



LAX MASTER PLAN

MITIGATION MONITORING AND REPORTING PROGRAM (MMRP)

2012 ANNUAL PROGRESS REPORT



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Prepared by

Los Angeles World Airports

LAX Master Plan MMRP 2012 Annual Progress Report

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- B. MMRP (SAIP, CFTP, and BWP-specific measures)
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1.0 Executive Summary

Los Angeles City Council certified the LAX Master Plan Final Environmental Impact Report (FEIR) and adopted the LAX Master Plan Mitigation Monitoring and Reporting Program (MMRP) on December 7, 2004. Pursuant to Section 15097 of the California State CEQA Guidelines, the lead agency, Los Angeles World Airports (LAWA), is responsible for reporting, monitoring, and ensuring implementation of all applicable mitigation measures in accordance with the adopted MMRP. This document is the eighth annual progress report for the LAX Master Plan MMRP. This report provides a status update on applicable mitigation activities, policies, and programs that have been and are being implemented by LAWA to ensure compliance with mitigation measures identified in the LAX Master Plan FEIR.

Additional project-specific mitigation measures were identified for the South Airfield Improvement Project (SAIP), Crossfield Taxiway Project (CFTP), and the Bradley West Project (BWP) Final Environmental Impact Reports (FEIRs), the second and third project-level tiered environmental review documents for the LAX Master Plan Program, respectively. Los Angeles City Council approved the SAIP and certified the FEIR on January 11, 2006, the CFTP and certified the FEIR on February 9, 2009, and the BWP and FEIR on October 14, 2009. The Los Angeles City Council adopted MMRPs for the SAIP, CFTP, and BWP to mitigate or avoid potentially significant effects on the environment during construction of these projects.

Mitigation measures applicable to the LAX Master Plan and the BWP are in the process of being implemented. Mitigation measures applicable to the SAIP and CFTP (with the exception of ongoing measures MM-BC (SA)-1) and MM-BC (CFTP)-1) were implemented and the projects are now complete. The SAIP was completed in June 2008 and the CFTP was completed in May 2010. Mitigation measures are implemented, monitored, and reported on in accordance with four main categories: (1) Program plans; (2) Construction-related mitigation measures; (3) Design mitigation requirements; and (4) "Stand-alone" mitigation plans, as explained below:

- (1) Program plans are documents that address program-wide mitigation measures specified in the LAX Master Plan MMRP and provide a framework to clearly identify the mitigation measure, define the process of implementation, and establish monitoring and reporting requirements. Some of the program plans are required to update existing operating procedures within appropriate LAWA Divisions and some program plans may be required to develop new procedures and guidelines. Examples of updating existing operations include the maintenance of applicable elements of the existing Aircraft Noise Abatement Program (ANAP) or implementing a Revised Aircraft Noise Mitigation Program (ANMP). New program plans were developed to address specific mitigation measures from the MMRP, such as the Mitigation Plan for Air Quality (MPAQ) to address air quality impacts.
- (2) To mitigate or avoid potential significant impacts on the environment during construction, construction-related mitigation measures were implemented by requiring the Construction Contractors to comply with specific environmental requirements. Key areas of mitigation include reduction of traffic impacts by requiring construction deliveries not to coincide with peak traffic periods; and construction equipment replacements and/or retrofit for noise control and reduction of air pollution.

- (3) Some mitigation measures, such as measures to maximize use of reclaimed water, were incorporated into the design of the CFTP and BWP and will be incorporated into all other LAX Master Plan projects during the design process.
- (4) “Stand-alone” mitigation plans are specifically developed to address impacts that are not specifically linked to any one project within the LAX Master Plan. These stand-alone plans are summarized in Appendix D of this report.

2.0 Introduction/Background

In December 2004, the Los Angeles City Council approved the LAX Master Plan and related entitlements for the future development of LAX. The LAX Master Plan allows for the first major new facilities for, and improvements to, the airport since 1984, and plans how projected growth in passengers and cargo at LAX can be accommodated, in part, through the year 2015. The approved LAX Master Plan includes airfield modifications, development of new terminals, and new landside facilities to accommodate passenger and employee traffic, parking, and circulation. The LAX Master Plan serves as a broad policy statement regarding the conceptual strategic planning framework for future improvements at LAX and working guidelines to be consulted by Los Angeles World Airports (LAWA) as it formulates and processes site-specific projects under the LAX Master Plan program.

Together with its approval of the LAX Master Plan, the Los Angeles City Council certified the LAX Master Plan Final Environmental Impact Report (FEIR) and adopted the LAX Master Plan Mitigation Monitoring and Reporting Program (MMRP). The MMRP (reference **Appendix A**) documents all mitigation measures set forth in the FEIR. The basic framework of, and requirements for, the MMRP were established in conjunction with approval of the LAX Master Plan and are anticipated to remain in effect throughout implementation of the Master Plan. If additional new mitigation measures are required in conjunction with subsequent environmental (i.e., CEQA) review of individual projects proposed under the Master Plan, such as the Crossfield Taxiway Project (CFTP) and the Bradley West Project (BWP), the MMRP will be updated in a similar manner to include such additional project-specific measures.

Additional project-specific mitigation measures were identified for the South Airfield Improvement Project (SAIP), Crossfield Taxiway Project (CFTP), and the Bradley West Project (BWP) Final Environmental Impact Reports (FEIRs), the second and third project-level tiered environmental review documents for the LAX Master Plan Program, respectively. Los Angeles City Council approved the SAIP and certified the FEIR on January 11, 2006, the CFTP and certified the FEIR on February 9, 2009, and the BWP and FEIR on October 14, 2009. The Los Angeles City Council adopted MMRPs for the SAIP, CFTP, and BWP to mitigate or avoid potentially significant effects on the environment during construction of these projects.

Mitigation measures applicable to the LAX Master Plan and the BWP are in the process of being implemented. Mitigation measures applicable to the SAIP and CFTP (with the exception of ongoing measures MM-BC (SA)-1 and MM-BC (CFTP)-1) were implemented and the projects are now complete. The SAIP was completed in June 2008 and the CFTP was completed in May 2010. Please see Section 25.0 of this report for project-specific status updates.

Appendix B provides a comprehensive delineation of all project-specific mitigation measures adopted to date for Master Plan projects. **Appendix A and B** provide the most current and comprehensive delineation of Master Plan commitments and mitigation measures included within the overall MMRP.

As discussed in prior annual MMRP progress reports, implementation or completion of some LAX Master Plan mitigation measures may be affected by ongoing evaluation of alternatives to certain LAX Master Plan projects as part of the LAX Specific Plan Amendment Study (SPAS) process. The SPAS is currently being reviewed in compliance with the California Environmental Quality Act (CEQA). The Draft Environmental Impact Report (EIR) was circulated for public review between July 27, 2012 and October 10, 2012. Preparation of written responses to comments received on the Draft EIR was subsequently initiated and extended into early 2013. Final action on the SPAS is expected in 2013.

The primary purpose of this report is to document and report on the status of the current and recently completed mitigation measures set forth in the LAX Master Plan MMRP. This report covers the period January 1, 2012 through December 31, 2012.

3.0 Noise

3.0.A N-1 Maintenance of Applicable Elements of Existing Aircraft Noise Abatement Program (ANAP)

The LAX Master Plan MMRP states:

“Maintenance of Applicable Elements of Existing Aircraft Noise Abatement Program. All components of the current airport noise abatement program that pertain to aircraft noise will be maintained.”

The existing Aircraft Noise Abatement Program (ANAP) at LAX currently is maintained by LAWA's Noise Management Section (NMS). The existing ANAP at LAX sets forth LAWA's noise abatement procedures for aircraft traffic, flight, and runway use. All aircraft operations at LAX must comply with FAA regulations and procedures for noise abatement and noise emission standards and with all rules, policies, procedures, resolutions, and ordinances established by the State of California, City of Los Angeles, LAWA, and LAWA's Board of Airport Commissioners relative to noise abatement. LAWA's NMS will continue to maintain the ANAP throughout implementation of the LAX Master Plan projects. Actions indicating compliance include submission of the Quarterly Report per the 2011 Variance to the County of Los Angeles. Included in each quarterly report is a short summary of actions indicating compliance with each condition of the variance, including “continue, in full force and effect, the implementation and enforcement of the.... noise abatement policies to the extent of its authority.”

Status→ Existing Policy:

LAWA has complied with this commitment by continually maintaining the existing Aircraft Noise Abatement Program (ANAP) at LAX, as well as submitting the summary report with each Quarterly Report to the County of Los Angeles, per the Variance requirement.

3.0.B MM-N-4 Update the Aircraft Noise Abatement Program Elements as applicable to adapt to the future Airfield configuration

The LAX Master Plan MMRP states:

“Update the Aircraft Noise Abatement Program Elements as applicable to adapt to the future Airfield configuration. When existing runways are relocated or reconstructed as part of the Master Plan, the aircraft noise abatement actions associated with those runways shall be modified and re-established as appropriate to assure continuation of the intent of the existing program.”

Status→ No action required at this time:

No changes to the ANAP were required as a result of any of the ongoing Master Plan projects.

3.0.C MM-N-5 Conduct Part 161 Study to Make Over-Ocean Procedures Mandatory

The LAX Master Plan MMRP states:

“Conduct Part 161 Study to Make Over-Ocean Procedures Mandatory. A 14 CFR Part 161 Study shall be initiated to seek federal approval of a locally-imposed Noise and Access Restriction on departures to the east during Over-Ocean Operations, or when Westerly Operations remain in effect during the Over-Ocean Operations time period.”

The Part 161 Study is a technical and legal study regarding implementation of a Noise and Access Restriction. The proposed restriction includes departures between the hours of midnight and 6:30 a.m. over the communities to the east of LAX, when LAX is operating in either over-ocean operations or remains in westerly operations, and excluding times when LAX operates in easterly operations (49 U.S.C. Section 47521 et seq.). The Part 161 Study must meet the relevant requirements of the Airport Noise and Capacity Act of 1990 (ANCA) and the Part 161 regulations (14 C.F.R. Part 161).

Status→ In Progress:

The Part 161 Study process encompasses three general elements including: (1) data collection and analysis to justify the LAX Proposed Restriction; (2) evaluation and explanation of the legal, environmental, and economic impacts of the proposed restriction; and (3) preparation and submittal to the FAA of the required reports and application materials. LAWA began the Part 161 Study in June 2005.

The LAX Part 161 Study was completed in September 2012. The Part 161 draft application was released on November 1st for public review and public comment review ended December 17, 2012. The study indicates that the LAX Proposed Restriction complies with the six statutory conditions of the Airport Noise and Capacity Act of 1990 and the Part 161 regulations. The baseline and projected fleet mix forecasts were revised to reflect the new 2013 implementation and 2018 forecast years, and received FAA approval. LAWA conducted the Public Outreach Program. A public workshop was held on November 13, 2012, and the LAX Noise Roundtable and the LAX Area Advisory Committee were briefed during their November meetings. The application will be submitted to the FAA in January 2013.

3.0.D. MM-N-7 Construction Noise Control Plan

The LAX Master Plan MMRP states:

“Construction Noise Control Plan. *A Construction Noise Control Plan will be prepared to provide feasible measures to reduce significant noise impacts throughout the construction period for all projects near noise sensitive uses. For example, noise control devices shall be used and maintained, such as equipment mufflers, enclosures, and barriers. Natural and artificial barriers such as ground elevation changes and existing buildings may be used to shield construction noise.”*

Status→ Ongoing:

LAWA requires submission of a Construction Noise Control Plan (CNCP) as a condition in all capital construction contracts at LAX. This is part of the standard LAWA specifications.

3.0.E. MM-N-8 Construction Staging

The LAX Master Plan MMRP states:

“Construction Staging. *Construction operations shall be staged as far from noise-sensitive uses as feasible.”*

Status→ Ongoing:

LAWA requires this condition on all capital construction contracts at LAX.

3.0.F. MM-N-9 Equipment Replacement

The LAX Master Plan MMRP states:

“Equipment Replacement. *Noisy equipment shall be replaced with quieter equipment (for example, rubber tired equipment rather than track equipment) when technically and economically feasible.”*

Status→ Ongoing:

LAWA requires this condition on all capital construction contracts at LAX.

3.0.G. MM-N-10 Construction Scheduling

The LAX Master Plan MMRP states:

“Construction Scheduling. *The timing and/or sequence of the noisiest on-site construction activities shall avoid sensitive times of the day, as feasible (9 p.m. to 7 a.m. Monday-Friday; 8 p.m. to 6 a.m. Saturday; anytime on Sunday or Holidays).”*

Status→ Ongoing:

LAWA requires this condition on all capital construction contracts at LAX.

3.0.H. MM-N-11 Automated People Mover (APM) Noise Assessment and Control

The LAX Master Plan MMRP states in part:

“Automated People Mover (APM) Noise Assessment and Control Plan. In conjunction with detailed design and engineering of the proposed APM systems, a noise control plan shall be prepared specifying noise attenuation measures to reduce APM noise levels at the two significantly impacted hotels to acceptable level (i.e. less than 67 dBA CNEL for the Courtyard by Marriott and the Four Points Sheraton).”

Status→ Not Applicable:

Not required at this time. This measure is not applicable at this reporting period because LAWA has not entered the engineering or design phases of the APM Project.

4.0 Land Use

4.0.A LU-1 Incorporation of City of Los Angeles Ordinance No. 159,526 (Q) Zoning Conditions for LAX Northside into the LAX Northside/Westchester Southside Project

The LAX Master Plan MMRP states in part:

“Incorporation of City of Los Angeles Ordinance No. 159,526 (Q) Zoning Conditions for LAX Northside into the LAX Northside/Westchester Southside Project. To the maximum extent feasible, all [Q] Conditions (Qualifications of Approval) from City of Los Angeles Ordinance No. 159,526 that address the Northside project area will be incorporated by LAWA into a new LAX Zone/LAX Specific Plan for the LAX Northside/Westchester Southside project.”

Status→ Completed:

The LAX Specific Plan, adopted by the City Council in December, 2004, established the LAX Northside as a distinct land use designation and added the LAX-N Zone to the Los Angeles Municipal Code. Section 11 of the LAX Specific Plan incorporates all conditions of development, including the [Q] Conditions, described in Ordinance 159,526 into the Specific Plan.

4.0.B LU-2 Establishment of a Landscape Maintenance Program for Parcels Acquired due to Airport Expansion

The LAX Master Plan MMRP states:

“Establishment of a Landscape Maintenance Program for Parcels Acquired due to Airport Expansion. Land acquired and cleared for airport development will be fenced, landscaped, and maintained regularly until the properties are actually developed for airport purposes.”

Status→ Completed and Ongoing:

The March 2005 LAX Street Frontage and Landscape Development Plan (LDP) addresses landscaping requirements for parcels acquired under the LAX Master Plan.

This measure is not applicable at this reporting period because LAWA did not acquire any Alternative D parcels in 2012. However property was previously acquired in 2009 for the former Park One property (6351 W. Century Boulevard), and in 2002 for the lot located on the southeast corner of La Cienega and Arbor Vitae. Currently the former Park One parking property is being used as a parking lot and the lot located on the southeast corner of La Cienega and Arbor Vitae is fenced in and maintained.

4.0.C LU-4 Neighborhood Compatibility Program

The LAX Master Plan MMRP states in part:

“Neighborhood Compatibility Program. *Ongoing coordination and planning will be undertaken by LAWA to ensure that the airport is as compatible as possible with surrounding properties and neighborhoods.”*

Status→ In Progress:

LAWA, through its Stakeholder Liaison Office, consults with the neighboring communities on all Master Plan projects. Other projects subject to the LAX Plan Compliance Review (LAX Specific Plan section 7) also must have community input before approval. Conditions of development along the northern and southern boundaries of the airport property include, but are not limited to, setbacks, buffer zones and landscaping.

4.0.D LU-5 Comply with City of Los Angeles Transportation Element Bicycle Plan

The LAX Master Plan MMRP states in part:

“Comply with City of Los Angeles Transportation Element Bicycle Plan. *LAWA will comply with bicycle policies and plans in the vicinity of LAX, most notably those outlined in the City of Los Angeles Transportation Element Bicycle Plan and the General Plan Framework, including Pershing Drive, Sepulveda Boulevard, and Aviation Boulevard.”*

Status→ Ongoing:

The City of Los Angeles approved the latest Bicycle Master Plan (independent of LAWA) in March 2011. The Plan includes streets that are expected to have bike routes and bike lanes in the future. LAWA used the information in the Los Angeles Bicycle Master Plan when considering off-airport mitigations for the Specific Plan Amendment Study. LAWA is in compliance with the Plan.

4.0.E MM-LU-1 Implement Revised Aircraft Noise Mitigation Program

The LAX Master Plan MMRP states:

“Implement Revised Aircraft Noise Mitigation Program. *LAWA shall expand and revise the existing Aircraft Noise Mitigation Program (ANMP) in coordination with affected neighboring jurisdictions, the State, and the FAA. The expanded Program shall mitigate land uses that would be rendered incompatible by noise impacts associated with implementation of the LAX Master Plan, unless such uses are subject to an existing aviation easement and have been provided with noise mitigation funds. LAWA shall accelerate the ANMP's timetable for achieving full compatibility of all land uses within the*

existing noise impact area pursuant to the requirements of the California Airport Noise Standards (California Code of Regulations, Title 21, Subchapter 6) and current Noise Variance. With the exception of a possible new interior noise level standard for schools to be established through the study required by Mitigation Measure MM-LU-3, Conduct Study of the Relationship Between Aircraft Noise Levels and the Ability of Children to Learn, the relevant performance standard to achieve compatibility for land uses that are incompatible due to aircraft noise (i.e., residences, schools, hospitals and churches) is adequate acoustic performance (sound insulation) to ensure an interior noise level of 45 CNEL or less. As an alternative to sound insulation, incompatible property may also achieve compatibility if the incompatible use is converted to a noise-compatible use.

LAWA shall revise the ANMP to incorporate new, or expand existing measures, including, but not necessarily limited to, the following:

- *Continued implementation of successful programs to convert existing incompatible land uses to compatible land uses through sound insulation of structures and the acquisition and conversion of incompatible land use to compatible land use.*
- *Ongoing monitoring and provision of annual updates in support of the requirements of the current LAX Noise Variance pursuant to the California Airport Noise Standards, with the updates made available (upon request) to affected local jurisdictions, the Airport Land Use Commission of Los Angeles County, and other interested parties.*
- *Continue the current pre- and post-insulation noise monitoring to ensure achievement of interior noise levels at or below 45 CNEL.*
- *Accelerated rate of land use mitigation to eliminate noise impact areas in the most timely and efficient manner possible through:*
 - *Increased annual funding by LAWA for land use mitigation;*
 - *Reevaluating aviation easements requirements with sound insulation mitigation;*
 - *Provision by LAWA of additional technical assistance, where needed, to local jurisdictions to support more rapid and efficient implementation of their land use mitigation programs;*
 - *Reduction or elimination, to the extent feasible, of structural and building code compliance constraints to mitigation of sub-standard housing.*
- *Revised criteria and procedures for selection and prioritization of properties to be sound insulated or acquired in consideration of the following:*
 - *Insulation or acquisition of properties within the highest CNEL measurement zone;*
 - *Acceleration of the fulfillment of existing commitments to owners wishing*

to participate within the current ANMP boundaries prior to proceeding with newly eligible properties;

- *Insulation or acquisition of incompatible properties with high concentrations of residents or other noise-sensitive occupants such as those housed in schools or hospitals.*
- *Amend the ANMP to include libraries as noise-sensitive uses eligible for aircraft noise mitigation.*
- *Upon completion of the acquisition and/or soundproofing commitment under the current Program, expand the boundaries of the ANMP as necessary over time. LAWA will continue preparing quarterly reports that monitor any expansion of the 65 CNEL noise contours beyond the current ANMP boundaries. Based upon these quarterly reports, LAWA will evaluate and adjust the ANMP boundaries, periodically as appropriate, so that as the 65 CNEL noise contours expand, residential and noise sensitive uses newly impacted by 65 CNEL noise levels would be included within the Program.”*

The Aircraft Noise Mitigation Program (ANMP) describes the ongoing efforts by LAWA to convert existing incompatible land uses surrounding LAX to compatible land uses through the implementation of two noise mitigation strategies: (1) sound insulation of structures; and (2) acquisition of property followed by the conversion of its incompatible land use to compatible land use (land recycling).

LAWA implements the ANMP in an effort to reduce adverse impacts of airport noise and achieve airport standards as set forth in Chapter 6 of Title 21 of the California Code of Regulations. ANMP reports are also specifically required by the State of California as a formal condition of approval of the three-year variances granted by the State to LAWA airports that have not achieved land use compatibility. Based on current data and funding commitments, the ANMP documents the progress made toward achieving land use compatibility and projects the ultimate date when full compatibility will be reached.

Status→ In Progress:

As described above, LAWA has an existing program in place with periodic updates to the State of California and the County of Los Angeles. The last full update was the 2005 ANMP which was submitted in October of 2006. The status of LAWA's existing Aircraft Noise Mitigation Program also is reported in **Appendix C**. In addition, specific updates are as follows:

- LAWA continues to implement two very successful programs to convert existing incompatible land uses to compatible land uses through sound insulation of structures (LAWA's LAX Soundproofing program) and the acquisition and conversion of incompatible land use to compatible land use (LAWA's Residential Acquisition program).
- Annual updates in support of the requirements of the current LAX Noise Variance pursuant to the California Airport Noise Standards are submitted with the Quarterly Report for the second quarter each year, with the updates provided to

all affected jurisdictions, and made available upon request to other interested parties.

- Pre- and post-insulation noise monitoring audits are regularly conducted to ensure achievement of interior noise levels at or below 45 CNEL.
- Land use mitigation programs are being implemented as quickly as possible given that participation in the program is voluntary.
- LAWA makes available land use mitigation funds as soon as the jurisdiction has met all program requirements and upon approval of BOAC.
- Avigation easements are no longer required for sound insulation, except for limited circumstances. Avigation easements are still required for land acquisition using LAWA funds.
- Under very limited circumstances, as required by California Airport Noise Standards where acoustical treatments alone are insufficient to convert residential land uses to compatible uses with airport operations, noise easements are required for residential sound insulation mitigation.
- LAWA makes available the resources for timely technical assistance, where needed, to local jurisdictions to support more rapid and efficient implementation of their land use mitigation programs.
- Selection of and prioritization of properties to be sound insulated or acquired are in consideration of the following:
 - a. Insulation or acquisition of properties within the highest CNEL measurement zone.
 - b. Acceleration of the fulfillment of existing commitments to owners wishing to participate within the current ANMP boundaries prior to proceeding with newly eligible properties.

4.0.F MM-LU-2 Incorporate Residential Dwelling Units Exposed to Single Event Awakenings Threshold into Aircraft Noise Mitigation Program

The LAX Master Plan MMRP states:

“Incorporate Residential Dwelling Units Exposed to Single Event Awakenings Threshold into Aircraft Noise Mitigation Program. In addition to any restrictive measures that may be implemented resulting from completion of Mitigation Measure MM-N-5, Conduct Part 161 Study to Make Over-Ocean Departure Procedures Mandatory, the boundaries of the ANMP will be expanded to include residential uses newly exposed to single event exterior nighttime noise levels of 94 dBA SEL, based on the Master Plan alternative that is ultimately approved and periodic reevaluation and adjustments by LAWA. Uses that are newly exposed would be identified based on annual average conditions as derived from the most current monitored data.”

Status→ In Progress:

All of the newly impacted areas, by definition, would be outside of the 65 CNEL area as defined by the ANMP. Therefore, they will be prioritized after the completion of the current residential program. As part of the standard Variance requirements, annual ANMP progress reports and periodic ANMP report updates will continue to be submitted to the County of Los Angeles.

4.0.G MM-LU-3 Conduct Study of the Relationship Between Aircraft Noise Levels and the Ability of Children to Learn

The LAX Master Plan MMRP states:

“Conduct Study of the Relationship Between Aircraft Noise Levels and the Ability of Children to Learn. Current studies of aircraft noise and the ability of children to learn have not resulted in the development of a statistically reliable predictive model of the relative effect of changes in aircraft noise levels on learning. Therefore a comprehensive study shall be initiated by LAWA to determine what, if any, measurable relationship may be present between learning and the disruptions caused by aircraft noise at various levels. An element of the evaluation shall be the setting of an acceptable replacement threshold of significance for classroom disruption by both specific and sustained aircraft noise events.”

Status→ In Progress:

The Transportation Research Board's (TRB's) Airport Cooperative Research Program (ACRP) has allocated \$450,000 to perform a study entitled Evaluating the Impact of Aviation Noise on Learning. This study is currently underway. A panel created by the TRB, including one LAWA staff member, has defined the scope and objectives of the study, selected the contractor to perform the work, is evaluating the work, and will review and comment on the draft and final report.

The objectives of the ACRP study, as currently defined, will be to determine when aircraft noise impacts student learning and what noise metric(s) best defines impact on learning. The contractor was hired by ACRP in 2010 to perform the study, and the study is now ongoing with the expected completion in 2013. The final study may not be published until well into 2013 or perhaps 2014 at this point.

Upon completion of the study, LAWA will assess the conclusions of the study against the goal of setting an acceptable threshold of significance for classroom disruption by both specific and sustained aircraft noise events. If the goals are met, then further study will not be necessary. If the goals are not met, or only partially met, then LAWA will assess the need for additional study, as required.

4.0.H MM-LU-4 Provide Additional Sound Insulation for Schools Shown by MM-LU-3 to be Significantly Impacted by Aircraft Noise

The LAX Master Plan MMRP states:

“Provide Additional Sound Insulation for Schools Shown by MM-LU-3 to be Significantly Impacted by Aircraft Noise. Prior to completion of the study required by Mitigation Measure MM-LU-3, Conduct Study of the Relationship Between Aircraft Noise

Levels and the Ability of Children to Learn, and within six months of the commissioning of any relocated runways associated with implementation of the LAX Master Plan, LAWA shall conduct interior noise measurements at schools that could be newly exposed to noise levels that exceed the interim LAX interior noise thresholds for classroom disruption of 55 dB Lmax, 65 dB Lmax, or 35 Leq(h), as presented in Section 4.1 Noise, of the Final EIS/EIR. All school classroom buildings (except those within schools subject to an aviation easement) that are found through the noise measurements to exceed the interim interior noise thresholds, as compared to the 1996 baseline conditions presented in the Final EIS/EIR, would become eligible for soundproofing under the ANMP.

Upon completion of the study required by Mitigation Measure MM-LU-3 and acceptance of its results by peer review of industry experts, any schools found to exceed a newly established threshold of significance for classroom disruption based on comparison with 1996 baseline conditions due to implementation of the LAX Master Plan, shall be eligible for participation in the ANMP administered by LAWA, unless they are subject to an existing aviation easement. A determination of which schools become eligible will be made following application of the new threshold based on measured data.”

Status→ Not required at this time:

LAWA will implement this measure's requirements contingent on the results from the study required by MM-LU-3. It should be noted that there is ongoing work related to settlement agreements that were reached between LAWA and both the Inglewood Unified and Lennox School Districts. LAWA actively is assisting each school district in its efforts to mitigate the impacts to schools, per those agreements.

On July 9, 2008 LAWA submitted a letter to the FAA asking that a determination be made related to which schools are impacted. On August 24, 2009 the FAA responded to LAWA by letter with information that this determination will be made as part of the Passenger Facility Charge (PFC) application process. LAWA is proceeding with the PFC application pending information from each school district sufficient for the FAA to make such a determination.

On October 2, 2008, Congress enacted Public Law 110-337, which made noise mitigation for certain schools located within the LAX noise impact area in both the Lennox School District (LSD) and the Inglewood Unified School District (IUSD) eligible for PFC funding regardless of an easement.

Lennox School District

On January 10, 2011, the BOAC authorized LAWA to submit the PFC application to the FAA for authorization to collect and use PFC funds to sound insulate impacted schools in the Lennox School District (LSD), with the application submitted to FAA on February 2, 2011.

On May 2, 2011 the FAA issued the Final Agency Decision (FAD) finding the schools in LSD to be “significantly impacted and adversely affected by aircraft noise,” and authorized the expenditure of up to \$34,089,058 in PFC funds to insulate the schools listed in the Settlement Agreement between LAWA and LSD.

On September 19, 2011 BOAC approved the Letter of Agreement between LAWA and LSD, and authorized the release of \$10 million to LSD for the first year of the sound insulation program. The funds were delivered to LSD on December 12, 2011.

During 2012, LSD contracted work related to those schools listed in their Year One Work Plan, including Animo Leadership High School, Felton Elementary School, Lennox Middle School, Jefferson Elementary School and new construction north of Jefferson Elementary School. Progress has been made on all of these projects, including the completion, in September 2012, of the new Amino Leadership High School.

Work related to the other schools listed in the Year One Work Plan is still in progress. No additional funding was provided to the district in 2012. It is anticipated that additional funds will be provided to Lennox in 2013, per the Settlement.

Inglewood Unified School District (IUSD)

LAWA is working with IUSD and FAA to complete the PFC application for submittal to FAA requesting authorization to impose and use PFC funding for sound insulation of impacted schools in IUSD. The date of completion of the PFC application is uncertain at this time but it is anticipated that the application will be submitted to BOAC and FAA during CY 2012 or 2013.

4.0.I MM-LU-5 Upgrade and Expand Noise Monitoring Program

The LAX Master Plan MMRP states:

“Upgrade and Expand Noise Monitoring Program. LAWA shall upgrade and expand its existing noise monitoring program in surrounding communities through new system procurement, noise monitor location, and equipment installation. Permanent or portable monitors shall be located in surrounding communities to record noise data 24 hours per day, seven days per week for correlation with FAA radar data to cross-reference noise episodes with flight patterns. The upgraded system will support LAWA and other jurisdictional ANMP’s when considering adjustments to airport noise mitigation boundaries.”

Status→ Completed:

On February 4, 2010, CalTrans approved LAWA’s Noise Monitoring Plan for LAX, ONT, and VNY airports that included the upgraded and expanded ANMMS. The system is fully functional at this time.

As part of the new system design, LAWA replaced all of the actual noise monitoring equipment located throughout the communities impacted by LAX operations. LAWA installed many new permanent noise monitors to better represent the actual noise levels in different areas, including areas well outside of the current 65 dB CNEL Noise Impact Area. A total of 39 noise monitors have been installed at LAX and all are operational. These monitors all are permanent sites, and will be collecting data continuously. Data from each site is downloaded nightly into the ANOMS system, and processed with the flight data to determine the noise levels associated with airport operations. The data then is used to calculate the annual noise levels represented in the State-required Quarterly Reports.

5.0 Surface Transportation (On-Airport)

5.0.A ST-2 Non-Peak CTA Deliveries

The LAX Master Plan MMRP states:

“Non-Peak CTA Deliveries. Deliveries to the CTA terminal reconstruction projects will be limited to non-peak traffic hours whenever possible.”

Status→ Ongoing:

Deliveries that require lane closures in the Central Terminal Area (CTA) are reviewed by LAWA staff. Restrictions are imposed to limit these deliveries during certain times of the day or certain days of the week depending on anticipated traffic impacts.

5.0.B ST-7 Adequate GTC, ITC, and APM Design

The LAX Master Plan MMRP states:

Adequate GTC, ITC, and APM Design. LAWA will ensure that the surface transportation system and curbside for the GTC and ITC, commercial vehicle staging areas, and APM systems will be designed to adequately accommodate all forecast vehicular activity through 2015.

Status→ No action required at this time:

The GTC, ITC, and the APM were not under design in 2012.

5.0.C ST-8 Limited Short-Term Lane Closures

The LAX Master Plan MMRP states:

“Limited Short-Term Lane Closures. When construction of any new ramps at the Century Boulevard/Sepulveda Boulevard interchange or construction for the GTC, ITC, or APM elevated structures require short-term lane closures, the lane closures will be for as brief a period as practical, with a goal that closures would principally be scheduled for non-peak periods.”

Status→ No action required at this time:

No new ramps at the Century Boulevard/Sepulveda Boulevard interchange were constructed in 2012, and the GTC, ITC, and the APM were not under design in 2012.

5.0.D MM-ST-1 Require CTA Construction Vehicles to Use Designated Lanes

The LAX Master Plan MMRP states:

“Require CTA Construction Vehicles to Use Designated Lanes. Whenever feasible, construction vehicles shall be restricted to designated roadways or lanes of traffic on CTA roadways adjacent to the existing close-in parking, thus limiting the mix of construction vehicles and airport traffic.”

Status→ Ongoing:

LAWA staff reviews and approves worksite traffic control plans for construction projects within the CTA. These worksite traffic control plans include routing of construction vehicles.

5.0.E MM-ST-2 Modify CTA Signage

The LAX Master Plan MMRP states:

“Modify CTA Signage. During construction, additional signage will be installed, as required, to separate construction traffic from non-construction traffic to the extent feasible.”

Status→ Ongoing:

LAWA staff reviews and approves worksite traffic control plans for construction projects within the CTA. These worksite traffic control plans include the need for additional and modified signage.

5.0.F MM-ST-3 Develop Designated Shuttle Stops for Labor Buses and ITC-CTA Buses

The LAX Master Plan MMRP states:

“Develop Designated Shuttle Stops for Labor Buses and ITC-CTA Buses. Develop shuttle stops for labor buses (i.e. buses carrying construction workers) and the ITC-CTA shuttle buses at the CTA arrivals level. All ITC-CTA shuttle buses will be routed to these lower level (arrivals) curb areas. These buses will not circulate through the upper level (departures) curbside.”

Status→ No action required at this time:

There were no LAX Master Plan projects that required labor or shuttle buses for construction workers in the CTA in 2012.

6.0 Surface Transportation (Off-Airport)**6.0.A ST-9 Construction Deliveries**

The LAX Master Plan MMRP states:

“Construction Deliveries. Construction deliveries requiring lane closures shall receive prior approval from the Construction Coordination Office. Notification of deliveries shall be made with sufficient time to allow for any modifications to approved traffic detour plans.”

Status→ Ongoing:

LAWA staff reviews and approves worksite traffic control plans for LAWLA construction projects. These worksite traffic control plans include restrictions on construction deliveries requiring lane closures.

6.0.B ST-12 Designated Truck Delivery Hours

The LAX Master Plan MMRP states:

“Designated Truck Delivery Hours. *Truck deliveries shall be encouraged to use night-time hours and shall avoid the peak periods of 7:00 a.m. to 9:00 a.m. and 4:30 p.m. to 6:30 p.m.”*

Status→ Ongoing:

All 2012 delivery schedules for the Bradley West Project were reviewed by LAWA staff. In 2012, individually-reviewed waivers were occasionally granted for peak-hour deliveries on a case-by-case basis.

6.0.C ST-14 Construction Employee Shift Hours

The LAX Master Plan MMRP states:

“Construction Employee Shift Hours. *Shift hours that do not coincide with the heaviest commuter traffic periods (7:00 a.m. to 9:00 a.m., 4:30 p.m. to 6:30 p.m.) will be established. Work periods will be extended to include weekends and multiple work shifts, to the extent possible and necessary.”*

Status→ In Progress:

All 2012 employee work schedules were approved as part of the Construction Traffic Management Plan for the Bradley West Project.

6.0.D ST-16 Designated Haul Routes

The LAX Master Plan MMRP states:

“Designated Haul Routes. *Every effort will be made to ensure that haul routes are located away from sensitive noise receptors.”*

Status→ In Progress:

Each 2012 haul route was approved by the Los Angeles Department of Building and Safety (LADBS). There is ongoing enforcement for the Bradley West Project.

6.0.E ST-17 Maintenance of Haul Routes

The LAX Master Plan MMRP states:

“Maintenance of Haul Routes. *Haul routes on off-airport roadways will be maintained periodically and will comply with City of Los Angeles or other appropriate jurisdictional requirements for maintenance. Minor striping, lane configurations, and signal phasing modifications will be provided as needed.”*

Status→ In Progress:

There is ongoing enforcement for the Bradley West project. Field inspection report and maintenance logs were updated as required to document compliance.

6.0.F ST-18 Construction Traffic Management Plan

The LAX Master Plan MMRP states:

“Construction Traffic Management Plan. *A complete construction traffic plan will be developed to designate detour and/or haul routes, variable message and other sign locations, communication methods with airport passengers, construction deliveries, construction employee shift hours, construction employee parking locations and other relevant factors.”*

Status→ Completed for the Bradley West project:

The LAWA-approved Construction Traffic Management Plan for the Bradley West project continued to be used in 2012; requests for modifications to the Plan were reviewed and approved by LAWA staff prior to implementation.

6.0.G ST-19 Closure Restrictions of Existing Roadways

The LAX Master Plan MMRP states:

“Closure Restrictions of Existing Roadways. *Other than short time periods during nighttime construction, existing roadways will remain open until they are no longer needed for regular traffic or construction traffic, unless a temporary detour route is available to serve the same function. This will recognize that there are three functions taking place concurrently: (1) airport traffic, (2) construction haul routes, and (3) construction of new facilities.”*

Status→ Ongoing:

Existing roadways remain open unless a temporary detour route is available to serve the same function.

6.0.H ST-20 Stockpile Locations

The LAX Master Plan MMRP states:

“Stockpile Locations. *Stockpile locations will be confined to the eastern area of the airport vicinity, to the extent practical and feasible. After the eastern facilities are under construction in Alternative D, stockpile locations will be selected that are as close to I-405 and I-105 as possible, and can be accessed by construction vehicles with minimal disruption to adjacent streets. Multiple stockpile locations may be provided, as required.”*

Status→ Ongoing:

Multiple stockpile locations near work locations are being utilized and were approved by LAWA as needed.

6.0.I ST-21 Construction Employee Parking Locations

The LAX Master Plan MMRP states:

“Construction Employee Parking Locations. *During construction of the eastern airport facilities, employee parking locations will be selected that are as close to I-405*

and I-105 as possible and can be accessed by employee vehicles with minimal disruption to adjacent streets. Shuttle buses will transport employees to construction sites. In addition, remote parking locations (of not less than 1 mile away from project construction activities) will be established for construction employees with shuttle service to the airport. An emergency return system will be established for employees that must leave unexpectedly.”

Status→ Not Applicable:

This measure is not applicable at this reporting period because eastern airport facilities are not currently under construction.

6.0.J ST-22 Designated Truck Routes

The LAX Master Plan MMRP states in part:

***“Designated Truck Routes.** For dirt and aggregate and all other materials and equipment, truck deliveries will be on designated routes only (freeways and non-residential streets). Every effort will be made for routes to avoid residential frontages....”*

Status→ In Progress:

Each designated route on City streets was approved by LADOT’s Bureau of Traffic Management and LADBS. The primary route for the Bradley West Project is the I-105 Freeway to Imperial Highway to Pershing Drive. There is ongoing enforcement of the routes for the Bradley West Project.

6.0.K ST-23 Expanded LAX Gateway Improvements/Greening of Impacted Communities

The LAX Master Plan MMRP states in part:

***“Expanded LAX Gateway Improvements/Greening of Impacted Communities.** Gateway LAX improvements will be enabled through transportation improvements along Century Boulevard to the east as they are proposed to extend into low-income and minority communities in the City of Inglewood. LAWA anticipates making financial contribution, on a fair-share basis up to a maximum of ten million dollars, to various off-airport surface transportation related components.”*

Status→ In Progress:

In 2007 FAA indicated that some elements of the proposed uses of funds would not be allowed and that those uses that would be allowed could only cover a portion of the cost, requiring additional funding from the adjacent community. LAWA has not received final determination on this measure. As LAWA has not received a final determination on this measure, LAWA will issue a follow up letter to the FAA in 2012.

6.0.L ST-24 Fair Share Contribution to Congestion Management Plan (CMP) Improvements

The LAX Master Plan MMRP states in part:

“Fair Share Contribution to Congestion Management Plan (CMP) Improvements. *At the time of substantial completion of the LAX Master Plan, LAWA will contribute funding on a fair-share basis to future transportation improvements identified through the Congestion Management Plan (CMP) analysis completed for Alternative D.”*

Status→ No action required at this time:

As the LAX Master Plan was not substantially complete in 2012, no action was required.

6.0.M MM-ST-6 Add New Traffic Lanes

The LAX Master Plan MMRP states in part:

“Add New Traffic Lanes. *Traffic lanes shall be added to select intersections to the satisfaction of LADOT or other appropriate jurisdiction, sufficient to increase the capacity of the intersection without unnecessarily reducing sidewalk widths, removing on-street parking, or encroaching onto other land uses.”*

Status→ In Progress:

Per the LAX Master Plan traffic mitigation program, no action was required in 2012.

6.0.N MM-ST-7 Restripe Existing Facilities

The LAX Master Plan MMRP states in part:

“Restripe Existing Facilities. *Existing traffic lanes shall be restriped to the satisfaction of LADOT or other appropriate jurisdiction, so that additional lane capacity will be provided without adding any new pavement to the intersection or road segment.”*

Status→ No action required at this time:

Per the LAX Master Plan traffic mitigation program, no action was required in 2012.

6.0.O MM-ST-8 Add ATSAC, ATCS or Equivalent

The LAX Master Plan MMRP states in part:

“Add ATSAC, ATCS or Equivalent. *Automated Traffic Surveillance and Control (ATSAC) or Adaptive Traffic Control System (ATCS) capability or equivalent shall be added to select intersections to the satisfaction of LADOT or other appropriate jurisdiction. The improved capability will result in a more effective traffic signal network.”*

Status→ No action required at this time:

Per the LAX Master Plan traffic mitigation program, no action was required in 2012.

6.0.P MM-ST-10 Modify Signal Phasing

The LAX Master Plan MMRP states in part:

“Modify Signal Phasing. *The traffic signal phasing of select intersections shall be modified to the satisfaction of LADOT or other appropriate jurisdiction, to allow more efficient use of the intersections, particularly those that will experience a notable change in traffic characteristics as a result of the project.”*

Status→ No action required at this time:

Per the LAX Master Plan traffic mitigation program, no action was required in 2012.

6.0.Q MM-ST-12 Provide New Ramps Connecting I-105 to LAX Between Aviation Boulevard and La Cienega Boulevard

The LAX Master Plan MMRP states:

“Provide New Ramps Connecting I-105 to LAX Between Aviation Boulevard and La Cienega Boulevard. *These ramps shall be provided to allow for direct access and egress to/from the ITC and GTC via I-105, between Aviation Boulevard and La Cienega Boulevard. A feasibility study is underway to determine the best design for these ramps.”*

Status→ No action required at this time:

No action was required in 2012 as the Intermodal Transportation Center (ITC) and the Ground Transportation Center (GTC) were not under design.

6.0.R MM-ST-13 Create a New Interchange at I-405 and Lennox Boulevard

The LAX Master Plan MMRP states:

“Create a New Interchange at I-405 and Lennox Boulevard. *This interchange shall provide grade-separated ramps from I-405 directly into airport property, and vice-versa. It shall be located approximately mid-way between Century Boulevard and Imperial Highway. A feasibility study is underway to determine the best design for the interchange. Should this proposed interchange not be constructed, suitable and alternate traffic mitigation measures shall be designed and implemented to the satisfaction of LADOT and the Bureau of Engineering.”*

Status→ No action required at this time.

Per the LAX Master Plan traffic mitigation program, no action was required in 2012.

6.0.S MM-ST-14 Ground Transportation/Construction Coordination Office Outreach Program

The LAX Master Plan MMRP states:

“Ground Transportation/Construction Coordination Office Outreach Program. *The construction coordination office proposed in Master Plan Commitment C-1, Establishment of a Ground Transportation/Construction Coordination Office, shall establish appropriate mechanisms to involve and coordinate with other major airport-*

area development projects to the extent feasible, to ensure that the cumulative impacts of construction in the airport area are coordinated and minimized.”

Status→ Ongoing:

Coordination with the Central Utility Plant, face of the CTA, elevator/escalator upgrades and other LAX improvements projects took place throughout 2012 as necessary to ensure that cumulative impacts related to the construction of these projects were minimized.

6.0.T MM-ST-15 Provide Fair-Share Contributions to Transit Improvements

The LAX Master Plan MMRP states in part:

“Provide Fair-Share Contributions to Transit Improvements. *Provide fair-share contributions to benefit transit to and from LAX to the satisfaction of LADOT and/or other appropriate jurisdiction or agency.”*

Status→ No action required at this time.

Per the LAX Master Plan traffic mitigation program, no action was required in 2012.

6.0.U MM-ST-16 Provide Fair-Share Contribution to LA County's project to extend the Marina Expressway

The LAX Master Plan MMRP states in part:

“Provide Fair-Share Contribution to LA County's project to extend the Marina Expressway. *Provide fair-share contribution to Los Angeles County's project to extend the Marina Expressway (Route 90) to Admiralty Way or complete alternative off-site improvements at the following intersections: By 2015: Lincoln Boulevard & Washington Boulevard, Bali Way & Lincoln Boulevard, Fiji Way & Lincoln Boulevard, Lincoln Boulevard & Marina Expressway, Lincoln Boulevard & Maxella Avenue, Lincoln Boulevard & Mindanao Way...”*

Status→ No action required at this time:

Per Los Angeles County, the Marina Expressway extension project is no longer programmed or funded. Per the LAX Master Plan traffic mitigation program, no action was required in 2012 for the alternative off-site improvements.

7.0 Relocation of Residences and Businesses

7.0.A RBR-1 Residential and Business Relocation Program

The LAX Master Plan MMRP states in part:

“Residential and Business Relocation Program. *To address the acquisition of properties and relocation of businesses and residents associated with the proposed Master Plan, LAWA will prepare a Residential and Business Relocation Plan (Relocation Plan) in compliance with the Uniform Relocation Assistance and Real Property*

Acquisition Policies Act of 1970, as amended, state and local regulations, and FAA Advisory Circular 150/5100-17, prior to the commencement of acquisition.”

Status→ Completed:

LAWA completed an LAX Master Plan Program, Alternative D Draft Relocation Plan on April 2004 in accordance to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and Title 49 Code of Federal Regulations Part 24 to address proposed acquisition and relocation of properties under Alternative D of the LAX Master Plan. However, no LAX Master Plan improvements requiring acquisition or relocation have occurred.

7.0.B MM-RBR-1 Phasing for Business Relocations

The LAX Master Plan MMRP states in part:

***“Phasing for Business Relocations.** To maximize opportunities for airport/airport-dependent businesses and other businesses being acquired to relocate in proximity to their current sites, LAWA shall, to the maximum degree feasible, schedule acquisition phasing and/or development phasing to accommodate interested parties on airport property in a manner that would avoid delays to the overall construction and development schedule.”*

Status→ Not Applicable:

This measure is not applicable at this reporting period, and will not be triggered until LAX Master Plan improvements require business acquisition and relocation.

7.0.C MM-RBR-2 Relocation Opportunities through Aircraft Noise Mitigation Program

The LAX Master Plan MMRP states in part:

***“Relocation Opportunities through Aircraft Noise Mitigation Program.** As a special project under the Aircraft Noise Mitigation Program (ANMP) for LAX, LAWA shall coordinate with the City of Inglewood and the County of Los Angeles to identify residential land uses that are subject to high levels of aircraft noise where land acquisition and conversion to compatible land uses is contemplated under applicable plans or is otherwise deemed appropriate.”*

Status→ In Progress:

LAWA fully supports the efforts of Inglewood and Los Angeles County in using land acquisition to achieve land use compatibility. However, it is up to those jurisdictions to identify properties for acquisition, and make the request for funding to LAWA via the Grant Implementation Plan (GIP) process. LAWA will process the GIP request and provide funding upon approval of BOAC. Inglewood has acquired incompatible land uses and converted them to airport compatible lands in the past, but has not submitted an acquisition GIP since January 2008. Los Angeles County is authorized to do land acquisition, but has not identified any properties for acquisition and has not submitted an acquisition GIP to LAWA.

8.0 Environmental Justice

LAWA has worked with local and contracting communities to develop programs that address the current and projected demands for qualified employees and contractors. Some of these programs are:

8.0.A EJ-1 Aviation Curriculum

The LAX Master Plan MMRP states:

“Aviation Curriculum. *LAWA will work with local school districts to offer aviation-related curriculum at elementary schools, middle schools, high schools and colleges in affected communities near the Los Angeles International Airport. Potential pilot schools could include: Beulah Payne Elementary School, Lennox Middle School, Hillcrest Continuation School, Inglewood High School, Morningside High School, and Los Angeles Southwest College.”*

Status→ Ongoing:

LAWA continually is coordinating with the local school districts in developing aviation-related curriculum. LAWA is working on a pilot program with Oroville Middle School in Westchester to offer an on-site Flight Simulation training program for their students.

8.0.B EJ-2 Aviation Academy

The LAX Master Plan MMRP states:

“Aviation Academy. *LAWA will work with local school districts to provide comprehensive educational and trade training for aviation-related careers, targeting students in the affected communities to provide them with increased career opportunities.”*

Status→ Ongoing:

The Aviation Career Education (ACE) Academy is a free, week-long motivational program to provide students with a basic understanding of career opportunities within the aviation industry, as well as a general knowledge about LAX. This program is open to all Los Angeles area seventh-and eighth-grade students (between the ages of 12 and 14) and high school students (between the ages of 15 and 18) in communities surrounding LAX, including El Segundo, Hawthorne, Inglewood, Lennox, South Los Angeles, and Westchester/Playa del Rey. Program participants attend site visits and presentations by organizations such as the Federal Aviation Administration, NASA Jet Propulsion Laboratory, Transportation Security Administration, Airlines, Encore Flight Academy, Los Angeles Airport Police, LAX Airport Operations, and others. Approximately 45 local students participated in the program during the summer of 2012.

The Gateways Internship Program was launched by LAWA as a collaborative initiative of the Inglewood Unified School District, South Bay Private Industry Council, and the Los Angeles World Airports. The program was developed as one of several approaches to address the current and projected demand for qualified employees to fill positions at LAWA. This program provides paid and non-paid internships to local youth currently attending high school or college and has been expanded to include the Los Angeles

Unified School District, Centinela Valley High School District, and the El Segundo Unified School District. The program consists of a high school and a college internship component. The goal of the program is to expose local high school and college students to career opportunities in the aviation industry. This is accomplished by providing on-the-job practical experience in the aviation field through education, training and mentoring programs and activities. In 2012, LAWA had 17 students participated in the internship program.

AIRCademics, "Passport to Art Program" is comprised of a 30-week curriculum offered at the Westchester YMCA, near LAX. This school-to-career enrichment program focuses on teaching the subjects of science, math, reasoning, and aviation through the completion of art projects. Participants, who are of middle school age, also learn about the history of flight while attending lectures and field trips. The final class project is the creation of a comic book about LAX. This program has been provided to 15 participants this year. LAWA is working on a new Request-for-Proposal and the program is pending a new contract.

Job Shadow Day is an opportunity for students to learn about the aviation industry and its career possibilities while experiencing the workplace. LAWA hosts a group of students and introduce them to the airport and the career possibilities in aviation. Each student shadows an airport employee throughout the day to witness the individual's daily work activities. In 2012, LAWA coordinated with the Westchester Aviation and Science Magnet High School from the Los Angeles Unified School District to host Job Shadow Day for approximately 50 students. In 2012, LAWA also coordinated with the Monroe Middle School Honor Society from the Inglewood Unified School District to host Job Shadow Day for approximately 25 students.

The "Flight Path Flyer" flight simulation program offers basic flying skills and operating techniques on flight simulators for six-Saturday sessions at the Flight Path Museum at LAX. This community-educational based program is free and offered three times per year aimed at novice students, ranging from middle school to senior citizens. In 2012, 71 students in the local communities participated in the flight Simulation program.

LAWA is continually coordinating with local school districts to provide education and trade training programs for aviation-related careers. Positive feedback was received from participants surveyed in these LAX education outreach programs.

8.0.C EJ-3 Job Outreach Center

The LAX Master Plan MMRP states in part:

"Construction and Other LAX-Related Job Outreach - LAWA will create or utilize an existing resource center to assist historically underrepresented and at-risk local residents to find construction and other substantive jobs with LAWA and surrounding airport-related businesses through training and comprehensive outreach."

Status→ In Progress:

LAWA representatives attended 35 job fairs in 2012. Business and Job Resources Center (BJRC) personnel have also attended events in support of LAWA's other operating units within BJRC (Business Outreach, Gateways and International Trade).

Due to excessive time demands and an increase in job creation activity, the BJRC does not send representatives to attend every job fair event it is invited to.

LAWA's website www.lawa.org/bjrc contains interactive applications for users to create and post resumes as well as apply for open positions and internships at LAWA. There is a link to the Los Angeles Business Assistance Virtual Network (BAVN) which provides information about upcoming procurement opportunities and job fairs. The Business Database will be the next innovation to be added to the site. It will allow prime contractors to locate qualified Minority Business Enterprise (MBE), Women's Business Enterprise (WBE), and Disadvantaged Business Enterprise (DBE) subcontractors who have previously worked on LAWA projects.

