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Permit Approved: 06/17/82
 Staff Report: 07/29/98
 Staff: LO, SG
 Hearing: 08/13/98

**STAFF REPORT
 CONDITION COMPLIANCE**

APPLICATION NUMBER: 4-82-300 (and amendments A1 through A4)

APPLICANT: **CALIFORNIA DEPT. OF PARKS AND RECREATION (DPR)**

PROJECT LOCATION: **Oceano Dunes State Vehicular Recreation Area (ODSVRA*)**, approx. 1 mile south of Pismo Beach, San Luis Obispo County.

PROJECT DESCRIPTION: Installation and maintenance of various developments required for the operation and management of an off-highway vehicle (OHV) recreation area at ODSVRA.

CONDITION TO REVIEW: Limitation on amount of OHV (Off-Highway Vehicle) use, pursuant to Conditions #3.D and 6.

ATTACHMENT: Submitted Final Draft of *Oceano Dunes State Vehicle Recreation Area Off-Highway Vehicle Day-Use Carrying Capacity Study*, dated June 30, 1998.

SUMMARY OF STAFF RECOMMENDATION

Staff recommends that the Commission **accept** the carrying capacity study prepared by the Department of Parks and Recreation as partial fulfillment of Conditions #3.D and #6; and, establish an *interim* limit on vehicle day use at a non-holiday maximum of 4,300 vehicles per day, including off-highway vehicles (OHV's). This number reflects the maximum amount of OHV day use that the Department believes it can manage without significant degradation of coastal resources. Staff also recommends, however, that further research and monitoring be conducted to better determine actual impact thresholds, particularly with respect to ecosystem carrying capacity. Staff further recommends that this acceptance be conditioned on the Department's agreement to certain measures, including a periodic review process, which are recommended by the County; and establishment of an interagency Technical Review Team.

* Oceano Dunes SVRA was known as Pismo Dunes SVRA until the mid-1990s; for clarity, references herein are to Oceano Dunes SVRA (ODSVRA), except where Pismo Dunes SVRA is found in direct quotations from previous documents.

The submitted Study describes how, through a combination of management measures (e.g., fencing, ranger patrols, dune restoration, user education) OHV impacts on ODSVRA's ecosystems are now confined to existing bare sand areas. The Study provides strong evidence that the balance between the vegetated and non-vegetated portions of the dune system is being maintained, an acceptable visitor safety trend is evident, sanitation problems have been resolved, traffic congestion within the community of Oceano has been minimized, and non-OHV visitor use is not precluded.

In addition, under the guidance of a resident Resource Ecologist, a Habitat Monitoring System (HMS) for both the bare sand and vegetated portions of ODSVRA would be implemented. The HMS would be implemented concurrently with the USFWS-approved Snowy Plover and Least Tern Habitat Management Plan (1997). An important element of condition compliance will be to establish OHV day use limits for the four peak warm-weather weekends (proposed as exceptions or "bump days" with respect to the interim 4,300 day use vehicle limit). Also, it should be noted that the proposed interim 4,300 day use vehicle limit would not apply to the 500 overnight camp units (up to 1,000 street-legal vehicles allowed), nor the OHV's that they bring into the area. The submitted study does not adequately define the systems which are to be sustained, nor does it contain sufficient evidence to determine if, because of OHV use, adverse impacts are occurring in what would normally be vegetated dune or plover nesting areas. Impacts on some wet beach fauna, such as grunion are not considered Implementation of the HMS, along with the recommended additional conditions of acceptance, is expected to answer these questions and to provide the data needed to finalize an acceptable carrying capacity with respect to both day use and camper-associated OHV's, as well for normal and peak holiday periods.

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STAFF RECOMMENDATION

Staff recommends that, after public hearing, the Commission adopt the following resolution:

Motion: "I move **approval** of the following resolution."

Resolution:

"The Commission hereby finds that the permittee, the California Dept. of Parks and Recreation, has appropriately documented, in the submitted Carry Capacity

Study, its collaborative efforts to establish a limit on off-highway vehicle (OHV) day use pursuant to the requirements of condition #3.D of Coastal Development Permit #4-82-300, as amended. This action includes approval of an interim day use limit of 4,300 vehicles including OHV's (except during the four peak season holidays), subject to the conditions listed below. However, the Commission recognizes the submitted Study's asserted carrying capacity only as a proposal; additional information will be needed to establish ecosystem carrying capacity and to complete compliance with Conditions 3.D and 6 of the permit."

Staff recommends a "YES" vote.

CONDITIONS

This review of condition compliance and acceptance of the Carrying Capacity Study is subject to the following conditions:

Conditions Derived from Recommendations of the San Luis Obispo County Board of Supervisors:

1. The Department of Parks and Recreation agrees to limit the number of motor vehicles to the established carrying capacity, once such carrying capacity is established as provided in the subsequent conditions below;
2. An interim limit on motor vehicle use on the beaches and dunes of Oceano Dunes SVRA is hereby established at 4,300 day use vehicles, which includes the off-highway vehicles transported into the recreation area (levels to be monitored using valid statistical and sampling methods); this number does not include vehicles attributable to allowed overnight camper use within ODSVRA;
3. The 4,300 day use vehicle limit may be exceeded only during the four major peak season holiday periods of Memorial Day, July 4th, Labor Day and Thanksgiving during an initial three year term, to allow for comprehensive monitoring and comparative analysis of historical levels of visitor uses and impacts during these highest attendance periods (after which time a day use vehicle limit shall also be established for the four peak season holidays, in accordance with the approval process used to establish the 4,300 vehicle limit);
4. The Department of Parks and Recreation shall utilize the day use carrying capacity study recommendations, including the Habitat Monitoring System (HMS), to monitor the impacts of visitor use and annually provide the data and analysis to the County Department of Planning and Building and the California Coastal Commission;
5. Adjustments of the Study's proposed day use carrying capacity shall be made in consultation with and agreement by the County of San Luis Obispo, the Executive Director of the Coastal Commission and the Department of Parks and Recreation at the end of an initial three year monitoring period; and whenever warranted by other circumstances as specified in Conditions 8 and 9 below;

6. Future adjustments to the proposed day use carrying capacity for the Oceano Dunes State Vehicular Recreation Area (ODSVRA) shall be based upon scientific and statistically valid data derived from monitoring and assessment. It is understood that the monitoring system established through the Carrying Capacity Study will require outcome and trend analysis over many years in order to determine the effectiveness of park management in preventing significant adverse impacts on the dune, beach and wetland ecosystems of ODSVRA.

Additional Conditions of Acceptance:

7. Commission Approval of Baseline Carrying Capacity Required. Within one year of completion of the initial three year monitoring period identified in Condition 5 above, permittee shall submit, for review and approval by the Coastal Commission, an updated Carrying Capacity Study for ODSVRA. Such updated study shall include a revised motor vehicle carrying capacity for the beach and dune areas of ODSVRA, including both day use and overnight vehicles, based on scientific evidence that no significant disruption of environmentally sensitive habitat areas will result (including, but not limited to, sensitive native dune plants and Snowy plover nesting sites). This carrying capacity, upon approval by the Commission, will serve as the baseline for subsequent management, subject to all future adjustments in motor vehicle numbers pursuant to the terms of these conditions. Additionally, seasonal use limitations, adjustments in the size or location of enclosures and/or fencing may be needed to comply with applicable Habitat Management Plan(s), and to reflect the actual extent and needs of sensitive ecosystems.

The updated study shall document the research components, methodology and results which support the revised day use carrying capacity; shall take into consideration total OHV impacts, including those attributable to the allowed number of camper units; shall include recommended use limits for both the peak season holidays and for periods of normal staffing; shall be submitted with a response letter or similar evidence of consultation with the Calif. Dept. of Fish and Game (CDFG), and the U.S. Fish and Wildlife Service (USFWS); and, shall be accompanied by a Resolution indicating consultation with, and agreement by, the County of San Luis Obispo. Prior to commencement of any new research component, the research design shall be submitted for review and approval by the Executive Director. Also, upon substantiation of good cause, the due date for the updated study may be extended, for not more than one year at a time, by the Executive Director.

