehicles the Park can effectively handle while meeting resource protection and dust control requirements. As a means of resolving this issue moving forward, staff believes that it makes the most sense for the TRT (or DPR)¹⁷ to study such issues, including addressing whether certain limits should be placed on vehicles seasonally (such as during high wind days or other days with a high potential for air quality impacts), providing for clear special event procedures, and assessing the impacts associated with varying levels of use on public recreational opportunities. Finally, the study should explore ways to ensure, via accurate counting and tallying, that the identified vehicle limit

¹⁶ 2013 Intensive Wind Erodibility Measurements at and Near the Oceano Dunes State Vehicular Recreation Area; Preliminary Report of Findings.

¹⁷ Or again, possibly an independent third party evaluator.

numbers are enforced. Once such analyses are complete, the next step would be for the Commission to take an action to recognize such use limits, including monitoring and potential adaptation procedures moving forward.

C. AIR QUALITY AND DUST CONTROL

Fugitive dust emissions emanating from ODSVRA are resulting in exceedances of State and Federal ambient air quality standards for particulate matter smaller than 10 and 2.5 microns in size, known as PM10 and PM 2.5 respectively. The high particulate matter concentrations have resulted in a public health problem for the people living inland of ODSVRA on the Nipomo Mesa. An air quality monitor, often referred to as the CDF monitor or tower, located one-half mile east of ODSVRA near the residential community of Nipomo, has recorded eight exceedances since 2010 of the federal daily PM10 standard of 150 micrograms (one-millionth of a gram) per cubic meter of air (expressed as $150 \mu\text{g}/\text{m}^3$), and seven exceedances of the PM2.5 standard of $35 \mu\text{g}/\text{m}^3$. The California daily standard for PM10 is 50 micrograms per cubic meter of air. Since 2010 there have been 362 recorded exceedances of the California standard. The federal and state standard for annual average emissions of PM2.5 is $12.0 \mu\text{g}/\text{m}^3$. This standard has been exceeded in each of the last two years.

Several studies have been performed to help better understand dust emissions emanating from the ODSVRA, as summarized below.

Nipomo Mesa Particulate Study – Phase 1

In 2004, the San Luis Obispo County Air Pollution Control District (SLO APCD, or District) conducted what is known as the Phase 1 study. The Phase 1 study was conducted to determine the cause and extent of the elevated particulate matter concentrations recorded on the Nipomo Mesa. The study concluded that entrainment of dust by prevailing northwesterly winds from ODSVRA upwind of the Nipomo Mesa was determined to be the largest factor resulting in the high particulate matter levels. However, the data from the Phase 1 study was not conclusive as to the whether OHV use within ODSVRA contributed to the high particulate matter levels. The results of the Phase 1 study were presented to APCD Board of Directors in 2007, at which time the Board directed APCD staff to conduct a second study.

South County Phase 2 Particulate Study – Phase 2

Based on the information learned from the Phase 1 study, the APCD Board directed APCD staff to conduct a second study to determine the role OHV activity plays with respect to the high particulate levels on the Nipomo Mesa, and/or whether the petroleum coke piles at the nearby ConocoPhillips Refinery complex were the cause. The findings of the Phase 2 study concluded that:

- The airborne particulate matter predominantly impacting the region on high episode days does not originate from an offshore source.
- Neither the petroleum coke piles at the ConocoPhillips facility nor agricultural fields nor activities in and around the area are a significant source of ambient PM10 on the Nipomo Mesa.

- The airborne particulate matter impacting the Nipomo Mesa on high episode days predominantly consists of fine sand material transported to the Mesa from upwind areas under high wind conditions.
- The primary source of high PM10 levels measured on the Nipomo Mesa is the open sand sheets in the coastal dune areas.
- The open sand sheets subject to OHV activity within ODSVRA emit significantly greater amounts of particulates than the undisturbed sand sheets at the study control sites under the same wind conditions.
- Vegetated dune areas do not emit wind-blown particles; the control site dunes have significantly higher vegetation coverage than what is present at ODSVRA.

The Phase 2 study concluded that OHV activity is a major contributing factor to the high particulate matter levels recorded on the Nipomo Mesa, and that the primary emissions cause was indirect impacts associated with OHV use. Indirect OHV-related emissions impacts are the devegetation, dune structure destabilization, and destruction of the natural dune surface crust caused by OHV use. The study determined that these impacts increase the ability of the wind to entrain sand particles from the dunes. Direct OHV-related emission impacts, meaning those impacts associated with fuel combustion exhaust or dust raised by the vehicle moving over the sand, were also found to be a significant, if lesser, contributor to the elevated PM10 levels. DPR did not accept all of the findings or conclusions of the Phase 1 and 2 studies due to objections regarding the study's methodology. Nonetheless, based on the conclusions reached in the Phase 1 and 2 studies, and to address these air quality impacts, the District adopted Rule 1001 in 2011 (see Exhibit 10).

APCD Rule 1001

APCD Rule 1001 required DPR to monitor PM10 and implement appropriate mitigation measures to meet State and Federal air quality standards. Rule 1001 does not identify specific areas within the ODSVRA for dust mitigation, and therefore provides DPR flexibility in determining the location of its required dust mitigation measures. The District's Rule 1001 consists of four key elements:

1. A PM10 concentration comparison between monitors downwind of a riding area and downwind of a non-riding area. The rule specifies a performance standard that concentrations at the monitor downwind of the riding area must not exceed $55 \mu\text{g}/\text{m}^3$ if the difference in PM10 concentrations at the two monitors is greater than 20%.
2. A requirement to deploy monitors to provide the data necessary for evaluating the concentrations and performance standards.
3. A requirement that DPR prepare a Particulate Matter Reduction Plan specifying the mitigation methods that will be implemented to meet the Rule's performance standards.
4. A requirement that ODSVRA obtain a permit from the District that would reflect the mitigation requirements of the Rule.

The Rule includes compliance deadlines, with May 31, 2015 as the deadline for total compliance with the performance standards. At this point in time, DPR is focusing mitigation efforts to meet the Federal $150 \mu\text{g}/\text{m}^3$ standard. If DPR is able to meet this standard, the U.S. Environmental Protection Agency (EPA) has indicated that it will not designate this as a nonattainment area. Some residents of Nipomo have requested that EPA designate this portion of the County as a nonattainment area for the federal PM₁₀ standard. Because implementation of the District's rule will in theory provide necessary controls to protect public health in the region, EPA has indicated that they will first allow DPR to work with the District on timely implementation of the Rule and assess its impact on air quality, and then will determine what actions it should take, if any.

In order to comply with Rule 1001, DPR must implement appropriate mitigation measures as part of a Particulate Matter Reduction Plan (PRMP). The implementation of some of these mitigation measures, including constructing infrastructure to support monitoring equipment within the Park, constitutes development per the Coastal Act and the LCP and therefore requires a CDP. Since Rule 1001 was adopted in 2011, DPR applied for a CDP in 2012 (CDP application number 3-12-050) for the development necessary to implement the PRMP. However, at that time, DPR hadn't finalized what specific measures were to be included in the PRMP and therefore the specific types of proposed development. DPR is still finalizing its PRMP, and a draft EIR is expected to be released in early 2015. Therefore, the CDP application remains unfiled. However, because Parks needed to implement monitoring studies and other measures for Rule 1001 compliance, DPR began applying for emergency CDPs to authorize particular dust mitigation measures. In acknowledgment of the significant public health problem and the need for its quick resolution, the Commission has complied with DPR's emergency CDP requests thus far. It is DPR's intention that all emergency permit work will be included in CDP application 3-12-050, and that they will diligently work towards completion of this application.

Emergency CDPs G-3-13-0213 and G-3-14-0007

The first emergency CDP (ECDP) was issued to DPR in 2013 to conduct a study from approximately May to September of 2013 to assess the meteorological, sand transport, and air quality conditions at twelve sites within ODSVRA (ECDP G-3-13-0213). Half of the sites were located within the riding area and the other half located outside of it. An additional ECDP was issued in March 2014 to authorize temporary monitoring and dust control measures (ECDP G-3-14-0007). The dust control measures included wind fencing (applied to 15 acres in the riding area) and straw bales (across 30 acres in the non-riding area). The initial proposal was to be performed in a phased approach. Three regions, Regions 1 through 3, were identified. Dust control would initiate in Region 1. If the dust control measures placed in this region were not sufficient to abate the hazard, then dust control would be placed in Region 2, and, if still necessary, Region 3. Region 1 is within the La Grande area of the ODSVRA. Regions 2 and 3 are in the more pristine ESHA area where no riding occurs and thus is protected from OHV use impacts. Each phase was to involve 30 acres of dust control. The phased approach was scientifically designed to enable DPR to ascertain the incremental effect of specific control measures, which would be essential to aid in designing and implementing future dust control efforts.

After conversation with DPR, the California Air Resources Control Board (CARB), and the APCD, Commission staff agreed to the ECDP for phase 1 of the initial proposal. If the dust

controls placed in Region 1 proved to be insufficient to abate the dust emissions, then DPR would come back to the Commission for a second ECDP for Region 2. However, based on field reconnaissance and follow-up discussions with the Desert Research Institute (DRI) (who evaluated the topography, logistical considerations, safety issues, and potential ridership impacts of implementing the original dust control project), DPR submitted a new proposal. The new proposal was for dust control to be placed simultaneously in Regions 1 and 2. Fifteen acres of Region 1 (in the La Grande area) would contain protective wind fencing and thirty acres of Region 2 (the non-riding area) would contain an estimated 6,000 straw bales (at a cost estimated at \$400,000).

Under the ECDP, DPR ultimately pursued this revised plan. The wind fencing was removed in August 2014 as required by the ECDP. According to the ECDP, a restoration plan for the area covered with straw bales was to be sent for review and approval by the Executive Director. Commission staff received DPR's proposed restoration plan and provided recommendations to modify the proposed plan, including removing all straw bales that could feasibly be removed as directed by the ECDP. However, the straw bales have yet to be removed and are still currently in place (see Exhibit 9 for photos of the straw bales). Staff is working with DPR to resolve this issue. In the meantime, it is anticipated that DPR will request another ECDP this spring for another set of dust mitigation measures, which may include additional fencing within the riding area, the refreshing of straw bales already placed, and the deployment of up to 1,500 new straw bales.

Many have questioned the appropriateness of the second proposal that was ultimately implemented, including the Commission's staff ecologist, Dr. Laurie Koteen (see Exhibit 15). The scientifically driven assumptions behind the initial proposal concluded that a comparable level of control in Region 1 provides about 50% more dust reduction than in Region 2. In other words, thirty acres of dust control in Region 2 is estimated to be as effective as 15 acres of dust control in Region 1. The initial proposal states "Region 1 provides the additional advantage that emplacing controls there first would allow assessment of some of the larger assumptions that are made in this analysis, including the very important question of how much winds carrying PM10 from La Grande influence CDF." Furthermore, APCD has estimated that 75% of days with particulate matter levels over the California standard are due to OHV use, and has questioned the assumption that dust control measures placed in Regions 2 and 3, which currently do not allow vehicular use, will result in significant dust reduction. They have recommended that the most effective strategy to reduce dust emissions is to reestablish vegetated foredunes along the coast, as these are the most critical areas in reducing wind force and sand movement (see Exhibit 11 for APCD's air quality recommendations). Thus, the appropriate strategies and mechanism by which DPR is to study and address the high PM10 and PM2.5 emissions emanating from ODSVRA is a complicated, challenging, and controversial endeavor, with many parties offering their own recommendations.

TRT Efforts

Since 2010, the TRT has received updates on ODSVRA's air quality problems. However, the TRT has not, until 2014, made any recommendations for studies to be performed or resource management measures to be implemented in regards to this issue. At a recent TRT meeting, a member brought forth a potential resource management measure that could be implemented to

help resolve the dust emission problem. The suggested measure is for salt water irrigation of the dunes. The TRT discussed this proposal and DPR will request that DRI review and provide feedback on its likelihood of success. However, it is not anticipated that this measure will be implemented for this spring's windy season. Furthermore, the TRT has not yet recommended that DPR study the air quality effects of closing an existing riding area, vegetating foredunes, or other commonly recommended strategies (see also Exhibits 11 and 15), and whether doing so would have quantifiable impacts on PM10 and PM2.5 emissions. The TRT's annual report stated that no conclusions could be drawn with regard to the effectiveness of DPR's recent fencing/straw bale program.

Next Steps

The Commission's staff ecologist, Dr. Laurie Koteen, has evaluated the available literature and studies related to dust control in general, and that related to ODSVRA and the Nipomo Mesa in particular (see Exhibit 15). Dr. Koteen's conclusions are that the ODSVRA riding areas appear to be the source of particulate emissions recorded at the Nipomo Mesa stations, and that:

There exists a clear and pressing need to reduce the excessive particulate emissions that rain down on the populations of the Nipomo Mesa downwind of the ODSVRA to levels acceptable for human health. Individuals with expertise in achieving particulate reductions should be brought into the process to develop a plan for achieving compliance with state and federal air quality standards in the near term. Such a plan should include specific measureable criteria to be achieved and enforceable time tables in which to achieve them.

Several mechanisms to reduce particulate emissions have been suggested. One option is to restrict the areas open to riding; a measure that may be necessary in the short term. Over the longer term, an effective option may be to establish large vegetation islands within the riding areas perpendicular to the direction of high winds that can act as barriers to particulates and prevent them from traveling to the Nipomo Mesa and other downwind areas (Zeldin 2015). As with all revegetation efforts, measures must be put in place to ensure that vegetation that reestablishes naturally is native, and that any vegetation that is directly planted stem from local native propagules. Other options include the use of environmentally safe soil binding agents in conjunction with fencing to hold the soil in place until biological crusts develop naturally. However, these measures would not have lasting value unless riding was also restricted in the treated areas. Another possible approach would be to restrict OHV use to winter months. The high winds that lead to particulate exceedance episodes most often occur in spring and late fall, and winter rains that wet the soils also prevent soil particles from entrainment.

Dr. Koteen further recommends that:

A priority of future work should be to document the number of OHVs that frequent each region of the ODSVRA with the express goal of understanding if relatively high ridership explains higher particulate emissions in some regions of the park relative to others.

DPR is currently developing a programmatic EIR to support its current dust control CDP application, and it is clear that that process can provide an appropriate vehicle for evaluating dust

control mechanisms and potential responses. Although the dust control issue is complicated, it is not going away, and it is imperative that measures be put in place to reduce particulate emissions as soon as possible. DPR is committed to this effort, including in partnership with CARB, APCD, and the Commission. As the EIR and CDP application process continues to unfold, staff believes that there will be ample opportunity for the kind of evaluation of alternatives that will prove critical for implementing a dust control program that can meet the requirements of APCD Rule 1001 and the Commission's CDP, and that will result in measurable air quality improvements. It will be important for such evaluation to study the air quality impacts associated with a variety of targeted controls, including analyzing the impacts of revegetating dunes, closing certain riding areas, rebuilding the dune's protective biological crust, and prohibiting riding seasonally. Staff remains committed to working with DPR to both perfect its CDP application and to provide whatever assistance it can to help address this significant public health problem. Ultimately, resolution of this issue will be tied to Commission action on the dust control CDP application at a later date.

D. LA GRANDE PROPERTY

The La Grande property is a 584-acre San Luis Obispo County-owned parcel located just south of the current staging area that is currently used as an OHV riding area. The La Grande property was on a long-term 25-year lease from the County to DPR that expired in 2009, and it is now leased on a month-to-month basis. As part of its General Development Plan, DPR has established a long-standing goal to purchase various areas within the Oceano Dunes system that are now leased from other jurisdictions, including primarily (and critically for ODSVRA operations, given its size and current use) the La Grande property. In anticipation of expiration of the last 25-year lease, DPR sought to acquire the La Grande property from the County. Prior to the sale, the County's Planning Commission concluded that the proposed sale of the La Grande Tract to the State would be inconsistent with portions of the County's General Plan and LCP. More specifically, the Planning Commission determined that the sale would be inconsistent with Figure 4 of the South County Area Plan, which is a component of the LCP's LUP. LCP Figure 4 (see Exhibit 2) designates the La Grande property as a buffer area, not as an OHV use area. Commission staff concurred on this point (see Exhibit 13). Specifically, in 2007, prior to the proposed sale, the County requested Commission staff's opinion regarding the relevance of Figure 4 and the LCP more broadly in its application to the proposed La Grande Tract sale. The County requested that staff respond to County staff's then-position that Figure 4 was "background information and advisory, but not regulatory or a critical component of the LCP." In response, Commission staff sent a letter to County staff, stating that, based upon past actions regarding the CDP and the LCP, including the fact that Figure 4 and the LCP was adopted by the Commission *after* approval and subsequent amendment to the CDP, it was "Coastal Commission staff's opinion that Figure 4 was intentionally included within the certified LUP to reflect the long-term objectives shared by the County and the Commission for this sensitive dune habitat area, which included phasing out of the northern access route for OHV use and restricting OHV use on County owned land." Therefore, "contrary to the County staff's presumption that Figure 4 should be viewed as background information only, it is the Commission staff's opinion that both Figure 4 and the associated LCP policies establish important standards that are applicable to the use and development of the County owned lands at issue." The letter concluded that it was Commission staff's opinion that selling La Grande Tract to DPR for the stated purpose of

retaining OHV use would be inconsistent with the land use designation for that site as an area off-limits to OHV use, as designated by Figure 4 (again, see Exhibit 13).

On April 17, 2007, the County Board of Supervisors partially denied The Friends of Oceano Dunes, Inc.'s (Friends) appeal of the Planning Commission's decision. The denial meant that the Board upheld the Planning Commission's decision confirming that the sale would be inconsistent with the General Plan and LCP.

Two lawsuits resulted from the proposed sale, which were ultimately consolidated (*Friends of Oceano Dunes, Inc. v. County of San Luis Obispo* and *Sierra Club v. State of California*). In the *Sierra Club* suit, the plaintiff sought a traditional writ of mandate to compel the State to operate ODSVRA in compliance with the County's LCP. The Sierra Club contended that the Figure 4 buffer map delineates the La Grande property as a buffer zone and that the LCP prohibits all OHV use in the buffer zone. The Sierra Club argued that the State is operating in the La Grande property in violation of the County's LCP, and claimed that the State must revise its GDP to comply with the LCP. The Court ultimately found that it could not reach the merits of this case because the lawsuit was not a timely challenge to a specific agency action.

In the event the County decides not to renew the existing lease for DPR, and if such a decision is accompanied by a restriction of vehicle use on this property, this would necessitate relocation of the existing interim staging and entrance access areas because vehicles currently must traverse the La Grande property to get to and from the riding area. Riders would no longer be able to traverse the La Grande property, which would mean that both staging and entrance access points would need to be located to the south.

It is clear that the uncertainty and issues surrounding the La Grande property need to be resolved, including in terms of LCP inconsistencies. The Commission is in a position to play a major role in resolving these issues, including inasmuch as the base ODSVRA CDP as amended currently allows for OHV use in this area, and provides a series of mechanisms for addressing and providing for the appropriate balance between facilitating vehicular recreation and protecting dune and related coastal resources. Future reviews need to explicitly provide for direction on the La Grande property, including through TRT evaluation and study as appropriate.

E. SNOWY PLOVER AND LEAST TERN EXCLOSURE STUDY

Since its inception, a primary TRT and Scientific Subcommittee research task has been to study appropriate management techniques for the Western snowy plover (WSP), California least tern (CLT), and steelhead trout (as specifically required per Special Condition 5(a) of the CDP's fifth amendment). As part of this research, the TRT reviews and comments on the annual *Nesting of the California Least Tern and Western Snowy Plover at Oceano Dunes State Vehicular Recreation Area* report, prepared by DPR staff. Since the last Commission annual review in 2007, the nesting reports have shown that the ODSVRA fledged¹⁸ rates for both WSP and CLT have generally been above USFWS's recovery goal of one fledged chick per adult male. The 2014 nesting report, as summarized by the TRT's annual report (see Page 1 of Exhibit 6), generally also echoes such findings:

¹⁸ For Western snowy plover, a chick is considered "fledged" if it survives to 28 days; for California least tern, 21 days.

*WSP had a good hatching success with 82.6% (compared to an 77.8% hatch rate for 2013), and a chick fledging success rate of 35.8% (compared to a 55.4% fledging rate for 2013 and a 25.0% fledging rate for 2012). **The WSP fledge rate was an estimated 1.63 juveniles fledged per male**, exceeding the U.S. Fish and Wildlife Service (USFWS) recovery goal of one fledged chick per adult male but falling below the previous year's rate of 2.03. CLT had a 2% decrease of breeding pairs from the 2013 season with a minimum of 47 pairs compared with 48 in 2013. Fifty-eight of the 76 chicks fledged for a rate of 76.3% and **1.23 chicks fledged per pair**. (emphasis added)*

The report further found that the Oceano Dunes area has seen “remarkable growth” in the adult WSP breeding population, but CLT breeding numbers remain flat for unknown reasons.

In order to improve WSP and CLT populations, the nesting report identifies recommended management strategies for Park implementation. One such strategy is to “continue to position a large section of the shoreline exclosure fence further east (inland) to provide a wider functional shoreline habitat” (see page 2 of Exhibit 8). As described earlier, currently DPR fences off a designated area during the March through September least tern and snowy plover nesting season. This area, called the Southern Exclosure, is a roughly 300-acre protected area closed to public entry, including for OHV use, for those seven months. In addition to this designated area, DPR also fences off any least tern or snowy plover nests found in the open riding area. Single nest exclosures of differing sizes may also be used to protect snowy plover nests in areas where vehicles are not permitted (e.g., the Oso Flaco Lakes area). Following the nesting season, and for the five month period from October through February, the Southern Exclosure area is open to public use, including camping, street-legal vehicles, and off-highway vehicles. This recreational use results in large areas of flattened terrain and barren sand with very limited scattered natural debris and vegetation. The nesting report recommends, at a minimum, extending the Southern Exclosure area's fencing 100 feet eastward in order to improve shoreline habitat, noting that there was an increase in plover and tern nests in the years 2012-2014 when compared with 2011, likely a result of moving the fence eastward at that time. Moving the fence eastward and extending the exclosure area should have similar benefits for snowy plover productivity. Therefore, the report recommends that for the 2015 breeding season, the Southern Exclosure fence be moved eastward 100 feet of its typical location.

As it does each year, the Scientific Subcommittee reviewed the nesting report and offered its own recommendations based upon the report's data and conclusions (see Exhibit 7 for the Scientific Subcommittee's recommendations to the TRT). The Subcommittee made its recommendations to the TRT, and the TRT responded to those recommendations via its annual report. The Subcommittee's recommendations were identical to those made in 2013, and include items such as continuing to band least tern and snowy plover chicks for monitoring purposes, to cover trash dumpsters, and to salvage and rescue eggs and adults. Most of these recommendations have been authorized for implementation by the ODSVRA Superintendent. However, one recommendation that the Subcommittee has consistently recommended, but that has not been recommended for implementation by the TRT nor DPR, is to study whether a year-round closure of a designated area within the Park would improve plover and tern habitat quality and productivity. Specifically, the Subcommittee recommended that DPR “conduct (a) study

evaluating alternative plover/tern habitat treatment strategies,” noting that the Subcommittee made this same recommendation in 2013 but it was not implemented by Parks. The reasons for the recommendation include (see page 5 of Exhibit 7):

The 2014 plover/tern nesting report continues to note the compromised quality of the habitat available in the riding area at the start of the breeding season. The option as stated in the SSC 2013 Recommendations Report is as follows: The seven-month closure may not allow enough time for habitat to recover from OHV recreation, especially by the beginning of the breeding season. During the non-breeding season, snowy plovers continue to roost between Grand and Pier Avenues. The question remains as to whether a year-round closure in some configuration would best serve breeding plovers and terns. The park has never conducted a controlled experiment to determine whether year-round closure is beneficial. Although the park implemented year-round closures of 11 and less than 4 acres in winters 2003/2004 and 2004/2005, respectively, the closures were not implemented in a manner that allowed biologists to draw conclusions as to whether such a closure is the optimal management approach. Available data do not allow for a scientifically-based recommendation for or against a particular habitat management strategy. Although the year-round closure seemed to benefit breeding success, it is possible that enhancement measures implemented by Oceano Dunes SVRA could be just as effective. Because available data are inconclusive, the SSC recommends scientific evaluation of year-round closure. A study should be designed and implemented allowing scientific analysis of year-round closure in comparison to habitat left open during the nonbreeding season. A formal proposal for this study should be made available for SSC and TRT review.

Essentially, the Subcommittee concurs with the 2014 nesting report’s conclusions that habitat nesting quality is compromised potentially due to the fact that a seven-month closure and the subsequent five-month use period may not allow enough time for the habitat to recover from OHV use. DPR has not to date conducted a year-round closure study, and such a study would appear to be able to provide the scientifically supported analysis needed to identify appropriate habitat management techniques. Thus, the Subcommittee again recommended that a year-round closure be evaluated that compares the closed-off area with habitat left open to riding during the nonbreeding season.

However, despite the recommendations of the nesting reports, the Scientific Subcommittee, and Commission staff¹⁹ to perform the closure study, DPR has not supported the recommendation, noting that the size of the riding area has been reduced from 25,000 acres prior to 1983 to less than 1,500 acres today, in large part to protect sensitive habitats. The 2014 annual report states “the park believes it is having good results with the current management program”, while also stating that any additional closure of the Park to OHV use would be inconsistent with its legislative mandates to provide for vehicular riding and its management goals of providing public recreational opportunities. Therefore, DPR has not been supportive of additional riding area exclosure for Western snowy plover and California least tern habitat protection.

¹⁹ Including the Commission’s Senior Ecologist, Dr. John Dixon, who also is a member of the Scientific Subcommittee.

Condition 5(a)(i) of CDP 4-82-500-A5 requires the TRT to study, as part of its ongoing research and management program, appropriate management techniques for plovers and terns, including an evaluation of how nest closure techniques affect their hatching and fledgling success and an identification of additional studies for species protection. However, perhaps most importantly, the studies are also meant to better understand the potential environmental, recreational, and economic costs and benefits of alternative protection strategies. Essentially, what the condition requires is for the TRT to study various nesting closures and understand their various impacts from both an environmental/resource protection and social/public recreation perspective. The Subcommittee's recommendation calls for the TRT, working in conjunction with the Subcommittee, to develop a study *proposal*. The recommendation does not include specific study parameters, including the particular study locations, impact criteria, and other particulars, but instead states that these points should be reserved for discussion and agreement among the members of the TRT. Thus, no particular outcome is identified, and Parks, working through the TRT, can ensure that a study meets its particular needs.

In sum, nest closure studies for plovers and terns continue to be a longstanding and specifically identified TRT and Scientific Subcommittee research priority, the Scientific Subcommittee and the nesting report have both continually recommended such a study be performed, and DPR can ensure that any such study appropriately takes into account the impact such a closure would have on recreational and vehicular, as well as habitat, resources. Staff believes that such a study would help provide the type of information envisioned by the CDP terms and conditions, including with respect to the role of the Scientific Subcommittee and the TRT, and that it would make sense to begin working with DPR to develop the parameters of such a study moving forward. From staff's perspective it is clear that any such study must analyze both the environmental and recreational impacts of such an enclosure.

F. HABITAT CONSERVATION PLAN

The TRT's 2014 Annual Report identified the completion of a public review draft of a Habitat Conservation Plan (HCP) as its highest priority research and management initiative (see Exhibit 6). DPR has been in the process of developing a HCP for ODSVRA for over 15 years. The HCP is required by the USFWS for the protection of listed species at ODSVRA, such as the Western snowy plover, California least tern, steelhead trout, and tidewater goby. The primary purpose of the HCP is to ensure that park management, maintenance, and development activities protect these threatened and endangered plant and animal species consistent with the federal Endangered Species Act (ESA).

According to DPR, the HCP is now on the revised third administrative draft, and upon review and insertion of additional refinements, DPR plans to release a public review HCP draft (there has not to date been an available review draft, including for Commission staff). At this time, DPR indicates that the initial two chapters of the HCP have been submitted to USFWS for review, and an additional two chapters are being finalized for their review as well. It is DPR's goal to finalize a draft HCP by the end of 2015. However, given the need to draft and circulate an EIR/EIS and a Biological Opinion, conduct public review and finalize those documents, completion of the HCP process could take an additional two to three years, if not longer if there are unforeseen delays.

The status of the HCP was recently discussed in December 2014 at both the TRT meeting and an ODSVRA HCP administrative workshop. Commission staff attended the meeting and was encouraged by the open dialogue between DPR and USFWS with respect to HCP completion; however, the meeting did not result in an agreed-upon specific HCP review or completion deadline. DPR needs to make progress on the HCP to ensure that sensitive habitats and endangered and threatened species are protected as required by the ESA at ODSVRA. Future action on the HCP by USFWS may be subject to Commission review pursuant to the federal consistency provisions established by the Federal Coastal Zone Management Act. In addition, all development activities contemplated by the HCP will be subject to CDP requirements.

Therefore, because the HCP is integrally related to Park management and resource protection, including with respect to how particular mandates emanating from the HCP will affect the Park's CDP and vis versa, it is critical that the HCP be completed as soon as possible. The HCP will need to also address and respond to each of the issues discussed in this report in a meaningful way. Staff is committed to working with DPR on the HCP, and continue to stand ready to provide input on it moving forward.

G. TRANSITIONING THE TRT

The final section of each annual review contains the TRT facilitator's recommendations regarding the future of the TRT. From 2008 to 2014, the facilitator noted the TRT members' desire to abandon the TRT as a functioning advisory group. The primary reason to dissolve the TRT was a sense that its role had been fulfilled and that public involvement would be available through other venues and processes, including preparation of the HCP. The facilitator also noted that there has been less openness for compromise on particular decisions and that, overall, the TRT no longer serves as an effective park management tool. The level of TRT participation has declined, and some members, such as the CDFW, have not participated on the TRT for years, despite the fact that the CDP requires CDFW's membership. Coastal Commission staff has only recently, since 2013, returned to participate in the TRT.

Despite these past observations, the 2014 annual report shows that many members suggested that they would like to see the TRT through until implementation of the HCP, and then have that be the vehicle to address and advise on complicated Park management decisions. DPR's preference is to continue the role of the TRT until the HCP has been released, which would provide greater clarity for a CDP amendment that would both reflect the HCP's recommendations/requirements and potentially replace the TRT with a different structure more relevant to the implementing and enforcing the HCP/CDP. Thus, there appears to be an overall assessment that the TRT in its current makeup is not the appropriate body to continue advising on ODSVRA decisions, and instead it may be time to either revamp its structure or institute a new arrangement entirely.

The TRT facilitator's recommendation regarding the future of the TRT contains three possible options for the future of the TRT management strategy, as outlined in the 2014 Annual Report (see page 17 of Exhibit 6):

Maintain the TRT Until the HCP is Implemented²⁰

This option would leave the TRT in place to function until the adoption of the HCP. Once the HCP is adopted, it is anticipated that many of the functions of the TRT will become irrelevant, as it is envisioned under this scenario that the HCP will provide requirements for management of sensitive species within the Park. However, the release of a public review draft HCP and the related environmental documentation have repeatedly been delayed. While DPR indicates that it is actively working to develop these documents, it remains unclear when the documents will be completed and released for public consumption and comment. Due to this uncertainty, this option may not provide for a structured transition time frame. Another variation of this option would be to continue with the TRT in 2015 and closely monitor the progress of the HCP. If significant progress is made towards completion and implementation of the HCP, then a more detailed plan for transition from the TRT to implementation of the HCP could be developed. If significant progress is not made, an alternative strategy to transition away from the current TRT management strategy can be decided upon and implemented in the next annual review.

TRT on Standby Status

This option would include a request by the TRT to the Superintendent and Executive Director that it be placed on a standby status, effectively declaring that it has met and/or exceeded its mission as an advisory body. The TRT would be absolved of its duties until a public draft of the HCP is available for review and comment. The Scientific Subcommittee would also be placed on standby status with the exception that it would continue to review and comment on new management strategies identified in the annual nesting reports. In regards to this option, the TRT facilitator notes that no other CDP-mandated advisory committee is known to have been required to perform its duties for over fourteen years. It is also not standard professional practice to require this length of service for a non-paid, community-based advisory committee. The recommendation goes on to state that the TRT is no longer necessary or cost effective as a process for balancing resource protection with recreational use.

Transition to Coastal Commission Review of Park Management Strategies

This alternative would entail the Commission amending the CDP to phase out the TRT and developing new alternative approaches to ODSVRA resource management. This option would be similar to the previous option, but would formally require the amendment of the CDP to officially decommission the TRT. This option would require the creation of a new platform for agency and public input. The process by which this would be accomplished would need to be fully developed before a complete transition could be made away from the TRT.

Thus, there are many options available in restructuring the TRT and ensuring that it functions as was envisioned in 2001's CDP amendment, including the option of eliminating the TRT and instituting an alternative management structure. However, regardless of who or what entity advises Parks to ensure that ODSVRA is being managed in a manner consistent with its CDP requirements and mandates to protect coastal resources, as detailed in this report, the Park has numerous complicated issues that necessitate an immense amount of time, energy, and attention to address. These issues range from determining appropriate permanent locations for the Park's entrance access and staging areas, to studies determining appropriate use limits and ensuring

²⁰ This is the preferred option of the majority of the TRT members present in this year's TRT meeting.

proper counting and enforcement of those use limits, to strategies for the abatement of PM10 emissions. Most importantly, all of these issues interrelate with one another, and all have significant impacts on the Park's public recreation and resource protection mandates. ODSVRA is a publicly-owned nearly 3,600-acre piece of California's coast that supports important public recreational opportunities, including day-use visitors, OHV riders, campers, and hikers, as well as sensitive habitats, including coastal dunes and Federally threatened and endangered species. Thus, ODSVRA management is a complicated balancing of various uses and users, and will continue to be into the future. Although not absolutely required, it is clear that the TRT (and potentially some revamped version of it) plays a role in terms of providing an important advisory group function. It is equally clear, however, that change is necessary so that its original core objective of assisting in studying and identifying appropriate management measures can be best realized. On this point, the Commission Senior Ecologist, Dr. Dixon, has provided his input on the relationship of the Scientific Subcommittee's role to the TRT and the Commission, including the need for better definition and implementation (see Exhibit 14).

Finally, as noted at the outset, a fundamental component of this review relates to the TRT and whether to allow it to continue to function as identified by the amended CDP. If the Commission finds that the TRT has been effective at managing vehicular impacts at the Park, then the Commission can allow the TRT to continue to be the primary CDP implementation mechanism for that purpose for another year. If the Commission is not satisfied, it may, through this review process, institute alternative approaches to resource management or institute a new set of management measures. Staff does not believe that it is timely to institute alternative management criteria at this time, and would not advocate that the Commission do this at this annual review.

At this point, staff believes that the TRT as it is currently structured has run its course, and it is time to work with DPR on an alternate mechanism to provide for its current function. Commission and DPR staff have been in dialogue on this point, and the next step would be to develop a set of potential transition alternatives, whether the TRT-identified set of alternatives or others, and to ultimately bring those forward for potential action at a future date. Clearly, progress on the issues identified in this report, including the HCP, will affect these options, and they could be a bit of a moving target as a result, but the issue cannot simply be left unaddressed, including as the TRT function plays an important role in terms of the CDP terms and conditions and the way in which they affect Park management.

III. NEXT STEPS

If one thing is clear regarding ODSVRA and the CDP (and LCP) requirements that apply to the Park, it is that ODSVRA operations present complicated and challenging public policy and planning issues, including those discussed in the preceding sections. It is clear to staff that there exist a range of issues at ODSVRA that deserve discussion, as noted above, and that the next steps associated with resolution for each of them are necessarily iterative and interrelated. Staff remains committed to working cooperatively with DPR, the County, and other interested and involved agencies, entities, and parties moving forward. As discussed above, that includes in terms of taking the next steps towards: 1) designation of permanent Park entrance and staging areas; 2) identification of appropriate use limits and carrying capacities, including related to

special events; 3) identification of measures to address dust control, including completion of the pending CDP application process; 4) resolution of use and ownership issues associated with the La Grande property; 5) implementation of a study that provides information on the effectiveness and impacts associated with a year-round enclosure for Western snowy plover and California least tern, including its impacts on recreational vehicular activity; 6) steps necessary to complete an HCP in conjunction with USFWS; and 7) transitioning and/or restructuring the TRT function.

Nearly all of these issues and next steps interrelate with one another, and all have significant impacts on the Park's public recreational access and sensitive habitat protection mandates. ODSVRA is a publicly-owned, nearly 3,600-acre piece of California's coast that supports important public recreational opportunities (including day-use visitors, OHV riders, campers, and hikers) as well as sensitive habitats, including coastal dunes and threatened and endangered species. Thus, almost by definition ODSVRA management is a complicated balancing of various uses and users, and will continue to be into the future, including with respect to these issues and next steps.

In addition, it is worth noting that all of these issues and next steps necessarily involve potential modifications to the CDP, the LCP, and/or potentially new vehicles to implement such management measures in as clear and straightforward a manner as possible (e.g., a the potential for an ODSVRA Public Works Plan). On this point there is little doubt that the existing CDP terms and conditions are complicated, and can lead to a certain lack of clarity in terms of what is required as a result. Staff believes that it is in all parties best interest to endeavor to update the CDP (or another implementation vehicle if it can provide for clearer and more streamlined implementation), including so that the parameters for Park management consistent with the Coastal Act and the LCP are clear and effective, and can best strike that appropriate balance between facilitating vehicular recreation and protecting dune and related coastal resources at ODSVRA.

Finally, and to conclude, staff's intent with this report is not that the Commission take specific actions at the February review hearing, but rather that the Commission consider and discuss the various ODSVRA issues and potential next steps as a means of providing guidance to Parks moving forward. That is not to say there are not actions to be taken related to the Commission's CDP obligations, but rather that these actions are probably best understood as future actions pending further study, evaluation, and coordination with DPR, including as discussed above. Staff already works very closely with DPR on these management issues, and is fully committed to that ongoing partnership and dialogue at ODSVRA moving forward.