Gateways Internship Program

The Gateways Internship Program provides college and high school students with exposure to career opportunities in the aviation industry and other airport-related jobs. The Gateways Program gives students on-the-job practical experience in various airport jobs through education, training, and mentoring activities to better prepare them to enter the workforce.

The Gateways Internship Program has partnered with various colleges such as UCLA, USC, Cal State University of Long Beach, Cal State University of Los Angeles, Loyola Marymount, West Los Angeles College, Cal State Fullerton, CSUN, Cal State University Dominguez Hills, Chapman-Brandman University, Cerritos College, Santa Monica College, East Los Angeles Community College, Trade Technical College, Southwest College, and Cerro Coso College. LAWA also partners with Watts Labor Community Action Committee (WLCAC), and Los Angeles Job Corps to place students into its internship program. Since its inception, the Gateways Program has placed more than 900 students in a wide range of internship positions, including Accounting, Administrative, Airfield Operations, Airports Development, City Attorney Office, Commercial Development Group, Information Management and Technology Group (IMTG), Engineering and Facilities Management, Environmental Services, Landside, Community Relations, Public Relations, and FAA-related.

LAWA's Gateways Program is comprised of three internship programs:

- Gateways College Student Professional Worker Program
- Gateways Volunteer Internship Program
- Gateways International Student Professional Worker Program

The BJRC was able to place over 70 students through its three programs within various internships in LAWA Divisions this year. This increase in internship positions was accomplished primarily through funding partners included community and faith-based organizations and colleges.

The BJRC conducted extensive outreach to students by attending Career Day events at colleges, posting internship job descriptions to the college career sites, and connecting with various college career centers and advisors. BJRC also disseminated internship information at 35 community job fairs. Additionally, the BJRC has continued its relationship with Cerritos College to place IT students with LAWA through its approved

prerequisite course work to the program. The BJRC also continues its partnership with City of Los Angeles Public Works High School Internship Program.

In addition to students from local and out-of-state schools, the BJRD also attracts international students who wish to volunteer at LAX. BJRC hosted international students from China, Germany, Korea, and Japan.

Goals for Next Year

Program goals for the upcoming year will be to increase the number of paid positions through partnerships with other organizations, and to increase the volunteer internship numbers by continuing our current relationships with the various colleges and community and faith based organizations. Also, BJRC plans to reach out to colleges that have not participated in the internship programs. Partner with new organizations that provide internship opportunities to students and increase international student participation, through other organizations such as Cultural Vistas and the Mayor's International Internship Program.

Job Training Program

Although the FAA has not approved a job training program (JTP) for LAWA and therefore no LAWA funds may be used for job training, LAWA leverages its relationships with various agencies funded to provide job training.

By leveraging relationships with over 16 JTP partners, LAWA, through its Business and Job Resources Division (BJRD) initiated its JTP in January 2007. LAWA was successfully able to partner with agencies funded through other means to provide job training opportunities to residents in the PIA. Currently, LAWA is working with agencies that provide an array of training, including computer skills, customer service, time management, bilingual skills, leadership skills, and other classes.

Based on surveys to employers, both internally and externally, new training courses, including Conversational Spanish for Concessions Division staff, and Management training in the areas of communication, coaching, and interviewing took place last year. The conversational Spanish course officially started on September 8, 2010 with a class of about 20 LAWA students and continued throughout 2011, training more than 80 individuals. Several beginning and intermediate Spanish classes were held throughout the year.

Many local residents have completed training in customer service, retail sales, auto mechanics and other disciplines through the LAWA partnerships. The Mayor's Office has initiated discussions with Worksource Centers, the Los Angeles Community College District and surrounding LAWA businesses to conduct Hospitality Training for local residents. Plans are underway to create training modules that will result in career paths for residents within the hospitality industry. Upon the completion of training, these candidates will be well-positioned to compete for job opportunities at the hotels or with various airport employers.

In addition, LAWA has partnered with Santa Monica College to offer opportunities for customized training in the following areas at no cost to LAWA's employees: Business Skills, Continuous Improvement and Professional Development, Computer and Technology Skills, Leadership and Team Building among other areas.

LAWA, along with the LAX Coalition, will continue to assess other job training opportunities and/or areas for collaboration with local training providers.

As of December 31, 2012

JTP Referrals: 694 Completed Training 396*

*This number includes new employees as well as incumbent workers.

Training Goals for 2013

JTP Referrals: 825 Completed Trainings: 520

First Source Hiring Program

The First Source Hiring Program (FSHP) is designed to provide residents from the communities immediately surrounding the airport and those most impacted by airport operations access to airport jobs. Those communities are a part of the Project Impact Area (PIA) and are comprised of South Los Angeles, El Segundo, Hawthorne, Inglewood and Lennox.

The FSHP is now automated with an Applicant Tracking System (ATS) to quickly assist those LAWA employers in need of prescreened and qualified individuals for employment consideration. Over 14,000 people have registered and posted their resumes on the ATS.

The Business and Jobs Resources Center (BJRC) works closely with the Work Source, One-Stop Centers and, community and faith-based organizations that serve the airport area and beyond to register potential candidates on the ATS for positions with LAWA employers. FSHP is training the job developers at these organizations to prescreen and qualify their clients to be eligible for opportunities at LAWA as they arise. Their clients are able to post their resumes and apply for positions and those applications are reviewed by hiring managers in the terminals.

The BJRC also participates in the Mayor's monthly roundtable with the Port of Los Angeles and the Los Angeles Department of Water and Power to discuss and work through workforce development initiatives and on the Mayor's South Los Angeles Initiative. The purpose of this initiative is to ensure job opportunities for those residents that experience disproportionate levels of poverty and unemployment compared to the general population, many of whom live in the designated Project Impact Area.

As new concessions contracts are being awarded, we will be working with the prime contractors to coordinate Targeted Recruitment Events and bring prescreened candidates for interview consideration. The FSHP hosted two such events for Delaware North Corporation at the Proud Bird Restaurant in January 2012 and Crews of California at the Flight Path Museum and Learning Center in May 2012. At both events, over 300 applicants were interviewed for food service positions at food and beverage locations within LAX. Over 60 percent of the prescreened applicants were selected by the respective companies.

During 2012, we hosted targeted interviews for the following companies at the BJRC Offices:

- Allegiant Airlines
- Areas, U.S.A.
- Crews of California
- Delaware North Companies
- Duty Free Shops, North America
- Hudson News

Human Resources Managers from these companies utilized office space at BJRC to conduct interviews away from their confined space in the Terminals. These events yielded many new hires for their respective companies.

As of 6/30/2012 - Actual

FSHP	Referrals:	9,073	Hires:	996
Hiring Goals:		Through June 2012		through June 2013
FSHP		954		1107

The opening of the Tom Bradley International Terminal extension in 2013 and the selection of Westfield as the Terminal Concession Manager will bring new employment opportunities to LAWA. Westfield estimates that upon completion they will open over 60 Food & Beverage and Retail locations to serve the travelling public in the new facility. This will translate into hundreds of new jobs for local residents.

8.0.D EJ-4 Community Mitigation Monitoring

The LAX Master Plan MMRP states:

“Community Mitigation Monitoring. LAWA will include community participation in monitoring the implementation of the final Mitigation Measures and Master Plan Commitments in order to ensure agency compliance and accountability. The community participation will include a diverse group of residents, stakeholders, environmental specialists and community leaders that will convene on a regular basis.”

Status→ In Progress:

The LAX Master Plan Stakeholders Liaison Office (LAX MP SLO) was created as a component of the LAX Plan and the LAX Specific Plan by the Los Angeles City Council to ensure public participation in the implementation of the LAX Master Plan. The LAX MP SLO provides stakeholders with direct access to applicable information on the LAX Master Plan. In addition, the SLO continues to provide the communities with notifications that solicit public comments, e.g., Notice of Preparation, Draft Environmental Impact Reports (DEIR's), Draft Environmental Assessments, Executive Director's Report, and LAX Plan Compliance Notifications.

In 2012 the SLO notified stakeholders of the following:

- Specific Plan Amendment Study
 - Release of the DEIR & notification of Public Hearings related to the release of the DEIR
- West Aircraft Maintenance Area
 - Release of Notice of Preparation and Initial Study
 - Notice of Public Scoping Meetings
- LAX 7L/25R Runway Safety Area and Associated Improvements Project
 - CEQA Process: Notice of Preparation and Public Scoping Meeting
 - NEPA: Release of Draft Environmental Assessment and Public Hearing Notice
- LAX Northside
 - Release of Notice Preparation, Public Scoping Meeting and public workshops.

9.0 Air Quality

9.0.A AQ-1 Air Quality Source Apportionment Study

The LAX Master Plan MMRP states in part:

"Air Quality Source Apportionment Study. LAWA will conduct an air quality source apportionment study to evaluate the contribution of on-airport aircraft emissions to off-airport air pollutant concentrations."

Status → In Progress:

In August 2011, LAWA selected Tetra Tech, Inc. from its existing environmental on-call contractors to conduct Phase III with a budget not-to-exceed \$2.75 million (the contract used for Phases I and II had expired).

The Study approach included a total of 17 monitoring sites, consisting of "core monitoring stations", "community satellite sites", and "saturation sampling sites." Four core monitoring stations were located in the communities surrounding LAX:

- Community North - Westchester
- Community South - El Segundo
- Community East - Lennox
- Upwind Northwest Site - Playa del Rey

There also were four smaller satellite sites located in Hawthorne, Westchester, El Segundo, and west of LAX; and gradient sampling to provide measurements for a subset of air pollutants at nine additional sites throughout the areas surrounding the airport.

The air quality monitoring began in 2012 and successfully occurred over two seasons to account for typical seasonal changes in meteorology, airport operations, and the

associated effects on pollutant transport and dispersion. The winter season was from January 31, 2012 through March 13, 2012, and the summer season, was from July 18, 2012 through August 28, 2012. The analysis of the monitoring and modeling results was performed in the latter half of 2012 and the report preparation is expected to be complete by June 2013.

9.0.B AQ-2 School Air Filters

The LAX Master Plan MMRP states:

"School Air Filters. LAWA will provide funding for air filtration system at qualifying public schools with air conditioning systems in place. The qualifying schools will be determined based upon review of the conclusions and recommendations of the Air Quality Source Apportionment Study to be conducted in Master Plan Commitment AQ-1."

Status→ Not required at this time:

LAWA will initiate the process of identifying qualifying schools following completion of AQ-1, Air Quality and Source Apportionment Study, anticipated to be completed in 2013.

9.0.C AQ-3 Mobile Health Research Lab

The LAX Master Plan MMRP states:

"Mobile Health Research Lab. LAWA will explore the ability to fund/co-fund, to the extent feasible and permissible by federal and local regulations, or seek funding sources to support the goal of a Mobile Health Research Lab. The goal of the Mobile Health Research Lab will be to research and study, not diagnose or treat, upper respiratory and hearing impacts that may be directly related to the operation of LAX."

Status→ Not required at this time:

It is expected that the Health Study will commence after the completion of AQ-1, Air Quality and Source Apportionment Study, anticipated to be completed in 2013.

9.0.D MM-AQ-1 LAX Master Plan – Mitigation Plan for Air Quality (Framework)

The LAX Master Plan MMRP states in part:

"LAX Master Plan - Mitigation Plan for Air Quality - LAWA shall expand and revise the existing air quality mitigation programs at LAX through the development of an LAX Master Plan –Mitigation Plan for Air Quality (LAX MP-MPAQ)."

Status→ Completed:

In 2005, LAWA completed a Mitigation Plan for Air Quality that established the overall framework for the implementation of specific measures for mitigating air quality impacts associated with the LAX Master Plan. The MM-AQ-1 Plan was adopted by the Board of Airport Commissioners in December 2005, in conjunction with approval of the SAIP (i.e., prior to implementation of the first project under the LAX Master Plan).

9.0.E MM-AQ-2 Construction-Related Mitigation Measures

The LAX Master Plan MMRP states in part:

"Construction-Related Mitigation Measures - The required components of the construction-related air quality mitigation measures are itemized below [starting on page 4-725 of the FEIR]. These components include numerous specific actions to reduce emissions from on-road and non-road mobile sources and stationary engines. All of these measures must be in place prior to commencement of the first Master Plan construction project and must remain in place through build out of the Master Plan. An implementation plan will be developed which provides available details as to how each of the elements of this construction-related mitigation measures will be implemented and monitored."

Status→ Completed:

LAWA completed a Construction-Related Mitigation Plan that set forth specific implementation requirements for the measures referenced in the FEIR. The MM-AQ-2 Plan was adopted by the Board of Airport Commissioners in December 2005, in conjunction with approval of the SAIP (i.e., prior to implementation of the first project under the LAX Master Plan) and were integrated into the CFTP construction specifications as appropriate. The execution of this implementation plan (i.e., the MM-AQ-2 Plan) will occur in conjunction with construction of each Master Plan project.

9.0.F MM-AQ-3 Transportation-Related Mitigation Measures

The LAX Master Plan MMRP states in part:

"Transportation-Related Mitigation Measure - The primary feature of the transportation-related air quality mitigation measure is the development and construction of at least eight (8) additional sites with Flyaway service similar to the service provided by the Van Nuys Flyaway currently operated by LAWA. The intent of these FlyAway sites is to reduce the quantity of traffic going to and from LAX by providing regional locations where LAX employees and passengers can pick up an LAX-dedicated, clean-fueled bus that will transport them from a FlyAway closer to their home or office into LAX and back."

Status→ In Progress:

LAWA operated four FlyAway routes between LAX and remote boarding locations at Van Nuys, Union Station, Westwood/UCLA, and Irvine Station for most of 2012. However, the Irvine Station route closed on 8/31/12 because of bankruptcy that resulted in an operator-induced contract termination. The three remaining routes demonstrated a consistent and mature level of passenger demand. Additionally, the Irvine route through August, showed a net reduction in emission reductions as compared to previous years. In 2012, the network realized an average daily ridership of 3,932 passengers, and removed 3,352 vehicles trips per day, travelling a combined total of 69,032 miles per day, and reduced vehicle emissions by over 10 tons annually on roads approaching LAX.

A new FlyAway station is scheduled to open in July 2013 at the Metro Rail Exposition Line rail station at La Brea Avenue and Exposition Boulevard. In addition, an extension of the La Brea station into Hollywood is being planned, as are stations in Santa Monica,

Torrance at the new transit center, and a new Van Nuys FlyAway stop to connect with the Orange Line.

Table 1 below summarizes the FlyAway network mitigation data for years 2008 through 2012. Note that the ridership on the Westwood FlyAway was down in 2009, from 2008, but more emissions have been mitigated due to increased efficiency (service reductions resulted in fewer bus trips for about the same number of passengers).

TABLE 1: CY 2008/2009/2010/2011/2012 LAX FlyAway Network Emissions Reduction Summary					
Emissions reported include NOX, CO, ROG, PM10 and CO2					
Van Nuys (rebuilt 12/05)	2008	2009	2010	2011	2012
Ridership	987,705	880,024	807,485	835,346	887,260
Vehicle Trips Saved	839,491 (2,300/day)	747,969 (2,049/day)	686,315 (1,880/day)	709,995 (1,945/day)	754,119 (2,060/day)
Reduction in Miles Traveled	17.6 million miles	15.7 million miles	14.4 million miles	14.9 million miles	15.8 million miles
Emissions reduced	7,400.6 tons	6,455.5 tons	5,595.2 tons	6,033.5 tons	6,296.9 tons
Auto operating cost savings	\$11.0 million	\$9.8 million	\$6.8 million	\$8.4 million	\$9.4 million
Union Station (opened 03/06)					
Ridership	433,216	409,491	413,975	434,096	455,919
Vehicle Trips Saved	368,208 (1,009/day)	348,043 (954/day)	351,854 (964/day)	368,956 (1,011/day)	387,504 (1,059/day)
Reduction in Miles Traveled	7.3 million miles	6.9 million miles	6.9 million miles	7.3 million miles	7.7 million miles
Emissions reduced	2,549.8 tons	2,322.2 tons	2,328.9 tons	2,496.3 tons	2,674.3 tons
Auto operating cost savings	\$4.5 million	\$4.3 million	\$3.3 million	\$4.1 million	\$4.6 million
Westwood (opened 06/07)					
Ridership	125,288	115,048	107,136	97,337	84,179
Vehicle Trips Saved	106,487 (292/day)	97,784 (268/day)	91,059 (249/day)	82,731 (227/day)	71,547 (195/day)
Reduction in Miles Traveled	1.3 million miles	1.2 million miles	1.1 million miles	1.0 million miles	858.6 thousand mi.
Emissions reduced	67.7 tons	211.9 tons	204 tons	187.4 tons	158.1 tons
Auto operating cost savings	\$796,000	\$731,000	\$618 thousand	\$562 thousand	\$512 thousand
Irvine* (opened 11/16/09 closed 8/31/12)					
Ridership	--	1,500	13,604	16,504	11,897
Vehicle Trips Saved	--	1,275	11,563 (32/day)	14,027 (38/day)	10,112 (38/day)
Reduction in Miles Traveled	--	60 thousand miles	580 thousand miles	701 thousand miles	505.6 thousand mi.
Emissions reduced	--	N/A	- 81 tons	- 20.3 tons	5.5 tons
Auto operating cost savings	--	\$40,000	\$327 thousand	\$397 thousand	\$301 thousand
Network Summary					
Ridership	1,546,209	1,406,063	1,342,200	1,383,283	1,439,255
Vehicle Trips Saved	1,314,186 (3,600/day)	1,195,295 (3,275/day)	1,140,791 (3,125/day)	1,175,709 (3,221/day)	1,223,282 (3,352/day)
Reduction in Miles Traveled	26.2 million miles	23.8 million miles	23.0 million miles	23.9 million miles	24.9 million miles
Emissions reduced	10,018 tons	8,990 tons	7,966 tons	8,697 tons	9,134.8 tons
Auto operating cost savings	\$16.3 million	\$14.9 million	\$13.0 million	\$13.5 million	\$14.8 million

* Irvine data for 2008 and 2012 are each partial year service; Irvine opened 11/16/2009 and closed on 8/31/2012.

The LAX Master Plan MMRP states in part:

"Transportation-Related Mitigation Measure – Other feasible mitigation elements may be developed to ensure that the emission reductions for this transportation-related measure are achieved. These may include, for example"... Clean Vehicle Fleets measures such as:

- *Promoting commercial vehicles/trucks/vans using terminal areas (LAX and regional intermodal) to install SULEZ/ZEV engines to reduce vehicle air emissions.*

Status→ In Progress:

LAWA's fleet is the largest Alternative Fuel Vehicle (AFV) airport fleet in the nation and includes over 590 AFVs. In 2012, over 57 percent of LAWA's fleet vehicles and equipment at LAX are AFV's. Additionally, 100 percent of the LAX courtesy shuttle fleet is powered by natural gas. LAWA has designed and built a state-of-the-art, high-technology LNG/LCNG fueling station at LAX and acquired over \$5 million in grant funding to offset the differential cost of AFVs. LAWA has partnered with the Department of Water and Power to install 32 public access electric vehicle charging stations at LAX.

The AFV program has been recognized as one of the most successful airport AFV programs in the nation and a world-class model for airports and other agencies. Awards and recognition include:

- Clean Air Awards from the Coalition for Clean Air and South Coast Air Quality Management District
- Certificate of Distinguished Achievement from the California Natural Gas Vehicle Coalition
- Clean Cities Certificate for participation in the U.S. Department of Energy's Clean Cities Program
- Recognized by the U.S. Department of Energy Clean Cities Program as a "success story for airports"

9.0.G MM-AQ-4 Operations-Related Mitigation Measures

The LAX Master Plan MMRP states in part:

"Operations-Related Mitigation Measure: The primary component of the operations-related air quality mitigation measure consists of one airside item, the conversion of ground support equipment (GSE) to extremely low emission technology (such as electric power, fuel cells, or other future technological developments)."

Status→In Progress:

In 2012, LAWA organized the approach, defined new tasks, and wrote a scope of work to update the 2007 LAX GSE inventory and conduct a comprehensive e-GSE feasibility study in 2013. LAWA also will evaluate strategies and options for GSE emission reductions in conjunction with airlines as part of the 2013 study.

10.0 Hydrology and Water Quality**10.0.A HWQ-1 Conceptual Drainage Plan**

The LAX Master Plan MMRP states in part:

"Conceptual Drainage Plan. Once a Master Plan alternative is selected, and in conjunction with its design, LAWA will develop a conceptual drainage plan of the area within the boundaries of the Master Plan alternative (in accordance with FAA guidelines and to the satisfaction of the City of Los Angeles Department of Public Works, Bureau of Engineering). The purpose of the drainage plan will be to assess area-wide drainage flows as related to the Master Plan project area, and at a level of detail sufficient to

identify the overall improvements necessary to provide adequate drainage capacity to prevent flooding.”

Status→ Completed:

LAWA completed a Conceptual Drainage Plan which was adopted in conjunction with the SAIP.

10.0.B MM-HWQ-1 Update Regional Drainage Facilities

The LAX Master Plan MMRP states:

“Update Regional Drainage Facilities. *Regional drainage facilities should be upgraded, as necessary, in order to accommodate current and projected future flows within the watershed of each stormwater outfall resulting from cumulative development. This could include upgrading the existing outfalls, or building new ones. The responsibility for implementing this mitigation measure lies with the Los Angeles County Department of Public Works and/or the City of Los Angeles Department of Public Works, Bureau of Engineering. A portion of the increased costs for the upgraded flood control and drainage facilities would be paid by LAX tenants and users in accordance with the possessory interest tax laws and other legal assessments, consistent with federal airport revenue diversion laws and regulations and in compliance with state, county and city laws. The new or upgraded facilities should be designed in accordance with the drainage design standards of each agency.”*

Status→ In Progress:

To determine if regional drainage facilities should be upgraded, LAWA evaluates the post-construction drainage conditions for ongoing and future projects.

11.0 Historical/Architectural and Archaeological/Cultural Resources

11.0.A HR-1 Preservation of Historic Resources

The LAX Master Plan MMRP states:

“Preservation of Historic Resources. *In implementing the LAX Plan and conducting ongoing activities associated with operation of the airport, LAWA will support the preservation of identified significant historic/architectural resources through careful review of design and development adjacent to those resources and by undertaking any modifications to those resources in a manner consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Additionally, where sound insulation is proposed for identified significant historic/architectural resources under the Aircraft Noise Mitigation Program, LAWA will ensure that methods are developed with the approval of a qualified architectural historian or historic architect, who meets the Secretary of the Interior's Professional Qualifications Standards, in compliance with the Secretary of the Interior's Standards for Rehabilitation.”*

Status→ Ongoing:

Any project at LAWA involving a designated historic resource is required to be reviewed by the Office of Historic Resources of the City of Los Angeles before any changes to the

resource are approved. The historic preservation architect within this division of the Department of City Planning is charged with this responsibility.

11.0.B MM-HA-1 Historic American Buildings Survey (HABS) Document

The LAX Master Plan MMRP states in part:

“Historic American Buildings Survey (HABS) Document. *For historic properties eligible at the federal, state or local levels that are proposed for demolition or partial demolition (i.e., the International Airport Industrial District), a Historic American Buildings Survey (HABS) document shall be prepared by LAWA in accordance with the Secretary of the Interior's Guidelines for Architectural and Engineering Documentation Standards. The level of documentation (I, II, III) shall be determined by the National Park Service (NPS).”*

Status→ Not required at this time:

No historic buildings were proposed for demolition or partial demolition during 2012. Therefore, this requirement has not been triggered.

11.0.C MM-HA-2 Historic Educational Materials

The LAX Master Plan MMRP states in part:

Historic Educational Materials. *For the significant historic resources proposed for demolition or partial demolition, educational materials suitable for the general public, secondary school use, and/or aviation historians and enthusiasts shall be designed with the assistance of a qualified historic preservation professional and implemented by LAWA.*

Status→ Not required at this time:

No significant historic resources were proposed for demolition or partial demolition during 2012. Therefore, this requirement has not been triggered.

11.0.D MM-HA-4 Discovery

The LAX Master Plan MMRP states in part:

“Discovery. *The FAA shall prepare an archaeological treatment plan (ATP), in consultation with SHPO, that ensures the long-term protection and proper treatment of those unexpected archaeological discoveries of federal, state, and/or local significance found within the APE of the selected alternative.”*

Status→ Completed:

Subsequent to the adoption of this measure, LAWA completed an Archaeological Treatment Plan in June 2005. Master Plan projects comply with this plan and thus comply with this mitigation measure.

11.0.E MM-HA-5 Monitoring

The LAX Master Plan MMRP states in part:

“Monitoring. Any grading and excavation activities within LAX proper or the acquisition areas that have not been identified as containing redeposited fill material or having been previously disturbed shall be monitored by a qualified archaeologist.”

Status→ Ongoing:

LAWA completed an Archeological Treatment Plan (ATP) in June, 2005 to achieve compliance with Section 106 of the National Historic Preservation Act (NHPA), the California Environmental Quality Act (CEQA), and the environmental guidelines of local agencies regarding the treatment of unexpected archeological discoveries of federal, state, and/or local significance that might be encountered during construction activities at LAX. The Plan focuses on the long-term protection and proper treatment of unexpected archeological discoveries at LAX including a summary of previously identified archeological sites within LAX and guidelines to follow should archeological discoveries are encountered during construction activities at LAX. Each project at LAX undergoes environmental analysis and clearances prior to grading and excavation activities are performed and those environmental clearances would identify the potential need for a project archeologist. LAWA and project archeologists would adhere to the guidelines provided in the ATP.

11.0.F MM-HA-6 Excavation and Recovery

The LAX Master Plan MMRP states:

“Excavation and Recovery. Any excavation and recovery of identified resources (features) shall be performed using standard archaeological techniques and the requirements stipulated in the ATP. Any excavations, testing, and/or recovery of resources shall be conducted by a qualified archaeologist selected by LAWA.”

Status→ Ongoing:

This is an ongoing requirement.

11.0.G MM-HA-7 Administration

The LAX Master Plan MMRP states:

“Administration. Where known resources are present, all grading and construction plans shall be clearly imprinted with all of the archaeological/cultural mitigation measures. All site workers shall be informed in writing by the on-site archaeologist of the restrictions regarding disturbance and removal as well as procedures to follow should a resource deposit be detected.”

Status→ Ongoing:

This is an ongoing requirement in all LAWA capital project specifications.

11.0.H MM-HA-8 Archaeological/Cultural Monitor Report

The LAX Master Plan MMRP states in part:

“Archaeological/Cultural Monitor Report. Upon completion of grading and excavation activities in the vicinity of known archaeological resources, the Archaeological/Cultural monitor shall prepare a written report. The report shall include the results of the fieldwork and all appropriate laboratory and analytical studies that were performed in conjunction with the excavation.”

Status→ Ongoing:

This is an ongoing requirement at LAWA.

11.0.I MM-HA-9 Artifact Curation

The LAX Master Plan MMRP states:

“Artifact Curation. All artifacts, notes, photographs, and other project-related materials recovered during the monitoring program shall be curated at a facility meeting federal and state standards.”

Status→ Ongoing:

This is an ongoing requirement at LAWA.

11.0.J MM-HA-10 Archaeological Notification

The LAX Master Plan MMRP states:

“Archaeological Notification. If human remains are found, all grading and excavation activities in the vicinity shall cease immediately and the appropriate LAWA authority shall be notified: compliance with those procedures outlined in Section 7050.5(b) and (c) of the State Health and Safety Code, Section 5097.94(k) and (i) and Section 5097.98(a) and (b) of the Public Resources Code shall be required. In addition, those steps outlined in Section 15064.5(e) of the CEQA Guidelines shall be implemented.”

Status→ Ongoing:

This is an ongoing requirement at LAWA.

12.0 Paleontological Resources

12.0.A MM-PA-1 Paleontological Qualification and Treatment Plan

The LAX Master Plan MMRP states:

“Paleontological Qualification and Treatment Plan. A qualified paleontologist shall be retained by LAWA to develop an acceptable monitoring and fossil remains treatment plan (that is, a Paleontological Management Treatment Plan - PMTP) for construction-related activities that could disturb potential unique paleontological resources within the project area. This plan shall be implemented and enforced by the project proponent

during the initial phase and full phase of construction development. The monitoring and treatment plan shall be subject to approval by the Vertebrate Paleontology Section of the Natural History Museum of Los Angeles County to comply with paleontological requirements, as appropriate.”

Status→ Completed:

The Paleontological Management Treatment Plan was prepared and revised in December 2005.

12.0.B MM-PA-2 Paleontological Authorization

The LAX Master Plan MMRP states:

“Paleontological Authorization. *The paleontologist shall be authorized by LAWA to halt, temporarily divert, or redirect grading in the area of an exposed fossil to facilitate evaluation and, if necessary, salvage. No known or discovered fossils shall be destroyed without the written consent of the project paleontologist.”*

Status→ Ongoing:

This is an ongoing requirement at LAWA.

12.0.C MM-PA-3 Paleontological Monitoring Specifications

The LAX Master Plan MMRP states:

“Paleontological Monitoring Specifications. *Specifications for paleontological monitoring shall be included in construction contracts for all LAX projects involving excavation activities deeper than six feet.”*

Status→ Ongoing:

This is an ongoing requirement on all LAWA construction contracts requiring excavation deeper than 6 feet.

12.0.D MM-PA-4 Paleontological Resources Collection

The LAX Master Plan MMRP states:

“Paleontological Resources Collection. *Because some fossils are small, it will be necessary to collect sediment samples of promising horizons discovered during grading or excavation monitoring for processing through fine mesh screens. Once the samples have been screened, they shall be examined microscopically for small fossils.”*

Status→ Ongoing:

This is an ongoing requirement at LAWA.

12.0.E MM-PA-5 Fossil Preparation

The LAX Master Plan MMRP states:

“Fossil Preparation. *Fossils shall be prepared to the point of identification and catalogued before they are donated to their final repository.”*

Status→ Ongoing:

This is an ongoing requirement at LAWA.

12.0.F MM-PA-6 Fossil Donation

The LAX Master Plan MMRP states:

“Fossil Donation. *All fossils collected shall be donated to a public, nonprofit institution with a research interest in the materials, such as the Los Angeles County Museum of Natural History.”*

Status→ Ongoing:

This is an ongoing requirement at LAWA.

12.0.G MM-PA-7 Paleontological Reporting

The LAX Master Plan MMRP states:

“Paleontological Reporting. *A report detailing the results of these efforts, listing the fossils collected, and naming the repository shall be submitted to the lead agency at the completion of the project.”*

Status→ Ongoing:

This is an ongoing requirement at LAWA.

13.0 Biotic Communities

13.0.A MM-BC-1 Conservation of State-Designated Sensitive Habitat Within and Adjacent to the El Segundo Blue Butterfly Habitat Restoration Area

The LAX Master Plan MMRP states in part:

“Conservation of State-Designated Sensitive Habitat Within and Adjacent to the El Segundo Blue Butterfly Habitat Restoration Area. *LAWA or its designee shall take all necessary steps to ensure that state-designated sensitive habitats within and adjacent to the Habitat Restoration Area are conserved and protected during construction, operation, and maintenance.”*

Status→ In Progress:

LAWA is continuing to maintain and manage the El Segundo Blue (ESB) Butterfly Habitat Restoration Area.

LAWA's ESB conservation program has three components:

- Restoration of the native sand dunes habitat
- Monitoring the progress of the program
- Public awareness

Because human activity negatively impacts the ESB and its food plant buckwheat, the area is protected and activities are controlled to meet the restoration goals. A major threat to both the ESB and buckwheat are the invasive plant species that dominate the habitat. LAWA's Maintenance Services Division has a dedicated two-man crew that worked exclusively at the LAX dunes to perform regular trash and debris removal, weeding, and other vegetation management activities. Numerous truckloads of trash (which continually blow onto the dunes from the adjacent Dockweiler State Beach), debris, and weeds are removed from the dunes regularly.

Detailed estimates of ESB population are performed annually through monitoring. The seasonal estimates indicate that ESB population decreased in 2012 compared to the seasonal population estimates for 2011 most likely due to drought conditions. Further details can be found in Appendix F.

Table 2. Total Number of Buckwheat Plants, Flowerheads and ESB Butterflies on the Historical Transect (2002 - 2012)

Year	Number of Plants	Number of Flowerheads	Number of ESB
2002	692	336,013	1,236
2003	627	399,783	2,688
2004	612	363,584	2,123
2005	658	506,660	2,653
2006	643	535,619	3,049
2007	522	165,996	777
2008	501	311,200	2,173
2009	520	524,599	2,859
2010	538	611,552	3,898
2011	552	920,184	4,690
2012	544	876,983	2,731

Source: Arnold, 2012.

In 2012, as part of the public awareness efforts, LAWA conducted four ESB preserve tours for LAWA employees, and one tour for environmental/natural resource management stakeholders and academicians.

Regarding the ESB conservation measures related to the Bradley West Project, prior to initiation of construction for the Bradley West Project, tarps were added to existing fencing on the western side of Pershing Drive to reduce the transport of fugitive dust particles related to construction activities. During construction, soil stabilization, watering and/or other dust control measures are being implemented to reduce fugitive dust emissions.

13.0.B MM-BC-2 Conservation of Floral Resources: Lewis' Evening Primrose

The LAX Master Plan MMRP states in part:

“Conservation of Floral Resources: Lewis' Evening Primrose. LAWA or its designee shall prepare and implement a plan to compensate for the loss of individuals of the sensitive Lewis' evening primrose, currently located at the westerly end of the north runway and within the Habitat Restoration Area. LAWA or its designee shall collect seed from those plants to be removed, and properly clean and store the collected seed until used. If possible, seeds shall be collected in multiple years to ensure an adequate seed supply for planting. A mitigation site of suitable habitat equal to the area of impact shall be delineated within areas of the Los Angeles/El Segundo Dunes as described in MM-BC-13.”

Status→ Not required at this time:

This measure is not applicable at this reporting period. There are no current LAX projects that would affect Lewis' evening primrose.

13.0.C MM-BC-3 Conservation of Floral Resources: Mature Tree Replacement

The LAX Master Plan MMRP states in part:

“Conservation of Floral Resources: Mature Tree Replacement. LAWA or its designee shall prepare and implement a plan to compensate at a ratio of 2:1 for the loss of approximately 300 mature trees, which would occur as a result of implementation of the LAX Northside project.”

Status→ Not required at this time:

This measure is not applicable at this reporting period. There are no current LAX projects that would result in the removal of mature trees. This mitigation measure may apply to future projects associated with the Specific Plan Amendment Study (SPAS), including use of construction staging areas and approval of a north airfield runway project.

Regarding the applicability of this measure to the Bradley West Project, please see MM-BC (BWP)-7 in the Project-Specific section of this report.

13.0.D MM-BC-8 Replacement of Habitat Units

The LAX Master Plan MMRP states in part:

“Replacement of Habitat Units. LAWA or its designee shall undertake mitigation for the loss of habitat units resulting from implementation of Alternative D. Implementation of Alternative D would result in the loss of 45.43 habitat units. These habitat units shall be replaced at a 1:1 ratio within the Los Angeles/El Segundo Dunes.”

Status→ In Progress:

This measure was partially fulfilled by MM-BC (SA)-1. Please see Section 25.0, Project-Specific Mitigations. It was estimated that 21 acres were required to offset the impact from the SAIP project, and 16.8 habitat units were restored in an offsite location in 2007.

In 2011, Environmental Services Division (ESD) initiated an analysis of LAX Master Plan Alternative D impacts to biotic communities to-date. ESD, with the assistance of the LAWA Geographic Information System (GIS) unit, commenced a mapping project in 2012 to estimate the total area of biotic communities identified in the Master Plan that were impacted by all Master Plan projects to date, as there was some overlap in construction staging areas for the three projects (SAIP, CFTP, and BWP).

The estimated impact areas from the mapping project were used to calculate additional mitigation requirements beyond the 17.17 habitat units identified in the SAIP EIR. The calculations show that a total of 21.43 habitat units require mitigation associated with SAIP, CFTP, and BWP. As noted above, 16.8 habitat units were restored in an offsite location, leaving 4.63 habitat units remaining to be replaced from the SAIP, BWP and CFTP projects. Mitigation for these units will be implemented by the Northern Dunes Improvement Project, which is located within the 48-acre LAX/EI Segundo Dunes area north of Sandpiper Street, beginning in Fall 2013. Native prairie grassland, dune scrub and coastal foredune habitats will be restored in phases at the site over a 3-year period. Phased botanical surveys will be conducted for 5 years after project implementation to determine project success measured in relative percent cover of native and non-native vegetation. It is calculated that this project will achieve restoration of more than 4.63 habitat units, thereby completing the mitigation requirement for SAIP, CFTP and BWP.

13.0.E MM-BC-9 Conservation of Faunal Resources

The LAX Master Plan MMRP states in part:

“Conservation of Faunal Resources. LAWA or its designee shall develop and implement a relocation and monitoring plan to compensate for the loss of 1.34 habitat units of occupied western spadefoot toad habitat and for the loss of western spadefoot toad individuals currently in the southwestern portion of the AOA; 2.38 habitat units of occupied San Diego black-tailed jackrabbit habitat and for the loss of individuals of this species within the AOA; and 10.83 habitat units utilized by loggerhead shrike within the western airfield. LAWA shall minimize incidental take of active nests of loggerhead shrike through pre-construction surveys and construction avoidance measures. LAWA shall conduct pre-construction surveys for silvery legless lizard, San Diego horned lizard and burrowing owls and relocate individuals, if required.”

Status→ Completed for the Bradley West Project:

As part of the Bradley West Project, LAWA conducted focused surveys for the Western Spadefoot Toad (*Spea [=Scaphiopus] hammondi*), a California Species of Special Concern, in March and April 2009. No Western Spadefoot were observed during the surveys. The removal of soil in the pool areas at LAX, as a condition of the Biological Opinion for the LAX Master Plan, resulted in modified site hydrology that no longer provides suitable breeding habitat for this species. For this reason, LAWA is not required to implement a relocation and monitoring plan for the Western Spadefoot.

See MM-BC (BWP)-4, MM-BC (BWP)-5, and MM-BC (BWP)-6 in Section 25.0, Project-Specific Mitigations, for information concerning other species addressed in this measure as they relate to the Bradley West Project.

13.0.F MM- BC-13 Replacement of State-Designated Sensitive Habitats

The LAX Master Plan MMRP states in part:

“Replacement of State-Designated Sensitive Habitats. *LAWA or its designee shall undertake mitigation for the loss of State-designated sensitive habitat within the Los Angeles/El Segundo Dunes, including the Habitat Restoration Area.”*

Status→ Not required at this time:

There are no current LAX projects that would result in the loss of State-designated sensitive habitat within the Dunes Area.

14.0 Endangered and Threatened Species

14.0.A MM-ET-1 Riverside Fairy Shrimp Habitat Restoration

The LAX Master Plan MMRP states in part:

“Riverside Fairy Shrimp Habitat Restoration. *LAWA or its designee shall undertake mitigation for direct impacts to 0.04 acre (1,853 square feet) of degraded wetland habitat containing embedded cysts of Riverside fairy shrimp and potential indirect impacts to 1.26 acres of degraded wetland habitat containing embedded cysts of the Riverside fairy shrimp.”*

Status→ In-Progress:

On April 20, 2004, the United States Fish and Wildlife Service (USFWS) issued a Biological Opinion (BO) based on their review of Alternative D of the Draft EIS/EIR for LAWA Master Plan for LAX and its effects on the federally endangered Riverside Fairy Shrimp (*Streptocephalus woottoni*, “RFS”) in accordance with Section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). The April 20, 2004 BO proposed several conservation measures (i.e. mitigation requirements) to offset direct and indirect impacts on the RFS. Subsequently, on April 8, 2005, the USFWS issued a BO based on their review of the proposed operations and maintenance activities for LAX and its effects on the RFS. Details of all of the conservation measures are described in both BOs and in Mitigation Measure MM-ET-1. To date LAWA has completed the following requirements:

- Salvage and storage of RFS cyst-bearing soils at LAX.
- On December 2, 2005, the FAA transmitted a letter confirming the completion of the RFS cysts conservation work to the USFWS.
- Submittal of conceptual and draft Final Habitat Creation, Enhancement, Maintenance and Monitoring Plans for mitigation at Madrona Marsh Preserve, Torrance, CA.

LAWA and the FAA pursued implementation of the mitigation project at the former Marine Corps Air Station El Toro until 2008. In August 2006, the proposed RFS habitat creation site was the subject of discussions between the FAA and the Federal Bureau of Investigation (FBI) regarding the future compatibility of the site between FBI training and

creation of a RFS habitat. After further investigation, in May 2008, it was determined that the El Toro site did not have suitable soil for developing RFS habitat.

With the concurrence of the USFWS and the FAA, LAWA pursued a mitigation site at the Madrona Marsh location in City of Torrance until 2012. Studies of the Madrona Marsh site were initiated beginning in 2005, and a conceptual design was developed in 2009. Soil studies and surveys were completed, and a hydrogeological model of the restoration site was been developed from the data. A conceptual design and restoration plan that meets the requirements of the mitigation measure and BOs were presented to the FAA, USFWS, California Department of Fish and Game (CDFG), and City of Torrance stakeholders, i.e., Friends of Madrona Marsh Preserve, in November and December 2011. The restoration plan was not finalized. Instead, in 2012, USFWS decided to pursue the acquisition of critical habitat in Riverside County that had been identified the previous year as an alternative means for LAWA and FAA to meet this requirement. USFWS is currently working with FAA to identify properties and willing sellers.

14.0.B MM-ET-3 El Segundo Blue Butterfly Conservation: Dust Control

The LAX Master Plan MMRP states:

“El Segundo Blue Butterfly Conservation: Dust Control. *To reduce the transport of fugitive dust particles related to construction activities, soil stabilization, watering or other dust control measures, as feasible and appropriate, shall be implemented with a goal to reduce fugitive dust emissions by 90 to 95 percent during construction activities within 2,000 feet of the El Segundo Blue Butterfly Habitat Restoration Area. In addition, to the extent feasible, no grading or stockpiling for construction activities should take place within 100 feet of occupied habitat of the El Segundo blue butterfly.”*

Status→ In Progress:

See MM-BC-1 above.

14.0.C MM-ET-4 El Segundo Blue Butterfly Conservation: Habitat Restoration

The LAX Master Plan MMRP states in part:

“El Segundo Blue Butterfly Conservation: Habitat Restoration. *LAWA or its designee shall take all necessary steps to avoid the flight season of the El Segundo blue butterfly (June 14 - September 30) when undertaking installation of navigational aids and associated service roads proposed under Master Plan Alternative D within habitat occupied by the El Segundo blue butterfly. Installation of navigational aids within the Habitat Restoration Area should be required to take place between October 1st and May 31st.*

...As possible, depending on the location and condition of individual plants, FAA and LAWA shall salvage existing coast buckwheat plants and any larvae on the plant or pupae in the soil below the plant that would be removed to accommodate the replacement navigational aids to further conserve this species. These plants shall be salvaged immediately prior to the installation of the replacement navigational aids outside of the butterfly flight season. These salvaged plants shall be transported in a suitable container and replanted after the onset of winter rains in subsite 23...”

Status→ Not required at this time:

No action is required at this time for these components of the measure.

“In conformance with the Biological Opinion, activities associated with navigational aids development shall be limited to the existing roads and proposed impacts areas as depicted in the Final EIS/EIR. Coast buckwheat shall be planted a minimum of three years prior to the impact, not only to allow for establishment of the plants, but also to ensure that the plants are mature enough to bloom. The plantings of coast buckwheat shall be located within the southwest corner of subsite 23 of the Habitat Restoration Area, as depicted in Figure F5-5, and shall encompass 1.25 acres in conformance with the Biological Opinion. Coast buckwheat plants will be planted at an initial density of 200 plants per acre to ensure the long-term planting density target (130 plants per acre). Coast buckwheat plants will be placed in clusters or groupings based on microtopographic features present within subsite 23 to better support the El Segundo Blue Butterfly, which is known to prefer large clusters of plants for nectaring and shelter.”

Status → In Progress:

Mitigation began in advance per instructions in the USFWS Biological Opinion in subsite 23 of the LAX El Segundo Dunes. The subsite was planted with 325 propagated buckwheat seedlings in November 2011, and irrigated. In December 2012, a survey showed that 154 plants had survived with a 47 percent survival rate. A progress report is included in Appendix F.

“...LAWA shall coordinate with the USFWS to create educational materials on the El Segundo blue butterfly for integration into LAWA’s public outreach program.”

Status → In Progress:

Fact sheets were created for the ESB Habitat restoration area to provide information about the ESB.

15.0 Energy Supply

15.0.A E-1 Energy Conservation and Efficiency Program

The LAX Master Plan MMRP states in part:

“Energy Conservation and Efficiency Program. *LAWA will seek to continually improve the energy efficiency of building design and layouts during the implementation of the LAX Master Plan. Title 24, Part 6, Article 2 of the California Administrative Code establishes maximum energy consumption levels for heating and cooling of new buildings to assure that energy conservation is incorporated into the design of new buildings.”*

Status→ Ongoing:

This requirement is addressed through the sustainable construction standards in the Los Angeles Green Building Code (LAGBC) and LAWA’s Design and Construction Handbook, which establish broad design and construction guidelines for all infrastructure, terminal buildings, renovations, and other public facilities owned, operated or maintained by LAWA.

In addition, based on the results of a 2011 High Performance Building Audit (HPBA) for Terminal 2 of the Los Angeles International Airport (LAX), several terminal energy conservation measures, operational enhancements, and utility consumption efficiencies were identified and implemented.

During calendar year 2012, LAWA electricians began a project to replace the existing T12 fluorescent lamps with T8 lamps which produce the same light output using forty percent less energy. Approximately 12,000 lamps were replaced in Terminals 1 through 4 and efforts will continue in the remaining terminals during calendar year 2013.

Also, during calendar year 2012, LAWA Heating, Ventilation, and Controls staff installed Variable Frequency Drives and associated motors for the return air sections of the Air Handling Units (AHUs) in Terminal 1. Prior to this measure, the AHU return fans and pumps remained at constant speed and operated at full capacity, translating to unnecessary energy use. LAWA plans to continue these efforts in the remaining terminals during calendar year 2013.

15.0.B E-2 Coordination with Utility Providers

The LAX Master Plan MMRP states:

“Coordination with Utility Providers. LAWA will implement Master Plan activities in coordination with local utility providers. Utility providers will provide input on the layout of utilities at LAX to assure that LAX and the surrounding region receive both safe and uninterrupted service. When service by existing utility lines could be affected by airport design features, LAWA will work with the utility to identify alternative means of providing equivalent or superior post-construction utility service.”

Status→ Ongoing:

This requirement is implemented with each Master Plan development project prior to issuance of applicable permits.

In addition, LAWA has met with the City of Los Angeles Department of Water and Power to discuss long-term improvements to the electrical distribution system to provide an additional feed and redundant power source to LAX. A new project is currently under development by LAWA to construct a new fifth DWP Electrical Power Feed dedicated solely to LAX to improve electrical power redundancy and reliability.

15.0.C PU-1 Develop a Utility Relocation Program

The LAX Master Plan MMRP states in part:

“Develop a Utility Relocation Program. LAWA will develop and implement a utilities relocation program to minimize interference with existing utilities associated with LAX Master Plan facility construction.”

Status→ Ongoing:

This is an ongoing requirement in all LAWA capital development projects.

16.0 Light Emissions

16.0.A L1-2 Use of Non-Glare Generating Building Materials

The LAX Master Plan MMRP states:

“Use of Non-Glare Generating Building Materials. Prior to approval of final plans, LAWA will ensure that proposed LAX facilities will be constructed to maximize use of non-reflective materials and minimize use of undifferentiated expanses of glass.”

Status→ Ongoing:

This is an ongoing requirement in LAWA specifications.

16.0.B L1-3 Lighting Controls

The LAX Master Plan MMRP states in part:

“Lighting Controls. Prior to final approval of plans for new lighting, LAWA will conduct reviews of lighting type and placement to ensure that lighting will not interfere with aeronautical lights or otherwise impair Airport Traffic Control Tower or pilot operations.”

Status→ Ongoing:

LAWA is committed to integrating sustainable practices in the areas of Sustainable Design, Energy and Atmosphere, Materials and Resources, Water Efficiency, Transportation Resources, and Administrative Processes into operations and administrative processes throughout the organization. Accordingly, all lighting plans are approved by LAWA prior to issuance of any permits which include lighting to ensure that new lights or changes in lighting will not have an adverse effect on airport operations.

17.0 Solid Waste

17.0.A SW-1 Implement an Enhanced Recycling Program

The LAX Master Plan MMRP states in part:

“Implement an Enhanced Recycling Program. “LAWA will enhance their existing recycling program, based on successful programs at other airports and similar facilities.”

Status→ Completed and Ongoing:

LAWA completed an enhanced recycling plan in 2011 for LAX. The total recycling and source reduction achieved by LAWA’s Maintenance Services Division’s Recycling and Source Reduction Program for calendar year 2012 was 20,320 tons. With this accomplishment, LAWA continues on the path toward meeting the Mayor’s goal of 70 percent recycling by 2015.

LAWA’s goals for 2012 included:

- Offering tenants file clearing services
- Environmental Preferred Purchasing for the procurement of goods and services that benefit the environment.

- Creating a pilot program to recycle organics
- Educating tenants on the new statewide, mandatory commercial recycling law set to go in effect July 2012

17.0.B SW-2 Requirements for the Use of Recycled Materials During Construction

The LAX Master Plan MMRP states:

“Requirements for the Use of Recycled Materials During Construction. LAWA will require, where feasible, that contractors use a specified minimum percentage of recycled materials during construction of LAX Master Plan improvements. The percentage of recycled materials required will be specified in the construction bid documents. Recycled materials may include, but are not limited to, asphalt, drywall, steel, aluminum, ceramic tile, cellulose insulation, and composite engineered wood products. The use of recycled materials in LAX Master Plan construction will help to reduce the project's reliance upon virgin materials and support the recycled materials market, decreasing the quantity of solid waste requiring disposal.”

Status→ Ongoing:

This is a standard requirement in LAWA specifications on all capital construction projects.

17.0.C SW-3 Requirements for the Recycling of Construction and Demolition Waste

The LAX Master Plan MMRP states:

“Requirements for the Recycling of Construction and Demolition Waste. LAWA will require that contractors recycle a specified minimum percentage of waste materials generated during demolition and construction. The percentage of waste materials required to be recycled will be specified in the construction bid documents. Waste materials to be recycled may include, but are not limited to, asphalt, concrete, drywall, steel, aluminum, ceramic tile, and architectural details.”

Status→ Ongoing:

This is a standard requirement in all LAWA specifications on capital construction projects.

17.0.D MM-SW-1 Provide Landfill Capacity

The LAX Master Plan MMRP states:

“Provide Landfill Capacity. Additional landfill capacity in the Los Angeles region should be provided through the siting of new landfills, the expansion of existing landfills, or the extension of permits for existing facilities. As an alternative, or to augment regional landfill capacity, landfill capacity outside the region could be accessed by developing the necessary rail haul infrastructure. The responsibility for implementing this mitigation measure lies with state, county, and local solid waste planning authorities. The costs for implementing this mitigation measure will be passed on to LAX and other solid waste generators through increased solid waste disposal costs.”

Status→ No Action Required:

LAWA has no jurisdiction regarding this mitigation measure which must be implemented by state, county, and local solid waste planning authorities.

18.0 Construction Impacts**18.0.A C-1 Establishment of a Ground Transportation/Construction Coordination Office**

The LAX Master Plan MMRP states in part:

“Establishment of a Ground Transportation/Construction Coordination Office.

Establish this office for the life of the construction projects to coordinate deliveries, monitor traffic conditions, advise motorists and those making deliveries about detours and congested areas, and monitor and enforce delivery times and routes.”

Status→ Ongoing:

This measure is an ongoing requirement in all of LAX’s capital projects to the extent possible.

18.0.B C-2 Construction Personnel Airport Orientation

The LAX Master Plan MMRP states:

“Construction Personnel Airport Orientation. *All construction personnel will be required to attend an airport project-specific orientation (pre-construction meeting) that includes where to park, where staging areas are located, construction policies, etc.”*

Status→ Ongoing:

This measure is an ongoing requirement in all of LAWA’s capital development projects.

19.0 Design, Art, and Architecture Applications/Aesthetics**19.0.A DA-1 Provide and Maintain Airport Buffer Areas**

The LAX Master Plan MMRP states:

“Provide and Maintain Airport Buffer Areas. *Along the northerly and southerly boundary areas of the airport, LAWA will provide and maintain landscaped buffer areas that will include setbacks, landscaping, screening or other appropriate view-sensitive improvements with the goals of avoiding land use conflicts, shielding lighting, enhancing privacy and better screening views of airport facilities from adjacent residential uses. Use of existing facilities in buffer areas may continue as required until LAWA can develop alternative facilities.”*

Status→ No action required at this time:

LAWA currently provides and maintains all buffer areas surrounding the airport. The Street Frontage and Landscape Development Plan provide integrated and coordinated landscape design guidelines for new development along the perimeter areas of LAX

consistent with the LAX Master Plan. Emphasis is placed on buffer areas between the airport and surrounding land uses to the north and south of the airport while incorporating all the necessary airport security guidelines and maximizing neighborhood compatibility. Additionally, the LAX Northside sub-area of the LAX Specific Plan is currently undergoing an update to which includes and update to the 1989 Northside Design Plan and Development Guidelines. These guidelines will also include additional landscape guidelines and buffer areas to the northern boundary of LAX.