8. Specific Monitoring Program Requirements. In order to establish baseline conditions for long-term trend analysis, comparing data sets over a multi-year time series, permittee shall implement the Habitat Monitoring System (HMS) detailed in the submitted draft Study dated June 30, 1998. Further, the HMS shall be augmented with the following supplemental programs and studies, listed below. Some studies may require manipulative investigative measures such as temporary enclosure fencing. Where such temporary measures have been reviewed and approved by the Technical Review Team (Condition 11 below), the Executive Director may authorize installation without additional coastal development permit.
 - a. Improve Retrophoto Baseline Archive. Collect all available useful pre-management air photos, and pre-management surface photos with identifiable dune revegetation and background landmarks. Publicize this need widely, via internet, news releases and other means as

appropriate. Offer compensation for particularly useful photos that can be dated and that show pre-OHV or pre-management conditions. Archive in a manner which makes them accessible to researchers and interested public.

- b. Establish Wet Beach Resident Fauna Study Program. Such program should include a grid of sample sites at a high intensity OHV site, a moderate intensity OHV site, and a non-OHV control (reference) site. Because sample site inventory will likely require sequential excavation of different sites within the grid in successive years -- which in itself could be considered a development -- such excavation to sample and screen subsurface biota is hereby authorized. The program shall be designed in consultation with the California Department of Fish and Game; shall be submitted for review and approval by the Executive Director within one year of the effective date of these conditions; and shall contain criteria for termination once the impacts, if any, on the Pismo clam and other wet beach resident fauna are determined.
- c. Conduct Shorebird Impacts Study. Compare shorebird activity in wet beach areas subject to intense OHV use, vs. an area of less intense OHV use and a non-OHV reference area which is subject to the usual recreational pursuits (like Pismo Beach). Evaluate whether the differences, if statistically significant, result in biologically significant impacts with respect to shorebird populations.
- d. Continue Snowy Plover Research. Continuing research projects should investigate the questions of recreational user proximity, vegetative cover and gull (and other predator) attractants as factors in Snowy plover breeding success. Do increased distances of bare sand between dense vegetative cover and plover nesting sites result in better protection from predator species? Do current types of recreational activity result in reduced nesting success, or increased gull or other predator concentrations? Does this have any significant affect on the plover population? If so, are there available measures to modify visitor and/or gull behavior?
- e. Establish Study Plot for Research on Successional Events in Dune Stabilization. The successional study program shall focus on a bare sand area that, absent recreational impacts, would be expected to revegetate with native plants. Selection of the research plot, control plot(s), and the design of the research program shall be performed in consultation with the appropriate experts at the California Dept. of Fish and Game, and U.S. Fish and Wildlife Service; shall be submitted for review and approval by the Executive Director within one year of the effective date of these conditions; and shall contain criteria for termination once the relationship of OHV activity to the successional stages of dune revegetation are determined. Particular topics to be investigated include the possible role of microcrust formation (comparable to that previously reported for desert areas); tolerance to vehicle impacts at different stages of the seasonal growth cycle; and,

identification of factors which would predict the extent of vegetated dunes absent the impacts of OHV's and exotic plant species.

- f. Assessment of Motor Vehicle Fluids Contamination. Such fluids include, but are not limited to fuels, lubricants, coolants, brake fluids, and additives. Questions to be addressed include: What is the incidence of spills? What measures are employed to prevent, detect and remediate such accidents? What are the cumulative effects? Could they be significant? If so, what mitigating measures could be employed?
1. Mandatory Reduction of Daily Use Limits. The approved interim non-holiday 4,300-vehicle daily OHV limit is dependent on the ability of the existing management measures, including ranger force, to prevent substantial disturbance of the dune ecosystem by allowed recreational activities. Therefore, if the ranger force is reduced, or management budget impacted, in such a way as to impair the ability of DPR to protect visitor safety, Snowy plover populations, or existing areas of native dune vegetation, the 4,300-vehicle daily vehicle limit shall be likewise reduced -- immediately and proportionately.
 2. Other Adjustments to Daily Use Limits. The 4,300-vehicle interim daily limit represents a maximum allowable loading for the OHV-accessible parts of the ODSVRA. It does not represent a legal entitlement. Permittee is expected to continue its role of regulating the time, amount and manner of recreational use; and, is further expected to make additional adjustments in response to new information as it becomes available from the research studies identified above. Provided, however, that the daily vehicle limit shall not be increased above 4,300 vehicles without prior agreement by the County of San Luis Obispo and amendment of Coastal Development Permit 4-82-300.
 3. Establish Technical Review Team. A Technical Review Team (TRT) shall be established by DPR. The TRT shall meet at least once a year to evaluate the monitoring results and to reevaluate monitoring protocols, shall make recommendations to DPR regarding additional monitoring focuses and management strategies, shall provide oversight review for the various research studies, and shall assist in the development of annual reports. The TRT shall be coordinated by DPR and shall be composed of representatives of the following seven agencies and groups:
 - a. San Luis Obispo County
 - b. California Coastal Commission
 - c. OHV Commission
 - d. *Local elected official (i.e., from the "5 Cities")
 - e. *Civic community (e.g., Chamber of Commerce, etc.)
 - f. *OHV user community (not an OHV manufacturer representative)
 - g. *Environmental community

*DPR shall solicit nominations from the groups represented by 4 through 7 and shall select one from each group.
 1. Disposition of Current Carrying Capacity Study. The Final Draft of the ODSVRA OHV Day-Use Carrying Capacity Study dated 30 June, 1998, shall be corrected and finalized. Commission staff shall be consulted for identification of all applicable conditions and findings from past Commission actions; correct characterization of the Study's preparers;

and an accurate representation of the status of the proposed 4,300 day-use vehicle carrying capacity (now recognized by the Commission only as an interim limit, pending further research). A copy of this Commission action shall be included as an appendix.

FINDINGS AND DECLARATIONS

A. Background

Vehicles have been driven on the beach at Oceano for at least 70 years. Prior to the 1980s, vehicles were operated on the entire 16 miles of beach from Pismo Beach on the north to Mussel Rock in Santa Barbara County on the south. Now, street-legal vehicles are allowed on approximately five miles of the beach from Grand Avenue south. OHVs are now restricted to about three miles of the beach, from a point one mile south of Pier Avenue to the southerly boundary of allowed OHV use, and on the dunes inland about two miles: the most southern and eastern portions are closed to vehicle use. The vehicular recreation area varies in width from a few hundred yards at the northern end to approximately three miles at the southern end. Its 3590 acres are comprised of sandy beach and sand dunes; about 1500 acres are available for OHV use.

The statute authorizing OHV Recreation Areas (Public Resources Code 5090 et seq.) was added to the code in 1982. Amendments in 1987 included additional provisions for environmental protection, allowed for the temporary or permanent closure of areas that could not be adequately protected from erosion, and placed priority for implementation of the OHV program on a par with other Department of Parks and Recreation (DPR) programs. The enabling legislation also provides for balancing of recreational and environmental factors, mandates a Commission composition of a variety of interest groups, and specifically allocates funding to both recreational and conservation projects. The legislation requires DPR to operate ODSVRA in a manner consistent with adopted erosion control standards and wildlife habitat protection plans and allows facilities or portions of facilities to be closed either temporarily or permanently.

Even though land for off-highway vehicle (OHV) use was acquired in 1974 and a General Development Plan was approved in 1975, the Department of Parks and Recreation (DPR) did not begin active management of Oceano Dunes State Vehicular Recreation Area (ODSVRA) until 1982. That year DPR proposed the construction of entrance kiosks and placement of fencing along portions of the perimeter of ODSVRA and around isolated vegetation "islands" and wetlands in the dunes. On June 17, 1982, prior to certification of San Luis Obispo County's Local Coastal Program, the South Central Regional Coastal Commission approved coastal development permit 4-82-300 to allow DPR to construct entrance kiosks and fencing. This permit, including four subsequent amendments, addressed the number of users to be allowed in ODSVRA (Special Conditions 3.B, 3.D, and 6).

