APPENDICES

Appendix A:
1999 Programmatic Agreement Among the National Park Service at Yosemite, the California State Historic Preservation officer, and the Advisory Council on Historic Preservation Regarding the Planning, Design, Construction, Operations, and Maintenance of Yosemite National Park

PROGRAMMATIC AGREEMENT AMONG THE NATIONAL PARK SERVICE AT YOSEMITE, THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION REGARDING PLANNING, DESIGN, CONSTRUCTION, OPERATIONS AND MAINTENANCE, YOSEMITE NATIONAL PARK, CALIFORNIA.

With October, 2003, Amendment 1

WHEREAS, the National Park Service (NPS) at Yosemite National Park (YOSE) has determined that planning, design, construction, operations and maintenance may have an effect on properties included in, or eligible for inclusion in, the National Register of Historic Places, and has consulted with the California State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (Council) pursuant to Section 800.13 of the regulations (36 CFR Part 800), implementing Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470f; hereinafter NHPA); and

WHEREAS, the NPS, the Council, and National Conference of State Historic Preservation Officers (NCSHPO) executed a Nationwide Programmatic Agreement on July 17, 1995 that establishes a framework for taking historic properties into account and is supplemented by this agreement; and

WHEREAS, the NPS completed a 1980 General Management Plan (GMP) that provides the management direction for YOSE; and

WHEREAS, the NPS, SHPO and Council executed a November 1, 1979, Memorandum of Agreement that is still in effect to cover actions specified in the 1980 GMP; and

WHEREAS, a Concessions Services Plan and a Yosemite Valley Plan exist or are underway to implement proposals of and amend the 1980 General Management Plan; and

WHEREAS, the NPS has on staff or has access to qualified cultural resource specialists who meet, at a minimum, the appropriate qualifications set forth in the Department of the Interior's "Professional Qualifications Standards" (36 CFR Part 61, Appendix A) to carry out programs for cultural resource management. These include cultural resource management advisors described in Stipulation III (C) (3) of the nationwide programmatic agreement; and

WHEREAS, the terms in 36 CFR Section 800.2 “Definitions” are applicable throughout this Programmatic Agreement, including “Historic Property” to mean any prehistoric or

historic district, site, building, structure or object included in, or eligible for inclusion in, the National Register of Historic Places. Historic Properties include artifacts and remains that are related to and located within such properties, cultural landscapes, as defined in National Register Bulletins 18 and 30, and traditional cultural properties, as defined in National Register Bulletin 38. "Indian Tribes" refers to American Indian tribes, bands, organized groups, or communities recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians, and who are culturally affiliated with YOSE lands and resources; and

WHEREAS, YOSE has consulted with Indian Tribes (American Indian Council of Mariposa County, Inc., the Tuolumne Me-Wuk Tribal Council, the Mono Lake Indian Community, the Bridgeport Paiute Tribe, the Chukchansi Nation, the Northfork Mono Rancheria and the Northfork Mono Indian Museum) and has provided these parties the opportunity to participate in the development of, and to concur in the terms of, this Agreement; and

WHEREAS, YOSE has consulted with the National Trust for Historic Preservation (National Trust) and has invited the National Trust to concur in this agreement; and

WHEREAS, YOSE has notified the public of the formulation of this agreement and provided them an opportunity to comment;

NOW, THEREFORE, the NPS, SHPO, and Council agree that YOSE shall carry out its responsibilities under the NHPA, as amended, for those undertakings/actions specified in Stipulation II below.

STIPULATIONS

YOSE shall ensure that the following measures are carried out:

I. POLICY

YOSE shall manage and preserve the historic properties of the park through undertakings and research, consistent with good management and stewardship. These efforts are, and will remain, in keeping with the NHPA, the National Environmental Policy Act of 1969 (NEPA), and other applicable laws, executive orders, regulations and policies. YOSE shall implement its programs with public review and in consultation with other federal agencies, the SHPO, Indian Tribes, city and county governments and their respective authorities, as appropriate.

A. Guidelines, standards, and regulations that are relevant to this Agreement and that shall provide guidance and performance standards for management of historic properties include:

NPS/ACHP	The Secretary of the Interior's Standards and Guidelines for Federal Agency Historic Preservation Programs Pursuant to the National Historic Preservation Act [Section 110 Guidelines]
ACHP	Treatment of Archeological Properties: A Handbook
FHWA	Manual for Uniform Traffic Control Services
NPS	Maintenance Management Program, Operations Manual, Parts 1&2
NPS	Museum Handbook, Parts 1&2
NPS	Director's Order 2: Park Planning
NPS-6	Interpretive and Visitor Services Guidelines
NPS-12	NEPA Compliance Guidelines
NPS-28	Cultural Resource Management Guideline
NPS-38	Historic Property Leasing Guidelines
NPS-76	Housing Design and Rehabilitation Guidelines
USDI	Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines
USDI	The Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings
USDI	The Secretary of the Interior's Standards for Historic Preservation Projects with Guidelines for Applying the Standards
USDI	The Secretary of Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes
US	Uniform Federal Accessibility Standards (49 FR 31528-31617)
US	Americans with Disabilities Act Accessibility Guidelines (56 FR 45731-45778)
US	Native American Graves Protection and Repatriation Act Regulations: Final Rule (43 CFR Part 10)

As needed, additional guidelines may be developed for the built or designed landscapes of YOSE. Proposed new guidelines developed by YOSE shall be submitted to the SHPO for review and comment. The SHPO shall have 30 days after receiving the proposed guidelines to respond to specific treatments described in the guidelines.

B. YOSE shall use the following Cultural Resource Identification and Professional or Technical Plans and Studies in management:

NPS	YOSE Hazard Tree Plan
NPS	YOSE Fire Management Plan
NPS	YOSE Wilderness Management Plan
NPS	YOSE Resource Management Plan
NPS	YOSE Archeological Synthesis and Research Design
NPS	Cultural Landscape Report, Yosemite Valley
NPS	Ethnographic Evaluation of Yosemite Valley, the Native American Cultural Landscape

NPS	Historic Resource Study, Yosemite National Park
NPS	List of Classified Structures, YOSE
NPS	Wilderness Historic Resource Study
NPS	Archeological Inventory, Testing, Data Recovery and Monitoring Reports
NPS	Ethnographic Studies
NPS	YOSE Interpretive Prospectus

II. APPLICABILITY

This agreement is applicable to all individual actions relating to:

A. Routine maintenance and park operations

B. Individual actions proposed in the 1980 General Management Plan, that will be attached in Appendix C, and individual actions proposed in implementing plans including, but not limited to:

- 1992 Concessions Services Plan
- Yosemite Valley Plan (in preparation)

C. Design projects

D. Specific management plans

III. SCOPE OF AGREEMENT

A. This Agreement applies to undertakings at YOSE that have not been covered by previous agreements, and that are under the direct or indirect supervision of the NPS including undertakings performed by NPS lessees, permittees, concessionaires, cooperators and park partners.

B. The NPS shall ensure that the lessees, permittees, concessionaires, cooperators and park partners are notified that they are subject to the terms of this Agreement.

IV. RELATIONSHIP TO OTHER PLANS

A. This Agreement incorporates provisions of, but does not supersede, the 1979 MOA executed for the 1980 GMP. Provisions of that agreement will continue to be implemented as written.

B. This Agreement supplements the 1995 Nationwide Programmatic Agreement among the NPS, the Council, and the National Conference of State Historic Preservation Officers.

V. PARTICIPATION OF INDIAN TRIBES

A. YOSE shall consult with Indian Tribes in such a manner as to meaningfully involve them in decisions affecting resources of concern.

B. Within one year of the execution of this Agreement, YOSE shall develop an agreement that sets forth the process by which Indian Tribes will be involved in considering the impacts of undertakings on Historic Properties at YOSE that are of interest to them. This protocol will:

1. Define when consultation between the YOSE and tribes is necessary.
2. Identify individuals or offices directly involved in the consultation process
3. Outline key elements of the consultation process
4. Outline the process to be followed in case of inadvertent discovery of human remains or other items subject to the NAGPRA

C. Until this agreement is in place, YOSE shall continue to consult with Indian Tribes according to 36 CFR Part 800 and, when appropriate, the provisions of NAGPRA.

VI. PUBLIC PARTICIPATION

A. YOSE shall consult with the signatories to this Agreement and with other Interested Parties or Persons to determine if there are organizations or individuals that may be concerned with actions described in Stipulation VIII below, and shall provide notice to the public of the undertakings subject to the stipulations of this Agreement through the public participation process of the National Environmental Policy Act (NEPA) and its implementing regulations set forth in 40 CFR Parts 1500-1508. Any member of the public may participate as an Interested Person in the consultation for a particular action upon notifying YOSE of their interest. YOSE, SHPO and Council, if participating, shall jointly determine when such Interested Persons shall be invited to participate as a consulting party for individual undertakings in accordance with 36 CFR Section 800.5(e)(1)(iv). YOSE shall take into account the views of such parties regarding any adverse effect of an undertaking described in Stipulation VIII below.