19.0.B DA-2 Update and Integrate Design Plans and Guidelines

The LAX Master Plan MMRP states in part:

“Update and Integrate Design Plans and Guidelines. *The following plans and guidelines will be individually updated or integrated into a comprehensive set of design-related guidelines and plans; LAX Street Frontage and Landscape Development Plan (June 1994), LAX Air Cargo Facilities Development Guidelines (April 1998; updated August 2002), and LAX Northside Design Plan and Development Guidelines (1989), including conditions addressing heights, setbacks and landscaping.”*

Status→ In Progress:

The Street Frontage and Landscape Plan was updated in March 2005. The Plan includes requirements to be incorporated into Master Plan projects. In addition to updating the above referenced plans, LAWA has completed the Airport Planning, Design and Construction Guidelines (LSAG) that apply to all LAWA projects including LAX Master Plan-related projects.

With the California Green Building Code and the LA Green Building Ordinance now in effect, LAWA's program is: “All building projects with an Los Angeles Department of Building and Safety (LADBS) permit-valuation over \$200,000 shall achieve LAGBC Tier-1 conformance, to be certified by LADBS during Final Plan-Check (on the issued building permit) and validated by the LADBS inspector during Final Inspection (on the Certificate of Occupancy).”

These guidelines were incorporated into LAWA's Design and Construction Handbook and the program went into effect on November 7, 2012.

An update of the LAX Northside Plan and Development Guidelines has been initiated and is scheduled to be completed in 2014.

19.0.C DA-3 Undergrounding of Utility Lines

The LAX Master Plan MMRP states:

“Undergrounding of Utility Lines. *In conjunction with the extension of the Century Freeway and other roadway/right-of-way improvement projects, LAWA will pursue opportunities to place existing overhead utility lines underground wherever feasible and appropriate.”*

Status→ No action required at this time.

There were no roadway projects in 2012 that triggered this requirement.

19.0.D MM-DA-1 Construction Fencing

The LAX Master Plan MMRP states:

“Construction Fencing. *Construction fencing and pedestrian canopies shall be installed by LAWA to the degree feasible to ensure maximum screening of areas under construction along major public approach and perimeter roadways, including Sepulveda Boulevard, Century Boulevard, Westchester Parkway, Pershing Drive, and Imperial Highway west of Sepulveda Boulevard. Along Century Boulevard, Sepulveda Boulevard, and in other areas where the quality of public views are a high priority, provisions shall be made by LAWA for treatment of the fencing to reduce temporary visual impacts.”*

Status→ Ongoing:

This ongoing requirement is implemented on each capital construction project prior to issuance of work permits.

20.0 Hazardous Materials

20.0.A HM-1 Ensure Continued Implementation of Existing Remediation Efforts

The LAX Master Plan MMRP states in part:

“Ensure Continued Implementation of Existing Remediation Efforts. *Prior to initiating construction of a Master Plan component, LAWA will conduct a pre-construction evaluation to determine if the proposed construction will interfere with existing soil or groundwater remediation efforts.”*

Status→ In Progress:

Comprehensive soil investigation is required prior to commencement of any capital project design and construction activity at the airport. All required remediation efforts are carried out as needed.

20.0.B HM-2 Handling of Contaminated Materials Encountered During Construction

The LAX Master Plan MMRP states in part:

“Handling of Contaminated Materials Encountered During Construction. *Prior to the initiation of construction, LAWA will develop a program to coordinate all efforts associated with the handling of contaminated materials encountered during construction. The intent of this program will be to ensure that all contaminated soils and/or groundwater encountered during construction are handled in accordance with all applicable regulations.”*

Status→ Completed:

A Hazardous Materials Management Plan was developed and revised in December 2005, and all LAWA contractors are required to comply with its provisions as they apply to the different projects.

21.0 Water Use

21.0.A W-1 Maximize Use of Reclaimed Water

The LAX Master Plan MMRP states:

“Maximize Use of Reclaimed Water. *To the extent feasible, LAWA will maximize the use of reclaimed water in Master Plan-related facilities and landscaping. The intent of this commitment is to maximize the use of reclaimed water as an offset for potable water use and to minimize the potential for increased water use resulting from implementation of the LAX Master Plan. This commitment will also facilitate achievement of the City of Los Angeles' goal of increased beneficial use of its reclaimed water resources. This commitment will be implemented by various means, such as installation and use of reclaimed water distribution piping for landscape irrigation.”*

Status→ In Progress:

This is an ongoing requirement on capital construction projects where reclaimed water is available and is implemented prior to approval of building and landscaping plans for qualifying projects.

21.0.B W-2 Enhance Existing Water Conservation Program

The LAX Master Plan MMRP states in part:

“Enhance Existing Water Conservation Program. *“LAWA will enhance the existing Street Frontage and Landscape Plan for LAX to ensure the ongoing use of water conservation practices at LAX facilities. The intent of this program, to minimize the potential for increased water use due to implementation of the LAX Master Plan program, is also in accordance with regional efforts to ensure adequate water supplies for the future. Features of the enhanced conservation program will include identification of current water conservation practices and an assessment of their effectiveness; identification of alternate future conservation practices; continuation of the practice of retrofitting and installing new low-flow toilets and other water-efficient fixtures in all LAX buildings, as remodeling takes place or new construction occurs; use of Best Management Practices for maintenance; use of water efficient vegetation for landscaping, where possible; and continuation of the use of fixed automatic irrigation for landscaping.”*

Status→ Completed:

The Street Frontage and Landscape Plan was updated in March, 2005 and it includes policies pertaining to the use of reclaimed water in Master Plan-related landscaping and new policies enhancing the ongoing use of water conservation practices at LAX.

Currently, 35 percent of all landscaped areas at LAX are irrigated by reclaimed water. The number of landscaped areas served is limited to those areas accessible to the reclaimed water supply pipeline. Approximately 40.2 million gallons or 123 acre-feet of water is conserved each year through the use of reclaimed water. Additionally, much of the irrigation system at LAX is monitored and controlled through a centralized computer irrigation control center. This system further conserves valuable water resources.

LAWA's Sustainable Airport Planning, Design and Construction Guidelines (LSAG) include guidelines to reduce wastewater generation. As a result of these guidelines and prior efforts, all buildings and passenger terminals at LAX feature low-flow devices on all toilets and sinks, with telephone numbers prominently posted in all restrooms so that people can notify maintenance staff if they encounter leaky faucets or other water problems. LSAG specifications for new and replacement water closets and urinals specify that the maximum water closet flush is to be limited to 1.28 gallons per flush and the maximum urinal flush is to be limited to 0.125 gallons per flush. In addition, water used in on-airport car wash facilities is recycled.

LAWA is installing complete infrastructure to enable the Central Utility Plant (CUP) cooling towers and toilet flushing in the new Bradley West terminal to utilize reclaimed water once the connection to a suitable, treated recycled water system is available from the Los Angeles Department of Water and Power (LADWP). LAWA is also studying the potential of including the infrastructure to enable street sweeping and parking garage wash-downs services the use of reclaimed water.

22.0 Wastewater

22.0.A MM-WW-1 Provide Additional Wastewater Treatment Capacity to Accommodate Cumulative Flows

The LAX Master Plan MMRP states:

“Provide Additional Wastewater Treatment Capacity to Accommodate Cumulative Flows. Additional wastewater capacity within the City of Los Angeles should be provided by the expansion/upgrade of the City's wastewater treatment systems via a combination of improvements to address the projected wastewater [capacity] shortfall resulting from cumulative development. Such improvements could include increasing capacity at the Hyperion Treatment Plant (HTP), building new reclamation capacity upstream of HTP, conservation of potable water, and infiltration/inflow reduction. Implementation of this mitigation measure is the responsibility of the City of Los Angeles Department of Public Works, Bureau of Sanitation. Specific improvements will be identified in the City's IPWP and Wastewater Facilities Plan component of the City's Integrated Resources Plan. The cost for implementing this mitigation measure would be passed on to LAX and other wastewater generators through increased wastewater fees.”

Status→ No Action Required:

LAWA has no jurisdiction regarding this mitigation measure which will be implemented by the City of Los Angeles Department of Public Works, Bureau of Sanitation.

23.0 Fire Protection

23.0.A FP-1 LAFD Design Recommendations

The LAX Master Plan MMRP states in part:

“LAFD Design Recommendations. During the design phase prior to initiating construction of a Master Plan component, LAWA will work with LAFD to prepare plans

that contain the appropriate design features applicable to that component, such as those recommended by LAFD.”

Status→ Ongoing:

This is an ongoing requirement in all LAWA capital design projects.

23.0.B PS-1 Fire and Police Facility Relocation Plan

The LAX Master Plan MMRP states:

“Fire and Police Facility Relocation Plan. *Prior to any demolition, construction, or circulation changes that would affect LAFD Fire Stations 51, 80, and 95, or on-airport police facilities, a Relocation Plan will be developed by LAWA through a cooperative process involving LAFD, LAWAPD, the LAPD LAX Detail, and other airport staff. The performance standards for the plan will ensure maintenance of required response times, response distances, fire flows, and a transition to new facilities such that fire and law enforcement services at LAX will not be significantly degraded. The plan will also address future facility needs, including details regarding space requirement, siting, and design.”*

Status→ Ongoing:

This requirement was not triggered in 2012, as there were no demolition construction, or circulation changes affecting relevant fire and police facilities.

23.0.C PS-2 Fire and Police Facility Space and Siting Requirements

The LAX Master Plan MMRP states:

“Fire and Police Facility Space and Siting Requirements. *During the early design phase for implementation of the Master Plan elements affecting on-airport fire and police facilities, LAWA and/or its contractors will consult with LAFD, LAWAPD, LAPD, and other agencies as appropriate, to evaluate and refine as necessary, program requirements for fire and police facilities. This coordination will ensure that final plans adequately support future facility needs, including space requirements, siting and design.”*

Status→ Ongoing:

This requirement was not triggered for in 2012 for any on-airport fire and police facilities.

24.0 Law Enforcement

24.0.A LE-1 Routine Evaluation of Manpower and Equipment Needs

The LAX Master Plan MMRP states:

“Routine Evaluation of Manpower and Equipment Needs. *LAWA will ensure that LAWAPD and LAPD LAX Detail continue to routinely evaluate and provide additional officers, supporting administrative staff, and equipment, to keep pace with forecasted increases in activity and development at LAX in order to maintain a high level of law*

enforcement services. This will be achieved through LAWA notification to LAWAPD and LAPD regarding pending development and construction and through LAWA review of status reports on law enforcement services at LAX."

Status→ Ongoing:

LAWAPD is notified of all pending development and construction activities and they update local law enforcement agencies on a regular basis and as needed.

24.0.B LE-2 Plan Review

***"Plan Review.** During the design phase of terminal and cargo facilities and other major airport development, the LAPD, LAWAPD, and other law enforcement agencies will be consulted to review plans so that, where possible, environmental contributors to criminal activity, such as poorly-lit areas, and unsafe design, are reduced."*

Status→ Ongoing:

This is an ongoing requirement in all LAWA design contracts.

25.0 Project-Specific Mitigations

25.1.A MM-BC (SA)-1 Replacement of Habitat Units Associated with the SAIP (Disturbed/Bare Ground and Non-Native Grassland/Ruderal Areas)

The SAIP MMRP states in part:

***"Replacement of Habitat Units Associated with the South Airfield Improvement Project.** LAWA or its designee shall undertake mitigation for the loss of 17.2 habitat units resulting from implementation of the SAIP. These habitat units shall be replaced at a 1:1 ratio within the FAA-owned habitat preserve at the former Marine Corps Air Station El Toro (El Toro site), or other appropriate site."*

Status→ In Progress:

On August 6, 2007, the BOAC approved an MOU between LAWA and the Palos Verdes Peninsula Land Conservancy (PVPLC) for the development of approximately 21 acres of coastal sage/needle grass habitat (equivalent to 16.8 habitat units) in near fulfillment of LAWA's MM-BC (SA)-1 commitment (17.17 habitat units) and partial fulfillment of LAWA's MM-BC-8 commitment (45.43 habitat units). This mitigation plan was approved by both the USFWS and CDFG. The new location near the coast, unlike the previously proposed location at El Toro, is better suited as a replacement site. LAWA funded PVPLC in the amount of \$610,938 for this conservation work to be performed over a three year period. Each year, PVPLC will provide an annual progress report documenting the result of their effort.

PVPLC staff has monitored the progress of the project through vegetation transect sampling and bird surveys. Year 1 monitoring occurred in May 2010. The 2010 status report stated that coastal sage scrub container plants have become established and are growing, but that native plant coverage is sparse. The report stated that 2010 vegetation transects in the grassland restoration area show low germination.

The “Annual Status Report 2011-2012” (March 29, 2013), stated that in fall 2011, PVPLC staff implemented a grow and kill program in the grassland in preparation for drill seeding of 7.7 acres which took place in December 2011. They also weeded several times over the course of the year. Staff collected seed and propagated plants for additional fill-in planting in the coastal sage scrub area. Eight thousand container plants were installed in 2011, and 665 in 2012, increasing the native plant cover. Vegetation monitoring reports indicated plant establishment and growth in the coastal sage scrub, and low germination of the seeded grass in the grassland restoration area in 2011 and 2012. However, the 2011 and 2012 monitoring reports did show increases in percent cover of native plants in the restored grasslands while percent cover declined in the reference grasslands. The native cover in the two restored grasslands in 2011 was 14 and 19 percent, and in 2012 was 22 and 33 percent, compared to 34 percent (2011) and 38 percent (2012) in the reference grassland site. Species diversity also increased, with 21 species present in 2012 compared to 15 in 2009. Native grass numbers were low possibly due to the use of the transect survey method.

PVPLC plans to add more seed to the grassland restoration area in Fall 2013, and to switch to the California Native Plant Society vegetation assessment method rather than transects so that grasses at the peripheries can be accounted for. They also plan to continue weed control activities and reseed portions of the grassland in the coming year. PVPLC will continue to control weeds in the coastal sage scrub in 2013 to allow the installed plants to establish.

Mitigation for the additional 0.37 habitat units associated with SAIP is in the planning stages. Please see Section 13.0.D, MM-BC-8 Replacement of Habitat Units.

25.1.B MM-BC (CFTP)-1 Conservation of Floral Resources: Southern Tarplant

The Crossfield Taxiway Project MMRP states in part:

“Conservation of Floral Resources: Southern Tarplant. LAWA or its designee shall prepare a special status plant mitigation program. The loss of the southern tarplant individuals shall be mitigated through seed collection and seeding into a suitable mitigation site within undeveloped property owned by LAWA, determined based on habitat, soil type, moisture levels, and other relevant conditions.”

Status→ In Progress:

The southern tarplant mitigation program for the Crossfield Taxiway Project was combined with the mitigation program for the Bradley West Project. The initial mitigation program that commenced in 2010 was unsuccessful. Remedial mitigation commenced in fall of 2010 for MM-BC (CFTP)-1 and MM-BC (BWP)-1 at a new mitigation site in the southwest corner of the airport near the water retention basins along Pershing Street. The new site is located east of the previous site, and contains clayey soils and existing southern tarplant individuals. The mitigation plan was revised to reflect the new site.

Monitoring completed after Year 1 showed that the mitigation project had far exceeded the requirement of approximately 200 plants flowering and setting seed for the first year with a count of about 10,000 individual flowering plants. Year 2 was a drought year in which very few southern tarplant grew and flowered. The quantitative survey for Year 2 showed 688 individual flowering southern tarplants, exceeding the required success

criteria (Year 2 success criteria is 264 plants). Quarterly monitoring and annual reporting will continue as required. If tarplant abundance continues to exceed the performance requirements to a similar degree through Year 3 despite minimal maintenance, monitoring will be discontinued following the Year 3 quantitative monitoring visit. See Appendix E for the Southern Tarplant First Annual Monitoring Report.

25.1.C MM-ST (BWP)-1 Trip Reduction Measures

The Bradley West Project MMRP states:

“Trip Reduction Measures. LAWA will implement the following trip reduction measures:

(a) Continue to promote and expand the FlyAway services in accordance with LAX Master Plan Mitigation Measure MM-AQ-3. It is anticipated that the continued expansion of the FlyAway service will promote a shift in mode-share away from the private vehicle mode which would reduce traffic volume using the CTA roadway system.

(b) Continue to promote the consolidation of shuttle services (e.g., hotel/motel, off-airport parking, rental cars) or programs to reduce trips associated with these modes.”

Status→ Ongoing:

This is an ongoing requirement until construction is completed.

25.1.D MM-ST (BWP)-2 Improve the Intersection of Center Way and World Way South

The Bradley West Project MMRP states in part:

“Improve the Intersection of Center Way and World Way South. Widen World Way South approach on the east side of the roadway to provide an additional right turn lane. The resulting configuration would be a single left turn lane, one through-left turn lane, two through lanes, and two right turn lanes.”

Status→ No action required at this time:

This intersection improvement is in the design phase and is expected to go to construction in 2013.

25.1.E MM-ST (BWP)-3 Widen World Way Across from TBIT

The Bradley West Project MMRP states:

“Widen World Way Across from TBIT. Widen the arrivals-level outer roadway across from TBIT by changing the left-most lane that currently terminates at Center Way to a through/left lane and extending this lane to World Way South.”

Status→ In Progress:

This design of this project is 90 percent completed and will be constructed as part of the Central Utility Plant upgrade in 2013.

25.1.F MM-ST (BWP)-4 Modify the Intersection of Airport Boulevard and Manchester Avenue (Intersection #9)

The Bradley West Project MMRP states in part:

“Modify the Intersection of Airport Boulevard and Manchester Avenue (Intersection #9). The eastbound approach to the Airport Boulevard and Manchester Avenue intersection shall be restriped to provide one left-turn lane, two through lanes, and a through/right lane... Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 19.7 million annual passengers.”

Status→ No action required at this time:

In 2012, there were 17.1 million international annual passengers at LAX. No action is required until the number of international passengers at LAX reaches 19.7 million annual passengers.

25.1.G MM-ST (BWP)-5 Modify the Intersection of Arbor Vitae Street and Aviation Boulevard (Intersection of Imperial Highway and Sepulveda Boulevard (Intersection #71))

The Bradley West Project MMRP states in part:

“Modify the Intersection of Arbor Vitae Street and Aviation Boulevard (Intersection #10). The eastbound approach to the Arbor Vitae Street and Aviation Boulevard intersection shall be widened to provide one left-turn lane, two through lanes, and a right-turn lane...Los Angeles and City of Inglewood. Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 20.7 million annual passengers.”

Status→ No action required at this time:

In 2012, there were 17.1 million international annual passengers at LAX. No action is required until the number of international passengers at LAX reaches 20.7 million annual passengers.

25.1.H MM-ST (BWP)-6 Modify the Intersection of Imperial Highway and Sepulveda Boulevard (Intersection #71)

The Bradley West Project MMRP states in part:

“Modify the Intersection of Imperial Highway and Sepulveda Boulevard (Intersection #71). The northbound approach to the Imperial Highway and Sepulveda Boulevard intersection shall be restriped to provide one left-turn lane, three through lanes, and two right-turn lanes. Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 19.7 million annual passengers.”

Status→ No action required at this time:

In 2012, there were 17.1 million international annual passengers at LAX. This measure will be triggered when the number of international passengers at LAX reaches 19.7 million annual passengers.

25.1.I MM-ST (BWP)-7 Modify the Intersection of La Cienega Boulevard and I-405 Ramps N/O Century Boulevard (Intersection #96)

The Bradley West Project MMRP states in part:

“Modify the Intersection of La Cienega Boulevard and I-405 Ramps N/O Century Boulevard (Intersection #96). The southbound approach to the La Cienega Boulevard and I-405 Ramps N/O Century Boulevard intersection shall be widened to provide two left-turn lanes and two through lanes....

Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 20.7 million annual passengers.”

Status→ No action required at this time:

In 2012, there were 17.1 million international annual passengers at LAX. This measure will be triggered when the number of international passengers at LAX reaches 20.7 million annual passengers.

25.1.J MM-ST (BWP)-8 Modify the Intersection of La Tijera Boulevard and Sepulveda Boulevard (Intersection #101)

The Bradley West Project MMRP states in part:

“Modify the Intersection of La Tijera Boulevard and Sepulveda Boulevard (Intersection #101). The westbound approach to the La Tijera Boulevard and Sepulveda Boulevard intersection shall be restriped and the traffic signal modified to provide two left-turn lanes, one through lane, and a through/right lane. ... Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 18.7 million annual passengers.”

Status→ No action required at this time:

In 2012, there were 17.1 million international annual passengers at LAX. This measure will be triggered when the number of international passengers at LAX reaches 18.7 million annual passengers.

25.1.K MM-ST (BWP)-9 Modify the Intersection of Sepulveda Boulevard and 76th/77th Street (Intersection #136)

The Bradley West Project MMRP states in part:

“Modify the Intersection of Sepulveda Boulevard and 76th/77th Street (Intersection #136). The eastbound approach to the Sepulveda Boulevard and 76th/77th Street intersection shall be restriped to provide two left-turn lanes, a through/left-turn lane, and one right-turn lane.... Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 19.7 million annual passengers.”

Status→ No action required at this time:

In 2012, there were 17.1 million international annual passengers at LAX. This measure will be triggered when the number of international passengers at LAX reaches 19.7 million annual passengers.

25.1.L MM-ST (BWP)-10 Modify the Intersection of Imperial Highway and Main Street (Intersection #68)

The Bradley West Project MMRP states:

“Modify the Intersection of Imperial Highway and Main Street (Intersection #68). Modify the median island on the east leg of the intersection to provide a second left turn lane. The resulting westbound configuration would be comprised of a dual left-turn lane and two through lanes.”

Status→ Completed:

This project was completed on February 14, 2012.

25.1.M MM-ST (BWP)-11 Modify the Intersection of Imperial Highway and Pershing Drive (Intersection #69)

The Bradley West Project MMRP states:

“Modify the Intersection of Imperial Highway and Pershing Drive (Intersection #69). Widen the north side of the westbound approach of Imperial Highway to provide a second right-turn lane. The resulting westbound lane configuration would be comprised of one left turn lane, two through lanes, and two right turn lanes.”

Status→ Completed:

This project was completed on February 14, 2012.

25.1.N MM-ST (BWP)-12 Distribution of Contractor Employee Parking between the Northwest Construction Staging/Parking Area and the East Contractor Employee Parking Area or Southeast Construction Staging/Parking Area

The Bradley West Project MMRP states in part:

“Distribution of Contractor Employee Parking between the Northwest Construction Staging/Parking Area and the East Contractor Employee Parking Area or Southeast Construction Staging/Parking Area. General parking for Bradley West Project contractor employees within the Northwest Construction Staging/Parking Area and within the East Contractor Employee Parking Area or Southeast Construction Staging/Parking Area shall be distributed such that neither the northwest area (i.e., Northwest Construction Staging/Parking Area) or the east/southeast area (i.e., East Contractor Employee Parking Area or Southeast Construction Staging/Parking Area) is assigned parking for more than 601 vehicles.”

Status→ Ongoing:

This is an ongoing requirement until construction is completed.

25.1.O MM-HA (BWP)-1 Conformance with LAX Master Plan Archaeological Treatment Plan .

The Bradley West Project MMRP states in part:

“Conformance with LAX Master Plan Archaeological Treatment Plan. Prior to initiation of grading and construction activities, LAWA will retain an on-site Cultural Resource Monitor (CRM), as defined in the LAX Master Plan MMRP ATP, who will determine if the proposed project area is subject to archaeological monitoring.”

BWP Status→ Ongoing:

LAWA has retained an on-site CRM. This is an ongoing requirement until construction is completed.

25.1.P MM-PA (BWP)-1 Conformance with LAX Master Plan Paleontological Management Treatment Plan

The Bradley West Project MMRP states in part:

“Conformance with LAX Master Plan Paleontological Management Treatment Plan. Prior to the initiation of grading and construction activities, LAWA will retain a professional paleontologist, as defined in the Final LAX Master Plan MMRP PMTP, who will determine if the project site exhibits a high or low potential for subsurface resources.”

BWP Status→ Ongoing:

LAWA has retained a professional paleontologist for the Bradley West Project site. This is an ongoing requirement until construction is completed.

25.1.Q MM-PA (BWP)-2 Construction Personnel Briefing

The Bradley West Project MMRPs states:

“Construction Personnel Briefing. In accordance with the PMTP, construction personnel will be briefed by the consulting paleontologist in the identification of fossils or fossiliferous deposits and in the correct procedures for notifying the relevant individuals should such a discovery occur.”

BWP Status→ Ongoing:

This is an ongoing requirement until construction is completed.

25.1.R MM-BC (BWP)-1 Conservation of Floral Resources: Southern Tarplant

The Bradley West Project MMRP states in part:

“Conservation of Floral Resources: Southern Tarplant. LAWA or its designee shall prepare a special status plant mitigation program for the southern tarplant. The loss of the southern tarplant individuals shall be mitigated through seed collection and seeding into a suitable mitigation site within undeveloped property owned by LAWA or at a suitable off-site location, determined based on habitat, soil type, moisture levels, and other relevant conditions. One suitable off-site location is the Three Sisters Reserve located on the Palos Verdes Peninsula.”

Status→ In Progress:

The southern tarplant mitigation program for the Bradley West Project was combined with the mitigation program for the Crossfield Taxiway Project. See the Crossfield Taxiway project-specific discussion of Mitigation Measure MM-BC (CTFP)-1, Conservation of Floral Resources: Southern Tarplant, in Section 25.1.Y. As indicated in that discussion, the initial mitigation program that commenced in 2010 was unsuccessful, and was, therefore, followed by a remedial effort in 2011 in a different site on LAWA property. The remedial effort exceeded Year 1 and 2 success criteria, as documented in Appendix E.

25.1.S MM-BC (BWP)-2 Conservation of Floral Resources: Lewis' Evening Primrose

The Bradley West Project MMRP states in part:

“Conservation of Floral Resources: Lewis' Evening Primrose. Prior to any work activities (i.e., vegetation clearing, invasive species removal and/or spraying, and sediment removal) on the project site, including construction staging areas, pre-construction focused surveys shall be conducted during the period of March through May by a qualified biologist to determine the presence or absence of Lewis' evening primrose.”

Status→ Completed:

Prior to the implementation of construction staging, laydown, and parking areas associated with the Bradley West Project, LAWA conducted focused plant surveys in November 2008 for the Lewis' evening-primrose (*Camissonia lewisii*) and California spineflower (*Mucronea californica*). Neither species was observed during the focused surveys. No additional mitigation is required.

25.1.T MM-BC (BWP)-3 Conservation of Floral Resources: California Spineflower

The Bradley West Project MMRP states in part:

“Conservation of Floral Resources: California Spineflower. Prior to any work activities (i.e., vegetation clearing, invasive species removal and/or spraying, and sediment removal) on the project site, including construction staging areas, pre-construction focused surveys shall be conducted during the period of March through July by a qualified biologist to determine the presence or absence of California spineflower.”

Status→Completed:

See status of MM-BC (BWP)-2 above.

25.1.U MM-BC (BWP)-4 Conservation of Faunal Resources: Burrowing Owl

The Bradley West Project MMRP states in part:

“Conservation of Faunal Resources: Burrowing Owl. Prior to any work activities (i.e., vegetation clearing, invasive species removal and/or spraying, and sediment removal) within the Southeast Construction Staging/Parking Area (also known as the Continental City site), a survey for burrows by a qualified biologist will be conducted by walking through the suitable habitat within the site in accordance with CDFG-accepted

protocols.”

Status→ Completed:

Prior to the implementation of construction staging, laydown, and parking areas associated with the Bradley West Project, LAWA conducted focused surveys in June 2009 for the western burrowing owl (*Athene cunicularia hypugea*). The burrowing owl was not observed during the spring surveys. However, based on previous reports of burrowing owl within the western portion of LAX, it was recommended that monthly surveys be conducted between September and January, during development of the West Construction Staging Area. These surveys were undertaken by the LAX USDA wildlife biologist under contract to LAWA. No burrowing owls were observed during these monthly surveys. No additional mitigation is required.

25.1.V MM-BC (BWP)-5 Conservation of Faunal Resources: Loggerhead Shrike

The Bradley West Project MMRP states in part:

***“Conservation of Faunal Resources: Loggerhead Shrike.** If construction is scheduled to occur during the nesting season for the loggerhead shrike (March 15 to August 15), vegetation that will be impacted by the proposed project shall be removed outside the nesting season if feasible.”*

Status→ Completed:

Vegetation that was required to be removed in order to develop construction staging and parking areas associated with the Bradley West Project was removed in 2010 prior to the nesting season for the loggerhead shrike.

25.1.W MM-BC (BWP)-6 Conservation of Faunal Resources: San Diego Black-Tailed Jackrabbit

The Bradley West Project MMRP states in part:

***“Conservation of Faunal Resources: San Diego Black-Tailed Jackrabbit.** Prior to the commencement of clearing operations or other activities involving significant soil disturbance at locations identified in Table 4.7-2 with suitable habitat, a survey shall be conducted to locate black-tailed jackrabbits within 100 feet of the outer extent of projected soil disturbance activities.”*

Status→ Completed:

Prior to clearing operations associated with development of construction staging and parking areas for the Bradley West Project, surveys for the presence of black-tailed jackrabbits were conducted by the LAX USDA wildlife biologist from September 2009 through February 2010 under contract to LAWA. No black-tailed jackrabbits were observed. No additional mitigation is required.

25.1.X MM-BC (BWP)-7 Conservation of Floral Resources: Mature Tree Replacement

The Bradley West Project MMRP states in part:

“Conservation of Floral Resources: Mature Tree Replacement. LAWA or its designee shall compensate at a ratio of 2:1 for the loss of mature trees, which would occur as a result of implementation of Northwest Construction Staging/Parking Area.”

Status→ Completed:

In conjunction with the implementation of the Bradley West Project's Northwest Construction Staging Area, LAWA entered into letters of agreement with TreePeople, a non-profit environmental organization, and funds were provided to plant 66 native mature trees at Westchester Park and 64 trees at Morningside High School and the adjacent, student-run Empowerment Community Garden. The mature tree plantings were initiated in 2010 and were completed by June 2012. As of June 2012, 67 trees had been planted at Westchester Park as part of the TreePeople project, 66 of which are associated with Mitigation Measure MM-BC (BWP)-7. In addition, TreePeople led six tree care events in Westchester Park over the past year.

The Morningside High School/Empowerment Community Garden project was expanded to encompass a large-scale greening plan in the City of Inglewood, in conjunction with the non-profit Social Justice Learning Institute. In addition to the 41 trees that had been planted in 2011, TreePeople and community volunteers planted 32 trees at Vincent Park in Inglewood. As of June 2012, 73 trees had been planted as part of the TreePeople project in Inglewood, 64 of which are associated with Mitigation Measure MM-BC (BWP)-7. The trees were planted at the Empowerment Community Garden, Warren Lane Elementary School (a feeder school to Morningside High School), Queen Park and Vincent Park. The Orchard that was planted at the Empowerment Community Garden is growing and the trees are already bearing fruit. In addition, three Tree Care follow-up events were held in 2012.

25.1.Y MM-BC (BWP)-8 Conservation of Faunal Resources: Nesting Birds/Raptors

The Bradley West Project MMRP states in part:

“Conservation of Faunal Resources: Nesting Birds/Raptors. To comply with the Migratory Bird Treaty Act, for those areas of the project site that are not actively maintained and have a potential for nesting birds/raptors, if construction is scheduled to occur during the nesting season for birds/raptors (generally February 1 to June 30 for raptors and March 15 to August 15 for nesting birds), vegetation that will be impacted by the proposed project shall be removed outside the nesting season if feasible.”

Status→Completed:

Prior to the removal of trees associated with implementation of the North Construction Staging Area for the Bradley West Project, LAWA conducted surveys for nesting raptors in April 2010. No birds exhibiting breeding behavior or active nests were observed during the survey. Moreover, according to the LAX USDA wildlife biologist, the West Construction Staging Area does not contain suitable habitat for raptors to nest and no nesting raptors have been observed in this area in the past 8 years. As a result, surveys for nesting raptors were not conducted for this construction staging area prior to the removal of vegetation. No additional mitigation is required.

25.1.Z MM-ET (BWP)-1 Mitigation for Riverside Fairy Shrimp

The Bradley West Project MMRP states in part:

“Mitigation for Riverside Fairy Shrimp. If Riverside fairy shrimp are found to be located on-site, LAWA shall coordinate with FAA and USFWS to initiate consultation under the federal Endangered Species Act and prepare a Mitigation Plan in consultation with the USFWS.”

Status→Completed:

Prior to the implementation of the Southeast Construction Staging/Parking Area associated with the Bradley West Project, two wet season surveys and one focused dry season survey for Riverside fairy shrimp (*Streptocephalus woottoni*) were conducted in 2009 and 2010 in accordance with USFWS protocol guidelines. No federally-listed Riverside fairy shrimp were observed within the survey area.

26.0 Awards and Achievements

26.1 Alternative Fuels

LAWA's Alternative Fuels Program began in 1993. The program is based on LAWA's commitment to take a leadership role in clean air efforts through the use of vehicles and equipment powered by alternative fuels. Alternative fuels are defined as zero to low-emission fuel, other than traditional fossil fuels such as gasoline and diesel.

Alternative fuels currently in use by LAWA include:

- Liquefied natural gas (LNG)
- Compressed natural gas (CNG)
- Electricity
- Solar electricity
- Propane

Policy

In April 1999, by Resolution 20609, the Board of Airport Commissioners formally adopted the Los Angeles World Airports Alternative Fuels Vehicle Program. Recognizing the environmental benefits to be derived from alternative fuel vehicles, this policy states, in part, that “Los Angeles World Airports is committed to identifying and replacing existing fossil fuel vehicles and equipment with alternative fuel vehicles and equipment, including vehicles powered by compressed natural gas, liquefied natural gas, electricity, and other clean burning alternative fuels.”

Program Elements

- Replace existing fossil fuel powered vehicles and equipment with alternative fuel vehicles (AFVs) whenever possible during the scheduled vehicle and equipment replacement program.
- Investigate the cleanest fuels available for all applications.
- Develop and maintain fueling infrastructure with the goal of minimizing fuel cost and maximizing the use of AFVs in the fleet.

- Continue the research, training, and communication necessary to insure a successful program and serve as a resource for companies and other agencies interested in understanding the principles and benefits of using alternative fuels.

Current Fleet at LAX

- 193 CNG sedans
- 259 CNG buses and light/medium/heavy trucks
- 56 electric trucks, forklifts, man-lifts
- 22 LNG buses and heavy trucks
- 39 propane trucks, forklifts
- 28 Hybrid sedans, SUV's, trucks

Total: 597 units, or 57 percent of fleet

Accomplishments

- Over 57 percent of LAWA's fleet vehicles and equipment at LAX are AFVs. Fleet includes over 597 AFVs.
- 100 percent of the LAX courtesy shuttle fleet is powered by natural gas.
- Designed and built a state-of-the-art, high-technology LNG/LCNG fueling station at LAX.
- Acquired over \$5 million in grant funding to offset the differential cost of AFVs.
- Partnered with the Department of Water and Power to install 32 public access electric vehicle charging stations at LAX.
- The AFV program has been recognized as one of the most successful airport AFV programs in the nation and a world-class model for airports and other agencies. Awards and recognition include:
 - Clean Air Awards from the Coalition for Clean Air and South Coast Air Quality Management District
 - Certificate of Distinguished Achievement from the California Natural Gas Vehicle Coalition
 - Clean Cities Certificate for participation in the U.S. Department of Energy's Clean Cities Program
 - Recognized by the U.S. Department of Energy Clean Cities Program as a "success story for airports"

26.2 Rideshare

Each year, LAWA's Rideshare Program saves over 8 million vehicle miles, over 600,000 gallons of gasoline, over 8 million pounds of air pollutants, thousands of dollars in insurance and vehicle depreciation costs, and countless hours spent driving on Southern California's over-burdened streets and freeways. LAWA's multi-faceted Rideshare Program includes 68 vanpools, 80 carpool program participants, 300 free monthly transit passes, and numerous marketing and advocacy activities to recruit and retain program participants. Currently, about 25 percent of LAWA's employees are participating in the Rideshare Program, saving nearly 1,000 vehicle trips to LAWA facilities every day.

In 2012, LAWA won its 16th consecutive Rideshare Diamond Award which was the Corporate Blue Diamond Award for “Outstanding Corporate Rideshare Leadership” from L.A. County Metro, Orange County Transportation Authority (OCTA), and the Ventura County Transportation Commission (VCTC). This award was operating the best corporate Rideshare Program in the tri-county area and for serving as a role model for other companies. Previous winners of the Blue Diamond Award – considered by transportation authorities as the highest form of recognition for a rideshare program in Southern California – include the Walt Disney Company, University of California, Los Angeles (UCLA), Jet Propulsion Lab (JPL), The Aerospace Corporation, and California Polytechnic Institute (CalTech).

In 2012, LAWA added three new vanpool routes and also met the required Average Vehicle Ridership (AVR) Target under South Coast Air Quality Management District (SCAQMD) Rule 2202 for the 8th consecutive year, with an average of 1.61 passengers per vehicle arriving to the worksite.

This year LAWA Rideshare was also chosen to participate in an Airport Cooperative Research Program (ACRP) study through the National Academies of Sciences (NAS) Transportation Research Board (TRB). This study, which is compiled information about Airport Employee Commute Programs nationwide, highlighted LAWA's Rideshare Program as one of the top four most successful airport employee transportation programs in the country.

27.0 Summary

To date, all applicable mitigation measures adopted for the LAX Master Plan MMRP are in the process of being implemented or have been completed. LAWA complied with some mitigation measures by developing program plans, and satisfied others incorporating them into LAX Master Plan project designs and/or construction specifications. The majority of the “Stand-Alone” mitigation plans has been completed or are in-progress. All applicable mitigation measures triggered by the Taxiway S Project and BWP are being implemented. LAWA will continue to monitor and report annually on the progress of the LAX Master Plan MMRP as implementation of the program progresses.

APPENDIX A

LAX MASTER PLAN MMRP AS ADOPTED SEPTEMBER 2004

REFERENCE

LAWA Website:

http://www.ourlax.org/pub_MMRP.aspx

for a copy of the document

APPENDIX B

LAX MASTER PLAN PROJECT-SPECIFIC MEASURES (SAIP-SPECIFIC MEASURES, CFTP-SPECIFIC MEASURES, AND BWP-SPECIFIC MEASURES)

**SOUTH AIRFIELD IMPROVEMENT PROJECT
MITIGATION MONITORING & REPORTING PROGRAM
FOR NEW MITIGATION MEASURES¹**

Master Plan Commitments/ Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
<i>Biotic Communities</i>					
MM-BC (SA)-1 Monitoring Agency: LAWA	Replacement of Habitat Units Associated with the South Airfield Improvement Project. LAWA or its designee shall undertake mitigation for the loss of 17.2 habitat units resulting from implementation of the SAIP. These habitat units shall be replaced at a 1:1 ratio within the FAA owned habitat preserve at the former Marine Corps Air Station El Toro (El Toro site), or other appropriate site.	Impacts on Disturbed/Bare Ground and Non-Native Grassland/Ruderal areas	Preparation of Replacement Plan prior to or concurrent with commissioning of relocated Runway 7R-25L	As per Replacement Plan for Habitat Units	Preparation of Replacement Plan for Habitat Units; Periodic Monitoring Report
MM-BC (SA)-2 Monitoring Agency: LAWA	Conservation of Faunal Resources Associated with the South Airfield Improvement Project. Directed surveys for the San Diego black-tailed jackrabbit and the loggerhead shrike shall be undertaken by a qualified wildlife biologist at least 14 days before construction activities. LAWA or its designee shall relocate any observed San Diego black-tailed jackrabbit individuals currently inhabiting the SAIP project areas. Relocation efforts shall be coordinated with CDFG.	Impacts on San Diego black-tailed jackrabbit habitat and loggerhead shrike habitat	Initiated and completed prior to or concurrent with commissioning of relocated Runway 7R-25L	As per Replacement Plan for Habitat Units	Preparation of Replacement Plan for Habitat Units; Periodic Monitoring Report

¹ The South Airfield Improvement Project is subject to many of the LAX Master Plan Commitments and Mitigation Measures adopted in conjunction with the LAX Master Plan Final EIR. See User Guide located at front of the MMRP.

**CROSSFIELD TAXIWAY PROJECT
MITIGATION MONITORING & REPORTING PROGRAM
FOR NEW MITIGATION MEASURES¹**

CFTP-Specific Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Historical/Architectural and Archaeological/Cultural Resources					
MM-HA (CFTP)-1 Monitoring Agency: LAWA	Conformance with LAX Master Plan Archaeological Treatment Plan: Prior to initiation of grading and construction activities, LAWA will retain an on-site Cultural Resource Monitor (CRM), as defined in the LAX Master Plan MMRP ATP, who will determine if the proposed project area is subject to archaeological monitoring. As defined in the ATP, areas are not subject to archaeological monitoring if they contain redeposited fill or have previously been disturbed. The CRM will compare the known depth of redeposited fill or disturbance to the depth of planned grading activities, based on a review of construction plans. If the CRM determines that the proposed project site is subject to archaeological monitoring, a qualified archaeologist (an archaeologist who satisfies the Secretary of the Interior's Professional Qualifications Standards [36 CFR 61]) shall be retained by LAWA to inspect excavation and grading activities that occur within native material. The extent and frequency of inspection shall be defined based on consultation with the archaeologist. Following initial inspection of excavation materials, the archaeologist may adjust inspection protocols as work proceeds.	Potential to unexpectedly encounter and impact subsurface archaeological resources, including Native American remains, during grading and excavation associated with construction of the CFTP	Prior to initiation of grading and/or excavation activities associated with the construction of the CFTP	As per the Cultural Resource Monitor determining proposed project area being subject to archaeological monitoring, the extent and frequency of inspection shall be defined based on consultation with the archeologist	Conformance with LAX Master Plan Archaeological Treatment Plan

¹ The Crossfield Taxiway Project is subject to many of the LAX Master Plan Commitments and Mitigation Measures adoption in conjunction with the LAX Master Plan Final EIR. See User Guide at front of MMRP.

**CROSSFIELD TAXIWAY PROJECT
MITIGATION MONITORING & REPORTING PROGRAM
FOR NEW MITIGATION MEASURES¹**

CFTP-Specific Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Paleontological Resources					
MM-PA (CFTP)-1 Monitoring Agency: LAWA	Conformance with LAX Master Plan Paleontological Management Treatment Plan: Prior to the initiation of grading and construction activities, LAWA will retain a professional paleontologist, as defined in the Final LAX Master Plan MMRP PMTP, who will determine if the project site exhibits a high or low potential for subsurface resources. If the project site is determined to exhibit a high potential for subsurface resources, paleontological monitoring will be conducted in accordance with the procedures stipulated in the PMTP. If the project site is determined to exhibit a low potential for subsurface deposits, excavation need not be monitored as per the PMTP. In the event that paleontological resources are discovered, the procedures outlined in the PMTP for the identification of resources will be followed.	Potential to unexpectedly encounter and impact subsurface paleontological resources during grading and excavation associated with construction of the CFTP	Prior to initiation of grading and/or excavation activities associated with the construction of the CFTP	As per the professional paleontologist determining proposed project area being subject to paleontological monitoring, the extent and frequency of inspection shall be defined based on procedures outlined in the PMTP	Conformance with LAX Master Plan Paleontological Management Treatment Plan
MM-PA (CFTP)-2 Monitoring Agency: LAWA	Construction Personnel Briefing: In accordance with the PMTP, construction personnel will be briefed by the consulting paleontologist in the identification of fossils or fossiliferous deposits and in the correct procedures for notifying the relevant individuals should such a discovery occur.	Potential to unexpectedly encounter and impact subsurface paleontological resources during grading and excavation associated with construction of the CFTP	Prior to initiation of grading and/or excavation activities associated with the construction of the CFTP	Once	Completion of briefing of construction personnel on identification of fossils or fossiliferous deposits and notification procedures in accordance with the PMTP

**CROSSFIELD TAXIWAY PROJECT
MITIGATION MONITORING & REPORTING PROGRAM
FOR NEW MITIGATION MEASURES¹**

CFTP-Specific Mitigation Measures		Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Biotic Communities					
MM-BC (CFTP)-1 Monitoring Agency: LAWA	<p>Conservation of Floral Resources: Southern Tarplant. LAWA or its designee shall prepare a special status plant mitigation program. The loss of the southern tarplant individuals shall be mitigated through seed collection and seeding into a suitable mitigation site within undeveloped property owned by LAWA, determined based on habitat, soil type, moisture levels, and other relevant conditions.</p> <p>A qualified Seed Collector shall monitor the tarplant phenology to determine the appropriate timing for seed collection. Tarplant seed shall be collected from all tarplants within the impact area, which shall be delineated in the field with lath and flagging by a Qualified Biologist. The Biologist shall ensure that seed shall only be collected from plants that will be impacted by the CFTP. Upon completion of seed collection, the seed collector shall clean the seeds to prepare for the seeding effort.</p> <p>A mitigation plan shall be developed at a level of detail necessary for successful program implementation by a Landscape Contractor. The detailed program shall contain the following items:</p> <ul style="list-style-type: none"> ◆ <i>Responsibilities and qualifications of the personnel to implement and supervise the plan.</i> The plan shall specify the responsibilities and qualifications of the personnel who will supervise and implement the mitigation plan, including LAWA, Technical Specialists, and Maintenance Personnel. 	Impacts on the loss of the southern tarplant individuals	Preparation of a special status plant mitigation program prior to relocation/ construction of the existing American Airlines employee parking lot	As per special status plant mitigation program for southern tarplant resources; Regular site visits (i.e. monthly, quarterly) for no more than 5 years or until germination, flowering and seed set of at least 29 individuals (100 percent of the original population size)	Preparation of special status plant mitigation program; Periodic Monitoring Report

**CROSSFIELD TAXIWAY PROJECT
MITIGATION MONITORING & REPORTING PROGRAM
FOR NEW MITIGATION MEASURES¹**

CFTP-Specific Mitigation Measures	Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
<ul style="list-style-type: none"> ◆ <i>Site selection.</i> The site for the mitigation shall be determined in coordination with LAWA, and shall be located in a suitable area within the boundaries of LAX. The appropriate site shall consist of approximately 0.14 acre and shall have suitable hydrology, soils, and other factors necessary for the establishment of the southern tarplant. Such suitable sites exist within the boundaries of LAX, including but not limited to areas within LAX Northside and in the southwestern portion of the airport, west of the south airfield complex. ◆ <i>Site preparation and planting implementation.</i> The plan shall include specifications for seed collection and storage and guidelines for on-site preparation. The guidelines shall contain specifications for (1) existing native species protection; (2) trash and weed removal; (3) soil treatments (e.g., imprinting and decompacting); (4) temporary irrigation installation as needed; (5) erosion control measures (e.g., rice or willow wattles); and (6) seed application. ◆ <i>Schedule.</i> A schedule shall be developed, which includes planting, to occur in late fall and early winter (between October and January 30). ◆ <i>Maintenance plan/guidelines.</i> A three to five year maintenance plan shall include (1) weed control; (2) herbivory control; (3) trash removal; (4) irrigation system maintenance; (5) maintenance training; and (6) replacement seeding, if necessary. Ten percent of the original seed collected shall be stored in the event it is needed for replacement seeding. 				