Specifically, the coastal development permit was conditioned to, among other things, require that "OHV day use will be limited to a specified number of users established in consultation with and agreement by the County of San Luis Obispo and the Executive Director of the Coastal Commission and the Department of State Parks." In 1993 and 1994 the Commission reviewed compliance with this condition and found that there was insufficient information to be able to make a determination of what, if any, limits should be placed on the number of OHV

day users. To provide the necessary information, the Commission also required that the Department of Parks and Recreation prepare, in consultation with San Luis Obispo County and Commission staff, a carrying capacity study for submission to and approval by the Commission. The carrying capacity study for Oceano Dunes State Vehicular Recreation Area (ODSVRA) has now been completed as a final draft, to assist the County and the Commission in determining compliance with coastal development permit 4-82-300.

B. Condition Compliance History

Three conditions are relevant to this action. Special Condition 3.B, as amended, which applies to camping, states:

Beginning 4th of July weekend 1983, Beach camping within the Parks 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. Thereafter, admittance to the Park for purposes 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.

Special Condition number 3.D, as amended, which applies to OHV day use, states in part:

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 and 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.

Special Condition 6 of the amended permit, which applies to both camping and OHV use, states in applicable part:

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.

In 1991, DPR requested that the Executive Director increase the number of allowed camping units from 500 to 1000. On June 14, 1991, the Executive Director approved the increase, subject to concurrence by the San Luis Obispo County Board of Supervisors. On October 1, 1991, the Board of Supervisors concurred with the Executive Director's action and the increase

became effective. On May 18, 1993, the Board of Supervisors by letter to the Executive Director requested a decrease in the number of camper units to 500 with a camper unit to be defined "as a maximum of 2 self-propelled vehicles along with whatever additional vehicles they have towed to the site." This limit would allow 1,000 overnight self-propelled vehicles in the park (500 campsites x 2 self-propelled vehicles per site). The total number of vehicles this limit could allow is unknown because it is unknown how many additional vehicles would be towed into the site. DPR indicated that limits on individual overnight vehicles can be enforced more effectively than trying to identify a "camping unit," since there are no established campsites and it is relatively easy to count vehicles.

The action by San Luis Obispo County requesting a decrease in the number of camper units after several public hearings, along with the controversial nature of this matter, resulted in Coastal Commission review of coastal development permit 4-82-300 for condition compliance.

On March 16, 1994, the Commission held a public hearing on the matter of condition compliance for Coastal Development Permit #4-82-300. DPR's Off-Road Vehicle Division had agreed at that point to perform a capacity study. The Commission formalized this agreement by voting to:

1. Require the California Department of Parks and Recreation to perform and submit a carrying capacity study so that appropriate limits can be determined for day use and overnight use, as required by Coastal Development Permit No. 4-82-300 conditions #3 and #6 ... [The] scope of study ... will cover counting of all day time uses and users ... and type and number of vehicles. In addition, there will include a survey of infrastructure constraints ... and environmental and user conflicts/constraints.

The study of the park's carrying capacity is needed to achieve full compliance with Special Conditions #3 and #6 of Permit 4-82-300.

2. Approve the 1,000 vehicle limit for overnight camping purposes at Pismo Dunes State Vehicle Recreation Area, consistent with the County's recommendation. This limit will be in effect until the completion of the carrying capacity study.

The Findings adopted in support of this action clarify that this study "...will be used as a guideline to determine the appropriate limits on day use, OHV use, and camper units at a Commission Meeting subsequent to submittal of the final report..." An interim OHV day use limit of 1200 vehicles had been recommended by Commission staff, but was deleted by the Commission at the hearing (letter of April 15, 1994, from David Loomis, Coastal Commission Asst. Dist. Director, to Jerry Johnson, DPR Deputy Director, Off Highway Vehicle Division).

C. Department of Parks and Recreation Condition Compliance Submittal.

As described by DPR, a primary purpose of the Study is to establish a rational basis for restricting OHV day use "to a specified number of users," as required by Special Condition 3.D. Pursuant to the Commission's 1994 action, OHV day use currently is not limited except in the vegetated dune areas, where no OHV use is allowed. Overnight camping is limited to 1,000

vehicles until the completion of the carrying capacity study. Since 1994, DPR has in consultation with Commission staff prepared and submitted the final draft document *Oceano Dunes State Vehicular Recreation Area Off-Highway Vehicle Day-Use Carrying Capacity Study*, subsequently referenced as the *Study* (provided to the Commission under separate cover). The County of San Luis Obispo has reviewed the Study; their recommendations, along with the Board of Supervisors' Resolution No.98-213, are attached as Exhibit 1. DPR's Executive Summary of the Study is attached as Exhibit 2.

Proposed Day Use Capacity Identified as 4,300 Vehicles. Overall, the submitted *Study* recommends that “the OHV day use carrying capacity of Oceano Dunes SVRA be established at those levels that were prescribed in the Park’s General Plan (i.e., 4300 Day Use vehicles including OHVs). . . .” The Department of Parks and Recreation (DPR) concluded that the 4300 figure would not have any adverse effects, based on the results of data collection and data interpretation concerning visitor types, interaction and compatibility of uses, visitor safety, sensitive natural resources, air quality, and sanitation and traffic impacts on the local economy.

More specifically, the Carrying Capacity Study investigated six criteria on which its conclusions are based. The six criteria are:

1. Visitor type, interaction and compatibility of uses
2. Visitor safety
3. Sensitive natural resources
4. Sanitation
5. Traffic impacts on the local community
6. Air Quality

1. Visitor type, interaction and compatibility of uses. A survey was randomly administered to 1650 participants at four locations selected in order to obtain a mix of visitors. Participants were interviewed either as they entered the SVRA in a vehicle or while they were within the SVRA and on foot rather than in a vehicle. Interviews of entrants were conducted at the Grand and Pier Avenue entrance kiosks. Interviews of those already inside the SVRA were conducted in the “midramps” area between Grand and Pier Avenues or along the beach strand area fronting the OHV open ride area. The survey was conducted on nine separate periods between Memorial Day and Labor Day of 1994, the idea being to obtain representative sampling of users on busy season holiday weekends (including Memorial Day, Fourth of July, and Labor Day), busy season non-holiday weekends, and busy season weekdays.

The following relationships were evaluated:

1. The influence of survey location on principal activity;
2. The influence of survey location on the importance of the use of a vehicle to the visit;
3. The influence of principal activity and the importance of the use of a vehicle to a visit;
4. The origin of the visitor and the principal activity;
5. The origin of the visitor and the importance of a vehicle to the visit;
6. Type of vehicle (i.e. sedan, truck RV, etc.) the visitor arrive in and the number of OHVs brought with them;

7. Type of vehicle (i.e. 2WD vs. 4WD) the visitor arrived in and the number of OHVs brought with them;
8. Primary activity and the number of children under age twelve;
9. Primary activity and the number of people with a physical handicap;

The analysis of the survey indicated that the “typical” visitor to the SVRA got there via a vehicle (89%), lives in the 93xxx zip code (generally, Ventura, Santa Barbara, San Luis Obispo, Monterey, Fresno, Kings, Tulare, and Kern counties) (57%), is part of a group of three with one child under twelve, is not camping (67%), and spends most of the time in the OHV area engaged in several activities (56%). Of the respondents, 72 percent felt that the use of a vehicle was very significant, if not extremely important to their visit. The majority of the day users (53%) planned on using the SVRA for less than three hours. Beach driving or OHV use were the principal reasons for coming to the SVRA for 38 percent of the respondents.

In order to identify relationships which might exist between the various parameters measured, three relationships were examined.

1. The influence of survey location on principal activity;
2. The influence of survey location on the importance of the use of a vehicle to the visit;
3. The influence of principal activity and the importance of the use of a vehicle to the visit;

Over 57 percent of those surveyed at the Pier Avenue kiosk indicated that either beach driving or OHV use was their principal activity. At the Grand Avenue entrance, 31 percent indicated that either beach driving or OHV use was their principal activity. At Grand Avenue, the next greatest activity was sightseeing (17%). Between Grand and Pier Avenues, the “midramps” area, 40 percent of the pedestrians surveyed indicated that walking was their principal activity, with sightseeing next (14%). Along the beach fronting the OHV area, 41 percent indicated that either beach driving or OHV use was their principal activity, with 31 percent indicating their principal activity was camping. These figures suggest that visitors segregate themselves by location according to whether or not beach driving or OHV use was their principal activity.