ODSVRA Location Maps



Pier Avenue Access

Interim Staging Area

La Grande Tract

Post Markers

Open Riding Area

Seasonal Exclosure Area
(Southern Exclosure)

Oso Flaco Access
(pedestrian only)



Oceano Dunes and Vicinity

- Post Markers
- Off-Highway Vehicle Riding Area
- Oceano Dunes SVRA State Park Boundary
- Seasonal Exclosure for Plover
- Dune Preserve

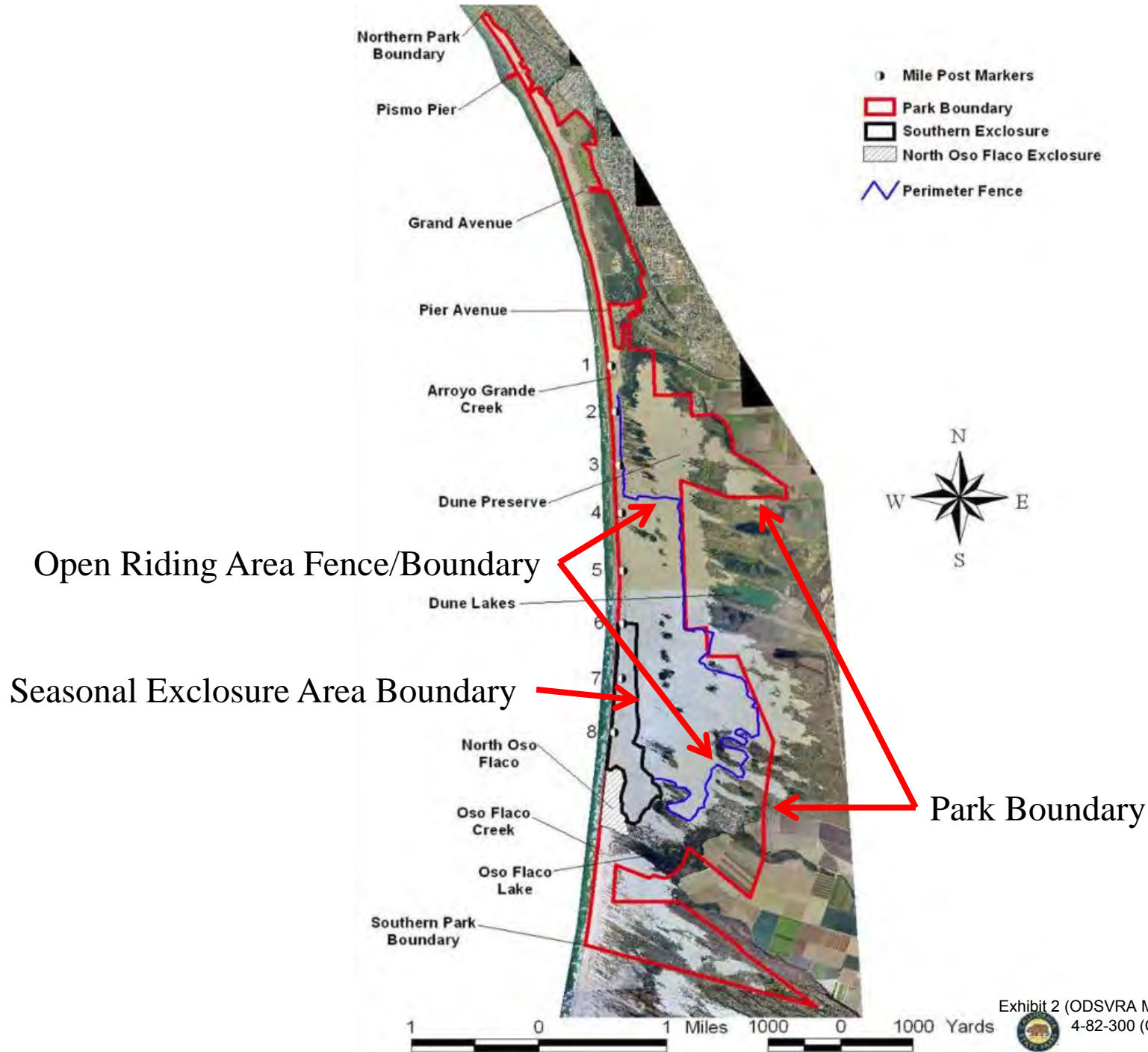


Map Scale: 1:42,000

Exhibit 2 (ODSVRA Maps and Figures)

4-82-300 (ODSVRA Review)

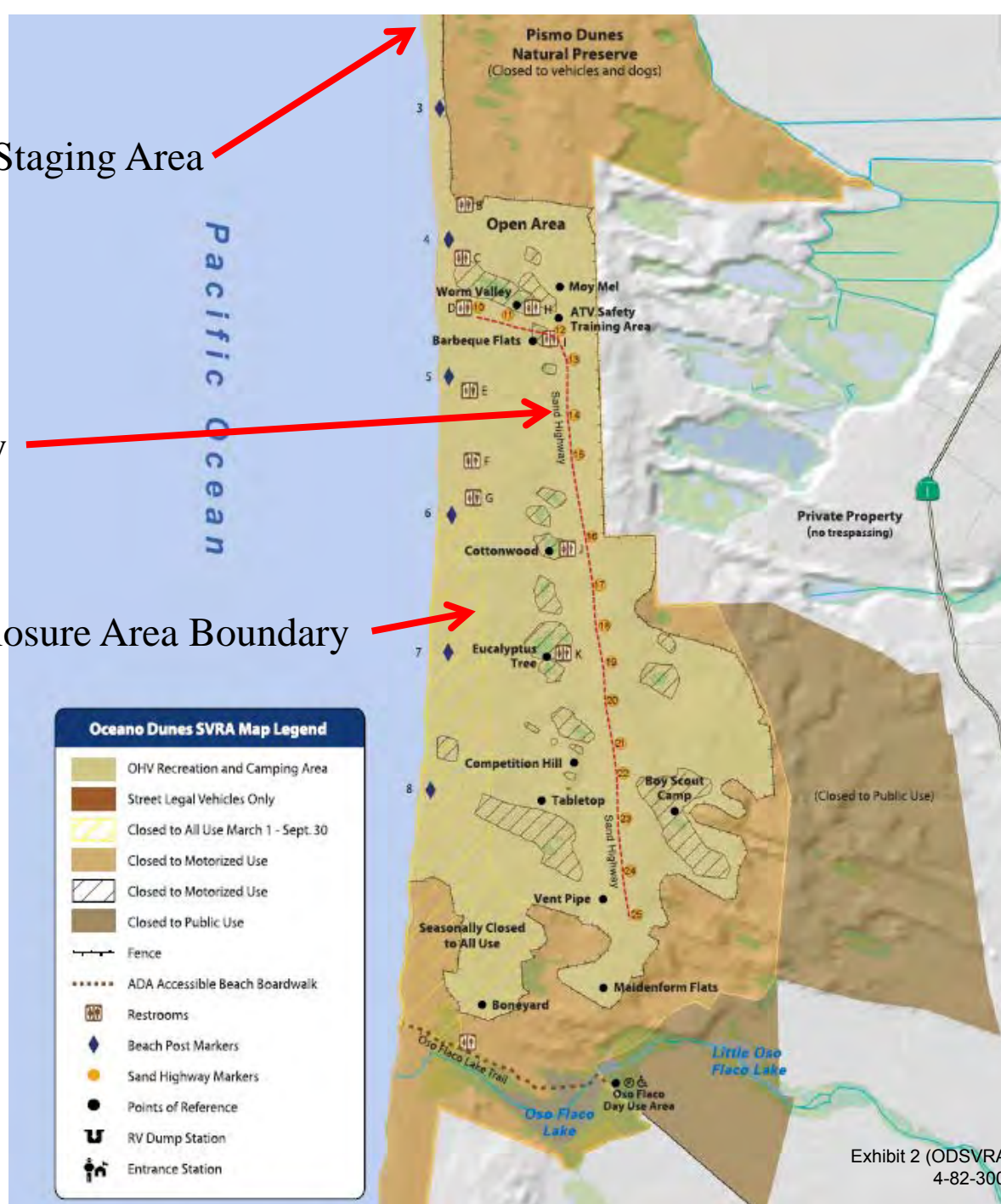
Page 1 of 6

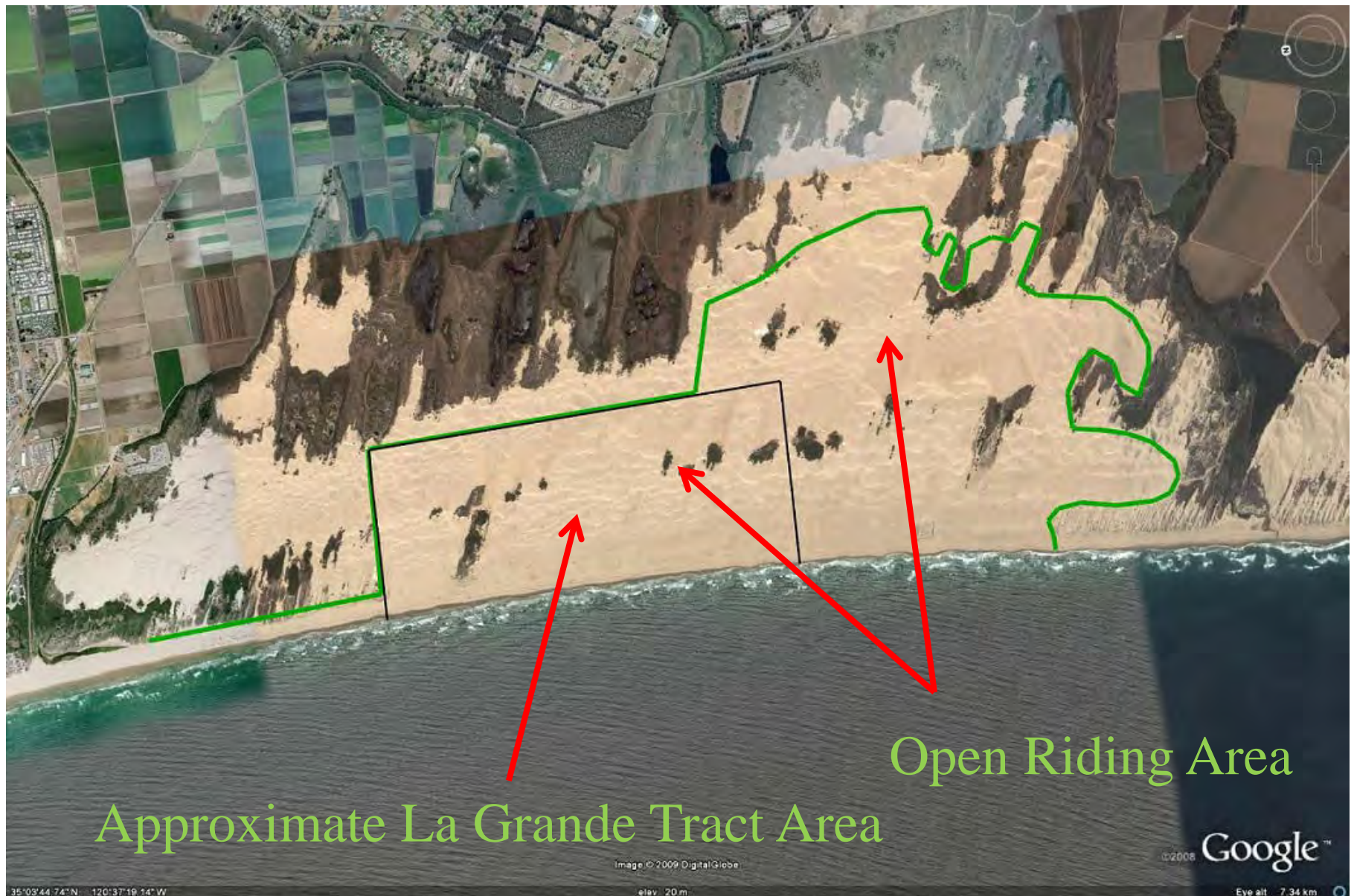


Interim Staging Area

Sand Highway

Seasonal Exclosure Area Boundary





Approximate La Grande Tract Area



Open Riding Area

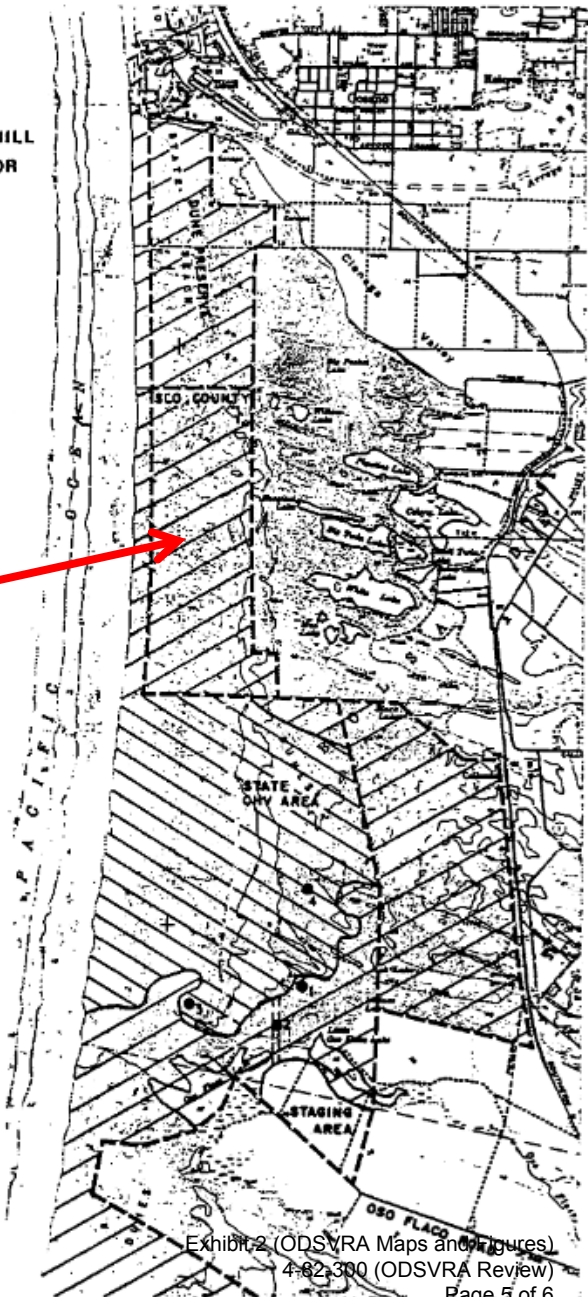
South County Area Plan
Figure 4

La Grande Tract

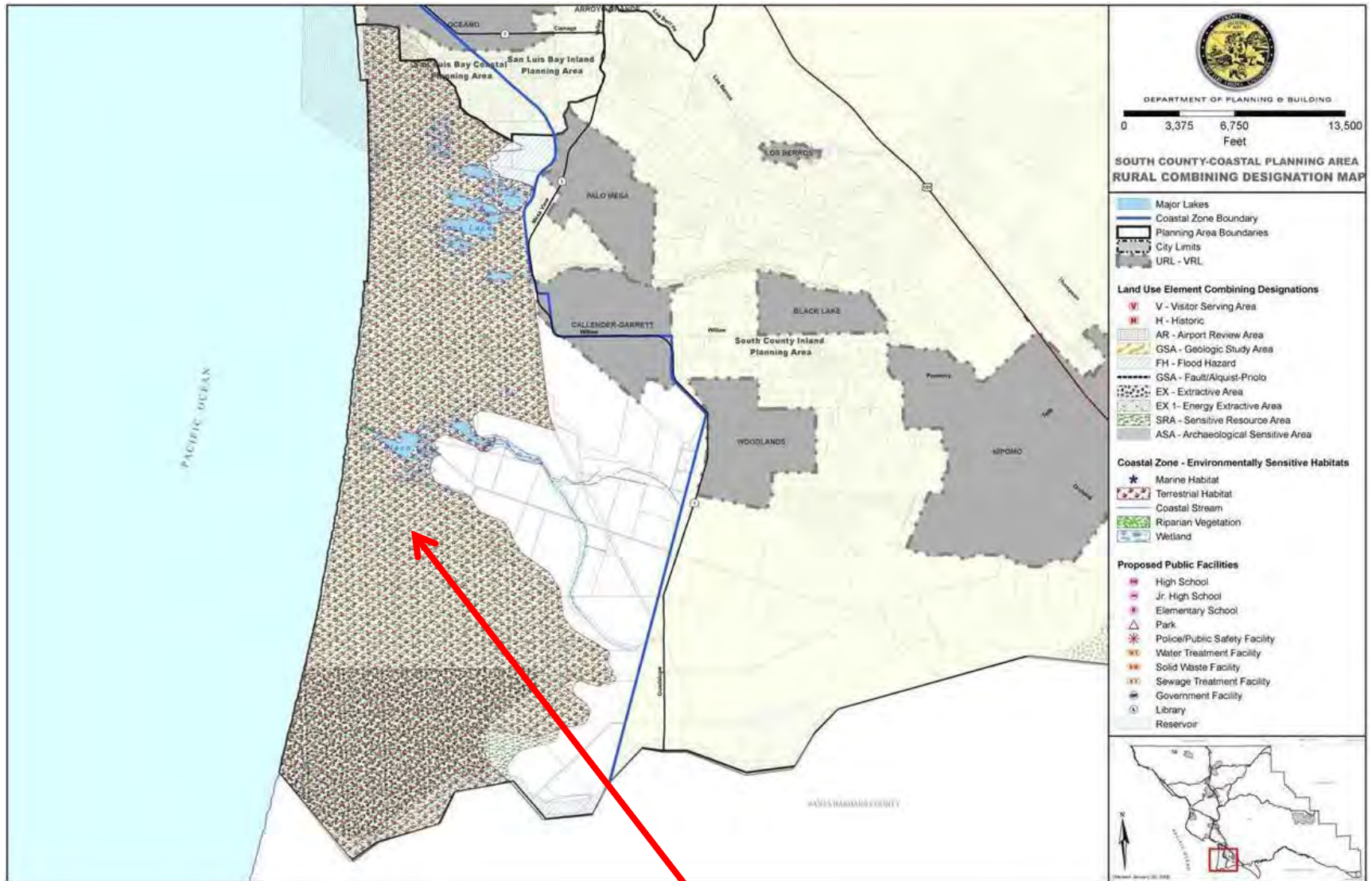
FIGURE 4
OFF-ROAD VEHICLE USE AREAS

LEGEND

-  OHV USE AREA
-  BUFFER AREA
- 1 LITTLE COREOPSIS HILL
- 2 OHV ACCESS CORRIDOR (Schematic)
- 3 MAIDENFORM FLATS
- 4 BOY SCOUT CAMP



San Luis Obispo County LCP ESHA Map



Sensitive Resource Area (SRA) and
Terrestrial Habitat ESHA Designation

Aerial Near Pier Avenue Access and community of Oceano



Aerial Near Interim Staging Area



Aerial of Open Riding Area



Oso Flaco Lake Area



Huckfest



CDP 4-82-300, approved in 1982**1. Staging Area Location:**

A. An interim OHV staging area shall be operational no later than Labor Day weekend 1982 in a designated area on or adjacent to the beach south of Sand Highway (Exhibit C). This staging area shall remain operational subject to the stated conditions and standards herein until such time as a permanent staging area is constructed.

Upon implementation of the interim staging area, all OHVs, ATCs and other non-street legal vehicles shall be trailored to and from Grande and Pier Avenues. At all times such vehicles when under their own power, shall be prohibited north of the northerly terminus of Sand Highway.

B. A permanent staging area site shall be selected as expeditiously as possible but in no case later than 18 months from the effective date of the County's LUP certification consistent with the following standards. Construction of this permanent staging area shall begin no later than three (3) years from the date of the certification of the County's LUP of its LCP. If construction and operation of a permanent staging area cannot be accomplished within the above time limits, this permit shall be subject to review and modification if necessary or appropriate by the County or the Commission or either in consultation with the other. Prior to construction, the County's LUP and the State Parks General Development Plan shall be amended to include the selected site with all additional standards or conditions for its design and operation. At the present time, there are several known locations which shall be considered and evaluated for staging area use, these locations are: Callendar Road area; the stables/agricultural lands area south of Arroyo Grande Creek; Agricultural lands north of Oso Flaco Creek adjacent to the Union Oil property; on the beach as per the interim staging area described herein (see Exhibit C). Other potential sites may also be evaluated. The site selection process shall include an environmental impacts analysis adequate to enable the selection of the least environmentally damaging location for the use. Accordingly, the on and off-site impacts of each alternative shall be measured against the impacts of the others. In selecting the site and amending the County's LUP and the State Parks General Development Plan to incorporate the selected site, the following standards must be found to have been met: 1) that the site selected is the least environmentally damaging alternative; and 2) that all feasible design and operational related mitigations have been incorporated to minimize adverse environmental impacts. Additional standards for site selection are in their order of importance: locating a site which reduces to the maximum extent feasible OHV related impacts to the residential character of the community of Oceano; locating a site which facilitates the successful separation and regulation of recreational uses within the park itself; locating a site which can be constructed and operational expeditiously.

C. Oso Flaco Lakes Area: An off-highway vehicle staging area shall not be constructed at the Oso Flaco Lake site indicated on Exhibit C. As part of the fencing proposed in this project, the Oso Flaco causeway to the PSVRA shall be permanently closed to vehicular traffic. Pedestrian and equestrian access only shall be allowed over

the causeway or in the vicinity of the Oso Flaco Lakes. The state owned agricultural lands south of Oso Flaco Lakes may be utilized for the development of a campground for passive recreational use of the dune areas within the Park excluded from OHV use. The State Parks and Recreation Department shall amend its General Development Plan accordingly. Uses in this camping area shall be permitted only if consistent with the resource protection policies of the San Luis Obispo County Land Use Plan; 100 foot buffering setbacks from the lakes, creek and wetlands shall be applied at a minimum with greater setbacks required if necessary, only resource dependent uses and passive recreational activities shall be permitted.

2. Control of Access to the Park: Effective immediately upon issuance of this permit and until either a permanent staging area is operational or this permit and the County's LUP is amended to accommodate possible necessary minor adjustments in the operation of these conditions, access and egress to and from the park shall be controlled and monitored in the following manner:

- A. All vehicular access and egress shall be via Grande Avenue and Pier Avenue, an effective vehicle barriers shall be placed at the southern end of the Oso Flaco causeway to assure that no OHV access over the causeway is permitted.
- B. Manned vehicle contact stations (kiosks) shall be placed at the Pier and Grande Avenue access points.

3. Control of uses within the Park: By the July 4 week-end of 1982 and as soon as possible prior to that date, the Parks and Recreation Department shall institute a Public Information program for vehicular recreational users within the Parks units. At the Grande and Pier Avenue's kiosks, occupants of all vehicles entering the Park will be provided a pass or ticket to the park and the following information:

- A. The following rules are effective immediately with violators subject to citation and fines:
 - All non-street legal vehicles shall be prohibited from the area north of Sand Highway after dusk each day.
 - Vegetated dune areas, whether they are fenced or unfenced, are strictly off-limits to all vehicles.
 - All areas posted as Private Property or Restricted Use are off-limits to vehicle activity.
 - All vehicle activity is prohibited south of the Oso Flaco Creek (or south of the fence line that is constructed).
- B. Beginning with LABOR DAY WEEKEND 1982 Beach Camping within the Park units shall be restricted to a maximum of 500 units* with each unit available only through a reservation obtained through the State Parks Reservation System (Ticketron). On that weekend and thereafter, admittance to the Park for the purpose of overnight camping will be denied to individuals without a valid reservation unless vacant unreserved camping spaces are available.

*One unit equals a campsite for a single camper vehicle.

- C. Beginning LABOR DAY WEEKEND, specific areas of the Park will be designated for specific types of vehicles. The designations will be as follows:
- Area north of Sand Highway to Grande Avenue designated for and restricted to street legal vehicle use.
 - Area south of Sand Highway to the fenced or posted area north of Oso Flaco Creek designated for OHV use.
- D. On or before January 1983, the following will occur: OHV day use will be limited to a specified number of users established in consultation with agreement by the County of San Luis Obispo and the Executive Director of the Coastal Commission and the Department of State Parks. OHV day use fees may be collected.
- E. Protective Fencing of Dunes, archeological resources, and wet environments shall be accomplished in the following manner subject to review and approval by the Executive Director of the Coastal Commission in consultation with the County of San Luis Obispo and the State Department of Fish and Game.
- (a) Fencing proposed and approved herein, plus fencing of the area shown as Area A on Exhibit D plus the perimeter fencing along the Sand Highway and the Eastern Boundary of ODSVRA shall be accomplished by November 30, 1982. All other vegetated areas indicated on Exhibit D shall be fenced by Aug 31, 1983.
- (b) One primary objective of the fencing is to prohibit vehicle access to the dune area south of Oso Flaco Creek. Accordingly, the east/west aligned fence north of Oso Flaco Creek shall continue seaward to the mean low water line so that vehicles do not pass to the south. The continuation of this line to mean low water may require different construction than normal fencing – possibly driven piles.
- (c) Except for the following, fencing alignments shall be placed a minimum of 100 feet from the vegetated areas being fenced:
1. Along Sand Highway where the fence would encroach into the Sand Highway travel corridor.
 2. Along the seaward side of the foredunes paralleling the beach where fencing may be placed in a manner similar to that already existing along the westerly line of the State Dune Preserve.
 3. In other areas where it is demonstrated that a placement closer to vegetation will not diminish the effectiveness of the fence to stabilize the dune, protect the vegetation and provide necessary conditions for dune rehabilitation and restoration. Said demonstration shall be in the form of competent analysis of the dynamics of dune sand transport and natural condition necessary for dune

stabilization. Reduction in the minimum setback under this condition shall be reviewed and approved by the Executive Director of the Coastal Commission.

- (d) If fenced corridors to the Oso Flaco are constructed, they shall only be for use of state parks personnel and for the purpose of emergency, normal patrol duties, management and enforcement. Accordingly, these corridors shall have locked gates as shown on Exhibit D.
- (e) Since a barrier to OHV movement south of Oso Flaco Creek is to be constructed on the north side of the creek, any construction of fencing south of Oso Flaco Creek or lakes shall be only for the purpose of preventing OHV intrusion into the State Park holdings from adjacent private lands. Such fencing shall therefore be perimeter fencing around parcels 8, 7, 3, and 4 and shall require a coastal development permit. Fencing applied for herein south of Oso Flaco which is not perimeter fencing shall not be constructed, or if constructed shall have been to an alignment approved herein by November 30, 1982.

4. Restoration

A dunes restoration program shall be undertaken by the DPR. The program shall be reviewed and approved by the Executive Director of the Coastal Commission. Restoration of vegetated dunes within the fenced-off areas shall be undertaken as expeditiously as funds and technical knowledge allows. Plantings shall begin no later than January 1983 with notification of the County and the Executive Director of the Coastal Commission. The restoration program shall be an ongoing program with the experimental or initial phase completed within three (3) years of the date of certification of the LUP and the full program in effect on that date or before.

5. Protection of Archeological Resources

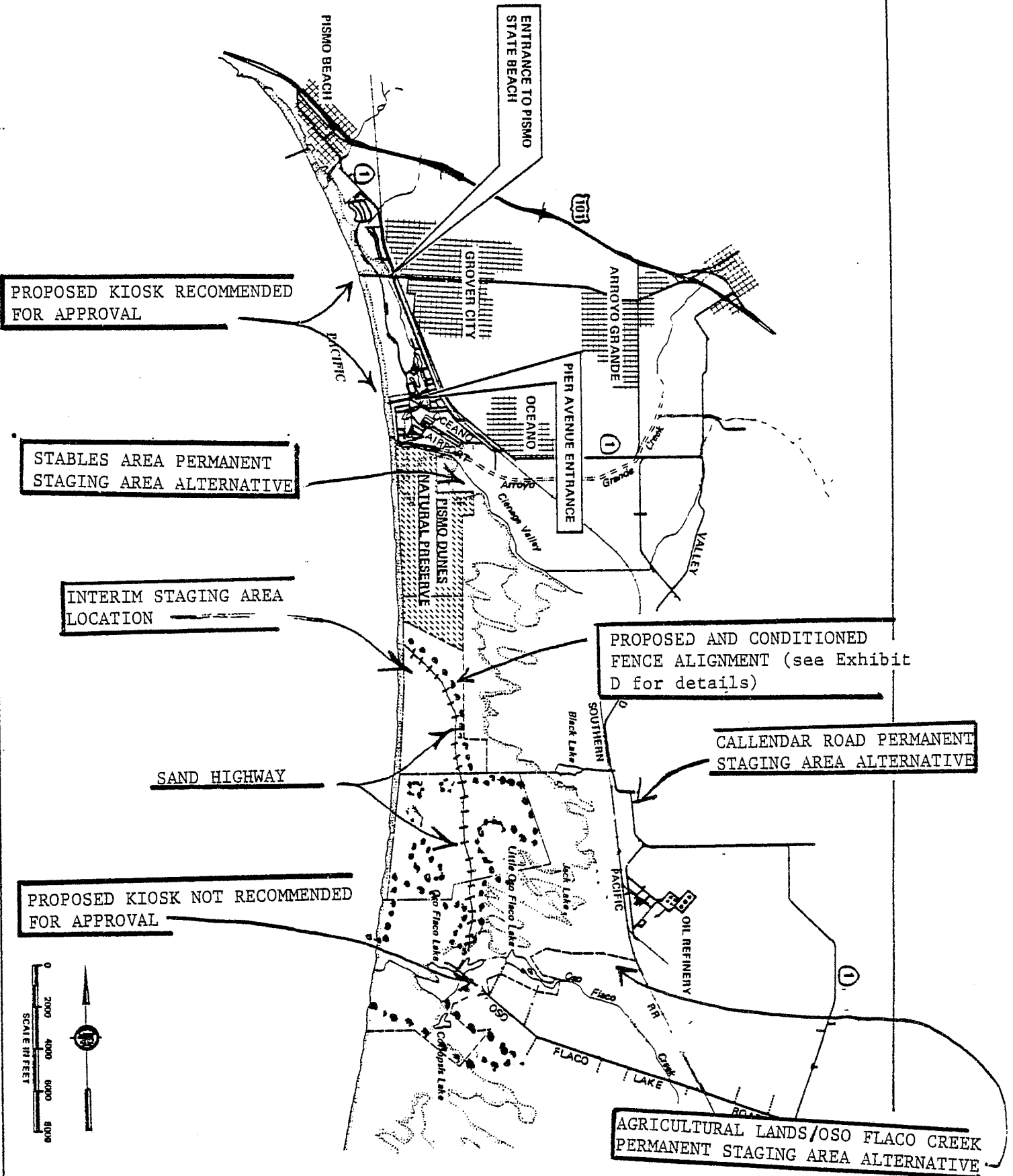
Archeological resources within the PDVRA shall be protected by fencing. Accordingly, as part of the current fencing project, site No. SLO 199 shall be fenced for protection. Other sites shall be fenced as their locations become known.

6. Six months after the issuance of this permit, and annually thereafter until a permanent staging area is operational, a formal review of the effectiveness of the conditions of the permit shall take place. This review shall be undertaken jointly by designated representatives of the California Coastal Commission, the California Department of Fish and Game, the County of San Luis Obispo, the Community of Oceano, the California Department of Parks and Recreation and user groups.

If after each of the annual reviews, or after the three year review required in condition 1(b) above, it is found that the Off-Highway Vehicle (OHV) use within the Pismo Dunes State Vehicle Recreation Area (PDSVRA) is not occurring in a manner which protects environmentally sensitive habitats and adjacent community values consistent with the requirements of the San Luis Obispo Local Coastal Program Land Use Plan, then OHV

access may be further limited pursuant to the access and habitat protection policies of the County certified Land Use Plan. If the above reviews find that OHV use within the PDSVRA is consistent with the protection of environmentally sensitive habitats and adjacent community values, and/or that additional staff and management revenues become available to the California Department of Parks and Recreation, levels of OHV use of the PDSVRA may be increased to a level not to exceed the enforcement and management capabilities available to the Pismo Beach State Parks Units.

EXHIBIT C



69

[illegible]

STATE BEACH AND
PROPOSED FENCE
ADDITIONAL FENCE
REQUIRED
X LOCKED GATES
REQUIRED
NOTE : FENCING INDICATED
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DEVELOPMENT WITHIN THE
EXISTING AND LO-
CATION OF VEGE-
TATION.

EXHIBIT D

STATE LEASED LANDS
of the State of New York
BUFFER ZONE
CRILL SITES
ADJACENT TO THE STATE LEASED LANDS

УБР - 478

VICINITY MAP

DESIGNED
BY
GAWM
Jan. 1977
CHLORO

DATE
12-7
6 5
7 4

REVISIONS

REVISED PCL 4 = 3 BOUNDARY

REVISED ACQ BOUNDARY PCL 1 = 3

DELETED PCL 1

DELETED PCL 2 (ALLEGEDLY NOT A SIGN AS
AS LEASE AGREEMENT ALSO REVISED PCL 3
[IN FILE, (U) - (S) - (S)]

REVISED ACQ BOUNDARY PCL 2, 3, 6, 7

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF PARKS AND RECREATION

APPROVED

REVISED AND DISCONTINUED PCL 7 b
REPLACES PCL 3 2-80

REVISIO AND BOUNDARY PLS 2,3&7
AND MOLO UNCL SITES

PISMO STATE BEACH
PISMO DUNES STATE VEHICULAR RECREATION AREA
ACQUISITION PLAN

2944145 70.
15651

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Exhibit 4 (CDP 4-82-300 through 4-82-300-A5 Conditions)
4-82-300 (ODSVRA Review)
Page 7 of 21

CDP 4-82-300-A, approved in 1982

1. Staging Area Location:

A. An interim OHV staging area shall be operational no later than ~~Labor Day weekend~~ September 15th 1982 in a designated area on or adjacent to the beach south of ~~Sand Highway~~ the two mile post (Exhibit C). This staging area shall remain operational subject to the stated conditions and standards herein until such time as a permanent staging area is constructed.

3. Control of uses within the Park: By the July 4 week-end of 1982 and as soon as possible prior to that date, the Parks and Recreation Department shall institute a Public Information program for vehicular recreational users within the Parks units. At the Grande and Pier Avenue's kiosks, occupants of all vehicles entering the Park will be provided a pass or ticket to the park and the following information:

A. The following rules are effective immediately with violators subject to citation and fines:

- All non-street legal vehicles shall be prohibited from the area north of ~~Sand Highway~~ the two mile post after dusk each day.
- Vegetated dune areas, whether they are fenced or unfenced, are strictly off-limits to all vehicles.
- All areas posted as Private Property or Restricted Use are off-limits to vehicle activity.
- All vehicle activity is prohibited south of the Oso Flaco Creek (or south of the fence line that is constructed).

B. Beginning ~~with LABOR DAY WEEKEND~~ September 15th, 1982 Beach Camping within the Park units shall be restricted to a maximum of 500 units* with each unit available only through a reservation obtained through the State Parks Reservation System (Ticketron). ~~On that weekend and~~ Thereafter, admittance to the Park for the purpose of overnight camping will be denied to individuals without a valid reservation unless vacant unreserved camping spaces are available.

*One unit equals a campsite for a single camper vehicle.

C. Beginning ~~LABOR DAY WEEKEND~~ September 15, 1982, specific areas of the Park will be designated for specific types of vehicles. The designations will be as follows:

- Area north of ~~Sand Highway~~ the two mile post to Grande Avenue designated for and restricted to street legal vehicle use.
- Area south of ~~Sand Highway~~ the two mile post to the fenced or posted area north of Oso Flaco Creek designated for OHV use.

E. Protective Fencing of Dunes, archeological resources, and wet environments shall be accomplished in the following manner subject to review and approval by the Executive Director of the Coastal Commission in consultation with the County of San Luis Obispo and the State Department of Fish and Game.

- (a) Fencing proposed and approved herein, plus fencing of the area shown as Area A on Exhibit D plus the perimeter fencing along the Sand Highway (or along the ridge just eastward of the Sand Highway) and the eastern boundary of ODSVRA shall be accomplished by November 30, 1982. All other vegetated areas indicated on Exhibit D shall be fenced by Aug 31, 1983.
- (b) One primary objective of the fencing is to prohibit vehicle access to the dune area south of Oso Flaco Creek. Accordingly, the east/west aligned fence north of Oso Flaco Creek shall continue seaward to the mean low water line so that vehicles do not pass to the south. The continuation of this line to mean low water may require different construction than normal fencing – possibly driven piles.
- (c) Except for the following, fencing alignments shall be placed a minimum of 100 feet from the vegetated areas being fenced:
 - 1. Along Sand Highway where the fence would encroach into the Sand Highway travel corridor.
 - 2. Along the seaward side of the foredunes paralleling the beach where fencing may be placed in a manner similar to that already existing along the westerly line of the State Dune Preserve except that a minimal number of breaks in the foredune fencing outside of the dune preserve may be allowed of OHV access to the backdune area. The fencing protecting the foredunes need not be a closed perimeter fence completely surrounding the foredune vegetation if it can be demonstrated to the Executive Director that such perimeter fencing is not necessary for effective preservation and stabilization of foredunes.