B. Documentation regarding identification and National Register evaluation of historic properties, when not subject to confidentiality concerns, will be available for inspection at YOSE, SHPO, or NPS Pacific West Regional Office.

VII. CONSIDERATION OF HISTORIC PROPERTIES

Pursuant to the NHPA and in the earliest stages of the planning process, YOSE shall identify, evaluate, determine effects to, and treat historic properties in conformance with all applicable regulations, policies and guidelines listed in Stipulation I above.

A. Identification

1. YOSE shall consult with Indian Tribes and Interested Persons, as appropriate, on activities to locate and inventory Historic Properties, in accordance with Section 110 of the NHPA, and 36 CFR Section 800.4e

2. If no Historic Properties are identified, YOSE shall maintain documentation of the inventory for purposes of review under Stipulation XVIII and no further action will be necessary.

3. If Historic Properties are identified, and consistent with any confidentiality protocols provided by the Tribe(s) and/or described in Section 304, NHPA, all final reports resulting from the Historic Properties surveys stipulated above shall be submitted to SHPO.

B. National Register Evaluation

1. YOSE, in consultation with SHPO, shall follow the procedures in 36 CFR Section 800. 4 (c) (1 through 3) to evaluate the historical significance of all properties that may be affected by an undertaking. If YOSE and SHPO do not agree on the National Register eligibility of any property, or if the Council so requests, YOSE shall obtain a formal determination of eligibility from the Keeper of the National Register pursuant to 36 CFR Section 800.4 (c) (4). If SHPO does not respond within the review period described in Stipulation IX below, YOSE may assume SHPO concurrence with YOSE determinations.

2. As part of the 1980 GMP planning process, NPS evaluated and SHPO concurred in National Register eligibility determinations of certain properties in Yosemite. These determinations are itemized in the Case Report accompanying the 1979 MOA (summary list to be appended within six months). In addition, subsequent studies have evaluated properties under National Register criteria. These determinations will be reviewed, on a case by case basis by YOSE cultural resource staff or advisors, for new information or changed circumstances. Previous National Register determinations will be revisited by YOSE staff or cultural resources advisors if new information, such as recognition of new property types (e.g. cultural landscapes and traditional cultural properties) or change in historic context(s), is forthcoming or if SHPO so requests.

3. If traditional cultural properties are identified through the process outlined in Stipulation VII (A), YOSE shall seek the participation of all Indian Tribes (or other groups as appropriate) who ascribe traditional cultural values to those properties

in applying the National Register criteria. Except as provided by any confidentiality protocols developed by Indian Tribes, and/or those described in Section 304, NHPA, YOSE shall ensure that documentation of determinations, including the SHPO's comments, are made available for inspection according to provisions stated in Stipulation VI.

C. Assessment of Effect

YOSE shall determine the effect of any undertaking subject to this Agreement using the Criteria of Effect and Adverse Effect (36 CFR Part 800). YOSE may consult with the signatories to this Agreement or with other Interested Persons regarding effect determinations for individual undertakings.

1. Repetitive, Low Impact Activities

Repetitive, low impact activities defined in *Stipulation IV B of the 1995 Service-wide programmatic agreement will be undertaken* with no additional review by YOSE cultural resource staff. The project proponent shall maintain records of actions for inspection according to Stipulation XVII below.

2. Actions Having No Effect or No Adverse Effect

Activities determined by YOSE to have "No Effect" or "No Adverse Effect" to Historic Properties, as defined in 36 CFR Part 800, may be implemented and will be documented for purposes of this Agreement by YOSE without further review by the Council or SHPO, provided:

a) that the undertaking is not subject to provisions of Stipulation VIII(B);

b) that the applicable YOSE management office has submitted a proposed undertaking to the YOSE Section 106 Coordinator for review and concurrence.

c) that the YOSE Section 106 Coordinator has reviewed the undertaking to ensure that identification and evaluation of Historic Properties in the area of potential effect has been completed according to Stipulation VII (A) and (B) above, and that adequate information has been compiled to identify and evaluate the effects of proposed undertakings on Historic Properties;

d) that YOSE ensures that decisions regarding proposed undertakings are made and carried out in conformance with the standards and guidelines in Stipulation I above;

e) that YOSE shall ensure that recovery of archeological data is based on the existing YOSE Archeological Research Design and Archeological Synthesis and Revised Research Design;

f) that YOSE has consulted with the appropriate Indian Tribe(s) regarding possible effects to Native American archeological or traditional cultural properties;

g) that YOSE has determined that the proposed action either does not affect or does not adversely affect Historic Properties based on the criteria of adverse effect found in 36 CFR Section 800.9; and

h) Monitoring, when appropriate, shall be summarized in a brief letter report. If Historic Properties are discovered during implementation, a detailed monitoring report shall be prepared. Large-scale ground disturbing activities shall be monitored in accordance with a monitoring plan. The monitoring plan shall include, at minimum, the following elements:

i. a detailed summary of properties that may be exposed during construction activities, based on archival research;
ii. treatment strategies (i.e. documentation, data recovery excavations, protection, etc.) for anticipated property types;
iii. specific guidelines for any necessary work stoppages;
iv. the locations of Historic Properties to be avoided and the means by which they will be avoided;
v. specific areas and phases of construction which will be monitored;
vi. a schedule for submitting progress reports of monitoring activities to the SHPO;
vii. a process for dealing with types of properties not anticipated in the monitoring plan, including names of individuals or offices to be contacted in the event of discovery
viii. reporting requirements, to be followed upon project completion
ix. specific procedures to be followed in the event of discovery of human remains
x. Indian tribal monitoring procedures

VIII. RESOLUTION OF ADVERSE EFFECTS

YOSE shall make every reasonable effort to avoid adverse effects to Historic Properties identified according to Stipulation VII (A) through project design, facilities' location, or other means. Avoidance alternatives will be documented during the NEPA process.

When avoidance of a Historic Property is not feasible or prudent, and the undertaking does not involve properties or actions described in (B) below, YOSE, as part of its examination of treatment options, may decide to implement one or more Standard Mitigating Measures (SMM) described in (A) below. YOSE shall notify the following parties in writing of the decision to implement SMM:

- the SHPO
- Indian Tribe(s) (when American Indian properties are involved)
- members of the public who have made their interest in the undertaking known according to provisions outlined in Stipulation VI.

Consultation with the Council will not be undertaken when YOSE decides to implement SMM. If the SHPO, any Indian Tribe or any Interested Person does not object, within 14 calendar days of the notification, to YOSE's decision to treat the adverse effect according to the SMM, YOSE will proceed without further involvement of these parties. Should the SHPO, Indian Tribe, or Interested Person(s) object to the implementation of SMM as set forth above, YOSE shall make every effort to resolve the objection. If YOSE decides not to implement SMM, or YOSE and the objecting party are unable to resolve the objection, YOSE shall consult in accordance with (B) below, Required Consultation.

A. Standard Mitigating Measures

1. Recordation

a) Individual, nationally significant Historic Properties will be documented according to the standards of the Historic American Buildings Survey or the Historic American Engineering Record, as appropriate. The level of documentation for these Historic Properties shall be determined by the NPS. Copies of documentation will be deposited in the YOSE archives, SHPO, and Library of Congress.

b) The following categories of structures, whether significant at the national, state, or local level, will be documented by black and white 5 x 7 photographic prints, and a Historic Record that includes narrative history and original drawings where available. Copies of documentation will be deposited in the YOSE archives and with SHPO:

- Contributing elements in a historic district (unless individually eligible)
- Individual elements of linear resources, such as ditches, roads, trails
- Minor elements of a complex (e.g. sheds, garages)

- Individual elements of cultural landscapes
- Individual Historic Properties of state and local significance

2. Salvage

If a Historic Property will be demolished, YOSE historical architect, curator and/or preservation specialist will conduct a documented inspection to identify architectural elements and objects that may be reused in rehabilitating similar historic structures or that may be added to the YOSE museum collection.

3. Interpretation

YOSE will ensure that the story of human interaction with nature and changes in that interaction is a central theme in the interpretation of the Yosemite story. This interpretation will include a history of alteration of the human environment and reasons for that change.

4. National Register Reevaluation

Within 120 working days after adverse alteration, relocation, or demolition of a Historic Property, YOSE shall consult with SHPO regarding the Property's continued eligibility for the National Register. The results of this consultation, with accompanying documentation, shall be forwarded to the Council and Keeper of the National Register. Should YOSE and SHPO disagree, YOSE shall seek a determination from the Keeper in accordance with 36 CFR Section 800.4 (C)(4).