Seventy-three percent of those visitors entering at Grand Avenue indicated that the use of a vehicle was either very significant or extremely important to their visit. At Pier Avenue, the figure was 82 percent, at the “midramps” area the figure was 31 percent with 58 percent indicating that use of a vehicle was either minimally important or not important at all, and 85 percent of those surveyed at the beach fronting the OHV and camping area felt that use of a vehicle was very significant or extremely important to their visit. These figures suggest that the importance of the use of a vehicle to a visit increased as function of distance downcoast, toward and into the OHV and camping area, that the survey was conducted.

The influence of principal activity and the importance of the use of a vehicle to the visit has a high correlation. Eighty-two percent of the 17 recreational classes (e.g., OHV use, camping, fishing, horseback riding, etc.) of visitors had 50 percent or more of their participants state that the use of their vehicle was either very significant or extremely important to their visit. Only two (horseback riding and walking) of the 17 recreational classes has a majority of respondents who indicated that vehicle use was either minimally or not at all important to their visit. These correlations are not surprising since a majority of visitors got there via a vehicle (89%) and spend most of the time in the OHV area (56%).

A survey done in 1991 from April 22 to April 28 showed that 2601 on-highway vehicles entered the SVRA trailering in a total of 924 OHVs resulting in a weekly average OHV/on-highway vehicle ratio of 0.36. A survey between Memorial Day and Labor Day weekends in 1994 revealed an OHV/on-highway vehicle ratio of 0.81. A third survey was conducted from June 14 to June 20, 1996 which showed an OHV/on-highway vehicle ratio of 0.36. The first and third surveys counted all vehicles entering the SVRA. The Memorial Day - Labor Day survey was randomly administered to approximately one in five vehicles at the entrance kiosks and randomly to pedestrians in the SVRA.

Daily ratios from the 1991 survey for Monday through Thursday ranged from a low of 0.119 on Wednesday to a high of 0.218 on Thursday. The daily Monday through Thursday ratio from the 1996 survey ranged from a low of 0.26 on Wednesday and Thursday to a high of 0.36 on Monday. Ratios increase on Friday and peak on Saturday; however no figures were supplied.

DPR recommends that an interim ratio of 0.5 be utilized in calculating the day use carrying capacity. For long-term purposes, DPR recommends that separate off season (January, March April, December), transition (February, May 1-15, October 15 - November 30), and peak season (May 15 to October 15) ratios be developed over a three year period subject to refinement and update.

In summary, the survey conducted by DPR revealed generally that visitors to the SVRA came for day use activities, drove a motor vehicle to the SVRA and considered use of the vehicle on the beach to be very significant to their visit, and generally engaged in several activities including OHV use, camping, sightseeing, walking, and beach driving. Conflict stemming from interaction among visitors engaged in differing activities was generally low.

2. Visitor Safety

Investigation of visitor safety involved comparing criminal activity at the SVRA with that in the nearby city of Pismo Beach and other state parks, beaches and recreation areas and investigating vehicle-related accidents.

a. Crime: Crime statistics were evaluated based upon measurements of both peace officer workload and per capita crime rate at the City of Pismo Beach and at ODSVRA. The study revealed that during the years 1992-93, ODSVRA had almost three times greater badged peace officer presence per capita than that of the City. The arrest load per badged officer in the City in 1993 was 5.46 times greater than that of badged peace officers at the SVRA. The number of crime reports per badged officer in the City in 1993 was 4.69 times greater than that experienced at the SVRA.

The rate of arrests per capita in the City in 1993 was 1.86 times greater than that of the SVRA, and the per capita crime rate in the City according to the number of crime reports in 1993 was 1.59 times that of the SVRA.

July Fourth holiday weekends show more nearly equal crime statistic ratios. The number of citizens served by each badged officer per day of the July 4th weekend ranged from 1.06 to 1.44 times greater at the SVRA than at the City. The number of arrests per officer per day of the weekend in 1992 and 1993 was, respectively, 1.15 and 7.39 times greater at the City than

at the SVRA. However, for the July 4th 1994 weekend, the number of arrests at the SVRA was 1.14 times greater than at the City. Crime reports per officer per day for the 1992, 1993, and 1994 July 4th weekends were, respectively, 1.64, 1.28, and 1.32 times greater at the SVRA than at the City. The number of arrests per capita per day of this weekend in 1992 and 1993 was, respectively, 1.66 and 7.99 times greater at the City than at the SVRA. In 1994 the figure was 1.06 times greater at the SVRA than at the City. The number of crime reports per capita per day of the weekend in 1992 was 1.14 times greater at the SVRA than at the City, in 1993 1.22 times greater at the SVRA than at the City, and in 1994 was 1.22 times greater at the SVRA than at the City.

Although on an annualized basis the SVRA is statistically more crime free than the City, on a peak summer holiday weekend, that is not always true. Presumably this is because the July 4th weekend is the busiest time at the SVRA when the number of visitors is at its highest. Overall, the SVRA is statistically a safer place, in terms of crime, than the City of Pismo Beach.

In the comparison of crime at ODSVRA in relation to other state park units in 1994, ODSVRA proved to be safer than most of the other units. The units selected for comparison were all in southern California and included state beaches and state recreation areas (in this case, lakes). Five had greater visitation than ODSVRA and five less. Compared with ten other units of the system with crime rates per 100,000 visitor days ranging from 4.7 to 21.5, ODSVRA ranked third lowest with a rate of 7.4 per 100,000 visitor days. In total reported crimes, ODSVRA ranked fourth highest with 83.

b. Vehicle-related Accidents: To gauge visitor safety relative to vehicle accidents, DPR investigated the types of accidents, i.e., single vehicle, multiple vehicle, vehicle vs. pedestrian, bicycles, or animals; causes; rates; response time; and relationship of rate to visitation.

No vehicle accidents involving pedestrians, bicycles, or animals were recorded for 8 of the 10 years from 1987-1996. One vehicle-pedestrian accident occurred in 1993, which involved a fatality, and one in 1996. During 1997, two fatalities occurred in one single-vehicle accident. Multiple vehicle accidents from 1989 to 1996, 10.7 percent of all vehicle accidents at ODSVRA involved two or more vehicles.

The accident rate from January 1, 1994 to October 31, 1994, at ODSVRA was compared to that at five other SVRAs. Although ODSVRA had the highest total number of injury accidents, 191, ODSVRA had the second lowest accident rate, 0.23 accidents per 1000 visitors. For the period 1987 - 1996, vehicle-pedestrian accidents accounted for 0.001 percent of all reported accidents.

Although the total vehicle accident numbers have fluctuated from 387 in 1989 to 144 in 1990 to 242 in 1994 to 187 in 1996, the overall trend is downward. The absolute number of ambulance transports (and therefore the number and percentage of serious injury accidents) has shown a continuing decrease from 1985 to 1993. Likewise, transports per 10,000 visitors has shown a continuing decrease for the same period.

At least seven causes of accidents have been identified. Excessive speed accounted for 58 percent of all accidents in 1996. Driving under the influence of alcohol/drugs accounted for 5 percent of all 1996 accidents.

Similar to the crime statistics, vehicle accident rates are highest in the summer months, when the most vehicles are at the SVRA, although there has been a general downward trend of accidents on the major holiday weekends.

In summary, the analysis of visitor safety by DPR showed that there was generally less criminal activity at the SVRA than at the City of Pismo Beach or most other State Parks. It was concluded that, in terms of motor vehicle accidents, Ocean Dunes SVRA was safer than most other off-highway areas in the state and that the visitor accident rate is declining.

3. Sensitive Natural Resources

Several sensitive natural resources exist in the SVRA, including vegetation islands, wetlands, snowy plovers, and least terns. DPR's vegetation efforts began in 1983 under permit 4-82-300 and involved the professional input of Coastal Commission, Fish and Game, San Luis Obispo County, and DPR staffs. Initially, vegetation islands were identified and protective fencing placed around them. Large parts of the eastern and southern portions of the SVRA were fenced to restrict vehicle entry into vegetated areas and wetlands, including Oso Flaco Lake and Creek. Based on aerial photography and on-the-ground inspection, vegetated areas which were fenced off have generally become more densely vegetated and less fragmented. DPR has contracted with academic contractors to assist in on-going monitoring and to establish a Geographic Information System (GIS) database for use in mapping and analysis of habitat changes. The study found that the total vegetative cover in 1994 was 138 percent of that which existed in 1983; when revegetated areas were included, the increase was 308 percent. Density in 1994 was 218 percent of that in 1983; when revegetated areas were included, the increase was 435 percent.