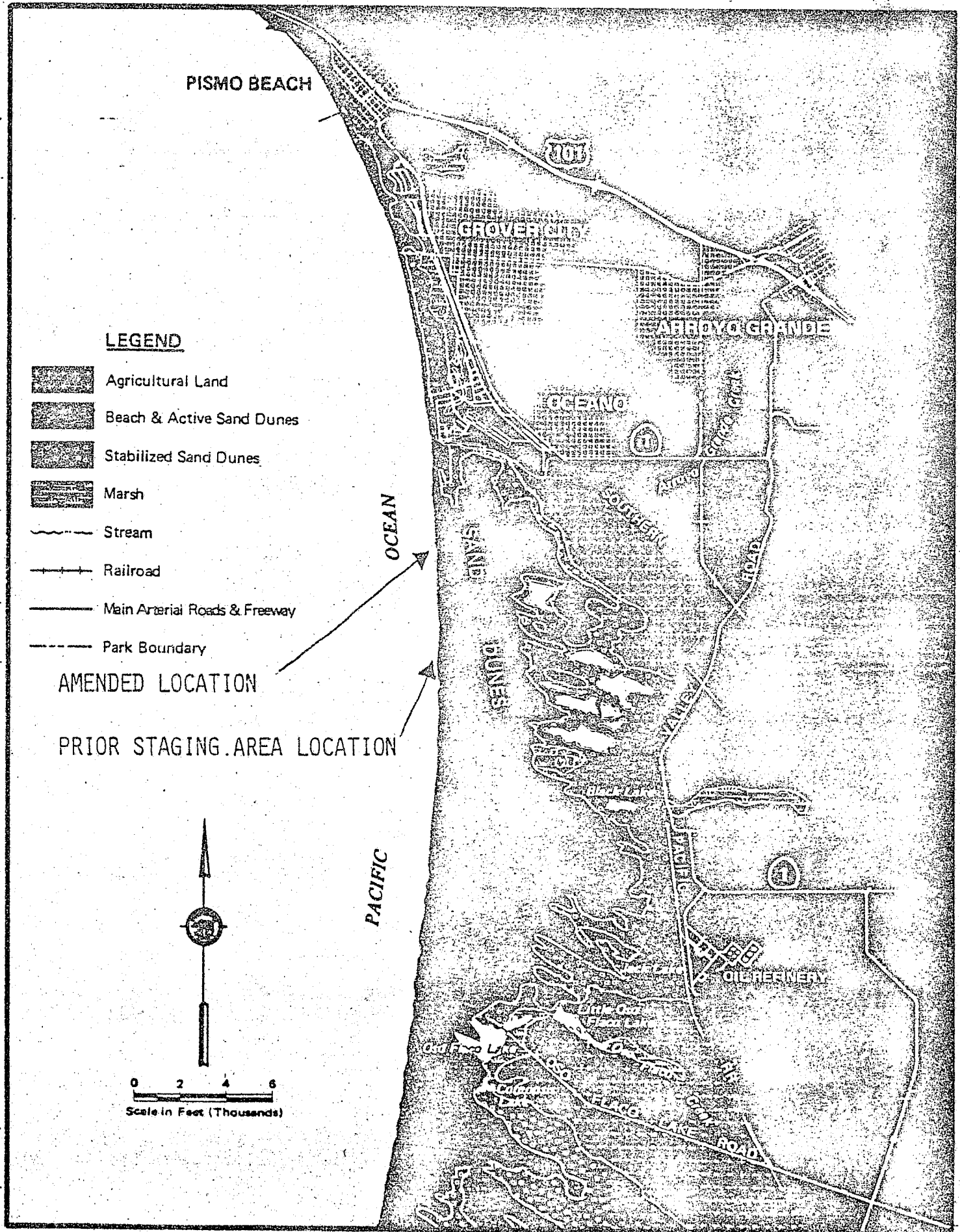


FIGURE 3

CDP 4-82-300-A2, approved in 1983

3. Control of uses within the Park: By the July 4 week-end of 1982 and as soon as possible prior to that date, the Parks and Recreation Department shall institute a Public Information program for vehicular recreational users within the Parks units. At the Grande and Pier Avenue's kiosks, occupants of all vehicles entering the Park will be provided a pass or ticket to the park and the following information:

- A. The following rules are effective immediately with violators subject to citation and fines:

- All non-street legal vehicles shall be prohibited from the area north of the two mile post after dusk each day.
- Vegetated dune areas, whether they are fenced or unfenced, are strictly off-limits to all vehicles.
- All areas posted as Private Property or Restricted Use are off-limits to vehicle activity.
- All vehicle activity is prohibited south of the Oso Flaco Creek (or south of the fence line that is constructed).

- B. Beginning with the September 15th, 1982 ~~4th of July weekend~~ 1983 Beach Camping within the Park units shall be restricted to a maximum of ~~500~~ 1000 units* with each unit available only through a reservation obtained through the State Parks Reservation System (Ticketron). Thereafter, admittance to the Park for the purpose of overnight camping will be denied to individuals without a valid reservation unless vacant unreserved camping spaces are available.

*One unit equals a campsite for a single camper vehicle.

6. Six months after the issuance of this permit, and annually thereafter (or as needed) until a permanent staging area is operational, a formal review of the effectiveness of the conditions of the permit shall take place. This review shall be undertaken jointly by designated representatives of the California Coastal Commission, the California Department of Fish and Game, the County of San Luis Obispo, the Community of Oceano, the California Department of Parks and Recreation and user groups.

~~If after each of the annual reviews, or after the three year review required in condition 1(b) above, it is found that the Off-Highway Vehicle (OHV) use within the Pismo Dunes State Vehicle Recreation Area (PDSVRA) is not occurring in a manner which protects environmentally sensitive habitats and adjacent community values consistent with the requirements of the San Luis Obispo Local Coastal Program Land Use Plan, then OHV access may be further limited pursuant to the access and habitat protection policies of the County-certified Land Use Plan. If the above reviews find that OHV use within the PDSVRA is consistent with the protection of environmentally sensitive habitats and adjacent community values, and/or that additional staff and management revenues become available to the California Department of Parks and Recreation, levels of OHV~~

~~use of the PDSVRA may be increased to a level not to exceed the enforcement and management capabilities available to the Pismo Beach State Parks Units.~~

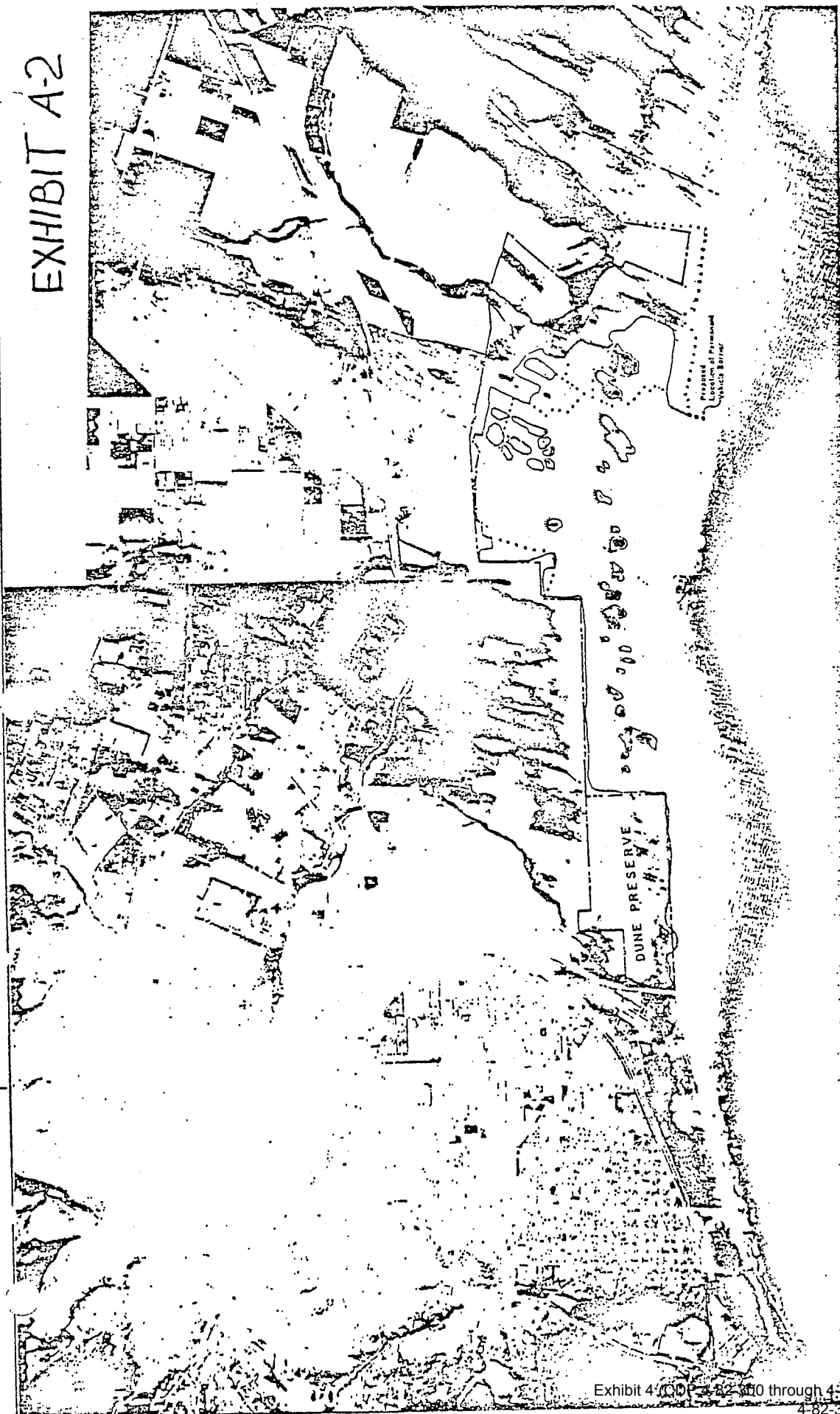
If, after an annual (or any other) review it is found that the ORV use within the SVRA is not occurring in a manner that protects environmentally sensitive habitats and community values consistent with the conditions of this permit and the County's Local Coastal Plan, then OHV access and the number of camp units allowed may be further limited by the Executive Director with concurrence by resolution of the Board of Supervisors of San Luis Obispo County. If the above reviews find that OHV use in the SVRA is consistent with the protection of environmentally sensitive habitats and community values, and/or that additional staff and management revenues become available to the DPR, levels of OHV access and the allowable number of camp units may be increased not to exceed the enforcement and management capabilities of the DPR by determination of the Executive Director with concurrence by resolution of the Board of Supervisors of San Luis Obispo County.

CDP 4-82-300-A3, approved in 1984

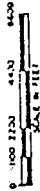
3. Control of uses within the Park: By the July 4 week-end of 1982 and as soon as possible prior to that date, the Parks and Recreation Department shall institute a Public Information program for vehicular recreational users within the Parks units.
 - E. Protective Fencing of Dunes, archeological resources, and wet environments shall be accomplished in the following manner subject to review and approval by the Executive Director of the Coastal Commission in consultation with the County of San Luis Obispo and the State Department of Fish and Game.
 - (a) Fencing proposed and approved herein, plus fencing of the area shown ~~as Area A~~ on Exhibit ~~D~~ A-2 plus the perimeter fencing along the Sand Highway (or along the ridge just eastward of the Sand Highway) and the eastern boundary of ODSVRA shall be accomplished by November 30, 1982. All other vegetated areas indicated on Exhibit ~~D~~ A-2 shall be fenced by Aug 31, 1983.
 - (b) One primary objective of the fencing is to prohibit vehicle access to the dune area south of Oso Flaco Creek. Accordingly, the east/west aligned fence north of Oso Flaco Creek shall continue seaward to the mean low water line so that vehicles do not pass to the south. The continuation of this line to mean low water may require different construction than normal fencing – possibly driven piles.
 - (c) Except for the following, fencing alignments shall be placed a minimum of 100 feet from the vegetated areas being fenced:
 1. Along Sand Highway where the fence would encroach into the Sand Highway travel corridor.
 2. Along the seaward side of the foredunes paralleling the beach where fencing may be placed in a manner similar to that already existing along the westerly line of the State Dune Preserve except that a minimal number of breaks in the foredune fencing outside of the dune preserve may be allowed of OHV access to the backdune area. The fencing protecting the foredunes need not be a closed perimeter fence completely surrounding the foredune vegetation if it can be demonstrated to the Executive Director that such perimeter fencing is not necessary for effective preservation and stabilization of foredunes.
 3. In other areas where it is demonstrated that a placement closer to vegetation will not diminish the effectiveness of the fence to stabilize the dune, protect the vegetation and provide necessary conditions for dune rehabilitation and restoration. Said demonstration shall be in the form of competent analysis of the dynamics of dune sand transport and natural condition necessary for dune stabilization. Reduction in the minimum setback under this condition shall be reviewed and approved by the Executive Director of the Coastal Commission.

- (d) If fenced corridors to the Oso Flaco are constructed, they shall only be for use of state parks personnel and for the purpose of emergency, normal patrol duties, management and enforcement. Accordingly, these corridors shall have locked gates ~~as shown on Exhibit D.~~

EXHIBIT A-2



- LEGEND
- SVRA BOUNDARY LINE
 - EXISTING FENCE TO REMAIN IN PLACE
 - TRAIL OPENINGS TO BE FENCED OFF
 - NEW FENCE TO BE INSTALLED
 - EXISTING FENCE TO BE REMOVED
 - VEGETATION AREA



CDP 4-82-300-A4, approved in 1991

1. Staging Area Location:

- C. Oso Flaco Lakes Area: An off-highway vehicle staging area shall not be constructed at the Oso Flaco Lake site indicated on Exhibit C. As part of the fencing proposed in this project, the Oso Flaco causeway to the PSVRA shall be permanently closed to vehicular traffic. Pedestrian and equestrian access only shall be allowed over the causeway or in the vicinity of the Oso Flaco Lakes effective no later than March 1, 1992.

By acceptance of this permit the applicant agrees to not close equestrian access at Oso Flaco Lake until March 1, 1992 or sooner if an alternative equestrian access solution is identified. The intent of this condition is to allow additional time for all parties involved in the attempt to locate alternative access routes to the beach to identify a site which would be suitable and acceptable to the Commission. The Commission will review and make a decision on the appropriateness of that site at a subsequent date. If an alternative equestrian access route is identified prior to March 1, 1992, the applicant will submit the proposed route to the Commission for its review and approval at a subsequent date. In the event an alternative equestrian access route is not identified, equestrian access through Oso Flaco Lake Natural Area can be closed on March 1, 1992.

The state owned agricultural lands south of Oso Flaco Lakes may be utilized for the development of a campground for passive recreational use of the dune areas within the Park excluded from OHV use. The State Parks and Recreation Department shall amend its General Development Plan accordingly. Uses in this camping area shall be permitted only if consistent with the resource protection policies of the San Luis Obispo County Land Use Plan; 100 foot buffering setbacks from the lakes, creek and wetlands shall be applied at a minimum with greater setbacks required if necessary, only resource dependent uses and passive recreational activities shall be permitted.

2. Control of Access to the Park: Effective immediately upon issuance of this permit and until either a permanent staging area is operational or this permit and the County's LUP is amended to accommodate possible necessary minor adjustments in the operation of these conditions, access and egress to and from the park shall be controlled and monitored in the following manner:

- A. All vehicular access and egress shall be via Grande Avenue and Pier Avenue, an effective vehicle barriers shall be placed at the southern end of the Oso Flaco causeway to assure that no OHV access over the causeway is permitted.
- B. Manned vehicle contact stations (kiosks) shall be placed at the Pier and Grande Avenue access points.

- C. Equestrian Gate: The applicant within sixty (60) days of approval (by November 10, 1991) shall reconstruct a portion of the existing fence along the southern Pismo Dunes State Vehicle Recreation Area (SVRA) boundary to allow equestrians and pedestrians to pass along the beach, while preventing passage by off-highway vehicles.

CDP 4-82-300-A5, approved in 2001

SPECIAL CONDITIONS OF APPROVAL

1. **Scope of Permit.** This permit amendment replaces Special Conditions 3B, 3D, and 6 of CDP 4-82-300. This permit amendment also authorizes the institution of interim vehicle (street-legal, off-highway vehicle, and camping) limits at the ODSVRA, and the establishment of an ODSVRA Technical Review Team, for an initial one-year period from the date of approval of the revised conditions and findings.
2. **Renewal of Permit.** Annually, the Commission shall review the overall effectiveness of the Technical Review Team in managing vehicle impacts at the ODSVRA. If the Commission is satisfied with the review, the amendment will remain in effect for another year. Otherwise, an alternative approach to resource management, or set of management measures, may be instituted through this review process.

(CONDITION 6 as amended in 4-82-300-A2 replaced by CONDITION 2 of this amendment)

~~6. Six months after the issuance of this permit, and annually thereafter (or as needed) until a permanent staging area is operational, a formal review of the effectiveness of the conditions of the permit shall take place. This review shall be undertaken jointly by designated representatives of the California Coastal Commission, the California Department of Fish and Game, the County of San Luis Obispo, the Community of Oceano, the California Department of Parks and Recreation and user groups.~~

~~If, after an annual (or any other) review it is found that the ORV use within the SVRA is not occurring in a manner that protects environmentally sensitive habitats and community values consistent with the conditions of this permit and the County's Local Coastal Plan, then OHV access and the number of camp units allowed may be further limited by the Executive Director with concurrence by resolution of the Board of Supervisors of San Luis Obispo County. If the above reviews find that OHV use in the SVRA is consistent with the protection of environmentally sensitive habitats and community values, and/or that additional staff and management revenues become available to the DPR, levels of OHV access and the allowable number of camp units may be increased not to exceed the enforcement and management capabilities of the DPR by determination of the Executive Director with concurrence by resolution of the Board of Supervisors of San Luis Obispo County.~~

3. **Interim Vehicle Limits**
 - a. **Interim Day-Use Vehicle Limits.** Except as qualified by 3d, interim limits on motor vehicle use on the beaches and dunes of Oceano Dunes SVRA shall be no more than 2,580 street-legal vehicles per day. This limit does not include off-highway vehicles, or street-legal vehicles attributable to allowed overnight camper use within the ODSVRA.

- b. **Interim Camping Limits.** Except as qualified by 3d, interim limits on overnight motor vehicle use on the beaches and dunes of Ocean Dunes SVRA shall be no more than 1,000 camping units (i.e. 1,000 street-legal vehicles) per night. This limit does not include off-highway vehicles or street-legal vehicles attributable to allowed day-use within the ODSVRA.
- c. **Interim Off-Highway Vehicle Limits.** Except as qualified by 3d, interim limits on off-highway vehicle use on the beaches and dunes of Oceano Dunes SVRA shall be no more than 1,720 off-highway vehicles at any given time. This limit does not include the street-legal vehicles used to tow or trailer the OHVs into the ODSVRA.
- d. **Holiday Periods¹.** Interim street-legal and off-highway vehicle limits may be exceeded only during the four major holiday periods of Memorial Day (Saturday through Monday), July 4th (one day and any adjacent weekend days), Labor Day (Saturday through Monday), and Thanksgiving (Thursday through Sunday).

(CONDITIONS 3(B) and 3(D) replaced by CONDITION 3 of this amendment)

~~B. Beginning with the September 15th, 1982 4th of July weekend 1983 Beach Camping within the Park units shall be restricted to a maximum of 500 1000 units* with each unit available only through a reservation obtained through the State Parks Reservation System (Ticketron). Thereafter, admittance to the Park for the purpose of overnight camping will be denied to individuals without a valid reservation unless vacant unreserved camping spaces are available.~~

~~*One unit equals a campsite for a single camper vehicle.~~

~~D. On or before January 1983, the following will occur: OHV day use will be limited to a specified number of users established in consultation with agreement by the County of San Luis Obispo and the Executive Director of the Coastal Commission and the Department of State Parks. OHV day use fees may be collected.~~

- 4. **Technical Review Team.** The Technical Review Team (TRT), advisory to the Superintendent of the Oceano Dunes State Vehicular Recreation Area, shall be established within three months, and shall meet within six months, from approval of the revised conditions and findings of this coastal development permit amendment (4-82-300-A5). A Charter for the TRT, establishing members, roles and procedures for the Team, shall be submitted to the Executive Director for review within one year of approval of the revised conditions and findings of this coastal development permit amendment.
 - a. The Charter shall establish a specific structure and process in order for the TRT to do at least the following:
 - i. Assist in building community support through problem solving, consensus building, new constituency development, and increasing understanding about the ODSVRA; and

¹ These exceedance periods are no longer allowed under terms of settlement agreement entered into by Parks.

- ii. Develop recommendations to the Superintendent of the ODSVRA regarding additional monitoring studies, adjustments to day and overnight use limits, and management strategies.
 - b. The Charter shall also include at least the following:
 - i. A provision to create a scientific subcommittee to identify, develop and evaluate the scientific information needed by decision-makers to ensure that the ODSVRA's natural resources are adequately managed and protected. The subcommittee shall be composed of resource experts representing the five government agencies (CCC, SLO County, USFWS, DFG, DPR) and at least two independent scientists with expertise in Western snowy plover, California least tern, steelhead trout or other species of concern, as well as ecological processes to analyze technical data and provide scientific recommendations to the TRT; and
 - ii. A provision to submit a list of proposed members of the scientific subcommittee to the Executive Director for review and approval.
 - c. The Charter shall establish a specific structure and process in order for the scientific subcommittee to do at least the following:
 - i. Recommend to the TRT the scientific studies and investigations that may be necessary to develop information needed by resource managers;
 - ii. Advise the TRT regarding the protection of the SVRA's natural resources by helping identify and review needed research measures and restoration efforts to rebuild or protect the ODSVRA natural resources;
 - iii. Evaluate monitoring results and reevaluate monitoring protocols contained in Oceano Dunes SVRA annual reports for the Habitat Monitoring System, reports on the breeding, nesting and fledgling success of the western snowy plover and California least tern populations in the SVRA, and other reports related to the environmental impacts of recreational activities;
 - iv. Provide comments on the adequacy of various scientific research studies and make management recommendations to the TRT; and
 - v. Submit the full recommendations of the scientific subcommittee to the Commission and make them available to the public, as part of the annual review process required in Special Condition 2.
5. **Annual Report.** The TRT and the ODSVRA Superintendent shall prepare annual reports (for the period of October to September) summarizing annual recreational use and habitat trends at the Park; and highlighting the TRT's major accomplishments (including progress made towards meeting the objectives of the TRT), projects, correspondence, and recommendations as well as a summary of subcommittees, working groups, and task force activities. The first annual report shall include (1) a draft or final Charter for the TRT, and (2) a description of the process by which the TRT will rank research and management questions and priorities. The second annual report shall include (1) the final Charter for the TRT (if not submitted with the first annual report), (2) the TRT's ranking of research and management questions and priorities, and (3) a scope of work for those projects identified as highest priority. Subsequent reports will include a status report on the progress of those projects as well as updates to research and management priorities

and the corresponding scopes of work for addressing those new priorities. One component of the Commission's annual review will be to evaluate the progress of the TRT's work as measured against the submitted work plans.

In identifying and selecting the priority research and management questions and projects, the TRT shall consider information developed by the USFWS and shall include the following:

- a.** Appropriate management techniques for the western snowy plover, California least tern, and steelhead trout including an evaluation of:
 - i.** How the geographic location of nests, proximity of nests to foraging areas, and nest closure techniques affect the hatching and fledgling success of the species,
 - ii.** What studies may be necessary to determine appropriate management techniques, or what known management techniques could be put in place, for protecting each species of concern, and
 - iii.** The potential environmental, recreational and economic costs and benefits of alternative beach/dune habitat protection strategies.
- b.** Appropriate management techniques for protecting water quality and dune habitats from potential pollutants that might result from motor vehicle fluids or other contaminants that might enter the ODSVRA and ocean through polluted runoff or direct discharges; and
- c.** The success of past revegetation efforts within the ODSVRA and the potential need for continuing or expanding those efforts, including expansion of vegetation enclosures.
- d.** Conduct a comprehensive, long-term monitoring and comparative analysis of the resources impacts associated with varying levels of use, including the highest (peak-use) attendance periods.

If alternative research and management questions and projects are identified as a higher priority than those listed in a through d above, the annual reports shall discuss the basis for such a determination. Annual reports shall be submitted to San Luis Obispo County and California Coastal Commission for informational purposes no later than January 1st of the following year. The first annual report (or portion thereof) shall be completed and submitted to the Commission no later than January 1, 2002.

Current CDP 4-82-300 Conditions (through 4-82-300-A5)

1. Staging Area Location:

A. An interim OHV staging area shall be operational no later than September 15th 1982 in a designated area on or adjacent to the beach south of the two mile post (Exhibit C). This staging area shall remain operational subject to the stated conditions and standards herein until such time as a permanent staging area is constructed.

Upon implementation of the interim staging area, all OHVs, ATCs and other non-street legal vehicles shall be trailored to and from Grande and Pier Avenues, At all times such vehicles when under their own power, shall be prohibited north of the northerly terminus of Sand Highway.

B. A permanent staging area site shall be selected as expeditiously as possible but in no case later than 18 months from the effective date of the County's LUP certification consistent with the following standards. Construction of this permanent staging area shall begin no later than three (3) years from the date of certification of the County's LUP or its LCP. If construction and operation of a permanent staging area cannot be accomplished within the above time limits, this permit shall be subject to review and modification if necessary or appropriate by the County or the Commission or either in consultation with the other. Prior to construction, the County's LUP and the State Parks General Development Plan shall be amended to include the selected site with all additional standards or conditions for its design and operation. At the present time, there are several known locations which shall be considered and evaluated for staging area use, these locations are: Calendar Road area; the stables/agricultural lands area south of Arroyo Grande Creek; Agricultural lands north of Oso Flaco Creek adjacent to the Union Oil property; on the beach as per the interim staging area described herein (see Exhibit C). Other potential sites may also be evaluated. The site selection process shall include an environmental impacts analysis adequate to enable the selection of the least environmentally damaging location for the use. Accordingly, the on and off-site impacts of each alternative shall be measured against the impacts of the others. In selecting the site and amending the County's LUP and the State Parks General Development Plan to incorporate the selected site, the following standards must be found to have been met: 1) that the site selected is the least environmentally damaging alternative; and 2) that all feasible design and operational related mitigations have been incorporated to minimize adverse environmental impacts. Additional standards for site selection are in their order of importance: locating a site which reduces to the maximum extent feasible OHV related impacts to the residential character of the community of Oceano; locating a site which facilitates the successful separation and regulation of recreational uses within the park itself; locating a site which can be constructed and operational expeditiously.

C. Oso Flaco Lakes Area: An off-highway vehicle staging area shall not be constructed at the Oso Flaco Lake site indicated on Exhibit C. As part of the fencing proposed in this project, the Oso Flaco causeway to the PSVRA shall be permanently closed to vehicular traffic. Pedestrian and equestrian access only shall be allowed over the causeway or in the vicinity of the Oso Flaco Lakes effective no later than March 1, 1992.

By acceptance of this permit the applicant agrees to not close equestrian access at Oso Flaco Lake until March 1, 1992 or sooner if an alternative equestrian access solution is identified. The intent of this condition is to allow additional time for all parties involved in the attempt to locate alternative access routes to the beach to identify a site which would be suitable and acceptable to the Commission. The Commission will review and make a decision on the appropriateness of that site at a subsequent date. If an alternative equestrian access route is identified prior to March 1, 1992, the applicant will submit the proposed route to the Commission for its review and approval at a subsequent date. In the event an alternative equestrian access route is not identified, equestrian access through Oso Flaco Lake Natural Area can be closed on March 1, 1992.

The state owned agricultural lands south of Oso Flaco Lakes may be utilized for the development of a campground for passive recreational use of the dune areas within the Park excluded from OHV use. The State Parks and Recreation Department shall amend its General Development Plan accordingly. Uses in this camping area shall be permitted only if consistent with the resource protection policies of the San Luis Obispo County Land Use Plan; 100 foot buffering setbacks from the lakes, creek and wetlands shall be applied at a minimum with greater setbacks required if necessary, only resource dependent uses and passive recreational activities shall be permitted.

2. Control of Access to the Park: Effective immediately upon issuance of this permit and until either a permanent staging area is operational or this permit and the County's LUP is amended to accommodate possible necessary minor adjustments in the operation of these conditions, access and egress to and from the park shall be controlled and monitored in the following manner:
 - A. All vehicular access and egress shall be via Grande Avenue and Pier Avenue, an effective vehicle barriers shall be placed at the southern end of the Oso Flaco causeway to assure that no OHV access over the causeway is permitted.
 - B. Manned vehicle contact stations (kiosks) shall be placed at the Pier and Grande Avenue access points.
 - C. Equestrian Gate: The applicant within sixty (60) days of approval (by November 10, 1991) shall reconstruct a portion of the existing fence along the southern Pismo Dunes State Vehicle Recreation Area (SVRA) boundary to allow equestrians and pedestrians to pass along the beach, while preventing passage by off-highway vehicles.
3. Control of uses within the Park: By the July 4 week-end of 1982 and as soon as possible prior to that date, the Parks and Recreation Department shall institute a Public Information program for vehicular recreational users within the Parks units. At the Grande and Pier Avenue's kiosks, occupants of all vehicles entering the Park will be provided a pass or ticket to the park and the following information:

- A. The following rules are effective immediately with violators subject to citation and fines:
- All non-street legal vehicles shall be prohibited from the area north of the two mile post after dusk each day.
 - Vegetated dune areas, whether they are fenced or unfenced, are strictly off-limits to all vehicles.
 - All areas posted as Private Property or Restricted Use are off-limits to vehicle activity.
 - All vehicle activity is prohibited south of the Oso Flaco Creek (or south of the fence line that is constructed).
- C. Beginning September 15, 1982, specific areas of the Park will be designated for specific types of vehicles. The designations will be as follows:
- Area north of the two mile post to Grande Avenue designated for and restricted to street legal vehicle use.
 - Area south of the two mile post to the fenced or posted area north of Oso Flaco Creek designated for OHV use.
- E. Protective Fencing of Dunes, archeological resources, and wet environments shall be accomplished in the following manner subject to review and approval by the Executive Director of the Coastal Commission in consultation with the County of San Luis Obispo and the State Department of Fish and Game.
- (a) Fencing proposed and approved herein, plus fencing of the area shown as A on Exhibit A-2 plus the perimeter fencing along the Sand Highway (or along the ridge just eastward of the Sand Highway) and the eastern boundary of ODSVRA shall be accomplished by November 30, 1982. All other vegetated areas indicated on Exhibit A-2 shall be fenced by Aug 31, 1983.
- (b) One primary objective of the fencing is to prohibit vehicle access to the dune area south of Oso Flaco Creek. Accordingly, the east/west aligned fence north of Oso Flaco Creek shall continue seaward to the mean low water line so that vehicles do not pass to the south. The continuation of this line to mean low water may require different construction than normal fencing – possibly driven piles.
- (c) Except for the following, fencing alignments shall be placed a minimum of 100 feet from the vegetated areas being fenced:
1. Along Sand Highway where the fence would encroach into the Sand Highway travel corridor.
 2. Along the seaward side of the foredunes paralleling the beach where fencing may be placed in a manner similar to that already existing along the westerly line of the State Dune Preserve except that a minimal number of breaks in the foredune fencing outside of the dune preserve may be allowed of OHV access to the backdune area. The fencing protecting the foredunes need not

be a closed perimeter fence completely surrounding the foredune vegetation if it can be demonstrated to the Executive Director that such perimeter fencing is not necessary for effective preservation and stabilization of foredunes.

3. In other areas where it is demonstrated that a placement closer to vegetation will not diminish the effectiveness of the fence to stabilize the dune, protect the vegetation and provide necessary conditions for dune rehabilitation and restoration. Said demonstration shall be in the form of competent analysis of the dynamics of dune sand transport and natural condition necessary for dune stabilization. Reduction in the minimum setback under this condition shall be reviewed and approved by the Executive Director of the Coastal Commission.

(d) If fenced corridors to the Oso Flaco are constructed, they shall only be for use of state parks personnel and for the purpose of emergency, normal patrol duties, management and enforcement. Accordingly, these corridors shall have locked gates.

(e) Since a barrier to OHV movement south of Oso Flaco Creek is to be constructed on the north side of the creek, any construction of fencing south of Oso Flaco Creek or lakes shall be only for the purpose of preventing OHV intrusion into the State Park holdings from adjacent private lands. Such fencing shall therefore be perimeter fencing around parcels 8, 7, 3, and 4 and shall require a coastal development permit. Fencing applied for herein south of Oso Flaco which is not perimeter fencing shall not be constructed, or if constructed shall have been to an alignment approved herein by November 30, 1982.

4. Restoration

A dunes restoration program shall be undertaken by the DPR. The program shall be reviewed and approved by the Executive Director of the Coastal Commission. Restoration of vegetated dunes within the fenced-off areas shall be undertaken as expeditiously as funds and technical knowledge allows. Plantings shall begin no later than January 1983 with notification of the County and the Executive Director of the Coastal Commission. The restoration program shall be an ongoing program with the experimental or initial phase completed within three (3) years of the date of certification of the LUP and the full program in effect on that date or before.

5. Protection of Archeological Resources

Archeological resources within the PDVRA shall be protected by fencing. Accordingly, as part of the current fencing project, site No. SLO 199 shall be fenced for protection. Other sites shall be fenced as their locations become known.

SPECIAL CONDITIONS OF APPROVAL (CDP 4-82-300-A5)

1. **Scope of Permit.** This permit amendment replaces Special Conditions 3B, 3D, and 6 of CDP 4-82-300. This permit amendment also authorizes the institution of interim vehicle (street-legal, off-highway vehicle, and camping) limits at the ODSVRA, and the establishment of an ODSVRA Technical Review Team, for an initial one-year period from the date of approval of the revised conditions and findings.
2. **Renewal of Permit.** Annually, the Commission shall review the overall effectiveness of the Technical Review Team in managing vehicle impacts at the ODSVRA. If the Commission is satisfied with the review, the amendment will remain in effect for another year. Otherwise, an alternative approach to resource management, or set of management measures, may be instituted through this review process.
3. **Interim Vehicle Limits**
 - a. **Interim Day-Use Vehicle Limits.** Except as qualified by 3d, interim limits on motor vehicle use on the beaches and dunes of Oceano Dunes SVRA shall be no more than 2,580 street-legal vehicles per day. This limit does not include off-highway vehicles, or street-legal vehicles attributable to allowed overnight camper use within the ODSVRA.
 - b. **Interim Camping Limits.** Except as qualified by 3d, interim limits on overnight motor vehicle use on the beaches and dunes of Ocean Dunes SVRA shall be no more than 1,000 camping units (i.e. 1,000 street-legal vehicles) per night. This limit does not include off-highway vehicles or street-legal vehicles attributable to allowed day-use within the ODSVRA.
 - c. **Interim Off-Highway Vehicle Limits.** Except as qualified by 3d, interim limits on off-highway vehicle use on the beaches and dunes of Oceano Dunes SVRA shall be no more than 1,720 off-highway vehicles at any given time. This limit does not include the street-legal vehicles used to tow or trailer the OHVs into the ODSVRA.
 - d. **Holiday Periods.** Interim street-legal and off-highway vehicle limits may be exceeded only during the four major holiday periods of Memorial Day (Saturday through Monday), July 4th (one day and any adjacent weekend days), Labor Day (Saturday through Monday), and Thanksgiving (Thursday through Sunday).
4. **Technical Review Team.** The Technical Review Team (TRT), advisory to the Superintendent of the Oceano Dunes State Vehicular Recreation Area, shall be established within three months, and shall meet within six months, from approval of the revised conditions and findings of this coastal development permit amendment (4-82-300-A5). A Charter for the TRT, establishing members, roles and procedures for the Team, shall be submitted to the Executive Director for review within one year of approval of the revised conditions and findings of this coastal development permit amendment.
 - a. The Charter shall establish a specific structure and process in order for the TRT to do at least the following:
 - i. Assist in building community support through problem solving, consensus building, new constituency development, and increasing understanding about the ODSVRA; and

- ii. Develop recommendations to the Superintendent of the ODSVRA regarding additional monitoring studies, adjustments to day and overnight use limits, and management strategies.
- b. The Charter shall also include at least the following:
 - i. A provision to create a scientific subcommittee to identify, develop and evaluate the scientific information needed by decision-makers to ensure that the ODSVRA's natural resources are adequately managed and protected. The subcommittee shall be composed of resource experts representing the five government agencies (CCC, SLO County, USFWS, DFG, DPR) and at least two independent scientists with expertise in Western snowy plover, California least tern, steelhead trout or other species of concern, as well as ecological processes to analyze technical data and provide scientific recommendations to the TRT; and
 - ii. A provision to submit a list of proposed members of the scientific subcommittee to the Executive Director for review and approval.
- c. The Charter shall establish a specific structure and process in order for the scientific subcommittee to do at least the following:
 - i. Recommend to the TRT the scientific studies and investigations that may be necessary to develop information needed by resource managers;
 - ii. Advise the TRT regarding the protection of the SVRA's natural resources by helping identify and review needed research measures and restoration efforts to rebuild or protect the ODSVRA natural resources;
 - iii. Evaluate monitoring results and reevaluate monitoring protocols contained in Oceano Dunes SVRA annual reports for the Habitat Monitoring System, reports on the breeding, nesting and fledgling success of the western snowy plover and California least tern populations in the SVRA, and other reports related to the environmental impacts of recreational activities;
 - iv. Provide comments on the adequacy of various scientific research studies and make management recommendations to the TRT; and
 - v. Submit the full recommendations of the scientific subcommittee to the Commission and make them available to the public, as part of the annual review process required in Special Condition 2.