**CROSSFIELD TAXIWAY PROJECT
MITIGATION MONITORING & REPORTING PROGRAM
FOR NEW MITIGATION MEASURES¹**

CFTP-Specific Mitigation Measures	Potential Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
<p>♦ <i>Monitoring plan.</i> The monitoring plan shall include the following success criteria:</p> <ul style="list-style-type: none"> - Germination, flowering and seed set of at least 17 individuals (60 percent of the original population size) in year one; - Germination, flowering and seed set of at least 23 individuals (80 percent of the original population size) by year three; - Germination, flowering and seed set of at least 29 individuals (100 percent of the original population size) by year five. <p>If these success criteria are not met, or are unlikely to be met within the required time periods, remedial measures will be required.</p> <p>This plan may include qualitative and quantitative monitoring. Qualitative monitoring includes site visits at regular intervals (i.e., monthly, quarterly, etc.) to determine the overall general performance of the site and maintenance needs. Quantitative monitoring is conducted on an annual basis and includes data collection specific to the performance standards established in the monitoring plan.</p> <p><i>Long-term preservation.</i> Long-term preservation of the site shall also be outlined in the conceptual mitigation plan to ensure that future development does not impact the mitigation site.</p>				

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Surface Transportation					
MM-ST (BWP)-1 Monitoring Agency: LAWA	<p>Trip Reduction Measures. LAWA will implement the following trip reduction measures:</p> <p>(a) Continue to promote and expand the FlyAway services in accordance with LAX Master Plan Mitigation Measure MM-AQ-3. It is anticipated that the continued expansion of the FlyAway service will promote a shift in mode-share away from the private vehicle mode which would reduce traffic volume using the CTA roadway system.</p> <p>(b) Continue to promote the consolidation of shuttle services (e.g., hotel/motel, off-airport parking, rental cars) or programs to reduce trips associated with these modes.</p>	Traffic congestion and delays along on-airport roadways during airport operations	Ongoing programs	Annually	Status updates/confirmation in annual MMRP progress report
MM-ST (BWP)-2 Monitoring Agency: LAWA	<p>Improve the Intersection of Center Way and World Way South. Widen World Way South approach on the east side of the roadway to provide an additional right turn lane. The resulting configuration would be a single left turn lane, one through-left turn lane, two through lanes, and two right turn lanes.</p> <p>During the Future (2013) Without Project overall airport peak hour the intersection of Center Way and World Way South operates at a V/C of 0.978 which is LOS E. With an intersection operating at a LOS E condition, the volume to capacity ratio can be increased by 0.01 without generating an impact. This</p>	Traffic congestion and delays at the intersection of Center Way and World Way South during airport operations	When traffic levels reach the conditions specified in the measure	(1) Prior to implementation of intersection improvements, this measure will be monitored annually to determine whether CTA average daily traffic volumes in the peak month (August) have	Confirmation that the subject intersection improvement has been completed

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures	Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
<p>equates to an increase in the intersection's V/C ratio from 0.978 to 0.988, or approximately 1.1 percent (i.e., 0.988/0.978) in the critical movement traffic volume without triggering an impact. LAWA will monitor traffic conditions at this intersection to determine when an estimated impact has been "triggered" in accordance with the LOS thresholds described above. Specifically, LAWA will monitor future CTA average daily traffic volumes in August to determine when CTA average daily traffic volumes have increased by more than 1.1 percent relative to the Future (2013) Without Project average daily traffic volumes. In addition, LAWA will record turning movement volumes at this intersection annually during the airport's peak month (August). When the August average daily CTA volumes have increased by 1.1 percent as compared to the Future (2013) Without Project estimated volume, LAWA will complete a V/C analysis using the same intersection methodology described in the Bradley West Draft EIR (Section 4.1.3.7) to determine if an impact has occurred. The mitigation measure would be constructed once both (a) the CTA average daily traffic volumes are 1.1 percent greater than the Future (2013) Without Project and (b) the V/C for the intersection meets or exceeds 0.988. The intersection analysis would be subject to approval by LADOT regarding timing of the mitigation measure.</p>			<p>increased by more than 1.1 percent relative to the Future (2013) Without Project average daily traffic volumes, based on annual passenger activity reports. (2) Following implementation of intersection improvements, the monitoring frequency will be reduced to once, upon completion of subject intersection improvement</p>	

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
MM-ST (BWP)-3 Monitoring Agency: LAWA	Widen World Way Across from TBIT. Widen the arrivals-level outer roadway across from TBIT by changing the left-most lane that currently terminates at Center Way to a through/left lane and extending this lane to World Way South.	Traffic congestion and delays along on-airport roadways during airport operations	The subject widening shall occur in conjunction with the project-related construction at TBIT, which is anticipated to be completed in 2013	Once, upon completion of subject roadway widening	Confirmation that the subject roadway widening has been completed
MM-ST (BWP)-4 Monitoring Agency: LAWA	Modify the Intersection of Airport Boulevard and Manchester Avenue (Intersection #9). The eastbound approach to the Airport Boulevard and Manchester Avenue intersection shall be restriped to provide one left-turn lane, two through lanes, and a through/right lane. Three parking spaces on the south side of Manchester Avenue west of Belford Avenue and two parking spaces on the south side of Manchester Avenue east of Belford Avenue shall be restricted during the PM peak period. Alternatively, the westbound approach to the Airport Boulevard and Manchester Avenue intersection shall be restriped and the traffic signal modified to provide two left-turn lanes, two through lanes, and a right-turn lane. This mitigation measure will be implemented to the standards and satisfaction of the City of Los Angeles. Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 19.7 million annual passengers.	Traffic congestion and delays at the intersection of Airport Boulevard and Manchester Avenue during airport operations	If/when international passenger activity levels at TBIT increase to 19.7 million annual passengers	(1) Prior to implementation of the intersection improvements, this measure will be monitored annually to determine whether TBIT passenger activity levels have reached 19.7 MAP, based on annual passenger activity reports. (2) Following implementation of the intersection improvement, the monitoring frequency will be reduced to	Confirmation that the subject intersection improvement has been completed

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
				occurring just once, upon completion of the intersection improvement	
MM-ST (BWP)-5 Monitoring Agency: LAWA	Modify the Intersection of Arbor Vitae Street and Aviation Boulevard (Intersection #10). The eastbound approach to the Arbor Vitae Street and Aviation Boulevard intersection shall be widened to provide one left-turn lane, two through lanes, and a right-turn lane. This mitigation measure will be implemented to the standards and satisfaction of the City of Los Angeles and City of Inglewood. Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 20.7 million annual passengers.	Traffic congestion and delays at the intersection of Arbor Vitae Street and Aviation Boulevard during airport operations	If/when international passenger activity levels at TBIT increase to 20.7 million annual passengers	(1) Prior to implementation of the intersection improvement, this measure will be monitored annually to determine whether TBIT passenger activity levels have reached 20.7 MAP, based on annual passenger activity reports. (2) Following implementation of the intersection improvement, the monitoring frequency will be reduced to occurring just once, upon completion of the intersection	Confirmation that the subject intersection improvement has been completed

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
				improvement	
MM-ST (BWP)-6 Monitoring Agency: LAWA	Modify the Intersection of Imperial Highway and Sepulveda Boulevard (Intersection #71). The northbound approach to the Imperial Highway and Sepulveda Boulevard intersection shall be restriped to provide one left-turn lane, three through lanes, and two right-turn lanes. While restriping this intersection as described above would mitigate this impact, an alternative would be to widen the east side of Sepulveda Boulevard south of Imperial Highway to provide one left-turn lane, three through lanes, and two right-turn lanes on the northbound approach. However, provided the right-of-way is available, the provision of additional travel lane area would require disruption of traffic flows, generation of construction-related air pollutant emissions and noise impacts, and therefore the restriping is recommended rather than the widening. This mitigation measure will be implemented to the standards and satisfaction of the City of Los Angeles, City of El Segundo, and Caltrans. Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 19.7 million annual passengers.	Traffic congestion and delays at the intersection of Imperial Highway and Sepulveda Boulevard during airport operations	If/when international passenger activity levels at TBIT increase to 19.7 million annual passengers	(1) Prior to implementation of the intersection improvement, this measure will be monitored annually to determine whether TBIT passenger activity levels have reached 19.7 MAP, based on annual passenger activity reports. (2) Following implementation of the intersection improvement, the monitoring frequency will be reduced to occurring just once, upon completion of the intersection improvement	Confirmation that the subject intersection improvement has been completed

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
MM-ST (BWP)-7 Monitoring Agency: LAWA	Modify the Intersection of La Cienega Boulevard and I-405 Ramps N/O Century Boulevard (Intersection #96). The southbound approach to the La Cienega Boulevard and I-405 Ramps N/O Century Boulevard intersection shall be widened to provide two left-turn lanes and two through lanes. This mitigation measure will be implemented to the standards and satisfaction of the City of Los Angeles, City of Inglewood, and Caltrans. Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 20.7 million annual passengers.	Traffic congestion and delays at the intersection of La Cienega Boulevard and I-405 Ramps N/O Century Boulevard during airport operations	If/when international passenger activity levels at TBIT increase to 20.7 million annual passengers	(1) Prior to implementation of the intersection improvement, this measure will be monitored annually to determine whether TBIT passenger activity levels have reached 20.7 MAP, based on annual passenger activity reports. (2) Following implementation of the intersection improvement, the monitoring frequency will be reduced to occurring just once, upon completion of the intersection improvement	Confirmation that the subject intersection improvement has been completed
MM-ST (BWP)-8 Monitoring Agency:	Modify the Intersection of La Tijera Boulevard and Sepulveda Boulevard (Intersection #101). The westbound approach to the La Tijera Boulevard and Sepulveda Boulevard intersection shall be restriped	Traffic congestion and delays at the intersection of La Tijera Boulevard and	If/when international passenger activity levels at TBIT	(1) Prior to implementation of the intersection improvement, this	Confirmation that the subject intersection improvement has been completed

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
LAWA	and the traffic signal modified to provide two left-turn lanes, one through lane, and a through/right lane. This mitigation measure will be implemented to the standards and satisfaction of the City of Los Angeles. Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 18.7 million annual passengers.	Sepulveda Boulevard during airport operations	increase to 18.7 million annual passengers	measure will be monitored annually to determine whether TBIT passenger activity levels have reached 18.7 MAP, based on annual passenger activity reports. (2) Following implementation of the intersection improvement, the monitoring frequency will be reduced to occurring just once, upon completion of the intersection improvement	

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
MM-ST (BWP)-9 Monitoring Agency: LAWA	Modify the Intersection of Sepulveda Boulevard and 76th/77th Street (Intersection #136). The eastbound approach to the Sepulveda Boulevard and 76th/77th Street intersection shall be restriped to provide two left-turn lanes, a through/left-turn lane, and one right-turn lane. This mitigation measure will be implemented to the standards and satisfaction of the City of Los Angeles. Implementation of this measure shall occur if/when international passenger activity levels at TBIT increase to 19.7 million annual passengers.	Traffic congestion and delays at the intersection of Sepulveda Boulevard and 76th/77th Street during airport operations	If/when international passenger activity levels at TBIT increase to 19.7 million annual passengers	(1) Prior to implementation of the intersection improvement, this measure will be monitored annually to determine whether TBIT passenger activity levels have reached 19.7 MAP, based on annual passenger activity reports. (2) Following implementation of the intersection improvement, the monitoring frequency will be reduced to occurring just once, upon completion of the intersection improvement	Confirmation that the subject intersection improvement has been completed
MM-ST (BWP)-10 Monitoring Agency:	Modify the Intersection of Imperial Highway and Main Street (Intersection #68). Modify the median island on the east leg of the intersection to provide a second left turn lane. The resulting westbound	Traffic congestion and delays at the intersection of Imperial Highway and Main	The preparation of intersection improvement plans, pursuit of	Once, upon completion of the subject intersection	Confirmation that the subject intersection improvement has been completed

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
LAWA	configuration would be comprised of a dual left-turn lane and two through lanes.	Street due to peak construction traffic	necessary approvals, and scheduling for receipt of contractor estimates/bids shall commence immediately upon approval of the Bradley West Project	improvement	
MM-ST (BWP)-11 Monitoring Agency: LAWA	Modify the Intersection of Imperial Highway and Pershing Drive (Inter-section #69). Widen the north side of the westbound approach of Imperial Highway to provide a second right-turn lane. The resulting westbound lane configuration would be comprised of one left turn lane, two through lanes, and two right turn lanes.	Traffic congestion and delays at the intersection of Imperial Highway and Pershing Drive due to peak construction traffic	The preparation of intersection improvement plans, pursuit of necessary approvals, and scheduling for receipt of contractor estimates/bids shall commence immediately upon approval of the Bradley West Project	Once, upon completion of the subject intersection improvement	Confirmation that the subject intersection improvement has been completed
MM-ST (BWP)-12 Monitoring Agency:	Distribution of Contractor Employee Parking between the Northwest Construction Staging/Parking Area and the East Contractor Employee Parking Area or Southeast Construction Staging/Parking Area. General parking for Bradley	Traffic congestion and delays at off-airport intersections during project construction	Prior to start of construction of the Bradley West Project	Once, prior to finalization of construction bid documents for activities that	Confirmation that construction bid documents for activities involving the subject parking areas

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
LAWA	West Project contractor employees within the Northwest Construction Staging/Parking Area and within the East Contractor Employee Parking Area or Southeast Construction Staging/Parking Area shall be distributed such that neither the northwest area (i.e., Northwest Construction Staging/Parking Area) or the east/southeast area (i.e., East Contractor Employee Parking Area or Southeast Construction Staging/Parking Area) is assigned parking for more than 601 vehicles. Should the need for contractor employees' daily general parking exceed 601 vehicles in either of these areas (northwest area or east/southeast area), the additional increment of daily parking demand shall be assigned to the other area.			would use the subject contractor employee parking areas	include the parking limitations specified in the measure

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Historical/Architectural and Archaeological/Cultural Resources					
MM-HA (BWP)-1 Monitoring Agency: LAWA	<p>Conformance with LAX Master Plan Archaeological Treatment Plan. Prior to initiation of grading and construction activities, LAWA will retain an on-site Cultural Resource Monitor (CRM), as defined in the LAX Master Plan MMRP ATP, who will determine if the proposed project area is subject to archaeological monitoring. As defined in the ATP, areas are not subject to archaeological monitoring if they contain redeposited fill or have previously been disturbed. The CRM will compare the known depth of redeposited fill or disturbance to the depth of planned grading activities, based on a review of construction plans. If the CRM determines that the proposed project site is subject to archaeological monitoring, a qualified archaeologist (an archaeologist who satisfies the Secretary of the Interior's Professional Qualifications Standards [36 CFR 61]) shall be retained by LAWA to inspect excavation and grading activities that occur within native material. The extent and frequency of inspection shall be defined based on consultation with the archaeologist. Following initial inspection of excavation materials, the archaeologist may adjust inspection protocols as work proceeds.</p>	Potential to unexpectedly encounter and impact subsurface archaeological resources, including Native American remains, during grading and excavation associated with construction of the Bradley West Project	Prior to initiation of grading and/or excavation activities associated with the construction of the Bradley West Project	The extent and frequency of inspection shall be defined based on consultation with the qualified archaeologist if the Cultural Resource Monitor determines that the project area is subject to archaeological monitoring	Conformance with LAX Master Plan Archaeological Treatment Plan

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Paleontological Resources					
MM-PA (BWP)-1 Monitoring Agency: LAWA	Conformance with LAX Master Plan Paleontological Management Treatment Plan. Prior to the initiation of grading and construction activities, LAWA will retain a professional paleontologist, as defined in the Final LAX Master Plan MMRP PMTP, who will determine if the project site exhibits a high or low potential for subsurface resources. If the project site is determined to exhibit a high potential for subsurface resources, paleontological monitoring will be conducted in accordance with the procedures stipulated in the PMTP. If the project site is determined to exhibit a low potential for subsurface deposits, excavation need not be monitored as per the PMTP. In the event that paleontological resources are discovered, the procedures outlined in the PMTP for the identification of resources will be followed.	Potential to unexpectedly encounter and impact subsurface paleontological resources during grading and excavation associated with construction of the Bradley West Project	Prior to initiation of grading and/or excavation activities associated with the construction of the Bradley West Project	The extent and frequency of inspection shall be defined based on procedures outlined in the PMTP if the professional paleontologist determines that the project area is subject to paleontological monitoring	Conformance with LAX Master Plan Paleontological Management Treatment Plan
MM-PA (BWP)-2 Monitoring Agency: LAWA	Construction Personnel Briefing. In accordance with the PMTP, construction personnel will be briefed by the consulting paleontologist in the identification of fossils or fossiliferous deposits and in the correct procedures for notifying the relevant individuals should such a discovery occur.	Potential to unexpectedly encounter and impact subsurface paleontological resources during grading and excavation associated with construction of the Bradley West Project	Prior to initiation of grading and/or excavation activities associated with the construction of the Bradley West Project	Once, prior to the initiation of grading and/or excavation activities	Completion of briefing of construction personnel on identification of fossils or fossiliferous deposits and notification procedures in accordance with the PMTP

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
Biotic Communities					
MM-BC (BWP)-1 Monitoring Agency: LAWA	<p>Conservation of Floral Resources: Southern Tarplant. LAWA or its designee shall prepare a special status plant mitigation program for the southern tarplant. The loss of the southern tarplant individuals shall be mitigated through seed collection and seeding into a suitable mitigation site within undeveloped property owned by LAWA or at a suitable off-site location, determined based on habitat, soil type, moisture levels, and other relevant conditions. One suitable off-site location is the Three Sisters Reserve located on the Palos Verdes Peninsula.</p> <p>A qualified Seed Collector shall monitor the tarplant phenology to determine the appropriate timing for seed collection. Tarplant seed shall be collected from all tarplants within the impact area, which shall be delineated in the field with lath and flagging by a qualified biologist. The biologist shall ensure that seed shall only be collected from plants that will be impacted by the Bradley West Project. Upon completion of seed collection, the seed collector shall clean the seeds to prepare for the seeding effort.</p> <p>A mitigation plan shall be developed at a level of detail necessary for successful program implementation by a landscape contractor. The detailed program shall contain the following items:</p> <ul style="list-style-type: none"> ◆ <i>Responsibilities and qualifications of the personnel to implement and supervise the plan.</i> The plan shall specify the responsibilities and 	Loss of southern tarplant individuals	Preparation of a special status plant mitigation program upon project approval and prior to initiation of construction of the Bradley West Project	As per special status plant mitigation program for southern tarplant ; Regular site visits (i.e., monthly, quarterly) for no more than 5 years or until germination, flowering and seed set of at least 300 individuals (100 percent of the original population size)	Preparation of special status plant mitigation program; periodic monitoring report, at least annually

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures	Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
<p>qualifications of the personnel who will supervise and implement the mitigation plan, including LAWA, Technical Specialists, and Maintenance Personnel.</p> <ul style="list-style-type: none"> ◆ <i>Site selection.</i> The site for the mitigation shall be determined in coordination with LAWA, and shall be located in a suitable area within the boundaries of LAX or at a suitable off-site location. The appropriate site shall consist of approximately 0.76 acre and shall have suitable hydrology, soils, and other factors necessary for the establishment of the southern tarplant. Such suitable sites exist within the boundaries of LAX, including but not limited to areas within LAX Northside and in the southwestern portion of the airport, west of the south airfield complex. If a site at LAX is selected, site selection will occur in consultation with LAWA's USDA Wildlife Hazard Biologist and will be consistent with FAA Advisory Circular No. 150/5200-33 "Hazardous Wildlife Attractants on or Near Airports" and LAWA's "LAX Wildlife Hazard Mitigation Plan" to avoid increasing wildlife hazards to aircraft. ◆ <i>Site preparation and planting implementation.</i> The plan shall include specifications for seed collection and storage and guidelines for on-site preparation. The guidelines shall contain specifications for (1) existing native species protection; (2) trash and weed removal; (3) soil treatments (e.g., imprinting and decompacting); (4) temporary irrigation installation as needed; (5) erosion control measures (e.g., rice or willow 				

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures	Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
<p>wattles); and (6) seed application.</p> <ul style="list-style-type: none"> ◆ <i>Schedule.</i> A schedule shall be developed, which includes planting, to occur in late fall and early winter (between October and January 30). ◆ <i>Maintenance plan/guidelines.</i> A three to five year maintenance plan shall include (1) weed control; (2) herbivory control; (3) trash removal; (4) irrigation system maintenance; (5) maintenance training; and (6) replacement seeding, if necessary. Ten percent of the original seed collected shall be stored in the event it is needed for replacement seeding. ◆ <i>Monitoring plan.</i> The monitoring plan shall include the following success criteria: <ul style="list-style-type: none"> – Germination, flowering and seed set of 60 percent of the original population size in year one; – Germination, flowering and seed set of 80 percent of the original population size by year three; – Germination, flowering and seed set of 100 percent of the original population size by year five. <p>If these success criteria are not met, or are unlikely to be met within the required time periods, remedial measures will be required. Such measures could include reseeding, transplanting container plants or selection of an alternative site if required.</p> <p>This plan may include qualitative and quantitative monitoring. Qualitative monitoring includes site visits at regular intervals (i.e., monthly, quarterly,</p> 				

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	<p>etc.) to determine the overall general performance of the site and maintenance needs. Quantitative monitoring is conducted on an annual basis and includes data collection specific to the performance standards established in the monitoring plan.</p> <ul style="list-style-type: none"> ♦ <i>Long-term preservation.</i> Long-term preservation of the site shall also be outlined in the conceptual mitigation plan to ensure that future development does not impact the mitigation site. 				
MM-BC (BWP)-2 Monitoring Agency: LAWA	<p>Conservation of Floral Resources: Lewis' Evening Primrose. Prior to any work activities (i.e., vegetation clearing, invasive species removal and/or spraying, and sediment removal) on the project site, including construction staging areas, pre-construction focused surveys shall be conducted during the period of March through May by a qualified biologist to determine the presence or absence of Lewis' evening primrose. Known populations of this species shall be monitored to determine the best time to conduct the surveys. The surveys shall follow guidelines developed by the CNPS and the CDFG. If this species is not observed, no further mitigation shall be required. If this plant species is observed on-site, a qualified botanist and LAWA shall evaluate the number of individuals, their location and the type of impact that would occur to determine if the anticipated impact would result in a substantial adverse effect or substantial net reduction in the population, given the species' rarity and abundance. If impacts are deemed not significant, no additional measures are warranted.</p>	Potential loss of Lewis' evening primrose individuals that would result in a substantial adverse effect or substantial net reduction in population	Prior to any work activities, pre-construction focused surveys during the period of March through May to determine the presence or absence of Lewis' evening primrose. If it is determined that a substantial net reduction in population would occur, preparation of a special status plant mitigation program prior to initiation of construction of the Bradley West	If required, as per special status plant mitigation program for Lewis' evening primrose; regular site visits (e.g., quarterly, annually) for no more than 5 years or until germination, flowering and seed set of at least an equal number of plants impacted	If required, preparation of special status plant mitigation program; periodic monitoring report, at least annually

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures	Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
<p>If it is determined that a substantial net reduction in population would occur, LAWA or its designee shall prepare and implement a plan to compensate for the loss of individuals of the sensitive Lewis' evening primrose. LAWA or its designee shall collect seed from those plants to be removed, and properly clean and store the collected seed until used. A mitigation site of suitable habitat equal to the area of impact shall be delineated within the boundaries of LAX or at a suitable off-site location. If a site at LAX is selected, site selection will occur in consultation with LAWA's USDA Wildlife Hazard Biologist and will be consistent with FAA Advisory Circular No. 150/5200-33 "Hazardous Wildlife Attractants on or Near Airports" and LAWA's "LAX Wildlife Hazard Mitigation Plan" to avoid increasing wildlife hazards to aircraft. Collected seed shall be broadcast (distributed) after the first wetting rain. LAWA or its designee shall implement a monitoring plan to monitor the establishment of individuals of Lewis' evening primrose for a period of not more than five years. Performance criteria shall include the establishment of an equal number of plants as that impacted in the first year following the distribution of seed within the mitigation site. Performance criteria shall also include confirmation of recruitment for two years following the first year flowering is observed and establishment of individuals throughout the mitigation area within three years following the first year flowering is observed.</p>		Project		

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
MM-BC (BWP)-3 Monitoring Agency: LAWA	<p>Conservation of Floral Resources: California Spineflower. Prior to any work activities (i.e., vegetation clearing, invasive species removal and/or spraying, and sediment removal) on the project site, including construction staging areas, pre-construction focused surveys shall be conducted during the period of March through July by a qualified biologist to determine the presence or absence of California spineflower. Known populations of this species shall be monitored to determine the best time to conduct the surveys. The surveys shall follow guidelines developed by the CNPS and the CDFG. If this species is not observed, no further mitigation shall be required. If this plant species is observed on-site, a qualified botanist and LAWA shall evaluate the number of individuals, their location and the type of impact that would occur to determine if the anticipated impact would result in a substantial adverse effect or substantial net reduction in the population, given the species' rarity and abundance. If impacts are deemed not significant, no additional measures are warranted.</p> <p>If impacts to California spineflower are found to be adverse, LAWA or its designee shall prepare and implement a plan to compensate for the loss of individuals of the sensitive California spineflower. LAWA or its designee shall collect seed from those plants to be removed, and properly clean and store the collected seed until used. A mitigation site of suitable habitat equal to the area of impact shall be delineated within the boundaries of LAX or at a suitable off-site location. If a site at LAX is selected,</p>	<p>Potential loss of California spineflower individuals that would result in a substantial adverse effect or substantial net reduction in population</p>	<p>Prior to any work activities, pre-construction focused surveys during the period of March through July to determine the presence or absence of California spineflower. If it is determined that a substantial net reduction in population would occur, preparation of a special status plant mitigation program prior to initiation of construction of the Bradley West Project</p>	<p>If required, as per special status plant mitigation program for California Spineflower; regular site visits (e.g., quarterly, annually) for no more than 5 years or until germination, flowering and seed set of at least an equal number of plants impacted</p>	<p>If required, preparation of special status plant mitigation program; periodic monitoring report, at least annually</p>

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	<p>site selection will occur in consultation with LAWA's USDA Wildlife Hazard Biologist and will be consistent with FAA Advisory Circular No. 150/5200-33 "Hazardous Wildlife Attractants on or Near Airports" and LAWA's "LAX Wildlife Hazard Mitigation Plan" to avoid increasing wildlife hazards to aircraft. Collected seed shall be broadcast (distributed) after the first wetting rain. LAWA or its designee shall implement a monitoring plan to monitor the establishment of individuals of California spineflower for a period of not more than five years. Performance criteria shall include the establishment of an equal number of plants as that impacted in the first year following the distribution of seed within the mitigation site. Performance criteria shall also include confirmation of recruitment for two years following the first year flowering is observed and establishment of individuals throughout the mitigation area within three years following the first year flowering is observed.</p>				
MM-BC (BWP)-4	<p>Conservation of Faunal Resources: Burrowing Owl. Prior to any work activities (i.e., vegetation clearing, invasive species removal and/or spraying, and sediment removal) within the Southeast Construction Staging/Parking Area (also known as the Continental City site), a survey for burrows by a qualified biologist will be conducted by walking through the suitable habitat within the site in accordance with CDFG-accepted protocols. If the site contains burrows that could be used by burrowing owls, four surveys will be conducted during the burrowing owl breeding season (April 15 through July</p>	Potential loss of burrowing owl individuals	Prior to any work activities within the Southeast Construction Staging/Parking Area, a survey for burrows that could be used by burrowing owls and, if burrows are present, four additional surveys	If required, monthly removal of burrows between September and January every year during construction period. If nesting owls are identified during the four surveys,	If required, preparation of Habitat Restoration Plan including periodic monitoring report, at least annually. Removal of burrows annually, if present, until entire staging area is in use; reports submitted periodically, at least annually, during construction or
Monitoring Agency:	LAWA				

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	<p>15). If an active burrow is observed during the nesting season, disturbance of the owls would constitute a significant impact and the burrow will be protected until nesting activity has ended to ensure compliance with Section 3503.5 of the California Fish and Game Code. Nesting activity for burrowing owl normally occurs from February 1 through August 31. To protect any active burrow, the following restrictions are required between February 1 and August 31 (or until burrows are no longer active as determined by a qualified biologist): (1) clearing limits will be established a minimum of 300 feet in any direction from any occupied nest and (2) access and surveying will be restricted within 200 feet of any occupied nest. Any encroachment into the 300/200 foot buffer area around the known nest will only be allowed if it is determined by a qualified biologist that the proposed activity will not disturb the nest occupants. These avoidance measures will be coordinated with LAWA's USDA Wildlife Hazard Biologist and will be consistent with FAA Advisory Circular No. 150/5200-33 "Hazardous Wildlife Attractants on or Near Airports" and LAWA's "LAX Wildlife Hazard Management Plan."</p> <p>If nesting individuals are observed, LAWA or its designee will develop and implement a habitat replacement plan to compensate for the loss of habitat associated with use of the site for construction staging and parking. The objective of the habitat replacement plan will be to replace the habitat value to be lost with equal or greater habitat value. The habitat replacement will occur at an off-site location to avoid</p>		between April 15 and July 15 followed by monthly removal of any burrows onsite between September and January until such time as the entire staging area is in active use	protection of active burrows between February 1 and August 31	until entire staging area is in use

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Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	<p>potential conflicts with aircraft activities at LAX. Off-site locations for habitat replacement may include Madrona Marsh Nature Center in Torrance, Three Sisters Reserve located on the Palos Verdes Peninsula, or another location deemed appropriate.</p> <p>Whether or not any nesting burrowing owls are identified on-site, after the end of the nesting period (August 31), LAWA or its designee will remove all burrows from the site on a monthly basis between September and January. Removal may include physically collapsing the burrows or installing one-way doors in burrow entrances. Such maintenance will continue annually until such time as the entire staging area is in active use.</p>				
MM-BC (BWP)-5	<p>Conservation of Faunal Resources: Loggerhead Shrike. If construction is scheduled to occur during the nesting season for the loggerhead shrike (March 15 to August 15), vegetation that will be impacted by the proposed project shall be removed outside the nesting season if feasible. If this is not feasible, a qualified biologist shall inspect the shrubs/trees at least 14 days prior to construction activities to ensure that no nesting shrike are present. If a nest is present, construction avoidance measures shall include flagging of all active nests and a 300-foot wide buffer area around the active nests. These construction avoidance measures will be coordinated with LAWA's USDA Wildlife Hazard Biologist and will be consistent with FAA Advisory Circular No. 150/5200-33 "Hazardous Wildlife Attractants on or Near Airports"</p>	Potential loss of nesting loggerhead shrike individuals	If construction is scheduled to occur between March 15 and April 15, removal of vegetation outside the nesting season, if feasible. If not feasible, pre-construction surveys 14 days prior to construction	If nests are present, a Biological Monitor shall be present between March 15 and August 15	Removal of vegetation between August 16 and March 14 prior to initiation of construction followed by a report of activities. Alternatively, if required, pre-construction surveys 14 days prior to construction occurring between March 15 and April 15. If required, establishment of construction avoidance measures and onsite monitoring between

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	and LAWA's "LAX Wildlife Hazard Mitigation Plan" to avoid increasing wildlife hazards to aircraft. In addition, a Biological Monitor shall be present to ensure the buffer area is not infringed upon and vegetation clearing within the designated 300-foot buffer only takes place from August 16 to March 14.				March 15 and August 15 and written report documenting construction avoidance measures undertaken; reports submitted periodically, at least annually, during construction or until vegetation has been removed
MM-BC (BWP)-6 Monitoring Agency: LAWA	Conservation of Faunal Resources: San Diego Black-Tailed Jackrabbit. Prior to the commencement of clearing operations or other activities involving significant soil disturbance at locations identified in Table 4.7-2 with suitable habitat, a survey shall be conducted to locate black-tailed jackrabbits within 100 feet of the outer extent of projected soil disturbance activities. The locations of any observed jackrabbits shall be clearly marked and identified on the construction plans. If this species is present, a monitoring biologist shall be on-site during any clearing to flush the jackrabbit from occupied habitat areas immediately prior to brush-clearing and earth-moving activities. The monitoring biologist shall have authority to halt construction activities until individual jackrabbits can be removed from the construction impact areas to assure that the jackrabbit shall not be directly impacted by brush-clearing and earth-moving equipment in a manner that also allows for construction activities on a timely basis.	Potential loss of San Diego black-tailed jackrabbit individuals	Prior to commencement of clearing operations or other activities involving significant soil disturbance within the Northwest Construction Staging/Parking Area, West Construction Staging Area, or Southeast Construction Staging/Parking Area	If species is present, a monitoring biologist shall be onsite prior to and during any brush-clearing and earth-moving activities	If required, onsite monitoring during brush-clearing and earth-moving activities and written documentation of field activities submitted periodically, at least annually, during construction or until all clearing and soil disturbance at identified locations is complete

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Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
MM-BC (BWP)-7 Monitoring Agency: LAWA	Conservation of Floral Resources: Mature Tree Replacement. LAWA or its designee shall compensate at a ratio of 2:1 for the loss of mature trees, which would occur as a result of implementation of Northwest Construction Staging/Parking Area. The species of newly planted replacement trees shall be local native tree species to the extent feasible. Each mitigation tree shall be at least a 15-gallon or larger specimen. The replacement will be implemented within the boundaries of LAX or at a suitable off-site location. If mitigation occurs within LAX boundaries, the replacement site and tree species will be determined in consultation with LAWA's USDA Wildlife Hazard Biologist and will be consistent with FAA Advisory Circular No. 150/5200-33 "Hazardous Wildlife Attractants on or Near Airports" and LAWA's "LAX Wildlife Hazard Mitigation Plan" to avoid increasing wildlife hazards to aircraft.	Potential loss of mature trees	Prior to removal of mature trees within the Northwest Construction Staging/Parking Area	If mitigation occurs within LAX boundaries, periodic site visits to ensure trees are established, at least annually	Replacement of trees, if required and monitoring report one year following planting
MM-BC (BWP)-8 Monitoring Agency: LAWA	Conservation of Faunal Resources: Nesting Birds/Raptors. To comply with the Migratory Bird Treaty Act, for those areas of the project site that are not actively maintained and have a potential for nesting birds/raptors, if construction is scheduled to occur during the nesting season for birds/raptors (generally February 1 to June 30 for raptors and March 15 to August 15 for nesting birds), vegetation that will be impacted by the proposed project shall be removed outside the nesting season if feasible. If this is not feasible, then a qualified biologist shall inspect the shrubs/trees prior to project activities to ensure that no nesting birds/raptors are present. If the	Potential loss of nesting birds/raptors subject to the Migratory Bird Treaty Act	If construction occurs between February 1 and August 15, removal of vegetation outside the nesting season, if feasible. If not feasible, pre-construction surveys	If active nests are present and may be impacted, a Biological Monitor shall be present during those periods when construction activities will occur near active nest areas	If required, establishment of buffer zones and construction avoidance measures between February 1 and August 15 and written report documenting construction avoidance measures undertaken; reports submitted periodically,

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Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures		Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
	biologist finds an active nest within the construction area and determines that the nest may be impacted, the biologist will delineate an appropriate buffer zone; the size of the buffer zone will depend on the species and the type of construction activity, and will be determined in consultation with CDFG. Only construction activities (if any) that have been approved by a Biological Monitor will take place within the buffer zone until the nest is vacated. The biologist shall serve as a construction monitor during those periods when construction activities shall occur near active nest areas to ensure that no inadvertent impacts on these nests shall occur. These construction avoidance measures will be coordinated with LAWA's USDA Wildlife Hazard Biologist and will be consistent with FAA Advisory Circular No. 150/5200-33 "Hazardous Wildlife Attractants on or Near Airports" and LAWA's "LAX Wildlife Hazard Mitigation Plan" to avoid increasing wildlife hazards to aircraft.				at least annually, during construction or until vegetation is removed
Endangered and Threatened Species of Flora and Fauna					
MM-ET (BWP)-1 Monitoring Agency: LAWA	Mitigation for Riverside Fairy Shrimp. If Riverside fairy shrimp are found to be located on-site, LAWA shall coordinate with FAA and USFWS to initiate consultation under the federal Endangered Species Act and prepare a Mitigation Plan in consultation with the USFWS. The plan shall provide mitigation for direct impacts to affected habitat through salvage and relocation of soil containing Riverside fairy shrimp. The receiver site of the soil and cysts shall be equal or	Potential loss of Riverside fairy shrimp individuals at Southeast Construction Staging/Parking Area	If required, preparation of Mitigation Plan for Riverside fairy shrimp prior to clearing or other construction activities within the Southeast	If required, monthly during the first year following relocation of cyst-bearing soils, quarterly in years 2-4, biannually in years 5, 7 and 9,	If required, preparation of Mitigation Plan for Riverside Fairy Shrimp; annual monitoring reports due to USFWS on September 1 of each specified monitoring year

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures	Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
<p>greater in biological value, as determined by the USFWS.</p> <p>Specific requirements of the Mitigation Plan shall be subject to the Section 7 consultation with USFWS, but generally will require that soils containing embedded cysts of the Riverside fairy shrimp be salvaged and translocated to created Riverside fairy shrimp habitat at a suitable site. One potential site is the Madrona Marsh Nature Center in Torrance, 20 miles south of LAX. Responsibility for habitat creation and maintenance of the created habitat may be transferred to a LAWA designee at any time with USFWS approval.</p> <p>Soils containing embedded cysts of the Riverside fairy shrimp shall not be translocated to the created habitat until the habitat is established and has met certain success criteria specified during Section 7 consultation. Success criteria for the created habitat will likely include holding water for a minimum of 60 days, having less than 10 percent absolute cover exotic herbaceous species within the created habitat, having less than 20 percent absolute cover of exotic herbaceous species within 300 feet of the area from limits of the created habitat, removal of all non-herbaceous plant species within the created habitat and 300 feet from the created habitat annually, and providing suitable water quality for Riverside fairy shrimp. Duration of inundation, exotic species removal, and water quality analyses may be undertaken within the first year after habitat creation. The performance criteria for percent absolute cover of</p>		Construction Staging/Parking Area; Implementation per Mitigation Plan	annually in year 10	

**Mitigation Monitoring and Reporting Program
Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures	Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
<p>exotic herbaceous species within 300 feet of the area from limits of the created habitat may be redesignated by mutual agreement of FAA, LAWA, and USFWS.</p> <p>Upon meeting success criteria and approval from the USFWS, soils containing embedded cysts of the Riverside fairy shrimp may be brought to the created habitat. LAWA shall make every effort to collect all cyst-bearing soils from the entire surface area of the occupied habitat, however it is expected that some small number of undetected individual cysts will remain in the soil. Soil containing the cysts shall be salvaged and translocated during the dry season to minimize damage to the cysts during transport. The soil shall be collected using a hand trowel, removed in chunks, and kept out of direct sunlight to ensure viability. Soil shall be stored in properly labeled boxes or bags with adequate ventilation. The soils shall then be deposited and spread out in small basins or pool-like areas of similar size without active mechanical compaction to minimize potential damage to the cysts. Any potential indirect environmental impacts resulting from habitat construction activities shall be compliant with best management practices and terms and conditions stipulated by the permitting agencies.</p> <p>LAWA or its designee, in conjunction with the USFWS and a qualified wildlife biologist, shall also develop a program to monitor created habitat for the presence of Riverside fairy shrimp as described in the Mitigation Plan. LAWA shall be responsible for implementing a monitoring and reporting program to demonstrate successful achievement of the performance standards</p>				

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Bradley West Project-Specific Mitigation Measures**

Bradley West Project-Specific Mitigation Measures	Impact Being Addressed	Timing of Implementation	Monitoring Frequency	Actions Indicating Compliance
<p>to be determined in consultation with USFWS for off-site relocation over a 10-year period:</p> <ul style="list-style-type: none"> ◆ Monthly during the first year, following relocation of soils containing embedded cysts of the Riverside fairy shrimp ◆ Quarterly in the second, third, and fourth years, following relocation of soils containing embedded cysts of the Riverside fairy shrimp ◆ Biannually in the fifth, seventh, and ninth years, following relocation of soils containing embedded cysts of the Riverside fairy shrimp ◆ Annually in the tenth year, following relocation of soils containing embedded cysts of the Riverside fairy shrimp <p>LAWA shall provide the USFWS with annual monitoring reports as specified in the Mitigation Plan. The monitoring report, due on September 1 of each specified monitoring year, shall provide information regarding the implementation of habitat creation, restoration, and maintenance activities. The yearly report shall also discuss the effectiveness of the project as it pertains to the existing condition of the created habitat and Riverside fairy shrimp population. To measure the effectiveness of the created habitat, the FAA and LAWA shall work with the USFWS to develop long-term goals and objectives as part of their habitat creation plan.</p>				

APPENDIX C

LAX MASTER PLAN MMRP PROGRAM PLAN STATUS UPDATE

LAX Master Plan Mitigation Measures and Reporting Program (MMRP)
Program Plan Status Update
December 2012

No.	Program Plan Title	Program Plan Description	Master Plan Commitments/Mitigation Measures Addressed	Status (as of December 2012)
1	Aircraft Noise Abatement Program (ANAP) (existing)	The ANAP sets forth LAWA's noise abatement traffic, flight, and runway use procedures and includes ground operations restrictions and other airport noise abatement procedures, restrictions, and regulations involving aircraft operations.	MM-N-4: Update the Aircraft Noise Abatement Program elements as applicable to adapt to the future airfield configuration	Ongoing: LAWA Noise Management Section provides ongoing updates to ANAP, which will include updates based on modifications to the LAX airfield configuration, as appropriate.
2	Aircraft Noise Mitigation Program (ANMP) (existing)	The ANMP describes the ongoing efforts by LAWA to convert existing incompatible land uses surrounding each of its three noise impacted airports to compatible land uses through the implementation of two noise mitigation strategies: (1) sound insulation of structures; and (2) the acquisition of property followed by the conversion of its incompatible land use to compatible land use (land recycling).	MM-LU-1 : Implement revised ANMP MM-LU-2 : Incorporate residential dwelling units exposed to single event awakenings into ANMP	Ongoing: Existing program is in place with periodic report updates to the County of Los Angeles.
3	Master Plan for Air Quality (MPAQ)	The MPAQ identifies the air quality mitigation requirements for the LAX Master Plan. Briefly stated, the objectives of the MPAQ are to maintain or reduce air emissions associated with the construction and operation of the LAX Master Plan to levels equal to (or less than) the thresholds of significance and, at a minimum, keep these emissions below the levels forecasted in the LAX Master Plan EIR.	MM-AQ-1 : LAX Master Plan – Air Quality Mitigation Plan for Air Quality MM-AQ-2 : Construction-Related Mitigation Measures MM-AQ-3 : Transportation-Related Mitigation Measures MM-AQ-4 : Operations-Related Mitigation Measures	In Progress: Master Plan for Air Quality (MPAQ) consists of 4 main parts: MM-AQ-1: Completed in October 2005 and adopted by City Council on January 11, 2006 MM-AQ-2: Completed in October 2005 and adopted by City Council on January 11, 2006 MM-AQ-3: Ongoing: To be completed in conjunction with implementation of the LAX Master Plan components that materially affect surface transportation emissions and operations. MM-AQ-4: Ongoing: In 2012, LAWA organized the approach, defined new tasks, and wrote a scope of work to update the 2007 LAX GSE inventory and conduct a comprehensive e-GSE feasibility study in 2013.

4	Ground Transportation Outreach Program (GTOP)	The GTOP establishes appropriate mechanisms to involve and coordinate with other major airport-area development projects to the extent feasible, to ensure that the cumulative impacts of construction traffic in the airport area are coordinated and minimized.	MM-ST-14: Ground Transportation/Construction Coordination Office Outreach Program C-1: Establishment of a GT/CCO	Completed: Final Ground Transportation Outreach Program issued in May 2006. Implementation for the Ground Transportation Outreach Program is ongoing.
5	Construction Transportation Management Plan (CTMP)	The CTMP provides additional information regarding the measures from the LAX Master Plan MMRP related to the management of construction traffic during the implementation of the Master Plan. Surface transportation mitigation measures which are unrelated to the movement of construction traffic are not included in this plan.	ST-9: Construction Deliveries ST-12: Designated truck delivery hours ST-14: Construction employee shift hours ST-16: Designated haul routes ST-17: Maintenance of haul routes ST-18: Construction Traffic Management Plan ST-19: Closure restrictions of existing roadways ST-20: Stockpile locations ST-21: Construction employee parking locations ST-22: Designated truck routes	Completed: Final Plan dated May 2005. Implementation for the Construction Transportation Management Plan (CTMP) is ongoing.
6	Archaeological Treatment Plan (ATP)	The ATP focuses on the long-term protection and proper treatment of unexpected archaeological discoveries of federal, State, and/or local significance that might be encountered during construction activities of the LAX Master Plan projects. The purpose of the ATP is to achieve compliance with Section 106 of the National Historic Preservation Act (NHPA), the CEQA, and the environmental guidelines of local agencies.	MM-HA-1 : Historic American Buildings Survey (HABS) MM-HA-2 : Historic educational materials MM-HA-4 : Archaeological discovery MM-HA-5 : Archaeological monitoring MM-HA-6 : Excavation and recovery MM-HA-7 : Administration MM-HA-8 : Archaeological/Cultural Monitoring Report MM-HA-9 : Artifact curation MM-HA-10 : Archaeological notification	Completed: Final Plan approved by the FAA and other outside agencies in early 2006. Implementation for the Archaeological Treatment Plan (ATP) is ongoing.
7	Paleontological Management Treatment Plan (PMTP)	The PMTP focuses on the identification, recovery, proper treatment, and long-term protection and archival conservation of expected and unexpected paleontological	MM-PA-1: Paleontological Qualification and Treatment Plan MM-PA-2 : Paleontological authorization	Completed: final Draft issued December 2005 by LAWA's Environmental Management Division (now Environmental Service Division). LAWA sent the PMTP to the

		discoveries of federal, State, and/or local significance that might be encountered during construction activities of the LAX Master Plan projects.	MM-PA-3 : Paleontological monitoring specification MM-PA-4 : Paleontological resources collection MM-PA-5 : Fossil preparation MM-PA-6 : Fossil donation MM-PA-7 : Paleontological reporting	Vertebrate Section of the County of LA Museum on January 11, 2006. Implementation for the Paleontological Management Treatment Plan (PMTP) is ongoing.
8	Conceptual Drainage Plan (CDP)	The CDP provides an overview of drainage and water quality conditions, capacities, constraints, regulatory framework, and analysis methodologies and identifies options for addressing the LAX Master Plan Alternative D impacts. The CDP provides the basis by which detailed drainage improvement plans shall be designed in conjunction with site engineering specific to each LAX Master Plan improvement project.	HWQ-1: Develop detailed drainage plan	Completed: Draft CDP issued in June 2005 and finalized in December 2005. Consistency Certification received from the Coastal Commission in December 2005. Implementation for the Conceptual Drainage Plan (CDP) is ongoing.
9	Procedures for Handling of Contaminated Materials during Construction	This procedure focuses on pre-existing, previously unknown contaminated materials that may be encountered or are first released, spilled, or generated during construction at any phase or project of the LAX Master Plan implementation.	HM-2: Handling of contaminated materials encountered during construction	Completed: Final document issued in December 2005. Implementation for the Procedures for Handling of Contaminated Materials during Construction is ongoing.
10	Utilities Relocation Program (URP)	The URP provides a framework to address potential impacts on the existing utilities and to minimize interference with the existing utilities associated with the LAX Master Plan construction.	PU-1: Develop a Utilities Relocation Plan E-2: coordination with utility providers DA-3: undergrounding of utility lines	Completed: Final Report completed in May 2005. Implementation for the Utilities Relocation Program (URP) is ongoing.
11	Street Frontage & Landscape Development Plan (SFLDP) (Existing)	The SFLDP provides integrated and coordinated landscape design guidelines for new development along the perimeter areas of LAX. It is not intended as a commitment by LAWA to affect and/or change existing conditions.	LU-4 : Neighborhood Compatibility Program LU-5 : Comply with City of LA Transportation Element Bicycle Plan DA-1 : Provide and Maintain Airport Buffer Areas DA-2 : Update and Integrate Design Plans and Guidelines W-1 : Maximize Use of Reclaimed Water W-2 : Enhance Existing Water Conservation Program	Completed: Final SFLDP completed on March 2, 2005. Implementation for the Street Frontage & Landscape Development Plan (SFLDP) is ongoing.

12	Water Conservation Program (WCP)	LAWA's Sustainability Objectives include increased water conservation in all airport facilities and for all operations, with specific targets for increasing use of reclaimed water for landscaping and other non-potable uses, planting of drought-resistant vegetation, and installation of low-flow fixtures. LAWA's Sustainable Airport, Design and Construction Guidelines include the encouragement of water efficiency and conservation in construction design.	W-2: Enhance Existing Water Conservation Program	Completed: The Water Conservation Program is addressed as components in LAWA's Sustainability Plan Annual Sustainability Report, and LAWA's Sustainable Airport Planning, Design and Construction Guidelines (LSAG). Implementation for the Water Conservation Program (WCP) is ongoing.
13	Landscape Maintenance Program (LMP)	The March 2005 LAX Street Frontage and Landscape Development Plan (LDP) addresses landscaping requirements for parcels acquired under the LAX Master Plan.	LU-2: Establishment of an LMP for parcels acquired due to airport expansion DA-1: Provide and maintain airport buffer areas	Completed and Ongoing: The March 2005 LAX Street Frontage and Landscape Development Plan (LDP) addresses landscaping requirements for parcels acquired under the LAX Master Plan. This measure is not applicable at this reporting period because LAWA did not acquire any Alternative D parcels in 2012. LAWA currently provides and maintains all buffer areas surrounding the airport.
14	Residential & Business Relocation Plan (Draft Relocation Plan) (DRP)	The DRP provides procedures for implementing LAWA's LAX MP Relocation Assistance Program (RAP) in accordance with applicable laws, regulations, and policies. The Uniform Act and Title 49 CFR Part 24 serve as the basis for the policies and procedures established in this plan.	RBR-1: Residential and Business Relocation Program MM-RBR-1: Planning for business relocation MM-RBR-2: Relocation opportunities through ANMP	In Progress: Draft Relocation Plan approved by the BOAC in Dec 2004. The Final Plan will be developed when Master Plan improvements requiring acquisition are advanced to more detailed planning.
15	Fire & Police Facility Program (FPFP)	Based on current implementation of the Master Plan Program, fire and police facilities are planned on an individual basis in consultation with LAFD, LAWAPD, LAPD, and other agencies as appropriate.	PS-1: Fire and Police Facility Relocation Plan PS-2: Fire and Police Facility space and siting requirements	Completed for Fire Station 80. This requirement was not triggered for other on airport fire and police facilities. Implementation for the Fire & Police Facility Program (FPFP) is ongoing.
16	Solid Waste Recycling Plan (SWRP)	LAWA developed an enhanced Recycling Plan for LAX in 2011.	SW-1: Implement an Enhanced Recycling Program	Completed. LAWA developed an enhanced Recycling Plan in 2011 that continues to be implemented.

APPENDIX D

SUMMARY STATUS OF STAND-ALONE MITIGATION PLANS

“Stand-Alone” Mitigation Plans

“Stand-alone” mitigation plans are derived from specific mitigation measures to address the overall impacts of the LAX Master Plan. These stand-alone plans are not linked to any particular project within the LAX Master Plan. Stand-alone plans are divided into five (5) major impact areas: Noise, Air Quality, Biotic Communities, Hydrology and Water Quality, and Environmental Justice. Table 1 below provides a summary status of all “stand-alone” mitigation plans. Brief descriptions of each stand-alone plan are discussed in the following subsections.

Table 1: "Stand-Alone" Mitigation Plans - Summary Status			Completed	In Progress	Existing Policy	Future Plan
<i>Noise and Land Use Mitigation Plans</i>						
4.0.A	N-1	Maintenance of Aircraft Noise Abatement Program			X	
4.0.B	MM-N-4	Update the Aircraft Noise Abatement Program				X
4.0.C	MM-N-5	Conduct Part 161 Study		X		
5.0.E	MM-LU-1	Implement Revised Aircraft Noise Mitigation Program		X		
5.0.F	MM-LU-2	Incorporate Residential Dwelling Units Exposed to Single Event Awakenings Threshold into Aircraft Noise Mitigation Program		X		
5.0.G	MM-LU-3	Conduct Study of the Relationship Between Aircraft Noise Levels and the Ability for Children to Learn		X		
5.0.H	MM-LU-4	Provide additional sound insulation for schools shown by MM-LU-3 to be significantly impacted by aircraft noise				X
5.0.I	MM-LU-5	Upgrade and Expand Noise Monitoring Program	X			
<i>Environmental Justice</i>						
9.0.A	EJ-1	Aviation Curriculum		X		
9.0.B	EJ-2	Aviation Academy		X		
9.0.C	EJ-3	Job Outreach Center		X		
9.0.D	EJ-4	Community Mitigation Monitoring		X		
<i>Air Quality Mitigation Plans</i>						
10.0.A	AQ-1	Air Quality Source Apportionment Study		X		
10.0.B	AQ-2	School Air Filters				X
10.0.C	AQ-3	Mobile Health Research Lab				X
10.0.D	MM-AQ-1	Mitigation Plan for Air Quality	X			
10.0.E	MM-AQ-2	Construction-Related Mitigation Measures	X			
10.0.F	MM-AQ-3	Transportation-Related Mitigation Measures		X		
10.0.G	MM-AQ-4	Operations-Related Mitigation Measures		X		
<i>Hydrology and Water Quality</i>						
11.0.A	HWQ-1	Develop Conceptual Drainage Plan	X			
<i>Biotic Communities</i>						
14.0.D	MM-BC-8	Replacement of Habitat Units		X		
14.0.E	MM-BC-9	Conservation of Faunal Resources		X		
15.0.A	MM-ET-1	Riverside Fairy Shrimp Habitat Restoration		X		

APPENDIX E

Southern Tarplant Second Annual Monitoring Report for the Los Angeles International Airport Bradley West Expansion and Crossfield Taxiway American Airlines Employee Parking Lot Relocation Projects

**Southern Tarplant Second Annual Monitoring Report
for the Los Angeles International Airport
Bradley West Expansion and Crossfield Taxiway Relocation Projects
Los Angeles County, California**



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November 2012

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INTRODUCTION

This report presents the results of the Second Annual Monitoring Survey of the Southern Tarplant Restoration Project (Project) conducted on September 14, 2012. The five-year restoration and maintenance efforts outlined in the Project's Southern Tarplant Mitigation Plan (STMP; LAWA et al., 2011a) and LAX Master Plan Mitigation Monitoring and Reporting Program (MMRP) serve as mitigation for southern tarplant (*Centromadia parryi australis*) impacted by the Bradley West Expansion and Crossfield Taxiway American Airlines Employee Parking Lot Relocation Projects (BWP and CFTP, respectively). This report documents the conditions of the mitigation site, the methods of quantitative analysis used to determine whether success criteria are being met, and future recommendations for the Project.

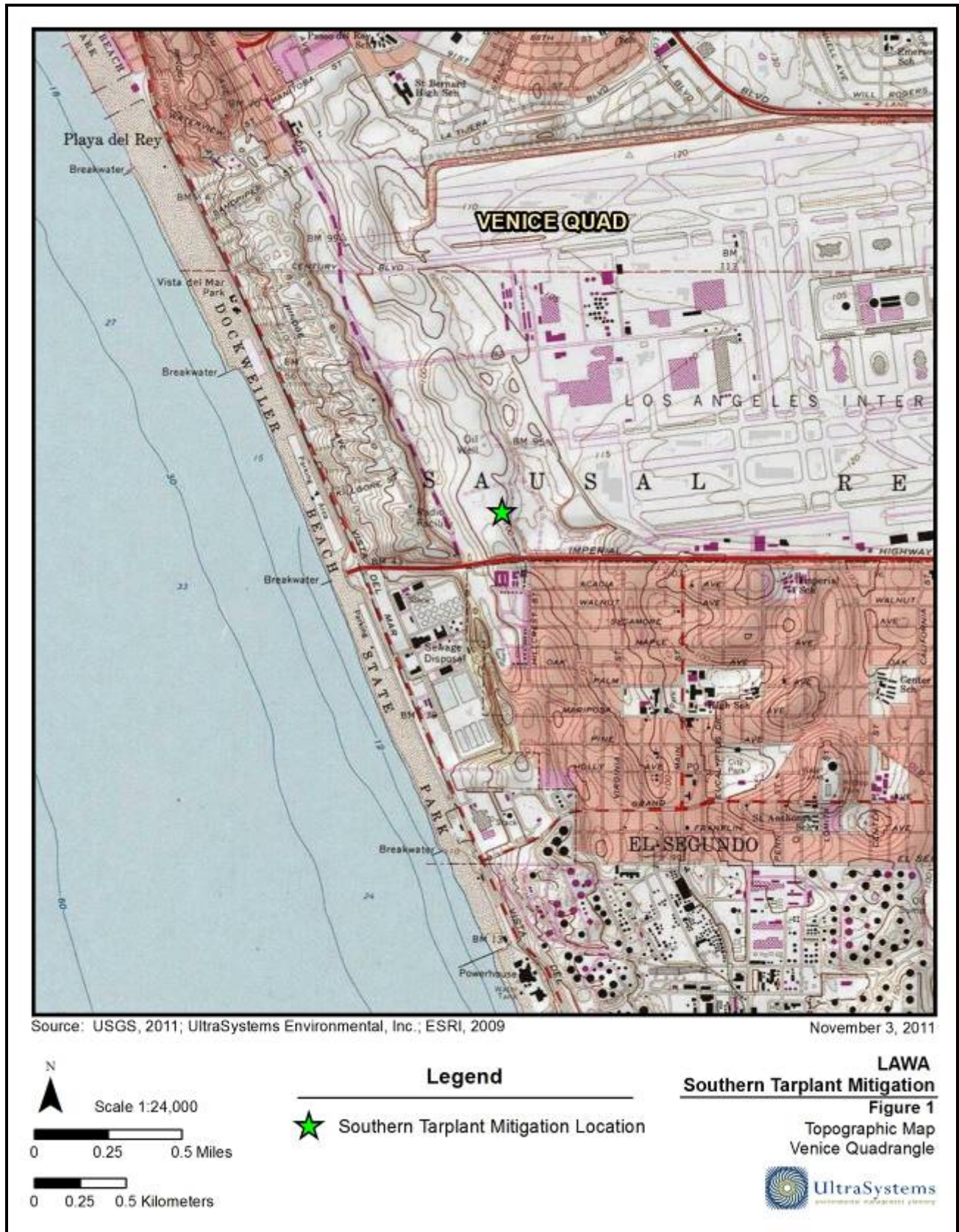
In accordance with the LAX Master Plan MMRP mitigation measures for the BWP and CFTP, impacts to southern tarplant must be mitigated at a 1:1 ratio. A total of 329 individual plants were found prior to construction activity at the impacted sites. Therefore, mitigation required the establishment of a minimum of 329 new individual germinating, flowering and seed-setting plants within a 5-year period. A qualified biologist is required to monitor the maintenance effort and site conditions each quarter during the 5-year monitoring period, and document whether individual counts of southern tarplant are meeting the success criteria as indicated in Table 1: Performance Standards.