Although numerous wildlife species inhabit the SVRA, the two that have received the most attention are the snowy plover and the least tern, both Federally listed species. In 1978, no plovers were found and human activity or development had destroyed or rendered potential plover habitat unsuitable. DPR's efforts to rehabilitate the habitat and protect the plovers has resulted in 41 plover nests being found in the SVRA in 1994. When nests are found, the area around the nest is fenced to prevent OHVs from physically destroying nests and eggs and from causing abandonment of the nesting site due to vehicle operation too close to the nest. DPR has worked with Fish and Game and the US Fish and Wildlife Service to develop a Habitat Management Plan to formally guide habitat management for plovers and terns.

DPR has undertaken a very large effort to enhance plover and least tern habitat and to protect their nesting sites. There is a clear connection between reducing or removing human activity and enhancing plover and tern habitat and reproductive success.

Overall, DPR's enhancement and management of sensitive resources, according to the *Study*, have met with much success. DPR has involved universities, other government agencies, and private groups in its resource management efforts. Since 1982, when DPR started active management of the SVRA, the sensitive natural areas have become significantly healthier. The Study states that the Snowy Plover/Least Tern monitoring and management program is probably the most successful in the State. DPR has developed a comprehensive Habitat Monitoring System to identify the health of natural communities and trends over time.

Based on the information contained in the *Study*, DPR demonstrates that environmentally sensitive habitats are in much better condition than they were in 1982 and that community values are being protected. The SVRA's General Plan of 1975 identified the carrying capacity to be 4300 vehicles. Given the improvements in enhancement and management of environmentally sensitive habitats and that no adverse effects on community values have been observed, DPR recommends that the day use carrying capacity be 4300 vehicles as identified in the 1975 General Plan (see Exhibit 3, attached).

4. Sanitation

From 1991 through October of 1994, no citations were written for illegal discharge of sewage from RV's in the SVRA. There are no records previous to 1991 to review. SVRA staff indicated that such illegal discharge was a problem in the 1970s but is not now. The change is probably due to educational effort of the SVRA staff, larger holding tanks in newer RV's, increased presence of rangers, and the availability of a dump station adjacent to the Grand Avenue entrance kiosk. Further, as many as 119 chemical toilets and six semi-permanent vault toilets are strategically placed throughout the SVRA during the summer. These are pumped on a regular basis. An evaluation of the chemical toilet facilities for the July 4th holiday weekend in 1992, 1993, and 1994 was performed. In 1992 the amount pumped equaled 46 percent of total chemical toilet capacity, in 1993 it was 30 percent of total capacity, and in 1994 it was 24 percent of total capacity. The effluent is discharged into the local sanitation district facilities. The sanitation district analyzed the SVRA's input into their sewer system and concluded that during the highest use month, the effluent was roughly equal to that generated by 24.3 homes. The local sewage treatment plant is just over 50 percent capacity, including the SVRA effluent. The Study substantiates the adequacy of the SVRA's restroom facilities; and, traffic impacts due to vehicles backed up at the entrances is shown to be insignificant.

5. Traffic impacts on the local community

Grand Avenue and Pier Avenue are the only access ways into the SVRA that are open to the public. The Grand Avenue entrance kiosk is adjacent to either vacant State Park lands or a parking lot. In contrast, the Pier Avenue entrance, the more heavily used of the two, is adjacent to a small retail business district and residential area. Thus backups of vehicles with associated noise and interference with local traffic has been most acutely experienced at Pier Avenue which, until it was widened to four lanes in 1994, was a two lane street.

A video camera was mounted at both kiosks on a variety of days, including Fourth of July, and times to record traffic levels. Analysis of the film revealed that backups were generally no more than two vehicles. On only one occasion were more than five vehicles backed up. Ironically, greater backups may occur during non-peak use times such as in the spring when Arroyo Grande Creek is running at its highest and may preclude vehicles from crossing it for several hours to travel downcoast. Crossings could be delayed for several days; presumably at those times visitors would leave the area relatively soon after arriving.

6. Air Quality

No data was provided for this criteria.

D. Condition Compliance Analysis.

1. Standard of Review. The applicable standards of review for the submitted OHV day use carrying capacity study, are permit conditions #3.D and #6, as cited in Finding B above and as further clarified by the Commission's 1994 action. The Study states that DPR is also responding to the policies contained in Coastal Act Sections 30210, 30214 and 30240. These policies were the basis for the original conditions placed on 4-82-300. As such, they provide a useful context for understanding the Commission's concern.

Section 30210 provides, in relevant part, that "...maximum access ...and recreational opportunities shall be provided for all people consistent with public safety needs and the need to protect ...natural resource areas from overuse."

Section 30214, anticipating the need for proper management of access, cites "...the need to regulate the time, place, and manner of public access depending on the facts and circumstances in each case including, but not limited to, the following:

- (1) Topographic and geologic site characteristics.
- (2) The capacity of the site to sustain use and at what level of intensity.
- (3) The appropriateness of limiting public access to the right to pass and repass depending on such factors as the fragility of the natural resources in the area and the proximity of the access area to adjacent residential uses. ..."

Section 30240 requires that environmentally sensitive habitat areas (ESHA's) be protected from any significant disruption.

Several additional policies would serve to inform the condition compliance process, but are not cited in the Study. Sections 30230-30232 are relevant because of the presence of OHV's in the wet beach ecosystem and the Arroyo Grande Creek crossing, and because OHV-related motor vehicle fluids (e.g., from blown engines, crankcase drips, refueling activities, etc.) could produce detrimental cumulative impacts. Specifically, Section 30230 calls for protection of marine resources; Section 30231 addresses protection of coastal waters, streams and wetlands; and Section 30232 requires protection "...against the spillage of crude oil, gas, petroleum products, or hazardous substances Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur."

And, because dune vegetation plays a significant role in reducing wind erosion (and the subsequent movement of dunes over downwind native vegetation, wetland habitats, agricultural lands and developed areas), the relevant policy language in Section 30253(2) is to "...Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area..." Nonetheless, while these policies provide helpful guidance for determining how to apply the conditions, the permit conditions themselves are the applicable standard.

2. What is Carrying Capacity?

As discussed, the Commission's 1994 review of State Parks' compliance with conditions #3 and #6 of permit 4-82-300 required that the Department perform and submit a "carrying capacity" study so that appropriate day use limits could be determined as required by these conditions. As in the original permit, the Commission's primary concern was with the impacts of OHV's to environmentally sensitive habitat; the infrastructure capacity of the ODSVRA; and user group conflicts (e.g. safety).

The term "carrying capacity" generally refers to the size of a population that can be sustained by an environment or system indefinitely.¹ The carrying capacity of a system is a *threshold* number. If surpassed, the healthy functioning of the system will be diminished or the system may even collapse. Although often thought of as an ecological concept, carrying capacity is also relevant to social systems, such as urban infrastructure or recreational systems, including the ODSVRA.

The definition of the environment or system is central to a carrying capacity study. For example, the earth is a system that many argue has a finite human population carrying capacity. In contrast, a pond may also be analyzed as a relatively closed system or habitat that has a finite carrying capacity for particular species, such as red legged frog. Obviously, the carrying capacity of an environment will depend in part on the size and character of the system itself. A large grazing pasture will carry more animal units than a small grazing pasture.

Another difficulty in ecological carrying capacity analysis is that environmental systems are both dynamic, and often comprise multiple and related subsystems. For example, as discussed in more detail below, the Oceano Dunes complex is actually composed of at least four major and distinct ecological systems (habitats) that, over time, have fluctuated depending on various ecological and human disturbances. In other words, the system that is being analyzed for sustainability is a moving target. Are we trying to maintain the dunes as we suppose they existed prior to the introduction of OHV's? Or the dunes as they exist today? Should the baseline for a carrying capacity be pre-OHV, pre-1900, or perhaps pre-European influences?