5. **Annual Report.** The TRT and the ODSVRA Superintendent shall prepare annual reports (for the period of October to September) summarizing annual recreational use and habitat trends at the Park; and highlighting the TRT's major accomplishments (including progress made towards meeting the objectives of the TRT), projects, correspondence, and recommendations as well as a summary of subcommittees, working groups, and task force activities. The first annual report shall include (1) a draft or final Charter for the TRT, and (2) a description of the process by which the TRT will rank research and management questions and priorities. The second annual report shall include (1) the final Charter for the TRT (if not submitted with the first annual report), (2) the TRT's ranking of research and management questions and priorities, and (3) a scope of work for those projects identified as highest priority. Subsequent reports will include a status report on the progress of those projects as well as updates to research and management priorities

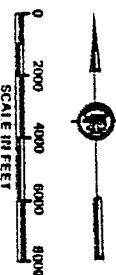
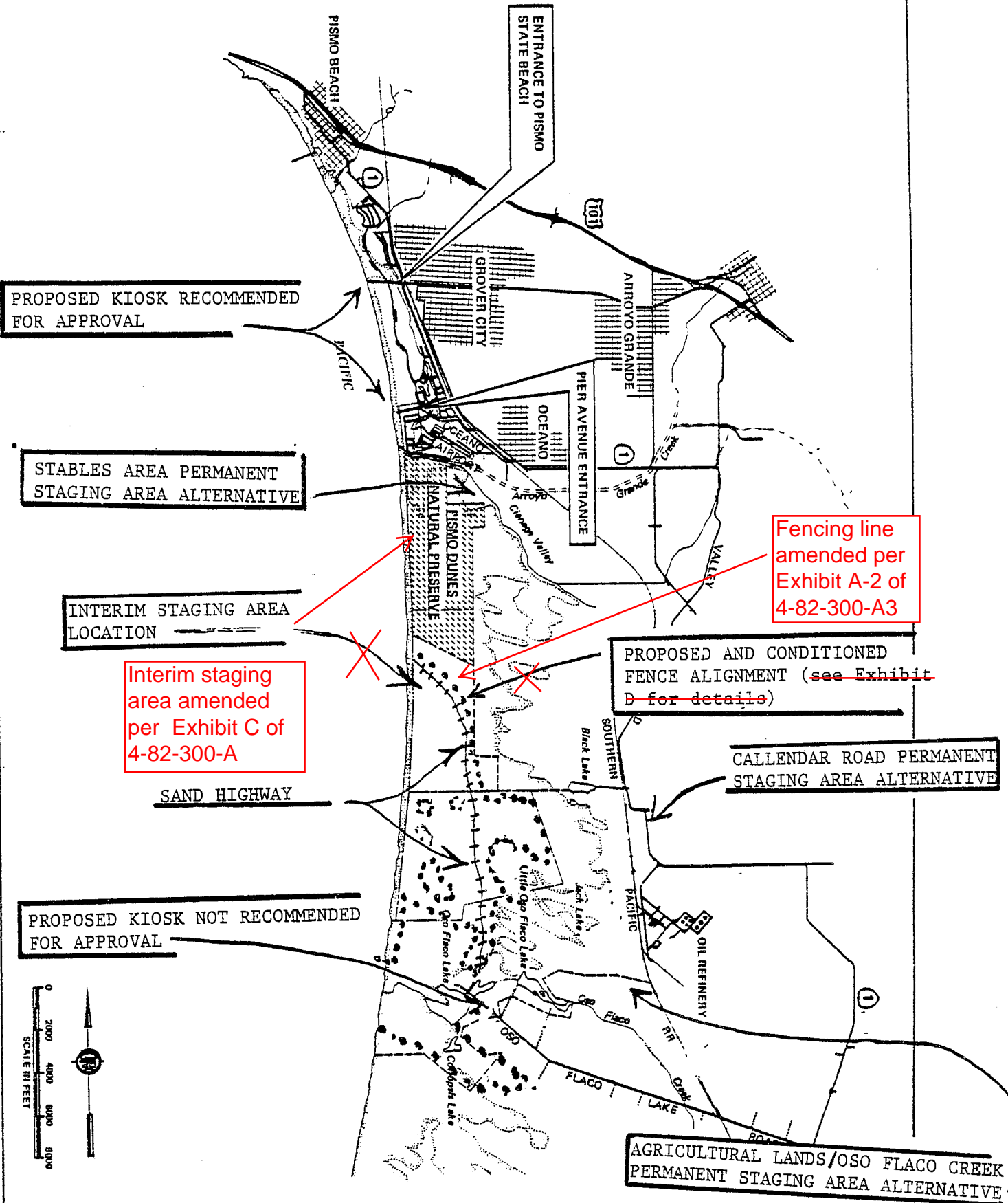
and the corresponding scopes of work for addressing those new priorities. One component of the Commission's annual review will be to evaluate the progress of the TRT's work as measured against the submitted work plans.

In identifying and selecting the priority research and management questions and projects, the TRT shall consider information developed by the USFWS and shall include the following:

- a.** Appropriate management techniques for the western snowy plover, California least tern, and steelhead trout including an evaluation of:
 - i.** How the geographic location of nests, proximity of nests to foraging areas, and nest closure techniques affect the hatching and fledgling success of the species,
 - ii.** What studies may be necessary to determine appropriate management techniques, or what known management techniques could be put in place, for protecting each species of concern, and
 - iii.** The potential environmental, recreational and economic costs and benefits of alternative beach/dune habitat protection strategies.
- b.** Appropriate management techniques for protecting water quality and dune habitats from potential pollutants that might result from motor vehicle fluids or other contaminants that might enter the ODSVRA and ocean through polluted runoff or direct discharges; and
- c.** The success of past revegetation efforts within the ODSVRA and the potential need for continuing or expanding those efforts, including expansion of vegetation enclosures.
- d.** Conduct a comprehensive, long-term monitoring and comparative analysis of the resources impacts associated with varying levels of use, including the highest (peak-use) attendance periods.

If alternative research and management questions and projects are identified as a higher priority than those listed in a through d above, the annual reports shall discuss the basis for such a determination. Annual reports shall be submitted to San Luis Obispo County and California Coastal Commission for informational purposes no later than January 1st of the following year. The first annual report (or portion thereof) shall be completed and submitted to the Commission no later than January 1, 2002.

EXHIBIT C



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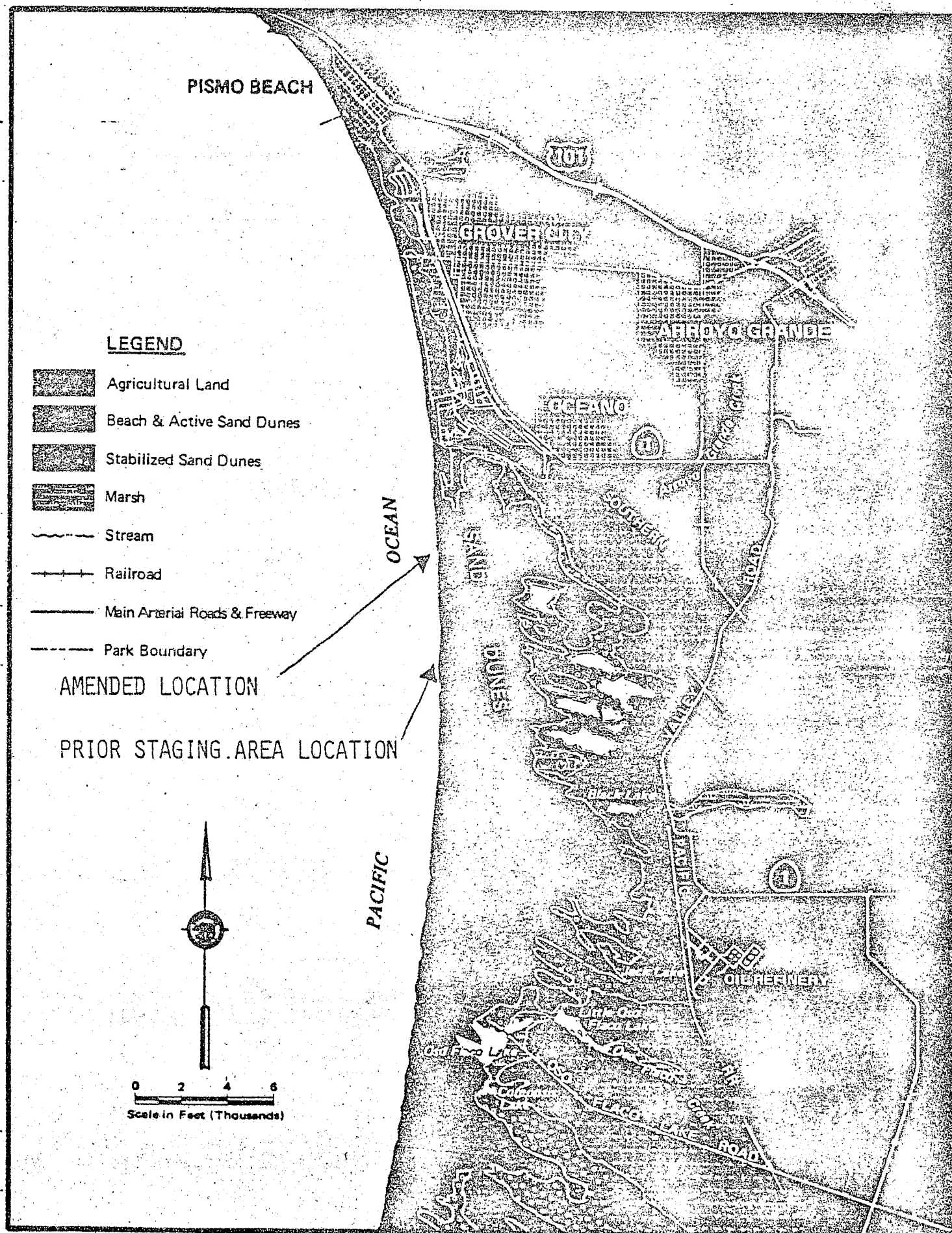
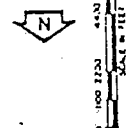


EXHIBIT A-2



- LEGEND**
- SVH A BOUNDARY LINE
 - - - EXISTING FENCE TO REMAIN IN PLACE
 - - - TRAIL OPENINGS TO BE FENCED OFF
 - - - NEW FENCE TO BE INSTALLED
 - EXISTING FENCE TO BE REMOVED
 - VEGETATION AREA





DISPUTE RESOLUTION
MEETING FACILITATION
DECISION SUPPORT
STRATEGIC PLANNING
PROGRAM MANAGEMENT

JOHN C. JOSTES

PLANNING, DISPUTE RESOLUTION AND PROGRAM MANAGEMENT

January 15, 2015

FINAL

Dr. Charles Lester
Executive Director
California Coastal Commission
45 Fremont Street
San Francisco, CA 94105

Re: Oceano Dunes State Vehicular Recreation Area (ODSVRA) Technical Review Team
(TRT) Fourteenth Annual Report

Dear Dr. Lester:

On June 17, 1982, prior to certification of San Luis Obispo County's Local Coastal Program, the South Central Regional Coastal Commission conditionally approved coastal development permit (CDP) 4-82-300 to allow the California Department of Parks and Recreation (DPR) to construct entrance kiosks, bathrooms and fencing at ODSVRA. A total of five amendments have been put into place since 1982. As required by the conditions and findings in Permit Amendment No. 4-82-300-A5, I am transmitting this 14th Annual Report to the Park Superintendent and the Executive Director to characterize the progress of the TRT over the 2014 calendar year in meeting its responsibilities as outlined within the permit. The TRT met once in person during the year, on December 15, 2014. It met again on January 12, 2015 to finalize this report.

In early November, the TRT received the 2014 report on the Nesting of the California Least Tern (CLT) and Western Snowy Plover (WSP) at the Oceano Dunes SVRA and the 2014 Predator Management and Avian Predator Management Reports and associated Necropsy Reports (see attachments). These reports and other information are summarized below.

In addition to recommendations pertaining to the nesting season, this Annual Report notes that the TRT has accomplished its mission and all of the tasks assigned to it by the CDP. However, after considering several options outlined at the conclusion of this report, the TRT was of mixed opinion that the advisory committee should continue to serve in its current role and continue to meet until such time as the Draft HCP has been released for public review (see discussion below).

Summary of the 2014 Nesting Season

The 2014 Nesting Report found that WSP had a good hatching success with 86.2% (compared to an 77.8% hatch rate for 2013), and a chick fledging success rate of 35.8% (compared to a 55.4% fledging rate for 2013 and a 25.0% fledging rate for 2012). The WSP fledge rate was an estimated 1.63 juveniles fledged per male, exceeding the U.S. Fish and Wildlife Service (USFWS) recovery goal of one fledged chick per adult male but falling below the previous year's rate of 2.03. CLT had a 2% decrease of breeding pairs from the 2013 season with a minimum of 47 pairs compared with 48 in 2013. Fifty-eight of the 76 chicks fledged for a rate

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of 76.3% and 1.23 fledged chicks per pair. The following three paragraphs provide details regarding the summary findings of the report.

Staff of Oceano Dunes State Vehicular Recreation Area (Oceano Dunes SVRA, ODSVRA) and Point Blue Conservation Science (Point Blue) monitored breeding California least terns (*Sternula antillarum browni*) (least tern, tern) and western snowy plovers (*Charadrius nivosus nivosus*) (snowy plover, plover) at ODSVRA, San Luis Obispo County, California, in 2014.

All least tern nests were inside a large seasonally fenced enclosure in the southern portion of the vehicle riding area. There was a minimum of 47 breeding pairs, similar to the 48 breeding pairs in 2013, and above the average of 40 pairs (range=20-55) from 2002-13. There were 49 known nesting attempts. Of the 46 nests with known location and fate, 42 hatched, for a nest hatching rate of 91.3%. Of the four nests that failed, one was abandoned pre-term (prior to the expected hatch date); one was abandoned post-term; one was abandoned, unknown if pre- or post-term; and one failed due to an unknown cause. Seventy-six chicks hatched and 50 were color-banded to individual. Fifty-eight of the 76 chicks (including 16 unbanded chicks) are known to have fledged (seen when 21 days old or older), for a chick fledging rate of 76.3% and 1.23 chicks fledged per pair. Predation was documented for a minimum of two terns (juveniles or adults). The maximum number of juveniles produced that may have survived to leave the site was 52 (six either known dead or last seen with nonsurvivable severe injury).

There was a minimum of 226 breeding snowy plovers (120 males and 106 females), compared to 163 in 2013. One hundred and sixteen banded birds were documented as breeding, 101 of these were banded as chicks and fledged from ODSVRA. There were 262 known nesting attempts, 201 were in the southern riding area seasonal enclosure (Southern Enclosure), 44 in Oso Flaco, one in the open riding area, and 16 from unknown locations (nesting known only by detection of brood). Of the 239 nests with known location and fate, 206 hatched for a nest hatching rate of 86.2%. Thirty-three nests failed, attributed to the following causes: abandoned pre-term (19); abandoned post-term (1); abandoned unknown pre- or post- (5); abandoned, suspected due to wind (1); flooded (2); unknown cause (2); unidentified predator (1); coyote (*Canis latrans*) (1); and unidentified avian (1). Of the 547 hatching chicks, 423 were color-banded to brood (157 fledged) and the fate of the 124 unbanded chicks is known (39 fledged). A total of 196 chicks fledged for a fledging rate of 35.8%. Survival was lower for chicks hatching in the early season compared to late season. In particular, of the initial 40% (220/547) of the total number of chicks produced, only 17.7% (39/220) fledged. This compares to a 48.0% (157/327) fledging rate for subsequent hatching chicks. For the initial 40% of chicks, 62.4% (53/85) of the broods lost all chicks. This compares to 32.8% (45/137) for subsequent broods. One chick fledged per breeding male is the estimated number needed to prevent the population of snowy plover from declining (assuming approximately 75% annual adult survival and 50% juvenile survival) (U.S. Fish and Wildlife Service 2007). In 2014, an estimated 1.63 juveniles fledged per male at ODSVRA. For the 13-year period 2002-14, average productivity was 1.39 juveniles fledged per breeding male.

In its review of the 2014 Nesting Report, the Scientific Subcommittee (SSC) provided a more regional context with regard to this year's breeding/nesting season noting that:¹

Western Snowy Plover:

No specific data for Washington or Oregon (Recovery Unit [RU] 1) were available, although it appeared SNPL did very well in Oregon; there were more juveniles than ever before. RU 2 (Del Norte, Humboldt, and Mendocino counties) data were not provided; the 2014 report is available at <http://www.fws.gov/arcata/es/birds/WSP/plover.html> along with other reports, such as the 2014 breeding window survey. SNPL in Monterey (part of RU 4) did not do as well as in an average year but still fledged 1.1 young/male with over 400 breeding adults. Survival was extremely high, and a high number of males and females rejoined the nest sites.

Breeding data for RU5 (San Luis Obispo, Santa Barbara, and Ventura counties), which seems to be doing well compared to other units, were still preliminary and are not reproduced here. RU5 average summer window counts and management potential from the SNPL Recovery Plan were as follows:

Recovery Goals: Numerical targets; summer window counts

Segment	Management Potential	5-year average Summer window count (x1.3)
Morro Bay Beach (CA-81)	110	117.8 (153.1)
Pismo Beach/Nipomo Dunes (CA-83)	350	188.6 (245.2)
Vandenberg Air Force Base (CA-84) (a.k.a. Minuteman Beach)	250	196.8 (255.8)
Santa Ynez River Mouth/Ocean Beach (CA-85) (a.k.a. Vandenberg Air Force Base)	150	
Santa Rosa Island (CA-93 - 1 through 11)	130	8.4 (10.9)
Mugu Lagoon Beach (CA-99)	110	68.8 (89.4)
San Nicolas Island (CA-100 - 1 through 15)	150	51.0 (66.3)

Neither the Chevron property nor Rancho Guadalupe County Park used breeding exclosures. Some sites will likely never meet the recovery plan management potential due to changes in conditions, e.g., San Nicolas Island, where pinniped numbers are increasing. The USFWS is reviewing a population viability analysis and also is developing a new lower impact monitoring technique. Due to staffing issues (e.g., staffing at the Ventura office is down 50% since 2010), the USFWS is forced to defer the 5-Year Status Review to higher priority projects.

Oceano Dunes District (District) has seen pretty remarkable growth in the adult breeding population. Good survival contributes to a good breeding population. High nest abandonment and predation occurred early in the season. Monitors sent a high number of eggs (due to abandoned nests) to Monterey Bay Aquarium. The District had one of the highest numbers of nests, a good hatch rate (86%), and almost 200 fledges. Figure 10 in the 2014 SNPL/LETE nesting report shows the difference in results in the two season halves, which were reversed from prior seasons. The early season had a poor fledge rate. The District got aggressive with predator control, including gulls and owls and eventually coyote. Merlin was active in the first

¹ Breeding data included in this report are for discussion purposes only and should be considered draft.

part of the season. The District and UC Santa Barbara continue to collaborate on assessing food resources, but UCSB researchers are not able to take samples or conduct related studies.

RU6 (Los Angeles, Orange, and San Diego counties) breeding season window survey results indicate a generally increasing population trend since 1991 but relatively stable numbers over the past four years (range 331-358 adults; 348 in 2014). The primary threat in RU6 appears to be predation of chicks, particularly with increasing local populations of corvids, gulls, and peregrine falcons; compression of potential predators into remaining non-urban habitat; and increasing restrictions on raptor management. Other threats include ongoing disturbance and suspected unquantified losses of chicks to governmental vehicle activity and encroachment of saltmarsh onto mudflats, which decreases foraging habitat and blocks continuity and chick access between nesting and foraging habitats.

California Least Tern

Although there has been a long-term increasing trend in breeding adult numbers statewide, numbers plateaued through the 2000s and have dropped since 2009. Fledgling production has remained low each season since 2002 with a generally decreasing trend. Northern LETE breeding sites seem to be doing very well through the Pismo Dunes area, but everything south was doing pretty poorly. San Diego results were a bit better than last year, but last year was dismal. Poor breeding results (since 2009) are leading to reduced numbers of breeding adults. The primary threat in San Diego appears to be predation of chicks, particularly with increasing local populations of corvids, gulls, and peregrine falcons; additional threats include compression of potential predators into remaining non-urban habitat and increasing restrictions on raptor management.

Breeding LETE pairs within the District are really hovering around the same numbers, raising the question as to why the numbers are not climbing given ongoing fledging success. LETE continued their ongoing breeding focus in the 6 and 7 exclosures with no nesting in Boneyard. A high number of injured and dead juvenile LETE were recovered within or immediately adjacent to the 6 exclosure. The cause of the injuries and mortality is unknown but could be related to predation (particularly peregrine falcon), fence collision, a combination of the two, or other unknown factors. SSC members noted at least some of the injuries could be consistent with predation. Since there are so many causes of mortality or severely injured birds, and especially given the peregrine falcon population, it seems unlikely that all such losses are caused by fence collisions. Fence injuries can occur, however, and it is possible District monitors detect events not detected at other sites. It is also possible some birds could have hit the fence while being chased by a predator. Without more information, no conclusions could be reached. If indeed LETE are colliding with the fence, it is unclear how such collisions could be avoided. Even if collisions cause some losses, it is better with the fence given reduced depredation. More information is needed to try and determine what role fence and predation are playing. The District may explore alternative necropsy providers with more experience in evaluating trauma and predation.

The District's environmental scientists may also reach out to CalPoly researchers to see if research into certain questions is possible. Possible questions include: Why are least LETE concentrating where they do? Why have they abandoned Boneyard? Did the shoreline become more attractive once disturbance there was eliminated? (Perhaps Boneyard was always suboptimal but LETE used it when they had no choice.) Why hasn't the LETE population

grown? Is the peregrine falcon relocation/release policy proving problematic (an individual peregrine falcon that was known to be preying on LETE was captured but was returned).

Regarding the LETE losses, the District has LETE take authorization related to LETE monitoring plus a take avoidance agreement, which has a provision to evaluate the previous year's take. In the current case where biologists are not certain about cause, the respective agencies will likely set up a meeting to discuss issues and possible responses. Possible responses could include changes to fencing design, enclosure size, or enclosure configuration. Peregrine falcon is also fully protected, which affects how it can be managed.

Key Issues

During 2014, the TRT continued to discuss several important issues related to its role as defined by Coastal Development Permit 4-82-300-A5. These issues included:

- *A continuing desire to have the 3rd draft of the Habitat Conservation Plan (HCP) submitted to the USFWS for their review with the ultimate goal of releasing a public review draft as early as possible;*
- *Issuance of an incidental take permit by the USFWS;*
- *The effectiveness, costs and adaptive nature of management and monitoring activities within and adjacent to the ODSVRA;*
- *Dust control activities and mitigation efforts and their off-site implications, as well as their impacts on the overall size of the riding area within the park;*
- *Positive and negative on and off-site impacts of Huckfest, a special event held at the park subsequent to the close of nesting season; and,*
- *A desire to conclude the efforts of the TRT with a tangible and useful outcome responsive to its assigned purpose (see Facilitator's Remarks below).*

The TRT also discussed implementation of the Particulate Matter Reduction Plan (PMRP) and the extent and effectiveness of dust control measures implemented to date. A Draft Program EIR is currently under development and scheduled for release in early 2015. The environmental document will focus on the impacts of dust control measures over a five-year time horizon including those that pertain to possible changes to the amount of area open to riding. As with other regulatory and species conservation management issues, there continues to be a focus on achieving a balance between the legislated off-highway vehicle (OHV) uses in the park, the amount and intensity of riding activities and their on- and off-site impacts, and the regulatory requirements for species and habitat conservation measures.

As with previous years, the ODSVRA undertook its review of monitoring and management efforts based upon the recommendations of its SSC and its own staff familiar with the resources present within and adjacent to the park.

Research and Management Priorities

Under Special Condition 5 of the CDP, the permit indicates that when selecting the priority research and management questions and projects, the TRT should consider 1) information provided by the USFWS and National Oceanographic and Atmospheric Administration/ National Marine Fisheries Service (NOAA/NMFS) and include appropriate management

techniques for the WSP, CLT, and steelhead trout; 2) appropriate management techniques for protecting water quality and dune habitats from potential pollutants; 3) the success of past revegetation efforts and potential need for continuing or expanding these efforts, including expansion of vegetation exclosures; and, 4) comprehensive long-term monitoring and comparative analysis of resource impacts (CDP A-5 pp. 8-9).

The completion of a public review draft of the HCP continues to be highest priority with regard to research and management initiatives. Once refinements are made in the administrative draft HCP, it will be reviewed and final revisions made prior to releasing a public review draft. At this time, the initial two chapters of the HCP have been submitted for review by the Service and an additional two chapters are being finalized for submittal to and review by the Service, with the goal of finalizing a draft HCP at the end of calendar year 2015. However, given the need to draft and circulate an EIR/EIS, and a Biological Opinion, conduct public review and finalize those documents, completion of the HCP process could take an additional 2-3 years.

The SSC recommendations and management efforts outlined below, and the results of the 2014 Plover/Tern Nesting Report, all document the need to actively manage resources through a balance of resource protections and user activities within the park. Following this approach has, and should in the future, resulted in a positive effect on WSP and CLT and other sensitive species within the park boundaries, while still providing recreational opportunities for which ODSVRA was established. The SSC no longer calls out a number of recommendations within their report because they have become standard operating procedures at ODSVRA.

In 2012, the TRT was also in general agreement that one additional priority for 2013 be that the USFWS should compile a spreadsheet of what other land owners have accomplished within the recovery unit (specifically, within subunit CA-83a) with regard to WSP recovery efforts. At that time, members of the TRT believed that ODSVRA is a role model for species management and that other landowners within the subunit should contribute proportionally with regard to recovery as well. Such a spreadsheet would assist land managers in determining what efforts should be undertaken with regard to the La Grande Tract, the National Wildlife Refuge, and the HCP on the Rancho Guadalupe Dunes County Park in Santa Barbara County. That spreadsheet has not been developed at this point in time.

Arroyo Grande Creek and Lagoon Fishery and Aquatic Resources Monitoring

DPR continues to undertake water quality and fisheries monitoring of the Arroyo Grande Creek mouth and lagoon through expertise provided by state fisheries biologist Doug Rischbieter of DPR and the California Department of Water Resources (DWR). However, continued conditions of exceptional drought throughout central and southern California have had significant negative impacts upon water levels and quality within the Arroyo Creek watershed and the lagoon. While the current water quality in the lagoon is not optimal, no vehicle effects upon threatened or endangered species were identified in 2013. No water quality testing was undertaken during 2014 with the exception that water quality testing is planned for some time in late December 2014 when creek flows are sufficient and vehicle activity is at or above average levels.

Oceano Dunes SVRA Soil and Water Quality Sampling Project

DPR initiated a contract in May 2009 with the DWR Division of Environmental Services, Environmental Compliance Branch. During the time frame between 2009 and 2013, sand and water were sampled and analyzed to determine existing chemical, physical and biological

constituents including: California Code of Regulations (CCR) Title 22 metals (CAM-17), bacteria/fecal coliform, pH, and total petroleum hydrocarbons. Given ongoing drought conditions and a desire to sample both soil and water quality during times of higher flows through the lagoon, these efforts were not undertaken this year. In the past, soil sampling has not found anything noteworthy with regard to water or soil impacts from vehicles.

Vegetation Islands Management

In previous years, vegetation islands management has focused primarily on stabilizing the western edges of existing vegetation islands within the ODSVRA so as to minimize fragmentation. This approach is continuing, but at levels less than those attempted during the initial years of the management effort.

Cultural Resource Preservation Efforts

Previous understanding of cultural resource sites in the North Oso Flaco area of the Park indicated that there were three separate sites present in the area. More recent sand movement has revealed that these three sites are actually part of a larger single archaeological site. As a result, approximately 6 acres of riding area has been closed in order to protect these sensitive resources consistent with the state and federal regulations. Consultation with tribal representatives has been a part of this process.

Air Quality Studies and Monitoring

Ronnie Glick reported that 5,200 hay bales were spread over 32 acres of the Park at a cost of approximately \$400,000 in an effort to control and monitor wind-blown dust impacting the Nipomo Mesa area. Efforts were made to evaluate the effects of these measures on the existing air quality monitoring station at the CDF fire station on the Mesa, but no conclusions were drawn with regard to effectiveness of the program. The inclusiveness was related to the location of hay bales in the Le Grande Tract, somewhat north of prevailing winds that are measured at the CDF station. Changes to the location of future hay bales are expected to be made so as to site them in areas directly upwind of the monitoring station and therefore be better able to draw meaningful conclusions regarding the effectiveness of this program.

These efforts are part of a longer-range 5-year mitigation program presently being evaluated in a Program EIR currently under development. In early 2015, a Notice of Preparation (NOP) will be circulated and public and agency input sought regarding the scope of the EIR. The EIR will be released several months after the NOP comment period closes. Peter Keith, representing the business community suggested an alternative approach whereby portions of the dunes upwind of the monitoring station could be irrigated with salt water to reduce wind-blown dust, or that new vegetation could be planted and irrigated to serve the function of Eucalyptus windrows that had provided some degree of wind blockage and dust control in the past, prior to more recent development in the Nipomo Mesa area.

Coastal Commission staff indicated that they were doing everything within their permitting authority to work with CDPR to provide emergency permits for the mitigation efforts, given what they consider as a public health emergency

Members of the public addressed the TRT on this issue and urged that more expeditious and effective efforts needed to be taken to mitigate wind blown dust. In particular, they suggested that hay bales be placed in active riding areas and off-road activity be curtailed in order to reduce off-site dust and particulate matter impacts.

One TRT member suggested that year round closures of portions of the Park, as recommended by the Scientific Subcommittee, be designed and located in such a manner as to not only protect nesting habitat, but also mitigate wind-blown particulate matter as well.

2014 Predator Management

The 2014 Oceano Dunes SVRA plover/tern nesting report also contains as attachments the predator management reports prepared by the U.S. Department of Agriculture (USDA) Wildlife Services and the Ventana Wildlife Society. Both reports contain a brief list of recommendations, which are being implemented at Oceano Dunes SVRA as follows:

USDA Wildlife Services

- Public education on the restriction of feeding wildlife. COMPLETED
- All garbage containers should have reinforced lids to prevent garbage consumption by wildlife. ATTEMPTING (see Recommendation 9)
- Maintain the height and strength of the perimeter fence surrounding the enclosures. COMPLETED
- Continue to enforce the leash law for pets on the beach. COMPLETED
- Remove dead animal carcasses from the beach to eliminate alternate food sources that serve as a lure to scavenging predators such as coyotes. COMPLETED
- Remove known least tern and snowy plover predators, especially on the shoreline and in nesting areas, prior to predation. COMPLETED
- Continue to allow the Wildlife Specialist to get permitted to enter areas where predators are located and where damage is occurring. COMPLETED

Ventana Wildlife Society

- Continue the practice of depositing wood chips and other substrates, including manufactured tern shelters, into the 6, 7, and 8 enclosures early in the season and place wrack on the enclosure shoreline. COMPLETED
- Keep the west fence in its present location and do not move it to the west where it would functionally create a narrower shoreline with less food and cover. COMPLETED
- Maintain the current size of the fenced tern and plover nesting enclosures. COMPLETED
- Purchase several bird-whistler devices and train several resource ecologists in their use for hazing avian predators.

This was implemented in 2014, although its effectiveness was unclear. In such a large area predators may simply have moved elsewhere. The devices do give the option to haze a predator without leaving vehicles, which serve as blinds. The devices did not seem to spook SNPL because they were already crouched down due to the presence of a predator. Some disruption of LETS has been observed at other sites.

The TRT continues to be supportive of the efforts at predator management.

Operational and Management Measures Undertaken by ODSVRA

ODSVRA continues to implement recommendations and measures from previous priority studies identified by the TRT and operational measures resulting from ongoing field work completed by DPR that serve to directly or indirectly minimize impacts on shorebirds. Oceano Dunes District staff continues to meet and/or exceed key management and monitoring issues that have been identified in the TRT report. These measures are similar to those of 2013 and include:

- Enforcement of camping and day use capacity limits consistent with the CDP (1000 camping vehicles, 2,580 street-legal day use vehicles, and 1,720 off-highway vehicles). ODSVRA implements on-going, focused enforcement to eliminate illegal camping vehicles.
- Restricting non-street legal OHV use and camping to approximately 3 ½ miles of beach (non-nesting season only). Restricting non-street legal OHV use and camping to approximately 2 miles of beach during the nesting season.
- Enforcement of 15 MPH beach speed limit. Additional speed limit signage on the beach continues to be implemented. The addition of portable signage was first implemented in 2005 and has proven to be effective in reducing speed related violations. Volunteers assist with portable and adjustable speed limit signage on beach that can be moved with the tides to give the drivers a better indication of the speed limit, especially important during busier use periods. Speed enforcement by radar was first implemented in mid-summer 2005, and additional more sophisticated Light Detection and Ranging (LIDAR) enforcement was initiated in 2006. Both of these measures continue to be utilized.
- In 2014 focused speed enforcement was implemented by law enforcement staff in the mid-ramps area between Grand Avenue and Pier Avenue beach area, including the placement of portable speed limit signs to protect WSP that congregate in the area during the fall months following the nesting season. Additional monitoring of tide conditions during this period and action taken to restrict vehicle access to the beach via Grand Avenue if tide conditions warrant.
- Public outreach and education. Park brochure and informational flyers, the FM radio station, Off Road PALS (Police Athletic League) activities directed at youth rider safety and orientation, ASI (ATV Safety Institute) certification program to provide ATV safety orientation and training, establishment of a registered ATV safety certificate training site within ODSVRA, organized clean up events, volunteer sound testing, ATV and Sandrail rental concessionaires and employees providing safety and orientation training, concessionaire employees attending ATV safety certificate training and becoming certified ASI safety trainers, concession employees also attending resource management and protection training.
- All Oceano Dunes District staff and concessionaire staff attend annual WSP/CLT training and general resource management orientation annually.
- The creation of a “Volunteer Dune Patrol,” made up of volunteers from the riding community who assist ODSVRA staff with public outreach and education regarding ODSVRA’s resource management and public safety programs. The program is growing and it remains very active with additional volunteers recruited for 2014.
- Dog leash law enforcement.

- Maintenance of an off-beach vehicle corridor, parallel to the beach to allow north/south vehicle traffic flow, to assist in relieving the volume of vehicle traffic directly on the beach during high tides.
- Maintenance of vehicle corridors, perpendicular to the beach, at intervals along the beach to assist vehicles to enter the dunes from the beach.
- Maintenance and enforcement of areas restricted to OHV recreation (1.5 miles of beach at Oso Flaco and Arroyo Grande Creek). These areas are closed entirely to motor vehicles.
- Maintenance and enforcement of areas restricted to non-street legal vehicles 1.5 miles of beach from Grand Avenue to beach post #2.
- Continued protection of the Arroyo Grande Creek lagoon, impounded water areas and the crossing of AG Creek through the implementation of restrictions, traffic control measures and direct and ongoing recommendations coming from continued aquatic analysis. The ongoing implementation of a “take avoidance plan” for steelhead in cooperation with NOAA/NMFS.
- Improved regulatory signage throughout ODSVRA. Five electronic billboards used throughout the park to improve regulatory advisements to the public and to provide public information.
- Improved response and care for sick and injured birds. A bird care way station is set up at the ranger station where resource staff care for sick and injured birds until they can be transferred to an animal care facility. A strict on-scene staffing protocol assures protection of sick and injured birds until help arrives.
- Improved response and care for sick and injured marine mammals. Strict on scene staffing protocols continue to be emphasized to assure the protection of marine mammals until recovery help arrives.
- Generally limiting motorized special events to back dune areas and areas well away from nesting area and typical roosting and feeding areas. Motorized events are subject to the DPR Special Event Permit process and may be subject to CEQA review.
- When park staff access Oso Flaco from the park, they will coordinate with a trained monitor who will be on site prior to entering the area, and stay on site for the duration of the work. The interior Boneyard fence ties into the west Boneyard perimeter fence just to the north of the Oso Flaco gate. Having an access route on the east side of the interior Boneyard fence would allow for efficient fence maintenance and allow for the Oso Flaco road to be maintained several times a season. This will also allow park staff access to the south boundary fence to maintain the waterline boundary as needed.

Annual OHV use statistics in the form of monthly graphs for the period October 1, 2013 to September 30, 2014 are presented in Attachment 3 to this report. They show 7 exceedances of OHV use limits established by the CDP.

SSC Recommendations and TRT Commentary on the 2014 Plover/Tern Breeding Report

DPR transmitted to the SSC and TRT “*Nesting of the California Least Tern and Snowy Plover at Oceano Dunes State Vehicular Recreation Area, San Luis Obispo, California 2014 Season*” prepared by ODSVRA, which includes as attachments the “ODSVRA Predator Management Report, 2014” prepared by the USDA Wildlife Services, the “Avian Predator Management

Project: Trapping and Relocation of Problem Predators at Oceano Dunes State Vehicular Recreation Area in 2014,” and necropsy reports.

The SSC met on November 24, 2014 via conference call and, upon review of the 2014 report, made the recommendations outlined below. As was done in last year’s Annual Report, this year’s report lists the full text of each recommendation contained within the 2014 Nesting report as well as the comments offered by the SSC. As with previous annual reports, the commentary provided by the TRT is also included under each recommendation.

These overall comments apply to all recommendations below; additional TRT commentary is provided. Where recommendations are new or updated, comments are added to that effect.

1. **Continue Monitoring** — Recommendation supported. No additional comments.

TRT Commentary: No additional TRT comments on this recommendation.

2. **Continue banding least tern and snowy plover chicks**—Recommendation supported. No additional comments

TRT Commentary: No additional TRT comments on this recommendation.

3. **Continue banding least tern chicks to individual**—Recommendation supported. No additional comments.

TRT Commentary: See TRT Commentary under 4, below.

4. **Continue option to band adult snowy plovers**—Recommendation supported. No additional comments, but see Recommendation 14 regarding banding least tern adults.

TRT Commentary: Regarding banding in general, Jim Suty raised the question regarding the level of risk posed to chicks and adult birds by such banding. Ronnie Glick noted that there is a small, but measurable chance of impact/injury when any bird is banded, but that the value of the information gained through banding outweighs the risk of impact or injury. Bill Standley with USFWS didn’t recall more than a single injury over the time the CDPR has had an incidental take permit (ITP) under consideration by the Service.

5. **Continue to provide adequate-sized bumpouts and single nest enclosures to better protect least tern and snowy plover nests in or close to the open riding area**—Recommendation supported.