TABLE 1: PERFORMANCE STANDARDS	
Year	Minimum Number of Germinating, Flowering and Seed-Setting Southern Tarplant Individuals
One	198 (60% of Required Number)
Three	264 (80% of Required Number)
Five	329 (100% of Required Number)

Plant installation and seeding was conducted in January and February 2011. A 90-Days Establishment Report was submitted in April 2011 (LAWA et al., 2011b) to document initial project efforts and outcomes, followed by Quarterly Monitoring letter reports (LAWA et al., 2011c). The purpose of this Second Annual Southern Tarplant Monitoring Report is to estimate the number of surviving individuals after two years of restoration efforts. The site is being monitored and maintained (e.g. weeded, irrigated, cleaned and controlled for pests) by Los Angeles World Airports (LAWA) landscaping staff on an ongoing basis, as advised by UltraSystems Environmental and Endemic Environmental Services.

Project Location

The mitigation site is approximately one acre total and is located near the southwest corner of the LAX airport in an area designated as open space (see Figure 1). The mitigation site is within the current LAX property limits, east of an existing Stormwater Retention Facility along Imperial Highway. This project



is located on the NW quarter of the SE quadrant of the Venice USGS Topographic map standard location reference. The mitigation site was considered suitable for southern tarplant reestablishment for several reasons: the site was identified as an ephemeral wetted area, has similar slope and aspect to the impacted site, and already supported five southern tarplant individuals.

Purpose and Background of Project

The Project serves as mitigation for adverse impacts to a southern tarplant population containing 329 individuals (observed at LAX in 2009) caused by the BWP and CFTP. A southern tarplant reestablishment effort was made in 2009 and 2010; however, this initial effort failed. In order to comply with their required mitigation of 1:1 plant replacement, LAWA reinitiated efforts in 2010 to restore and maintain a southern tarplant population. The previous STMP was revised as deemed appropriate and a new mitigation site (described above in Project Location) was chosen. For detailed descriptions of the revised restoration effort, see the 2011 Southern Tarplant Mitigation Plan (UltraSystems 2011).

WATERING AND MAINTENANCE

The mitigation site has been watered twice per week from November of 2011 through the end of June 2012. The preliminary watering was recommended to increase the robustness of the germinated southern tarplant. Watering discontinued in late June 2012 after late spring rains saturated the plots.

Rainfall has been below average during spring and summer 2012, and limited weed removal activities were conducted. Invasive annuals will continue to be removed during the 3 to 5-year maintenance period (ending 2015). General maintenance efforts and protection measures include trash removal, herbivore control when necessary, fence maintenance, repositioning fencing rope to include southern tarplant individuals growing on the gravel road, and mowing after the southern tarplant has set seed in the fall of each year.

The past watering and maintenance efforts have allowed for larger flowering individuals and reduced disturbance, yielding more viable seed, and increasing the chances of establishment for the next generation of individuals.

METHODS AND RESULTS

Prior to sowing southern tarplant seed, the approximately one-acre mitigation site was divided into six plots (1a, 1b, 2, 3, 4a and 4b), with each plot selected to receive a different source and/or condition of seed (see Table 2 and Figure 2). Clean seed (i.e. seed with the outer husk removed) purchased from S&S Seed Company (Carpentaria, CA) as well as locally collected seed soaked in water for four days, and was sown in plot 1a and the western portion of plot 1b; only clean purchased seed was sown into the remaining area of the plot 1b; clean seed collected from the population planned for the airport expansion (local seed) was sown in plots 2 and 3; and rough (i.e. seed with the outer husk retained), local seed was

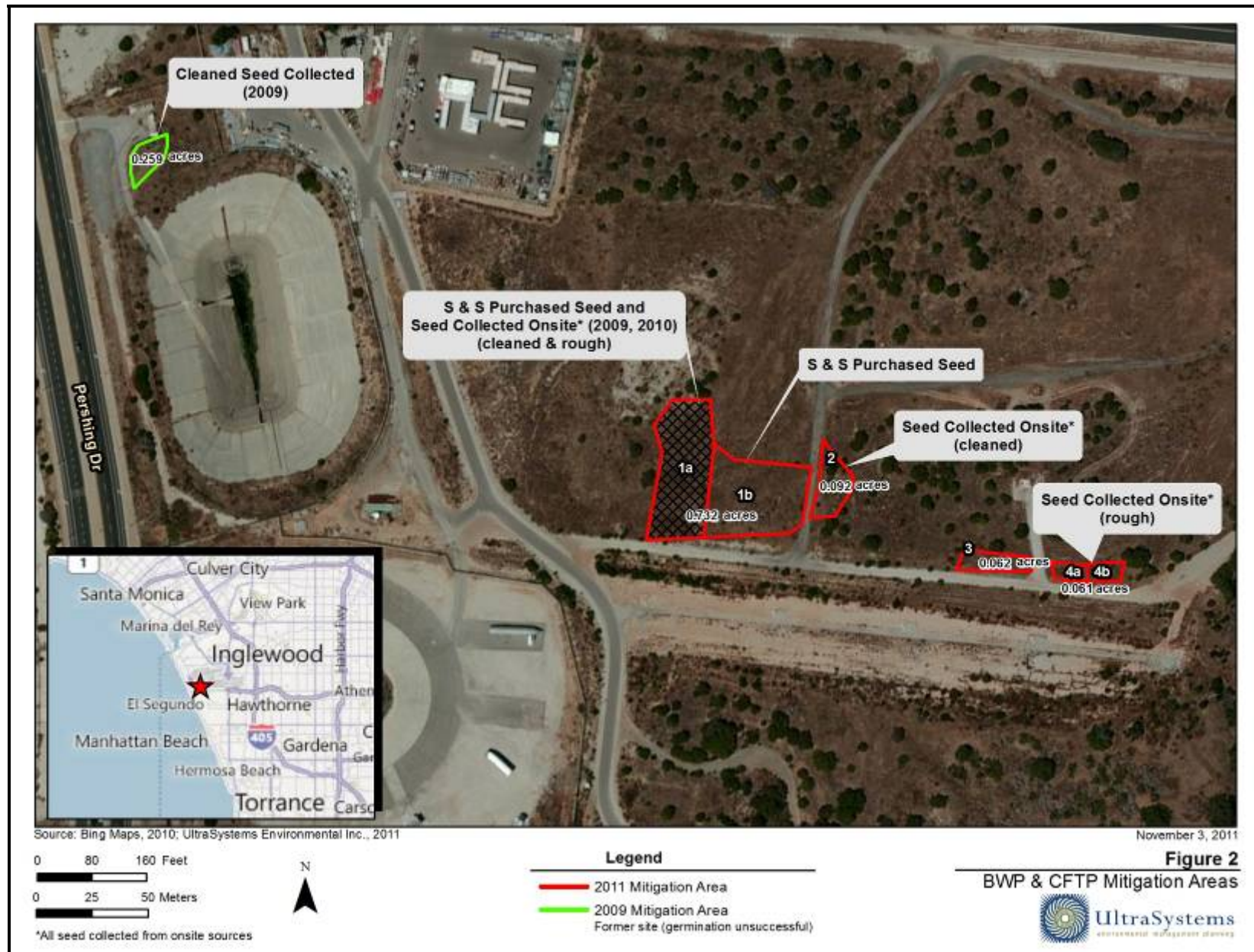
sown in plots 4a and 4b. Seed was sown on two occasions; once on January 12, 2011 and again on February 15, 2011.

TABLE 2: MITIGATION SUBPLOT DESCRIPTIONS			
Site	Size (acres)	Seed Application (hand broadcast)	Site Description
1a/b	0.732	1a: Clean purchased S&S seed and clean and rough local seed collected in 2009 and 2010 1b: Clean S&S seed purchased in 2010	Relatively dry soil with existing “depressions” located throughout the site. Soil in area 1a and the western parts of 1b was tilled with a cultivator. Soaked seeds were hand-sown in this cultivated area, and then a roller was used to tamp seeds into the soil.
2	0.092	Clean local seed collected in 2010	Mesic site (i.e. sustains surface water the longest following watering/rainfall events)
3	0.062	Clean local seed collected in 2010	Semi-mesic area
4a/b	0.061	Rough local seed collected in 2010	Semi-mesic area

The second annual monitoring visit was conducted on September 14, 2012. Due to the relatively dry year, the September 2012 overall density of the southern tarplant was relatively low. It was determined that the use of a “walking line transects pattern” was the most effective method for counting the total number of individuals occurring in each plot. Southern tarplant individuals were counted by walking line transects spaced ten meters apart and spanning the length of each plot. All plants observed five meters on either side of a line transect were counted to ensure the entire area of the plots were sampled. The number of plants counted in each plot was then summed to produce a total estimate of 688 southern tarplant individuals for 2012. Pursuant to the Southern Tarplant Mitigation Plan, only individuals were counted if they were observed flowering or seeding.

The site was parceled into six subplots and each subplot was counted separately. The totals of all subplots were then summed to obtain the final total count. Southern tarplant individuals were counted by using transects and also, in dense areas, estimated by numbers per square meter. With over 600 healthy individuals estimated, the southern tarplant numbers have exceeded expectations for the year-two success criteria. Table 3 summarizes the estimated number of southern tarplant individuals per plot.

TABLE 3: ESTIMATED NUMBER OF SOUTHERN TARPLANT INDIVIDUALS PER PLOT	
Subplot	Individuals Counted
1a	0
1b	13
2	1
3	671
4A	3
4B	0
Subtotals	688
Total Estimated	688



DISCUSSION

The ultimate goal of the Southern Tarplant Mitigation Plan was to reestablish at least 329 plants after five years, which is the number of plants impacted by the BWP and CFTP.

General Site Conditions

The southern tarplant mitigation site exhibits seemingly ideal conditions for southern tarplant. With the recommendations of the restoration ecologist and efforts from the LAWA Environmental Services Division, the southern tarplant population continues to establish, despite below average rainfall and relatively dry conditions. However, this southern tarplant site is showing similar response to the rainfall year as many other reference populations surveyed in 2012, and continued monitoring is still warranted. There were no populations of southern tarplant that had a dramatic increase in population in the last two years. The site conditions appeared to be unchanged with no trash, vandalism, or herbivory damage observed at the mitigation site.

Southern Tarplant Conditions

During this time of year, southern tarplant is expected to be fully matured with flowering, seeding and senescing individuals. The southern tarplant observed were all exhibiting these life stages. They all appear to be healthy with a wide range of sizes and growth forms. There was no sign of disease, overwatering, wilting, or any other stress that would be detrimental to this plant species.

Southern Tarplant Plot Observation Variation

As the 2012 observation table indicates (see Table 3), 98% of the current southern tarplant individuals were counted in Plot 3. Plot 3 was seeded with locally collected, soaked and clean seeds. This may explain some of the variation in number of plants observed, but there are two additional factors as well. The Plot 3 area has a higher clay content in the soil and may be retaining more water than other areas. Also, this plot has easy access for supplemental watering, and even a small amount may be enough supplemental water in a dry year to explain the differences in numbers of individuals observed.

Native Recruitment & Wildlife Usage

Other native plant species were observed on the mitigation site, and appear to have increased in number since the seeding effort in January 2011. However, populations of these species were not measured or documented prior to project implementation. Species observed include fasciculated tarplant (*Deinandra fasciculata*), deerweed (*Lotus scoparius*) and telegraph weed (*Heterotheca grandiflora*). These plant species share similar traits and habits with the southern tarplant including a short life-cycle, high reproductive rate and preference for growing in open areas with moderate disturbance.

A few wildlife species were also observed utilizing the southern tarplant habitat. California buckeye butterfly (*Junonia coenia*), native invertebrate pollinators (*Unidentified*), and side-blotched lizards

(*Utastaneburiana*) were also observed at the mitigation site. These plant-pollinator and predator-prey interactions are indications that the restoration is affecting more than just the plant community, but are also enhancing ecosystem diversity and functioning at higher trophic levels.

RECOMMENDATIONS AND FUTURE MONITORING

In summary, the second year of monitoring of the southern tarplant mitigation project is complete, activities are in compliance with the STMP, and second-year performance standards were exceeded. Based on the second annual monitoring survey, the southern tarplant mitigation site has no immediate or necessary maintenance issues that need to be addressed. However, weed abatement during the upcoming growing season will likely be required. Evidence of senesced tocolate (*Centaurea melitensis*), a common exotic annual of Southern California habitats, was observed in several of the mitigation plots. Along with other invasive plant species, it should be monitored and removed during the general growing season (December to June) to ensure that they do not increase in diversity and/or density.

The southern tarplant population is expected to continue to grow for the duration of the monitoring period, and it appears likely to continue after the mitigation period. As prescribed in the STMP, quarterly monitoring visits will be continued to oversee population establishment and provide necessary recommendations. Quantitative performance data will be collected during the annual monitoring visits to monitor southern tarplant abundance. Both quarterly monitoring and annual reports will include analysis of the qualitative performance data and discussions regarding the project's progress towards the southern tarplant and native vegetation sustainability at the mitigation site.

REFERENCES

- LAWA/UltraSystems/Endemic Environmental, April 2011a. Southern Tarplant (*Centromedia parryi* ssp. *australis*) Mitigation Plan.
- LAWA/UltraSystems/Endemic Environmental, April 2011b. Southern Tarplant (*Centromedia parryi* ssp. *australis*) 90-Days Establishment Report.
- LAWA/UltraSystems/Endemic Environmental, July 2011c. Southern Tarplant (*Centromedia parryi* ssp. *australis*) Quarterly Report.

APPENDIX A

Photo Documentation



Photo 1. Site 1a from NE corner



Photo 2. Site 1b from NW corner



Photo 3. Site 2 from NW



Photo 4. Site 3 from SE corner



Photo 5. Site 4a from SW corner



Photo 6. Site 4b from SE corner



Photo 7. Southern Tarplant from the site



Photo 8. Southern Tarplant from the site

APPENDIX B

Fall September 2012 Field Monitoring Logs

LAWA Southern Tarplant Annual Monitoring 2012



Site Location: LAX
 Date: 14 Sept 2012
 Time: 2:10
 Plot Number: 1A

Observers: BN PN
 Cloud Cover(%): 0
 Temperature(F): 84

General Site Conditions:

Dry low density of low growing vegetation

Qualitative Site Observations:

Item	Yes	No	Remedial Actions Needed
Trash Present	—	X	_____
Irrigation required	—	XX	_____
Vandalism	—	XX	_____
Photos Taken	X	—	_____
Herbivory Damage	—	X	_____
Are there Problem	—	X	_____
Weed species?	—	X	_____
So. Tarplant Present?	X	X	_____

Overall Southern Tarplant Conditions:

Description	Yes	No
Germinating	—	X
Seeding	—	XX
Senescence	—	XX
Flowering	—	X
Healthy	—	X
Disease	—	X
Wilting	—	X
Yellowing	—	X

Southern Tarplant Metrics

Quantity (# of individuals)	Estimated Density (Quan./m ²)	Estimated Density (Quan./Plot)
<u>0</u>		

LAWA Southern Tarplant Annual Monitoring | 2012

Observations/Recommendations

No recommendations at this time, may recommend mowing next winter.

LAWA Escort: Peggy Nguyen

Signature of Restoration Ecologist Present onsite

Printed Name of Restoration Ecologist Present onsite

Barry Nerhus
Barry Nerhus

For any questions, please contact:

Barry Nerhus, Jr.
Restoration Ecologist
President
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Cell: (714) 393-6249
Email: bnerhus@endemicenvironmental.net

LAWA Southern Tarplant Annual Monitoring | 2012



Site Location: LAX

Date: 14 Sept 2012

Time: 10

Plot Number: 1B

Observers: BN PN

Cloud Cover(%): 0

Temperature(F): 84

General Site Conditions:

Dry, very low density of growing vegetation.

Qualitative Site Observations:

Item	Yes	No	Remedial Actions Needed
Trash Present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Irrigation required	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Vandalism	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Photos Taken	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Herbivory Damage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are there Problem	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Weed species?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
So. Tarplant Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Overall Southern Tarplant Conditions:

Description	Yes	No
Germinating	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Seeding	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Senescence	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Flowering	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Healthy	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Disease	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Wilting	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Yellowing	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Southern Tarplant Metrics

Quantity (# of individuals)	Estimated Density (Quan./m ²)	Estimated Density (Quan./Plot)
<u> </u>		

LAWA Southern Tarplant Annual Monitoring | 2012

Observations/Recommendations

No recommendations at this time. Will probably
recommend mowing during the winter

LAWA Escort:

Peggy Nguyen

Signature of Restoration Ecologist Present onsite

Printed Name of Restoration Ecologist Present onsite

Barry

Barry Nerhus

For any questions, please contact:

Barry Nerhus, Jr.

Restoration Ecologist

President

Endemic Environmental Services, Inc.

Office: (714) 842-4328

Cell: (714) 393-6249

Email: bnerhus@endemicenvironmental.net

LAWA Southern Tarplant Annual Monitoring | 2012



Site Location: LAX
 Date: 14 Sept 2012
 Time: _____
 Plot Number: 2

Observers: BN PN
 Cloud Cover(%): 0
 Temperature(F): 85

General Site Conditions:

dry; no apparent issues due anthropogenic
activities relatively low activity

Qualitative Site Observations:

Item	Yes	No	Remedial Actions Needed
Trash Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Irrigation required	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Vandalism	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Photos Taken	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Herbivory Damage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are there Problem	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Weed species?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
So. Tarplant Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Overall Southern Tarplant Conditions:

Description	Yes	No
Germinating	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Seeding	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Senescence	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Flowering	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Healthy	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Disease	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Wilting	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Yellowing	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Southern Tarplant Metrics

Quantity (# of individuals)	Estimated Density (Quan./m ²)	Estimated Density (Quan./Plot)
<u>1</u>		

LAWA Southern Tarplant Annual Monitoring | 2012

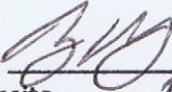
Observations/Recommendations

No recommendations at this time.

LAWA Escort:

Peggy Nguyen

Signature of Restoration Ecologist Present onsite



Printed Name of Restoration Ecologist Present onsite

Barry Nerhus

For any questions, please contact:

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LAWA Southern Tarplant Annual Monitoring | 2012



Site Location: LAX
 Date: 14 Sept 2012
 Time: 1030
 Plot Number: 3

Observers: BN AN
 Cloud Cover(%): 0
 Temperature(F): 84

General Site Conditions:

Dry, high weeds primarily Plantago lanceolata
and non-native grass

Qualitative Site Observations:

Item	Yes	No	Remedial Actions Needed
Trash Present	—	<input checked="" type="checkbox"/>	—
Irrigation required	—	<input checked="" type="checkbox"/>	—
Vandalism	—	<input checked="" type="checkbox"/>	—
Photos Taken	<input checked="" type="checkbox"/>	—	—
Herbivory Damage	—	<input checked="" type="checkbox"/>	—
Are there Problem	<input checked="" type="checkbox"/>	—	<u>possibly now later</u>
Weed species?	—	—	—
So. Tarplant Present?	<input checked="" type="checkbox"/>	—	—

Overall Southern Tarplant Conditions:

Description	Yes	No
Germinating	—	<input checked="" type="checkbox"/>
Seeding	<input checked="" type="checkbox"/>	—
Senescence	—	<input checked="" type="checkbox"/>
Flowering	<input checked="" type="checkbox"/>	—
Healthy	<input checked="" type="checkbox"/>	—
Disease	—	<input checked="" type="checkbox"/>
Wilting	—	<input checked="" type="checkbox"/>
Yellowing	—	<input checked="" type="checkbox"/>

Southern Tarplant Metrics

Quantity (# of individuals)	Estimated Density (Quan./m ²)	Estimated Density (Quan./Plot)
<u> </u>	<u>25</u>	
<u> </u>	<u>25</u>	
<u> </u>	<u>26</u>	
<u> </u>	<u>28</u>	
<u> </u>	<u>25</u>	
<u> </u>	<u>30</u>	
<u> </u>	<u>30</u>	
<u> </u>	<u>30</u>	
<u> </u>	<u>30</u>	
<u> </u>	<u>30</u>	
<u> </u>	<u>35</u>	
<u> </u>	<u>35</u>	
<u> </u>	<u>40+10</u>	

Endemic Environmental Services, Inc.

670

+13+7+25+18

LAWA Southern Tarplant Annual Monitoring | 2012



Site Location: 4A
 Date: 14 Sep 2012
 Time: 11:15
 Plot Number: 4A

Observers: BN PN
 Cloud Cover(%): 2
 Temperature(F): 85

General Site Conditions:

Low density PLA LAN, some non-native annual grass
No visible tarplant

Qualitative Site Observations:

Item	Yes	No	Remedial Actions Needed
Trash Present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Irrigation required	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Vandalism	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Photos Taken	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Herbivory Damage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are there Problem	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Weed species?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
So. Tarplant Present?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Overall Southern Tarplant Conditions:

Description	Yes	No
Germinating	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Seeding	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Senescence	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Flowering	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Healthy	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Disease	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Wilting	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Yellowing	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Southern Tarplant Metrics

(3)

Quantity (# of individuals)	Estimated Density (Quan./m ²)	Estimated Density (Quan./Plot)
<u>1/1</u>		

LAWA Southern Tarplant Annual Monitoring | 2012

Observations/Recommendations

Only 3 individuals, area is very dry. I attribute low SOTA abundance to infrequent rainfall during the winter.

LAWA Escort:

Peggy Nguyen

Signature of Restoration Ecologist Present onsite

Printed Name of Restoration Ecologist Present onsite



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LAWA Southern Tarplant Annual Monitoring | 2012



Site Location: BLA

Date: 14 Sept 2012

Time: 4:00

Plot Number: 46

Observers: BN PN

Cloud Cover(%): 0

Temperature(F): 85

General Site Conditions:

(Acacia Fennel) Two perennials that are moving in; No annuals growing in the site.

Qualitative Site Observations:

Item	Yes	No	Remedial Actions Needed
Trash Present	—	<input checked="" type="checkbox"/>	—
Irrigation required	—	<input checked="" type="checkbox"/>	—
Vandalism	—	<input checked="" type="checkbox"/>	—
Photos Taken	<input checked="" type="checkbox"/>	—	—
Herbivory Damage	—	<input checked="" type="checkbox"/>	—
Are there Problem	<input checked="" type="checkbox"/>	—	Acacia remove
Weed species?	—	—	—
So. Tarplant Present?	—	<input checked="" type="checkbox"/>	—

Overall Southern Tarplant Conditions:

Description	Yes	No
Germinating	<input checked="" type="checkbox"/>	—
Seeding	<input checked="" type="checkbox"/>	—
Senescence	<input checked="" type="checkbox"/>	—
Flowering	<input checked="" type="checkbox"/>	—
Healthy	<input checked="" type="checkbox"/>	—
Disease	<input checked="" type="checkbox"/>	—
Wilting	<input checked="" type="checkbox"/>	—
Yellowing	<input checked="" type="checkbox"/>	—

Southern Tarplant Metrics

Quantity (# of individuals)	Estimated Density (Quan./m ²)	Estimated Density (Quan./Plot)
—		

LAWA Southern Tarplant Annual Monitoring | 2012

Observations/Recommendations

The non-native perennials should be removed before
soil chemistry is altered.

LAWA Escort:

Peggy Nguyen

Signature of Restoration Ecologist Present onsite

Printed Name of Restoration Ecologist Present onsite

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APPENDIX F

Final El Segundo Blue Butterfly 2012 Report for Los Angeles International Airport

**REPORT
LOS ANGELES INTERNATIONAL AIRPORT
EL SEGUNDO BLUE BUTTERFLY
2012**



**Entomological Consulting Services, Ltd.
Richard A. Arnold, Ph.D.**

REPORT OF EL SEGUNDO BLUE BUTTERFLY

MONITORING ACTIVITIES IN 2012 AT THE

LOS ANGELES INTERNATIONAL AIRPORT

Conducted under USFWS Permit
PRT-797233 issued to Richard A. Arnold, Ph.D.

Prepared for:
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Denver, CO 90224

and

Environmental Management Division
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and

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Final Report:
December 2012

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SECTION 1 INTRODUCTION

This report describes the findings of monitoring surveys for the federally-listed, endangered El Segundo Blue (ESB) butterfly (*Euphilotes battoides allyni*) and its foodplant, Coast Buckwheat (*Eriogonum parvifolium*) that occurred in May through August 2012, at the Los Angeles International Airport (LAX). All activities described in this report were conducted under the auspices of a recovery permit issued by the U.S. Fish & Wildlife Service to Richard Arnold, Ph.D., President of Entomological Consulting Services, Ltd.

During the ESB's adult flight season in 2012, the following butterfly and habitat monitoring activities were performed at LAX:

- a) Three surveys were conducted in May and early June to check on the flowering status of the ESB's food plant, Coast Buckwheat and estimate the start of the butterfly's flight season;
- b) 13 counts of ESB adults were conducted along the historical transect route;
- c) a single block count of ESB adults throughout the entire dune preserve area was conducted at the peak of the butterfly's 2012 flight season;
- d) a seasonal population estimate was calculated for the entire 2011 flight season of the ESB and throughout the entire 202.8-acre LAX preserve; and
- e) the buckwheat food plant of the butterfly was mapped and flowerhead numbers tallied for the entire historical transect route (1.5 miles) and 126 randomly placed transects (10.1 miles) in the blocks.

The remainder of this report describes the LAX study site, plus the 2012 ESB monitoring activities and findings. The 2012 monitoring results are compared to findings from previous years to discern year-to-year trends in the ESB population numbers plus buckwheat plant and flowerhead numbers at LAX, as well as to identify habitat management actions.

In addition, 325 seedlings of Coast Buckwheat, the sole larval food plant and primary adult nectar plant for the ESB, were outplanted during November of 2011 at LAX. This report provides details on the survival of these buckwheat plants as of August 24, 2012.

SECTION 2

LAX STUDY SITE

2.1 Site Description.

The LAX dunes comprise a 307.1-acre site located west of the runways and terminals at the Los Angeles International Airport. These dunes are generally bounded by Waterview St. on the north, Imperial Highway on the south, Pershing Blvd. on the east and Vista Del Mar on the west. The southern approximately 202.8 acres of the LAX dunes comprises the preserve, which was designated the El Segundo Blue Butterfly Habitat Restoration Area (hereafter, Habitat Restoration Area, study area, or preserve) in 1987. Approximately 104.3 acres of undeveloped, but degraded dunes lie immediately north of the Habitat Restoration Area. The Habitat Restoration Area, where the 2011 studies of the ESB and its habitat were focused, is depicted in Figure 1 on the Venice 7.5' quadrangle U.S. Geological Survey topographic map (Range 15 West, Township 3, South).

Weather conditions at LAX are characterized by a Mediterranean climate as is typical of coastal areas in Southern California. The summer temperatures are warmest between June and October, with daily high temperatures typically between 75 and 85°F. Winter, spring, and fall temperatures are generally mild, with a daytime high in the 70s F and nightly low in the 50s F. The rainy season is measured between July 1 and June 30 and the annual, average rainfall totals 12 inches.

Predominant dune landforms that remain today at LAX include foredunes, backdunes, and deflation plain. Strand and bluff landforms were formerly located where Dockweiler Beach State Park is now located, immediately west of LAX dunes (Figure 1). There are approximately 210.2 acres of foredunes, 24.4 acres of backdune, and 34 acres of deflation plain. In addition to the dune communities, there are also 23 acres of non-dune soil type and about 15.5 acres of developed or heavily disturbed areas. Approximately 38.6 acres of roads overlay on these habitats, which remain from the former residential community that was razed during 1966-1972, and buildings and other structures that are used for current airport operations. The historical transect route (Figure 2), which is walked repeatedly throughout the ESB's flight season to document the timing and abundance of the butterfly, includes portions of the foredunes and backdunes, as well as the edge of the deflation plain.

Figure 3 illustrates the various subsites, based upon former residential blocks and located within the Habitat Restoration Area, that were used for the ESB's annual block count. The blocks vary in size as delineated by the existing streets in the central and northern portions, or by natural landmarks in the southern and eastern portions of the Habitat Restoration Area. These pre-existing polygons or "blocks" were used as the sampling areas for the ESB block count. Blocks to the north and northwest of the Habitat Restoration Area are also checked annually during the block count, but the ESB and its food plant have not been observed outside of the preserve portion of the LAX dunes for many years. In addition, buckwheat monitoring was performed along 126 transects that were randomly located throughout the blocks, as illustrated in Figure 4.

2.2 Plant Communities.

Because of the former residential neighborhood, movement of sand to uplift the current VOR site (VHF Omnidirectional Range navigational system for the airplanes), former sand mining activities, and the construction of roads around the periphery of the dunes, most of the dunes have been disturbed to some degree. The disturbance is reflected in the mixture of native plant communities and various weeds and exotics that now grow at the dunes. During the past couple of decades, habitat restoration activities have resulted in the removal of various non-native plant species, (see earlier monitoring reports prepared by Dr. Rudi Mattoni) in portions of the dunes and some plantings of native species, primarily Coast Buckwheat, to improve habitat quality. However, the weeds continue to colonize and now dominate in portions of the dunes.

Native plant communities at the LAX dunes include southern foredune, southern dune scrub, and valley needlegrass grassland. The southern foredune community is found on the foredunes, the southern dune scrub on the backdunes, and the valley needlegrass grassland (or prairie) on the deflation plain. Coast Buckwheat, also sometimes referred to as Seacliff or Dune buckwheat, is the sole larval and primary adult food plant of the ESB and grows primarily in the foredune and backdune portions of the preserve, although a few individuals can be found in portions of the valley needlegrass grassland.

The southern foredune plant community is dominated by perennials with a high proportion of shrubs and sub-shrubs. Characteristic species of the southern foredune plant community include: Coast Buckwheat (*Eriogonum parvifolium*), Bush Lupine (*Lupinus chamissonis*), Coast Goldenbush (*Ericameria ericoides*), Beach Evening Primrose (*Camissonia chieranthifolia*), Dune Wallflower (*Erysimum suffrutescens*), Beach Sand Verbena (*Abronia umbellata*), and Beach Bur (*Ambrosia chamissonis*). The southern dune scrub plant community consists of a coastal scrub community of shrubs and sub-shrubs characterized by most of the aforementioned taxa. One of the main differences between these two communities is the degree of plant cover, as the southern foredune is generally characterized by sparser vegetative cover than the dense vegetative growth characteristic of southern dune scrub plant communities. At the LAX dunes, the distinction between these two plant communities is also blurred due to the infusion of various non-native weeds and grasses that have colonized the formerly more open portions of the dunes.

The valley needlegrass grassland community is now almost completely absent at the LAX dunes due to grading for the construction of Pershing Boulevard, and subsequent invasion of exotics and annual grasses that now dominate in portions of the dunes where the valley needlegrass grassland formerly occurred. Under more natural conditions, this prairie would be dominated by bunchgrasses, primarily, Purple Needle Grass (*Nassella cernua*), a mixture of herbaceous flowers and shrubs, including California Encelia (*Encelia californica*), Lewis' Evening Primrose (*Camissonia lewisii*), Deerweed (*Lotus scoparius*), and Bush Lupine. Today the dominant grasses are introduced species, including Ripgut Brome (*Bromus diandrus*), Bermuda Grass (*Cynodon dactylon*), and Veldt Grass (*Ehrharta* sp.).

2.3 Coast Buckwheat

Eriogonum parvifolium serves as both the larval and primary adult food plant of the ESB. It is a perennial shrub (also sometimes referred to as a subshrub) that grows in sand dunes, coastal scrub, coastal strand, and on coastal bluffs between San Diego and Monterey counties. When full grown, it is characterized by loosely branched, decumbent stems that may get as tall as about three feet, or in windblown areas may be prostrate. The stems terminate in one or more white flowerheads, about the size of a small cotton ball, which contain numerous individual flowers.

Arnold (unpublished data) has followed the growth and survivorship of individual Coast Buckwheat plants at the nearby Chevron Refinery in El Segundo since 1977. Individual buckwheat plants commonly live 25-30 years and exhibit five growth stages: seedling, juvenile, mature, senescent, and dead. Seedlings spend most of their energy developing a deep root system, so few if any flowerheads are produced during the first couple years of life. Juvenile plants are small statured, but the number of flowerheads and branches increase rapidly with each year's growth. The seedling and juvenile stages are apparent during the first 4-7 years of life, with plants in sheltered portions of the dunes growing faster than those in windy locations. The buckwheat's mature stage typically refers to the "middle-aged" years of the plant's lifespan and is characterized by hundreds and often thousands flowerheads. This is the life stage of greatest value to the ESB since both its larval and adult life stages feed on the flowers. In its later years, flowerhead numbers decline on an aging or senescent buckwheat plant as it directs most of its energy into just surviving. Dead plants do not have any flowerheads.

2.4 El Segundo Blue Butterfly

The El Segundo Blue was recognized as an endangered species by the US Fish & Wildlife Service in 1976. It is a small butterfly, whose wingspan is about one inch. Uppersides of the males' wings are blue, while those of females are brownish-gray (see report cover). Background color of the undersides of the wings in both sexes are light gray, with numerous black irregularly shaped markings and a row of orange markings near the outer margin of the hind wings.

At the time of its recognition as endangered, the butterfly was only known from the Chevron refinery in El Segundo and at LAX. Both of these sites are remnant populations that occur on the formerly more extensive El Segundo Sand Dunes, which ranged from Playa del Rey south to the Malaga Cove area at the northern end of the Palos Verdes Peninsula. Subsequent surveys have found the butterfly at a few coastal bluff locations on the Palos Verdes Peninsula, a sand dune remnant at the Ballona Wetlands, and most recently in Santa Barbara County in both coast sage scrub and sand dune habitats. Recent sand dune habitat restoration efforts in Redondo Beach and at Dockweiler State Beach have successfully attracted ESBs that colonized these new habitat locations.

At all locations the ESB larvae feed on the flowerheads of *Eriogonum parvifolium*. The flowers of this plant also serve as the primary nectar source for adults. This dual dependence of both larvae and adults on the flowers of its buckwheat host is

somewhat unusual among butterflies. Most butterflies feed as larvae on one or a few closely related plants, and then as adults on several flowers that are generally not related to the larval food plant.

The adult flight season generally occurs between about mid-June through late August, although there is annual variation in the starting and ending times of the flight season, as well as, its duration. On average, individual adults generally live less than a week under field conditions. During this time, they mate and females lay eggs in the flowerheads of the buckwheat. About one week later, the caterpillar (or larva) emerges and begins feeding on the buckwheat. As it grows in size, it molts four times during about a one month period. When the larva is full grown it pupates. The pupal stage lasts until the next summer, when the next generation of the adult butterfly emerges.

SECTION 3 METHODS

3.1 Historical Transect Survey

Dr. Rudi Mattoni established a transect route that has been used for monitoring the El Segundo Blue butterfly at the airport since 1984. Mattoni (1990, Figure 11), in his summary report on the ESB at LAX, illustrated his transect as a nearly continuous route that is very similar to the route followed since 1996 at LAX. Mattoni et al. (2001, Figure 1) illustrated his route as five, discrete transects, which did not survey all habitat along the transect route, including some areas supporting significant stands of buckwheat (e.g., Block 9) situated between the boundaries of these transects. The route used for the historical transect surveys conducted since 1996 follows the nearly continuous route originally established in 1984 and is illustrated in Figure 2.

During the 2012 ESB flight season, the historical transect route was surveyed on 13 days between June 16th and August 24th. Additional specific survey dates included June 22 and 29, July 5, 13, 17, 19, 21, and 26, plus August 3, 11, 17, and 24. Richard Arnold conducted all transect counts during 2012.

The historical transect route (Figure 2) meanders approximately 1.3 miles through a portion of the foredunes that lie immediately west of the VOR facility, and along the top and toe of the backdunes in the southern and eastern portions of the Habitat Restoration Area. The backdune portion of the transect begins east of the VOR and meanders north, generally parallel to Pershing Blvd. to the entrance road (Century Blvd.) of the Habitat Restoration Area. The historical transect route traverses sectors of the Habitat Restoration Area where the ESB's food plant, *Eriogonum parvifolium*, was abundant and thriving in prior years, areas where the food plant is currently abundant, some hillside areas where natural regeneration has occurred, areas where non-natives have been removed, areas where non-natives still need to be removed, and portions of the dune preserve where restoration activities have occurred in prior years.

Beginning in 1996, the beginning, ending, and intermediate points along the historical transect route were marked by stakes (Interval Posts in Figure 2) in the field with unique alphanumeric identifiers. During 2002, the stakes were remarked, due to loss of the older identification tags, with pre-numbered, aluminum tags to facilitate the identity of interval boundaries. The distance between two consecutive stakes along the transect route is referred to as an interval. There are 35 intervals in the entire transect route (Figure 2), which vary in length from about 65 to 837 feet (Table 1). The intervals vary in length because the beginning and ending points of each interval are located where there are changes in the vegetation, changes in topographic relief, and man-made features, all of which are used to identify the transect route in the field (Figure 2). Table 1 provides the length of every interval of the historical transect route and the total transect length, which equals 7,114 feet. A Trimble XR Pro global positioning system (GPS), with real-time submeter precision, was used to obtain positional information using Universal Trans Mercator (UTM) geographic coordinates (a world-wide coordinate system based on the metric system of measurement and similar to latitude and longitude) for every stake along the entire route of the historical transect during 2002. These

coordinates were differentially corrected via post-processing to improve the accuracy of the positional readings. Data collected with the GPS were transferred to a geographic information system, ArcGIS from software developer ESRI, to measure interval lengths.

As an observer walks the historical transect from beginning to end (i.e., intervals #1 to #35), the numbers of adult ESBs that are observed along the route within 10 feet on either side of the transect centerline are counted. Tallies are recorded as males or females when diagnostic characteristics are clearly observed, and as undetermined sex when sexual characteristics cannot be observed. No ESBs are captured or otherwise handled. The locations of observed adults are noted by obtaining positional coordinates using a GPS unit.

A Kestrel 2000 Pocket Thermo Wind Meter was used to measure air temperature and wind speed during all butterfly counts. Cloud cover was also noted during the counts. All transect counts occurred when weather conditions were suitable for ESB activity, usually greater than 68° F and winds less than 5 mph, and as evidenced by ESB adults and other butterflies being active at the times of the transect counts.

3.2 Block Count Survey

When the historical transect was initiated in 1984, the distribution of *Eriogonum parvifolium* at LAX was restricted primarily to the backdunes along the transect route and in the foredunes west of the VOR facility. However, due to restoration efforts in the early 1990's, *E. parvifolium* now grows in portions of the foredunes where the residential neighborhood once existed. Since the historical transect route did not include most portions of the Habitat Restoration Area where buckwheat propagation activities were undertaken, an alternative survey method was necessary to monitor the ESB in these areas. Starting in 1996, and annually thereafter, block count surveys have been utilized in addition to the historical transect survey to monitor the ESB population throughout the entire 200-acre Habitat Restoration Area.

ESB counts were conducted in 86 blocks, which collectively comprise the entire LAX dunes, during the butterfly's 2012 flight season. The blocks are numbers 1-60, although some blocks are divided into an east and west or north and south blocks, which results in the 86 total blocks. Only the blocks within the Habitat Restoration Area, where Coast Buckwheat grows, are illustrated in Figure 3. These include blocks #1 through #45, and #49 through #52. The remaining blocks lie north of the Habitat Restoration Area and include blocks #46 through #48, and #53 through #60.

During the block count, all blocks are visited once during the flight season within a period of a few days. The visit is timed to coincide with the approximate peak of the ESB's flight season. In 2012, these counts were performed between July 18th and 21st by Richard Arnold. Using the information gathered from the counts along the historical transect route, the timing of the approximate peak of the ESB flight season can be estimated while the flight season is in progress by examining the trend in the numbers of butterflies observed on the transect counts and the sex ratio of males to females.

Each block is uniquely identified and is delineated by either the streets or, as in

the southern and eastern portions of the LAX dunes, by natural or topographic features with the boundaries marked by stakes (Figure 3). During the block count, the observer systematically surveys all portions of a particular block and visits every buckwheat plant only once, while looking for ESB adults. As adults are observed, their numbers were tallied and their locations were mapped using a handheld, WAAS-enabled GPS manufactured by Trimble (GeoExplorer 6000). Tallies were recorded as males or females when diagnostic characteristics could be observed. Tallies were recorded as undetermined sex when sexual characteristics could not be readily observed, or in a few cases, when butterflies were so abundant at a single plant that individuals could not be tracked to reliably sex all individuals. No ESBs are captured or otherwise handled. When possible, behaviors were also noted. All 86 blocks were surveyed in five days using one observer on each survey day.

The data dictionary of the GPS was programmed to store all butterfly observations for every block as well as the associated behaviors. The GPS was used to obtain a positional fix for the location of every observation, which may include more than one butterfly. Data files were downloaded from the GPS unit to a laptop computer at the end of each survey day. During post-processing, the coordinates were differentially corrected to improve the positional accuracy. After completion of the field survey portion of the block counts, the coordinates and other butterfly data were transferred to a data base to facilitate the analysis of the block count data, and to link the data file to a geographic information system to prepare maps of the findings for this report.

Under ideal circumstances, all 86 blocks in the preserve would be simultaneously inventoried and the counts of observed ESB adults would represent a census (i.e., a complete count of all individuals) of the butterfly population at that time. This approach would minimize the chance of counting the same individual more than once during the census, which could result in inflated census counts. Using this approach, the ESB population could be considered demographically and geographically closed, because the sampling period is short enough that no births, deaths, immigration, or emigration occurs.

Since 86 qualified and permitted surveyors were not available to conduct the counts of the 86 blocks simultaneously, the counts were performed over a 5-day period in 2012 (4 days for the ESB occupied blocks in the Habitat Restoration Area and a fifth day for the unoccupied blocks outside of the Habitat Restoration Area). Because the butterflies were not marked, it is possible that some individuals were counted more than once during the census effort as the butterflies dispersed from one location to another within the dunes. Similarly, because the count occurred over a 4-day period, some unknown quantity of births and deaths occurred during this period, thus the ESB population is considered open during the block count. Also, it is possible that some unknown number of butterflies dispersed from the LAX dunes during the census period and were not detected.

Despite these limitations, the block count remains a very valuable method of estimating the overall ESB population as well as assessing the butterfly's distribution and relative abundance throughout the entire Habitat Restoration Area. The results of the block count surveys from different years are compared to evaluate the stability of the ESB

population, document its fluctuations and detect any trends, and to provide insight for maintenance, monitoring, and restoration recommendations that will benefit the ESB and LAX dunes.

3.3 Seasonal Population Estimate for the ESB.

After the 1998 monitoring report was submitted, Dr. Andrew Huang, formerly of LAX but now retired, developed a mathematical methodology to calculate a seasonal population estimate for the ESB within the detection area of the historical transect route. This value, in conjunction with the tallies of the block count and information from prior capture-recapture studies¹ of the ESB (Arnold 1983 and 1986), were then used to extrapolate a seasonal population estimate for the entire LAX dune preserve. These methods are briefly summarized in the remainder of this section, but are explained in greater detail in Dr. Huang's memo (1998). Although Dr. Huang's methodology has not been published yet, it has been informally reviewed by insect population biologists at Yale University and the University of California, Davis, and a statistical ecologist at Stanford University (Arnold, personal communication).

Monitoring observations and the transect counts establish the starting and ending dates of the ESB's flight season, plus the magnitude and shape of the seasonal population curve. When the transect counts are plotted against the flight day, the seasonal population curve of ESB adult numbers closely tracks a normal bell shape or Gaussian curve, which can be described mathematically.

On any particular day of the ESB's flight season, the butterfly population consists of individuals that emerged earlier that same day, as well as individuals that emerged on prior days and survived to the present day. Similarly, the butterflies observed on the day of each transect count are comprised of individuals that just emerged and survivors from previous days. Estimated residence rates for the ESB at the Chevron refinery in El Segundo and at LAX were derived from prior capture-recapture studies of the ESB (Arnold 1983 and 1986). These capture-recapture studies also revealed that the maximum residence for ESB adults in the field is six days, even though the maximum observed adult life span under lab conditions is about 14 days (Mattoni 1992). The shorter lifespan in the field is due to mortality from predation and inclement weather conditions (i.e., foggy days or cool temperatures that can prevent cold-blooded ESB adults from warming up sufficiently and limit their activity).

Thus, mathematically the transect survey count for the butterflies, $P(x)$, on any particular survey date within the ESB's flight season can be expressed as:

¹ Capture-recapture (also sometimes referred to as "capture-mark-recapture" or "mark-release-recapture") is a technique for estimating the population density and other population parameters, such a birth and death rates, and dispersal for mobile animals. A sample of the population is captured, marked, and released and marked individuals are subsequently recaptured. Various statistical models have been devised to estimate population numbers and other population parameters for each sampling period.

$$P(x) = P_1(x) + P_2(x) + P_3(x) + P_4(x) + P_5(x) + P_6(x) \quad (1)$$

where x is the flight day of the survey. $P_1(x)$, $P_2(x)$, $P_3(x)$, $P_4(x)$, $P_5(x)$, and $P_6(x)$, are the butterflies that just emerged, and those who survived from two, three, four, five and six days ago, respectively. $P_1(x) > P_2(x) > P_3(x) > P_4(x) > P_5(x) > P_6(x)$, as fewer and fewer butterflies are left in each successive day, as demonstrated by the capture-recapture studies (Arnold 1983 and 1986).

The rate of mortality for a population can be expressed mathematically by the following equation from Pianka (1988):

$$dN/dt = -a N \quad (2)$$

This commonly accepted model assumes that the rate of decrease in a population is proportional to the number of individuals within that population. Using equation (2) and the fact that the ESB lives only 4 to 6 days under field conditions, the remaining butterflies for each successive day after the first day of emergence can be described mathematically as:

$$N = N_0 \exp(-a(t-1)) \quad 2 \leq t \leq 6 \quad (3)$$

$$= 0 \quad 6 < t$$

where t is in days and N_0 is the number of butterflies emerging on day one.

Assuming that at the end of day four, only 5% of the original butterflies that emerged 4 days earlier still remained, then the value of " a " in the above equation can be shown to be 0.998. Substituting this value and evaluating equation (3) for day 2, 3, 4, 5 and 6, we have mathematically

$$P(x) = 1.00 P_1(x) + 0.37 P_1(x) + 0.14 P_1(x) + 0.05 P_1(x) + 0.02 P_1(x) + 0.01 P_1(x) \quad (4a)$$

or

$$P(x) = 1.59 P_1(x) \quad (4b)$$

Equation 4b suggests that on any day of the transect survey, the actual number of emerging butterflies is the total number counted divided by 1.59, as suggested by Huang's mathematical derivation, or 1.66 as indicated by field results. Either number can be used since they are close in value. In this report, both values are used to provide a range of seasonal population estimates for the ESB at LAX. A capture-recapture study at the Chevron preserve for the ESB indicates that this factor may be as low as 1.21 (Arnold 1986).

For the entire flight season, the total ESB population size is the number of newly

emerged butterflies on each day added over the total days of the flight season. This summation is equivalent to integrating $P_1(x)$, the population distribution function, over the total number of flight days. Mathematically, it is described by:

$$\text{Total seasonal count} = \int P_1(x) dx \quad (5)$$

Equation (5) can be assessed from the field count data by using equation (4b), in which we have

$$\text{Total seasonal count} = \int P_1(x) dx = \int P(x) dx / 1.59 \quad (6)$$

To calculate a seasonal population estimate for the entire dunes, the first step is to determine the number of butterflies for the entire flight season for the transect acreage alone. This is mathematically equivalent to evaluating the right side of equation (6). The integral $\int P(x) dx$ is simply the area under the Gaussian curve that illustrates the ESB seasonal population numbers based on the transect counts. Huang (1998) described two methods to solve this integral; using a trapezoidal numerical approximation method and a best-fitted Gaussian curve integration method. Both methods yield similar solutions. In this report, the 2012 ESB transect survey data, in conjunction with the trapezoidal numerical approximation method, were used to estimate the total seasonal population number of ESB for the transect route in 2012.

After establishing the total seasonal ESB population number for the historical transect, this number is scaled up proportionately to estimate the seasonal population number for the entire 200-acre, Habitat Restoration Area. Since the block count data were obtained during or close to the peak flight period of the ESB, the scaling factor is simply the ratio of the block count to the transect peak value. Thus, the ESB seasonal count for the entire LAX dunes is obtained by multiplying the total seasonal population number of the transect survey by this scaling factor.

3.4 Buckwheat Monitoring.

Monitoring of the ESB at LAX during the past several years has revealed that population numbers of the ESB fluctuate dramatically from year-to-year. A variety of factors affect population numbers of the butterfly, including seasonal weather conditions, levels of parasitism, disease, and predation, plus abundance of its sole larval and primary adult food plant, Coast Buckwheat.

Arnold (1985) demonstrated the positive correlation that exists between buckwheat plant and flowerhead numbers with ESB numbers based on his studies performed at the nearby Chevron refinery in El Segundo. Arnold and Goins (1987) further elaborated upon this relationship. Since information on the numbers of buckwheat plants and flowerheads can provide insight as to why ESB numbers increase or decrease annually, monitoring of the buckwheat was initiated in 2002 and has been

performed annually since. At LAX the 2012 inventories of buckwheat plant numbers, age classes, and flowerhead numbers were obtained for:

- a) the entire length of the historical transect route; and
- b) 126 transects laid in other portions of the Habitat Restoration Area (i.e., outside of the historical transect route).

Lengths of the 35 intervals of the historical transect route are presented in Table 1, while the lengths of the 126 transects are presented in Table 2. Buckwheats were inventoried along the entire 1.3-mile length of the historical transect. The 126 other transects collectively measure 10.1 miles in total length. Results of the 2012 buckwheat monitoring efforts are compared to those of prior years for the historical transect and the block transects to identify any trends.

For both buckwheat monitoring activities, a Trimble Ranger GPS with real-time submeter precision was used to map the locations of buckwheat plants. A laser rangefinder, the bluetooth TruPulse model of Laser Technology, Inc., was used with the GPS to obtain the positional coordinates for every buckwheat so the operator did not have to stand next to each plant with the GPS antenna, which could have damaged the buckwheat or life stages of the ESB. The positional information for all buckwheats was differentially corrected during post-processing to improve the accuracy of all positional fixes.

All buckwheats growing within the 20-foot wide corridor of the historical transect route were mapped using the GPS and laser rangefinder. In addition, the age class (seedling, juvenile, mature, or senescent) and number of flowerheads for every buckwheat plant was also recorded and later transferred to a data base to perform various summary statistics and to link the information to the GIS to summarize the findings in a series of maps.

3.5 Relationship Between Rainfall, Buckwheat Flowerheads and ESB Numbers.

The relationships between annual rainfall, the annual number of buckwheat flowerheads, and annual numbers of ESB adults observed during the block counts was examined using linear regression analysis. Regression analysis is a statistical method used for testing hypotheses about the relationships between two variables, which can also be used for prediction or estimation purposes. The results of regression analyses are equations that show the mathematical relationship between the dependent variables (in this case the annual number of flowerheads and ESB adults) and the independent or explanatory variable (in this case rainfall and number of flowerheads). Thus the linear regression equations are used to estimate the numbers of flowerheads and butterflies one could “expect” to observe this year. For comparative purposes, two different sets of regression equations are utilized, one using data from 2002 through 2011 and the second using data from 2002 through 2012.