The Access/Preservation Equation. The concept of carrying capacity, as applied to recreational use, can be summarized as: *the level of use a given area or resource can sustain, without significant degradation, over the long run.*

Recreational impacts, in general, can be offset with design and management measures. These measures range from enforcement to visitor education to better signage and facility design. Controlling the numbers of visitors or visitor vehicles is another important component. These concepts can be summarized by the following equation: $H/R = Q$, where ...

H= Habitat Preservation Effort
R= Recreation Impacts
Q= Environmental Quality

¹ See, for example, Meadows, Donella H., Dennis L. Meadows, Jorgen Randers, *Beyond the Limits: Confronting Global Collapse, Envisioning a Sustainable Future* (Chelsea Green Publishing Co., 1992).

What the equation means, is that in order to maintain a defined level of environmental quality, habitat preservation efforts must keep pace with recreational impacts. Alternatively, the recreational impacts of each user must be reduced. Otherwise, environmental quality will be degraded.

3. Analysis of State Parks Submittal

The Submitted Carrying Capacity Study Adequately Documents the Success of OHV Mitigation Measures Undertaken by DPR.

As described earlier, the State Parks study proposes 4,300 vehicles as the OHV day use carrying capacity of the ODSVRA. Although the submitted study does not include a particular definition of carrying capacity, the 4,300 figure was first derived through a carrying capacity analysis done for the 1975 General Plan. As summarized in Exhibit 3, it was based primarily on *recreational* capacity analyses from other State Park units, with particular focus on the appropriate threshold number of vehicles that would maintain a beneficial visitor experience. It was not based on any ecological analyses of the Oceano dunes environment in relation to the appropriate number of OHVs.

The Study does rely on an analysis of six criteria which, overall, adequately documents the success of OHV mitigation measures undertaken by DPR. First, since the main attraction of the SVRA is the ability to drive on the beach and in the sand dunes, it stands to reason that most people go there for that purpose; that most arrive via motor vehicle; and that use of a motor vehicle is very important to most, especially the farther downcoast, into the OHV and camping area one goes. Second, It has been shown that visitor safety is generally better than in the surrounding community and other State Park units. Third, specific sensitive natural resources, especially vegetation islands and plover and tern habitat, have been targeted for enhancement, with good results. Those vegetated areas protected from OHV use have shown gains in area and density. Snowy plovers have made significant comebacks due to DPR's management. Finally, the Study supports a finding that sanitation is adequately provided for and traffic impacts have been reduced.

On the whole, the submitted carrying capacity study documents the great success of OHV mitigation measures undertaken by DPR and provides valuable information and conclusions that hitherto were not available in one document or were unknown. The *Study* presents evidence that the various management measures such as sensitive area exclusions and fencing prevent significant degradation of sensitive vegetation which stabilizes the dunes and prevents their wind-driven encroachment on adjacent wetland habitats, farmlands, and developed areas. The Study also asserts that DPR's present ranger force, educational program, and facility design is adequate to preserve habitats at their present level of quality, if OHV day use does not exceed 4,300 vehicles per day (other than the occasional high use period on holiday weekends).

However, as elaborated below, this documentation of successful OHV mitigation measures does not ask nor answer other questions that a complete ecosystem "carrying capacity" study must ask and answer. For this reason, and because peak holiday use and camper-associated OHV use are not included in the analysis, it would be premature to settle on the proposed day

use capacity of 4,300 vehicles. In general, revisions to the *Study* are necessary to establish the basic framework for identifying carrying capacity; to define the system(s) we are attempting to sustain; and to establish more clearly the point on the time scale where we want to maintain the dynamic equilibrium, especially with respect to barren and vegetated dunes. Discussion of these points follows.

Further Study is Required to Define the ODSVRA Carrying Capacity

To address the question of carrying capacity, the dynamics of the different ecosystems which are present at ODSVRA must be recognized. There are four main categories of natural resource areas (systems) in this case: 1) the ocean, especially the intertidal (wet) beach which is home to the Pismo clam and other species, as well as a feeding area for various shorebirds and a possible breeding area for grunion on certain high tide nights; 2) the barren sand areas, including the dry sand beach and adjacent barren dunes, which are either devoid of vegetation (or nearly so) but are used by the endangered Snowy plover for nesting; 3) the vegetated dunes, generally located further from the shoreline; and, 4) freshwater streams and ponds. Each of these ecosystems interacts with its neighbors.

Dunes which support native vegetation, as well as wetlands, are generally considered environmentally sensitive habitats (ESHA's). Some of the other natural systems may, at least seasonally, have ESHA-type attributes as well. The following is a more detailed consideration of these different natural resource systems found at ODSVRA:

Wet beach -- clams and other infaunal organisms: Although no specific data is cited by the *Study*, there does not appear to be any evidence that OHV's are directly impacting clams and other subsurface beach dwellers. OHV's do make it easy for clam diggers to access the beach, so it would be logical that there is an indirect impact from increased take of the resource. The allowable take is explicitly regulated by the Calif. Dept. of Fish and Game, and no issue of overuse of this resource has been raised with respect to OHV use levels. Nonetheless, future research with respect to compaction, petrochemical contamination, reproductive success, growth rates, etc., would be appropriate.

Wet beach -- shorebirds: As a feeding area for shorebirds, considerable disruption is possible whenever ORV's cruise along the water's edge close enough to make the birds move away or take flight. The result (we can presume) is similar to what happens when there is intense use by pedestrians, equestrians cantering in the surf run-up, or dogs chasing the birds. That is, less feeding success due to less time on the surface and a greater drain on the bird's energy reserves from having to run away or take flight frequently. Together these effects are said to "stress" the impacted species.

The submitted *Study* does not have enough data to ascertain a carrying capacity relative to the bird foraging function of the wet beach. To make such a determination, we would need to know:

1. How often does OHV activity stress the resident shorebird population, as compared to similar non-OHV recreational beaches?

2. Are wildlife population balances being upset by the presence of OHV's? Are there particularly skittish species which flee, resulting in overcrowding by another, more tolerant species such as gulls?
3. Are there direct impacts on food supply attributable to OHV's running on the wet beach, such as from vibrations or trace hydrocarbon residues?
4. Are there indirect impacts on food supply attributable to OHV activity, such as competition from crows or gulls which are attracted to left-behind picnic scraps?
5. Is the level of disruption attributable to OHV activity significant? Is there evidence of the local populations of any of the shorebirds naturally occurring at this beach being placed in jeopardy?
6. If there is a significant local disruption, is it also significant in terms of cumulative impacts over the whole system? (Which, in this case, could be considered the entire wet beach from Pismo Beach to Pt. Sal.)
7. If there are significant impacts to the system, are there available mitigation measures which could reduce the impacts to a less than significant level?
8. If the appropriate mitigation measures include testing a reduced OHV use level, what level would be appropriate to test? (Such reduction should be, at a minimum, statistically significant, in the mathematical sense.)

Wet beach -- grunion: According to the Calif. Dept. of Fish and Game, grunion runs occur in the Pismo Beach area. These small fish utilize the wet beach to lay their eggs. Perhaps because the Study concerns only day use carrying capacity, disruption of the fish's night time reproductive activity was not at issue. However, will their nests (if any) be mashed by day-time OHV use? Would this be a significant impact? Can such impacts be mitigated by banning driving on the wet beach after a grunion run? Would this be practical to enforce? This topic is not addressed by the Study.

Wet beach -- Summary. Only generalized concerns have been raised regarding the wet beach ecosystem. No information is available that demonstrate that marine resources or ESHA's are at risk from OHV activity. Nonetheless, further study is warranted because of the possibility of cumulative adverse effects on this portion of the marine environment. Accordingly, the acceptance of condition compliance is conditioned to require wet beach-specific studies regarding clams and other resident fauna; shorebird activities; grunion runs; and an assessment of impacts from motor vehicle fluids.