B. Required Consultation

YOSE shall consult, according to 36 CFR Section 800.5(e) with the SHPO, Indian Tribe(s) (as appropriate) and Interested Persons as defined and identified under Stipulation VI (as appropriate), and shall invite the Council's participation regarding any action that:

1. may affect a National Historic Landmark*, or properties of national significance listed on the National Register of Historic Places*
2. may affect a human burial
3. adversely affect a traditional cultural property
4. generates significant public controversy
5. involves a disagreement among YOSE, the SHPO, any Indian Tribe, or any Interested Persons regarding proposed use SMMs

IX. REVIEW PERIODS

A. YOSE shall submit the results of all identification efforts, NRHP eligibility determinations, discovery plans, and treatment plans to SHPO, Indian Tribes, and Council (as necessary) for a 30 calendar day review and comment period, unless otherwise agreed to. Opportunity for review by Interested Persons is as identified in Stipulation VI. This period shall begin upon receipt of adequate documentation by the reviewing party. If any reviewing party does not respond to YOSE within 30 calendar days of receipt of adequate documentation, YOSE may assume that that party does not object to the findings and recommendations as detailed in the submission. If any party does not respond, does not object, or proposes changes that YOSE accepts, no further review by that party will be required and YOSE may proceed according to its findings and recommendations.

B. Should any party object to findings or recommendations in any submittal within the time period specified in (A) above, YOSE shall consult with the objecting party to resolve the objection. If the objection is not resolved, YOSE shall consult according to Stipulation XIV, Dispute Resolution.

X. DISCOVERY

A. Native American Human Remains

1. YOSE shall ensure that any Native American burials or Native American human remains, funerary objects, sacred objects and objects of cultural patrimony discovered during implementation of an undertaking, archeological fieldwork, or other actions, are treated with appropriate respect and according to federal law, including, but not limited to, the Native American Graves Protection and Repatriation Act, Public Law 101-601 (NAGPRA) and its implementing regulations (43 CFR Part 10, Native American Graves Protection and Repatriation Act Regulations). Actions described herein do not constitute compliance with provisions of NAGPRA.

2. If objections are raised by any Indian Tribe regarding treatment of human remains or cultural items as defined under NAGPRA, the objection shall be resolved in accordance with NAGPRA. YOSE shall notify SHPO and Council of any such dispute if so requested by involved tribes.

B. Other Historic Properties

YOSE shall notify the SHPO and Indian Tribe(s), as appropriate, as soon as practicable if it appears that an undertaking will affect a previously unidentified property that may be eligible for inclusion in the National Register, or affect a known Historic Property in an unanticipated manner. YOSE shall stop all potentially harmful activities (if ongoing) in the vicinity of the discovery and shall take all reasonable steps to avoid or minimize harm to the property until YOSE concludes

consultation. If the newly discovered property has not previously been included in or determined eligible for listing in the National Register, YOSE may assume that the property is eligible for purposes of this Agreement. YOSE shall notify the SHPO at the earliest possible time and consult with the SHPO to develop actions that will take the effects of the undertaking into account. YOSE will notify SHPO of any time constraints, and YOSE and SHPO will mutually agree upon time frames for this consultation. YOSE shall provide the SHPO (and Indian Tribe[s], as appropriate) with written recommendations that take the effects of the undertaking into account. If the SHPO does not object to YOSE's recommendations within the agreed upon time frame, YOSE will implement the recommendations. If SHPO or the Indian Tribe(s) object to the proposed treatment, and these objections cannot be resolved, YOSE shall follow procedures outlined in Stipulation XIV, Dispute Resolution.

XI. NATURAL DISASTERS

In the past YOSE has experienced major floods, fires, earthquakes, wind damage from storms, earth slides, and other natural disasters/emergencies which are likely to recur in the future. For a period not exceeding 45 days after the conclusion of the emergency (plus any extension agreed upon by YOSE, SHPO and Council) YOSE will proceed as follows:

A. YOSE will, without SHPO consultation, undertake emergency actions pursuant to the terms of this Agreement to stabilize Historic Properties and prevent further damage.

B. YOSE cultural resource specialists shall work closely with the emergency operations team, participate in discussions regarding emergency response activities and monitor work that has the potential to affect Historic Properties.

C. YOSE staff shall consult with the appropriate Indian Tribe(s) regarding emergency actions.

D. All work having the potential to affect Historic Properties shall be documented.

E. Every effort will be made to avoid known or discovered Historic Properties during emergency response activities. However, in those rare cases where this is impossible or could impede emergency responses, photographic and written documentation of affected Historic Properties shall be completed.

F. All such emergency measures shall be undertaken in a manner that does not foreclose future preservation or rehabilitation, unless YOSE determines that integrity has been permanently lost.

G. Within 90 days after the conclusion of the disaster or emergency period, YOSE shall submit to the SHPO, Council and the Federal Preservation Officer, NPS a report that documents how any effect of disaster or emergency response operations on Historic Properties were taken into account.

XII. EMERGENCY REPAIRS

A. In the event that damage to or failure of park infrastructure poses an immediate threat to life or health, YOSE will undertake emergency repairs with on-site monitoring by appropriate cultural resource specialists.

B. Should Historic Properties be discovered during emergency repair activity, all work that could result in adverse effects shall cease provided the Superintendent or designated representative determines work cessation will not impede emergency repairs. If the work stoppage at the discovery site will impede emergency repairs, emergency repair will continue and YOSE officials shall immediately notify the SHPO by telephone and provide the following information:

1. finding of a required emergency
2. description of the emergency and steps necessary to address the situation
3. description of the discovery and its apparent significance
4. description of the emergency and potential effect on the discovery feature
5. efforts to consider Historic Properties

C. Repairs and emergency treatment of any discovered properties shall be documented by YOSE on a Preservation Assessment Form or its equivalent. This form, along with a description of the emergency situation, signed by the requesting park official and the cultural resource specialist accomplishing the monitoring, shall be provided to the SHPO within 15 days of the emergency repair.

XIII. PERMITS

A. Permits and other legal agreements including, but not limited to, special use permits, leases, concessions, contracts and easements (hereinafter "Permits") for use of lands or structures in YOSE reflect a diversity of utilities and uses. All such Permits shall contain terms and conditions YOSE deems appropriate to protect and preserve Historic Properties.

B. YOSE shall require that any undertaking proposed and implemented by a permittee/licensee, which may affect a Historic Property, shall meet the guidelines and standards set forth in Stipulation I above, and is reviewed by YOSE in accordance with Stipulation VII (c). Any permittee/licensee who proceeds with an undertaking without project review and approval, and who forecloses the obligation

of YOSE to fulfill terms of this agreement, may be subject to appropriate sanctions in accordance with the terms of the permit/license.

XIV. DISPUTE RESOLUTION

A. Should SHPO or Council object within 30 calendar days to any matter submitted by YOSE for review pursuant to this Agreement, YOSE shall consult with the objecting party to resolve the objection. If after 30 calendar days YOSE or the objecting party determines that the objection cannot be resolved, YOSE shall forward all documentation relevant to the dispute to the Council. Within 30 calendar days after receipt of all pertinent documentation, the Council will either:

1. provide YOSE with recommendations, which YOSE shall take into account in reaching a final decision regarding the dispute; or

2. notify YOSE that it will comment pursuant to 36 CFR Section 800.6(b), and proceed to comment. Any Council comment provided in response to such a request shall be taken into account by YOSE in accordance with 36 CFR Section 800.6(c)(2) with reference only to the subject of the dispute; YOSE's responsibility to carry out all actions under this Agreement that are not the subjects of the dispute will remain unchanged.

B. Should any Indian Tribe object to the manner in which the terms of this Agreement are implemented, YOSE shall take the objection into account and consult with the objecting party for 30 calendar days. If YOSE determines that the objection cannot be resolved, YOSE shall refer the objection to the Council according to Section A of this Stipulation.

C. Should any Interested Persons or a member of the public object to the manner in which this Agreement is implemented, YOSE shall take the objection into account and consult with the objecting party for 30 calendar days. If YOSE determines that the objection cannot be resolved, YOSE shall refer the objection to the Council in accordance with Section A of this Stipulation.

D. Should the subject of an objection pertain to the eligibility of a property for listing in the National Register, YOSE shall consult with the objecting party for a 30-day period. If the objection is not resolved within those 30 calendar days, YOSE shall refer the matter to the Keeper of the National Register for a final determination.

XV. FUTURE AGREEMENTS

Programmatic agreements or memoranda of agreement may be negotiated by YOSE, SHPO, and the Council, as appropriate, and may supplement this Agreement.

XVI. AMENDMENTS

Any signatory may request that this Agreement be amended, whereupon the parties will consult in accordance with 36 CFR Section 800.13. Where the parties cannot agree on executing an amendment, the matter shall be addressed pursuant to Stipulation XIV, Dispute Resolution. Any amendment agreed upon will be executed in the same manner as the original Agreement.

XVII. FAILURE TO CARRY OUT AGREEMENT

In the event YOSE does not or cannot carry out the terms of this Agreement, YOSE shall comply with the NPS Nationwide Programmatic Agreement with regard to individual undertakings covered by this Agreement.