TRT Commentary: Jim Suty noted that one bumpout had a failed nest this year and asked whether there is an alternative to the “bumpout” approach, such as harvesting the egg and rearing it elsewhere. Ronnie Glick responded that this is an appropriate item for discussion within the Habitat Conservation Plan (HCP), but that CDPR only takes nests to wildlife rehab if there is no other option. He indicated and Bill Standley concurred that the regulatory mandate is for in situ protection, even if that ultimately results in the loss of an individual. Bill further noted that captive-reared chicks do not necessarily have the same chances of long term survival as wild-reared chicks. He noted that the Service is trying to recover birds in the habitat where they evolved, not in zoos, without human intervention as much as possible. Peter Keith also expressed his support for captive-reared chicks if it can add to the population of fledged chicks.

Bill responded that the Service would be happy to entertain captive rearing within the context of the HCP if determined to be the best thing for the birds, but that such an initiative would have to be undertaken under an Incidental Take Permit/HCP.

6. **Continue to position a large section of the shoreline enclosure fence further east to provide a wider functional shoreline habitat**—Recommendation supported. Ronnie Glick confirmed that this approach has been utilized for the past two years.

TRT Commentary: No additional TRT comments on this recommendation.

7. **Continue to enhance habitat in the Southern Enclosure by distributing natural materials, seed, and plants and increase efficiency with the help of maintenance staff and heavy equipment**—Recommendation supported. No additional comments.

TRT Commentary: There was considerable TRT discussion of habitat dynamics in the southern portions of the Park (6, 7, and 8 enclosures). Jim Suty noted that habitat in this portion of the park had been changing with more vegetation hummocks developing. Ronnie Glick responded that particularly in the 8 enclosure there is more vegetation and hummocky dune habitat, but that as the hummocks get taller, and more vegetated, they do not function as well for nesting. The reason for this is that the birds can't see predators as well and prefer to use smaller hummocks 2-3 ft. in height. He noted that there is a "sweet spot" where a little bit of vegetation is helpful to nesting success, but too much vegetation or dune height is not. Jim noted that some vegetation removal might help plover nesting success and that the CDPR should remove excessive vegetation to spread out the density of breeding plovers. He also indicated that SLO APCD should be made aware of these dynamics in terms of the trade-offs between particulate matter reduction and nesting success. He indicated that there is a need to clearly document what is desired habitat and then make the whole area like that. Ronnie responded that there is considerable uncertainty in terms of what exactly leads to productivity differences among the enclosures and how to exactly define the "sweet spot".

8. **Continue to study the benefits of wrack addition to the Southern Enclosure shoreline and inoculation with wrack-associated invertebrates as a possible means to restore invertebrate species and biomass (these invertebrates are part of the prey base for snowy plover chicks, juveniles, and adults)**—Recommendation supported.

The SSC discussed whether wrack addition and supplementation are effective at supplying prey base for SNPL and whether it is as effective as other options. Jennifer Dugan, Ph.D. (UCSB), conducted extensive studies of breeding season wrack from 2007 – 2012 and concluded this strategy has value. The quantity of talitrids (amphipods) in the wrack is a good indicator of wrack forage value. Food is only one part of the picture. Ronnie Glick will investigate whether there is a report that can be circulated to the SSC for review. The SSC recommends this study be continued as has been done and be reviewed in 2015.

TRT Commentary: No additional TRT comments on this recommendation.

9. **Continue to look for an appropriate design to cover trash dumpsters**—Recommendation supported. The dumpster issue was not solved in 2014. Due to water quality requirements, in addition to endangered species concerns, the dumpster cover remains a high priority, and a disposal company representative visited the park in

November 2014 to explore options for covering the dumpsters. The 20 cubic yard dumpsters make covers more challenging than smaller dumpsters, and the cover must be easy enough to use so that visitors are not discouraged from using the dumpster.

TRT Commentary: Jim Suty suggested that this issue is being overblown because the dumpsters are miles away from the exclosures. Ronnie Glick responded that this recommendation is a “good housekeeping” program that deserves the attention of CDPR throughout California. He noted that the CDPR is in contact with a manufacturer of a new product that may prove beneficial in this regard.

10. Continue to maintain option to salvage and rescue eggs, chicks, juveniles, and adults under very limited circumstances—Recommendation supported.

TRT Commentary: No additional TRT comments on this recommendation.

11. Conduct study evaluating alternative plover/tern habitat treatment strategies—Ongoing SSC recommendation.

The District was unable to implement this recommendation in 2014. The SSC continues this recommendation for 2015. The 2014 plover/tern nesting report continues to note the compromised quality of the habitat available in the riding area at the start of the breeding season.

The option as stated in the SSC 2013 Recommendations Report is as follows: The seven-month closure may not allow enough time for habitat to recover from OHV recreation, especially by the beginning of the breeding season. During the non-breeding season, snowy plovers continue to roost between Grand and Pier Avenues. The question remains as to whether a year-round closure in some configuration would best serve breeding plovers and terns. The park has never conducted a controlled experiment to determine whether year-round closure is beneficial. Although the park implemented year-round closures of 11 and less than 4 acres in winters 2003/2004 and 2004/2005, respectively, the closures were not implemented in a manner that allowed biologists to draw conclusions as to whether such a closure is the optimal management approach.

Available data do not allow for a scientifically-based recommendation for or against a particular habitat management strategy. Although the year-round closure seemed to benefit breeding success, it is possible that enhancement measures implemented by Oceano Dunes SVRA could be just as effective. Because available data are inconclusive, the SSC recommends scientific evaluation of year-round closure. A study should be designed and implemented allowing scientific analysis of year-round closure in comparison to habitat left open during the non-breeding season. A formal proposal for this study should be made available for SSC and TRT review.

TRT Commentary: Gordon Hensley voiced his support for this study and suggested that under the Park’s enabling legislation, that it is obliged to carry out follow-up studies to manage the resources under its control. He noted that the Scientific Subcommittee has made this recommendation several years in a row and that implementation of this recommendation is necessary. Ronnie Glick responded that the Park does have year-round closed areas and has been learning from those efforts. Some members of the TRT equated the Scientific Subcommittee’s recommendation for a year-round closure to a permanent closure of portions of the park to OHV use. Paula Hartman indicated she had been providing support to the Scientific Subcommittee for

13 years and has not heard anyone on the subcommittee implying that their recommendation is about closing the park.

Justin Buhr indicated that it was his understanding that the recommendation pertained to a small section of the Park and not the entire Park. He noted that portions of the riding area are closed for the summer nesting season, but that businesses still thrive, and there is no reduction in carrying capacity at the Park. Peter Keith noted that the size of the riding area has been reduced from 25,000 acres prior to 1983 to less than 1500 acres now. Park Superintendent Brent Marshall noted that the North Oso Flaco dunes are permanently closed to OHV use. Gordon suggested that the Scientific Subcommittee may wish to consider a report that compares the nesting productivity of this area with those areas open to riding and an alternative approach. In the end, there was no resolution of differing perspectives on this recommendation regarding year-round closure as a habitat treatment strategy.

12. Consider option to capture previously banded adult least terns to determine their origin – Ongoing SSC recommendation.

The District did not pursue implementing this option in 2014. Only a handful of LETS could have been feasibly captured, and only two would have been candidates since they had only silver bands. It could be useful to have this option, but there are risks, including possibly injury, abandoned nests, or disturbance to adjacent broods of SNPL chicks. By the time LETS nests are ready to hatch, there is a lot of activity in the colony, and it would be very hard to get into the area without significant disruption. It may also require hiring additional staff.

The option is as follows: Based on the number of banded plover adults showing up, the SSC is interested in banding adult least terns. It could be valuable to know if least terns are coming in from elsewhere, which would affect how the site is managed. Ronnie is concerned it could cause nest abandonment, but others have had very low abandonment rates due to trapping. Trapping can be quick and relatively non-intrusive. Adults are caught via remote control trap after the eggs have been temporarily replaced with decoy eggs to avoid egg damage. It requires two visits but takes no more than 10-30 minutes from start to finish and takes 1-20 minutes for adults to return. Trapping is done at 7-14 days incubation so birds are invested in the site and less likely to abandon. Biologists do not trap once the majority of nests have hatched.

The logistics at Oceano Dunes SVRA are very challenging since the 6 and 7 enclosures are very narrow. It is hard to get in and band due to nesting density, and there are concerns about chasing chicks into the riding and camping area. The presence of nesting plovers makes it more challenging. Ronnie will need to discuss this idea with his staff.

Regarding whether banded chicks will eventually return and give this data anyway, the origins of least terns that only have USFWS bands would be unknown. This effort would specifically targeting only those individuals. All chicks now get a metal band, but you cannot always see whether birds are banded due to distance. For a while at the SVRA, the other leg got a plastic band that wasn't well retained. Monitors could also try cameras.

Ultimately this information would help support the strong management at Oceano Dunes SVRA. Least terns from Oceano have been observed passing through San Diego, but not nesting. Ronnie has no records of his birds breeding at other sites, but it is likely that few sites are monitored intensely enough to detect them. Other sites should be encouraged to look. Unfortunately, a recent trend in LETS management had been to step away from banding, largely due to cost. However, CDFW has recently begun to emphasize the perceived value of banding as a tool to determine survivability.

TRT Commentary: No additional TRT comments on this recommendation.

The SSC's review of the recommendations in the 2014 predator management reports, listed as Item 13 in the SSC Report, is summarized above in "2014 Predator Management Reports" and was not discussed by the TRT.

Review of Implementation of SSC Recommendations made in 2013

In 2013 the SSC reviewed ODSVRA's 2013 plover/tern nesting report and made recommendations based upon that report (2013 Recommendations and Comments of the ODSVRA SSC re: WSP and CLT Monitoring and Management, December 17, 2013). This section lists those recommendations with a brief summary of specific SSC recommendations where given and describes whether each recommendation was implemented in 2014. Numbering is consistent with the December 2013 SSC report.

1. Continue monitoring – *Recommendation supported, Implemented*
2. Continue banding least tern and snowy plover chicks – *Recommendation supported, Implemented*
3. Continue banding least tern chicks to individual- *Recommendation supported, Implemented*
4. Option to band adult snowy plovers - *Recommendation supported. Option retained but not necessary to implement.*
5. Use of motion detector cameras for nest monitoring - *Recommendation supported, Implemented*
6. Continue to use an anemometer with data logger to record wind speed and direction - *Recommendation supported, Implemented*
7. Continue to provide adequate-sized bumpouts and single nest enclosures to better protect least tern and snowy plover nests in or close to the open riding area - *Recommendation supported, Implemented*
8. Continue to position a large section of the shoreline enclosure fence further east to provide a wider functional shoreline habitat – *Recommendation Supported, Implemented.*
9. Continue to enhance habitat in the Southern Enclosure by distributing natural materials, seed, and plants and increase efficiency with the help of maintenance staff and heavy equipment – *Recommendation supported, Implemented*
10. Continue to study the benefits of wrack addition to the Southern Enclosure shoreline and inoculation with wrack-associated invertebrates as a possible means to restore invertebrate species and biomass (these invertebrates are part of the prey base for snowy plover chicks, juveniles, and adults) - *Recommendation supported, Implemented as feasible.*

11. Continue to look for an appropriate design to cover trash dumpsters – *No solution yet identified*
12. Continue to maintain option to salvage and rescue eggs, chicks, juveniles, and adults under very limited circumstances - *Recommendation supported, Implemented*
13. Conduct study evaluating alternative plover/tern habitat treatment strategies – *Ongoing SSC Recommendation Not Implemented.*
14. Consider option to capture previously banded adult least terns to determine their origin – *New SSC Recommendation. Option not implemented.*

As noted in the TRT's discussion of this year's Scientific Subcommittee Recommendations, the park believes it is having good results with the current management program; thus, the Superintendent did not agree to implement Recommendation #13 for the 2014 season. The SSC continues to recommend that Oceano Dunes SVRA conduct a study for year-round exclosures in the 2015 season.

Facilitator Recommendations Regarding the Future of the TRT

[NOTE: The next series of paragraphs represent the professional opinion of the facilitator, and not necessarily a consensus view of the TRT members themselves or that of DPR. This commentary was provided to the CCC in previous years without response or commentary being provided back to either the facilitator or to the TRT.]

Since the release of last year's Annual Report, attendance by members of the TRT has been consistent with three members participating remotely by phone, and the four remaining active members meeting in person, along with SVRA staff and consultants. Previously as well as currently, there has been no representation from the California Department of Fish and Wildlife (DFW). 2008 saw the withdrawal of the TRT's "convening agency," the CCC, from the process due to budget shortfalls. A CCC ecologist has actively participated in the SSC since that body's inception. Both last year and this year saw renewed participation on the part of CCC staff. Those members who do continue to attend meetings do so in good faith and represent their constituencies effectively. However, the extended tenure of the TRT as an advisory has taken its toll on some members, and some positions on key issues have hardened. Previous years' commitments to disciplined problem solving has also slackened due to the sheer length of the process. It is the opinion of some members that the only reason for continuing the existence of the TRT is to counterbalance the technical focus of the SSC. Others feel that the group has served to mitigate some of those hardened positions through collaborative problem solving. While some active members of the TRT attend more out of dedication to their constituencies than expectations of bipartisan cooperation or joint problem solving, others perceive continued value in the opportunity for community engagement and joint problem solving with regard to balancing recreational use and species protection/habitat enhancement.

The 7th Annual Report transmitted to the Executive Director and Park Superintendent in early 2008 reflected recommendations for several options designed to function as a "Transition Plan" to phase out the TRT. Nothing has substantively changed in the subsequent seven years. It has been a desire on the part of many of the remaining TRT members to abandon the TRT as a functioning advisory group during this seven year timeframe, suggesting that its role had been fulfilled, and that public involvement was available through other venues and processes, including the HCP process.

The release of a public review draft HCP and its National Environmental Policy Act documentation continues to be delayed, possibly for up to three years or more. At the present time, it is not known when such a document will be ready for public release, although DPR is actively working with the permitting agencies to develop the HCP. Given the length of these continuing delays, the previous options have become outdated. Accordingly, these previous options are reproduced in an attachment to this report.

It remains CDP's preference to continue the role of the TRT until such time as an HCP has been released and there is greater clarity to provide the basis for a CDP amendment that would respond to both the HCP and the need to decommission the TRT and its SSC and replace it with something more relevant to the broader context and coverage of the HCP.

There appear to be at least three non-exclusive transition approaches that warrant discussion and consideration. These three approaches can integrate public participation into the habitat conservation and monitoring and management efforts at ODSVRA. These approaches and the associated assumptions underlying them are as follows:

Option 1: Status Quo for TRT in 2015 and 2016. No Sunset

- Continue with the two annual meetings and reporting format as prescribed by CDP Permit Amendment No. 4-82-300-A5
 1. Receive and review annual Nesting Reports and Predator Management activities
 2. Provide updates on monitoring and management issues, particularly from an operational stand point
 3. Acknowledge completion of Prioritizing Research
- At such time as HCP is released for public review, meet to review final TRT Report, and recommend dissolution of TRT as a permit condition.

Benefits of Option:

- Continued compliance with permit condition A5.
- Continued technical review and recommendations from the Scientific Subcommittee
- Continued venue for stakeholder engagement and collaborative problem solving

Tradeoffs:

- Limited TRT productivity;
- Continuing time, transit, and dollar expense of convening TRT meetings, staffing, facilitating and producing annual reports;
- Continuing time, transit, and dollar expense of convening Scientific Subcommittee meetings, staffing, facilitating and producing recommendations;
- Continuing time demands upon volunteers to review technical reports and prepare comments;
- Probable lapse in attendance and participation by non-compensated volunteer members, resulting in condition non-compliance due to inability of TRT to achieve quorum and conduct business.

Option 2: Notify the Park Superintendent and Coastal Commission Executive Director of Completion of TRT Tasks and Condition Compliance regarding Section III. 4., and request "Standby Status" - This option entails the TRT highlighting in its Annual Report to the Park Superintendent and Executive Director a finding that the advisory body has met and/or

exceeded its mission and responsibilities articulated in its Adopted Charter and within Section III. 4. of the Amended Coastal Development Permit through its Annual Report. As part of this notice, this option would include a request for the TRT to be placed on standby until a public Draft of the HCP is available for comment. The Scientific Subcommittee would also be placed on standby status except for review and comment on new management initiatives included in annual nesting reports.

After 14 years of existence as an advisory committee to the ODSVRA Superintendent, the TRT has achieved its stated mission to provide on-going recommendations on the management of the ODSVRA, and completed all six of its explicit responsibilities reflected in Section B of its adopted Charter. The TRT has also accomplished all seven tasks outlined within Section IV. Findings and Declarations, subsection B. 6., Alternatives for Habitat Conservation and Management, Tasks of the TRT.

No other CDP-mandated advisory committee is known to have had a life-span approaching that of the TRT (14 years), nor is it standard professional practice to require such tenure of non-compensated community-based committees in the State of California particularly in light of ongoing, largely intractable disputes over resource use and conservation.

Given ongoing delays associated with the development and release of the HCP, there are no other research or management priorities that the TRT can further articulate or achieve consensus on at this point in time. Moreover, in addition to accomplishing its assigned tasks, the TRT is no longer necessary or cost effective as a process for balancing ESHA protection with the existing recreational use.

Benefits of this Option:

- Temporarily eliminates time, transit and other administrative burdens and costs associated with TRT staffing, attendance, support and follow-up.
- Advisory committee members relieved of TRT responsibilities and time commitments during the remaining HCP preparation timeframe.
- Does not detract from CDPR's capacity to manage park resources and usage
- Allows those interested in providing input and feedback to ODSVRA to continue to do so on an as needed basis.
- Scientific Subcommittee still responsible for reporting its recommendations on any new management initiatives to the California Coastal Commission and the public.
- Preserves option to reconvene TRT to make final recommendations at a later date.
- Annual Nesting Reports would continue to be prepared and acted upon by CDPR and other appropriate agencies.

Tradeoffs:

- Lost opportunity for limited interaction, consensus building and management advice in a formalized, although sparsely attended multi-stakeholder setting during interim standby period.
- Temporary lost opportunity for a community-based stakeholder group to formally review and comment upon the recommendations of agency resource experts functioning as the Scientific Subcommittee.

- Opportunity for public comment on ODSVRA monitoring and management activities temporarily shifted from TRT² directly to OHV Commission and/or Coastal Commission's annual review process.

Option 3: Request for Executive Director Determination of Condition Compliance regarding Section III. 4. - This option entails the TRT including in its Annual Report a formal request to the Park Superintendent and Executive Director to de-commission the group.

- A. TRT makes a finding that the advisory body has met and/or exceeded its mission and responsibilities articulated in its Adopted Charter and within Section III. 4. of the Amended Coastal Development Permit; and,
- B. Forwards a request to truncate and conclude its business through a determination of condition compliance, effective as of the date of the California Coastal Commission's February 2014 public hearing.

This option is similar to Option 2 above, but requests formal action to conclude its activities and responsibilities. The commentary referenced under Option 2 applies to this option as well. However, this option entails a permanent and formal sun-setting of the TRT and Scientific Subcommittee as advisory committees to the Superintendent.

Benefits of this Option:

- Permanently eliminates time, transit and other administrative burdens and costs associated with TRT and Scientific Subcommittee staffing, attendance, support and follow-up.
- Advisory committee members relieved of TRT responsibilities and time commitments
- TRT mission and tasks achieved without further effort or cost, and intent of condition compliance achieved.
- Does not detract from CDPR's capacity to manage park resources and usage
- Allows those interested in providing input and feedback to ODSVRA to continue to do so on an as needed basis.
- Annual Nesting Reports would continue to be prepared and acted upon.

Tradeoffs:

- Lost opportunity for limited interaction, consensus building and management advice in a formalized, although sparsely attended multi-stakeholder setting.
- Lost opportunity for a community-based stakeholder group to formally review and comment upon the annual nesting report recommendations of agency resource experts functioning as the Scientific Subcommittee.
- Opportunity for public comment on ODSVRA monitoring and management activities shifted from TRT directly to Coastal Commission's annual review process.
- Scientific Subcommittee functions would sunset until such time as this function is redefined and reconvened by the Habitat Conservation Plan; however, DPR could still seek input from SSC members outside of the SSC structure, as it has and continues to value commentary and review from technical experts.

These options were brought to the attention of the TRT at its December 15, 2014 meeting and a plurality of those present at the meeting voiced the opinion that they feel that the TRT continues to provide value as a forum for collaborative problem solving. One member

² Public attendance and comment on matters pertaining to TRT has been limited to a total of 4 individuals over the past five years of TRT meetings.

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expressed indifference toward the various options and another voiced concern over the duration of the process suggesting that the TRT should be phased out in favor of alternate resource management strategies. Of those in favor of continuing the TRT, there was some concern voiced that without the TRT to balance the recommendations of its Scientific Subcommittee, that the broader community constituencies would not effectively be represented in the monitoring and management efforts within the ODSVRA. The TRT felt that it was appropriate to share the above options with the Executive Director and Coastal Commission.

Concluding Remarks:

This concludes the 14th Annual Report of the Oceano Dunes SVRA's TRT as prepared by the group's facilitator. Based upon review of the permit conditions related to the TRT, the group has:

1. *Summarized annual recreational use and habitat trends, and*
2. *Ranked its research and management questions and priorities through highlighting the importance of completing a public review draft of the Habitat Conservation Plan that covers the ODSVRA, among other park units.*
3. *Completed all assigned and implied tasks and responsibilities prescribed by the Coastal Development Permit Amendment #4-82-300-A5*

Should you have any further questions about the activities, roles, products or outcomes of the TRT, please feel free to contact me.

Sincerely,



John C. Jostes,
TRT Program Facilitator

JCJ/

cc: Paula Hartman
Brent Marshall
Rick LeFlore

Attachments:

- Attachment 1: TRT Membership List
- Attachment 2: ODSVRA Vehicle Use
- Attachment 3: 2014 Tern/Plover Nesting Reports, incl. Predator Management Reports
- Attachment 4: Scientific Subcommittee Recommendations
- Attachment 5: Adopted Meeting Notes
- Attachment 6: Previous TRT Transition/Wind-Down Options

2014 Recommendations and Comments of the Oceano Dunes SVRA Scientific Subcommittee re: Western Snowy Plover and California Least Tern Monitoring and Management (December 3, 2014):

A. INTRODUCTION

The Oceano Dunes SVRA Scientific Subcommittee (SSC) members discussed the 2014 Oceano Dunes SVRA western snowy plover (SNPL)/California least tern (LETE) nesting report (*Nesting of the California Least Tern and Western Snowy Plover at Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California, 2014 Season*) at their November 24, 2014, meeting. All SSC agencies were represented as Deb Hilyard participated on behalf of California Department of Fish and Wildlife. Doug George (Point Blue Conservation Science), Amber Branske and Joanna Iwanicha (Oceano Dunes SVRA Environmental Scientists), and Aaron Gabbe (MIG | TRA) also participated.

A brief overview of the 2014 breeding season and the SSC's recommendations and comments on the 2014 Oceano Dunes SVRA plover/tern nesting report are provided in Section B of this report; background discussion is provided as needed. Section C lists the recommendations made by the SSC in December 2013 and describes whether each recommendation was implemented for the 2014 season.

B. 2014 SEASON OVERVIEW AND COMMENTS ON PLOVER/TERN REPORT

Western Snowy Plover

No specific data for Washington or Oregon (Recovery Unit [RU] 1) were available, although it appeared SNPL did very well in Oregon; there were more juveniles than ever before. RU 2 (Del Norte, Humboldt, and Mendocino counties) data were not provided; the 2014 report is available at <http://www.fws.gov/arcata/es/birds/WSP/plover.html> along with other reports, such as the 2014 breeding window survey. SNPL in Monterey (part of RU 4) did not do as well as in an average year but still fledged 1.1 young/male with over 400 breeding adults. Survival was extremely high, and a high number of males and females rejoined the nest sites.

Breeding data for RU5 (San Luis Obispo, Santa Barbara, and Ventura counties), which seems to be doing well compared to other units, were still preliminary and are not reproduced here. RU5 average summer window counts and management potential from the SNPL Recovery Plan were as follows:

Recovery Goals: Numerical targets; summer window counts

Segment	Management Potential	5-year average Summer window count (x1.3)
Morro Bay Beach (CA-81)	110	117.8 (153.1)
Pismo Beach/Nipomo Dunes (CA-83)	350	188.6 (245.2)
Vandenberg Air Force Base (CA-84) (a.k.a. Minuteman Beach)	250	196.8 (255.8)
Santa Ynez River Mouth/Ocean Beach (CA-85) (a.k.a. Vandenberg Air Force Base)	150	
Santa Rosa Island (CA-93 - 1 through 11)	130	8.4 (10.9)
Mugu Lagoon Beach (CA-99)	110	68.8 (89.4)
San Nicolas Island (CA-100 - 1 through 15)	150	51.0 (66.3)

Neither the Chevron property nor Rancho Guadalupe County Park used breeding exclosures. Some sites will likely never meet the recovery plan management potential due to changes in conditions, e.g., San Nicolas Island, where pinniped numbers are increasing. The USFWS is reviewing a population viability analysis and also is developing a new lower impact monitoring technique. Due to staffing issues (e.g., staffing at the Ventura office is down 50% since 2010), the USFWS is forced to defer the 5-Year Status Review to higher priority projects.

Oceano Dunes District (District) has seen pretty remarkable growth in the adult breeding population. Good survival contributes to a good breeding population. High nest abandonment and predation occurred early in the season. Monitors sent a high number of eggs (due to abandoned nests) to Monterey Bay Aquarium. The District had one of the highest numbers of nests, a good hatch rate (86%), and almost 200 fledges. Figure 10 in the 2014 SNPL/LETE nesting report shows the difference in results in the two season halves, which were reversed from prior seasons. The early season had a poor fledge rate. The District got aggressive with predator control, including gulls and owls and eventually coyote. Merlin was active in the first part of the season. The District and UC Santa Barbara continue to collaborate on assessing food resources, but UCSB researchers are not able to take samples or conduct related studies.

RU6 (Los Angeles, Orange, and San Diego counties) breeding season window survey results indicate a generally increasing population trend since 1991 but relatively stable numbers over the past four years (range 331-358 adults; 348 in 2014). The primary threat in RU6 appears to be predation of chicks, particularly with increasing local populations of corvids, gulls, and peregrine falcons; compression of potential predators into remaining non-urban habitat; and increasing restrictions on raptor management. Other threats include ongoing disturbance and suspected unquantified losses of chicks to governmental vehicle activity and encroachment of saltmarsh onto mudflats, which decreases foraging habitat and blocks continuity and chick access between nesting and foraging habitats.

California Least Tern

Although there has been a long-term increasing trend in breeding adult numbers statewide, numbers plateaued through the 2000s and have dropped since 2009. Fledgling production has

remained low each season since 2002 with a generally decreasing trend. Northern LETE breeding sites seem to be doing very well through the Pismo Dunes area, but everything south was doing pretty poorly. San Diego results were a bit better than last year, but last year was dismal. Poor breeding results (since 2009) are leading to reduced numbers of breeding adults. The primary threat in San Diego appears to be predation of chicks, particularly with increasing local populations of corvids, gulls, and peregrine falcons; additional threats include compression of potential predators into remaining non-urban habitat and increasing restrictions on raptor management.

Breeding LETE pairs within the District are really hovering around the same numbers, raising the question as to why the numbers are not climbing given ongoing fledging success. LETE continued their ongoing breeding focus in the 6 and 7 exclosures with no nesting in Boneyard. A high number of injured and dead juvenile LETE were recovered within or immediately adjacent to the 6 exclosure. The cause of the injuries and mortality is unknown but could be related to predation (particularly peregrine falcon), fence collision, a combination of the two, or other unknown factors. SSC members noted at least some of the injuries could be consistent with predation. Since there are so many causes of mortality or severely injured birds, and especially given the peregrine falcon population, it seems unlikely that all such losses are caused by fence collisions. Fence injuries can occur, however, and it is possible District monitors detect events not detected at other sites. It is also possible some birds could have hit the fence while being chased by a predator. Without more information, no conclusions could be reached. If indeed LETE are colliding with the fence, it is unclear how such collisions could be avoided. Even if collisions cause some losses, it is better with the fence given reduced depredation. More information is needed to try and determine what role fence and predation are playing. The District may explore alternative necropsy providers with more experience in evaluating trauma and predation.

The District's environmental scientists may also reach out to CalPoly researchers to see if research into certain questions is possible. Possible questions include: Why are least LETE concentrating where they do? Why have they abandoned Boneyard? Did the shoreline become more attractive once disturbance there was eliminated? (Perhaps Boneyard was always suboptimal but LETE used it when they had no choice.) Why hasn't the LETE population grown? Is the peregrine falcon relocation/release policy proving problematic (an individual peregrine falcon that was known to be preying on LETE was captured but was returned).

Regarding the LETE losses, the District has LETE take authorization related to LETE monitoring plus a take avoidance agreement, which has a provision to evaluate the previous year's take. In the current case where biologists are not certain about cause, the respective agencies will likely set up a meeting to discuss issues and possible responses. Possible responses could include changes to fencing design, exclosure size, or exclosure configuration. Peregrine falcon is also fully protected, which affects how it can be managed.

The SSC provided the following specific comments on the 2014 Oceano Dunes SVRA plover/tern nesting report. Items are listed in the order they appear in the report. Recommendations 11 and 12 are separate recommendations from the SSC that do not appear in the 2014 Oceano Dunes SVRA plover/tern nesting report.

1. Continue monitoring – Recommendation supported

No additional comments.

2. Continue banding least tern and snowy plover chicks – Recommendation supported

No additional comments.

3. Continue banding least tern chicks to individual – Recommendation supported

No additional comments.

4. Continue option to band adult snowy plovers – Recommendation supported

No additional comments.

5. Continue to provide adequate-sized bumpouts and single nest enclosures to better protect least tern and snowy plover nests in or close to the open riding area – Recommendation supported

No additional comments.

6. Continue to position a large section of the shoreline enclosure fence further east to provide a wider functional shoreline habitat – Recommendation supported

Ronnie confirmed this has been done past two years.

7. Continue to enhance habitat in the Southern Enclosure by distributing natural materials, seed, and plants and increase efficiency with the help of maintenance staff and heavy equipment – Recommendation supported

No additional comments.

8. Continue to study the benefits of wrack addition to the Southern Enclosure shoreline and inoculation with wrack-associated invertebrates as a possible means to restore invertebrate species and biomass (these invertebrates are part of the prey base for snowy plover chicks, juveniles, and adults) – Recommendation supported

The SSC discussed whether wrack addition and supplementation are effective at supplying prey base for SNPL and whether it is as effective as other options. Jennifer Dugan, Ph.D. (UCSB), conducted extensive studies of breeding season wrack from 2007 – 2012 and concluded this strategy has value. The quantity of talitrids (amphipods) in the wrack is a good indicator of wrack forage value. Food is only one part of the picture. Ronnie Glick will investigate whether there is a report that can be circulated to the SSC for review. The SSC recommends this study be continued as has been done and be reviewed in 2015.

9. Continue to look for an appropriate design to cover trash dumpsters – Recommendation supported

The dumpster issue was not solved in 2014. Due to water quality requirements, in addition to endangered species concerns, the dumpster cover remains a high priority, and a disposal company representative visited the park in November 2014 to explore options for covering the

dumpsters. The 20 cubic yard dumpsters make covers more challenging than smaller dumpsters, and the cover must be easy enough to use so that visitors are not discouraged from using the dumpster.

10. Continue to maintain option to salvage and rescue eggs, chicks, juveniles, and adults under very limited circumstances – Recommendation supported

No additional comments.

11. Conduct study evaluating alternative plover/tern habitat treatment strategies – Ongoing SSC recommendation

The District was unable to implement this recommendation in 2014. The SSC continues this recommendation for 2015. The 2014 plover/tern nesting report continues to note the compromised quality of the habitat available in the riding area at the start of the breeding season.

The option as stated in the SSC 2013 Recommendations Report is as follows: The seven-month closure may not allow enough time for habitat to recover from OHV recreation, especially by the beginning of the breeding season. During the non-breeding season, snowy plovers continue to roost between Grand and Pier Avenues. The question remains as to whether a year-round closure in some configuration would best serve breeding plovers and terns. The park has never conducted a controlled experiment to determine whether year-round closure is beneficial.

Although the park implemented year-round closures of 11 and less than 4 acres in winters 2003/2004 and 2004/2005, respectively, the closures were not implemented in a manner that allowed biologists to draw conclusions as to whether such a closure is the optimal management approach.

Available data do not allow for a scientifically-based recommendation for or against a particular habitat management strategy. Although the year-round closure seemed to benefit breeding success, it is possible that enhancement measures implemented by Oceano Dunes SVRA could be just as effective. Because available data are inconclusive, the SSC recommends scientific evaluation of year-round closure. A study should be designed and implemented allowing scientific analysis of year-round closure in comparison to habitat left open during the non-breeding season. A formal proposal for this study should be made available for SSC and TRT review.

12. Consider option to capture previously banded adult least terns to determine their origin – Ongoing SSC recommendation

The District did not pursue implementing this option in 2014. Only a handful of LETE could have been feasibly captured, and only two would have been candidates since they had only silver bands. It could be useful to have this option, but there are risks, including possibly injury, abandoned nests, or disturbance to adjacent broods of SNPL chicks. By the time LETE nests are ready to hatch, there is a lot of activity in the colony, and it would be very hard to get into the area without significant disruption. It may also require hiring additional staff.

The option is as follows: Based on the number of banded plover adults showing up, the SSC is interested in banding adult least terns. It could be valuable to know if least terns are coming in from elsewhere, which would affect how the site is managed. Ronnie is concerned it could cause nest abandonment, but others have had very low abandonment rates due to trapping. Trapping

can be quick and relatively non-intrusive. Adults are caught via remote control trap after the eggs have been temporarily replaced with decoy eggs to avoid egg damage. It requires two visits but takes no more than 10-30 minutes from start to finish and takes 1-20 minutes for adults to return. Trapping is done at 7-14 days incubation so birds are invested in the site and less likely to abandon. Biologists do not trap once the majority of nests have hatched.

The logistics at Oceano Dunes SVRA are very challenging since the 6 and 7 exclosures are very narrow. It is hard to get in and band due to nesting density, and there are concerns about chasing chicks into the riding and camping area. The presence of nesting plovers makes it more challenging. Ronnie will need to discuss this idea with his staff.

Regarding whether banded chicks will eventually return and give this data anyway, the origins of least terns that only have USFWS bands would be unknown. This effort would specifically targeting only those individuals. All chicks now get a metal band, but you cannot always see whether birds are banded due to distance. For a while at the SVRA, the other leg got a plastic band that wasn't well retained. Monitors could also try cameras.

Ultimately this information would help support the strong management at Oceano Dunes SVRA. Least terns from Oceano have been observed passing through San Diego, but not nesting. Ronnie has no records of his birds breeding at other sites, but it is likely that few sites are monitored intensely enough to detect them. Other sites should be encouraged to look. Unfortunately, a recent trend in LETS management had been to step away from banding, largely due to cost. However, CDFW has recently begun to emphasize the perceived value of banding as a tool to determine survivability.

13. Recommendations of the two predator management report attachments

The 2014 Oceano Dunes SVRA plover/tern nesting report also contains as attachments the predator management reports prepared by the U.S. Department of Agriculture (USDA) Wildlife Services and the Ventana Wildlife Society. Both reports contain a brief list of recommendations, which are being implemented at Oceano Dunes SVRA as follows:

USDA Wildlife Services

- Public education on the restriction of feeding wildlife.

Done

- All garbage containers should have reinforced lids to prevent garbage consumption by wildlife.

Attempting; see Recommendation 9

- Maintain the height and strength of the perimeter fence surrounding the enclosures.

Done

- Continue to enforce the leash law for pets on the beach.

Done

- Remove dead animal carcasses from the beach to eliminate alternate food sources that serve as a lure to scavenging predators such as coyotes.

Done

December 3, 2014

- Remove known least tern and snowy plover predators, especially on the shoreline and in nesting areas, prior to predation.

Done

- Continue to allow the Wildlife Specialist to get permitted to enter areas where predators are located and where damage is occurring.

Done

Ventana Wildlife Society

- Continue the practice of depositing wood chips and other substrates, including manufactured tern shelters, into the 6, 7, and 8 exclosures early in the season and place wrack on the exclosure shoreline.

Done

- Keep the west fence in its present location and do not move it to the west where it would functionally create a narrower shoreline with less food and cover.

Done

- Maintain the current size of the fenced tern and plover nesting exclosures.

Done

- Purchase several bird-whistler devices and train several resource ecologists in their use for hazing avian predators.

This was implemented in 2014, although its effectiveness was unclear. In such a large area predators may simply have moved elsewhere. The devices do give the option to haze a predator without leaving vehicles, which serve as blinds. The devices did not seem to spook SNPL because they were already crouched down due to the presence of a predator. Some disruption of LETS has been observed at other sites.

C. REVIEW OF IMPLEMENTATION OF SCIENTIFIC SUBCOMMITTEE RECOMMENDATIONS MADE IN 2013

In 2013 the SSC reviewed Oceano Dunes SVRA's 2013 plover/tern nesting report and made recommendations based upon that report (2013 Recommendations and Comments of the Oceano Dunes SVRA Scientific Subcommittee re: Western Snowy Plover and California Least Tern Monitoring and Management, December 17, 2013). This section lists those recommendations with a brief summary of specific SSC recommendations where given and describes whether each recommendation was implemented in 2014. Numbering is consistent with the December 2013 SSC report.