SECTION 4

RESULTS AND DISCUSSION

4.1 Timing and Length of the ESB's 2012 Flight Season.

The first adults of ESB at LAX in 2012 were observed on June 16th. This date is six days later than the first ESB observation of 2011 (Arnold 2012). Four, very worn butterflies were observed during a historical transect count that was performed on August 24th, and based on their physical condition are presumed to have died on that date. Thus, the butterfly's flight season was at least 70 days during 2012 or approximately 10 weeks in duration. In prior years, the ESB flight season has ranged from 64-76 days in length (Arnold 1997, 1998, 1999, 2001, 2002, 2003, 2004, 2005a, 2007a, 2007b, 2009, 2010, 2011, 2012, plus Arnold and Rios 2000). Thus the timing and duration of the ESB's 2012 flight season was very comparable to that of most recent years.

4.2 Historical Transect Survey.

A total of 2,731 adult ESBs were observed on the 13 survey dates in 2012, including 1,809 males and 922 females. The seasonal total applies to only the detection area of the transect route, which measures approximately 20 ft. x 7,114 ft. or 3.3 acres, rather than to the entire dune preserve. Table 3 summarizes the total numbers (males + females) of ESB adults observed by survey date. The transect counts suggest that the seasonal population peak occurred on July 19th, when 404 butterflies were observed. Observed ESB numbers per interval of the historical transect throughout the 2012 flight season ranged from 0 in 5 intervals to 316 within interval #34 (Table 3).

Table 4 summarizes the annual ESB counts for the historical transect at LAX for the years 1984 through 2012. The historical transect counts have been performed annually since 1984, except for 1985 when no counts were undertaken. As depicted in Table 4, the 2011 seasonal tally of 4,690 ESB adults was the highest seasonal total observed. The 2012 ESB seasonal total is approximately 42% less than the 2011 seasonal total. Nonetheless, the 2012 seasonal total was well above the 28-year average seasonal total of 1,725 adults.

4.3 Block Count Survey.

In 2012, a total of 4,061 adult ESBs were observed during the block count, including 2,566 males and 1,495 females (Table 5). Each block, as illustrated on the attached map of the LAX dunes (Figure 3), was visited only once during the period July 18th – 21st. Table 5 summarizes the numbers of ESBs that were observed in every block during 2012.

Figure 5 is a map that illustrates the location of every ESB adult noted during the 2012 block count. Behaviors of adult ESBs observed during the block counts are also summarized in Table 5 for each block where butterflies were seen. The vast majority of individuals (77.0%) were observed flying, while smaller percentages of individuals exhibited perching (7.9%), basking (6.2%), courtship (2.0%), mating (1.1%), feeding (i.e., for nectar, 5.7%), or oviposition (0.1%) behaviors. These percentages are comparable to the observed frequencies of these behaviors in prior monitoring years.

Within the approximately 200-acre Habitat Restoration Area, tallies of the numbers of ESB adults observed during the 2012 block count ranged from zero individuals in 6 blocks to 339 individuals in block #38N. Outside of the Habitat Restoration Area (blocks #46 - #48 and #53 - #60), no ESBs were observed.

Annual block count data presented in Table 6 indicates that during the 17-year period, 1996-2012, ESB adults were generally found in the same blocks in all years and most blocks exhibited similar trends in population numbers during this period. Results of the block counts indicate that ESB population numbers declined about 24% in 2012 compared to 2011 (Table 7).

4.4 Seasonal Population Estimate for the ESB.

Using the trapezoidal numerical integration method, the 2012 seasonal population estimate for the ESB throughout the entire Habitat Restoration Area at LAX was 83,943 to 87,639 individuals (Table 8). These seasonal estimates indicate that ESB population numbers decreased about 30% in 2012 compared to the seasonal population estimates for 2011 (Arnold 2012).

4.5 Year-to-Year ESB Population Trends.

All three population estimation techniques, the historical transect counts (42%), the block count (24%), and the seasonal population estimate (30%), indicate that the ESB numbers decreased in 2012 compared to 2011. Table 8 summarizes the seasonal population estimates for the ESB for the years 1998 through 2012. During this 15-year period, estimated seasonal population numbers have fluctuated from a low of 36,624 in 1999 to 142,727 in 2006, a factor of 3.9 times.

Declines and increases of this magnitude are not unusual among insects, especially those that have only a single generation per year, such as the ESB. Indeed, several moths that are routinely monitored because they are forest pests, can exhibit a 10-fold increase in population numbers within a few generations (i.e., an outbreak) or may decline just as rapidly (Varley, Gradwell, and Hassell 1974). Factors such as seasonal weather conditions, increased parasitism and predation, a higher incidence of disease, or a decline in food plant numbers (or flowerhead numbers in the case of the ESB), may individually or collectively affect population numbers.

One factor that influences annual ESB population numbers is rainfall, which in turn influences flower production of the Coast Buckwheat. Table 9 presents annual rainfall totals, measured between July 1 and June 30, for the years 1996 through 2012. During this period the average annual rainfall was 12.25 inches, with a low of 2.63 inches in 2007 and a high of 31.28 inches in 1998. During this same period, annual ESB numbers, as measured during the block counts, ranged from 2,093 to 5,675 individuals. The graph associated with Table 9 illustrates the correlation between ESB numbers and annual rainfall during this 15-year period.

During this monitoring program, dramatic fluctuations in ESB population numbers have been witnessed even between consecutive generations of the butterfly. For example, ESB numbers nearly doubled between 1996 and 1998, between 2002 and 2003,

and between 2004 and 2005. In contrast, substantial declines have also been observed. For example, there was an approximate 50% decline between 1998 and 1999, between 2001 and 2002, between 2003 and 2004, as well as the 68% decline between 2006 and 2007. These dramatic increases and decreases in annual numbers are likely within the “normal” range of population fluctuations for the ESB. Even though population data on the butterfly have now been collected in a consistent manner for the past several years, statisticians would insist that another 15-20 years may be needed to evaluate the full range of normal variation on annual population numbers. Because of the unusual weather conditions that the Los Angeles area experienced in the past few years, the extremes in fluctuations of ESB numbers may have already been observed, even within this relatively short period of time.

4.6 Buckwheat Monitoring and Trends.

Figure 6 illustrates the locations of Coast Buckwheat plants that grew within the historical transect route in 2012. It also summarizes the numbers of plants and flowerheads in each of the 35 intervals. Four intervals supported no buckwheat plants, 13 intervals supported between 1 and 10 plants, 11 intervals supported between 11 and 20 plants, 2 intervals supported between 21 and 30 plants, 3 intervals supported between 31 and 40 plants, 0 intervals supported between 41 and 50 plants or between 51 and 60 plants, and 2 intervals had between 61 and 90 plants.

Table 10 provides a breakdown of the buckwheat age classes (seedling, juvenile, mature, and senescent) that were observed in every interval along the historical transect route in 2012. Survey results indicated that approximately 68.6% of the buckwheats were mature plants, while 22.4% were senescent, 7.5% were juveniles, and 1.3% were seedlings.

A total of 544 Coast Buckwheat plants grew within the historical transect route during 2012, which represents a 1.2% decrease in plant numbers between 2011 and 2012 (Table 11). These plants produced an estimated total of 876,983 flowerheads in 2012, which represents a 5% decrease from the 2011 tally. The number of flowerheads in a particular transect interval ranged from 0 (4 intervals) to 389,170 (Figure 6). As in recent past years, five transect intervals, #30, #31, #33, #34, and #35 accounted for approximately 87% of the buckwheat flowerheads observed along the entire historical transect route in 2012.

As detailed in Table 11, buckwheat plant numbers along the historical transect exhibited a net decline of 28% (692 to 501) between 2002 and 2008, but increased to 552 in 2011. Even though plant numbers declined, the average numbers of flowerheads of mature buckwheats doubled between 2002 and 2006, but declined 49% in 2007 (a drought year) to return to the 2002 level (Table 12). Because of the drought of 2007 (Table 9), total flowerhead biomass declined 80% between 2007 and 2006. Fortunately, rainfall during the winter of 2007- 2008 was nearer normal levels and the average flowerhead numbers doubled in 2008 compared to 2007 (Table 12). Between 2008 and 2009, rainfall was below average, but again near normal, and average flowerhead numbers more than doubled, increasing 61% (Table 12). Precipitation totals were normal during the 2009-2010 rainy season, so flowerhead numbers remained high in 2010.

Higher than normal precipitation during the 2010-2011 rainy season enabled flowerhead numbers to continue to increase in 2011. Precipitation during the 2011-2012 rainy season was only about 63% of normal, so not surprisingly, the average number of flowerhead numbers dropped slightly.

Arnold (1985) described the strong positive correlation between buckwheat plant numbers, flowerhead numbers, and ESB adults. Table 13 details this relationship for the historical transect during the period of 2002 through 2012.

Outside of the historical transect route, 126 transects were randomly placed throughout the blocks of the Habitat Restoration Area to collect data on the numbers of Coast Buckwheat plants and flowerheads, as well as their locations. Figure 7 illustrates the locations of these transects and the buckwheats growing along them. Of the 126 transects, buckwheat data was also collected from 56 of these same transects during 2002, while 70 new transects were added during 2003 (Table 2) and have been monitored annually since then. Table 14 lists the number of plants and average numbers of flowerheads observed along each transect during 2012.

Tables 15 and 16 summarize the numbers of buckwheat plants by age class and the average numbers of flowerheads by age class for all 126 transects for the 10-year period, 2003 through 2012. Although the numbers of mature buckwheats increased 0.6% in 2012 compared to 2011, the proportion of mature buckwheats growing along the block transects declined by 4% during the same period (Table 15). The proportion of seedlings and juveniles in the buckwheat population collectively increased 4% between 2011 and 2012, while the proportion of senescent plants did not change during this period. However, the average number of flowerheads on all buckwheat plants, regardless of age class, declined about 16% between 2011 and 2012 (Table 16).

Table 17 summarizes the annual block counts of ESB, buckwheat plants, and buckwheat flowerhead numbers for the period of 2003 through 2012 at the LAX dunes. It also illustrates the correlations between ESB and buckwheat plant (including all age classes) numbers, as well as the ESB and flowerhead numbers. Although the increases and declines in ESB numbers correlate well with changes in buckwheat plant numbers, an even stronger positive correlation exists between ESB numbers and buckwheat flowerhead numbers.

Tables 18 and 19 summarize the same information for the 56 transects that were surveyed during the 11-year period, 2002 through 2012. Similar declines and proportions for plant numbers, flowerhead numbers, and increased senescence as observed for the buckwheats on all 126 transects occurred during the 10-year period.

4.7 Relationship Between Rainfall, Buckwheat Flowerheads, and ESB Numbers.

Table 20 and its associated graphs illustrate the strong positive correlation between ESB adult numbers from the block counts and buckwheat flowerhead numbers. As noted earlier, both of these numbers are positively correlated with annual rainfall. Graphs of these relationships are provided, as well as, regression equations that describe the correlations between rainfall and flowerhead numbers, plus ESB and flowerhead

numbers.

As noted earlier, regression analysis can be used to predict the estimated numbers of buckwheat flowerheads and ESB adults that would be tallied during a particular year, such as 2012. Results of the estimates and a comparison of the equations are shown in Table 21. Also, the regression equations for 2011 and 2012 are provided in the note to this table.

Total rainfall at LAX for the 2012 growing season (July 1, 2011 – June 30, 2012) was 7.61 inches. The estimated number of flowerheads in 2012 using the 2011 Equation (1) is 1,089 flowerheads and using the 2012 Equation (2) is 1,159 flowerheads. Both equations underestimate the actual number of flowerheads observed (1,585). The underestimates are 496 (46%) and 426 (37%) for the 2011 Equation (1) and the 2012 Equation (2) respectively (see Table 21). Additional years of observations and/or a more refined measure of rainfall during a critical period might improve the ability of this approach to estimate flowerhead numbers. Total rainfall in 2012 was the second lowest in the 10 years of observations, yet the rainfall in March and April was relatively high (third highest during the past 10 years) suggesting that rainfall during this period is very important to the buckwheat plant for production of flowerheads.

The estimated number of ESB adults in 2012 is 4,345 using the estimated number (1,089) of flowerheads from 2011 Equation (3) in Table 21. The estimated numbers of ESB butterflies in 2012 are 5,317 and 5,180 using the actual number (1,585) of flowerheads and equations 2011 Equation (3) and 2012 Equation (4), respectively. All three estimates were higher than the actual number of ESB butterflies actually counted (4,061). The overestimates were 284 (7%), 1,256 (24%) and 1,119 (22%) respectively. While the regression equations show there is a strong positive relationship between the number of flowerheads and ESB butterflies observed, other factors can influence butterfly numbers too. For example, due to the somewhat drier past rainy season, the ESB may have experienced a lower mortality rate of its pupae that would have become part of the 2012 adult generation, which resulted in more adults being counted. Since the pupae are in the sand, prolonged wet soil conditions would favor the growth of bacteria and other pathogens that may increase mortality of this life stage.

Additional years of observations and data collection should also help to refine the relationship between flowerhead numbers and ESB counts. Statisticians normally want a minimum sample size of 30, whereas the current sample sizes for these analyses are much smaller.

SECTION 5

HABITAT MANAGEMENT ACTIVITIES AND RECOMMENDATIONS

5.1 Routine Habitat Management Activities.

The Construction and Maintenance Services Division of Los Angeles World Airports (LAWA) has a dedicated two-man crew that works exclusively at the LAX dunes to perform regular trash and debris removal, weeding, and other vegetation management activities. This crew works throughout the entire 307.1-acre dune area, not just the 202.8 Habitat Restoration Area where the ESB occurs.

Although some habitat management activities occur throughout the Habitat Restoration Area, in recent years the emphasis of these activities has been in the peripheral portions of the Habitat Restoration Area as approved by USFWS in 2005 as part of the short-term weed removal plan (Arnold 2005b). In 2005, Dr. Richard Arnold trained the crew and their supervisors to recognize the butterfly's buckwheat food plant and how to distinguish it from other buckwheat taxa that currently grow at the LAX dunes, as well as about 15 other invasive weeds that were targeted for control in the aforementioned short-term weed management plan. In recent years, much of the crew's weed removal activities have focused on the southern border (i.e., adjacent to Imperial Highway) and the western border (i.e., adjacent to Vista Del Mar). In other portions of the Habitat Restoration Area, removal of acacias, sea lavender, dead palm trees, and castor bean has been performed at various locations.

At this time I recommend that the crew refocus its weed removal efforts to the other blocks of the Habitat Restoration Area where the ESB and its buckwheat food plant occur, as well as blocks where invasives dominate. Ice plant, acacia, three buckwheat taxa, and various weedy grasses, especially Veldt grass, are expanding and increasing in abundance throughout these areas and reducing habitat quality not only for the ESB but also other dune endemic plants and animals. Due to citizen concerns a few years ago, LAWA banned the use of any herbicides, including Garlon, which the crew had previously painted on freshly cut stumps of acacias to prevent re-sprouting. Thus, only manual removal methods can now be used by the crew to combat the substantial and expanding weed problem at the LAX dunes. The prior use of Garlon was preferred because it eliminated the need to uproot stumps and roots of the acacia, which minimized ground disturbance in ESB habitat. Compared to manual removal methods, the herbicide usage also enabled the crew to work throughout a larger portion of the habitat during the same amount of time, thus providing a greater benefit to more of the habitat preserve. I recommend that the crew again be allowed to use herbicides to combat the acacia and other invasive plants at the dunes. The weed issue has become much greater than a 2-man crew properly deal with, so the crew needs all of the management and control tools available to them to maintain suitable dune habitat.

To guide the crew's weed control efforts, Figures 8, 9, and 10 illustrate selected locations of three non-endemic buckweeds (*Eriogonum fasciculatum*, *Erigeron grandiflorum*, and *E. cinereum*), acacia, pine, and ice plant within the Habitat Restoration Area at the LAX dunes that need attention. As illustrated on these three figures, the estimated areas occupied by these invasive plants are 3.2 acres for the two buckweeds,

25.9 acres by acacia, 0.1 acre by the pine, and 4.2 acres by ice plant. Appendix A is a series of photographs for a subset of the aforementioned weed locations, which illustrate the targeted, invasive plants.

Appendix B provides copies of the work logs for the crew for the period of January through December 2012. The logs describe the types of habitat management activities that were performed and their locations within the dunes. As detailed in the logs, numerous truck loads of trash, which continually blows onto the dunes from the adjacent Dockweiler State Beach and vehicles that park along Vista Del Mar, are hauled out of the dunes regularly, along with other debris and uprooted weeds. Trash pickup consumes much of the 2-man crew's time, which preferably should be spent dealing with the weeds and other vegetation management issues. I encourage LAWA to find alternative solutions for the on-going trash issue so the dune crew can devote its time to vegetation management rather than trash pickup and removal.

5.2 Buckwheat Outplanting in Block #23.

A total of 330 Coast Buckwheat seedlings were outplanted at the LAX dunes on November 29, 2011 in block #23. The buckwheats were planted in groups of five seedlings at 66 locations (Figure 11). This block was chosen for the outplanting effort because it had only a few naturally occurring buckwheats, but is situated between neighboring areas on all sides that support larger patches of the ESB's food plant. Prior to the outplanting, acacias, non-native cacti, and ice plant were removed (Figure 11) and a drip irrigation system was installed to provide supplemental water to the buckwheat plants in the event that rainfall was insufficient to facilitate survival and establishment of these new plants. In Figure 11, drip lines start at the 10 irrigation valves (#1 - #10) next to the street curb and extend southward into block #23. The outplants were propagated by The Tree of Life Nursery (San Juan Capistrano, CA) using seeds collected at the LAX dunes.

These outplants were monitored four times during 2012, on January 16th, May 29th, July 17, and August 24. As of the last visit, 244 of the original 330 outplants were still alive, which is a 74% survival rate. Table 22 documents the numbers of outplants that were alive during each of the four monitoring visits in 2012.

It was also gratifying to observe that many of the outplanted buckwheats exhibited not only good growth and multiple branches during this period, but also produced flowers. In future years usage of these buckwheats by ESB adults will be documented as part of the annual block counts.

Throughout the LAX dunes a primary cause of the lack of buckwheat seedlings is the presence and abundance of various herbaceous weeds, annual grasses, and ornamental plants that continue to spread throughout the dunes and are locally abundant. Thus, the propagation and outplanting of Coast Buckwheat should be continued at the LAX dunes, preferably on an annual basis. Ideally, other dune indigenous plants should also be propagated and outplanted along with the Coast Buckwheat to revegetate areas that are weeded at the LAX dunes to re-establish the habitat and improve habitat values for not only the ESB but also other plants and animals endemic to this remnant of the El Segundo

dunes system.

SECTION 6 REFERENCES CITED

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SECTION 7

TABLES

Table 1. Lengths of the 35 intervals along the historical ESB transect at LAX.

Interval Number	Length (feet)
1	510
2	837
3	142
4	75
5	168
6	107
7	223
8	140
9	126
10	119
11	79
12	184
13	200
14	194
15	94
16	137
17	214
18	295
19	234
20	193
21	226
22	230
23	89
24	89
25	264
26	186
27	89
28	65
29	107
30	101
31	294
32	125
33	105
34	383
35	490
Total Length	7,114

Table 2. Lengths of the 126 transects for the block buckwheat monitoring.

Transect Number	Length (feet)	Transect Number	Length (feet)	Transect Number	Length (feet)
1	662	43*	287	85*	379
2	430	44*	255	86	958
3	540	45*	243	87	959
4	557	46	240	88	300
5*	787	47	269	89	256
6*	766	48	279	90	257
7	71	49	278	91	281
8	139	50	314	92	352
9*	168	51	259	93	361
10*	178	52	268	94	369
11*	201	53	248	95	333
12*	230	54	248	96*	379
13*	277	55	254	97*	379
14*	295	56	252	98*	420
15*	329	57	283	99*	442
16*	430	58	164	100*	285
17	191	59	254	101*	292
18	233	60	240	102*	307
19	276	61	238	103*	318
20	301	62	702	104	987
21*	295	63	924	105	1,171
22*	259	64	830	106*	309
23*	245	65	858	107*	304
24*	244	66*	175	108*	309
25*	562	67*	133	109*	292
26*	556	68*	176	110*	369
27*	535	69*	213	111*	244
28*	384	70	261	112*	239
29*	507	71	288	113*	270
30*	498	72	286	114*	1,432
31*	493	73	284	115*	1,432
32*	467	74	401	116	1,422
33	231	75	411	117	1,454
34	239	76	390	118	897
35	274	77	384	119	846
36	317	78*	170	120	1,015
37	318	79*	198	121	744
38	317	80*	191	122	603
39	860	81*	157	123	835
40	411	82*	398	124	674
41	461	83*	321	125	39
42*	320	84*	322	126	439
				Total Length	53,153

* indicates the 56 transects that have been monitored since 2002; the other transects have been monitored since 2003.

Table 3. Daily ESB Counts for the Historical Transect in 2012 (M = male, F = female).

Transect Interval Number	ESB Counts by Survey Date and Transect Number																								Seasonal Total				
	16-Jun		22-Jun		29-Jun		5-Jul		13-Jul		17-Jul		19-Jul		21-Jul		26-Jul		3-Aug		11-Aug		17-Aug					24-Aug	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M+F
1	1	0	3	0	7	1	6	1	9	3	9	4	11	5	10	6	7	4	3	3	1	2	0	0	0	0	67	29	96
2	0	0	0	0	3	2	2	0	4	2	4	2	7	3	10	4	5	3	2	2	0	1	0	0	0	0	37	19	56
3	1	0	6	0	9	4	10	5	14	6	11	4	13	6	10	5	7	5	3	4	1	2	0	0	0	0	85	41	126
4	0	0	0	0	1	1	3	2	6	3	5	2	4	3	4	1	3	2	2	1	0	1	0	0	0	0	28	16	44
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	1	3	3	1	2	3	2	2	3	1	2	1	0	1	1	0	0	0	0	0	14	12	26
11	0	0	1	1	3	1	4	1	3	2	4	1	3	3	3	3	2	2	1	0	0	0	1	1	0	0	25	15	40
12	0	0	3	0	4	1	5	2	7	3	5	4	8	5	10	6	7	5	3	3	2	2	1	2	0	0	55	33	88
13	0	0	0	0	0	0	1	0	1	0	1	1	5	2	9	4	6	4	3	4	2	3	0	1	0	0	28	19	47
14	0	0	0	0	2	1	4	1	6	3	5	3	5	4	2	2	1	2	1	2	1	0	0	1	0	0	27	19	46
15	0	0	0	0	0	0	1	0	0	1	1	0	2	1	6	3	4	4	2	1	0	1	1	0	0	0	17	11	28
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	1	0	0	0	1	1	0	1	2	1	1	0	0	0	1	0	0	0	0	1	0	0	6	4	10
18	2	0	3	0	9	2	11	3	13	5	10	7	14	9	15	8	12	9	8	6	5	5	2	3	0	0	104	57	161
19	0	0	0	0	0	0	1	0	1	1	2	0	2	2	3	0	2	1	2	1	2	1	0	1	0	0	15	7	22
20	0	0	2	1	9	3	5	1	7	2	6	7	10	5	14	7	11	8	7	5	4	3	1	1	0	0	76	43	119
21	0	0	2	0	3	2	4	3	6	4	7	4	6	4	8	5	6	5	3	4	2	2	0	0	0	0	47	33	80
22	0	0	2	0	3	1	4	2	4	3	6	3	8	4	7	3	5	3	2	2	1	2	0	1	0	0	42	24	66
23	0	0	1	0	2	0	2	1	3	2	5	3	6	2	7	3	4	5	2	2	1	0	0	1	0	0	33	19	52
24	0	0	1	0	2	0	4	2	7	3	9	5	5	4	2	1	1	1	2	1	1	0	0	1	0	0	34	18	52
25	0	0	5	1	5	3	9	4	6	2	7	4	6	2	3	1	1	1	0	1	0	0	1	0	0	0	43	19	62
26	0	0	1	0	6	3	12	3	8	4	5	4	3	2	0	0	2	1	1	1	1	0	0	1	0	0	39	19	58
27	0	0	0	0	5	1	3	0	4	2	5	1	6	3	2	1	3	2	1	2	2	1	1	1	0	0	32	14	46
28	0	0	0	0	1	0	4	0	5	1	3	4	6	3	1	0	3	2	1	1	1	0	0	1	0	0	25	12	37
29	0	0	2	0	1	1	6	1	4	1	5	3	3	3	2	2	1	2	1	1	0	1	0	0	0	0	25	15	40
30	0	0	4	0	13	5	14	3	15	6	15	8	11	7	5	0	6	5	4	3	3	2	1	1	1	2	92	42	134
31	0	0	6	0	26	9	18	2	17	5	20	8	22	15	25	21	19	15	11	12	7	7	2	5	0	0	173	99	272
32	0	0	4	0	7	1	7	1	10	2	11	5	9	5	7	3	8	5	6	5	3	4	2	4	0	0	74	35	109
33	0	0	4	0	8	2	16	7	15	5	18	7	20	9	16	9	13	7	8	5	5	6	2	3	0	0	125	60	185
34	1	0	10	0	17	5	21	4	18	5	38	8	35	13	30	18	25	13	16	12	8	9	4	5	0	1	223	93	316
35	0	0	7	0	24	7	29	5	25	6	23	9	28	15	31	18	24	13	16	10	7	8	3	4	0	0	217	95	312
Daily Total	5	0	67	3	171	56	207	57	222	84	242	115	262	142	247	135	190	130	112	95	61	63	22	39	1	3	1,809	922	2,731
M+F	5		70		227		264		306		357		404		382		320		207		124		61		4				
Sex Ratio	1.00		0.96		0.75		0.78		0.73		0.68		0.65		0.65		0.59		0.54		0.49		0.36		0.25				

Table 4. Summary of Annual ESB Historical Transect Counts at LAX for 1984-2012

Year	Number of Survey Dates	Span of Survey Dates (days)	Number of ESB Adults
1984	4	16	193
1985		Not surveyed	
1986	5	35	258
1987	9	56	473
1988	10	61	1,049
1989	11	54	1,390
1990	10	63	1,192
1991	12	90	906
1992	15	111	1,051
1993	10	58	925
1994	8	63	500
1995	10	69	1,239
1996	4	21	1,455
1997	4	21	126
1998	6	60	2,175
1999	11	64	1,741
2000	13	59	2,107
2001	10	64	2,652
2002	14	67	1,236
2003	14	72	2,688
2004	15	72	2,123
2005	14	70	2,653
2006	14	69	3,049
2007	12	60	777
2008	14	68	2,173
2009	13	70	2,859
2010	14	76	3,898
2011	14	76	4,690
2012	13	70	2,731

Table 5. 2012 El Segundo Blue Block Data Counts (Census dates July 18 - 21, 2012)

Block No.	No. of ESB Observed		No. of ESB Observed by Type of Behavior						
	Female	Male	Fly	Perch	Bask	Nectar	Court	Mate	Oviposit
1	43	72	80	12	10	13	-	-	-
2	17	34	47	1	1	2	-	-	-
3	-	1	1	-	-	-	-	-	-
4	26	30	39	5	10	-	-	2	-
5	5	9	12	-	-	-	-	2	-
6	10	20	23	3	1	-	-	2	1
7	23	29	43	4	-	-	-	4	1
8	10	19	29	-	-	-	-	-	-
9	53	104	113	16	14	8	4	2	-
10	28	57	71	4	5	3	-	2	-
11	10	21	21	2	2	2	2	2	-
12	-	2	2	-	-	-	-	-	-
13	44	72	99	5	6	2	2	2	-
14	31	86	72	14	12	12	6	-	1
15	40	64	77	7	10	7	2	-	1
16	21	30	46	2	2	-	-	-	1
17	-	2	2	-	-	-	-	-	-
18	28	60	72	4	3	3	2	4	-
19	-	1	1	-	-	-	-	-	-
20	28	45	39	22	5	5	-	2	-
21	1	1	-	2	-	-	-	-	-
22	3	8	9	-	-	-	-	2	-
23	2	6	7	1	-	-	-	-	-
24	1	5	3	1	-	-	2	-	-
25	8	15	19	1	1	-	2	-	-
26	8	9	5	4	2	4	2	-	-
27	14	13	12	4	5	4	2	-	-
28	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-
31	6	10	11	1	1	1	-	2	-
32	-	-	-	-	-	-	-	-	-
33	-	-	-	-	-	-	-	-	-
34	-	-	-	-	-	-	-	-	-
35	49	51	87	4	4	2	-	2	1
36N	107	196	218	33	26	20	6	-	-
36S	51	71	89	11	5	12	4	-	1
37N	50	96	95	14	21	10	6	-	-
37S	86	146	161	22	20	19	8	-	2
38N	142	197	301	20	7	8	-	2	1
38S	70	92	137	8	9	5	-	2	1
39N	23	40	52	5	1	3	-	2	-
39S	21	49	57	5	2	3	-	2	1
40C	8	23	24	1	2	2	-	2	-
40N	56	122	140	11	13	8	6	-	-
40S	26	57	69	7	5	2	-	-	-
41N	28	61	75	4	3	3	4	-	-
41S	46	74	102	6	8	4	-	-	-
42N	61	100	117	13	11	15	2	2	1
42S	50	73	88	14	5	10	4	2	-
43N	46	66	92	4	1	15	-	-	-
43E	46	65	100	5	-	5	-	-	1
43W	9	12	16	1	-	1	-	2	1
44N	22	64	65	6	3	10	2	-	-
44S	25	52	52	8	7	6	4	-	-
45N	4	8	10	-	-	-	2	-	-
45S	8	25	21	3	4	3	2	-	-
46-60	-	-	-	-	-	-	-	-	-
Circle	1	1	2	-	-	-	-	-	-
TOTALS	1,495	2,566	3,125	320	247	232	76	46	15
F + M	4,061								
% Males	63.2%								

Table 6. Summary of Annual ESB Block Counts at LAX (1996 - 2012)

Block No.	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	17-Year Totals
1	107	51	96	64	3	110	77	365	119	260	256	124	132	105	186	158	115	2,328
2	34	25	170	72	80	123	27	166	69	134	134	38	52	74	67	58	51	1,374
3	0	0	14	1	0	9	119	9	15	9	10	7	5	2	6	1	1	208
4	22	1	1	16	1	6	66	95	30	59	43	15	61	36	107	92	56	707
5	26	3	10	18	10	13	18	68	9	46	25	6	12	21	27	23	14	349
6	8	1	13	9	125	16	19	51	14	37	28	13	25	22	55	48	30	514
7	23	1	8	4	24	47	40	111	40	70	88	39	64	49	101	98	52	859
8	103	9	147	46	47	127	42	179	47	139	161	45	58	86	71	61	29	1,397
9	221	48	539	286	310	258	198	512	94	493	456	74	230	200	304	293	157	4,673
10	54	18	134	60	28	66	86	120	55	175	135	34	84	59	131	103	85	1,427
11	14	1	0	1	7	3	21	61	13	106	79	24	37	10	73	60	31	541
12	85	55	66	57	33	53	35	5	4	0	3	2	5	15	12	9	2	441
13	152	35	113	92	65	107	96	168	38	340	139	33	59	103	169	135	116	1,960
14	5	3	19	9	15	14	26	133	30	68	121	49	71	139	117	112	117	1,048
15	55	0	108	27	38	81	75	234	39	128	222	50	110	186	103	96	104	1,656
16	6	0	36	15	13	35	47	59	12	23	73	52	83	117	94	90	51	806
17	3	0	1	0	1	5	0	1	0	0	1	1	1	1	2	2	2	21
18	47	28	120	75	65	90	48	106	15	188	83	39	80	59	137	137	88	1,405
19	10	10	16	27	37	30	24	2	0	0	1	1	1	1	0	0	1	161
20	50	75	169	245	175	346	87	133	85	118	190	16	64	70	122	86	73	2,104
21	11	5	37	6	7	3	0	0	1	2	3	0	0	0	0	1	2	78
22	1	0	4	0	1	2	7	5	2	14	9	15	16	14	9	5	11	115
23	1	0	0	0	1	0	1	0	0	2	4	4	5	4	3	3	8	36
24	18	0	20	6	23	34	0	34	6	7	6	3	9	6	4	3	6	185
25	0	0	4	28	53	48	33	62	19	39	53	17	42	39	16	14	23	490
26	6	0	4	19	25	22	0	5	10	5	14	5	18	20	17	9	17	196
27	0	1	0	2	0	18	6	27	14	57	49	22	56	50	26	26	27	381
28	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4
29	2	0	0	9	6	7	0	0	0	0	0	1	0	0	0	0	0	25
30	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
31	2	0	6	5	26	23	16	41	7	5	65	11	18	12	12	14	16	279
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
35	25	3	40	43	82	126	32	81	38	66	114	46	136	133	89	84	100	1,238

Table 6. Summary of Annual ESB Block Counts at LAX (1996 - 2012) - continued

[illegible]

Table 6. Summary of Annual ESB Block Counts at LAX (1996 - 2012) - continued

Block No.	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	17-Year Totals
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Circle	0	0	0	8	0	15	8	19	5	25	23	3	14	4	4	2	2	132
Total	2,093	726	4,069	2,135	2,960	4,733	2,750	5,803	2,645	5,560	7,642	2,440	4,447	4,843	5,675	5,347	4,061	67,929

Table 7. Year-to-year changes in number and percentage change in Block ESBs Census (1996 - 2012)

Measure	1996 to 1997	1997 to 1998	1998 to 1999	1999 to 2000	2000 to 2001	2001 to 2002	2002 to 2003	2003 to 2004	2004 to 2005	2005 to 2006	2006 to 2007	2007 to 2008	2008 to 2009	2009 to 2010	2010 to 2011	2011 to 2012
Number	(1,367)	3,343	(1,934)	825	1,773	(1,983)	3,053	(3,158)	2,915	2,082	(5,202)	2,007	396	832	(328)	(1,286)
Percent	-65%	460%	-48%	39%	60%	-42%	111%	-54%	110%	37%	-68%	82%	9%	17%	-6%	-24%

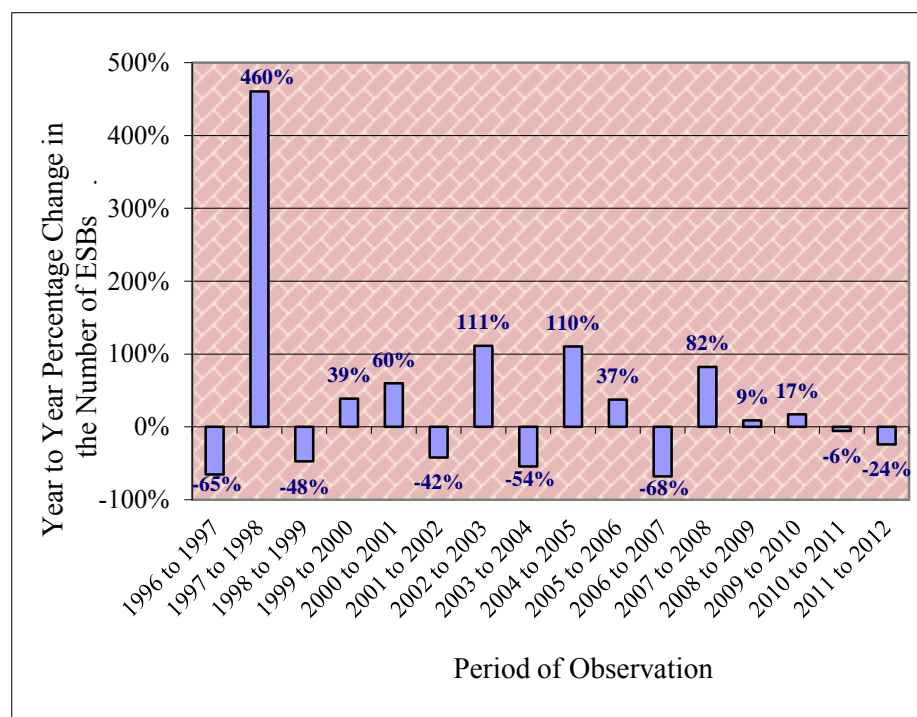
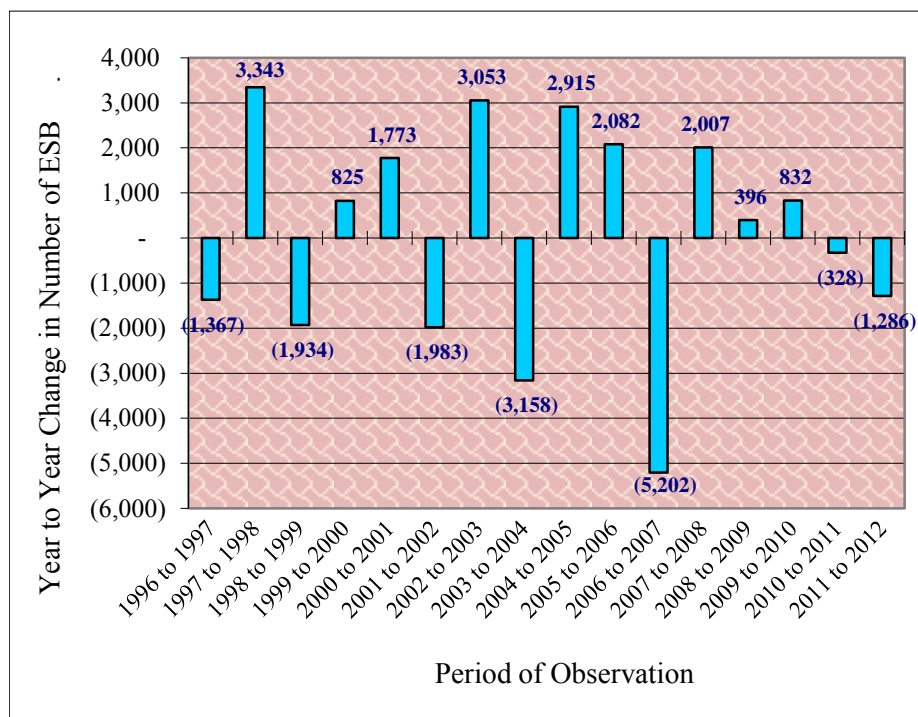


Table 8. Comparison of ESB Seasonal Population Estimates for 1998 - 2012

Year	Low Population Estimate	High Population Estimate
1998	83,000	87,000
1999	36,624	39,282
2000	66,650	69,584
2001	75,773	79,109
2002	51,725	54,002
2003	105,183	109,814
2004	49,617	51,801
2005	84,088	87,790
2006	136,708	142,727
2007	41,915	43,761
2008	64,576	67,419
2009	78,893	82,460
2010	111,562	116,474
2011	120,910	125,920
2012	83,943	87,639

Table 9. Annual ESB Numbers (from the Block Counts) and Annual (July 1st through June 30th) Rainfall Totals

Survey Year	ESB Numbers	Rainfall
1996	2,093	10.29
1997	726 *	13.30
1998	4,069	31.28
1999	2,135	9.27
2000	2,960	10.11
2001	4,733	15.56
2002	2,750	4.16
2003	5,803	10.38
2004	2,645	8.63
2005	5,560	26.51
2006	7,642	10.89
2007	2,440	2.63
2008	4,447	10.24
2009	4,843	8.13
2010	5,675	12.43
2011	5,347	17.85
2012	4,061	7.61

Note * - only latter part of the 1997 season was surveyed

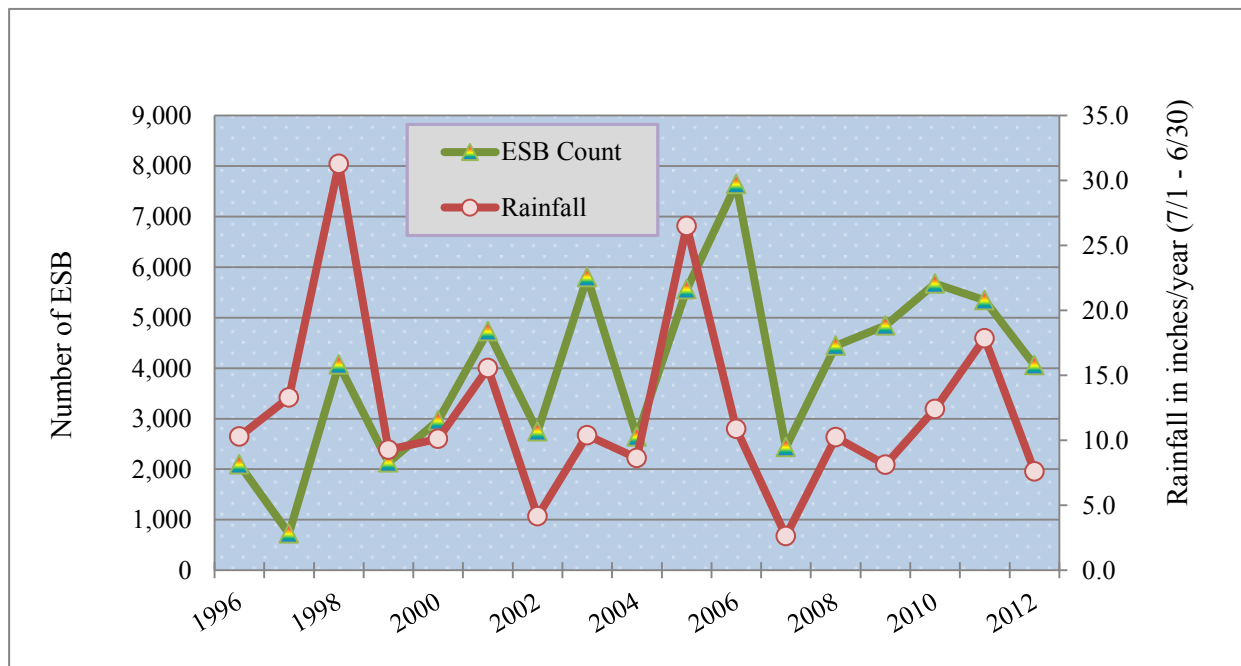


Table 10. 2012 Summary of Buckwheat Plants on the Historical Transect: Age Class and Flowerheads per Plant

Historical Interval Number	All Transects		Seedlings			Juveniles			Mature			Senescent		
	Total Plants	Average Flowerheads per Plant	Total Plants	Percent Seedlings	Average Flowerheads per Plant	Total Plants	Percent Juveniles	Average Flowerheads per Plant	Total Plants	Percent Mature	Average Flowerheads per Plant	Total Plants	Percent Senescent	Average Flowerheads per Plant
1	20	241	0	0.0%	0	4	20.0%	13	9	45.0%	478	7	35.0%	68
2	9	265	0	0.0%	0	0	0.0%	0	5	55.6%	425	4	44.4%	65
3	18	209	0	0.0%	0	0	0.0%	0	7	38.9%	386	11	61.1%	97
4	6	183	0	0.0%	0	0	0.0%	0	2	33.3%	213	4	66.7%	169
5	0	na	0	na	na	0	na	na	0	na	na	0	na	na
6	0	na	0	na	na	0	na	na	0	na	na	0	na	na
7	0	na	0	na	na	0	na	na	0	na	na	0	na	na
8	7	13	0	0.0%	0	4	57.1%	6	0	0.0%	0	3	42.9%	22
9	1	200	0	0.0%	0	0	0.0%	0	0	0.0%	0	1	100.0%	200
10	8	70	1	12.5%	2	0	0.0%	0	1	12.5%	175	6	75.0%	64
11	13	267	1	7.7%	2	5	38.5%	15	4	30.8%	769	3	23.1%	105
12	22	452	0	0.0%	0	4	18.2%	14	13	59.1%	663	5	22.7%	257
13	8	200	0	0.0%	0	0	0.0%	0	8	100.0%	200	0	0.0%	0
14	5	212	0	0.0%	0	0	0.0%	0	4	80.0%	203	1	20.0%	250
15	0	na	0	na	na	0	na	na	0	na	na	0	na	na
16	1	60	0	0.0%	0	0	0.0%	0	1	100.0%	60	0	0.0%	0
17	2	250	0	0.0%	0	0	0.0%	0	2	100.0%	250	0	0.0%	0
18	27	254	0	0.0%	0	8	29.6%	25	12	44.4%	527	7	25.9%	49
19	1	150	0	0.0%	0	0	0.0%	0	1	100.0%	150	0	0.0%	0
20	18	765	0	0.0%	0	2	11.1%	29	6	33.3%	1,875	10	55.6%	247
21	15	547	1	6.7%	1	2	13.3%	24	8	53.3%	763	4	26.7%	516
22	18	648	0	0.0%	0	0	0.0%	0	15	83.3%	763	3	16.7%	75
23	13	169	2	15.4%	1	1	7.7%	15	7	53.8%	254	3	23.1%	135
24	8	1,825	0	0.0%	0	0	0.0%	0	6	75.0%	2,400	2	25.0%	100
25	33	395	0	0.0%	0	0	0.0%	0	30	90.9%	419	3	9.1%	150
26	5	280	0	0.0%	0	0	0.0%	0	5	100.0%	280	0	0.0%	0
27	12	414	0	0.0%	0	1	8.3%	36	8	66.7%	571	3	25.0%	120
28	8	226	0	0.0%	0	3	37.5%	36	3	37.5%	333	2	25.0%	350
29	18	467	2	11.1%	2	2	11.1%	14	6	33.3%	483	8	44.4%	684
30	18	3,101	0	0.0%	0	2	11.1%	12	14	77.8%	3,714	2	11.1%	1,900
31	34	3,637	0	0.0%	0	0	0.0%	0	31	91.2%	3,911	3	8.8%	800
32	14	544	0	0.0%	0	0	0.0%	0	11	78.6%	529	3	21.4%	600
33	37	2,053	0	0.0%	0	2	5.4%	10	27	73.0%	2,665	8	21.6%	499
34	82	4,746	0	0.0%	0	0	0.0%	0	79	96.3%	4,919	3	3.7%	187
35	63	1,818	0	0.0%	0	1	1.6%	12	49	77.8%	2,267	13	20.6%	265
Total	544	1,612	7	1.3%	2	41	7.5%	18	374	68.8%	2,270	122	22.4%	276

Table 11. Number of buckwheat plants by age class on the Historical Transect.

Year	Total	Number of Plants by Age Class							
		Seedlings		Juveniles		Mature		Senescent	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent
2002	692	12	2%	24	3%	518	75%	138	20%
2003	627	2	0%	13	2%	518	83%	94	15%
2004	612	4	1%	20	3%	444	73%	144	24%
2005	658	2	0%	38	6%	434	66%	184	28%
2006	643	2	0%	48	7%	407	63%	186	29%
2007	522	1	0%	25	5%	222	43%	274	52%
2008	501	2	0%	43	8%	251	48%	205	39%
2009	520	0	0%	20	4%	301	58%	199	38%
2010	538	2	0%	30	6%	408	78%	98	19%
2011	552	2	0%	18	3%	422	81%	110	21%
2012	544	7	1%	41	8%	374	72%	122	23%

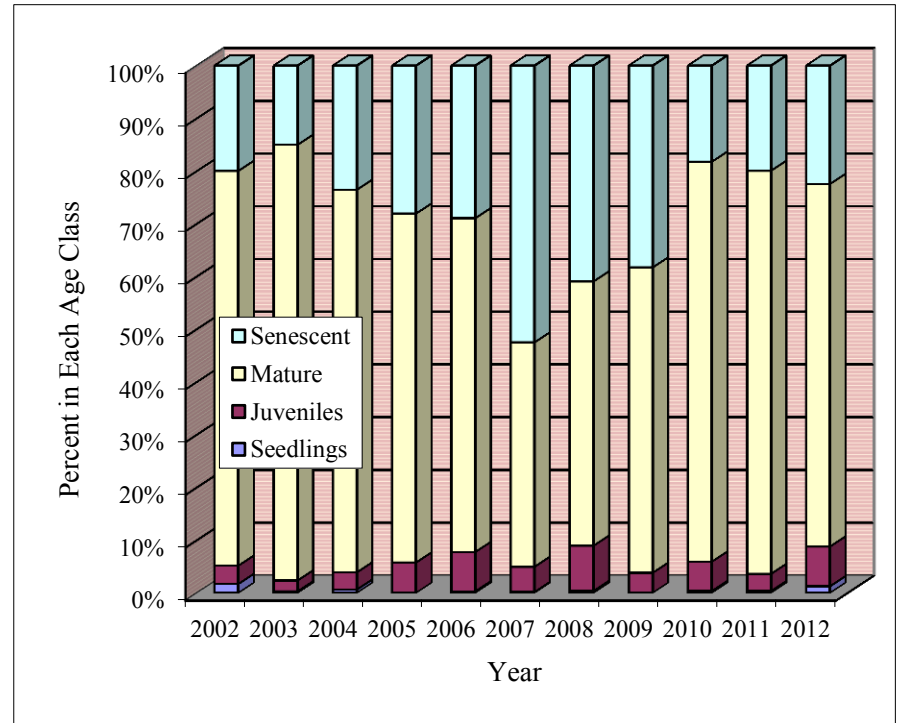


Table 12. Average number of flowerheads per plant by age class on the Historical Transect.