XVIII. REVIEW OF AGREEMENT

A. On or before November 15 of each year for two years and biannually thereafter, so long as this Agreement is in effect, YOSE shall prepare and provide to the signatories and all parties invited to concur with this Agreement and the NPS Federal Preservation Officer a report describing how YOSE is carrying out its responsibilities under this Agreement. The report shall include, at a minimum, a list of "no effect and "no adverse effect" actions carried out in accordance with Stipulation VIII (B) , above; efforts to identify and/or evaluate potential Historic Properties; monitoring efforts, and treatment of Historic Properties. YOSE shall ensure that this report is made available for public inspection pursuant to Stipulation VI, that potentially Interested Persons and members of the public are made aware of its availability, and that interested members of the public are invited to provide comments to the Council and SHPO as well as to YOSE. The SHPO, Council, and Indian Tribes may review the annual report and provide comments to YOSE. At the request of any party to this Agreement, YOSE shall supplement this process through meeting(s) to address comments and/or questions.

B. The SHPO and the Council may monitor activities carried out pursuant to this Agreement, and the Council will review such activities if so requested. YOSE shall cooperate with the SHPO and the Council in carrying out their monitoring and review responsibilities.

XIX. TERMINATION

YOSE, SHPO, or Council may terminate this Agreement by providing 30 calendar days' written notice to the other parties provided that the parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. In the event of termination, the NPS shall comply with 36 CFR Sections 800.4 through 800.6 for individual undertakings covered by this Agreement.

XX. EXPIRATION

This Programmatic Agreement shall be null and void fifteen (15) years from date of execution of this Agreement by the Council.

Execution and implementation of this Programmatic Agreement evidences that YOSE has satisfied its Section 106 responsibilities for all individual undertakings referenced in this Agreement.

Appendix B:
Scoping Report

Analysis of Public Comment

CAT
Content
Analysis
Team

December 2002

Yosemite National Park

Environmental Education Campus Plan - Scoping

200 E. Broadway
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Missoula, MT 59807
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National Park Service
Yosemite National Park

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Introduction

Yosemite National Park was created in 1890 to preserve the spectacular scenery, forests, meadows and waterfalls found in this part of the Sierra Nevada Mountains of southern California. The Park is administered by the National Park Service and attracts visitors from around the world.

Yosemite's General Management Plan was completed in 1980 and addressed the needs for visitor services, resource management, interpretive services, concession operations and park operations. The Yosemite Valley Plan, finalized in 2000, aims to carry out the goals of the General Management Plan and restore Yosemite Valley's natural processes.

In the fall of 2002, Yosemite National Park began public scoping in preparation for the Environmental Impact Statement for the Environmental Education Campus Development Program. The Park Service invited the public to submit ideas and concerns pertaining the proposed design and construction of the Environmental Education Campus.

During the comment period 58 responses were received through written correspondence. This report, developed by the U.S. Forest Service Content Analysis Team and based on a review of all received responses, provides a comprehensive list of public concerns raised during the comment period. The public concern list identifies specific requests and common themes expressed by individuals and groups. Each public concern is accompanied by one or more illustrative sample statements. Sample statements support the public concerns, and may also impart the author's suggestion(s) on how, when, or where the concern should be addressed. Moreover, it should be noted that sample statements are just that—samples. A given public concern may reflect one or many submitted comments. In addition, this report provides a series of appendices that explain the process for reviewing public comments, analyze demographic information, and list the names of the analysts.

Public Concerns List

Planning

#29 Public Concern: Yosemite National Park should consider all public comment.

Please consider all comments so you can make an informed choice. (Individual, Yosemite National Park, CA - #41)

#31 Public Concern: Yosemite National Park should ensure its staff is made aware of public forums.

Today's "public" forum wasn't very public. When I came into the park September 15 and asked about this "public" forum, no one in the visitor center knew anything about it. The ranger got on the phone and made several calls before he got in touch with someone that could confirm that there was a forum planned. He immediately posted info that day. My question is: How can this be a public forum when you haven't provided info even to your own staff? (Individual, Long Beach, CA - #26)

#18 Public Concern: The Environmental Education Campus Plan should include alternatives that preserve Yosemite National Park's natural environment.

We request that the Park develop and select alternatives that preserve or enhance the natural ecosystems of Yosemite Valley. (Preservation/Conservation Organization, Twain Harte, CA - #33)

The Yosemite Valley Plan and the Environmental Education Campus Development center expansion alternative will degrade the natural values of Yosemite: Any alternative in the draft Environmental Education Campus Development Center which allows for an increase in the size of the Crane Flat Campus—by numbers and/or by footprint will demonstrate the failure of the Yosemite Valley Plan to protect the health of the ecosystems and hydrology of Yosemite National Park and the health, survivability, ability to reproduce, and future sustainability of the flora and fauna which depend on them. It must also be remembered that the wilderness boundary is nearby and must be respected and the wilderness values protected. (Individual, San Francisco, CA - #50)

#19 Public Concern: Yosemite National Park should consider integrating the Yosemite Institute into the Yosemite Lodge Plan, rather than building new facilities.

A possible option would be allocating Yosemite Institute a specific section of the new Yosemite Lodge Project. The YI program could continue to function as it currently does with a portion of its students at Crane Flat and the rest in Yosemite Valley. The Institute could house the students in a block of economical cabin/motel-like facilities, all concentrated in one area of the Yosemite Lodge during the fall, winter, and spring. Those facilities could then be opened up to the general public for the busiest season of the year, the summer. Students could eat at the lodge cafeteria instead of Curry Village. This would require no new developments to be built anywhere else within or outside of Yosemite National Park. YI would be guaranteed the use of those facilities at a set rate negotiated with the NPS so as to avoid being "priced out" of the valley. (Individual, Yosemite National Park, CA - #44)

#20 Public Concern: Yosemite National Park should adopt the Environmental Education Campus Plan because it conforms with the Yosemite Valley and Merced River Plans.

I find acceptable all proposed projects listed in the September 20, 2002 letter regarding the opening of public scoping, as they meet the terms of the Yosemite and Merced River Plans. (Individual, No Address - #31)

#21 Public Concern: Yosemite National Park should disclose how the Environmental Education Campus Plan modifies the General Management Plan.

Nowhere on the NPS web site, Yosemite Park planning site sheets, nor in the YVP does it disclose that this proposal would be a significant amendment to the park's general management plan. (Individual, San Francisco, CA - #49)

#22 Public Concern: Yosemite National Park should disclose the cumulative impacts of the Environmental Education Campus Plan.

This project is barely disclosed in the Yosemite Valley Plan, yet it will create significant cumulative impacts—none of which were disclosed in the YVP. (Individual, San Francisco, CA - #49)

The brief, un-descriptive paragraph in the YVP does not disclose that this will be an expansion in numbers served and in footprint. It merely mentions that, "among the expanded facilities would be a science lab…" It does not disclose the many cumulative impacts at all and, e.g., does not mention the Great Gray Owl. . . . What good does it do to study and interpret such values when in order to do this, those very values are put at risk and destroyed? For example, the program might teach or interpret, "This was an area that used to support Great Gray Owls, but the development of these structures and the implementation of this program in 2004 served to disturb to destroy the environment which used to support them. They are no longer here." (Preservation/Conservation Organization, Yosemite National Park, CA - #56)

#23 Public Concern: Yosemite National Park should complete an Environmental Impact Statement for the Environmental Education Campus Plan based on the Merced River Plan.

The YVP should be based on a protective Merced River Plan. A full EIS should be completed for this plan after the YVP is in compliance with a protective Merced River Plan. (Individual, San Francisco, CA - #49)

#26 Public Concern: Yosemite National Park should prepare a single Draft EIS that evaluates the cumulative impacts of the Environmental Education Campus, Yosemite Lodge Area, Curry Village/East Valley Campground, South Fork Bridge, and El Portal Office Building plans.

I am very concerned that NPS is violating the Council on Environmental Quality's (CEQ) regulation which implements the National Environmental Policy Act (NEPA). CEQ, in section 150.4(a) states, "Proposals or parts of proposals which are related to each other closely enough to be, in effect, a single course of action shall be evaluated in a single impact statement." (Individual, Houston, TX - #30)

#27 Public Concern: The Environmental Education Campus Plan should disclose the financial arrangements between the Yosemite Institute and Yosemite National Park.

Monetary incentives: Does NPS get a kick-back from YI expansion (i.e., do additional revenue opportunities for YI also mean increased revenue sharing with the NPS?) from YI additional outside rentals? Does NPS have a monetary incentive for YI and/or Crane Flat Campus expansion? (Preservation/Conservation Organization, Yosemite National Park, CA - #56)

Alternatives

#98 Public Concern: Yosemite National Park should give fair consideration to each alternative set forth in the Environmental Education Campus Plan.