Barren sand -- Snowy plover habitat: The barren sand ecosystem is comprised of dry sand beach and dunes with sparse or no vegetation. This is a dynamic system which is characterized by a high level of natural disturbance. Here, a small shorebird known as the Western Snowy plover makes its nest on bare sand. Loss of suitable breeding habitat has contributed to the decline of the species, such that it is a Federally-listed endangered species. Accordingly, known Snowy plover breeding habitats are considered to be environmentally sensitive habitat areas (ESHA's). The bare sand portions of the plover's habitat also happen to (otherwise) be the most tolerant and suitable for intensive recreational use.

The problem is not the absence of bare sand areas, but that too many bare sand areas have been made unsuitable. For example, observations on the Monterey Bay shoreline reveal visitors approaching too closely to the difficult-to-see nests (frightening the parent bird off the eggs and exposing the eggs to gull predation); harassment by domestic dogs running unleashed on the beach; and direct predation by introduced red foxes. At Oceano Dunes, an additional element of stress is added by OHV activity, including noise and vibration. Also, young plover chicks have been reported to take shelter in the minimal (but only available) shade offered by the wheel tracks of an OHV. Of course, this places them in jeopardy of being hit by a following OHV. (Despite the apparent hazard, there is no significant evidence of plover chick mortality from this cause).

At both the Monterey Bay dunes and at Oceano Dunes, the Dept. of Parks and Recreation (DPR) has put forth a great deal of effort to mitigate impacts to nesting Snowy plovers. For instance, DPR representatives indicate that, usually within one hour of the sighting of a plover nest, an enclosure is erected around the site. An enclosure amounts to a wire mesh cage that the plovers can freely move through, but is large enough to exclude predators such as dogs, foxes and gulls. The cage also serves to mark the site so that OHV's won't inadvertently run over it.

DPR prepared, and the U.S. Fish & Wildlife Service approved, a Habitat Plan (HMP) for Snowy plover habitat at ODSVRA. The number of Snowy plover nests have increased from none before DPR management to a reported 41 in 1994. Because the plover is holding its own or increasing at ODSVRA, it can be surmised that the current management measures under the HMP are effective. Therefore, the Study concludes that the present levels of OHV activity do not represent a significant disruption of Snowy plover habitat. However, the data presented in the Study does not indicate what the extent of plover habitat or nesting success would be in the absence of OHV activity. More research is needed before a no-impact carrying capacity can be identified.

Barren sand -- other: No significant plant or animal habitats are readily evident on the majority of bare sand areas at ODSVRA. Nonetheless, a closer look will reveal evidence of insect activity, vertebrate and invertebrate insect predators, wind-blown seeds and other evidence of biologic activity. Thin strands of plant life are sporadically present only as native "pioneer" species, or remnants of introduced exotics such as European dune grass and South African iceplant. No ESHA issues have been identified here.

Vegetated dunes: This dynamic ecosystem is characterized by significant levels of natural disturbance (wind, moving sand) such that specially-adapted dune species have a competitive advantage over the typical coastal bluff flora found along the central coast of California. These dune systems along California's central coast which are naturally stabilized by native vegetation are generally recognized as ESHA's. While native dune plants are adapted to (and may actually require) disturbance at some level, they are vulnerable to trampling and crushing during the growing season. A single pass by an OHV can leave tracks -- and a disturbed site susceptible to wind erosion -- that will persist for the rest of the year. Totally precluding disturbance has an impact as well.

Staff has observed that in similar dune areas where disturbance has been completely precluded (as at Salinas River Lagoon National Wildlife Refuge), a thin crust forms on top of the sand. This thin and fragile crust is comprised of sand grains, presumably cemented together with calcium carbonate, kelp algin or other such materials available in the immediate

environment. The presence of such crusts, their environmental importance, and recreational impacts on them, have been reported elsewhere (for example, at Arches National Park in Utah).

It is not clear whether in coastal dune systems microcrust formation is concurrent with -- or follows -- establishment of native "pioneer" plants. It appears that they have a possible stabilizing effect on the dunes, by reducing wind erosion and consequent dune movement. The crust supports small colonies of fungi, moss or lichen, which yield a tiny amount of nutrients in an otherwise relatively sterile sand expanse. The thin but hard crust also appears to inhibit germination or at least rooting of native plant seeds, except where rodent burrows, animal or human footprints have broken the surface. At these broken-through locales, native plant seedlings are often profuse. It can be hypothesized that at these sites, the sandy "soil" is suitable for root penetration, nutrients are available from rodent droppings and/or fungi/moss/lichen remnants, and at least some moisture is to be found under the adjacent intact crust (in what is otherwise a very hostile and xeric environment).

Further stages of dune stabilization follow. As the native (or introduced) dune plants grow, their root systems tend to hold the sand together, providing resistance to wind erosion.

Further plant growth attracts plant eaters, particularly rodents and rabbits. These animals in turn attract predators such as hawks and grey foxes. Animal droppings, and the remains of dead plants and animals provide more nutrients, thus leading in successional stages to increasingly more vegetated and stable dunes.

Dune plants also cause wind velocities at the immediate surface to be reduced, acting as miniature "windbreaks." This causes the wind to drop its load of sand grains; the amount of sand that a given gust of wind can bounce along the dune surface is proportional to the velocity of the wind. Thus, any object which reduces wind energy results in dune building. Put another way, plant cover builds higher dunes.

The Study does not explain current scientific ideas concerning the successional process on dunes, nor does it present data to indicate what the extent of vegetated dunes would likely be in the absence of OHV activity. More research and monitoring is needed before a no-impact carrying capacity can be identified.

Freshwater ponds and streams.

A number of unusual freshwater lakes and marshes occur along the inland side of this dune formation. These include the relatively large Oso Flaco Lake. All of these wetlands have been made off-limits to OHV's. In addition, Arroyo Grande Creek runs through ODSVRA. According to the Study, this stream once supported a run of Steelhead trout, but none have been seen in the last 20-30 years. The stream empties into the ocean across the beach, and must be forded by all OHV's headed south of this point. While the Study does partially address the potential for impacts on the stream ecosystem, a better understanding of potential cumulative effects is needed -- especially with respect to petrochemical contamination.

Summary

The submitted carrying capacity study contains much valuable information, especially regarding steps that have been taken to mitigate for recreational impacts. These mitigations include fencing of vegetated islands, fencing of snowy plover and least tern nests, and revegetation of areas now closed to OHV use. The submitted *Study* does not contain the information needed to adequately assess recreational impacts “from scratch,” that is, by describing first a dunes ecosystem without OHV use and then analyzing the impacts of OHV use on the previously OHV-free dunes ecosystem. The submitted *Study* implicitly assumes that there are no recreational impacts from OHV use because of the mitigation measures undertaken by DPR since 1982. In part, this stems from the fencing undertaken pursuant to permit 4-82-300. The location of the fencing, what areas should be fenced, involved input from DPR, Fish and Game, and Commission staff. While the location of the initial fencing did not necessarily mean that there might not be other areas that could be considered sensitive upon review and analyses of additional information, the findings of permit 4-82-300 do not indicate that additional areas beyond those identified at that time were considered “sensitive.” Nonetheless, there may be additional sensitive areas, such as the wet sand area that have not been investigated. OHV use on presumably already-barren dune is not treated as an adverse impact.

There can be no doubt that DPR’s management policies have enhanced vegetation island habitats by excluding OHVs from those areas. Similarly, by excluding OHVs from plover and tern nesting sites, DPR has enhanced the viability of those species. However, information is lacking regarding impacts to the wet sand area (clams, etc.) and what characteristics the dunes would have without OHVs, for example. In short, recreational impacts to the dunes ecosystem cannot be completely gauged without knowing what the ecosystem looked like and how its parts related to each other and to the whole of the ecosystem. The information provided allows for gauging impacts to the ecosystem since 1982; the conditions of this condition compliance are integral to being able to completely gauge recreational impacts.

The Existing Equilibrium between Barren and Vegetatively Stabilized Dunes is an Appropriate Measure of Environmental Quality Pending Further Research.

At ODSVRA, there appears to have historically been areas of both naturally barren and naturally vegetated dunes. The proposed levels of OHV use on the barren dunes will discourage establishment of pioneer plants and eliminate any likelihood of crust formation and other successional events which would lead to loss of bare sand areas. On the other hand, beyond the fences on the vegetated dunes, there is complete protection from OHV disturbance (and only minimal non-OHV recreational use and animal disturbance). The conditions favored by native dune plants will be perpetuated behind the fences, thus no reduction in this ecosystem is expected either.