1. Continue monitoring – Recommendation supported

Implemented

2. Continue banding least tern and snowy plover chicks – Recommendation supported

Implemented

December 3, 2014

3. Continue banding least tern chicks to individual – Recommendation supported
Implemented

4. Continue option to band adult snowy plovers – Recommendation supported
Option retained but not necessary to implement

5. Continue use of motion detector cameras for nest monitoring – Recommendation supported
Implemented

6. Continue to use an anemometer with data logger to record daily wind speed and direction – Recommendation supported
Implemented

7. Continue to provide adequate-sized bumpouts and single nest enclosures to better protect least tern and snowy plover nests in or close to the open riding area – Recommendation supported
Implemented

8. Continue to position a large section of the shoreline enclosure fence further east to provide a wider functional shoreline habitat – Recommendation supported
Implemented

9. Continue to enhance habitat in the Southern Enclosure by distributing natural materials, seed, and plants and increase efficiency with the help of maintenance staff and heavy equipment – Recommendation supported
Implemented

10. Continue to study the benefits of wrack addition to the Southern Enclosure shoreline and inoculation with wrack-associated invertebrates as a possible means to restore invertebrate species and biomass (these invertebrates are part of the prey base for snowy plover chicks, juveniles, and adults) – Recommendation supported
Implemented as feasible

11. Continue to look for an appropriate design to cover trash dumpsters – Recommendation supported
Solution not yet identified

12. Continue to maintain option to salvage and rescue eggs, chicks, juveniles, and adults under very limited circumstances – Recommendation supported
Implemented

December 3, 2014

**13. Conduct study evaluating alternative plover/tern habitat treatment strategies –
Ongoing SSC recommendation**

Not implemented

**14. Consider option to capture previously banded adult least terns to determine their
origin – New SSC recommendation**

Option not implemented

See 12 in Section B, above.

RECOMMENDATIONS

Continue monitoring

Monitoring is critical for effective protection of nesting terns and plovers. As problems and threats arise for adult birds, nests, and chicks, timely information from monitoring can help guide appropriate management actions and evaluate their effectiveness. Monitoring efforts at ODSVRA should have adequate funding, resources, and flexibility to address anticipated problems (e.g., nesting failure, causes of chick loss, predator pressure) as well as unanticipated problems. Specific recommendations for monitoring are the following:

Continue banding least tern and snowy plover chicks

Continue banding least tern and snowy plover chicks to better understand chick behavior and factors promoting or threatening survival of chicks (e.g., feeding rates for tern chicks, foraging activity and movements of plover chicks, age and location of disappearance of different cohorts of chicks). Banding also provides a means to document fledging success. Without this information, the seasonal productivity of terns and plovers at ODSVRA would be unknown and management effectiveness could not be assessed. Additionally, bands provide an opportunity to gain insight into predator impacts on chicks and fledglings. Over time, banding of tern and plover chicks will provide information on natal site fidelity of terns and plovers fledged at ODSVRA, as well as migration to other sites.

Continue banding least tern chicks to individual

Beginning in 2006, least tern chicks were banded to allow individual chicks to be identified. This was done, in part, by placing one or two different colors of tape on the federal band, creating a unique combination for each chick. Banding to individual provides the opportunity to gain additional information that otherwise may not be obtainable, including:

- 1) providing the most accurate means to count the number of juveniles produced;
- 2) identifying if different areas within the colony are having different fledging success during a season;
- 3) identifying if broods hatching more than one chick are fledging more than one chick;
- 4) tracking individual chick and juvenile movement within the ODSVRA colony;
- 5) providing information on the length of stay of individual juveniles at the colony site after fledging;
- 6) tracking recruitment of juveniles into ODSVRA's breeding population; and
- 7) tracking movement of individuals to other colonies in California.

Banding to individual provides valuable information to assist in developing and assessing site management actions directed toward the recovery of the least tern.

Continue option to band adult snowy plovers

The occurrence of abandoned plover nests can raise concern about possible mortality of adult plovers. If elevated adult mortality rates occur or are suspected, it could prove beneficial to band certain adults. This would allow monitors to verify if mortality was taking place and possibly identify the causes.

Continue to provide adequate-sized bumpouts and single nest enclosures to better protect least tern and snowy plover nests in or close to the open riding area

Least tern and snowy plover nests inside the Southern Enclosure and located close to the north or east fence receive temporary additional fencing to create a buffer from recreational activities in the open riding area. These bumpouts connect to the fence adjacent to the nests and extend into the open riding area. Prior to 2010, only nests found within 75 feet of the Southern Enclosure fence were given a bumpout. Beginning in 2010, nests found within 100 feet of the Southern Enclosure fence bordering the open riding area received bumpouts. Nests inside the enclosure and more than 100 feet from the fence may also receive a bumpout if repeated disturbance from the open riding area is observed. Prior to 2012,

nests found in the open riding area initially received an 82-foot-radius circular single nest enclosure as per the previously existing protocol. It is our experience that these earlier identified minimums (75 feet and 82 feet) are not sufficient to adequately reduce disturbance from recreational activity and, in response to birds flushing from their nests, additional fence installation was often necessary to increase the size of the buffer.

In 2014, one least tern nest and four snowy plover nests were given bumpouts to increase the distance from the nest to the open riding area fence to a minimum of 100 feet. The least tern nest (LT6) failed of unknown cause; two of the plover nests (SP68 and SP176) hatched a total of six chicks and one chick fledged; and two of the plover nests (SP15 and SP142) were abandoned pre-term and the eggs were taken to Monterey Bay Aquarium (see Notes section). There was one snowy plover nest (SP17) found in the open riding area in 2014. The one egg nest was depredated by an unknown avian predator.

For 2015, it is recommended to continue to install bumpouts for nests close to the Southern Enclosure fence to create a buffer of at least 100 feet between the nest and the open riding area. Nests in the open riding area should receive a single nest enclosure with a minimum radius of 100 feet. Nests will be monitored closely to assess the adequacy of protective fencing in reducing disturbance. If necessary, bumpouts or single nest enclosures may increase in size if disturbance to incubating birds is observed as a result of recreational activity. ODSVRA will continue to maintain a safe vehicle corridor adjacent to the north and east fence, any bumpouts, and single nest enclosures.

Continue to position a large section of the shoreline enclosure fence further east (inland) to provide a wider functional shoreline habitat

The shoreline west of the enclosure west fence is important snowy plover habitat for rearing chicks. Prior to 2011, the management practice has been to place the west fence as low as possible on the shoreline. This was to maximize the amount of nesting and potential brooding area inside the seasonal fence protected from coyotes. In 2011, two small experimental shoreline fence sections, located in 6 and 7 enclosures, were placed up to 100 feet further to the east and these areas appeared to have a broader and more functional shoreline when evaluated at the end of the season. In 2012-14, the shoreline fence was moved 100 feet east for the southern half of 6 enclosure and for the majority of 7 enclosure (except for the 7.5 revegetation area) (Appendix C). The Southern Enclosure is seasonally open to off-highway vehicles during five months of the year between October and February. As a result of recreational activity during this time, the shoreline of the 6, 7, and 8 enclosures has almost no cover or topographic relief at the beginning of the breeding season and park staff distributes wood and wrack to provide some cover above and below the drift line. The shoreline is further altered with the installation of the west fence as it results in substantial deposition of fine windblown sand on the leeward (east) side of the fence. A fence set low on the shore can result in a very narrow swath of shore with cover (west of the fence) bordered by limited cover over the majority of a strip of habitat (approximately 100 to 180 feet wide) immediately east of the fence, with deposited sand burying existing or introduced cover.

Moving the west fence 100 feet eastward improved shoreline habitat characteristics for chick-rearing by allowing for a wider area of shore with cover and wrack. There was more topography and cover created by increased debris, woodchips, and wrack as well as greater foraging opportunities with the increased area of habitat enhancement. There continued to be broad areas of mobile sand with little cover east of the west fence.

Adjusting the fence eastward allows for the following benefits to the overall management goals for snowy plover productivity:

- 1) allow access from the shoreline for monitoring staff to maintain a wider swath of shore with habitat enhancement materials (including wrack) throughout the breeding season;

- 2) reduced chance of high tides and surf washing up and removing a low-set fence and habitat enhancement material;
- 3) provide better conditions for pioneering plants to grow in a wider area between the high tide line and the west fence (windblown sand deposited leeward of the fence can adversely impact seedling survival);
- 4) may increase foraging opportunities for plovers;
- 5) may reduce vulnerability to predators by providing more space and cover for chicks; and
- 6) may reduce bouts of aggression between adults with broods by decreasing brood density and, therefore, may decrease the chance of chicks becoming separated from their brood or attacked by adults with other broods.

Data was compared for nests of 6 and 7 exclosures west of the west fence (shoreline) to nests within the exclosure fencing (inside exclosure). The following numbers exclude five plover nests at the northern 6 exclosure shoreline and west of 7.5 revegetation area where the fence was not moved.

There was an increase in plover and tern nests on the shoreline in 2012-14 compared to 2011, likely as a result of moving the west fence eastward. In 2012-14, 13-16% of plover nests in 6 exclosure and 18-19% in 7 exclosure were on the shoreline, respectively; this compares to 12% and 5% in 2011. In 2014, 29% (14/49) of least tern nests in 6 and 7 exclosures were on the shoreline. This is an increase from 2013 and 2012 when 14% (8/56) and 16% (7/45) of tern nests in 6 and 7 exclosures were on the shoreline. No least tern nests were found on the shoreline for the seven-year period from 2005-11 when the shoreline portion of the exclosure was in a narrower configuration.

For known fate nests in 2014, the hatch rate for plover nests inside 6 and 7 exclosures was 90% and was similar to the shoreline (92%). Two plover nests on the 6 and 7 exclosure shoreline were known to fail and both were abandoned pre-term. The least tern hatch rate for known fate nests was 89% for nests inside the 6 and 7 exclosure and 100% for nests on the shoreline (of the total of 14 shoreline nests, three could not be approached to determine fate because of the high density of nearby plover broods). In 2014, the overall snowy plover chick survival to fledging age (36%) was good and was comparable within all shoreline areas.

Moving the west fence eastward did not appear to move plover or tern nesting closer to the east fence or east of the exclosure into the open riding area. There was one nest found east of the exclosure in 2012 compared to two nests in 2011. No nests were found east of the exclosure in 2013 and one nest was found east of the exclosure in 2014. In 2012-14, the number of bumpouts for nests found near the east fence has not increased compared to the previous two years. In 2012-14 there were four, two, and five nests, respectively, receiving a bumpout. This compares to two nests in 2010 and eight in 2011.

It is recommended for 2015 to repeat the shoreline configuration as was present in 2014, with a large portion of the 6 and 7 exclosure shoreline fence approximately 100 feet to the east of the typical shoreline fence location and continue to collect further information. The northern section of 6 exclosure would not be moved east to avoid potential impacts to nests on the shoreline from trespassers and to reduce the possibility of pushing nesting activity further to the east side and closer to the riding area in this narrow portion of north 6 exclosure. The shoreline fence should continue to be installed last (after all other fencing is installed) and as close to 1 March as possible to lessen the chance of storm-driven high surf damaging the fence.

Continue to enhance habitat in the Southern Exclosure by distributing natural materials, seed, and plants and increase efficiency with the help of maintenance staff and heavy equipment

Natural materials such as driftwood, woodchips, and wrack (surf-cast kelp) should be distributed in large amounts within the exclosures (including the shoreline) to enhance habitat features. Since 2002, wrack

has been gathered by hand and placed in the enclosure. Approximately 325 cubic yards of wrack were distributed on the enclosure shoreline during the 2014 season as habitat enhancement. Greater efficiencies may be possible for this wrack distribution. Since 2008, OSDVRA monitoring staff has received assistance from available heavy equipment operators from park maintenance staff in loading woodchips to be distributed in the enclosure. A method using heavy equipment has not been found to collect and distribute large amounts of wrack from the open riding to the seasonal shoreline enclosure. Attempts in the past resulted in more sand than wrack being collected with the equipment compared to hand collection. In 2015, it is recommended that methods to better use heavy equipment for wrack collection should be further explored. The goal would be to have heavy equipment available throughout the season to assist in loading large piles of wrack collected from the open riding area, to then be placed in the seasonal enclosure to be distributed by permitted staff. This would increase staff efficiency and allow larger amounts of wrack to be dispersed on the shoreline, helping to maintain larger populations of invertebrate prey over a broader area for snowy plover chicks, fledglings, and adults. Broader distribution of wrack also provides shelter from wind and cover from predators. The use of heavy equipment needs to be balanced with other operational needs in the park.

Wrack and woodchip additions could also occur during the winter or prior to 1 March if materials and staff levels allow. Prior to the 2014 season during the winter months, a limited amount of wrack was placed in a few large piles as well as spread thinly in a few areas (600-1,000 square feet). These wrack areas persisted to the end of the season helping to create temporary hummocks within the enclosure and, in most cases, provided a favorable area for plants to grow. As time permits, it is recommended to continue to place large wrack piles in the winter or at the beginning of the season in the area where the seasonal enclosure will be located.

The addition of quick-growing annual dune vegetation should continue to be evaluated as habitat enhancement. Planting in early spring, with sufficient late rains, may allow enough time for plant growth to provide topographic features that could benefit plovers and terns. Seeding of areas in the Southern Enclosure with sea rocket (*Cakile maritima*), beach bur (*Ambrosia chamissonis*), and other on-site available seed is recommended to continue in 2015. Planting of sea rocket or other appropriate available container stock (grown on-site) in test plots with areas of added materials (e.g., woody debris, wrack) should also continue to be evaluated in 2015. The seeding and planting would occur as soon as possible after the fence is installed on 1 March. Seeding or planting may be attempted prior to the fence installation in order to take advantage of rain events and moist sand. The goal of this planting is to provide areas of scattered vegetation for cover and to encourage the development of small hummocks.

Continue to study the benefits of wrack addition to the Southern Enclosure shoreline and inoculation with wrack-associated invertebrates as a possible means to restore invertebrate species and biomass (these invertebrates are part of the prey base for snowy plover chicks, juveniles, and adults)

In 2007, a study was initiated by Drs. Jenifer Dugan and Mark Page, researchers from the Marine Science Institute at the University of California Santa Barbara (UCSB), examining the responses of invertebrate numbers and diversity in areas where wrack was added to the Southern Enclosure shoreline throughout the breeding season. Preliminary findings from the five-year study (2007-11) indicated that the seven-month seasonal closure (March-September) is not a sufficient period of time for invertebrates to effectively and naturally recover species diversity and abundance on the Southern Enclosure shoreline following five months of recreational use. In 2012, invertebrate sampling (by Dr. Dugan) was more limited, with one series of transects at the beginning of the season and repeated once at the end of the season. In 2013-14, park staff, following the same methodology, performed one series of invertebrate sampling at the end of the season, comprised of 10 transects in the Southern Enclosure and three transects in North Oso Flaco (as a control). Samples were sent to Dr. Dugan at UCSB for analysis and findings added to the data set.

Preliminary analysis suggests that inoculating a large number of wrack-associated invertebrates (talitrids) into wrack over a wide area of the enclosure shoreline increases the estimated abundance of talitrids. From 2012-14, park staff has inoculated wrack added to the shoreline with invertebrates following protocols developed by UCSB. If funding levels allow, experimental examination of wrack and invertebrate manipulation on the Southern Enclosure shore should continue in the 2015 season with the goal of identifying potential means to enhance the diversity and abundance of invertebrate species that are natural prey for plovers. Park staff should continue the end of season sampling, add a beginning of season sampling, and should continue to explore further ways to assess shoreline ecosystem health and responses to management actions.

Continue to look for an appropriate design to cover trash dumpsters

The predator management strategy at ODSVRA includes methods to discourage attracting predators to the site. The large trash dumpsters (22 feet long, 20 cubic yard capacity) located near marker post 2 attract a large number of gulls landing on and foraging in the dumpsters. Four to six dumpsters are present during the busy summer months. In 2012, an experimental cover was designed for one dumpster with fence material enclosed in an approximate 12-foot-high metal frame with heavy 7.5-inch-wide plastic strips hanging from the front of the frame. This design was intended to prohibit gulls from landing on the trash, allowed park visitors to easily discard their trash without lifting a lid, and allowed maintenance staff to lift the cover off and compact the trash with heavy equipment which is necessary before the dumpster can be pulled out and replaced each week. The cover was removed after periods of high winds quickly destroyed the plastic strips, making the cover ineffective. A dumpster cover design that could fit the needs of ODSVRA was not discovered and no covers were used in 2013-14. Daily surveys at the dumpster area resulted with the month of June having the highest daily average number of gulls (93) as well as the maximum number of gulls present at one time (550 on 30 June) (see section titled Predators and predator management on page 41 for more details). It is recommended for 2015 to cover the trash dumpsters in the marker post 2 area with lids designed to exclude gulls and meet the needs of the ODSVRA staff and visitors.

Continue to maintain option to salvage and rescue eggs, chicks, juveniles, and adults under very limited circumstances

In some circumstances the abandonment of least tern or snowy plover eggs and chicks can be directly attributed to human disturbance. The option to salvage such eggs and chicks to be raised in captivity by an approved facility and released in the wild is useful. Beginning in 2003, a limited number of abandoned but likely viable snowy plover eggs or chicks from ODSVRA were brought into captivity. Chicks were raised in a manner that they did not imprint on humans and were released into the wild when fledged. All fledglings were color-banded to individual to facilitate collecting information on movements, survival, and future reproductive success. Captive care should only be used selectively and not as a substitute for responding to the primary causes of elevated egg or chick abandonment rates.

Ongoing management actions that will continue in 2015

The following are part of our ongoing management actions and monitoring procedures for which a specific recommendation is no longer necessary (see Monitoring and Management Actions section for more detail). Background information and justifications for these management actions have been discussed in detail in previous annual reports.

- Oso Flaco area protection will continue at the same monitoring and management level as set in 2005 (Site Description).
- The Arroyo Grande Creek protected area will be clearly delineated as a closed area around the Arroyo Grande Creek and lagoon by using posts and signs as practiced since 2006 (Site Description).
- Night vision equipment will continue to be used for monitoring the least tern night roost. The equipment has been used for monitoring since 2007.
- Continue monitoring least tern juveniles, night roost, and foraging activity at nearby freshwater lakes.
- Continue use of motion detector cameras for nest monitoring and train and permit additional monitoring staff as needed.
- Continue to use an anemometer with data logger from a wind tower to record daily wind speeds and direction.
- Continue option to use tern chick shelters.
- Continue option to use least tern chick fencing on the east side of the enclosure and a method to maintain the tern chick fencing will continue to be explored.
- Predator monitoring and management actions that have been in place since 2003 and 2004 will continue.
- Gull surveys will continue as they have since 2008.
- The Southern Enclosure protected area will include the use of increased fence height as practiced since 2006 and use of aprons as used since 2007 to improve the effectiveness of the perimeter fence in protecting the breeding terns and plovers.
- The Southern Enclosure and North Oso Flaco shoreline will continue to be protected, this includes maintaining the posts and rope at marker post 6 and Oso Flaco boardwalk intertidal zones to minimize trespass, which has been part of the management actions in these locations since 2008.
- Continue use of 10-foot by 10-foot single nest enclosures with net tops, circular enclosures with net tops, and mini-enclosures as needed to protect nests from avian predators. These small enclosures are not without risks to incubating adults and we will continue to closely monitor and evaluate their use.
- Surveys for plovers will continue during the nonbreeding season. These surveys have been conducted since the winter of 2009-10.
- Continue to document impacts and, when possible, reduce disturbance caused by low-flying aircraft over the Southern Enclosure and Oso Flaco.
- Continue to work to address water quality issues at Oso Flaco Lake.
- Efforts to retain skilled monitors will continue at ODSVRA.

Straw Bale Photos











Exhibit 9 (DPR's Straw Bale Project Photos)
4-82-300 (ODSVRA Review)
Page 5 of 5

REGULATION X

FUGITIVE DUST EMISSION STANDARDS, LIMITATIONS AND PROHIBITIONS

RULE 1001 Coastal Dunes Dust Control Requirements *(Adopted 11/16/2011)*

- A. APPLICABILITY. The provisions of this Rule shall apply to any operator of a coastal dune vehicle activity area, as defined by this Regulation, which is greater than 100 acres in size.
- B. DEFINITIONS. For the purpose of this Rule, the following definitions shall apply:
1. “APCD”: The San Luis Obispo County Air Pollution Control District.
 2. “APCO”: The San Luis Obispo County Air Pollution Control Officer.
 3. “Coastal Dune”: means sand and/or gravel deposits within a marine beach system, including, but not limited to, beach berms, fore dunes, dune ridges, back dunes and other sand and/or gravel areas deposited by wave or wind action. Coastal sand dune systems may extend into coastal wetlands.
 4. “Coastal Dune Vehicle Activity Area (CDVAA)”: Any area within 1.5 miles of the mean high tide line where public access to coastal dunes is allowed for vehicle activity.
 5. “CDVAA Monitor”: An APCO-approved monitoring site or sites designed to measure the maximum 24-hour average PM₁₀ concentrations directly downwind from the vehicle riding areas at the CDVAA. At a minimum, the monitoring site shall be equipped with an APCO-approved Federal Equivalent Method (FEM) PM₁₀ monitor capable of measuring hourly PM₁₀ concentrations continuously on a daily basis, and an APCO-approved wind speed and wind direction monitoring system.
 6. “CDVAA Operator”: Any individual, public or private corporation, partnership, association, firm, trust, estate, municipality, or any other legal entity whatsoever which is recognized by law as the subject of rights and duties, who is responsible for the daily management of a CDVAA.
 7. “Control Site Monitor”: An APCO-approved monitoring site or sites designed to measure the maximum 24-hour average PM₁₀ concentrations directly downwind from a coastal dune area comparable to the CDVAA but where vehicle activity has been prohibited. At a minimum, the monitoring site shall be equipped with an APCO-approved Federal Equivalent Method (FEM) PM₁₀ monitor capable of measuring hourly PM₁₀ concentrations continuously on a daily basis, and an APCO-approved wind speed and wind direction monitoring system.

8. “Designated Representative”: The agent for a person, corporation or agency. The designated representative shall be responsible for and have the full authority to implement control measures on behalf of the person, corporation or agency.
9. “Monitoring Site Selection Plan”: A document providing a detailed description of the scientific approach, technical methods, criteria and timeline proposed to identify, evaluate and select appropriate locations for siting the temporary and long-term CDVAA and control site monitors.
10. “Paved Roads”: An improved street, highway, alley or public way that is covered by concrete, asphaltic concrete, or asphalt.
11. “PM₁₀”: Particulate matter with an aerodynamic diameter smaller than or equal to a nominal 10 microns as measured by the applicable State and Federal reference test methods.
12. “PMRP”: Particulate Matter Reduction Plan.
13. “PMRP Monitoring Program”: The APCO approved monitoring program contained in the PMRP that includes a detailed description of the monitoring locations; sampling methods and equipment; operational and maintenance policies and procedures; data handling, storage and retrieval methods; quality control and quality assurance procedures; and related information needed to define how the CDVAA and Control Site Monitors will be sited, operated and maintained to determine compliance with section C.3.
14. “Temporary Baseline Monitoring Program”: A temporary monitoring program designed to determine baseline PM₁₀ concentrations at the APCO-approved CDVAA and Control Site Monitor locations prior to implementation of the PMRP emission reduction strategies and monitoring program. The program shall include a detailed description of the monitoring locations; sampling methods and equipment; operational and maintenance policies and procedures; data handling, storage and retrieval methods; quality control and quality assurance procedures; and related information needed to define how the temporary monitors will be sited, operated and maintained to provide the required baseline data. The temporary monitors shall meet the specifications of the CDVAA and Control Site Monitors unless otherwise specified by the APCO.
15. “Track-Out”: Sand or soil that adhere to and/or agglomerate on the exterior surfaces of motor vehicles and/or equipment (including tires) that may then fall onto any highway or street as described in California Vehicle Code Section 23113 and California Water Code 13304.
16. “Track-Out Prevention Device”: A gravel pad, grizzly, rumble strip, wheel wash system, or a paved area, located at the point of intersection of an unpaved area and a paved road that is designed to prevent or control track-out.
17. “Vehicle”: Any self-propelled conveyance, including, but not limited to, off-road or all-terrain equipment, trucks, cars, motorcycles, motorbikes, or motor buggies.

18. “24-Hour Average PM₁₀ Concentration”: The value obtained by adding the hourly PM₁₀ concentrations measured during a calendar 24-hour period from midnight to midnight, and dividing by 24.

C. GENERAL REQUIREMENTS

1. The CDVAA operator shall develop and implement an APCO-approved Temporary Baseline Monitoring Program to determine existing PM₁₀ concentrations at the APCO-approved CDVAA and Control Site Monitor locations prior to implementation of the PMRP emission reduction strategies and monitoring program.
2. The operator of a CDVAA shall prepare and implement an APCO-approved Particulate Matter Reduction Plan (PMRP) to minimize PM₁₀ emissions for the area under the control of a CDVAA operator. The PMRP shall contain measures that meet the performance requirements in C.3 and include:
 - a. An APCO-approved PM₁₀ monitoring network containing at least one CDVAA Monitor and at least one Control Site Monitor.
 - b. A description of all PM₁₀ control measures that will be implemented to reduce PM₁₀ emissions to comply with this rule, including the expected emission reduction effectiveness and implementation timeline for each measure.
 - c. A Track-Out Prevention Program that does not allow track-out of sand to extend 25 feet or more in length onto paved public roads and that requires track-out to be removed from pavement according to an APCO-approved method and schedule.
3. The CDVAA operator shall ensure that if the 24-hr average PM₁₀ concentration at the CDVAA Monitor is more than 20% above the 24-hr average PM₁₀ concentration at the Control Site Monitor, the 24-hr average PM₁₀ concentration at the CDVAA Monitor shall not exceed 55 ug/m³.
4. The CDVAA operator shall ensure they obtain all required permits from the appropriate land-use agencies and other affected governmental agencies, and that the requirements of the California Environmental Quality Act (CEQA) and the National Environmental Quality Act (NEPA) are satisfied to the extent any proposed measures identified in the PMRP or Temporary Baseline Monitoring Program require environmental review.
5. All facilities subject to this rule shall obtain a Permit to Operate from the Air Pollution Control District by the time specified in the Compliance Schedule.

D. Exemptions

1. Section C.3 shall not apply during days that have been declared an exceptional event by the APCO and where the United States Environmental Protection Agency has not denied the exceptional event.

- E. RECORDKEEPING REQUIREMENTS: The CDVAA operator subject to the requirements of this Rule shall compile and retain records as required in the APCO approved PMRP. Records shall be maintained and be readily accessible for two years after the date of each entry and shall be provided to the APCD upon request.
- F. COMPLIANCE SCHEDULE:
1. The CDVAA operator shall comply with the following compliance schedule:
 - a. By February 28, 2012, submit a draft Monitoring Site Selection Plan for APCO approval.
 - b. By May 31, 2012, submit a draft PMRP for APCO review.
 - c. By November 30, 2012, submit complete applications to the appropriate agencies for all PMRP projects that require regulatory approval.
 - d. By February 28, 2013, obtain APCO approval for a Temporary CDVAA and Control Site Baseline Monitoring Program and begin baseline monitoring.
 - e. By May 31, 2013, complete all environmental review requirements and obtain land use agency approval of all proposed PMRP projects.
 - f. By July 31, 2013, obtain APCO approval of the PMRP, begin implementation of the PMRP Monitoring Program, and apply for a Permit to Operate.
 - g. By May 31, 2015, the requirements of Section C.3 shall apply.
 2. With the exception of section F.1.g, the CDVAA operator will not be subject to civil penalties for failure to meet any timeframe set forth in section F.1 caused solely by delays from regulatory or other oversight agencies required to consider and approve the operator's PMRP or any part thereof.



Air Pollution Control District
San Luis Obispo County

January 27, 2015

Justin Buhr, Coastal Planner
Central Coast District Office
California Coastal Commission
725 Front Street, Suite 300
Santa Cruz, CA 95060

SUBJECT: Response to January 12, 2015 letter requesting information

Dear Mr. Buhr:

In your attached letter dated January 12, 2015, you have asked for data regarding all exceedances of the state and federal PM₁₀ standards recorded at our CDF monitoring station since 2008. The CDF monitor records the highest level of PM₁₀ and PM_{2.5} from all the monitors located throughout SLO County. This monitoring site was not established until 2010, however, so data is only available from that point forward, as shown in the following table:

Year	PM ₁₀			PM _{2.5}		Notes
	Federal 24-hr Exceedences	State 24-hr Exceedences	Annual Average (ug/m3)	Federal 24-hr Exceedences	Annual Average (ug/m3)	
2014	2	83	38.6	1	12.3	Unofficial, includes preliminary data.
2013	2	93	39.9	3	12.5	
2012	3	70	33.6	3	9.6	
2011	0	63	34.4	0	11.9	
2010	1	53	32.4	0	9.5	Partial year-site only operated 10 months.

— Federal PM₁₀ 24-hr standard is 150 ug/m3; State PM₁₀ 24-hr Standard is 50 ug/m3

— State Standard for PM₁₀ annual average is 20 ug/m3. (There is no federal standard for the PM₁₀ annual average.)

— Federal PM_{2.5} 24-hr standard is 35 ug/m3. (There is no state standard for 24-hr PM_{2.5}.)

State and federal standards for PM_{2.5} annual average are both 12 ug/m3

You have also asked for our opinions on the following questions:

1. Whether or not OHV use contributes to dust emissions;
2. Where the most emissive parts of the ODSVRA are; and
3. What the SLOAPCD believes would be the most efficient and cost effective measures to reduce dust emissions to be in compliance with Rule 1001.

Fortunately, the data speaks for itself on questions 1 and 2 so no opinion is necessary. For question No. 3, there is also a substantive body of data from various studies performed at the ODSVRA and elsewhere regarding the most effective controls for reducing dust, but cost-effectiveness has many associated variables that require a more subjective interpretation. Our response to each of the questions is below.

1. Does OHV use contribute to dust emissions?

The San Luis Obispo County Air Pollution Control District (SLOAPCD) determined several years ago that off-highway vehicle use (OHV) at the Oceano Dunes State Vehicular Recreation Area (ODSVRA) was a significant contributor to dust levels measured on the Nipomo Mesa. This determination was reached after performing comprehensive air monitoring studies and extensive data analyses evaluating PM₁₀ levels downwind of the riding areas and comparable nonriding areas at the ODSVRA. Those studies showed that PM₁₀ concentrations downwind of the riding areas are significantly higher than those measured downwind of nonriding areas. As shown below in Figure 3.54 from the SLOAPCD *South County Phase 2 Particulate Study* (February 2010), average PM₁₀ levels measured at both the CDF and Mesa2 monitoring sites downwind of the riding areas were more than twice as high as those measured at the Oso site downwind of a nonriding area. These differences were measured despite the Oso site being considerably closer to shore and subject to much stronger winds than either the CDF or Mesa2 sites.

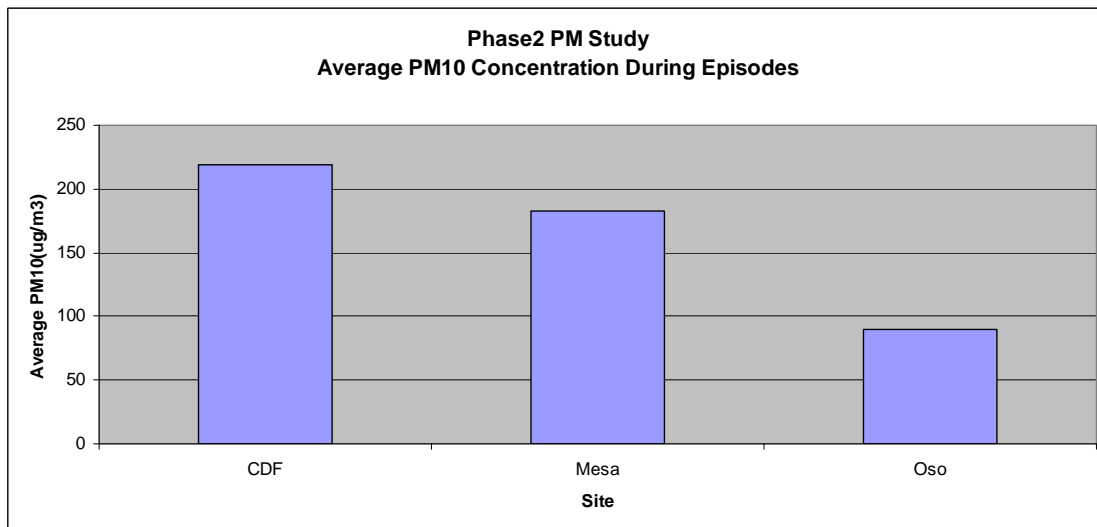


Figure 3.54 – Comparison of Average Downwind PM10 Concentration During Episodes

More recently, the OHV Division of State Parks measured very similar results after performing extensive air monitoring studies in the Spring and Summer of 2013, the results of which are documented in the report prepared by their consultant, Desert Research Institute (DRI), titled: Wind and PM₁₀ Characteristics at the ODSVRA from the 2013 Assessment Monitoring Network (September 2014). They installed monitoring equipment along 4 different transects in the ODSVRA in the direction of the prevailing northwest winds. Transect 1 was located in the Nature Preserve at the north end of the SVRA; Transect 2 was located within the LeGrande Tract riding area; Transect 3 was located within the larger riding area south of the LeGrande tract; and Transect 4 was located in the nonriding area southeast of Oso Flaco Lake. As shown in Figure 47 from that report (below), PM₁₀ levels measured at site 2C in the LeGrande tract riding area were far higher than all other sites, with PM₁₀ levels measured at site 3C in the more southerly riding area being next highest. PM₁₀ levels measured at sites 4B and 1C in the southerly and northerly nonriding areas were considerably lower than those measured in the riding areas, as shown in the figure below.

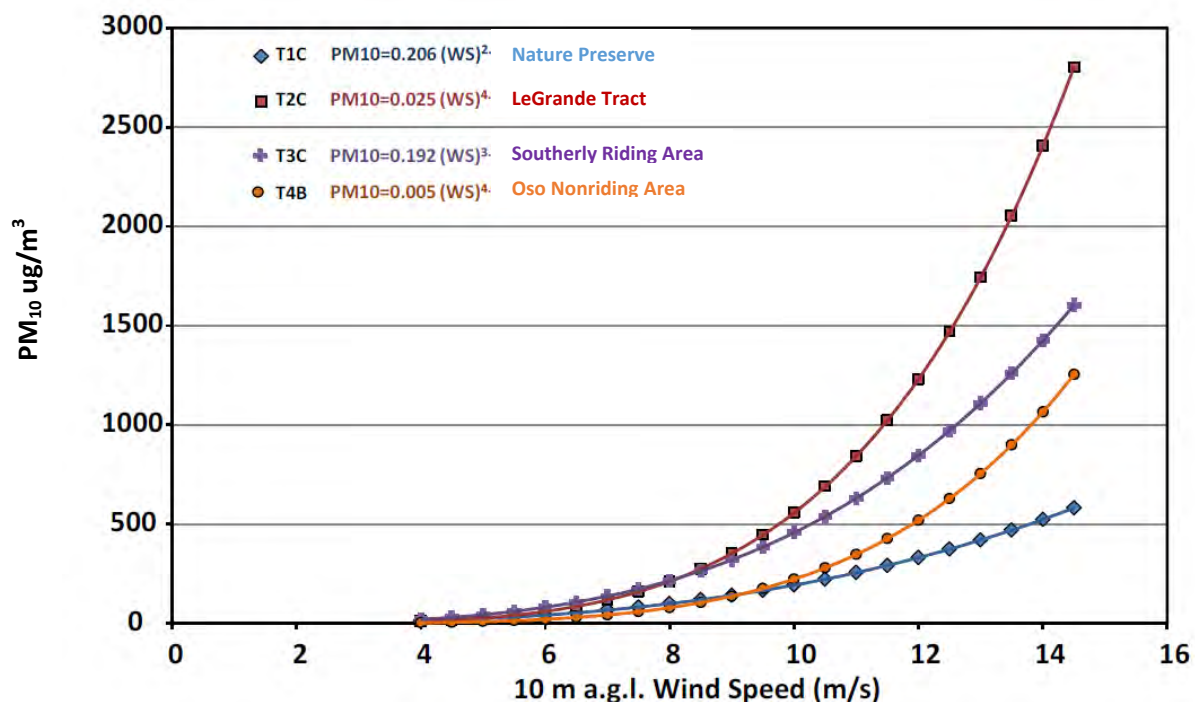
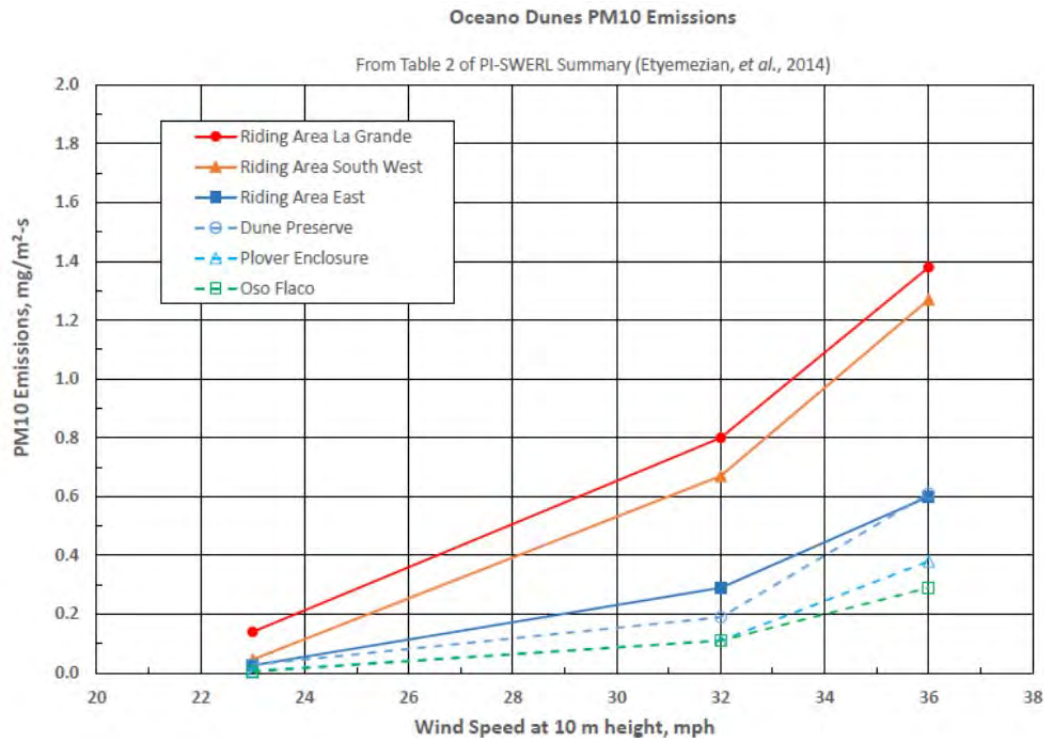


Figure 47. Relationships between mean 10 m hourly wind speed and PM₁₀ for the four e-Bam measurement positions for the 292° winds (NB: no 10 m wind speed measured at position T3B).