Alternatives—are these merely to make a show of satisfying the National Environmental Policy Act (NEPA)? Has a predetermination already been made to keep the campus at Crane Flat and expand it—as on the schematic on the board at one of the NPS open Houses at the East Auditorium, Yosemite Valley Visitor Center? (Preservation/Conservation Organization, Yosemite National Park, CA - #56)

Alternatives need equal consideration in the decision making process with NEPA, and YNI Board. (Individual, Yosemite National Park, CA - #4)

#32 Public Concern: Yosemite National Park should select the No Action Alternative for the Environmental Education Campus Plan.

Crane Flat ranks as an average facility in an extraordinary, nay, stupendous locale. To build more there seems antithetical to the stated purpose of the organization. Therefore, I support the No Action alternative. (Individual, Santa Cruz, CA - #25)

Wetlands

#44 Public Concern: Yosemite National Park should consider the impacts to nearby meadows from redeveloping the Crane Flat campus.

What are the important issues and opportunities to consider as Yosemite Institute and the National Park Service move forward with the project to redevelop the Crane Flat Campus? Spring Meadow sensitivity in additional people, possibility of soil compaction. (Individual, Yosemite National Park, CA - #4)

I strongly support Yosemite Institute, a unit of the Yosemite National Institute, in its mission of environmental education. With respect to the proposed reconstruction and/or expansion of the present campus due to aging of the current structures and the increased maintenance costs associated with same, please do not permit any impacts that could result in further drainage or reduction of the Crane Flat meadow and its water table. (Individual, Citrus Heights, CA - #48)

#43 Public Concern: Yosemite National Park should test for any reduction in groundwater before drilling new wells in the Crane Flat area.

Larger facility drawing down the meadow aquifer, affecting flora, etc. Subterranean water flow is a mysterious thing (look at helitack's need for a 600 foot deep well!); is there a chance that increased water withdrawals from the meadow wells will actually reduce groundwater that supplies the sequoia grove? Can you test for this before the facility is committed to and new wells are drilled? (Individual, Yosemite National Park, CA - #57)

Vegetation

#47 Public Concern: Yosemite National Park should consider monitoring the Environmental Education Campus's impacts on the Crane Flat ecosystem.

Pristine meadows and forests, how are you monitoring the health, well-being of the life living at Crane Flat with added people/development? (Individual, Yosemite National Park, CA - #41)

#46 Public Concern: Yosemite National Park should consider the impacts to the Tuolumne Sequoia Grove from increasing the student population at Crane Flat.

What are the important issues and opportunities to consider as Yosemite Institute and the National Park Service move forward with the project to redevelop the Crane Flat Campus? Soil compaction and Giant Sequoia shallow root systems are vulnerable to additional hiking groups. (Individual, Yosemite National Park, CA - #4)

Areas of concern that need solid research if expansion occurs: Fragile shallow root system of giant sequoias, current use with 4-6 hiking groups on existing trails is a maximum number without impacting the grove, and soil surface. (Individual, Yosemite National Park, CA - #41)

The proximate location of the Crane Flat campus to the Tuolumne giant sequoia grove indicates increased impacts from doubling the student population at Crane Flat. (Individual, San Francisco, CA - #49)

#105 Public Concern: The Environmental Education Campus Plan should address the fate of the Giant Sequoias planted near the old Crane Flat Ranger Station.

What becomes of the three sequoias planted [near the old Crane Flat Ranger Station] historically? This was Muir's first stop on his first trip into the park; he found a landscape with sandhill cranes and one small cabin. What have we allowed ourselves to give up since Muir's time, and are we burying it further? (Individual, Yosemite National Park, CA - #57)

Wildlife

#53 Public Concern: The Environmental Education Campus Plan should minimize the educational facility's impacts to wildlife.

You need to select the location in Yosemite Park where the education facilities will have the least impact on wildlife. That should be job one. I don't think we should compromise sensitive wildlife like the Great Gray Owl in order to have good educational facilities. We need good educational facilities, but the appropriate place for them must be found. (Individual, Ben Lomond, CA - #55)

Displaced wildlife from extra noise and disturbance. How to minimize the effects on this resource? . . . Increased traffic (noise, parking challenges, wildlife by vehicles). How is this impact mitigated? (Individual, Yosemite National Park, CA - #57)

#50 Public Concern: The Environmental Education Campus Plan should address nocturnal wildlife impacts from increased campus lighting.

Increased night lighting—effects on crepuscular/nocturnal wildlife? As it is, lights at the current campus shine all the way across the main meadow, which can't be good for the resource of night. (Individual, Yosemite National Park, CA - #57)

#49 Public Concern: The Environmental Education Campus Plan should assess the impact to neotropical bird migration patterns from redeveloping the Crane Flat campus.

What are the important issues and opportunities to consider as Yosemite Institute and the National Park Service move forward with the project to redevelop the Crane Flat Campus? Neotropical bird migration stop-over site in Dog's Meadow. (Individual, Yosemite National Park, CA - #4)

#52 Public Concern: The Environmental Education Campus Plan should address how to restore rare amphibian species.

Rare amphibians. Seasonal wetlands may, or could, harbor species of value. Mountain yellow-legged frogs? Threats to extant Pacific Tree Frogs from new run-off, more kids? Any chance that the tiny wetlands beside the campus could be a reintroduction site for species of concern? (Individual, Yosemite National Park, CA - #57)

Rare, Threatened, and Endangered Species

#54 Public Concern: The Environmental Education Campus Plan should disclose possible effects on listed species from the redevelopment of Crane Flat.

What are the important issues and opportunities to consider as Yosemite Institute and the National Park Service move forward with the project to redevelop the Crane Flat Campus? Endangered Species - Pacific Fisher, S. Spotted Owl, Gray Owl, and Plant Species! (Individual, Yosemite National Park, CA - #4)

BAT SPECIES

Yosemite is habitat for many federal and state listed bat species. We can well imagine that the Crane Flat area is habitat for many of these species containing meadow and woodland interfaces. The historic buildings that NPS and YI propose to tear down undoubtedly provide roosting sites for many bats. Even if the buildings are torn down outside of roosting time frames, can NPS ensure that the bats will find suitable new sites in the same approximate areas? There are probably other sensitive species that also depend on the habitat and attributes of the Crane Flat area which would be negatively affected by this proposal. (Preservation/Conservation Organization, Yosemite National Park, CA - #56)

GREAT GRAY OWL

I consider the meadow system to be of great importance as a home for breeding Great Gray Owls and as a migration stopping place. The impact an expanded campus could have on the meadow may mean the end of owl breeding in that area. (Individual, No Address - #2)

The entire YI campus is within the potential nesting area (as judged by proximity to the meadow foraging areas) of the Great Gray Owl. More people, noise, etc., in this important habitat for the Great Gray Owl can only diminish the foraging success of the owl, which will ultimately lead to a decline in the nesting success of the owl. (Individual, El Portal, CA - #46)

Great Gray Owls will be further impacted by any expansion in numbers and/or footprint at the Crane Flat Campus. The Great Gray Owl is very rare south of Canada and is listed as an Endangered California species. There are only around 75 owls in the entire state of CA. "Entire California population of this species is restricted to the Yosemite region," "Research suggests that human disturbance, could affect foraging success of this species, which may explain its absence from the [Yosemite] Valley." (YVP, K-25) They probably exist at all due to the existence of the Park, yet the Park proposes to impact and probably cause the demise of some or many of them, and their ability to reproduce, through this expansion at Crane Flat. Some or many of them use and probably depend on the Crane Flat area. (How ironic would it be for a children's environmental education organization to be the cause of the degradation of Yosemite's natural values and the death of Great Gray Owls and elimination of the owls' future generations.) (Individual, San Francisco, CA - #49)

Great Gray Owl habitat. Marginal nesting habitat, because of human disturbance (opening the Tioga Road, increased traffic, opening Crane Flat Campground—in the middle of breeding season), yet used every year for breeding. The sustainability of this state endangered species presence in the region has already been compromised by the expansion of Crane Flat gas station operations with 24-hour service, 12-month service, and new, louder generator and compressor. Shouldn't the park be doing whatever it can to protect this bird's habitat? (Individual, Yosemite National Park, CA - #57)

WOLVERINES

There may be wolverines using the area between Crane Flat and Gin Flat, as well; very rare and sensitive to disturbance. Has anyone looked for their tracks in the area in winter, and how will growth at Crane Flat impact them? (Individual, Yosemite National Park, CA - #57)

FISHERS

"Fishers [Pacific fisher, Martes pennanti pacifica] have been seen within the last 10 years near Henness Ridge and Crane Flat." (YVP K-27) In fact in the last year, a Fisher was unexpectedly seen near the Crane Flat Campus. They are a Federal and California Species of Concern. All the more reason not to increase impacts at Crane Flat and potentially impact this unexpected good indication of their presence. Densities in the central Sierra Nevada where Yosemite is located are very low. (YVP K-27) (Preservation/Conservation Organization, Yosemite National Park, CA - #56)

Fisher habitat. Tracks are seen at the Crane Flat BRC each winter; this area is one of the few places in the Yosemite region where fishers seem to have a regular population. Have park biologists done winter track studies? How will program growth here affect these sensitive animals? (Individual, Yosemite National Park, CA - #57)

Cultural Resources

#55 Public Concern: Yosemite National Park should implement the Environmental Education Campus Plan to promote valuable Yosemite Institute courses.