Year	Average All Plants	Flowerheads per Plant by Age Class			
		Seedlings	Juveniles	Mature	Senescent
2002	486	31	41	634	44
2003	638	20	40	763	43
2004	594	6	23	797	63
2005	770	3	29	1,114	122
2006	833	3	20	1,254	146
2007	318	2	9	642	91
2008	621	2	16	1,112	153
2009	1,009	-	23	1,613	194
2010	1,137	2	19	1,482	121
2011	1,667	2	19	2,147	188
2012	1,612	2	18	2,270	276

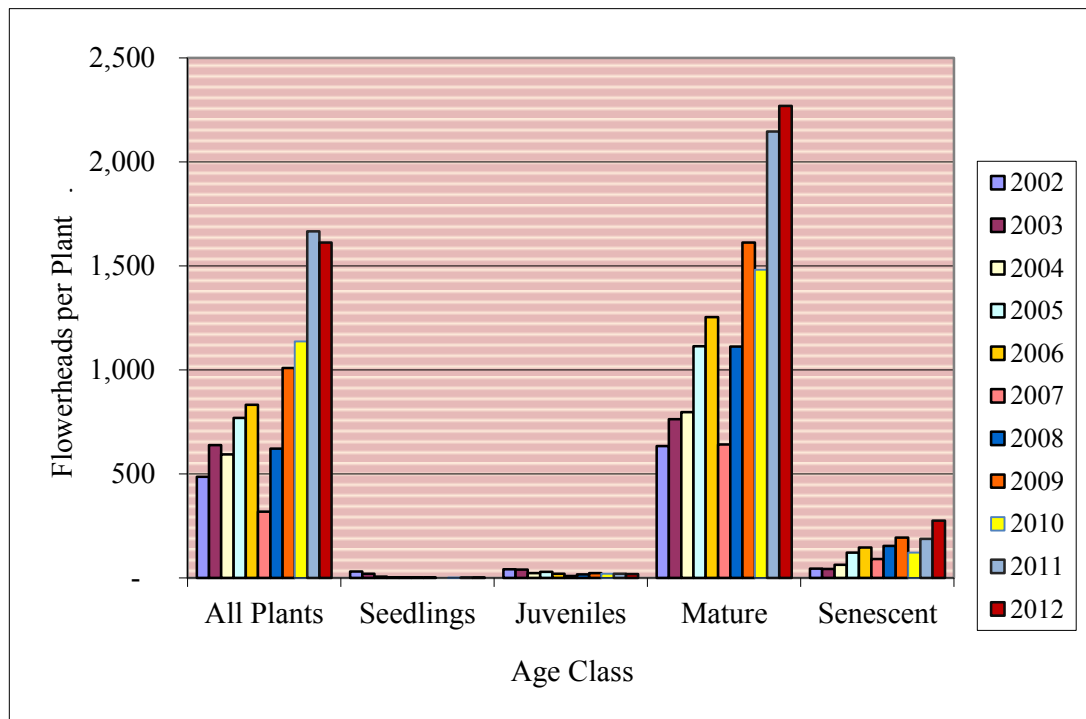


Table 13. Total number of buckwheat plants, flowerheads and ESB butterflies on the Historical Transect (2002 - 2012)

Year	Number of Plants	Number of Flowerheads	Number of ESB
2002	692	336,013	1,236
2003	627	399,783	2,688
2004	612	363,584	2,123
2005	658	506,660	2,653
2006	643	535,619	3,049
2007	522	165,996	777
2008	501	311,200	2,173
2009	520	524,599	2,859
2010	538	611,552	3,898
2011	552	920,184	4,690
2012	544	876,983	2,731

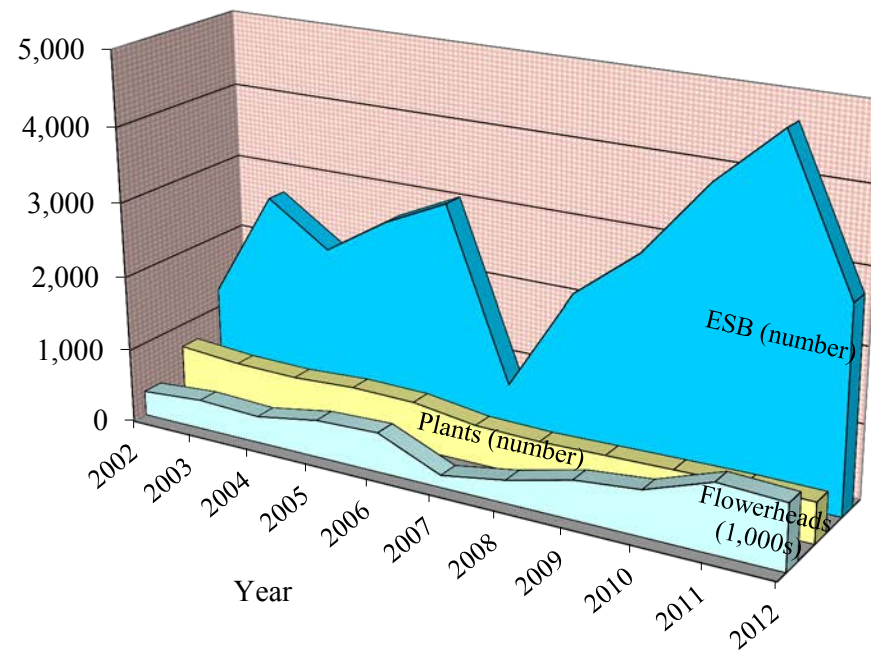


Table 14. 2012 Summary of Buckwheat Plants on Buckwheat Block Transects: Age Class and Flowerheads per Plant
El Segundo Blue Butterfly Preserve at LAX

Block Transect Number	Total All Classes		Seedlings			Juveniles			Mature			Senescent		
	Total Plants	Average Flowerheads per Plant	Total Plants	Percent Seedlings	Average Flowerheads per Plant	Total Plants	Percent Juveniles	Average Flowerheads per Plant	Total Plants	Percent Mature	Average Flowerheads per Plant	Total Plants	Percent Senescent	Average Flowerheads per Plant
1	33	4,103	0	0.0%	0	0	0.0%	0	32	97.0%	4,229	1	3.0%	60
2	3	500	0	0.0%	0	0	0.0%	0	3	100.0%	500	0	0.0%	0
3	22	325	0	0.0%	0	0	0.0%	0	15	68.2%	465	7	31.8%	25
4	26	221	0	0.0%	0	3	11.5%	11	18	69.2%	289	5	19.2%	101
5	78	304	3	3.8%	4	17	21.8%	16	42	53.8%	519	16	20.5%	103
6	56	178	0	0.0%	0	12	21.4%	9	24	42.9%	326	20	35.7%	103
7	2	300	0	0.0%	0	0	0.0%	0	2	100.0%	300	0	0.0%	0
8	3	77	0	0.0%	0	0	0.0%	0	1	33.3%	100	2	66.7%	65
9	3	1,950	0	0.0%	0	0	0.0%	0	2	66.7%	2,880	1	33.3%	90
10	3	43	0	0.0%	0	0	0.0%	0	2	66.7%	63	1	33.3%	4
11	3	867	0	0.0%	0	0	0.0%	0	3	100.0%	867	0	0.0%	0
12	0	na	0	na	na	0	na	na	0	na	na	0	na	na
13	12	1,655	0	0.0%	0	0	0.0%	0	9	75.0%	2,194	3	25.0%	37
14	3	630	0	0.0%	0	1	33.3%	14	2	66.7%	938	0	0.0%	0
15	6	916	0	0.0%	0	1	16.7%	36	5	83.3%	1,092	0	0.0%	0
16	0	na	0	na	na	0	na	na	0	na	na	0	na	na
17	28	791	0	0.0%	0	5	17.9%	22	12	42.9%	1,421	11	39.3%	452
18	8	572	0	0.0%	0	2	25.0%	25	6	75.0%	754	0	0.0%	0
19	12	212	0	0.0%	0	2	16.7%	23	8	66.7%	272	2	16.7%	160
20	15	875	0	0.0%	0	2	13.3%	15	11	73.3%	1,118	2	13.3%	400
21	10	142	1	10.0%	2	2	20.0%	20	6	60.0%	217	1	10.0%	75
22	12	328	0	0.0%	0	3	25.0%	13	9	75.0%	432	0	0.0%	0
23	46	152	6	13.0%	5	18	39.1%	22	18	39.1%	337	4	8.7%	125
24	14	946	0	0.0%	0	0	0.0%	0	9	64.3%	1,391	5	35.7%	144
25	6	165	0	0.0%	0	3	50.0%	19	2	33.3%	458	1	16.7%	20
26	6	1,742	0	0.0%	0	0	0.0%	0	5	83.3%	2,072	1	16.7%	90
27	3	470	0	0.0%	0	0	0.0%	0	3	100.0%	470	0	0.0%	0
28	10	786	0	0.0%	0	0	0.0%	0	10	100.0%	786	0	0.0%	0
29	40	808	0	0.0%	0	8	20.0%	20	24	60.0%	1,257	8	20.0%	250
30	52	315	4	7.7%	6	4	7.7%	23	40	76.9%	384	4	7.7%	225
31	57	620	4	7.0%	4	19	33.3%	21	26	45.6%	1,258	8	14.0%	279
32	78	190	12	15.4%	7	28	35.9%	23	27	34.6%	465	11	14.1%	143

Table 14. 2012 Summary of Buckwheat Plants on Buckwheat Block Transects: Age Class and Flowerheads per Plant
El Segundo Blue Butterfly Preserve at LAX - continued

Block Transect Number	Total All Classes		Seedlings			Juveniles			Mature			Senescent		
	Total Plants	Average Flowerheads per Plant	Total Plants	Percent Seedlings	Average Flowerheads per Plant	Total Plants	Percent Juveniles	Average Flowerheads per Plant	Total Plants	Percent Mature	Average Flowerheads per Plant	Total Plants	Percent Senescent	Average Flowerheads per Plant
33	10	346	0	0.0%	0	1	10.0%	11	8	80.0%	409	1	10.0%	175
34	8	752	0	0.0%	0	0	0.0%	0	6	75.0%	891	2	25.0%	335
35	12	2,272	0	0.0%	0	1	8.3%	11	11	91.7%	2,477	0	0.0%	0
36	7	1,321	0	0.0%	0	0	0.0%	0	7	100.0%	1,321	0	0.0%	0
37	13	804	0	0.0%	0	1	7.7%	22	9	69.2%	1,134	3	23.1%	75
38	12	78	0	0.0%	0	3	25.0%	15	5	41.7%	127	4	33.3%	63
39	40	286	0	0.0%	0	5	12.5%	26	22	55.0%	434	13	32.5%	135
40	44	296	0	0.0%	0	4	9.1%	15	27	61.4%	421	13	29.5%	125
41	54	533	2	3.7%	2	2	3.7%	15	38	70.4%	712	12	22.2%	142
42	22	723	1	4.5%	2	4	18.2%	27	14	63.6%	1,079	3	13.6%	234
43	10	873	0	0.0%	0	0	0.0%	0	9	90.0%	961	1	10.0%	75
44	9	408	1	11.1%	5	3	33.3%	23	3	33.3%	983	2	22.2%	325
45	33	642	1	3.0%	5	2	6.1%	10	25	75.8%	829	5	15.2%	85
46	7	39	0	0.0%	0	3	42.9%	8	2	28.6%	113	2	28.6%	13
47	16	872	0	0.0%	0	6	37.5%	22	9	56.3%	1,525	1	6.3%	100
48	59	246	0	0.0%	0	10	16.9%	19	42	71.2%	324	7	11.9%	106
49	31	614	0	0.0%	0	1	3.2%	6	24	77.4%	754	6	19.4%	153
50	19	292	2	10.5%	2	6	31.6%	20	7	36.8%	670	4	21.1%	185
51	17	352	0	0.0%	0	0	0.0%	0	12	70.6%	468	5	29.4%	72
52	15	686	0	0.0%	0	2	13.3%	18	11	73.3%	900	2	13.3%	175
53	33	784	0	0.0%	0	4	12.1%	45	18	54.5%	1,324	11	33.3%	170
54	13	731	0	0.0%	0	0	0.0%	0	10	76.9%	885	3	23.1%	217
55	14	2,979	0	0.0%	0	0	0.0%	0	12	85.7%	3,292	2	14.3%	1,100
56	15	778	0	0.0%	0	4	26.7%	30	8	53.3%	1,359	3	20.0%	227
57	13	431	0	0.0%	0	1	7.7%	25	7	53.8%	697	5	38.5%	140
58	28	621	0	0.0%	0	3	10.7%	28	18	64.3%	904	7	25.0%	148
59	6	2,000	0	0.0%	0	0	0.0%	0	6	100.0%	2,000	0	0.0%	0
60	26	932	0	0.0%	0	3	11.5%	26	17	65.4%	1,211	6	23.1%	596
61	18	1,091	0	0.0%	0	1	5.6%	9	14	77.8%	1,380	3	16.7%	100
62	48	458	0	0.0%	0	1	2.1%	45	37	77.1%	570	10	20.8%	88
63	12	662	1	8.3%	2	0	0.0%	0	8	66.7%	919	3	25.0%	197
64	77	349	1	1.3%	3	10	13.0%	11	52	67.5%	453	14	18.2%	226

Table 14. 2012 Summary of Buckwheat Plants on Buckwheat Block Transects: Age Class and Flowerheads per Plant
El Segundo Blue Butterfly Preserve at LAX - continued

Block Transect Number	Total All Classes		Seedlings			Juveniles			Mature			Senescent		
	Total Plants	Average Flowerheads per Plant	Total Plants	Percent Seedlings	Average Flowerheads per Plant	Total Plants	Percent Juveniles	Average Flowerheads per Plant	Total Plants	Percent Mature	Average Flowerheads per Plant	Total Plants	Percent Senescent	Average Flowerheads per Plant
65	48	619	0	0.0%	0	2	4.2%	12	36	75.0%	732	10	20.8%	335
66	11	1,026	0	0.0%	0	1	9.1%	13	7	63.6%	1,557	3	27.3%	125
67	1	250	0	0.0%	0	0	0.0%	0	1	100.0%	250	0	0.0%	0
68	9	3,161	0	0.0%	0	1	11.1%	32	7	77.8%	4,029	1	11.1%	220
69	17	626	0	0.0%	0	0	0.0%	0	12	70.6%	818	5	29.4%	167
70	29	159	1	3.4%	2	8	27.6%	14	16	55.2%	244	4	13.8%	148
71	4	3,655	0	0.0%	0	2	50.0%	60	2	50.0%	7,250	0	0.0%	0
72	1	100	0	0.0%	0	0	0.0%	0	0	0.0%	0	1	100.0%	100
73	9	2,000	0	0.0%	0	0	0.0%	0	9	100.0%	2,000	0	0.0%	0
74	4	816	0	0.0%	0	0	0.0%	0	2	50.0%	1,550	2	50.0%	81
75	9	286	0	0.0%	0	1	11.1%	21	4	44.4%	550	4	44.4%	89
76	17	433	2	11.8%	3	0	0.0%	0	9	52.9%	744	6	35.3%	110
77	5	360	0	0.0%	0	0	0.0%	0	5	100.0%	360	0	0.0%	0
78	6	1,715	0	0.0%	0	0	0.0%	0	4	66.7%	2,250	2	33.3%	645
79	1	3,800	0	0.0%	0	0	0.0%	0	1	100.0%	3,800	0	0.0%	0
80	1	300	0	0.0%	0	0	0.0%	0	1	100.0%	300	0	0.0%	0
81	1	1,600	0	0.0%	0	0	0.0%	0	1	100.0%	1,600	0	0.0%	0
82	28	384	0	0.0%	0	3	10.7%	21	12	42.9%	802	13	46.4%	81
83	5	156	0	0.0%	0	0	0.0%	0	2	40.0%	325	3	60.0%	43
84	2	900	0	0.0%	0	0	0.0%	0	1	50.0%	1,500	1	50.0%	300
85	20	936	0	0.0%	0	2	10.0%	19	13	65.0%	1,346	5	25.0%	238
86	106	316	8	7.5%	4	20	18.9%	19	56	52.8%	521	22	20.8%	178
87	61	407	5	8.2%	2	14	23.0%	17	35	57.4%	679	7	11.5%	114
88	36	479	0	0.0%	0	10	27.8%	13	18	50.0%	915	8	22.2%	82
89	27	657	0	0.0%	0	8	29.6%	28	16	59.3%	1,059	3	11.1%	183
90	20	755	0	0.0%	0	1	5.0%	6	11	55.0%	1,280	8	40.0%	126
91	12	366	0	0.0%	0	0	0.0%	0	9	75.0%	444	3	25.0%	130
92	26	1,514	0	0.0%	0	6	23.1%	29	15	57.7%	2,589	5	19.2%	72
93	21	692	0	0.0%	0	2	9.5%	20	9	42.9%	1,478	10	47.6%	119
94	8	1,575	0	0.0%	0	1	12.5%	32	7	87.5%	1,796	0	0.0%	0
95	12	474	0	0.0%	0	0	0.0%	0	5	41.7%	880	7	58.3%	184
96	34	711	0	0.0%	0	5	14.7%	13	19	55.9%	1,202	10	29.4%	126

Table 14. 2012 Summary of Buckwheat Plants on Buckwheat Block Transects: Age Class and Flowerheads per Plant
El Segundo Blue Butterfly Preserve at LAX - continued

Block Transect Number	Total All Classes		Seedlings			Juveniles			Mature			Senescent		
	Total Plants	Average Flowerheads per Plant	Total Plants	Percent Seedlings	Average Flowerheads per Plant	Total Plants	Percent Juveniles	Average Flowerheads per Plant	Total Plants	Percent Mature	Average Flowerheads per Plant	Total Plants	Percent Senescent	Average Flowerheads per Plant
97	34	524	0	0.0%	0	8	23.5%	12	16	47.1%	1,044	10	29.4%	103
98	36	464	4	11.1%	3	8	22.2%	15	18	50.0%	874	6	16.7%	140
99	17	954	0	0.0%	0	2	11.8%	21	10	58.8%	1,550	5	29.4%	135
100	41	1,109	0	0.0%	0	6	14.6%	33	27	65.9%	1,614	8	19.5%	213
101	32	539	3	9.4%	3	4	12.5%	25	14	43.8%	1,161	11	34.4%	81
102	23	408	0	0.0%	0	4	17.4%	14	11	47.8%	746	8	34.8%	141
103	9	1,764	0	0.0%	0	2	22.2%	11	5	55.6%	2,980	2	22.2%	475
104	73	409	1	1.4%	2	11	15.1%	14	46	63.0%	601	15	20.5%	139
105	57	392	0	0.0%	0	2	3.5%	27	45	78.9%	480	10	17.5%	65
106	5	912	0	0.0%	0	0	0.0%	0	5	100.0%	912	0	0.0%	0
107	18	478	0	0.0%	0	1	5.6%	20	12	66.7%	646	5	27.8%	165
108	4	438	0	0.0%	0	1	25.0%	25	3	75.0%	575	0	0.0%	0
109	7	85	0	0.0%	0	3	42.9%	26	4	57.1%	130	0	0.0%	0
110	39	474	0	0.0%	0	9	23.1%	34	20	51.3%	820	10	25.6%	180
111	30	306	0	0.0%	0	4	13.3%	23	10	33.3%	653	16	53.3%	160
112	18	100	4	22.2%	3	5	27.8%	16	5	27.8%	181	4	22.2%	200
113	5	540	0	0.0%	0	0	0.0%	0	5	100.0%	540	0	0.0%	0
114	16	320	0	0.0%	0	1	6.3%	6	4	25.0%	744	11	68.8%	195
115	61	263	4	6.6%	3	7	11.5%	29	29	47.5%	469	21	34.4%	105
116	38	201	2	5.3%	4	6	15.8%	15	13	34.2%	438	17	44.7%	108
117	33	453	0	0.0%	0	7	21.2%	13	18	54.5%	749	8	24.2%	173
118	19	87	0	0.0%	0	10	52.6%	9	5	26.3%	291	4	21.1%	26
119	5	47	0	0.0%	0	3	60.0%	9	2	40.0%	105	0	0.0%	0
120	6	57	0	0.0%	0	1	16.7%	16	2	33.3%	80	3	50.0%	55
121	1	25	0	0.0%	0	0	0.0%	0	1	100.0%	25	0	0.0%	0
122	1	150	0	0.0%	0	0	0.0%	0	0	0.0%	0	1	100.0%	150
123	3	22	0	0.0%	0	0	0.0%	0	0	0.0%	0	3	100.0%	22
124	17	2,429	0	0.0%	0	0	0.0%	0	17	100.0%	2,429	0	0.0%	0
125	3	2,667	0	0.0%	0	0	0.0%	0	3	100.0%	2,667	0	0.0%	0
126	7	91	0	0.0%	0	0	0.0%	0	0	0.0%	0	7	100.0%	91
Total	2,640	600	73	2.8%	4	403	15.3%	19	1,569	59.4%	947	595	22.5%	156

Table 15. Number and percentage of buckwheat plants by age class on the Block Transects.
(126 Transects)

Year	Total	Number of Plants by Age Class							
		Seedlings		Juveniles		Mature		Senescent	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent
2003	2,192	4	0%	131	6%	1,583	72%	474	22%
2004	2,246	4	0%	145	6%	1,507	67%	590	26%
2005	2,519	137	5%	232	9%	1,543	61%	607	24%
2006	2,575	120	5%	434	17%	1,508	59%	513	20%
2007	2,006	24	1%	329	16%	649	32%	1,004	50%
2008	2,185	15	1%	392	18%	872	40%	906	41%
2009	2,244	3	0%	222	10%	1,079	48%	940	42%
2010	2,348	12	1%	194	8%	1,507	64%	635	27%
2011	2,490	62	2%	304	12%	1,560	63%	564	23%
2012	2,640	73	3%	403	15%	1,569	59%	595	23%

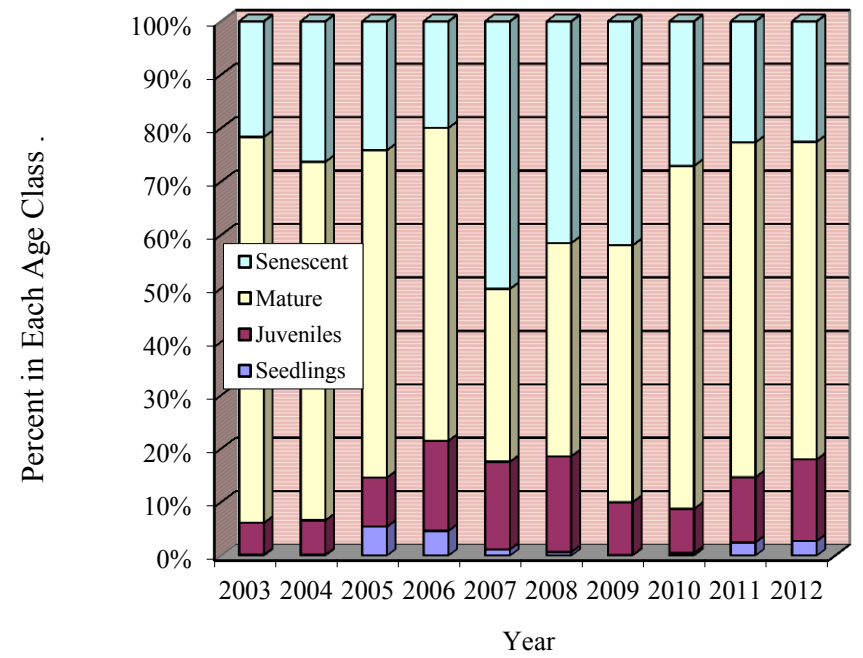
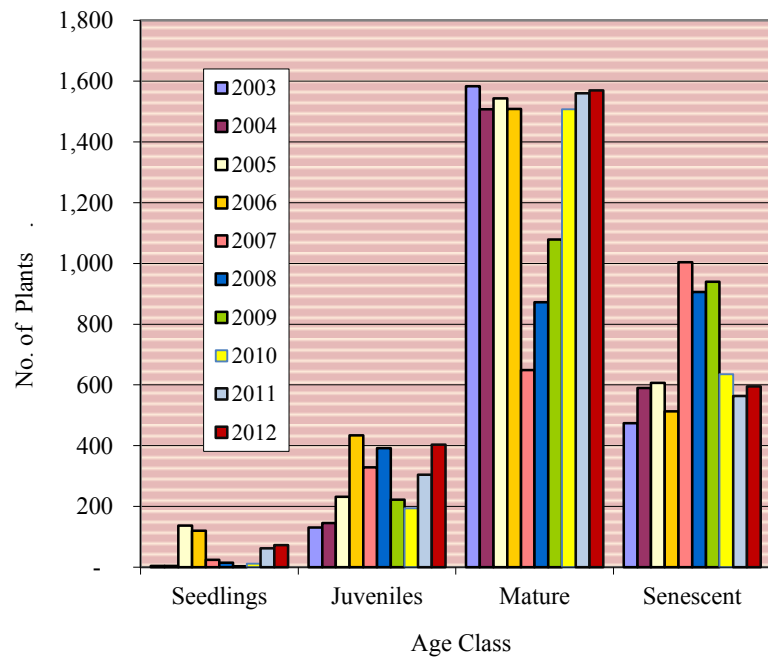


Table 16. Average number of flowerheads per plant by age class on the Block Transects
(126 Transects)

Year	Average All Plants	Flowerheads per Plant by Age Class			
		Seedlings	Juveniles	Mature	Senescent
2003	493	6	31	662	57
2004	412	5	27	586	65
2005	884	2	26	1,378	156
2006	997	3	18	1,642	159
2007	245	4	18	580	111
2008	517	2	18	1,132	150
2009	477	2	18	895	106
2010	528	2	14	755	155
2011	714	1	14	1,057	224
2012	600	4	19	947	156

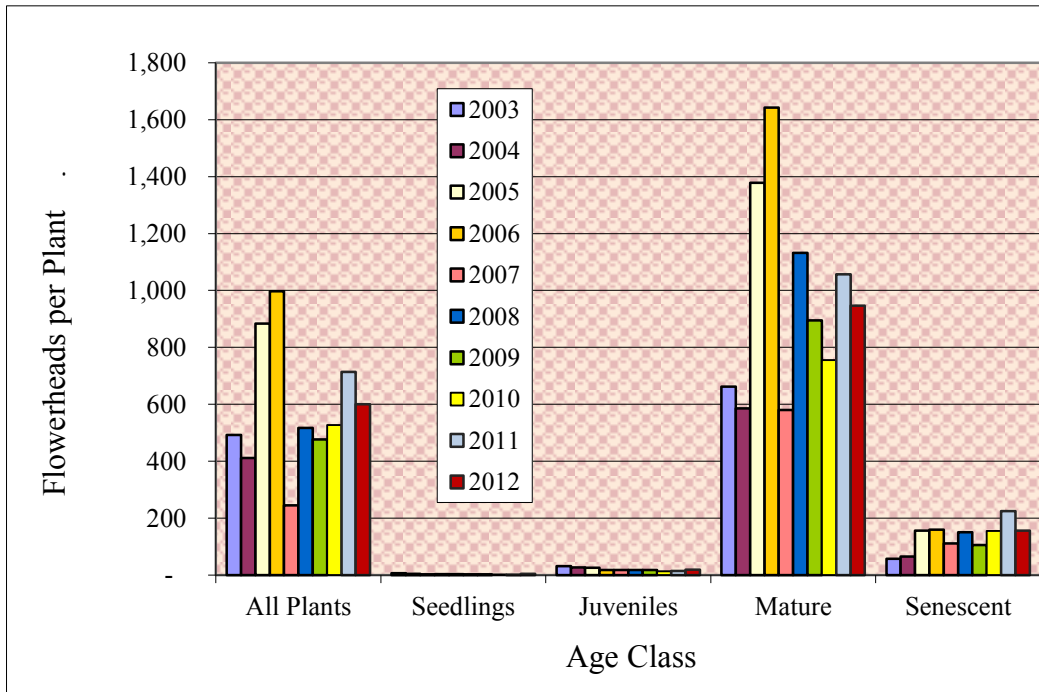


Table 17. Total number of buckwheat plants and flowerheads on the Block Transects
Total number of ESB butterflies observed during July Block Counts (2003 - 2012)

Year	Number of Plants	Number of Flowerheads	Number of ESB
2003	2,192	1,079,811	5,803
2004	2,246	924,629	2,645
2005	2,519	2,226,796	5,560
2006	2,575	2,566,623	7,642
2007	2,006	491,470	2,440
2008	2,185	1,130,301	4,447
2009	2,244	1,069,559	4,843
2010	2,348	1,238,803	5,675
2011	2,490	1,778,245	5,347
2012	2,640	1,585,224	4,061

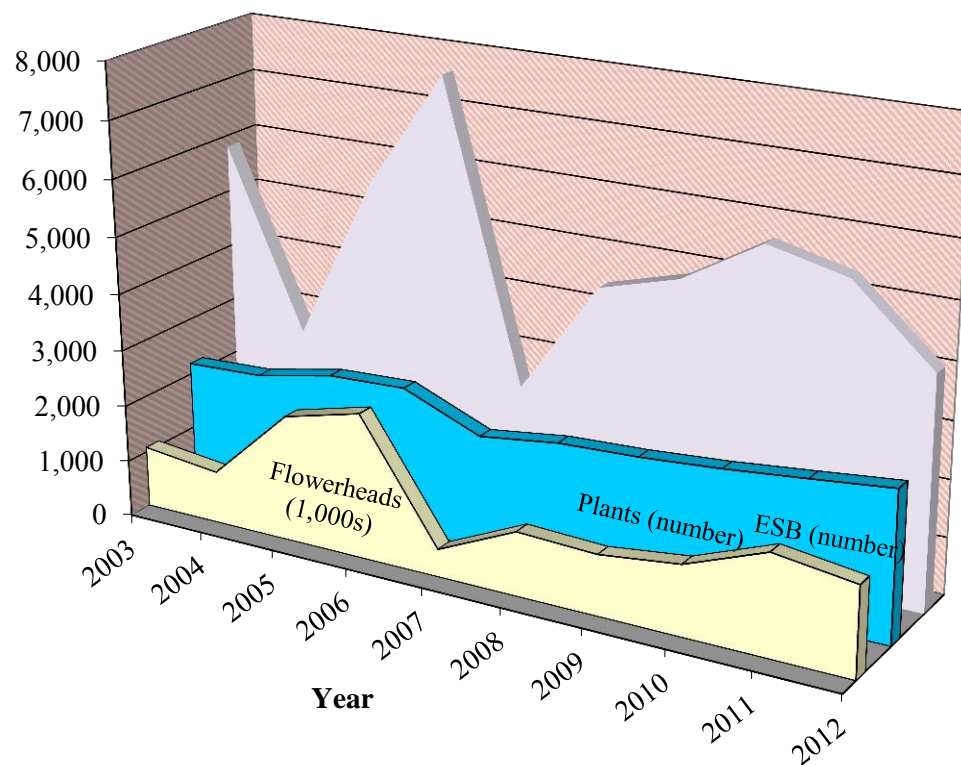


Table 18. Number of buckwheat plants by age class on the Block Transects.
(56 Common Transects)

Year	Total	Number of Plants by Age Class							
		Seedlings		Juveniles		Mature		Senescent	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent
2002	906	8	1%	26	3%	410	45%	462	51%
2003	881	-	0%	33	4%	637	72%	211	24%
2004	906	2	0%	45	5%	620	68%	239	26%
2005	971	36	4%	72	7%	637	66%	226	23%
2006	963	43	4%	165	17%	585	61%	170	18%
2007	750	5	1%	131	17%	244	33%	370	49%
2008	865	6	1%	144	17%	315	36%	400	46%
2009	898	2	0%	80	9%	416	46%	400	45%
2010	932	2	0%	61	7%	581	62%	288	31%
2011	1,028	33	3%	168	16%	571	56%	256	25%
2012	1,103	48	4%	202	18%	598	54%	255	23%

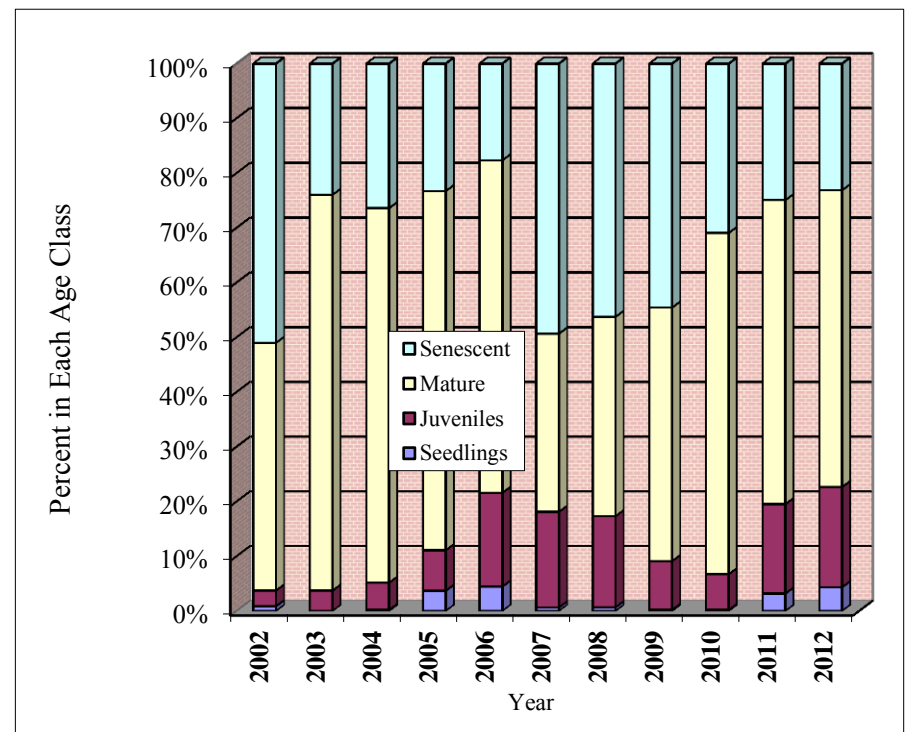
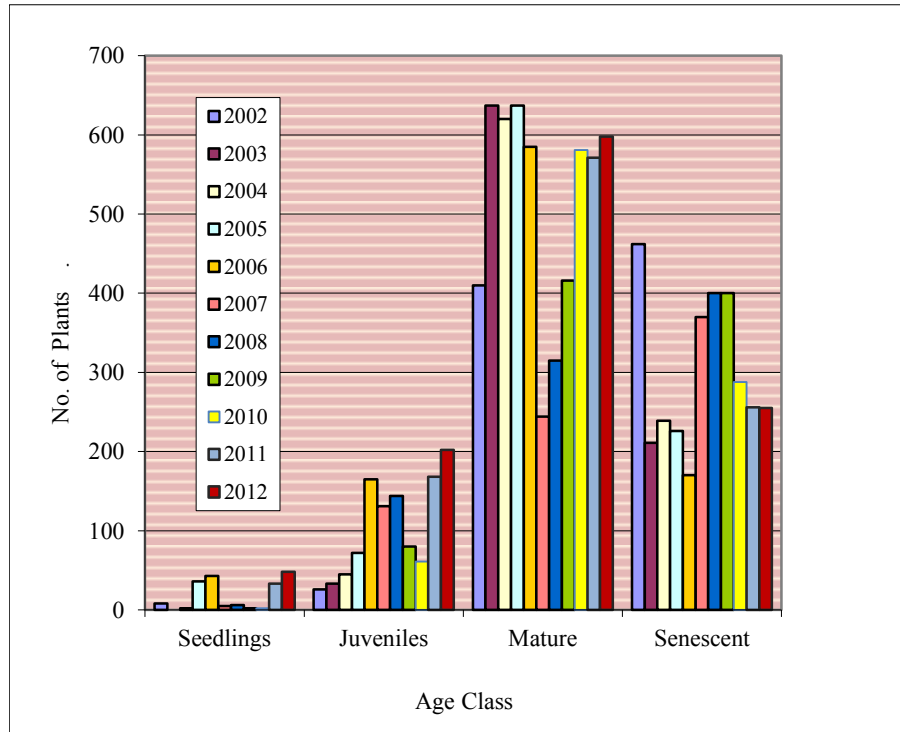


Table 19. Average number of flowers per plant by age class on the Block Transects
(56 Common Transects)

Year	Average All Plants	Flowers per Plant by Age Class			
		Seedlings	Juveniles	Mature	Senescent
2002	289	20	31	584	46
2003	552	-	32	744	54
2004	445	7	31	619	73
2005	913	2	26	1,325	178
2006	1,156	3	18	1,843	190
2007	281	3	19	664	127
2008	567	2	18	1,341	164
2009	433	2	20	826	109
2010	500	2	14	738	130
2011	675	1	14	1,112	224
2012	538	5	20	923	149

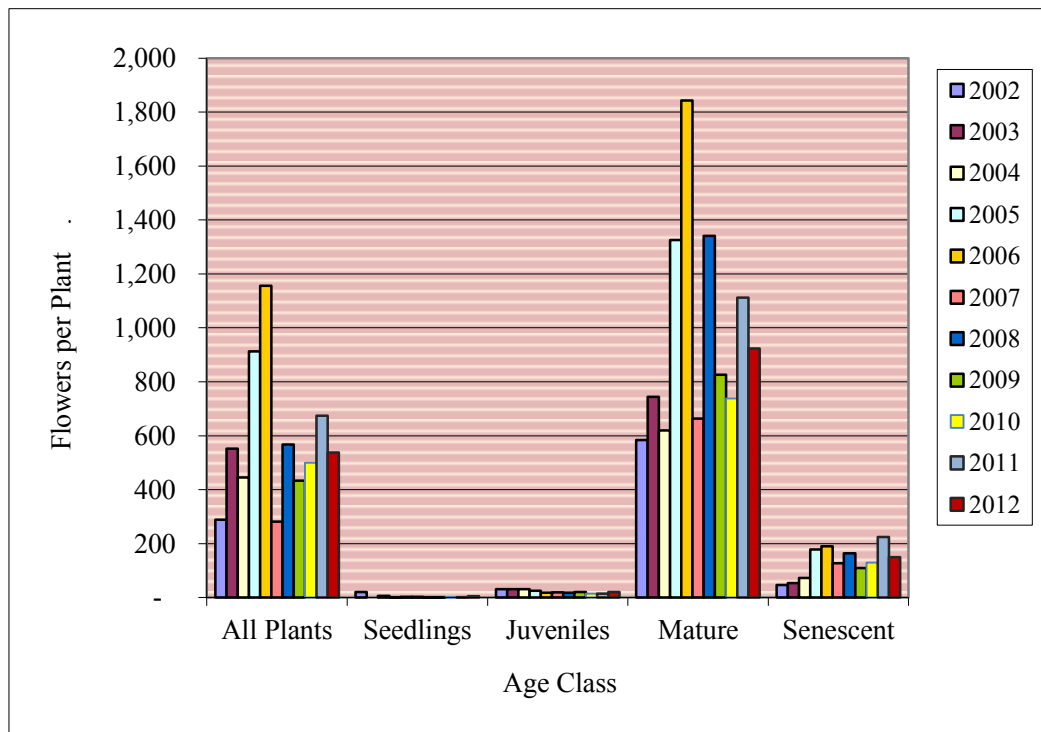


Table 20. Annual ESB Numbers (from the Block Counts), Annual Rainfall and Flowerheads (in 1,000s from the Block Transect Count)

Survey Year	ESB Numbers	Rainfall (July 1 - June 30)	Flowerheads/1,000
2003	5,803	10.38	1,080
2004	2,645	8.63	925
2005	5,560	26.51	2,227
2006	7,642	10.89	2,567
2007	2,440	2.63	491
2008	4,447	10.24	1,130
2009	4,843	8.13	1,070
2010	5,675	12.43	1,239
2011	5,347	17.85	1,778
2012	4,061	7.61	1,585

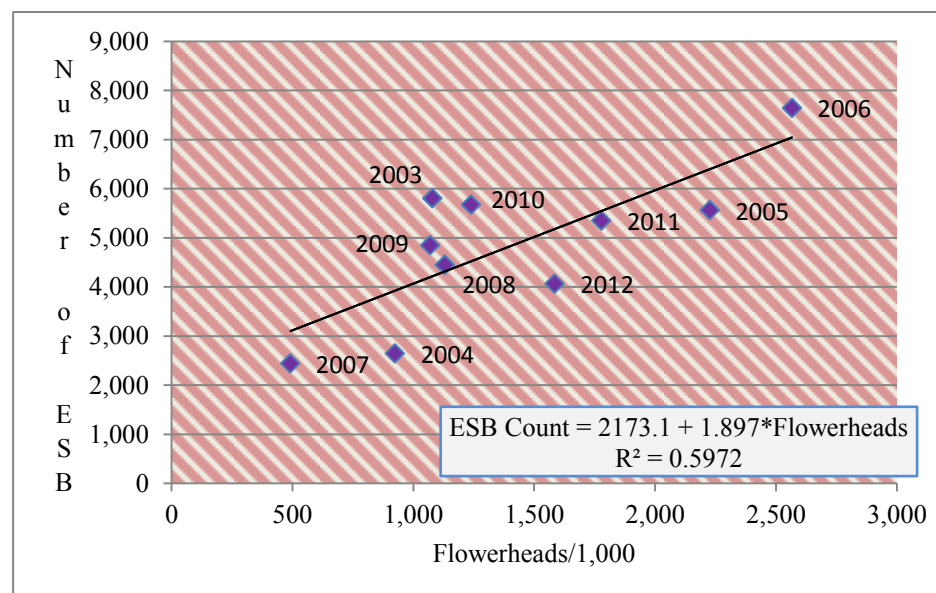
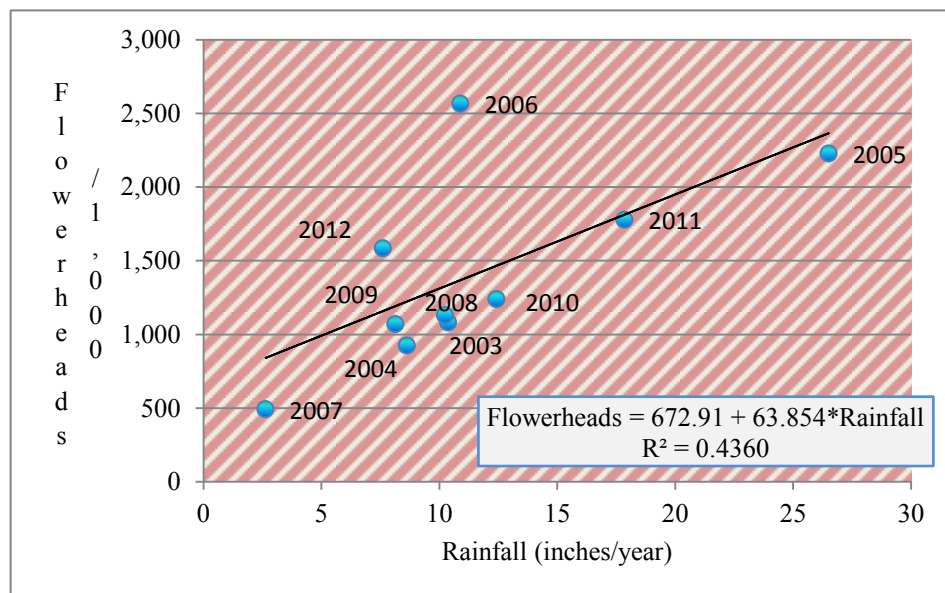
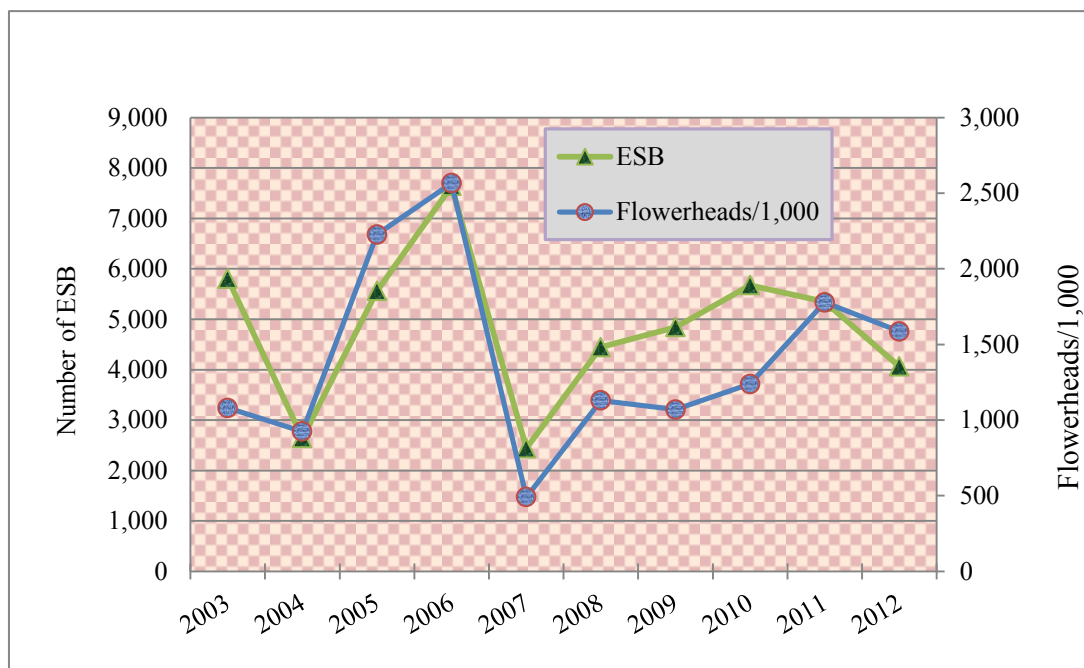


Table 21: Estimates of the number of flowerheads on Block Transects and ESB butterflies
observed in Block Census Counts
Estimates made using equations estimated using annual rainfall amounts and flowerhead counts

Equation Used (see note below)	Independent Variable		Dependent Variable		
			No. of Flowerheads (in 1,000's)		
	Variable Name	Value	Estimate	Actual	Difference
2011 Equation (1)	Rainfall (inches)	7.61	1,089	1,585	496
2012 Equation (2)	Rainfall (inches)	7.61	1,159	1,585	426
			No. of ESB butterflies		
			Estimate	Actual	Difference
2011 Equation (3)	Flowerheads (1,000's)	1,089	4,345	4,061	(284)
2011 Equation (3)	Flowerheads (1,000's)	1,585	5,317	4,061	(1,256)
2012 Equation (4)	Flowerheads (1,000's)	1,585	5,180	4,061	(1,119)

Note: The equations used are summarized below

Flowerheads [F] (in 1,000's) = f(Rainfall [R] (in inches July 1 - June 30))

2011 Equation (1) $F = 564.82 + 68.928 \cdot R$

Used data from the 2003 - 2011 period

2012 Equation (2) $F = 672.91 + 63.854 \cdot R$

Used data from the 2003 - 2012 period

El Segundo Blue butterflies [ESB] = f(Flowerheads [F] (in 1,000;s))

2011 Equation (3) $ESB = 2211.7 + 1.9587 \cdot F$

Used data from the 2003 - 2011 period

2012 Equation (4) $ESB = 2173.1 + 1.8970 \cdot F$

Used data from the 2003 - 2012 period

Table 22. Numbers of Surviving Buckwheats in Block #23

Drip Line ID	Number Planted 11/29/2011	Number of Surviving Plants in 2012			
		16-Jan	29-May	17-Jul	24-Aug
1	30	30	28	24	23
2	30	30	25	24	24
3	40	40	36	34	32
4	30	30	25	25	23
5	35	34	32	26	26
6	25	25	24	18	15
7	25	24	21	20	19
8	40	40	34	32	31
9	35	35	28	24	23
10	40	40	33	29	28
Total	330	328	286	256	244
Survival Rate	100%	99%	87%	78%	74%

SECTION 8
FIGURES

Figure 1. Study Area for the El Segundo Blue Butterfly at the Los Angeles International Airport

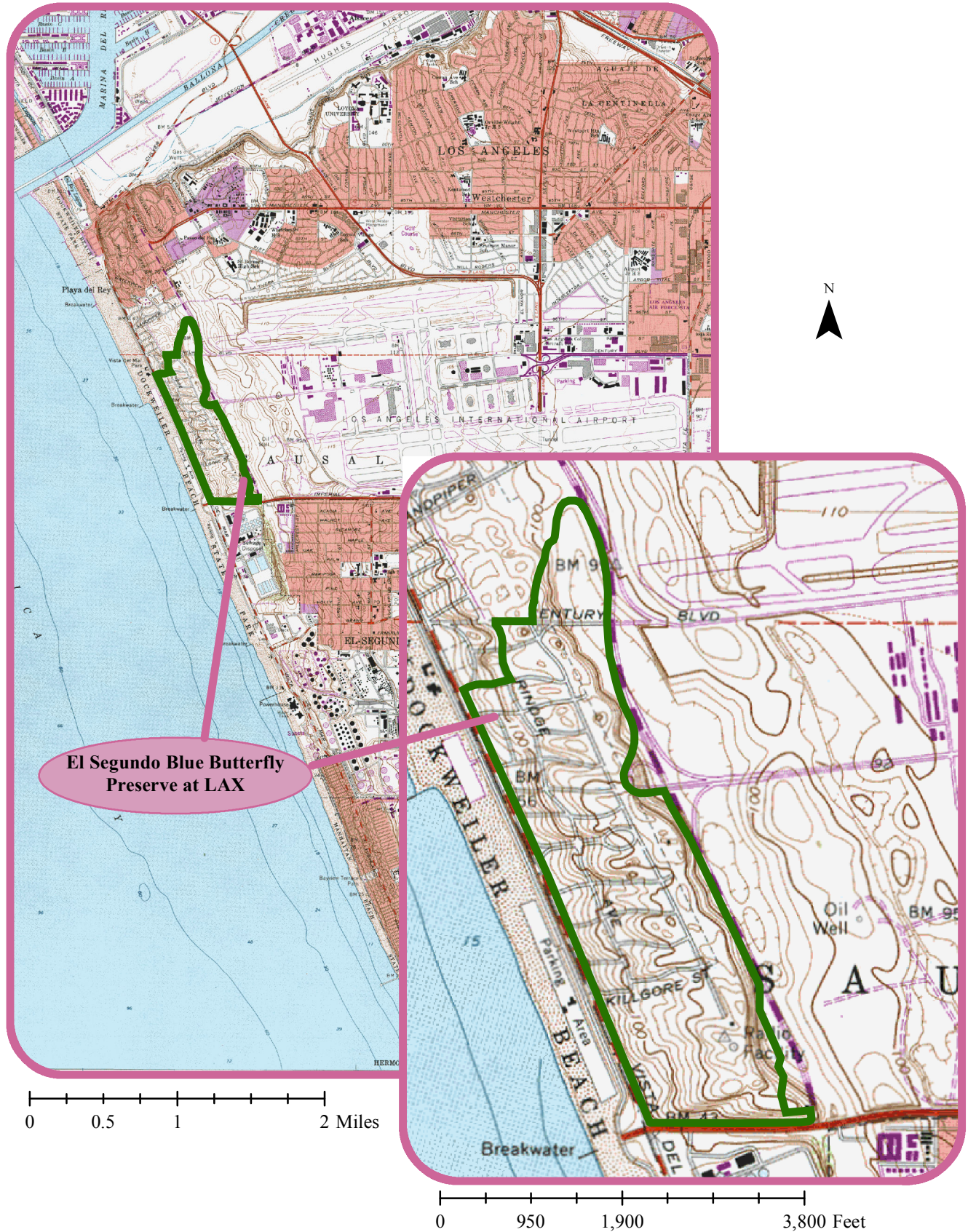
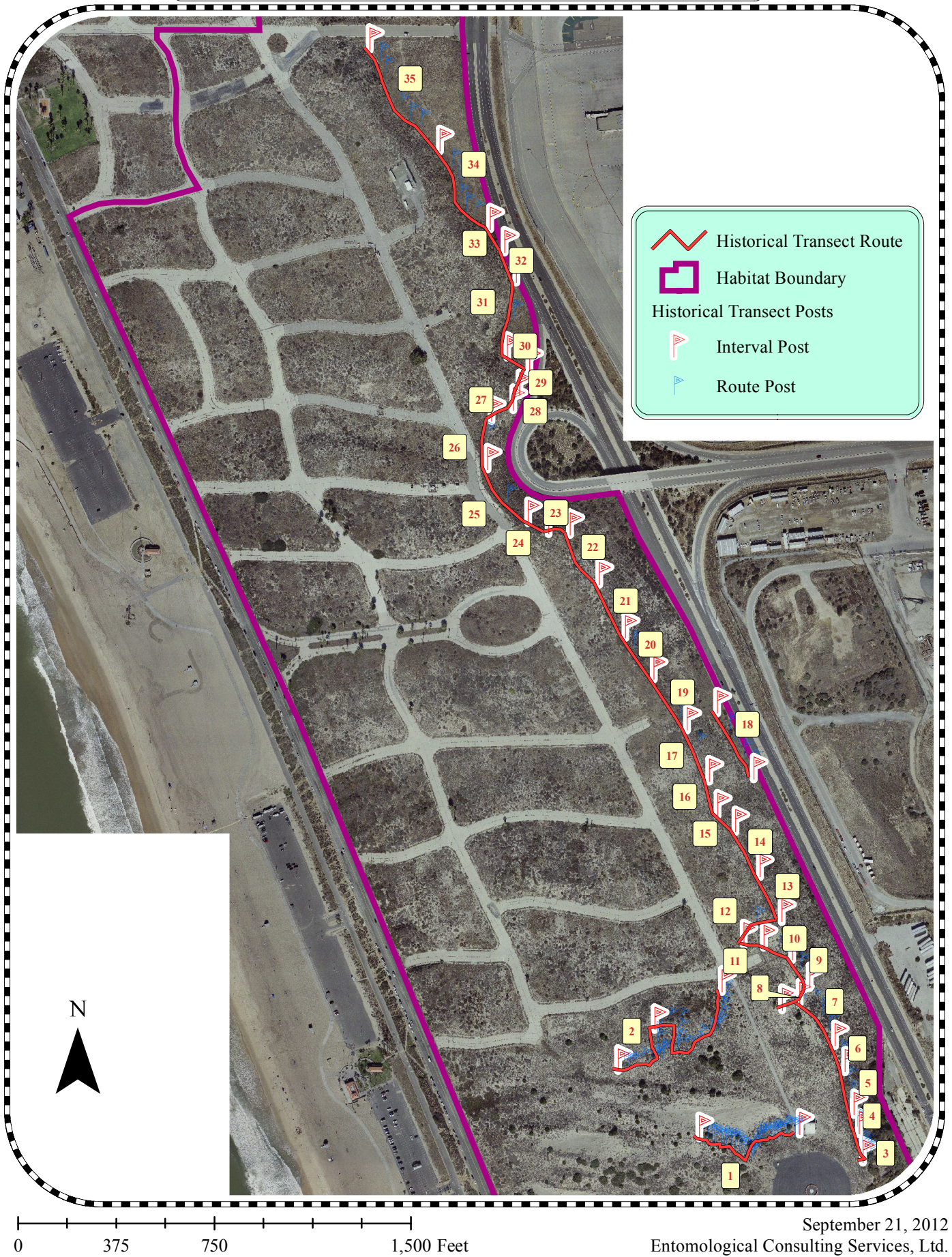


Figure 2. Historical Transect Route Intervals
El Segundo Blue Butterfly Preserve at LAX



September 21, 2012

Entomological Consulting Services, Ltd.