2. Where are the most emissive areas of the ODSVRA?

During the 2013 monitoring study referenced above, DRI scientists also performed extensive analyses of soil emissivity throughout the ODSVRA using their patented PiSwirl measurement device. Over 350 measurements were performed to evaluate the relative emissivity of the riding areas and nonriding areas in the park. Their preliminary report, titled 2013 Intensive Wind Erodibility Measurements at and Near the Oceano Dunes State Vehicular Recreation Area: Preliminary Report of

Findings (July 2014), clearly shows the riding areas to be substantially more emissive than the nonriding areas, with the LeGrande tract riding area up to 30 times more emissive than the Oso nonriding area, and up to 8 times more emissive than all nonriding areas combined. The figure below is a graph of the data presented in Table 2 of that report.



3. What does the SLOAPCD believe would be the most efficient and cost effective measures to reduce dust emissions to be in compliance with Rule 1001?

As mentioned above, there are a number of variables associated with answering this question, so I asked our consultant, Mel Zeldin, to provide his professional recommendations (attached). While Mr. Zeldin identified eliminating riding upwind of the affected populated areas as the most effective strategy, that action is not endorsed nor recommended by the SLOAPCD. We firmly believe effective dust control strategies are available to reduce emissions to a level that complies with Rule 1001 while continuing to allow recreational riding in the park, provided such measures are applied appropriately in the most emissive areas. We do, however, agree with and support his recommendation that replanting of vegetation is the most effective long-term strategy currently available.

In our opinion, reestablishing vegetated foredunes in the areas where they have been destroyed by vehicle activity would appear to be the most effective strategy, followed by establishing additional vegetation islands in the inland riding areas. Studies performed by DRI as described in their Oceano Dunes Pilot Projects report (July 2011) show vegetated areas to be nearly 100% effective in reducing sand movement and would provide year-round, permanent reductions; wind fencing is less than

half as effective at best, and provides only a temporary solution. Regarding the need to reestablish vegetated foredunes, that recommendation is provided in a substantive study commissioned by State Parks and performed by the California Geologic Survey. Their report, titled Review of Vegetation Islands, Oceano Dunes SVRA (August 2007), documents the historical and current vegetation coverage at the ODSVRA and the nearly complete loss of vegetated foredunes in the riding area between 1970 and 1992 due to OHV activity. In that report, the authors identify the need to reestablish vegetated foredunes along the coast to the west and northwest of all areas where inland vegetation is desired due to their ability to substantially reduce wind force and sand movement that will otherwise bury newly planted inland vegetation without that protection.

We believe the use of soil binders and sand fencing, as is currently proposed by State Parks for 2015 dust control, will provide immediate help in dust reduction, but are not adequate without significant revegetation to achieve compliance with Rule 1001. Nonetheless, soil binders have the potential to be far more effective than sand fencing in terms of dust reduction and cost and, if proven feasible for use at the ODSVRA, may be the best interim control measure before revegetation efforts are fully established. Thus, adequate testing of soil binders is essential to determining their potential effectiveness.

Summary

As documented in the studies described in our responses to questions 1 and 2 above, OHV use at the ODSVRA is clearly the major contributor to dust emissions generated there, and the Le Grande tract riding area is the most emissive area at that facility. In our opinion, reestablishing vegetated foredunes near shore and additional vegetation islands further inland, together with seasonal use of soil binders and/or sand fencing in the high emissive back dune areas, represents the most effective approach capable of meeting the requirements of Rule 1001, and for achieving the overall objective to reduce emissions in the riding areas to natural background levels while retaining offroad vehicle activity.

I hope these responses adequately answer the questions you posed. All studies referenced above are available on the SLOAPCD website at <http://slocleanair.org/air/pmstudydata.php>. Please feel free to contact me at (805) 781-5912 if you have any questions or need additional clarification on the issues addressed in this letter.

Sincerely,



Larry R. Allen
Air Pollution Control Officer

Cc: Christopher Conlin, OHV Division, State Parks
Kurt Karperos, California Air Resources Board

Enclosure(s)

MELVIN D. ZELDIN
Environmental Consultant
6636 Black Oaks Street
North Las Vegas, NV 89084
775-530-9548

January 21, 2015

Mr. Larry Allen, APCO
San Luis Obispo County APCD
3433 Roberto Ct.
San Luis Obispo, CA 93401

RE: Evaluation of Efficiency and Cost-Effectiveness of ODSVRA Mitigation Measures

Dear Mr. Allen:

This letter is in response to your e-mail of January 20, 2015.

Just as a quick background for the Coastal Commission, in the 1990's I was with the South Coast AQMD and was responsible for the initial PM10 State Implementation Plan for the Coachella Valley -- an area with substantial winds (and associated wind farms) plus annually replenished coarse sand, the combination of which caused considerable exceedances of the federal PM10 standards. The conditions there are reasonably similar to those occurring in the Oceano Dunes area. Having been involved with numerous studies trying to determine the best and most cost-effective ways of reducing PM10 caused by winds acting on coarse sand, I have a very relevant background and firsthand knowledge of appropriate mitigations.

This response is based primarily on my scientific knowledge and experience, because an in-depth analysis of comparative cost-effectiveness will take some time to prepare.

The current conditions in the Oceano Dunes area, based on a number of studies, clearly show significant PM10 levels, sometimes exceeding federal PM10 standards, and more frequently the state PM10 standards. These conditions, as measured at the CDF site indicate unhealthful exposures to the population inland of the ODSVRA. In my opinion there are three primary options to mitigate these conditions, in the descending order of overall effectiveness in reducing PM10 levels affecting the inland populated areas :

Mitigation #1) Based on all the studies I have reviewed, there is no question that the recreational vehicle activities contribute to the elevated PM10 conditions, both directly by mechanical action of sand movement which, in conjunction with stronger winds, produces direct PM10 emissions which are carried inland by the winds; and secondly, preventing the natural stabilization of the sand surface such that greater emissivity of emissions occurs during windy conditions. The most effective mitigation measure, and one that has the greatest possibility of meeting state PM10 standards and the provisions of Rule 1001, is to eliminate all off-road vehicle activity in the area most impacting the downwind residential areas of the Nipomo Mesa. While I recognize this is not likely an

option under consideration, it is my professional opinion that all the key effective mitigation alternatives at least be identified. It should also be noted that EPA will not accept any form of exceptional event where there is any indication that anthropogenic activity is a key source of a PM10 exceedance; thus any federal exceedances measured under any other mitigation alternative will not be considered by EPA to meet exceptional event criteria.

Mitigation #2) If vehicle activity must be accommodated, then the second most effective method will be to establish at least two parallel rectangular vegetative areas enclosed by fencing within the riding areas, such that the extent of the vegetation is of sufficient size to eventually act as a wind barrier, a collector of saltating particles, and a limiting area of the constantly disturbed sand in the riding areas. Under this scenario, the riding areas would be more limited and the vegetative barriers would reduce the PM10 emissions. The degree to which emissions would be reduced would depend on the extent and location of the vegetated areas. The difficulty with this approach is that it takes a number of years for the vegetation to develop and grow to sufficient size and coverage to achieve its purpose, so for several years, other mitigation methods will be needed as well. From the SLOAPCD's South County Phase 2 Particulate Study, dated February 2010, there is mention of State Parks previously initiating re-vegetation in the southern section of the ODSVRA, but what is needed is a similar approach more northward where the origins of the PM10 impacting the population are occurring.

As stated in Chapter 6 of that report:

OHV activity prevents formation of a stabilizing crust in the SVRA through continual disturbance of the sand surface.....Similarly OHV activity prevents vegetation from growing in the riding areas of the SVRA, as stated in the State Parks report "Review of ODSVRA Vegetation Islands." That study clearly shows that revegetation efforts in unfenced areas have failed.

Denuding of vegetation and the resulting increase in the aerial extent of open sand sheets from OHV activity on the SVRA is obviously a significant factor in the level of windblown sand emissions from the area.

...the complete lack of sand collected by the sandcatcher located in a vegetated area of the control site dunes provides clear demonstration of the ability of vegetation to control wind erosion.

Thus the ability to re-vegetate in the appropriate and strategically placed upwind areas of the ODSVRA can lead to significant reductions in PM10 emissions once the vegetation has matured, although it is not possible to determine if compliance with Rule 1001 would be achieved. At least, though, if indeed there are violations of the Rule, there would be fewer occurrences of such violations.

Mitigation #3) If vehicle activity is to be accommodated AND the ability to re-vegetate in strategic areas of the ODSVRA is not feasible, then other mitigations must be used. Currently, as I understand it, the State Parks is proposing the use of wind fencing covering somewhere around 30-40 acres. From tests in the Coachella Valley that I was involved in, wind fencing has limited effectiveness in controlling saltation, a source of PM10 emissions; however, once emissions are airborne upwind of the fences, their effectiveness is virtually zero. A number of studies have shown that the saltation process PM10 reduction from wind fences has a PM10 control effectiveness of about 35% in the area immediately downwind of the fencing. Considering that there would be substantial areas of PM10 emissions upwind of the fencing in the riding areas, I would

not expect such a small area to have much of an impact on any of the key parameters: federal PM10 exceedances, state PM10 exceedances, and Rule 1001 violations.

From the Coachella Valley experiences, we found that eco-friendly soil stabilizers had about twice the control effectiveness as wind fences; and the South Coast AQMD's "Dust Control in the Coachella Valley - Volume 1" lists close to 100 different soil stabilization products on the market, though very few would meet the conditions needed for the Oceano Dunes area; however, a few products would likely work well in this environment.

Based on my experience and knowledge, it is my best estimate that strategically applied soil stabilizers in dual rectangular areas, with perimeter wind fences, within the primary riding areas shown to be most emissive by DRI studies, covering a total area of at least 80 acres is the best mitigation approach under condition #3. This, or a combination of this strategy then coupled with the wind fencing as proposed by State Parks, may have a reasonable possibility of reducing PM10 sufficiently to eliminate exceedances of the federal PM10 standards, and reduce, though not eliminate, the number of state standard PM10 violations. It still would not eliminate periodic violations of Rule 1001.

Further, from one of the vendors whose western operations are located in nearby Santa Maria, the application cost of an effective eco-friendly soil stabilizer is around \$1200 per acre. So an 80-acre area would cost about \$100k for the application, and additional costs for perimeter fencing. Such an approach is, in my opinion, more efficient and cost effective than wind fencing alone, since it is my understanding that the cost of the 15-acre wind fencing mitigation project in 2014 as implemented by State Parks was well in excess of \$100k. The combination of the two would achieve greater control effectiveness than any one method alone.

Regarding the issue of longevity, Mitigation #1 would permanently reduce the PM10 impacts caused by the ODSVRA, first by the elimination of the mechanical dust producing actions of the vehicles, and second, by restoration of a more wind resistant surface, since there is some evidence from the Snowy Plover area that once a disturbed area is fenced off preventing further disturbances by vehicles, that natural crusting can re-establish within a relatively short period of time. Mitigation #2 would be permanent once the re-vegetation process was completed and the vegetation reached its full growth potential. However, because riding activity would still be occurring, the net PM10 reductions for Mitigation #2 would not be as great as for Mitigation #1. Lastly, Mitigation #3 is the least permanent and would require likely annual reapplications of soil stabilizers and fencing, and the placements, if not strategically optimal, may need to be changed annually as to location and areal extent.

While the data show seasonality to the stronger wind days, nevertheless, the same data show that strong wind conditions favorable for impacting the CDF site can occur almost any month of the year. For this reason, Mitigation #1 would be most permanently effective; Mitigation #2 would need to be permanent and the re-vegetation areas permanently restricted from vehicle activity; and for Mitigation #3, seasonal approaches to mitigation efforts are troublesome for two reasons: (1) there could be off-season wind events leading to PM10 standards and Rule 1001 violations; and (2) there is significant added costs in taking down and rebuilding the mitigations each year.

In my opinion, if it is determined that recreational vehicle activity is going to continue into the future, then Mitigation #2 is likely the best approach, provided that it is clearly understood that re-vegetation areas need to be of sufficient size and strategic placement within the riding area to achieve substantial reductions in PM10 once the vegetation has achieved its growth potential.

I hope this assessment is helpful.

Sincerely,

A handwritten signature in black ink, appearing to read "Melvin D. Zeldin". The signature is fluid and cursive, with the first name "Melvin" being more prominent and the last name "Zeldin" written in a more compact, stylized manner.

Melvin D. Zeldin

CONCERNED CITIZENS FOR CLEAN AIR

RECEIVED

JAN 27 2015

CALIFORNIA
COASTAL COMMISSION
CENTRAL COAST AREA

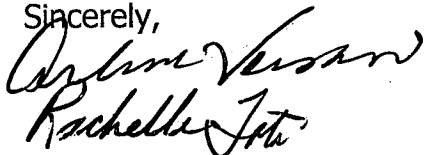
January 22, 2014

California Coastal Commission
725 Front Street Suite 300
Santa Cruz, Ca. 95060

Dear Commisioners,

Attached please find three letters from residents of the Nipomo Mesa concerning the high levels of particulate matter we are routinely exposed to due to the lack of vegetation and broken crust found in the OHV riding area. These Mesa residents wrote these letters out of deep concern about the health threats, but we did not forward them at the time, preferring to wait until the Commission would meet and hear this issue. Please accept these letters and consider them when your annual review and discussion about CDP #4-82-300 and its amendments are under discussion.

Sincerely,



Rachelle Toti and Arlene Versaw
Concerned Citizens for Clean Air

P.O. Box 118
Arroyo Grande, Ca.
93420

PHONE
FAX
EMAIL ccca10@charter.net
WEB SITE nipomomesa-air.org

August 27, 2014

California Coastal Commission
c/o CCCA
PO Box 118
Arroyo Grande, CA 93420

To Whom It May Concern:

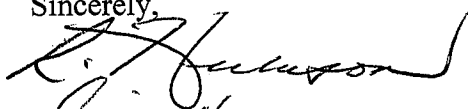
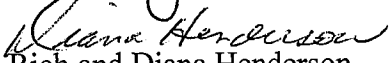
I am writing you today to voice our concern regarding the devegetation of the Oceano Dunes and the disturbance of the dune crust which allows PM10 to become airborne and to be carried up to the Mesa and to our home in Cypress Ridge. We are very concerned about the health effects of continued exposure to this particulate matter. Because my wife has asthma, we were forced to install an air conditioning unit in our home which now allows us to keep the windows closed in order for her to breathe cleaner air. We believe that concern for people's health should outweigh any economic and recreational gains by continuing to ravage the Oceano Dunes. This particulate matter far exceeds the standards set to protect public health. In addition to the above concerns, these issues can and will adversely affect the property values of all of our homes.

For these reasons, my wife and I respectfully ask the Commission to:

1. Take action to stop the OHV use of the La Grande tract, which is identified in the Local Coastal Plan as a "non-riding" Buffer Area. It is also identified by the APCD as the major source of the PM10.
2. Require restoration of the foredunes from the Pismo Dunes Preserve to the Oso Flaco Lake beachfront. Restoration of the foredunes has been recommended by the APCD and the California Geological Survey.
3. Review all provisions of the current permit and amendments which pertain to the vegetation and intensity of use in the park.
4. Ensure compliance with the provisions of the Coastal Act.

I would like to thank you for taking the time to consider this letter and the health and wellbeing of our community.

Sincerely,



Rich and Diana Henderson
Cypress Ridge

To California Coastal Commission,

September 14, 2014

I am very concerned with the health effects on the Nipomo Mesa of continued exposure to particulate matter that continually exceeds minimum standards.

On August 23, 2014, Thomas Bosshardt, M.D., Surgeon and Barry Feldman, M.D., Pulmonologist, from Marian Regional Medical Center spoke on lung cancer awareness.. They said exposure to the high particulate matter that we on the Nipomo Mesa are exposed to does not increase lung cancer. However, it can cause pulmonary fibrosis which is even worse because there is no treatment!

If this environmental pollution was caused by an oil company or an agricultural conglomerate, I have no doubt that the state of California would immediately demand they correct the problem.

But because this is caused by the California Parks Department, there are constant delays and good old boy cronyism at work.

The reputation that California has as leader in environmental protection seems like a sham!

I've worked for over 40 years as a geriatric pharmacist and those exposed to air pollution with resultant breathing problems have no golden years to enjoy.

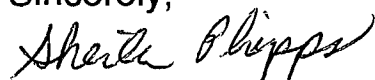
I implore you to do the right thing and follow the provisions of the Coastal act

Stop the OHV use of the LaGrande tract which is the major source of the PM 10.

Restore the foredunes as recommended by the California Geological Survey and the APCD.

I look forward to your response.

Sincerely,



Sheila Phipps, RPh, CGP


Nipomo, CA 93444

**Michael & Judy Eisenhard
Residents in Cypress Ridge
Arroyo Grande, CA 93420**

October 13, 2014

California Coastal Commission
% CCCA
P.O. Box 118
Arroyo Grande, CA 93420

We live in Arroyo Grande, in the Cypress Ridge development in the area referred to as "the Mesa". We are directly in the path of the highly toxic PM10 dust pollution being generated from the Oceano Dunes Recreational Vehicle area. We are submitting this letter to you as a desperate plea for help.

We retired and moved here in 2008 believing that we would be spending our retirement years breathing healthy, fresh ocean air. Unfortunately, as we later discovered, we moved to an area with very toxic air quality. The PM10 dust pollution emanating from the Oceano Dunes Recreational Vehicle area has caused a negative impact on our health, specifically a marked reduction of our lung capacity and our immune system.

You are well aware of the seriousness of PM10 pollution, and the exposure limits established by the various health and environmental agencies. Our area routinely exceeds these limits, sometimes by 2 and 3 times, or more.

This is the only area on the California coast that allows the blatant destruction of critical dune environments, including vegetation and animal habitats, for the sole purpose of racing around in high horsepower off road trucks, ATVs and other vehicles. At the same time it is causing major health problems for all of the people living in the area of the PM10 dust plume being generated by the OHV area.

As I wanted a complete understanding of what is going on out on the dunes, I rented an ATV and went out on the dunes myself. I was stunned at the extent of the dangerous "recreational activity" taking place out there! It was significantly worse than I had ever expected. I know the State Parks department has "rules" governing these dunes, but it was clear there is no enforcement of the rules, and due to the vastness of the area, no way to realistically enforce them. For example, all forms of fireworks are supposedly forbidden on the dunes. However, we regularly hear what are clearly near-commercial grade fireworks exploding out on the dunes most weekends.

Some of the other violations I witnessed: people urinating on the sand; vehicles tipping or rolling over and leaking gas and oil on the dunes; public drunkenness; people doing "donuts" and spinning tires, kicking up massive plumes of sand and ripping apart the dunes and vegetation.

**Michael & Judy Eisenhard
Residents in Cypress Ridge
Arroyo Grande, CA 93420**

What is so hard to believe is that our state, one of the most ecologically concerned states in the union, allows this massive environmental damage and toxic pollution to continue unabated. If this were a private enterprise it would be shut down immediately.

This is taking place in an area that was specifically identified on the local Coastal Plan as a "non-riding" Buffer Area: The La Grande tract. It has also been identified by the Air Pollution Control District as the source of the PM 10 in our area. Note that this is the ONLY coastal area in California with a PM 10 pollution issue. It is also the ONLY coast area in California allowing people to race vehicles 24/7 on the fragile dunes. The evidence is irrefutable: The PM10 toxic dust is caused by the unrestricted vehicular activity on the Oceano Dunes.

We ask that the Coastal Commission take immediate action to correct this horrific situation. Please:

- 1. Prohibit further vehicular activity on these precious dunes, especially the La Grande tract which was never supposed to have vehicles on it in the first place.**
- 2. Require the State Parks Department to restore the foredunes from the Pismo Dunes Preserve to the Oso Flaco Lake beach front, as recommended by the Air Pollution Control District AND the California Geological Survey.**
- 3. Review all provisions of the current permit and amendments which pertain to the vegetation and intensity of use in the park.**
- 4. Ensure compliance with provisions of the Coastal Act.**

From your web site:

"The mission of the Coastal Commission is to protect, conserve, restore, and enhance environmental and human-based resources of the California coast and ocean for environmentally sustainable and prudent use by current and future generations".

We request that, as the agency established to protect our diminishing coastal areas, you take prompt and direct action to stop this destructive activity immediately.

Respectfully -



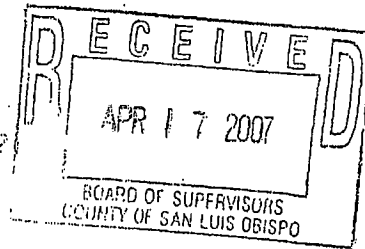
Michael Eisenhard



Judy Eisenhard

CALIFORNIA COASTAL COMMISSION

CENTRAL COAST DISTRICT OFFICE
725 FRONT STREET, SUITE 300
SANTA CRUZ, CA 95060
(831) 427-4863



April 17, 2007

Mr. Matt Janssen
Coastal Supervising Planner
San Luis Obispo County Department of Planning and Building
County Government Center
San Luis Obispo, CA 93408

Subject: Coastal Commission Staff Response to Your Letter of March 9, 2007, Regarding the County's Proposed Sale of 585 Acres of Oceano Dunes Property to State Parks

Dear Mr. Janssen:

Thank you for contacting me regarding your department's review of the proposal by the San Luis Obispo County Department of General Services to sell approximately 585 acres of property within Oceano Dunes to the State of California. Your letter of March 9, 2007 requests the Commission staff's opinion regarding the relevance of the Figure 4 of the South County Area Plan and Coastal Plan Policies to the General Plan Conformity Report process. In addition, your letter requests our input on how Figure 4 played into the 1982 coastal development permit for the park (CDP 4-82-300) and subsequent amendments. This letter attempts to respond to these requests, as well as to the County staff's stated presumption that Figure 4 is "background information and advisory, but not regulatory or a critical component of the LCP".

1. Figure 4 Background

Use of the Oceano dunes for off-highway vehicle (OHV) recreation, and the need to protect sensitive habitats and adjacent properties from adverse impacts attributable to OHV use, has been a long-standing controversial issue for both the Coastal Commission and San Luis Obispo County, and was discussed in detail during the County's development of its Local Coastal Program (LCP). Based on a review of the LCP and permit history regarding this issue, it is clear that both San Luis Obispo County and the Coastal Commission have had significant concerns regarding the appropriate location for a permanent access route and staging area to serve the OHV riding area. We have also been concerned about managing OHV use, and other forms of recreation, in a manner that is consistent with the resource protection requirements of the Coastal Act.

These concerns were particularly evident during the development and certification of the LCP's Land Use Plan (LUP), which, as originally adopted by the County in October 1981, proposed to close the dunes to vehicle use and camping until a management plan was submitted by State Parks and approved by the County. In response to the issues raised by this proposal, staff from the County, the Coastal Commission, and State Parks worked together with interested parties to evaluate and develop alternative policies that would allow for continued OHV and camping uses, while providing appropriate levels of resource protection. The results of this effort are reflected

by the terms of the Commission's approval of Coastal Development Permit 4-82-300 (which occurred prior to the Commission's adoption of the LUP in 1983) as well as in the certified LUP.

In particular, both CDP 4-82-300 and the LUP consider the existing access route to the OHV riding area (via Grand and Pier Avenues) to be temporary in nature; recognize that OHV and other recreational uses have adverse impacts on the sensitive habitat areas supported by the park; and require further evaluation of alternative access routes and management measures to avoid and minimize these impacts. Specifically, condition 1b of CDP 4-82-300 requires the selection of a permanent staging area within 18 months of LUP certification, and construction of the permanent staging area within 3 years of LUP certification. In the event that the construction and operation of a permanent staging area is not completed within these timeframes (as is currently the case), condition 1b states that the permit shall be subject to review and modification by the County or the Commission. This condition also states that prior to construction, the County LUP and the State Parks General Development Plan shall be amended to include the selected permanent staging area site and additional standards or conditions for its design and operation. Such an amendment has never been proposed.

In light of the above history, it is the Coastal Commission staff's opinion that Figure 4 was intentionally included within the certified LUP to reflect the long-term objectives shared by the County and the Commission for this sensitive dune habitat area, which included phasing out of the northern access route for OHV use and restricting OHV use on County owned land. At the time that CDP 4-82-300 was approved and the LUP was certified it was recognized that further evaluation of the most appropriate location for the permanent staging area would be needed to implement this objective. The inclusion of Figure 4 within the LUP, along with policies that cross-reference the requirements of CDP 4-82-300, reflect the interim nature of current OHV use patterns and require further consideration of these long-term management options as necessary to carry out the resource protection requirements of the Coastal Act and the certified LCP. Contrary to the County staff's presumption that Figure 4 should be viewed as background information only, it is the Commission staff's opinion that both Figure 4 and the associated LCP policies establish important standards that are applicable to the use and development of the County owned lands at issue.

2. Relationship of Figure 4 to CDP 4-82-300 and Associated Permit Amendments

As described above, the Commission's decision to approve CDP 4-82-300 predates the certification of the LUP and associated figures. The Commission's action on this permit recognizes, in the adopted findings, that "The proposed projects recommended for approval herein are central to the resolution of a major Substantial Issue within the submitted San Luis Obispo County Land Use Plan of its Local Coastal Program. They are proposed by State Parks as an initial step in the resolution of that issue."

Following the Commission's action on CDP 4-82-300, the County submitted an LUP that included the figure currently referenced as Figure 4 by the LCP, as well as policies that continued to propose a temporary moratorium on vehicle use and camping. The Commission suggested modification to these policies that were later accepted by the County, which provided

a cross reference to the interim provisions of CDP 4-82-300, and maintained the County's stated desire to establish a natural buffer from the impacts of OHV use on County owned land (e.g., as reflected by Figure 4 and South County Area Plan Policy 9). Thus, the relevant LCP policies and Figures reflect the interim status of the OHV and camping use patterns in effect at the time of certification, and the County and the Commission's long term desire to provide increased protection of sensitive dune habitats, among other ways by relocating the OHV staging area to the south, and establishing a buffer area on all County owned lands.

Implementation of these LCP and permit conditions has taken place in conjunction with State Parks, using various techniques. Condition Compliance reviews initiated by the Commission in 1994, partly in response to concerns expressed by the County regarding the intensity of recreational use, resulted in a renewed effort to understand the "carrying capacity" of the park unit, and regulate the types and levels of public use accordingly. After failing to reach consensus on how to effectively accomplish this objective, State Parks proposed an amendment to establish a Technical Review Team (TRT), which was approved by the Coastal Commission in 2001 (CDP 4-82-300-A5), and currently functions as the method by which these long-term management issues continue to be discussed.

Although Figure 4 and other LCP policies calling for the establishment of a buffer on County land have not, to the knowledge of Commission staff, been raised in prior amendments and permit reviews, the issues associated with these provisions and described above, continue to be discussed. In fact, at its February 2007 hearing, the Coastal Commission decided to send a letter to the park superintendent that identifies the need to resolve the interim status of the existing riding entrance and staging area, and states that State parks should submit a permit amendment application that, among other things, proposes a permanent location for recreational vehicle access and staging. The provisions of the certified LCP will be applicable to this application, and currently apply to any new development proposed within the area.

3. General Plan Conformity Report and Potential Sale

The County's decision whether to sell the land it owns, as well as its implementation of Government Code Section 65402 (requiring a General Plan conformity report prior to such a sale), are not "development" decisions that are regulated by the Coastal Commission. This decision may, however, affect both the County's and the Coastal Commission's ability to carry out the terms of the certified LCP and CDP 4-82-300 discussed above, and the Commission staff therefore appreciates the opportunity to comment on the proposed sale, and we support the conclusions of the County Planning staff that the sale would result in the continuation of a use that is inconsistent with the land use designations established by the certified LCP.

With respect to the proposed sale, the Commission staff is concerned that a transfer of ownership to State Parks, for the stated purpose of continued OHV use, may affect implementation of the long term planning and resource management requirements established by CDP 4-82-300 and the certified LCP. In the past, the OHV enabling legislation has been cited by State Parks as preempting the Commission's ability to regulate the type and level of recreational use within the park unit. As a result, retaining County ownership over these lands will help ensure that LCP

Matt Janssen
Oceano Dunes GP Conformity
April 17, 2007
Page 4

and Coastal Act policies can be applied to future park management decisions that affect these areas.

For these reasons, the Commission staff encourages the County to consider entering into a short-term lease agreement with State Parks rather than selling the land. This will enhance our ability to work with County and State Parks staff on the outstanding long-term park management issues discussed above. Thank you for your consideration of these comments.

Sincerely,

Steve Monowitz
District Manager

MEMORANDUM

FROM: John D. Dixon, Ph.D.
Ecologist

TO: Justin Buhr

SUBJECT: Oceano Dunes Scientific Advisory Panel

DATE: January 29, 2015

The information in this memorandum is based on meeting agenda, meeting summaries, recommendations from the Scientific Subcommittee to the Technical Review Team, and other documents from the subcommittee. Paula Hartman of Thomas Reid Associates was contracted by the Department of Parks and Recreation to provide staff services and has supported the subcommittee from the beginning. She has kindly provided chronologies and many of the documents that I did not have ready access to.

On February 14, 2001, the Commission endorsed (via Coastal Development Permit Amendment 4-82-300-A5) State Park's proposal to establish a Technical Review Team (TRT)¹ to oversee monitoring of environmental and use trends in the Oceano Dunes State Vehicular Recreation Area (ODSVRA) and to advise the Superintendent on resource management issues. As a condition of Commission approval, the TRT was required to include a scientific subcommittee that was to identify, develop and evaluate the scientific information needed by decision makers to ensure that the natural resources are adequately managed and protected.

Specifically, Condition 4 of the Amendment required that

- A scientific subcommittee be created to identify, develop and evaluate the scientific information needed by decision-makers to ensure that the ODSVRA's natural resources are adequately managed and protected;
- The subcommittee be composed of resource experts representing the five government agencies (CCC, SLO County, USFWS, DFG, DPR) and at least two independent scientists with expertise in Western snowy plover, California least tern, steelhead trout or other species of concern, as well as ecological processes to analyze technical data and provide scientific recommendations to the TRT; and,
- The TRT submit a list of proposed members of the scientific subcommittee to the Executive Director of the Coastal Commission for review and approval.

The responsibilities of the Scientific Subcommittee, as directed by Condition 4, are to:

- Recommend to the TRT the scientific studies and investigations that may be necessary to develop information needed by resource managers;

¹ The Coastal Commission adopted Revised Findings in support of this action on May 7, 2001.

- Advise the TRT regarding the protection of the SVRA's natural resources by helping identify and review needed research measures and restoration efforts to rebuild or protect the ODSVRA natural resources;
- Evaluate monitoring results and reevaluate monitoring protocols contained in Oceano Dunes SVRA annual reports for the Habitat Monitoring System, reports on the breeding, nesting and fledgling success of the western snowy plover and California least tern populations in the SVRA, and other reports related to the environmental impacts of recreational activities;
- Provide comments on the adequacy of various scientific research studies and make management recommendations to the TRT; and
- Submit the full recommendations of the scientific subcommittee to the Commission and make them available to the public, as part of the annual review process.

These provisions were included in the adopted TRT Charter.

The TRT first met on October 30, 2001. Among other matters, they discussed the composition of the scientific subcommittee and reviewed a list of potential candidates presented by the staff of the Department of Parks and Recreation. On January 14, 2002 the TRT met and approved the scientific subcommittee membership², adopted criteria for appointing new members³, and adopted a process for prioritizing scientific subcommittee research and management questions⁴.

The scientific subcommittee⁵ met for the first time on January 18, 2001. The subcommittee met eight times during 2002. During this time they completed the following actions:

- reviewed the 2001 Point Reyes Bird Observatory report on snowy plovers and least terns and made recommendations to the TRT concerning management actions for the birds and for habitat enhancement in Oso Flaco
- reviewed a study of the effects of night riding on birds and recommended that a new study of the issue be conducted to correct flaws in the existing study

² Which included 3 independent ornithologists in addition to the agency biologists. The County contracted with a professor with botanical and dune processes expertise from California Polytechnic University at San Luis Obispo to be their representative.

³ The TRT adopted the following criteria to guide the addition of members to the Scientific Subcommittee:

- *That the appointment of an additional member to the Scientific Subcommittee would provide valued expertise that is not currently present on the Subcommittee;*
- *That changes in the existing membership of the Scientific Subcommittee result in the need for additional expertise that is no longer represented on the panel; and/or,*
- *That the Subcommittee itself identifies the need for additional expertise that is not currently represented on the Subcommittee.*

⁴ The TRT adopted the following process for use by the Scientific Subcommittee in prioritizing research and management questions:

1. *That timing of the research activity or management strategy is critical to restoration or protection efforts;*
2. *That the research question or management activity is directly related to the satisfaction of a permit condition imposed by the California Coastal Commission;*
3. *That the research question or management activity is directly related to the satisfaction of a permit condition imposed by another regulatory body;*
4. *That the research question or management strategy is in direct response to a question posed by the California Coastal Commission; and/or,*
5. *That the research question or management strategy is directly related to the identification or migration of a potentially significant environmental or resource impact*

⁵ ODSVRA (Laura Gardner, later Ronnie Glick), Coastal Commission (John Dixon), US Fish & Wildlife Service (Steve Henry, later Julie Vanderwier), Ca Department of Fish & Wildlife (Bob Stafford; CDFW ceased participating in 2007), County of San Luis Obispo (V. L. Holland; resigned in 2003 and was not replaced), Independent bird experts (Robert Patton, Elizabeth Copper, and Gary Page (Pt Blue Conservation Science))

- reviewed the ODSVRA Interim Predator Management Plan and made recommendations
- reviewed the ODSVRA Habitat Monitoring Methodology and made recommendations
- made recommendations regarding research and management questions and priorities (See Appendix)

Each year in the fall and early winter, the Scientific Subcommittee reviewed the annual report on the nesting of the California least tern and snowy plover at ODSVRA and made recommendations to the TRT. Most recommendations were implemented. However, beginning in 2003, one of those recommendations was to maintain a year-round closure of a portion of the nesting area to improve habitat quality. This recommendation was revised in 2005 to make a year-round closure part of a three-year study of alternative habitat treatment strategies. This recommendation has been repeated each year, but has never been implemented. However, those management actions that the park has implemented have generally been beneficial. Western snowy plover and California least tern reproductive success at ODSVRA is usually high relative to other sites in California.

Despite the broad scope of potential actions identified by the Scientific Subcommittee in the Appendix, the primary focus has been on the management of snowy plovers and least terns. This is largely because many of the management concerns identified would need studies that were not required of the ODSVRA. Since 2002, the subcommittee has only met once or twice in the fall or early winter by conference call to review the status of least terns and snowy plovers throughout the state and to review the annual nesting report and make recommendations. Occasionally, other reports are submitted by Parks for review and comment. Although this is a useful function, there are many other management questions that would benefit from scientific analysis. For example, a major issue that is currently facing the Park is the elevated emissions of fine particulates that result from off-highway vehicle use and that may affect the health of the neighboring community.

In order for the scientific subcommittee to function more affectively, it must be given clear direction by the TRT or other entity. The subcommittee ought not be expected or allowed to develop its own agenda. The charge to the subcommittee should be specific and related to actions that the Park is required to take. The tasks of the subcommittee would then be to evaluate the plan of action, to evaluate the effectiveness of those actions, to make recommendations for changes or additions, and to critically review data analyses and reports of the actions taken.

Different scientific questions require different scientific expertise. The current subcommittee includes bird specialists and has functioned effectively with regard to snowy plovers and least terns. However, determining where and how revegetation should take place requires botanical and dune processes knowledge, and devising mitigation strategies for fine particulate emissions requires yet a different suite of technical abilities. In essence, a separate advisory panel of three or four scientists in appropriate disciplines is needed for each group of related specialized problems.

Agency scientists could be used to identify and coordinate the activities of the specialists required, but no agency is likely to have all the needed specialists on staff.

APPENDIX

Recommendations of the ODSVRA Scientific Subcommittee re: Research and Management Questions and Priorities (January 30, 2015):

Introduction

As a part of identifying which research and management questions should be recommended by the Scientific Subcommittee, the members considered what they believe to be their charge from the Coastal Commission. They identified the following items as management concerns that the Sc. Subcommittee should address:

1. Understanding the biological potential of the ODSVRA area.
 - What species exist there now?
 - What could be there based upon alternative management regimes?
2. Estimate the Impact of ORV Use.
 - What has been the effect of off-road vehicular use on the natural dune habitats and associated aquatic habitats? What is known? What work needs to be done to make this determination for particular habitats?
 - What are the relative impacts associated with different levels of use (e.g., peak holiday periods vs. average use).
 - What are the mechanisms of impact (e.g., physical disruption of vegetated dunes, physical disturbance and increased turbidity of streams, compaction of beach habitat, impact injury to wildlife, etc)?
3. Identify Areas to Protect or Restore:
 - Which areas that are currently impacted by ORV use could potentially be restored to native vegetation?
 - Which areas serve, or could potentially serve, the needs of snowy plovers and least terns?
 - Are there conflicts between dune restoration and nesting activities? If there are conflicts, what is the optimal balance between the conflicting needs?
 - What other sensitive species should be part of a management plan? What are their restoration needs?
4. Recommend ORV Management Activities to Protect Natural Resources:
 - To which areas should ORVs be confined in order to protect natural resources?
 - During which hours of the day should vehicular use be allowed?
 - What uses should be allowed? Evaluate access routes and camping areas.
 - Should use restrictions have a seasonal component?
5. Review Natural Resource Management Activities and Make Recommendations:
 - Monitoring of snowy plovers and least terns.
 - Use of fencing and shelters.
 - Predator monitoring and management.
 - Vegetation restoration, including exotics removal and control.