I am writing to encourage your support of a new Yosemite Institute campus at Crane Flat. Our school brings a group of 45-50 high school science students to Yosemite Institute every year, in February. . . . Our students learn through experiential education in the majestic setting of Yosemite National Park, where they hike, cross-country ski, and snowshoe to study sites. These students are given the opportunity to learn about science, as well as about each other. This is a program that cannot be recreated on our high school campus, and is one that would be better served by a new facility at Crane Flat. The Crane Flat area is ideal for the Yosemite Institute programs because it offers a very unique and varied environment, in a small area. (Individual, Moraga, CA - #5)

The experience the YI provides is excellent. The instructors are well educated and knowledgeable about the area. Environmental sustainability is emphasized and my students leave the trip with a profound appreciation of the world around them. For many of my students, the experience at Yosemite is the highlight of their entire high school experience. I highly recommend that the Yosemite Institute experience be able to remain and look forward to any help that I can provide to them to accommodate this. (Individual, San Clemente, CA - #10)

I am asking you and all members of the committee to consider allowing Y.I. to build new facilities at Crane Flat. This will insure the opportunity for young people to benefit from this experience will continue. (Individual, Fremont, CA - #6)

I am pleased to be able to comment on the Environmental Education Campus Development Program. This program is of lasting importance to the citizen of California and the nation. Yosemite Park and its natural and historical importance to our people are better served with this partnership and the educational programs it provides. The need for a new facility is self-evident; the need to provide a safe and healthy campus that will meet the needs of a large group of participants is long past due. (Individual, Yuba City, CA - #47)

I am a sixth grade teacher in Selma, California. Each year our school sends 90 sixth graders to the Yosemite Institute. Our kids are mostly lower socio-economic children and mostly Hispanic. Some are in "Honors" class, but most are "regular." The week-long trip to Yosemite is foundational in their young lives. It opens their minds and lives to a new world of natural water, plants, animals, weather, and ecosystems. The trip dovetails nicely with California's sixth grade science curriculum. We have been making this trip for almost 20 years, and we have seen our former students grow up and use the knowledge and experiences from Yosemite to make good decisions about the environment, camping, voting, and preserving nature. They pass these values on to their children. Y.I. is trying to expand their facilities to improve their program and make it available to more children. I am very much in favor of this expansion. (Individual, Selma, CA - #7)

I hope you realize what an incredible program YI is and you do all you can to improve upon it and make it more accessible to all students. (Individual, Redwood City, CA - #15)

#101 Public Concern: The Environmental Education Campus Plan should address the potential changes in the quality of education if programming is increased.

What are the important issues . . . to consider as Yosemite Institute and the National Park Service move forward with the project to redevelop the Crane Flat Campus? Quality of education if programming is increased. (Individual, No Address - #3)

#100 Public Concern: Yosemite National Park should encourage the Yosemite Institute to pursue alternative partnerships and educational programs to minimize infrastructure development.

It's worth thinking about a housing facility that'd host a couple dozen high school juniors in a semester-length credit program that focuses on the values of national parks and wilderness. A small dormitory, with

a bit of classroom space could be added to the existing 76-bed campus, and there'd be a large increase in the depth of education about park concerns. A semester-long course would have profound effects on those learners, would grow YI away from YCS, wouldn't need much infrastructure. If YI were better endowed, it could start an operation that focused attention on the great number of schools that visit Yosemite for a day, or that camp for a few days, but which have little or no contact with the NPS or any local interpretive services. Here is a major need and opportunity to improve resource based education in/about Yosemite. Though it's beyond YOSE, having YI grow at SEKI provides a way to reach more young people with the national park message, without impairing Yosemite's resources. Rather than partnering with YCS, YNI could expand their partnership to DNC, work an arrangement, with NPS support, for affordability, safety and reliability. (Individual, Yosemite National Park, CA - #57)

#102 Public Concern: The Environmental Education Campus Plan should clarify Yosemite Institute's role within Yosemite National Park.

What are the important issues and opportunities to consider as Yosemite Institute and the National Park Service move forward with the project to redevelop the Crane Flat Campus? What role is YI expected to fulfill by NPS? (Individual, No Address - #3)

#56 Public Concern: Yosemite National Park should not rely on private institutes to provide environmental education.

It must be questioned whether it is appropriate to have a private entity, rather than a public entity, providing environmental education and interpretation at a monetary cost to children in a public land. It is a shame that the US Congress and the NPS continues to cut the NPS Ranger interpretive program (of natural and cultural Park values, not interpretation of Park development plans). If there is no "Ranger Rick" present, but instead increasing amounts of commercial "opportunities," amenities having nothing to do with Park values, costs, and fees, what does the US Congress, the National Park Service and the public think public lands are for and how are they valued? We believe there is a huge difference between public lands and values and private lands and values, and that this difference must be preserved. (Preservation/Conservation Organization, Yosemite National Park, CA - #56)

#58 Public Concern: Yosemite National Park should provide affordable environmental education.

Demand for affordable EE: If YI gets away from the concessioner's prices (which are really NPS prices), it will still be too expensive for most California families, and NPS will continue to ignore the scores of schools that come to the park without YI (or NPS) services. This center will serve the unmet current and future needs of a limited number of people who can afford what will likely still be an expensive tuition. (Individual, Yosemite National Park, CA - #57)

I am a teacher at Palo Alto High School and I have been bringing students to Yosemite for the past nine years to participate in the incredible program that Yosemite Institute has offered. This YI experience has become an integral part of our ninth grade interdisciplinary TEAM program. However, throughout the last several years it has been increasingly difficult for YI to accommodate our entire group. Both the cost of accommodations in the valley floor as well as the lack of meeting space to use during inclement weather and evening programs have become an ongoing logistical problem. (Individual, Palo Alto, CA - #11)

NPCA believes that redevelopment of YI's Crane Flat campus is critical to meeting the demand for high quality resource-related education and interpretation for diverse and underserved audiences. According to the Institute, each year the YI turns away deserving students due to lack of space. In addition to space limitations, the cost of an average program (one student for one week) is approximately $311 dollars. Because of increased visitation and demand for accommodations in Yosemite Valley, the concessionaire has reduced the window for discounted rates offered to Yosemite Institute, resulting in higher tuitions. By increasing space at Crane Flat, YI can reduce dependency on the concessionaire, reduce operational expenses, and provide higher quality services within Yosemite National Park. (Preservation/Conservation Organization, Oakland, CA - #52)

#82 Public Concern: Yosemite National Park should not promote the Environmental Education Campus Plan on the assumption that high lodging costs would be reduced and thereby student diversity would increase.

Too much is made of the cost of concessionaire lodging in this equation. It is a stretch to propose that the redevelopment of the existing campus would insure diversity. If cost is so important to insure diversity and ultimately meet Yosemite's goals and partner goals, the NPS could easily control lodging availability and pricing to insure student diversity. This would not necessitate increasing development at Crane Flat or numbers of visitors in the area. If Yosemite Valley concessionaire lodging prices are fair enough to encourage diversity of the visiting public, then shouldn't it be acceptable to insure diversity of the YI students? (Individual, El Portal, CA - #46)

#35 Public Concern: Yosemite National Park should allow only children's educational groups to use the Environmental Education Campus facilities.

Meetings, seminars, conferences, colloquiums: An additional wrinkle to this development is the ongoing and presumably future increase in accommodation of meetings and seminars of other groups. In the past, groups other than YI have held meetings or conferences at Crane Flat. We believe that it is appropriate for a children's educational group such as YI to educate the children about Yosemite on-site, as its value is as a hands-on site-based experience; however, groups, whether their subject is Yosemite or not, should not be meeting in Yosemite to discuss Yosemite or its values, and therefore unnecessarily negatively impact Yosemite by being there. Those groups should more appropriately meet in cities where meeting facilities abound for such purposes. (Individual, San Francisco, CA - #49)

#76 Public Concern: The Environmental Education Campus Plan should include a comprehensive Development Concept Plan for the Crane Flat area.