Figure 3. Habitat Boundary and Block Identification
El Segundo Blue Butterfly Preserve at LAX

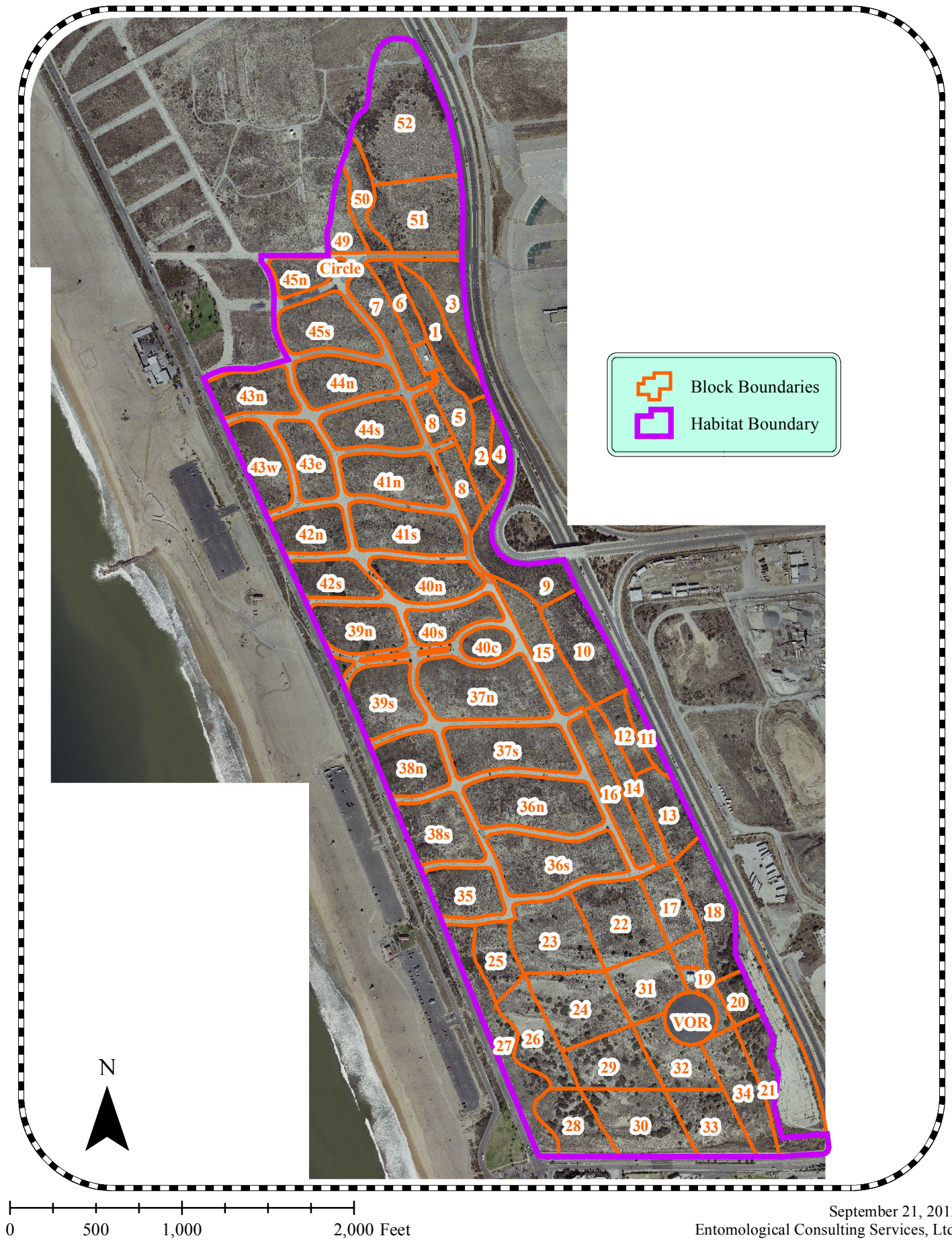


Figure 4. Habitat Boundary and Locations of the Block Buckwheat Transects
El Segundo Blue Butterfly Preserve at LAX

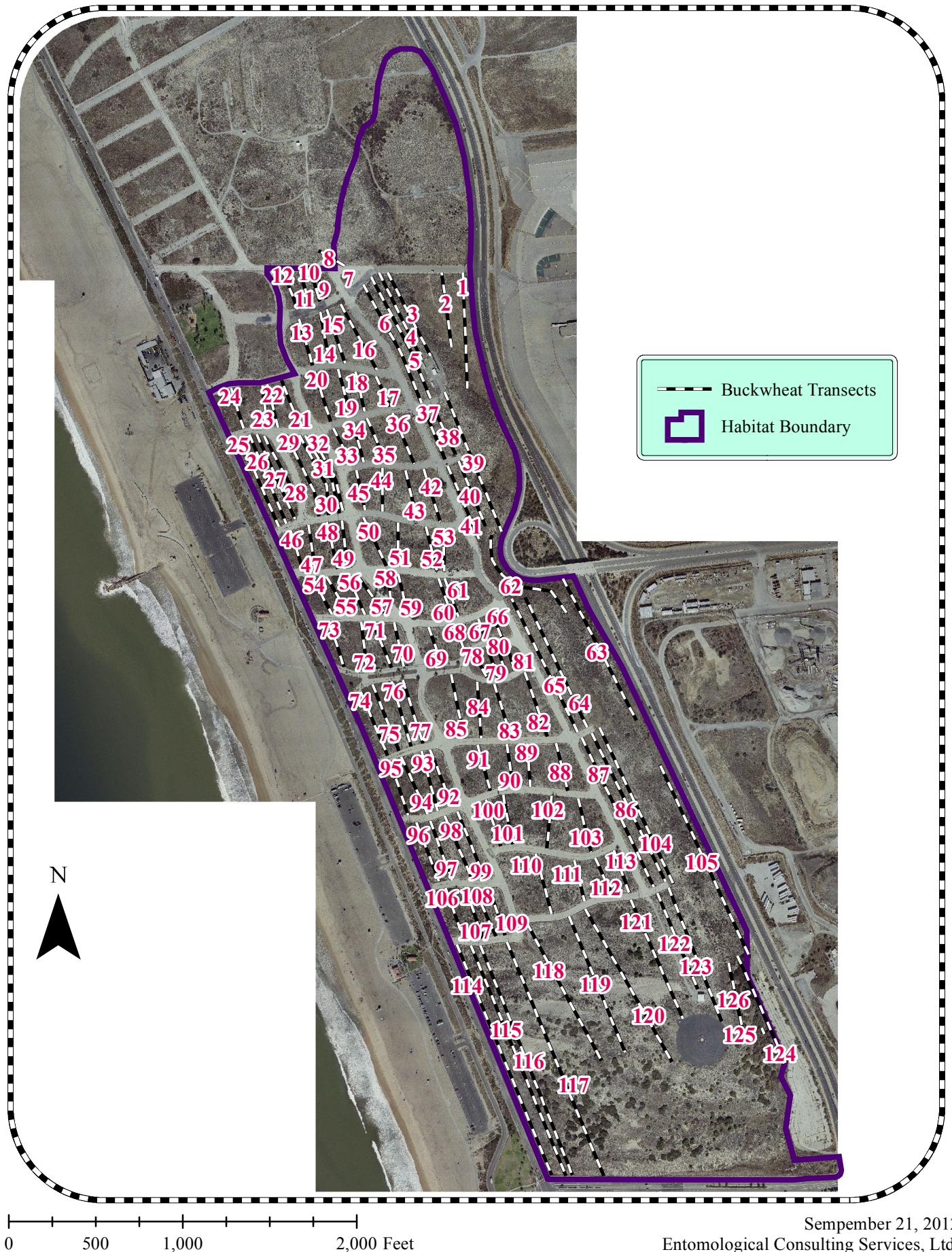


Figure 5. Locations of El Segundo Blue Butterflies Observed during the July 18 - 21, 2012 Block Counts at the El Segundo Blue Butterfly Preserve at LAX

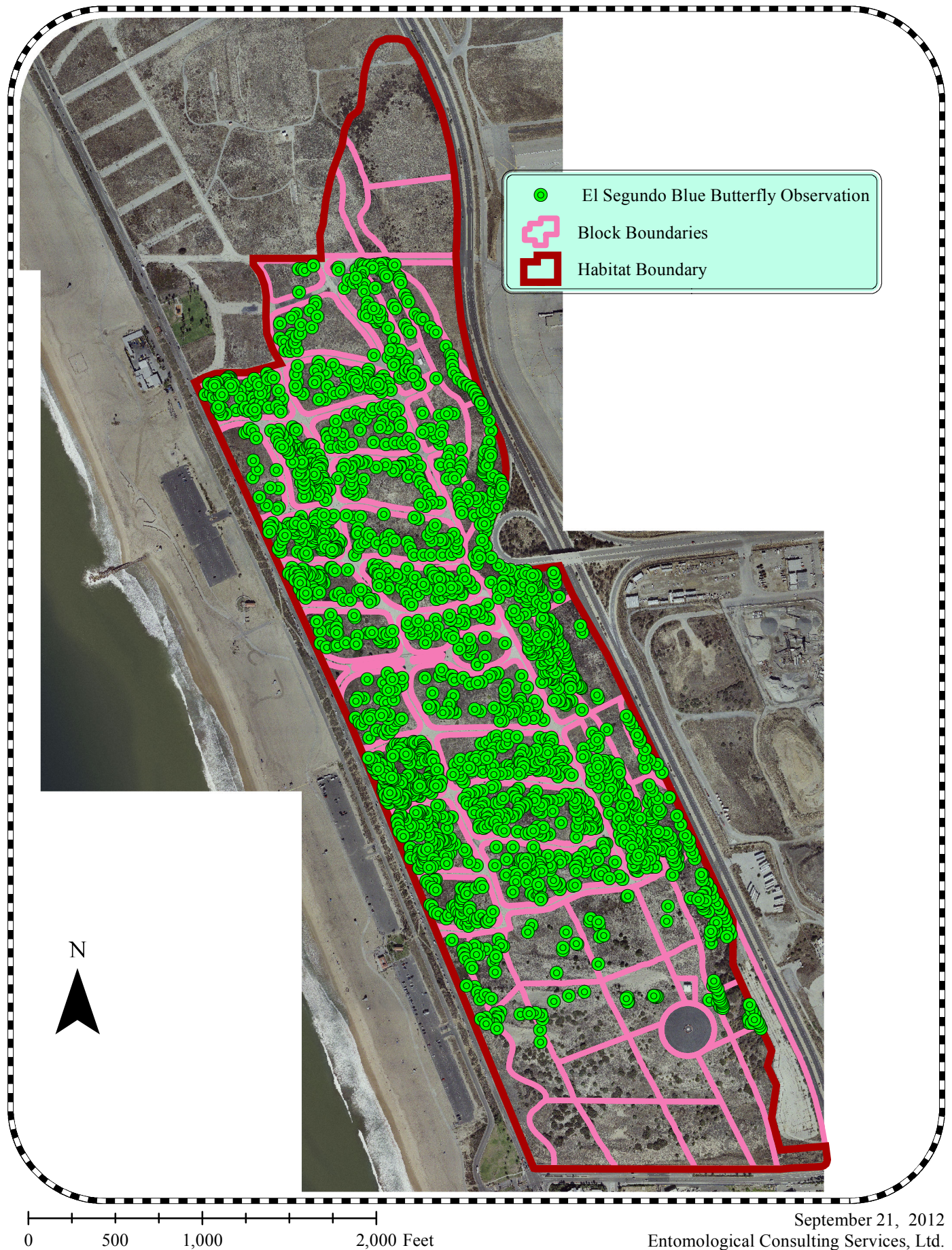


Figure 6. Overview of Buckwheat Plants on the Historical Transect:
Age Class and Flowerhead Counts, by Interval

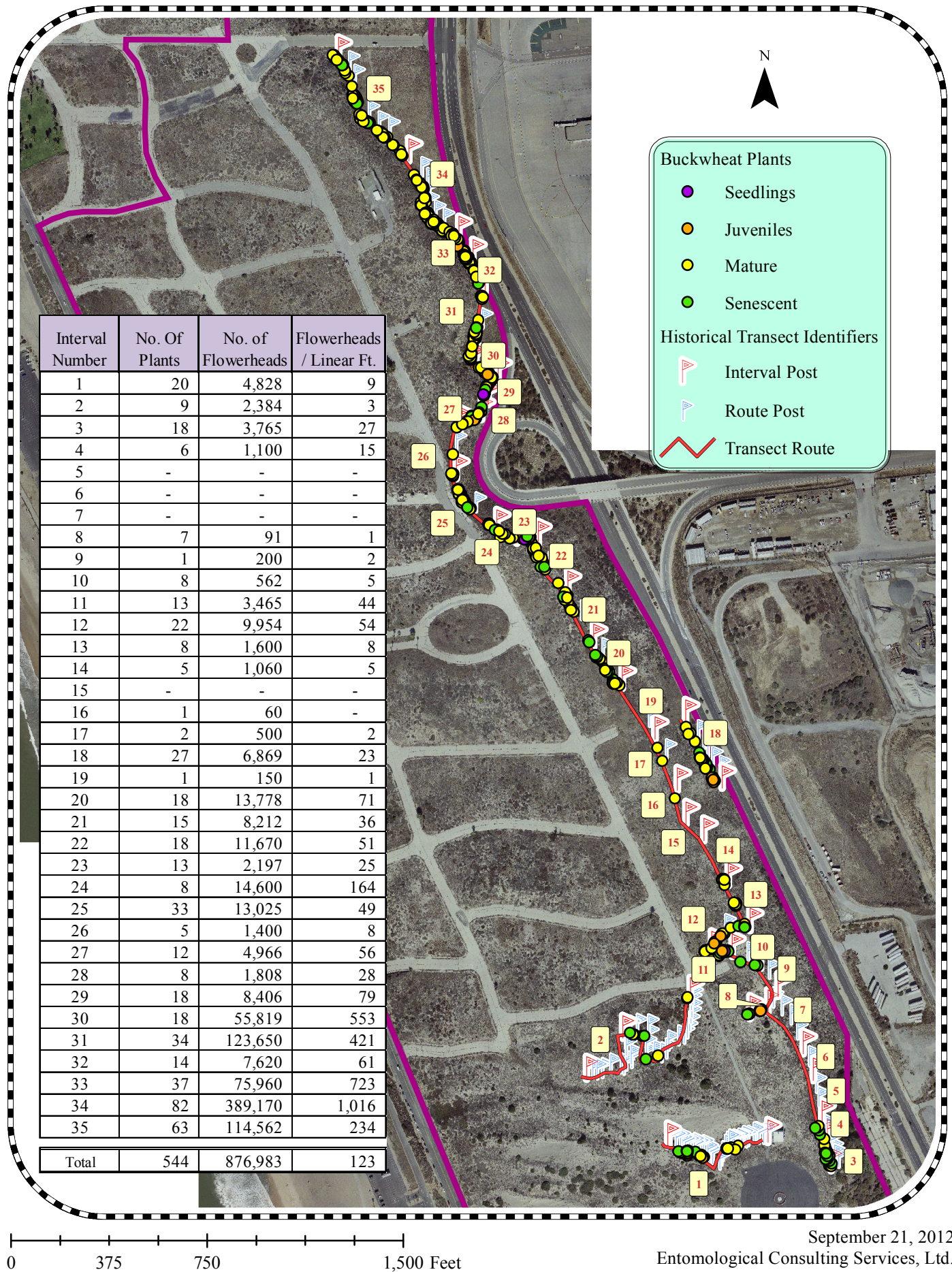


Figure 7. Overview of Buckwheat Plants on the Block Buckwheat Transects by Age Class

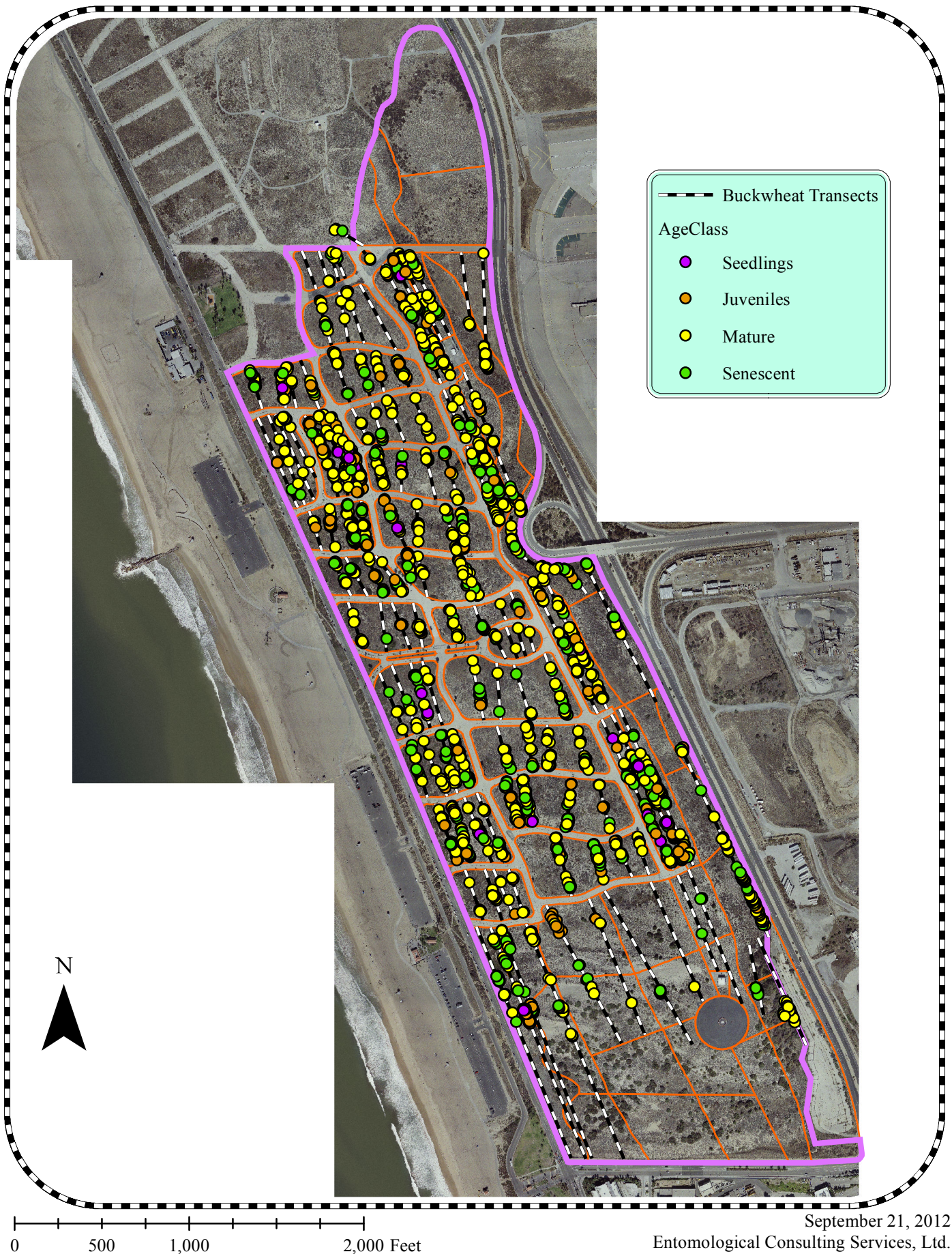


Figure 8. Example locations for removal of invasive buckwheats
[photograph locations are shown - photographs are in Appendix A]

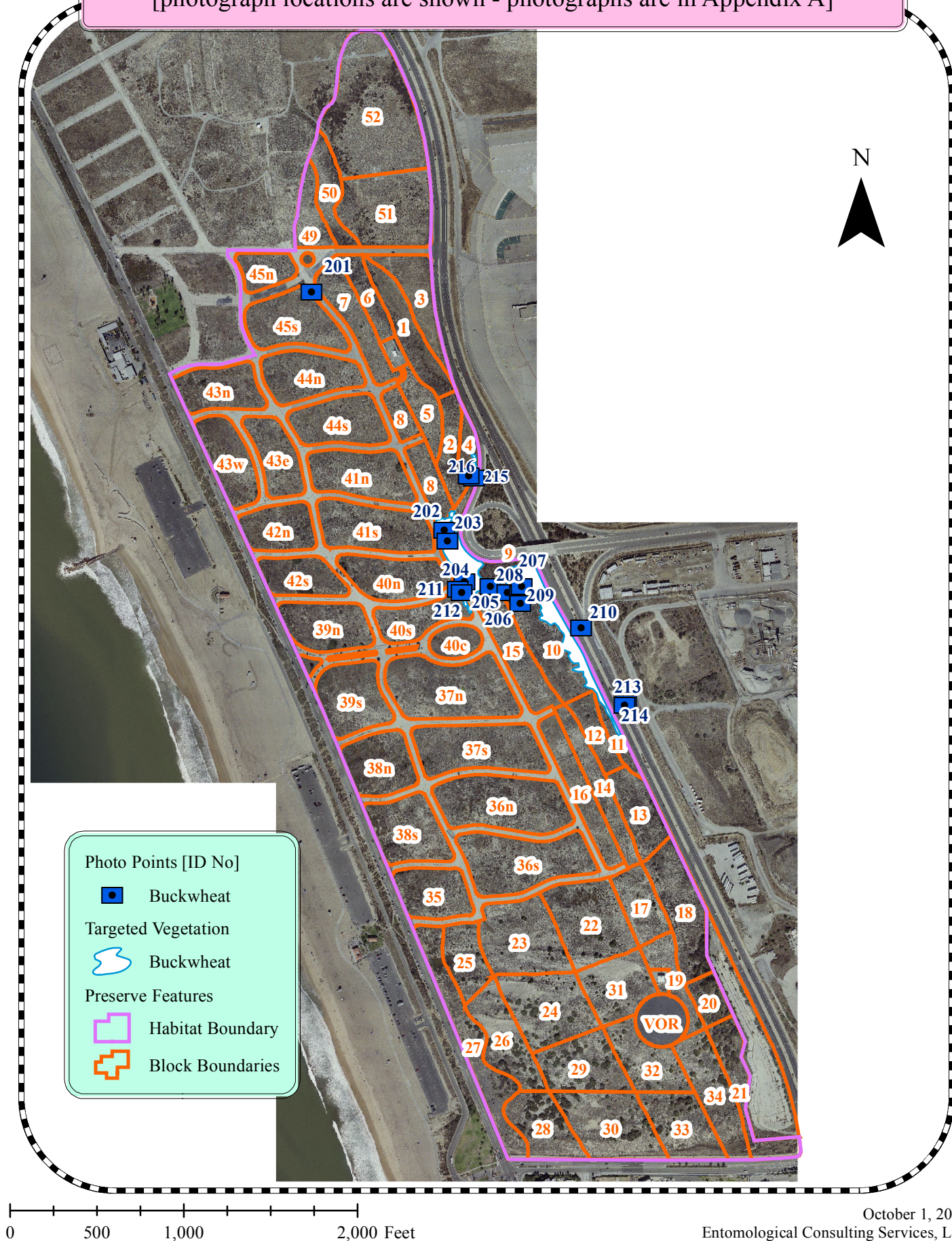


Figure 9. Example locations for removal of Acacia & Pine
[photographs locations are shown - photographs are in Appendix A]

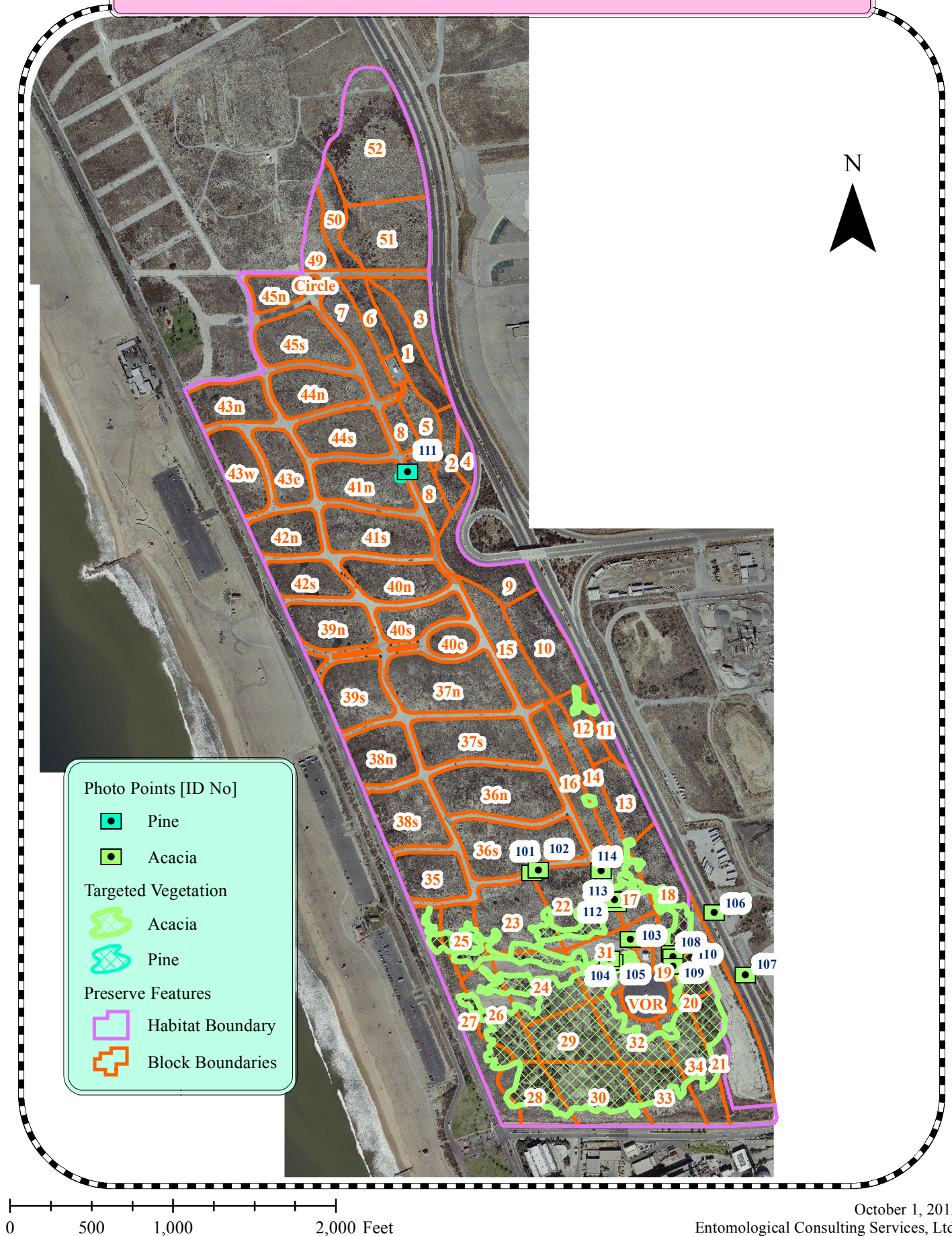
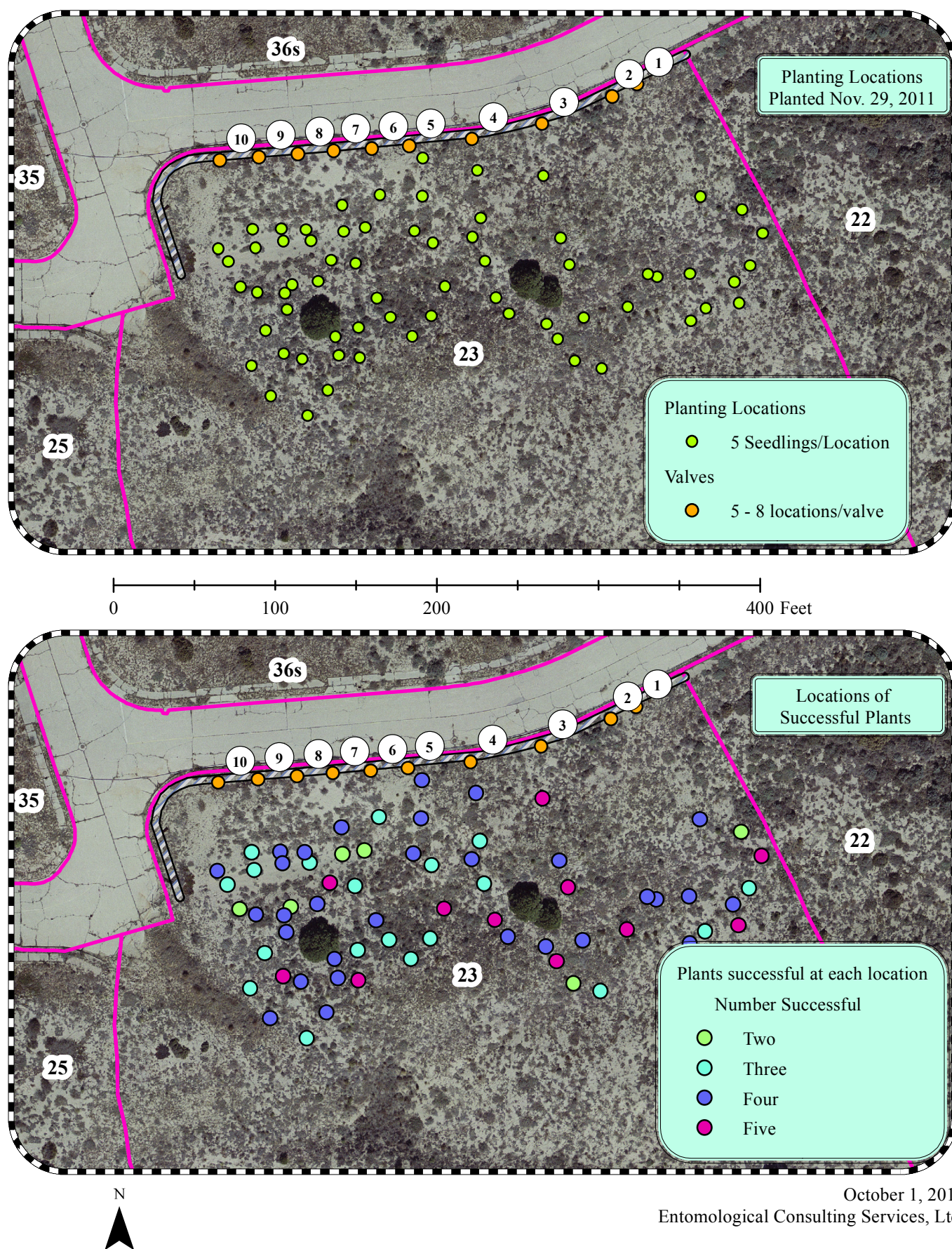


Figure 11. Buckwheat Mitigation on Block 23
Planting locations and August 2012 survey results



SECTION 9
APPENDIX A: PHOTOGRAPHS OF SELECTED
LOCATIONS FOR VEGETATION REMOVAL

LAX ESB Preserve
Photodocumentation of Selected Areas Needing Vegetation Control



Photo Pt 101 - Block 22



Photo Pt 102 - Block 22



Photo Pt 103 - Block 22



Photo Pt 104 - Block 31



Photo Pt 105 - Block 31



Photo Pt 106 - Block 18

LAX ESB Preserve
Photodocumentation of Selected Areas Needing Vegetation Control



Photo Pt 107 - Block 20

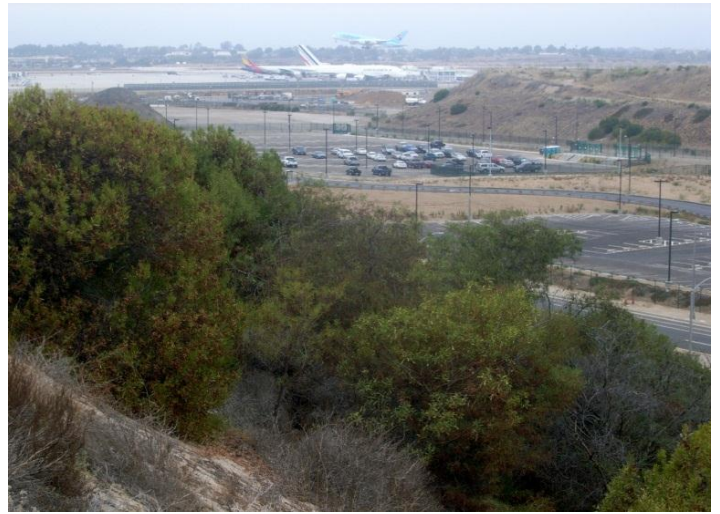


Photo Pt 108 - Block 18



Photo Pt 109 - Block 18



Photo Pt 110 - Block 20



Photo Pt 111 - Block 41n



Photo Pt 112 - Block 17

LAX ESB Preserve
Photodocumentation of Selected Areas Needing Vegetation Control



Photo Pt 113 - Block 17



Photo Pt 114 - Block 22



Photo Pt 201 - Block 45s

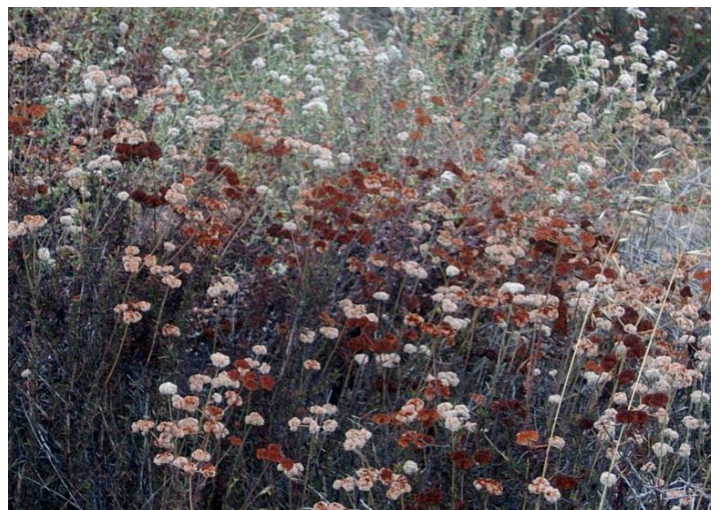


Photo Pt 202 - Block 9

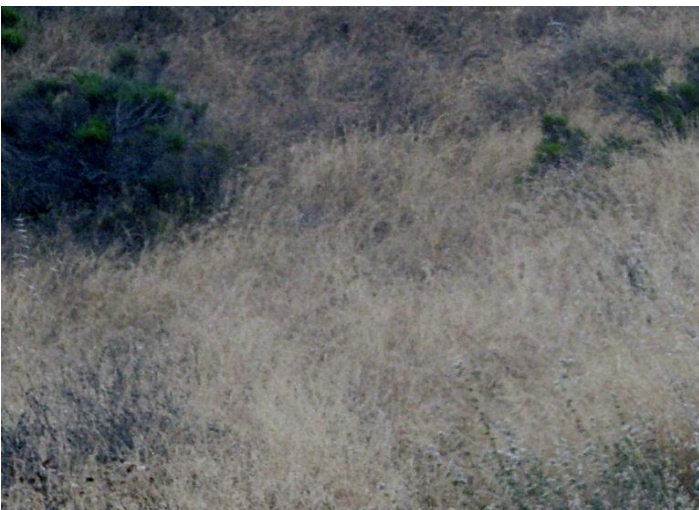


Photo Pt 203 - Block 9



Photo Pt 204 - Block 15

LAX ESB Preserve
Photodocumentation of Selected Areas Needing Vegetation Control



Photo Pt 205 - Block 9



Photo Pt 206 - Block 9

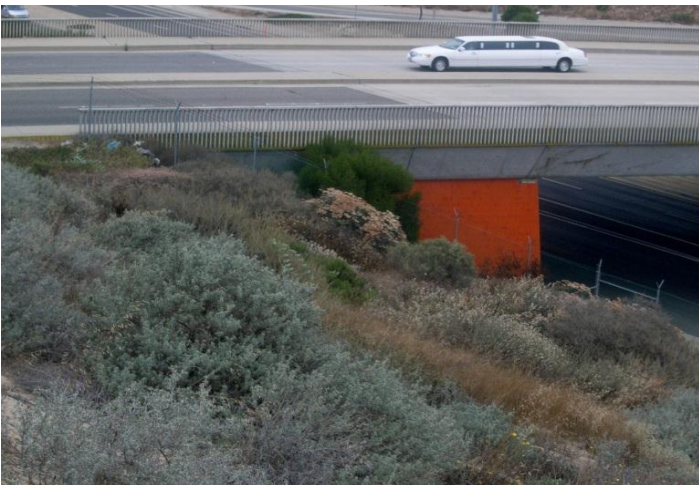


Photo Pt 207 - Block 9



Photo Pt 208 - Block 9



Photo Pt 209 - Block 10



Photo Pt 210 - Block 10

LAX ESB Preserve
Photodocumentation of Selected Areas Needing Vegetation Control



Photo Pt 211 - Block 40s



Photo Pt 212 - Block 40s

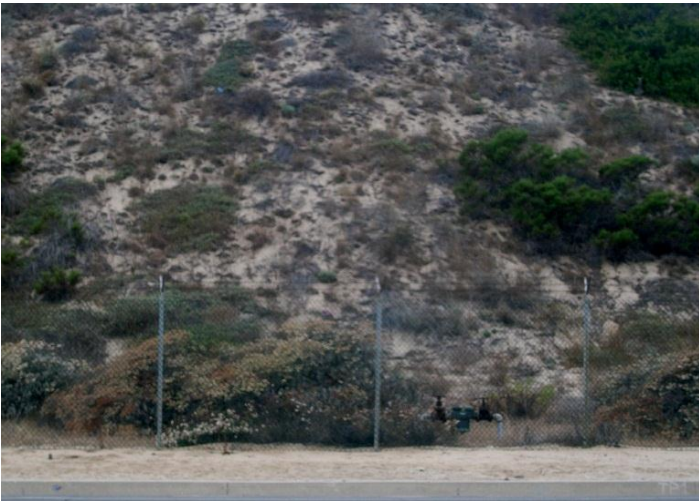


Photo Pt 213 - Block 11



Photo Pt 214 - Block 11



Photo Pt 215 - Block 2



Photo Pt 216 - Block 2

LAX ESB Preserve
Photodocumentation of Selected Areas Needing Vegetation Control



Photo Pt 301 - Block 43n



Photo Pt 302 - Block 43n



Photo Pt 303 - Block 42n



Photo Pt 304 - Block 42n



Photo Pt 305 - Block 40n



Photo Pt 306 - Block 42s

LAX ESB Preserve
Photodocumentation of Selected Areas Needing Vegetation Control



Photo Pt 307 - Block 42s



Photo Pt 308 - Block 39n



Photo Pt 309 - Block 39n



Photo Pt 310 - Block 39n



Photo Pt 311 - Block 39n



Photo Pt 312 - Block 39s

LAX ESB Preserve
Photodocumentation of Selected Areas Needing Vegetation Control



Photo Pt 313 - Block 39s



Photo Pt 314 - Block 39s



Photo Pt 315 - Block 39s



Photo Pt 316 - Block 10



Photo Pt 317 - Block 10



Photo Pt 318 - Block 10

LAX ESB Preserve
Photodocumentation of Selected Areas Needing Vegetation Control



Photo Pt 319 - Block 37n



Photo Pt 320 - Block 37n



Photo Pt 321 - Block 37s



Photo Pt 322 - Block 38n



Photo Pt 323 - Block 38n



Photo Pt 324 - Block 38n

LAX ESB Preserve
Photodocumentation of Selected Areas Needing Vegetation Control



Photo Pt 325 - Block 38n



Photo Pt 326 - Block 36n



Photo Pt 327 - Block 36n



Photo Pt 328 - Block 37s



Photo Pt 329 - Block 37s



Photo Pt 330 - Block 38n

LAX ESB Preserve
Photodocumentation of Selected Areas Needing Vegetation Control



Photo Pt 331 - Block 38n



Photo Pt 332 - Block 38n



Photo Pt 333 - Block 38s



Photo Pt 334 - Block 38s



Photo Pt 335 - Block 36n



Photo Pt 336 - Block 18

LAX ESB Preserve
Photodocumentation of Selected Areas Needing Vegetation Control



Photo Pt 337 - Block 41s



Photo Pt 338 - Block 41n



Photo Pt 339 - Block 41s



Photo Pt 340 - Block 41s



Photo Pt 341 - Block 41n



Photo Pt 342 - Block 27

LAX ESB Preserve
Photodocumentation of Selected Areas Needing Vegetation Control



Photo Pt 343 - Block 35



Photo Pt 344 - Block 27



Photo Pt 345 - Block 35



Photo Pt 346 - Block 44n



Photo Pt 347 - Block 44e



Photo Pt 348 - Block 44w

SECTION 10
APPENDIX B: WORK LOGS

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.	WORK PERFORMED	LOCATION
		/	
12-20-11	Two - 18 HRS	Removed Buckwheat Piles	AREA 1
12-21-11	Two - 18 HRS	Cut And Removed Buckwheat	AREA 1
1-3-12	Two - 18 HRS	Litter Pickup	All Through out
1-4-12	Two - 18 HRS	Cut And removed Buckwheat 2-loads	AREA 1
1-5-12	Two - 18 HRS	Cut and piled Buckwheat	AREA 1
1-6-12	Two - 18 HRS	Litter pick up removed New growth	All Through out
1-11-12	Two - 18 HRS	removed Buckwheat Piles 3 1/2-loads	AREA 1
1-12-12	Two - 18 HRS	Cut and removed Buckwheat	AREA 1
1-17-12	Two - 18 HRS	Litter Pickup	All Throughout
1-19-12	Two - 18 HRS	Removed New Growth	All Throughout
1-20-12	Two - 18 HRS	Removed Buckwheat Piles	AREA 1
1-23-12	Two - 18 HRS	Litter pickup	All Throughout
1-24-12	Two - 18 HRS	Removed Buckwheat Piles	AREA 1

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.	WORK PERFORMED	LOCATION
1-25-12	Two - 16 HRS	Removed Buckwheat Piles	AREA 1
1-26-12	Two - 16 HRS	Removed Palm Fronds	All Throughout
1-30-12	Two - 18 HRS	Litter pick up	All Throughout
1-31-12	Two - 16 HRS	Cut and Piled Buckwheat	AREA 1
2-1-12	Two - 16 HRS	Removed new growth	All Throughout
2-6-12	One - 9 HRS	Litter pick up	All Throughout
2-13-12	Two - 16 HRS	Litter pick up	All Throughout
2-14-12	Two - 16 HRS	Removed Buckwheat Pile	AREA 1
2-15-12	Two - 18 HRS	Removed Buckwheat Piles	AREA 1
2-21-12	Two - 16 HRS	Litter Pick up	All Throughout
2-22-12	Two - 10 HRS	remove new growth	All Throughout
2-27-12	Two - 18 HRS	Litter pick up	All Throughout
2-28-12	Two - 18 HRS	removed palm fronds	All Throughout
2-29-12	Two - 16 HRS	removed weed around New Buckwheat growth	
3-1-12	One - 9 - HRS	Sprayed new growth Buckwheat sprays	AREA 1
3-5-12	Two - 16 HRS	Litter pick up	All Throughout

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.	WORK PERFORMED	LOCATION
3-6-12	Two - 16 HRS	Removed Buckwheat Piles	AREA 1
3-7-12	Two - 18 HRS	Cut and piled Buckwheat	AREA 1
3-12-12	Two - 18 HRS	Litter pickup	All Through out
3-13-12	Two - 16 HRS	Removed Buckwheat Piles	AREA 1
3-15-12	Two - 16 HRS	Removed Buckwheat Piles	AREA 1
3-19-12	ONE - 9 - HRS	Litter pick up	All Through out
3-20-12	Two - 18 HRS	Removed Buckwheat Piles Then Cut and Piled Buckwheat	AREA 1
3-21-12	Two - 16 HRS	Removed Buckwheat Piles	AREA 1
3-22-12	Two - 16 HRS	Removed Buckwheat Piles	AREA 1
3-27-12	Two - 18 HRS	Litter pick up	All Through out
3-28-12	Two - 18 HRS	Sprayed New growth Buckwheat to once's	AREA 1
4-2-12	Two - 18 HRS	Litter pick up	All Through out
4-3-12	Two - 18 HRS	Removed Buckwheat Piles	AREA 1
4-4-12	Two - 10 HRS	Removed Palm Fronds	All Through out

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.	WORK PERFORMED	LOCATION
4-5-12	Two - 16 HRS	Removed Palm Fronds	All Through out
4-9-12	ONE - 9 HRS	Litter pick up	All Through out
4-10-12	Two - 14 HRS	Removed Buckwheat Ties	AREA 1
4-11-12	Two - 16 HRS	Removed Palm Fronds	All Through out
4-23-12	Two - 16 HRS	Litter pick up	All Through out
5-8-12	Two - 18 HRS	Litter Pick up	All Through out
5-9-12	Two - 18 HRS	Fixed or Replaced Water line for New Buckwheat growth Filled for water Buckets Removed New Mimosa Growth	AREA 1 All Through out
5-15-12	Two - 14 HRS	Cut and piled Buckwheat	AREA 1
5-16-12	Two - 18 HRS		
6/4/12	TWO / 18 HRS	LITTER PICKUP	ALL THROUGHOUT
6/5/12	TWO / 14 HRS	CUT AND REMOVED ACACIA NEW GROWTH.	PERSHING SLOPE.
6/6/12	TWO / 18 HRS	CUT AND REMOVED ACACIA NEW GROWTH.	PERSHING SLOPE
6/11/12	TWO / 18 HRS	LITTER PICKUP	ALL THROUGHOUT
6/12/12	TWO / 14 HRS	CUT AND REMOVED ACACIA NEW GROWTH.	PERSHING SLOPE
6/13/12	TWO / 14 HRS	CUT AND REMOVED ACACIA NEW GROWTH.	PERSHING SLOPE.

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.	WORK PERFORMED	LOCATION
6/18/12	TWO/18 HR	LETTER PICKUP	ALL THROUGHOUT
6/29/12	TWO/18 HR	REMOVED ACACIA NEW GROWTH.	IMPERIAL SLOPE
6/29/12	TWO/18 HR	REMOVED ACACIA NEW GROWTH.	IMPERIAL SLOPE
6/29/12	TWO/18 HR	LETTER PICKUP	ALL THROUGHOUT
6/26/12	TWO/18 HR	REMOVED NEW SEA LAVENDER.	ALL THROUGHOUT
6/27/12	TWO/18 HR	REMOVED NEW SEA LAVENDER AND CASTER BEEN.	ALL THROUGHOUT
7/2/12	TWO/18 HR	LETTER PICKUP	ALL THROUGHOUT
7/3/12	TWO/18 HR	REMOVED ACACIA NEW GROWTH.	IMPERIAL SLOPE
7/9/12	ONE/9 HR	LETTER PICKUP	ALL THROUGHOUT
7/14/12	TWO/18 HR	LETTER PICKUP	ALL THROUGHOUT
7/18/12	TWO/18 HR	REMOVED ACACIA NEW GROWTH.	ALL THROUGHOUT
7/19/12	TWO/18 HR	REMOVED ACACIA NEW GROWTH.	IMPERIAL SLOPE
7/23/12	TWO/18 HR	LETTER PICKUP.	ALL THROUGHOUT
7/24/12	TWO/18 HR	REMOVED ACACIA NEW GROWTH.	IMPERIAL SLOPE
7/25/12	TWO/18 HR	REMOVED ACACIA NEW GROWTH.	IMPERIAL SLOPE
7/26/12	TWO/18 HR	REMOVED ACACIA NEW GROWTH.	IMPERIAL SLOPE

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.	WORK PERFORMED	LOCATION
7/30/12	TWO / 18 HR	LETTER PICKUP	ALL THROUGHOUT
7/31/12	TWO / 18 HR	CUT AND REMOVED NEW SEA LAVENDER AND CASTOR BEAN GROWTH.	ALL THROUGHOUT
8/1/12	TWO / 18 HR	CUT AND REMOVED NEW SEA LAVENDER AND CASTOR BEAN GROWTH.	ALL THROUGHOUT
8/2/12	TWO / 18 HR	CUT AND REMOVED NEW SEA LAVENDER AND CASTOR BEAN GROWTH.	ALL THROUGHOUT
8/6/12	TWO / 18 HR	LETTER PICKUP	ALL THROUGHOUT
8/13/12	TWO / 18 HR	LETTER PICKUP	ALL THROUGHOUT
8/20/12	TWO / 18 HR	LETTER PICKUP	ALL THROUGHOUT
8/21/12	ONE / 9 HR	Pulled Sea lavender New Growth	Westside
8/22/12	ONE / 9 HR	Pulled Sea lavender New Growth	Westside
8/23/12	ONE / 9 HR	Pulled Sea lavender New Growth	Westside
8/27/12	TWO / 18 HR	LETTER PICKUP	ALL THROUGHOUT
8/28/12	ONE / 9 HR	REMOVED PINE LEAVES FROM PUMPS	ALL THROUGHOUT
8/29/12	ONE / 9 HR	REMOVED ACACIA NEW GROWTH.	ALL THROUGHOUT
8/30/12	ONE / 9 HR	REMOVED ACACIA NEW GROWTH.	ALL THROUGHOUT
9/4/12	TWO / 18 HR	LETTER PICKUP	ALL THROUGHOUT
9/5/12	TWO / 18 HR	REMOVED CASTOR BEAN NEW GROWTH.	PERSHING SLOPE

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.	WORK PERFORMED	LOCATION
9/10/12	TWO/18 HR	LETTER PICKUP	ALL THROUGHOUT
9/11/12	ONE/9 HR	SPRAYED CALIF BUCKWHEAT NEW GROWTH.	
9/12/12	ONE/9 HR	SPRAYED CALIF BUCKWHEAT NEW GROWTH.	
9/13/12	ONE/9 HR	SPRAYED CALIF BUCKWHEAT NEW GROWTH.	
9/17/12	TWO/18 HR	LETTER PICKUP	ALL THROUGHOUT
9/18/12	TWO/18 HR	CUT AND REMOVED ACACIA NEW GROWTH.	
9/19/12	TWO/18 HR	CUT AND REMOVED ACACIA NEW GROWTH.	
9/20/12	TWO/18 HR	CUT AND REMOVED ACACIA NEW GROWTH.	
9/24/12	TWO/18 HR	LETTER PICKUP	ALL THROUGHOUT
9/25/12	TWO/18 HR	CUT AND REMOVED ACACIA EXCESS PLANT MATERIAL GROWING IN A ROAD DUE TO A LEAK.	NORTH AREA
9/26/12	TWO/18 HR	CUT AND REMOVED EXCESS PLANT MATERIAL GROWING IN A ROAD DUE TO A WATER LEAK.	NORTH AREA
9/27/12	TWO/18 HR	CUT AND REMOVED ACACIA NEW GROWTH.	
10/1/12	TWO/18 HR	LETTER PICKUP	ALL THROUGHOUT
10/2/12	TWO/18 HR	CUT AND REMOVED ACACIA NEW GROWTH.	

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.	WORK PERFORMED	LOCATION
10/3/12	TWO / 18 HR	CUT AND REMOVED ACACIA NEW GROWTH.	
1			
10/10/12	TWO / 18 HR	LETTER PICKUP	ALL THROUGHOUT
10/15/12	TWO / 18 HR	LETTER PICKUP	ALL THROUGHOUT
10/16/12	TWO / 18 HR	CUT AND SPRAYED CALEF BUCKWHEAT.	
1			
10/17/12	TWO / 18 HR	CUT AND SPRAYED CALEF BUCKWHEAT.	
10/18/12	TWO / 18 HR	CUT AND SPRAYED CALEF BUCKWHEAT.	
10/22/12	TWO / 18 HR	LETTER PICKUP	ALL THROUGHOUT
10/23/12	TWO / 18 HR	CUT AND SPRAYED CALEF BUCKWHEAT.	
10/24/12	TWO / 18 HR	CUT AND SPRAYED CALEF BUCKWHEAT.	
10/29/12	TWO / 18 HR	LETTER PICKUP	ALL THROUGHOUT
10/30/12	TWO / 18 HR	CUT AND REMOVED SPRAYED CALEF BUCKWHEAT	
10/31/12	TWO / 18 HR	CUT AND REMOVED CALEF BUCKWHEAT.	
11/5/12	TWO / 18 HR	LETTER PICKUP	ALL THROUGHOUT
11/6/12	TWO / 18 HR	CUT AND SPRAYED CALEF BUCKWHEAT.	
11/7/12	TWO / 18 HR	ESCORTED DWP. FIXED A LEAK IN ONE OF THE ROADS.	

EL SEGUNDO DUNES MAINTENANCE

DATE	NUMBER OF EMPLOYEES/ Total Hr.	WORK PERFORMED	LOCATION
11/8/12	Two/16 HR	CUT AND REMOVED ACACIA NEW GROWTH.	FROM ROADS
11/13/12	Two/18 HR	LETTER PICKUP	ALL THROUGHOUT
11/14/12	Two/18 HR	CUT AND SPRAYED CALIF BUCKWHEAT	
11/15/12	Two/18 HR	CUT AND REMOVED ACACIA NEW GROWTH.	FROM ROADS
11/19/12	Two/18 HR	LETTER PICKUP	ALL THROUGHOUT
11/20/12	Two/18 HR	CUT AND REMOVED ACACIA NEW GROWTH.	
11/26/12	Two/18 HR	LETTER PICKUP	ALL THROUGHOUT
11/27/12	Two/18 HR	REMOVED SAND FROM ROAD THAT HAD A BIG WATER LINE BREAK.	
11/28/12	Two/18 HR	CUT AND SPRAYED CALIF BUCKWHEAT NEW GROWTH..	
11/28/12	Two/18 HR	CUT AND SPRAYED CALIF BUCKWHEAT NEW GROWTH.	
12/3/12	Two/18 HR	LETTER PICKUP.	ALL THROUGHOUT
12/4/12	Two/18 HR	CUT AND REMOVED CASTOR BEAN.	NORTH AREA
12/5/12	Two/18 HR	CUT AND REMOVED ACACIA TREE AND NEW GROWTH.	NORTH AREA
12/6/12	Two/18 HR	CUT AND SPRAYED CALIF BUCKWHEAT NEW GROWTH.	
12/10/12	Two/18 HR	CUT AND SPRAYED CALIF BUCKWHEAT NEW GROWTH.	

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