This situation is dependent on having enough management measures in place to assure that OHV use is confined to the existing barren sand areas. If for example the OHV-user educational program were to fall short, if the fences were to fall into disrepair, or if the ranger patrol forces were cut back, OHV exclusion from the vegetated part of the dune system could no longer be counted on. Even a small number of “outlaw” OHV’s could, with continuous activity, threaten the sustainability of this ESHA.

The separation of uses is absolutely critical to the capacity of the barren portion of the dune system to co-exist with the vegetated portion of the dune system. The capacity of the barren dunes to sustain motorized recreational disturbance is very great. The capacity of the (naturally) vegetated dunes to sustain motorized recreational disturbance is very small. The precise historic extent of the bare sand areas is not known, but appears to have been extensive. What is known is that excessive disturbance will increase the proportion of bare sand at the expense of habitat suitable for native dune plants. Formerly vegetated areas which were made barren through excessively concentrated recreational use -- including OHV's, equestrians, pedestrians -- have recovered nicely once they are fenced and restored. On the other hand, through artificial stabilization, especially through planting of (highly undesirable) European dune grass, the area of bare dunes could theoretically be greatly increased. However, in accepting continued substantial OHV use on part of the dune system, we are perpetuating (and probably emphasizing the distinction between) two distinct subsystems.

It is believed that a dynamic equilibrium once existed between the barren dunes and the vegetated dunes. That equilibrium was upset through the introduction of artificial stabilization (planting of European dune grass), and then again in the other direction by extensive OHV activity extending into naturally vegetated areas. The Study provides substantial evidence that an equilibrium has been reestablished.

Therefore, in recognition that the new equilibrium requires an attentive, adaptive management effort in order for it to be sustained, this action is conditioned to require that: 1) the historic photographic record be found, protected and analyzed, in order to better understand long-term trends especially as they concern the equilibrium between barren and vegetated areas; 2) research test plots be established, to better understand actual OHV impacts on the successional process; and, 3) that the interim day use limit of 4,300 OHV's be reduced proportionately in event the carrying capacity is found to be less or that reductions in management capability (e.g., because of a budget reduction) result in a loss of derived carrying capacity.

A Maximum of 4,300 Day-Use Vehicles is Appropriate as an Interim Capacity Limit

According to DPR, the 1975 General Development Plan carrying capacity of 4300 day use vehicles has not been reached; the highest number was 4229 on Fourth of July, 1985. No baseline datum had been established at that time with respect to the SVRA's coastal resources, so it is unknown what impacts that that near-1975 carrying capacity number had on the SVRA.

It is difficult to know if there is a better basis for any particular number over another for an interim capacity limit. It is unknown how thorough the analysis was that was used to determine a carrying capacity of 4300 vehicles. Intuitively, it would seem that a lesser number of vehicles would have a lesser impact on the resources of the SVRA and a greater number of vehicles would have a greater impact.

The limit of 4300 day use vehicles has historically been accepted absent any compelling evidence that it should be some other number. The further conditions of this condition compliance are designed to elicit whatever compelling evidence there may be for a long term

capacity limit. An initial long term capacity limit is expected to be determined within the next three years, according to the conditions of this condition compliance. Since any long term capacity limit must be based in part on monitoring of data over time, it is not inappropriate to set an interim capacity limit at 4300 day use vehicles, pending determination of a long term capacity limit.

Recommended Modifications Submitted by San Luis Obispo County Should Be Incorporated.

Condition 3.D required that the OHV day use limit be established "in consultation with and agreement by the County of San Luis Obispo..." The Study was in fact submitted to the County; following analysis by County staff and public hearings, the Board of Supervisors adopted Resolution No. 98-213, attached as Exhibit 1. The Resolution contains six specific recommendations, including endorsement of the 4,300 vehicle OHV day use limit and a call for a three year monitoring program to help establish use limits for the peak season holiday weekends. The first six conditions attached to this acceptance are each derived from the respective six County recommendations.

E. Conclusion: The Submitted Carrying Capacity Study Only Partially Addresses the Requirements of Conditions 3.D and 6 of Coastal Development Permit 4-82-300

Special Condition number 3.D does not state on what basis a specified number of OHV day users will be established, only that the County, the Executive Director, and the Department of Parks and Recreation (DPR) are to consult and agree to a specified number. As part of its condition compliance review of permit 4-82-300 in 1993-94, the Commission required DPR to determine the carrying capacity of Oceano Dunes SVRA.

The 1975 General Development Plan for the SVRA contained a less-than-one-page discussion of carrying capacity and a one page table listing the carrying capacity of various categories, e.g., number of people, number of vehicles, etc. (See Exhibit 3) According to the discussion:

These [carrying capacities] are based on regulated capacities used within other units of the California State Park System, together with currently known use patterns, densities, and problems at Pismo State Beach. The figures are not infallible. This is particularly true as relates to off-highway vehicle use, which is a relatively new activity and one with which most agencies have had little experience.

It is imperative that these recommended carrying capacities be carefully monitored, studied, and adjusted as determined necessary to maintain environmental integrity of the resources and a quality experience for the visitor.

As early as the 1975 General Development Plan, there was a recognition that carrying capacity was dynamic, not static. Permit 4-82-300 also recognized this in Special Condition number 6 which allowed for limiting OHV access if OHV use is determined to be ". . .not occurring in a manner that protects environmentally sensitive habitats and community values. . . ." consistent with the permit's conditions and the County's LCP. Special Condition number 6 also allowed for increases in levels of OHV access if ". . .OHV use in the SVRA is consistent

with the protection of the environmentally sensitive habitat and community values, and/or that additional staff and management revenues become available to the DPR. . . .” Such increases would be approved by the Executive Director with concurrence of the Board of Supervisors, by resolution.

The appropriate way to determine if 4,300, or some other number of vehicles is the carrying capacity of the SVRA is to monitor the use and its impacts on the environmentally sensitive habitats and community values and then analyze the results of the monitoring -- and make adjustments in the allowable use limit. This implies an initial acceptance and approval of the OHV use on the beach and dunes. Sometimes referred to as adaptive management, this approach provides a framework for responding to changing conditions.

The Commission’s prior actions relative to the SVRA evidence an initial acceptance and approval of the OHV use on the beach and dunes. The Commission approved the General Development Plan on February 27, 1975. In 1982, the Commission approved permit 4-82-300 (since amended four times) for the construction of fencing to keep OHVs out of the known locations of environmentally sensitive habitats. In 1994, the Commission required the production of a carrying capacity study for use in determining a limit on OHV use. So, while an initial acceptance and approval of OHV use on the beach and dunes is evident from the Commission’s actions, Special Condition number 6 of the 1982 permit clearly indicates that OHV use could be reduced if review of OHV use showed it did not protect environmentally sensitive habitats or community values.

A carrying capacity study has now been completed, after a period of four years, which reviews the OHV use relative to protection of environmentally sensitive habitats and community values. It recommends that “. . .the OHV day use carrying capacity of Oceano Dunes SVRA be established at those levels which were prescribed in the Park’s initial General Plan (i.e., 4300 Day Use vehicles including OHVs). . . .” San Luis Obispo County recommends “. . . that the day use carrying capacity of Ocean Dunes SVRA be established at 4,300 day use vehicles which includes the off-highway vehicles. . . .” Both DPR and the County agree that there should be additional monitoring.

As conditioned, this condition compliance requires monitoring and analysis of environmental issues at Oceano Dunes in addition to those listed in the *Study*. Further, the conditions allow for adjustments of the 4300 figure, either up or down (with decreases required immediately if DPR’s ability to protect sensitive resources is impaired). Given that a carrying capacity study has been produced which provides the first review of the resources at the SVRA and the impacts of OHVs, that additional monitoring will occur, and that OHV numbers may be adjusted based on the additional monitoring, an OHV day use level of 4300, as described in this condition compliance report, can be accepted only as an interim limit on use, rather than an established carrying capacity. Accordingly, this action is conditioned to require additional monitoring research, and an updated, complete carrying capacity study in order to satisfy the requirements of Conditions 3.D and 6 of coastal development permit 4-82-300.