Using the above list as a guide, the Sc. Sub. identified and ranked the research and management questions in this report.⁶ The Sc. Sub. members would not actually design any of these studies, but the members have drafted a

⁶ Page 7 of the permit includes the following direction to the TRT and Scientific Subcommittee: The TRT should develop recommendations to the Superintendent regarding “additional monitoring studies, adjustments to day and overnight use limits, and management strategies.” The Sc. Sub. will “identify, develop and

preliminary list of questions that these studies would address. The Sc. Sub. members could also review the proposed design once a study has been designed. The six topics are listed in order of priority.

1. Night Riding

The overall question that the Sc. Sub. identified as being the focus of such a study is: What are the impacts of vehicles on plovers, terns, and other shorebirds? Other shorebirds, such as sanderlings, should be included because the mandate of the Coastal Commission is not limited to listed species, plus observation of other shorebirds can provide insight into effects on plovers and terns. Carcass recovery could be one component. Additionally, reconnaissance work would need to be conducted prior to designing the study. The Sc. Sub. has identified the following questions and goals for such a study:

1. Define the area and amount of plover and tern use at night.
2. Define the area and amount of human use at night.
3. Determine what the birds are doing:
 - a. Does their location affect what they're doing, i.e., whether they are in or out of exclosures?
 - b. What are the differences between winter and summer use?
 - c. How do the tides affect their behavior?
 - d. How do various human activity levels affect their behavior?
 - e. How does motorized traffic affect winter flocks and breeding success?

2. Wintering Snowy Plovers and Other Shorebirds

1. How many snowy plovers are there?
2. Where are they?
3. Where have they come from?
4. What are they doing (e.g., foraging, roosting)?
5. How are they affected by human activity (e.g., pets, vehicles, pedestrians, equestrians)?
6. What other shorebirds are using the area? The same questions (i.e., how many, where, what are they doing, how are they affected) would apply to these other species.
7. What potential predators are present in the winter?

3. Invertebrates

Sandy beach invertebrates are of particular interest. Invertebrates are currently not monitored, but are critical to understanding plovers and terns, among other resources. Good baseline surveys of both terrestrial and intertidal species are needed. A study should determine what species are in ODSVRA. The study should include both open and closed areas.

evaluate the scientific information needed by decision-makers to ensure that the ODSVRA's natural resources are adequately managed and protected." Among other things, the Sc. Sub. will:

1. Recommend to the TRT the scientific studies and investigations that may be necessary to develop information needed by resource managers;
2. Advise the TRT regarding the protection of the SVRA's natural resources by helping identify and review needed research measures and restoration efforts to rebuild or protect the ODSVRA resources.

4. Vegetation/Soils Management

In 1999, the Off-Highway Motor Vehicle Recreation Division (OHMVRD) identified an issue Oceano Dunes needs to address.⁷ Accelerated sand movement caused by recreation patterns is contributing to loss of vegetation in and around Oso Flaco Lake, as well as the vegetated islands within the SVRA. This sand movement is contributing to loss of open water at Oso Flaco Lake (due to sand inundation). Within the Oceano Dunes complex there are small, vegetated areas that are unprotected by fencing and signage. The "OHMVRD Adopted Recommendation for Sandy Soil Areas" (1999) identified six alternative management options to slow the rate of sand movement and recommended all six options be tested and evaluated for one year.⁸ This work has not occurred. The big-picture question is: Can areas that are appropriate for restoration be identified? With this goal in mind, specific questions would include:

1. To what extent has the area of the vegetation communities changed?
2. To what extent have the communities been altered by invasions of exotics?
3. What areas have potential for restoration with appropriate vegetation?
 - a. Can they be restored? How?
 - b. Should they be restored (keeping in mind specific habitat needs of various species, e.g., plovers and terns)?

5. Fish Surveys

Tidewater goby and steelhead would be of particular interest. Grunion would also be of interest. Some data should already exist for Arroyo Grande Creek.

6. Water Quality

Water quality is especially relevant to juvenile least terns and gaining an overall understanding of the dunes. A watershed assessment may be underway soon.

⁷ This information is from the ODSVRA Wildlife Habitat Protection Plan, August 2001, p. 22.

⁸ The six options are:

1. Fence 1 to 5 acre foredune areas utilizing sand barriers/fences to trap the sand and gradually build up the dunes and actively revegetate with native plants.
2. Fence ¼ to 1-acre foredune areas utilizing sand barriers/fences to trap the sand and gradually build up the dunes and actively revegetate with native plants.
3. Fence ¼ to 5-acre foredune areas and allow both vegetation and sand to grow and /or move naturally.
4. Construct artificial sand dunes with heavy equipment between ¼ to 5 acres in size before fencing and revegetating.
5. Fence and revegetate a minimum ¼ acre utilizing sand barriers/fences to trap the sand and gradually build up the dunes to duplicates the original foredune system (aligned with the prevailing wind direction).
6. Use heavy equipment to reduce the height of existing sand dunes 1.5 feet in front of the slack dune vegetated islands. The sand would then be pushed north or south of the islands and allowed to move down-wind naturally away from the vegetated islands.

Three control/comparison areas were identified: the Dune Preserve north of pole 3, the protected foredune area south of pole 8, and areas of existing OHV use.

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**M E M O R A N D U M**

FROM: Laurie Koteen, Ph.D., Ecologist
TO: Justin Buhr
SUBJECT: Oceano Dunes State Vehicle Recreation Area
DATE: January 29, 2014

Documents reviewed:

California State Parks and Recreation. 2013. Oceano Dunes State Vehicular Recreation Area Rule 1001 Draft Temporary Baseline Monitoring Program: First Draft.

California State Parks and Recreation. 2014. Restoration Plan for Straw Bale Dust Control Area, Oceano Dunes SVRA. Spring 2014. Emergency CDP G-3-14-0007 (ODSVRA Dust Control Program).

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Gillies, J.A., V. Etyemezian, and C. Dugan. (Desert Research Institute and TRA Environmental Services, Inc.). 2014. Sand transport and dust reduction measures within and near the ODSVRA to reduce 24-hour average PM10 concentrations at the CDF ambient air quality monitoring station in San Luis Obispo County, CA. A report dated January 13, 2014 to the Department of Parks and Recreation.

Craig, J., T. Cahill, and D. Ono. (San Luis Obispo Air Pollution Control Board, The Delta Group & The Great Basin Unified Air Pollution Control District). 2010. South County Phase 2 Particulate Study. Oceano State Vehicle Recreation Area: San Luis Obispo Air Pollution Control Board.

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Etyemezian, V., J. Gillies, D. Zhu, A. Pokharel, and G. Nikolich (Desert Research Institute). 2014. 2013 Intensive Wind Erodibility Measurements at and Near the Oceano Dunes State Vehicular Recreation Area: Preliminary Report of Findings. A report dated July 9, 2014 to The Department of Parks and Recreation.

Bedrossian, T.L., and J. P. Schlosser (California Geological Survey). 2007. Review of Vegetation Islands, Executive Summary, Oceano Dunes SVRA.

History of the Ocean Dunes State Vehicular Recreation Area Air Quality Project

Historical monitoring of air quality in the area of the Nipomo Mesa has revealed repeated episodes where state and air quality standards for PM 10 and PM 2.5¹ have been exceeded (Tables 1 and 2). As a result, several research efforts were initiated with the goals of 1. identifying the source of excess particulate matter in local air masses, 2. understanding the physical processes that control and exacerbate particulate emissions, and 3. designing mitigation measures to reduce particulate emissions. Phase 1 and 2 studies were completed in 2004 and 2010 respectively by the San Luis Obispo Air Pollution Control District (the APCD), and associated state agencies and academic entities. Their research directly attributes the excess particulate emissions to the open sand sheets of the Oceano Dunes State Vehicular Recreation Area, (ODSVRA), which lie upwind of monitoring stations within the Nipomo Mesa. Several additional studies were

¹ PM 10 are particulate emissions with an aerodynamic diameter of 10 µm or less. PM 2.5 are particulate emissions with an aerodynamic diameter of 2.5 µm or less. Aerodynamic diameter is the diameter of an idealized particle that has the same aerodynamic properties as a given particle, but which is spherical in shape. 1 µm = 10⁻⁶ m.

commissioned by the California Department of Parks and Recreation (CDPR) and these studies largely confirm the APCD findings. These were completed by the Desert Research Institute (DRI) independently, or with TRA Environmental, a private consulting agency. I reviewed these documents and several others for the purpose of evaluating mitigation efforts, both implemented and proposed, to reduce particulate emissions from the ODSVRA.

Table 1: State and National Ambient Air Quality Standards for Particulate Matter

	California Ambient Air Quality Standards for PM²		National Ambient Air Quality Standards for PM³	
Averaging Time	PM 10	PM 2.5	PM 10	PM 2.5
Annual	20 µg.m ⁻³	12 µg.m ⁻³	*	12 µg.m ⁻³
24 Hours	50 µg.m ⁻³	35 µg.m ⁻³	150 µg.m ⁻³	*

*Standards not set for these emission categories

Table 2: Number of State and Federal Exceedances of Particulate Air Standards at the CDF Station on the Nipomo Mesa, reproduced from (Allen 2015).

Year	PM 10			PM 2.5		Notes
	Federal 24-hr Exceedances	State 24-hr Exceedances	Annual* Average	Federal 24-hr Exceedances	Annual* Average	
2014	2	83	38.6	1	12.3	Unofficial, includes preliminary data
2013	2	93	39.9	3	12.5	
2012	3	70	33.6	3	9.6	
2011	0	63	34.4	0	11.9	
2010	1	53	32.4	0	9.5	Partial year-site operated 10 months

*Annual average reflects the average daily particulate concentration for the CDF station.

² <http://www.arb.ca.gov/research/aaqs/caaqs/pm/pm.htm>

³ <http://www.epa.gov/air/criteria.html>

Particulate Matter and Human Health

Several decades of research have now documented strong correlations between particulate emissions (PM 10 and PM 2.5) and a wide range of adverse health outcomes. These include increased rates of pulmonary and cardiovascular morbidity and mortality, adverse reproductive outcomes, and possible neurological effects⁴. Adverse health outcomes have been found for short-term acute exposures to high particulate concentrations. High particulate concentration generally are correlated with increased visits to hospital emergency rooms, hospital admission rates or doctor's visits. Long-term health impacts can also result from sustained exposure to elevated particulate levels⁵ and result in premature death rates in locations where they occur. Particularly vulnerable populations include children, those with chronic ailments, such as asthma or cardiovascular disease, and the elderly.⁶

The Source Region for Particulate Exceedances on the Nipomo Mesa is the ODSVRA

As documented in the South County Phase 2 Particulate Study overseen by the APCD, the particulate emission concentrations on locations along the Nipomo Mesa regularly exceed state and national particulate standards. Based on their analyses, this study definitively established the source areas of particulate emissions to be the riding areas of the ODSVRA. To arrive at this conclusion, they investigated the meteorological conditions that are present during episodes of high particulate emissions, performed chemical and particle size analyses of the particulates present at nine candidate source locations and at the air quality monitoring stations during high emission episodes⁷. Element and air quality samplers were placed at each of these locations along north-south transects downwind of the ODSVRA riding areas, as well as along areas to the north and south of the ODSVRA where riding does not occur (Figure 1). They also collected numerous soil samples from regions upwind of the sampling sites along transects that

⁴ Dockery, D.W. 2009. Health effects of particulate air pollution. *Annals of Epidemiology*. 19:257–263.
Rueckerl, R., A. Schneider, S. Breitner, J. Cyrus, and A. Peters. 2011. Health effects of particulate air pollution: A review of epidemiological evidence. *Inhalation Toxicology*. 23:555–592.

⁵ Puett, R.C., J. Schwartz, J.E. Hart, J.D. Yanosky, F.E. Speizer, H. Suh, C.J. Paciorek, L.M. Neas, and F. Laden. 2008. Chronic particulate exposure, mortality, and coronary heart disease in the nurses' health study. *American Journal of Epidemiology*. 168:1161–1168.
Strak, M., N.A.H. Janssen, K.J. Godri, I. Gosens, I.S. Mudway, F.R. Cassee, E. Lebret, F.J. Kelly, R.M. Harrison, B. Brunekreef, et al. 2012. Respiratory health effects of airborne particulate matter: The role of particle size, composition, and oxidative potential-The RAPTES Project. *Environmental Health Perspectives*. 120:1183–1189.

⁶ Rueckerl, R., A. Schneider, S. Breitner, J. Cyrus, and A. Peters. 2011. Health effects of particulate air pollution: A review of epidemiological evidence. *Inhalation Toxicology* 23:555–592.

⁷ The APCD study used TEOM, e-BAM and FRM PM 10 monitors to assess particulate concentrations, standard micrometeorological sensors to measure wind speed, wind direction, relative humidity and air temperature, and DRUM aerosol samplers to measure particle size and elemental composition.

extended west from these points to the ocean. In most cases, these sampling campaigns extended from March 2008 – March 2009. Through this analysis, the research group determined that the air quality violations occurred primarily at the CDF and Mesa 2 monitoring stations, during periods of high northwest (290 – 310°) winds. In addition, they found that the materials collected by the elemental samplers at the CDF and Mesa 2 stations were composed primarily of crustal materials similar in size and elemental composition to the samples collected in ODSVRA riding areas. Moreover, the particulates captured at the CDF and Mesa 2 monitoring stations were dissimilar to the soil samples collected outside the riding areas (Craig et al. 2010).

These findings are substantiated by an additional study commissioned by CDPR. In this CDPR analysis, a series of transects were arrayed along areas both open and closed to riding in the sandy regions of the ODSVRA (Etyemezian et al. 2014). Transects were located approximately parallel to the prevailing wind direction or to the shoreline. Each transect location was subject to simulated winds by a device called the PI-SWERL, which stands for Portable in-situ wind erosion lab⁸. Subsequently, the size and number of particles entrained, or captured, by the air mass were assessed. An example of the results of this analysis for wind speeds of 32 mph, (14.3 m/s) are shown in Figure 2.

Direct and Indirect Factors Affecting High Particulate Emissions on the Nipomo Mesa

The goal of the third prong of the South Coast Phase 2 Particulate Study was to determine which mechanisms best explain differences in emissions between riding and non-riding areas and to confirm that sand flux measurements recorded within the ODSVRA corresponded to high PM 10 emission episodes documented at the CDF and Mesa 2 monitoring stations. This was accomplished through measurements performed by “sand catchers” located in riding areas on the ocean side of the fore dunes (Beach Dunes) and within the fore dune interior (Interior Dunes), as well as in non-riding areas in the Oso Flaco region (Natural Area – Oso) in sandy regions and vegetated areas. The threshold wind speeds from this investigation appear in Table 3, where the threshold wind speed represents the lowest wind speed required to cause entrainment of particulates in an air mass as it travels across the soil surface. A combination of Sensit and sand catcher sensors were used for the particulate flux measurements⁹.

⁸ <http://www.dri.edu/pi-swerl>

⁹ Sensits record the count and kinetic energy of sand particles that hit the sensing element. Sand catchers trap sand particles as they travel above the soil surface. These devices require daily collection of captured particles.

Table 3: Comparison of Threshold Wind Speed for Different Areas Tested, from Table 4.3 from (Craig et al. 2010)

Location	Threshold Wind Speed at 10 Meters above the ground surface for mobilization of particulates
SVRA - Beach Dunes	7.7 mph (3.4 m.s ⁻¹)
SVRA - Interior Dunes	10.6 mph (4.7 m.s ⁻¹)
Natural Areas - Oso	13.3 mph (6.0 m.s ⁻¹)
Vegetated Natural Areas	No particulates captured at wind speeds that occurred over the measurement period

Given the clear evidence that the riding areas of the ODSRVA are the source of the particulate emissions recorded at the Nipomo Mesa stations, three plausible mechanisms present themselves. The first is the direct impact of OHVs riding across the sand sheets and causing sand particles to be kicked up into the air. The second is indirect and involves the de-vegetation and destabilization of dune structures by OHVs, and destruction of the biological crusts that hold sand particles together. Without their protective covering, fine silt and clay particles are more readily entrained by air masses passing over the surface during high wind events. Lastly, differences in emission profiles between riding and non-riding areas could result from a higher proportion of fine particles in the sand at the riding areas than in the non-riding areas.

Considering these mechanisms one by one in reverse order, the idea that differences in emissions are the result of differences in substrate composition is refuted by the analysis of soil samples conducted by DRI, and which appear in Table 4. These values are all associated with different regions within the ODSVRA where different mitigation efforts were implemented in an attempt to reduce emissions. As is evident from the table, all regions supports similar particle size distributions. It is important to note, however, that these are percentages by weight. Size designations by diameter are: sand: 63 – 2000 µm, silt: 2 – 63µm, and clay: < 2 µm, and a single particle with a diameter of 100 µm weighs the same as 1,000 particles with a diameter of 10 µm. Therefore, there are many more individual silt and clay particles than sand particles at each of these locations.

Table 4: Percent soil particle sizes for different regions of the ODSVRA; Table 4 from (Lancaster et al. 2011)

Site	Average % Sand	Std. Dev. % Sand	Average % Silt	Std. Dev. % Silt	Average % Clay	Std. Dev. % Clay
Straw Bales	99.52	0.15	0.25	0.07	0.28	0.04
Vegetation	99.24	0.51	0.54	0.37	0.16	0.04
ATV	99.57	0.13	0.20	0.06	0.20	0.06
Exclosure	99.37	0.18	0.31	0.12	0.24	0.07

The second mechanism involves the destruction of vegetation and biological soil crusts by OHVs. As is evident in Table 3, the presence of vegetation provides by far the most stability to sand dunes, with vegetated regions exhibiting very little to no particulate emissions. Soil crusts are also frequently observed in this region, (Craig 2010), and are well known to reduce wind erosion in arid and semi-arid regions worldwide¹⁰. As an example, a simple search on the Web of Science Citation Index yields 345 journal and book articles to the search terms: “wind erosion and soil crusts”. Biological soil crusts, also referred to as microphytic, cryptobiotic, microbiotic or cryptogamic crusts are composed of diverse assemblages of organisms that colonize bare soil. These organisms can include cyanobacteria, fungi, lichens, mosses, and liverworts, many of which are capable of photosynthesizing, thus increasing the nutrient content for further soil colonization by plants. They bind the soil together through physical mechanisms via fungal hyphae or algal filaments, and mucilaginous sheaths. Soil crusts have been known to form on sandy soils in as little as 2 months following cessation of disturbance¹¹. Examples of biological crusts appear in Figure 4.

There is some evidence that heightened emissions in riding areas are caused directly by the OHVs injecting fine particulates into the air via movement of tires over sand. A significant relationship was found by the South Coast Phase 2 study by comparing particulate emissions at the Mesa 2 monitoring stations on the 50 highest vehicle days with the 50 days of lowest OHV use (Craig et al. 2010). Anecdotal evidence also suggests that

¹⁰ Benlap J. and D. Gillette. 1998. Vulnerability of desert biological soil crusts to wind erosion: the influences of crust development, soil texture, and disturbance. *Journal of Arid Environments*. 39:133–142.

Li, X.R., F. Tian, R.L. Jia, Z.S. Zhang and L.C. Liu. 2010. Do biological soil crusts determine vegetation changes in sandy deserts? Implications for managing artificial vegetation. *Hydrological Processes*. 24:3621–3630.

Li X.R., H.L. Xiao, J.G. Zhang, and X.P. Wang. 2004. Long-term ecosystem effects of sand-binding vegetation in the Tengger Desert, northern China. *Restoration Ecology* 12:376–390.

Williams J.D., J.P. Dobrowolski, N.E. West, and D.A. Gillette. 1995. Microphytic crust influence of wind erosion. *Transactions of the ASAE (USA)* Available from: <http://agris.fao.org/agris-search/search.do?recordID=US9561451>

¹¹ Levin N., G.J. Kidron, and E. Ben-Dor. 2007. Surface properties of stabilizing coastal dunes: combining spectral and field analyses. *Sedimentology*. 54:771–788.

the higher number of OHVs driving on the northern regions of the ODSVRA explains the higher particulate emissions from this area relative to other riding areas, (Etyemezian et al. 2014). Although data is lacking for ridership per area of the ODSVRA, most or all of the camping occurs in the northern La Grande Tract region, and higher vehicle use is associated with the camp sites. A priority of future work should be to document the number of OHVs that frequent each region of the ODSVRA with the express goal of understanding if relatively high ridership explains higher particulate emissions in some regions of the park relative to others.

Mitigation Measures to Reduce Particulate Emissions

Proposed Mitigation Measures

The Department of Parks and Recreation commissioned a mitigation plan to reduce particulate emissions in the ODSVRA (Gillies et al. 2014), and this plan was implemented in the Spring of 2014 (California Department of State Parks and Recreation 2014). The essentials of the plan were the fencing of a 30 acre area in the Northern portion of the riding area (Region 1 in Figure 5), and the placement of straw bales in a uniform pattern on over 60 acres of bare sand along the eastern border of the park (Regions 2 & 3 in Figure 5). These activities were to have occurred in a phased approach, and were detailed as such in an emergency CDP, which was approved. According to the proposal and the ECDP, park managers were to have fenced Region 1 first, with straw bale placement occurring only if the desired particulate emissions reductions were not achieved in Region 2, and then in Region 3 if necessary. In actuality, a smaller 15 acre area was fenced in Region 1, and 5,200 straw bales were placed on 30 acres in Region 3 all at once in the spring of 2014 (Figure 6).

I have several concerns about the approach that was implemented by the CDPR, and would be surprised if the measures employed are found to achieve the desired particulate reductions. My first concern is with the intent of the mitigation measures. Whereas high particulate concentrations are a problem across large swaths of the Nipomo Mesa, as indicated by repeated high emission episodes at both the CDF and the Mesa 2 monitoring stations, the proposed measures appear designed primarily to reduce the emission **readings** at the CDF monitoring station. This is evident not only from the title of the proposal, “Sand Transport and Dust Reduction Measures within and near the ODSVRA to Reduce 24-hour Average PM10 Concentrations at the CDF Ambient Air Quality Monitoring Station in San Luis Obispo County, CA”, but also by the mitigation design. For example, in Figure 5, a purple wedge has been drawn in the prevailing wind direction from CDF monitoring station to the ocean, outlining the source area for that monitor, and that monitor only. This appears to be the reason behind the placement of the proposed mitigation in regions 1, 2 and 3. No other areas in the ODSVRA were targeted, even though they also contribute to the high emission conditions that exist throughout the Nipomo Mesa. The intent of mitigation efforts should be to address a pressing public health issue, not to reduce the emissions as registered by one monitor. Moreover, it is clear from the text of the proposal that the plan is only to reduce emissions to a point where the federal air quality standard for PM 10 is met; a standard of $150 \mu\text{g.m}^{-3}$, and not the more stringent California PM 10 standard of $50 \mu\text{g.m}^{-3}$. Within the proposal, the figure of 150

$\mu\text{g.m}^{-3}$ is repeatedly referenced as a target concentration, and the $50 \mu\text{g.m}^{-3}$ is mentioned not at all in this context.

A second concern I have with the proposal is the assumptions that underpin the mitigation design. In the proposal, the reason given for choosing Region 1 in the La Grande Tract is the higher emissions recorded in this area relative to other locations in the ODSVRA. Emissions do appear to be higher in this region, and I concur that reducing access to this area is likely to lower emission rates on the Nipomo Mesa. However, the mechanism suggested for the higher emissions in the La Grande Tract is a smaller particle size distribution relative to other areas. Yet nowhere are data presented to justify this assumption which remains entirely speculative. Nor have I seen such evidence in my review of several other studies documenting the environmental characteristics of the ODSVRA.

The assumptions behind the choice of regions 2 and 3 for straw bale placement are also problematic. In the proposal, the authors state, "if all other factors are equal, areas closer to CDF may contribute more to measured PM10 concentrations than areas farther away from CDF". While this is undoubtedly true, all other factors are not remotely equal. A wealth of data definitively attributes the high particulate emission episodes to the riding areas within the ODSVRA, and specifically to the increased mobility of sand particles following the removal of vegetation and soil crusts by OHVs. Not only are the areas where straw bales are placed not within the riding areas of the ODSVRA, they are not even within the borders of the park (Figure 5). Moreover, the plan's intent is to allow riding to continue in Region 1. The proposal states that, "The OHMVR Division would design the dust control treatment to provide required dust control effectiveness while supporting use of the treatment area for OHV training or other limited OHV activity". However, it does not indicate how dust control measures would be achieved.

Regarding the use of straw bales as a means of reducing particulate emissions, I also have several concerns. First, this measure is of limited effectiveness as a short term means for reducing particulate emissions. Whereas some reductions in sand fluxes were recorded during the 2011 pilot project at experimental straw bale locations, they were reduced after the first couple of days, and monitoring was of short duration thereafter (Lancaster et al. 2011). Second, the bales do not appear to be an effective long-term solution. As with any landscape feature, straw bales are acted upon by their environment, and are affected by wind, water, sand, sea spray, animals and humans (Figure 7). As a natural material they will decompose, causing ongoing reduction in their surface roughness properties. Furthermore, the plan for their use is remarkably short on details. Will they be removed? Replaced? Disinterred? What is the cost effectiveness of this approach relative to other measures? How will they act upon their environment? How are the values of non-OHV recreationists affected by the placement of straw bales on the landscape? The hay bale project site is an area that provides for walking, birding, and general enjoyment of the coastal environment; a picture that does not normally include many acres of straw bales. In addition to the above concerns, a comprehensive review of the scientific literature revealed no evidence of this measure ever having been used in any other location before or since for the purpose of reducing particulate emissions. Given all these concerns, the straw bales currently located within the ODSVRA should be removed as required by Condition 3 of the emergency CDP (G-3-14-0007).

Potential Strategies for Reducing Particulate Emissions at the ODSVRA

There exists a clear and pressing need to reduce the excessive particulate emissions that rain down on the populations of the Nipomo Mesa downwind of the ODSVRA to levels acceptable for human health. Individuals with expertise in achieving particulate reductions should be brought into the process to develop a plan for achieving compliance with state and federal air quality standards in the near term. Such a plan should include specific measureable criteria to be achieved and enforceable time tables in which to achieve them.

Several mechanisms to reduce particulate emissions have been suggested. One option is to restrict the areas open to riding; a measure that may be necessary in the short term. Over the longer term, an effective option may be to establish large vegetation islands within the riding areas perpendicular to the direction of high winds that can act as barriers to particulates and prevent them from traveling to the Nipomo Mesa and other downwind areas (Zeldin 2015). As with all revegetation efforts, measures must be put in place to ensure that vegetation that reestablishes naturally is native, and that any vegetation that is directly planted stem from local native propagules. Other options include the use of environmentally safe soil binding agents in conjunction with fencing to hold the soil in place until biological crusts develop naturally. However, these measures would not have lasting value unless riding was also restricted in the treated areas. Another possible approach would be to restrict OHV use to winter months. The high winds that lead to particulate exceedance episodes most often occur in spring and late fall, and winter rains that wet the soils also prevent soil particles from entrainment.

Figure 1: Locations of sampling sites used in the South Coast Phase 2 Particulate Study (Craig et al. 2010). Sampling locations designated by yellow circles.



Figure 2: PI-SWERL measured emissions at 3000 RPM or 32 mph at a height of 10 m above the surface in units of $\text{mg}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$ (from Figure 6 in Etyemezian et al. 2014).

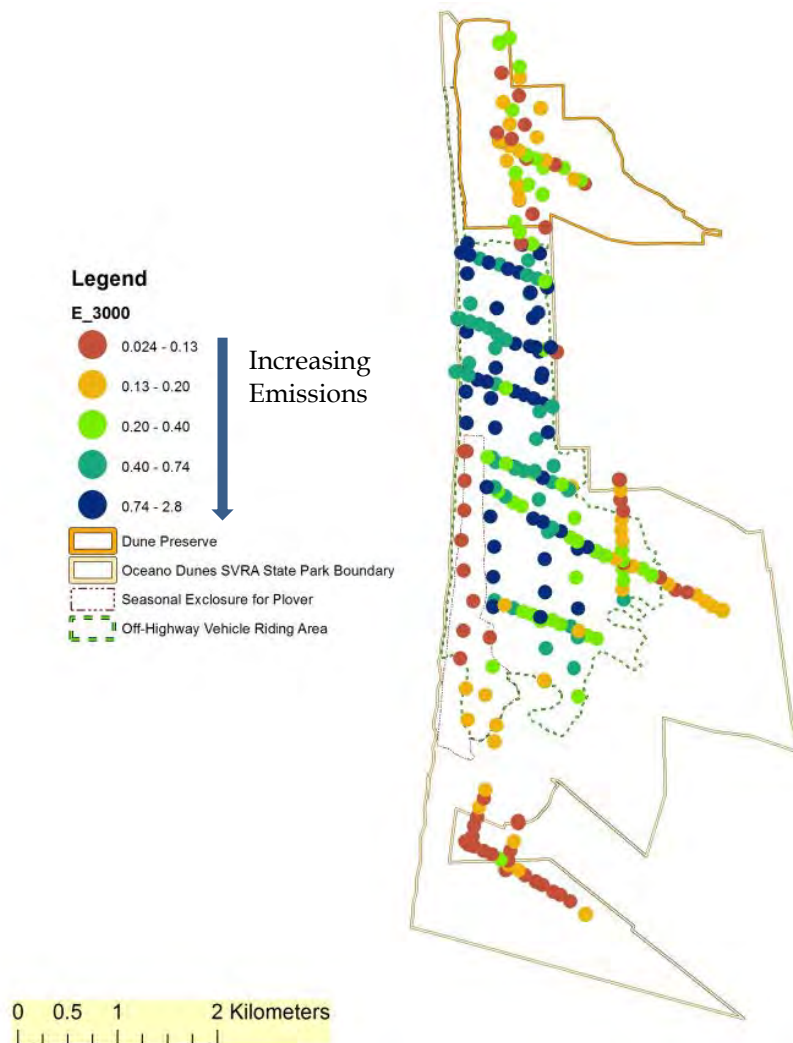


Figure 3: Increased resistance to high wind speeds with colonization by soil crustal organisms and vegetation¹².

Increased Wind Speed Required to Initiate the Capture of Fine Particles by Wind



a. No crust present



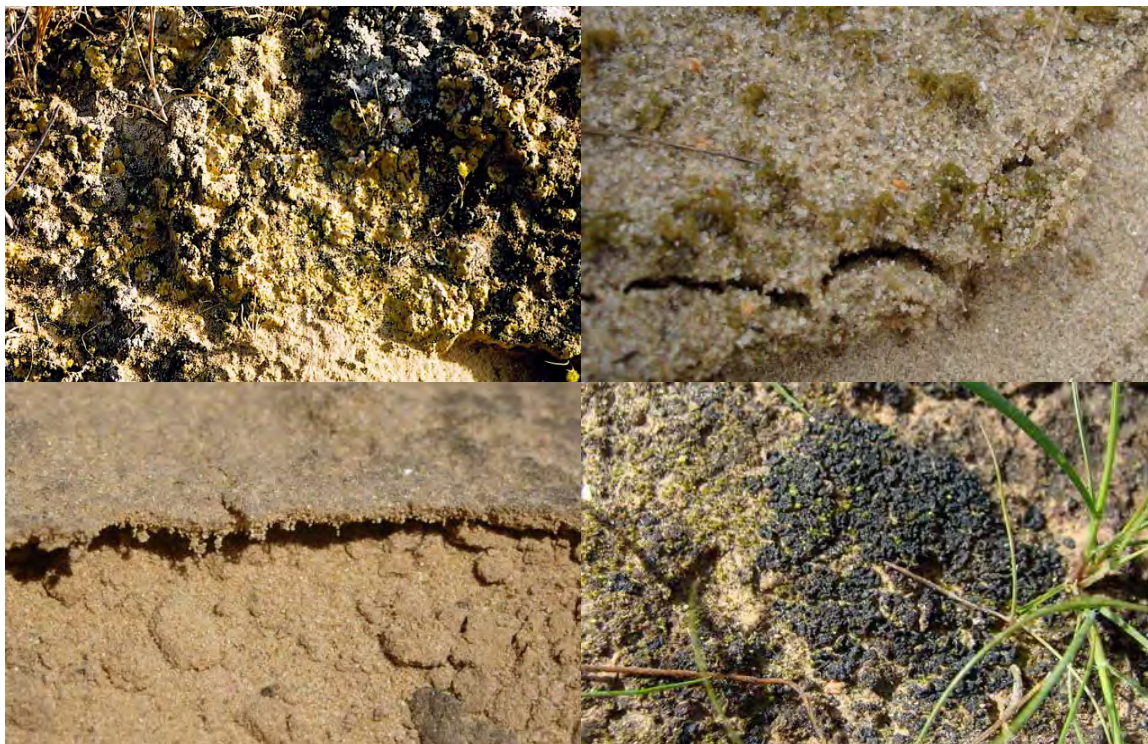
b. Well-developed biotic soil crust



c. Vegetated dunes

¹² Figure 3a from: <https://www.rockymountainatvmc.com/>,
Figure 3b from <http://www.drylandresearch.de/biological-soil-crusts.html>,
Figure 3c from: http://www.seftoncoast.org.uk/shore_sanddunesprocess.html

Figure 4: Examples of Biological Crusts¹³



¹³ Figure 4 images from: <http://www.drylandresearch.de/biological-soil-crusts.html>

Figure 5: Locations of Mitigation Regions in the ODSVRA adapted from (Gillies 2014)

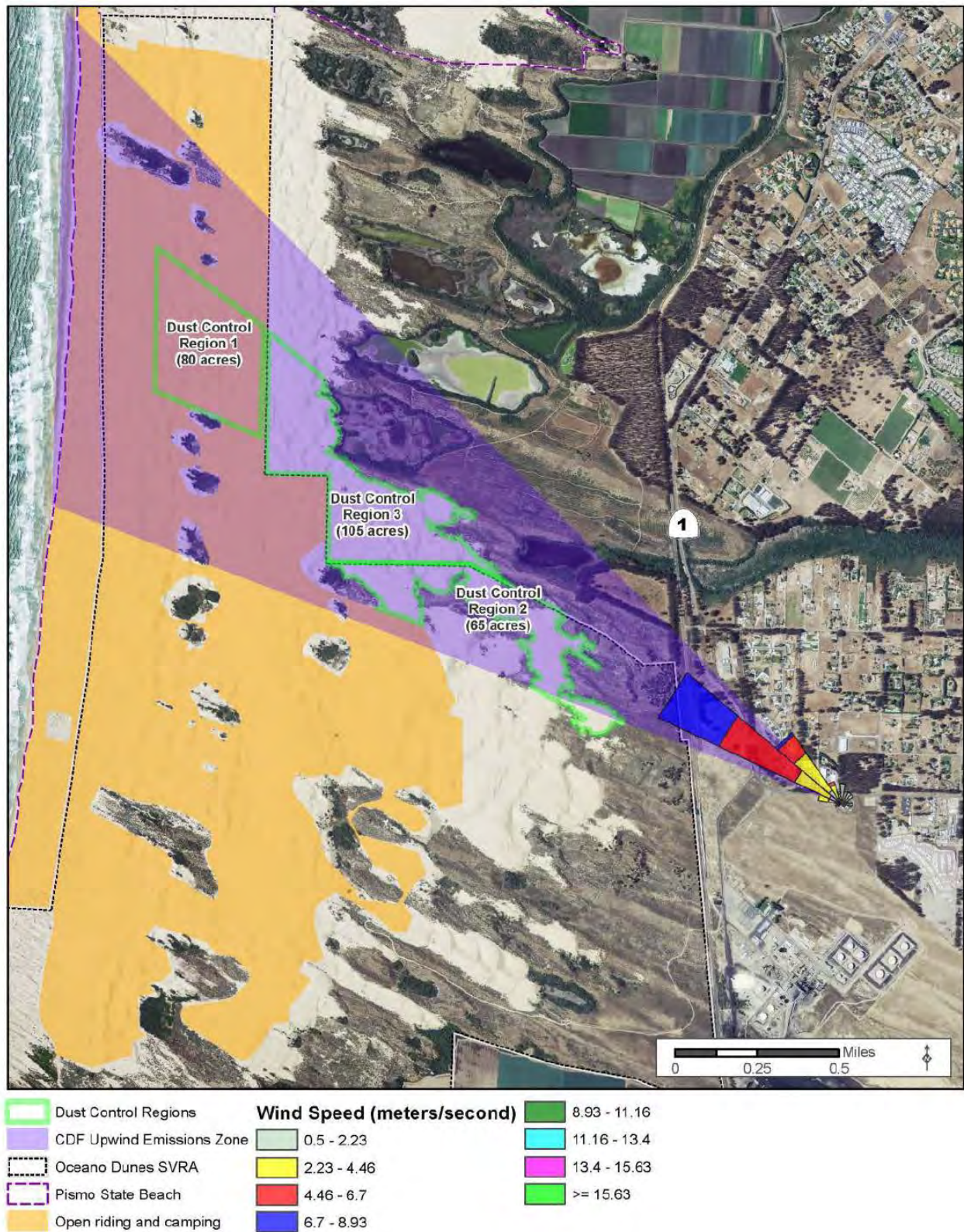


Figure 6: Oceano Dunes Straw Bale Mitigation Treatment



Figure 7: Straw Bales Buried by Sand in the ODSVRA from (California State Parks and Recreation 2014)