Crane Flat has been plagued with "piece-meal" development because there is no comprehensive Design Plan for the Crane Flat area. Cumulative impacts of development cannot be assessed adequately if the future development and uses of the Crane Flat are left to "piece-meal" development. For example, within the last 12 years, the following incremental changes have taken place at Crane Flat: A) Closure of the Tuolumne Grove Road—increased visitor use at the Tuolumne Grove parking lot, more use in the meadow, more impacts on Great Gray Owl habitat, more need for waste water treatment (new vault toilet building) at the parking lot. B) Conversion of the gas station, from a seasonal operation with a seasonal generator for electricity, to a full year operation with a full time generator. There are a lot more visitors around the gas station and adjacent meadow areas. The generator runs full time. Also, there was a new building constructed for ground water remediation. C) Increased use of the Crane Flat Heliport in routing parking operations. Crane Flat Lookout has expanded both the helipads as well as a new Flight Operations Building, a well house/chlorinator building, new vault toilet, and new leach field and water well. More expansion of the heliport is planned. FMO would like to put a housing area at the Lookout! Increased helicopter use that is relatively low has to have an effect on Great Gray Owls as well as be disturbing to visitors. D) YCC [Yosemite Conservation Corps] camp at the old CCC [Civilian Conservation Corps] camp. (Individual, El Portal, CA - #46)

Despite any benefits to a valuable program like YI, is more development here, in the absence of an area Development Concept Plan, appropriate to the protection of the park's core values? (Individual, Yosemite National Park, CA - #57)

#60 Public Concern: Yosemite National Park should improve the deteriorated Yosemite Institute facilities.

The existing facilities at Crane Flat are clearly degraded, and I wholeheartedly support the Park Service's goal to provide an interpretive program of high quality, in a safe, modern, uncrowded, and attractive facility. The only way I see this possible is to redevelop and expand the existing facility. I have personally witnessed accidents and "close calls" among students due to inadequate facilities and old, worn out infrastructure, and I am hopeful that the Park Service will approve a plan to modernize and expand the campus in the interests of student safety. While I am sure there are other projects within the Park in need of

equal if not greater attention, my feeling is that the positive experience a young person has while on an outdoor education trip goes a long way to creating attitudes and values that will shape that person's life and affect indirectly, in a beneficial way, the future of all of our national parks. As it is, a visit to the campus now does not leave a positive impression as far as basic accommodations are concerned. (Individual, No Address - #21)

The current campus is in dire need of reconstruction. The bathhouse and dining room floors are slanted and weakening with age. The kitchen walls have so many open spaces in them that controlling rodent entry is a daily challenge. During heavy rainfall and harsh snowfall, there is inadequate space to allow instructors to teach their students in warm, dry places because the dining room is so small and the bunk houses are not designed to allow group activities to be conducted in their common spaces. (Individual, Yosemite National Park, CA - #44)

Yosemite National Park assigned YI existing buildings at Crane Flat for overnight accommodations for school groups, staff housing and office space in the early 1970s. Most facilities, including dorms, our buildings and the septic system, toilets, dining room, and kitchen were built in the 1930s require substantial year-round maintenance. The septic system and toilets are in need of constant repair and present health and safety concerns for both students and faculty. The time is right to remove these outdated and unsafe facilities and build clean, low-impact, energy efficient infrastructure to house education and research for the park. (Preservation/Conservation Organization, Oakland, CA - #52)

#57 Public Concern: Yosemite National Park should not develop new facilities for the Yosemite Institute.

YI does not need a new campus. YI is the last organization that should ask for more development in the Park. YI should stand up for the integrity of the ecosystem, not build to make more money. (Individual, Santa Cruz, CA - #25)

#70 Public Concern: Yosemite National Park should consider the benefits of a smaller campus for the Yosemite Institute.

We need to consider the impact of a “small campus” as a way to help students connect to each other and to place. A big campus loses personality and personal responsibility. Our role as instructors is to connect students to nature. The further “padded” our students are, the more pampered and sheltered, the harder it will be for them to realize they are out in the wild where Nature is in control. Our job will be harder the fancier and bigger our campus is. (Individual, Yosemite National Park, CA - #58.3-4.39100.)

We hope to continue coming to Crane Flat in the years to come. I do hope that the development is environmentally friendly and in itself does not ruin the environment. I've actually liked the rustic aspect of the current Crane Flat campus. I enjoy the smallness of it, and hate to see it become a huge education site. (Individual, El Cerrito, CA - #17)

YI is a great thing for Yosemite; new campus is a good call, keep it simple, no more than 90 beds, concentrate this function in Yosemite Valley by working with the concessionaire. (Individual, Yosemite National Park, CA - #57)

#83 Public Concern: Yosemite National Park should retain the rustic atmosphere of the Environmental Education Campus when making improvements.

It is true that the campus currently has a rustic feel, and the alternatives should reflect keeping that feel alive. The electricity for the program comes from a diesel generator. Dilapidated buildings should be fixed, but not done away with. Over the past four years, there have also been problems with the septic system. Even though it was supposedly fixed, the smell of sewage still wafts in the area making it unpleasant to be around the campus. I do not think an increase of participants will help this process. (Individual, Yosemite National Park, CA - #43)

#2 Public Concern: Yosemite National Park should preserve the Blister Rust Camp as an example of the park's working-class heritage.

The Crane Flat Blister Rust Camp is the Park's only remaining work camp where the unlettered working man lived and toiled. Bulldozing this camp destroys the last vestige of this little-known element of Yosemite's cultural history. Replacing this rustic feature with a fancy facility is doubly tragic. YI says it wants to enhance student diversity, but is this project wiping out the blue-collar component of the region's heritage? (Individual, Yosemite National Park, CA - #57)

#1 Public Concern: Yosemite National Park should maintain Civilian Conservation Corp-era buildings at the Environmental Education Campus.

The construction phase and the operation of a larger facility will impact cultural resources that are on/in the ground or are standing structures. Most of the camp is gone, but the current facility is one of the park's only remnants of the important CCC era. How do we assure that we're not discarding something irreplaceable? (Individual, Yosemite National Park, CA - #57)

#3 Public Concern: Yosemite National Park should maintain U.S. Navy buildings at the Environmental Education Campus.

The dining room and the bigger bunkhouse are the only known remnants of the US Navy's WW II presence in Yosemite. Is it best to level these? (Individual, Yosemite National Park, CA - #57)

#90 Public Concern: The Environmental Education Campus Plan should clarify the design and operation of the proposed facilities.

Type of Buildings: A. Who will have control as to the architectural style of the buildings? B. Will they be handicapped accessible land met current state codes in California? C. Will the staff have separate rooms, buildings or live off site? D. Will most road and parking be year around or gravel? E. Will there be outside activity areas, for programs, study and recreation? F. Will there be an outside deck or patio area for eating, programs, study etc.? G. Will the buildings have a sprinkler system for fire protection and will there be an adequate water supply for the system? H. Will the building be federal property or that of the Yosemite Institute? I. Will the maintenance and upkeep of the campus be a partnership or just part of the park's yearly budget? J. Will the food facilities be a separate building? K. Will there be a separate first aid facility on site? (Individual, Yuba City, CA - #47)

#91 Public Concern: Yosemite National Park should build sustainable and environmentally-friendly facilities for the Environmental Education Campus.

NPCA also believes the redevelopment of the buildings at Crane Flat allows for the park and YI to make the campus a truly sustainable one. What better place to employ the cleanest technologies, use sustainable materials, and harness energy from renewable sources. The campus will provide a learning environment and allow YI to teach the students at Crane Flat about sustainability. Energy efficient operations will also reduce operational expenses in the long run. (Preservation/Conservation Organization, Oakland, CA - #52)

With all buildings, roads, and structures, I would advise/suggest the use of solar, recycled materials that are available to reduce costs and improve relations with the environmental groups, and the residents of the country. (Individual, Campbell, CA - #40)

I believe a new, green facility can be a wonderful lesson to visitors in sustainability and its importance in today's changing world. (Individual, Yosemite National Park, CA - #54)

There are many issues that suggest that if, and when, YI does redevelop their Crane Flat campus, that the viable alternatives should not allow for an increase in the number of staff and participants. Rather, the maximum number that should be allowed is 75 people total, and the alternatives should reflect how the redevelopment is done. For example, creating a more ecologically sustainable campus that focuses on: using alternative energy sources (solar, bio-diesel—a diesel that is made from cooking oil), creating less waste (recycling, an indoor bear-proof composting facility on site, composting toilets), using hay bail structures and recycled building materials (the plastic "wood" and wood from other buildings), and, in

general, having a campus that teaches environmental education in its design. This campus could serve as a model for all other environmental education institutions in National Parks, and perhaps in the designing of how to make our Parks sustainable. (Individual, Yosemite National Park, CA - #43)

EXPANSION HARMS ENVIRONMENT

My suggestion is that the campus be reconstructed on its current footprint, using as many recycled/sustainably produced materials as possible. It should be designed to house a maximum of 75 to 100 students instead of the proposed 125 to 250. I understand that it would be ideal to be able to house all of the Yosemite Institute students in one locale, but I fear that the impacts of so many people using that space day after day, not to mention the space required to build the structures necessary to host that many folks, would be too great for such a sensitive area. (Individual, Yosemite National Park, CA - #44)

Plans for green building, while laudable (and should be the standard), do not mitigate for an expanded footprint or for expansion in numbers of students. (Preservation/Conservation Organization, Bend, OR - #56)

EXPANSION HELPS ENVIRONMENT

It is a good idea to build this new campus. . . . A new campus, even larger campus, would be more sustainable and have less impact on renewable resources. (Individual, Mariposa, CA - #36)

#93 Public Concern: Yosemite National Park should place water treatment facilities and other additions out of view from the Tioga Road.

The forest meadow at Crane Flat appears to be the largest and most lush of its type seen from the Tioga Road. As such, it is unique, and it is especially important that it not be compromised. Inescapably, the visual impact of the water treatment facility as seen from the Tioga Road would be great. This is supposed to be a National Park. To the extent that facilities may be necessary, they most certainly should not be located right on a major scenic drive. The present facility already impairs the view, and a greatly expanded one would have an even greater impact. Particularly with a large parking lot immediately adjacent to the scenic road, as shown in the conceptual drawings. (Preservation/Conservation Organization, San Francisco, CA - #53)

#75 Public Concern: The Environmental Education Campus Plan should clarify if Crane Flat is the best location for the Yosemite Institute.

Location: Crane Flat: 1. Is Crane Flat the best location for this campus? 2. Is this to be a year around facility? 3. Is this a central location for field trips? 4. Is this location close to Yosemite NPS staff who are participating in the campus's educational programs or is travel time a consideration? 5. Is this location handicapped accessible? 6. Does the weather and road conditions limit accessibility? (Individual, Yuba City, CA - #47)

As you deliberate the campus development options for Yosemite Institute, please consider that Adults as well as children have benefited greatly from YI's programs and that the location of their facility at Crane Flat is integral to this success. Being midway between the Valley and Tuolumne Meadows and adjacent to the Tuolumne Giant Sequoia Grove provides unparalleled opportunities for experiencing the diversity and range of ecosystems in Yosemite. (Recreational Organization, Walnut Creek, CA - #13)

#77 Public Concern: Yosemite National Park should consider how locating the Yosemite Institute at Crane Flat may impact visitor experiences.

I have always felt that having a "campus," however small, is problematical at this particular place. Visitors coming in from the Tioga Road see this as a first sign of "civilization" and are confused (there is even a sign posted saying that restrooms are further on at the gas station). It seems strange also to have this use so prominently along the road in a National Park—and somewhat elitist—also to be located beside a busy road is not best for the young students. (Individual, Mammoth Lakes, CA - #18)

Will this bigger facility attract more drive-by visitors to stop in, looking for a Coke, a restroom, lodging? How will they feel being turned away? (Individual, Yosemite National Park, CA - #57)

#81 Public Concern: Yosemite National Park should develop the Environmental Education Campus at Crane Flat to decrease Yosemite Valley crowding.

Environmental Education Campus Development: I heartily support the work of the Yosemite Institute, and am enthusiastic about its continuation and expansion. I cannot tell from the brief letter I received whether there is a plan to move the Institute from Crane Flats into the Valley. I feel very strongly that the Valley is overcrowded as it is, and that the physical plant for the institute can be expanded from its present site, while staying where it is. The fact of its removal from the scurry of the Valley can only improve the experience for all who attend the Institute's programs. (Individual, No Address - #35)

#61 Public Concern: Yosemite National Park should allow students to stay overnight in the valley.

We are asking that your planning include both a new YI campus inside the park—Crane Flat is the obvious choice—and the opportunity for our students to stay overnight in Yosemite Valley. The future of Yosemite National Park must include room for our student citizens to have the ability stay in, and study in, Yosemite. To do anything less would be to help unravel what John Muir intended for our park. (Individual, Cupertino, CA - #19)

I strongly urge the Yosemite Institute to keep the residential cabins and allow students to continue overnighting in the Valley. As a student who went through the program myself, I wholly believe that by eliminating these residential halls, the Institute would be denying future students the complete experience of absolute marvel and wonder that is Yosemite National Park. Nothing would better give students the feeling of respect and appreciation which the land deserves than the experience of living first-hand in the heart of the Valley itself. (Individual, Temple City, CA - #24)

#104 Public Concern: Yosemite National Park should limit student access to Yosemite Valley.

Be assured I love young people and believe utmost in their getting an outdoor education, however I believe YI's students should be given just a very small portion of their time in Yosemite Valley as they are noisy, congest the buses, congest the trails—Perhaps most of their learning experience can occur outside of the Valley itself and their brief time in the valley be the culmination of their other studies—and also perhaps another place could be found for their headquarters. (Individual, Mammoth Lakes, CA - #18)

#6 Public Concern: Yosemite National Park should recognize the benefits of retaining Yosemite Valley accommodations for Yosemite Institute programs.

TO STUDENT EXPERIENCE

We wanted to take a moment to jot down some of the reasons whey we enjoy the entire valley experience every February when we visit Yosemite National Park. Staying in the valley, we enjoy the beauty of the sun rising over the valley. Walking to breakfast in the morning we experience the changing weather in the valley. We are up at 6:30 AM for breakfast at 7:00 AM and meet our instructors at 8:00 AM to begin our day. We experience early morning wildlife, i.e. deer, coyotes, etc., before the valley "wakes up." During the evenings we enjoy the beauty of the moon risking over Half Dome. We ice skate in the village, outdoors! Our evening programs are so special when we take night hikes and see nocturnal animal life. And, of course, the snow falling at night is spectacular to walk through. . . . Transporting students in and out of the valley each day would add to the pollution problems you are trying to prevent! Temple City High School has been participating in the Yosemite Institute program for over twenty years, and we cherish the memories we have of our "valley experience." We would like to continue to offer students the special opportunity of "waking up in the beautiful Yosemite Valley." (Individual, Temple City, CA - #22)

The busing experience for kids has to be detraction from their time in the park. Staring out the window for 45 minutes twice a day? What is the "high quality" advantage of anyone adding that to their experience of Yosemite? Time afield in Yosemite will be reduced by 20% for those riding buses each day. (Individual, Yosemite National Park, CA - #57)

TO STUDENT ACCESS TO MEDICAL FACILITIES

We like being close to medical facilities in the valley, which we have used from time to time. (Individual, Temple City, CA - #22)

YI kids visit the Yosemite Medical Clinic a lot, scores of times a year, most of these are students staying in the Valley. Moving them away from this facility hurts the safety of their experience. (Individual, Yosemite National Park, CA - #57)

TO STUDENT TRANSPORTATION COSTS

What cost will the bus operation add to student expenses? (Individual, Yosemite National Park, CA - #57)

The cost of bus transportation daily could possibly increase the cost to our students, which might make it financially impossible to attend Yosemite Institute. (Individual, Temple City, CA - #22)

#87 Public Concern: Yosemite National Park should provide environmental education facilities in Yosemite Valley for Yosemite Institute students.

Alternative solutions: After all the work in park visitor contacts, stewardship projects, and bio monitoring, Y.I. does on a daily basis for the NPS which greatly benefits NPS interpretation/ and mission, I feel we deserve the opportunity to remain in Yosemite Valley. (Individual, Yosemite National Park, CA - #41)

We are looking to expand in the "wildness" at Crane Flat when our program would flow better if we had guaranteed/affordable space in the valley. We need to get space in the valley. Our impact on the ecosystem at Crane Flat (BRC) is upsetting. Keep the impact in the valley. Expansion at BRC will detract from the student experience of "intimate, small and connected." The "feel" will change to one of man over nature instead of man in nature. (Individual, Yosemite National Park, CA - #58)

Is there a need to re-develop the Crane Flat Campus, and what is a reasonable need for the next 25 years? How important is education in Yosemite National Park, and why not offset the development of Crane Flat by staying in Yosemite Valley where NPS is better able to mitigate the impacts of visitors? How is consumerism valued more (Curry Village vs. a YI site in Yosemite Valley) than education? (Individual, No Address - #3)

Ask NPS and YCS to grant us Building/Lodging Space in the Valley. If NPS is asking YI to handle part of their interpretation mission, it seems we naturally deserve space in Yosemite valley as most of our programming occurs here, and we are working closely (beyond special interest group status) with N.P.S. (Individual, Yosemite National Park, CA - #4)

CURRY VILLAGE AND YOSEMITE LODGE

Maybe YI should grow in the Valley, where there's already lots of tourism infrastructure, and there's more building planned. Is an opportunity being missed, to dedicate some of the growth planned for Curry Village and Yosemite Lodge to an environmental education facility? Why would it be advantageous to say that students belong somewhere outside the Valley? The concessionaire should be compelled, through the CSP, to provide affordable accommodations for high quality resource-related education and interpretation via YI. (Individual, Yosemite National Park, CA - #57)

I believe the best solution is a campus at Curry Village that is separate from the main areas and only for YI. This idea would work well since Curry will be reduced under the valley plan. YI could take over parts that would have been removed. (Individual, No Address - #2)

Turn over a Yosemite Lodge motel unit for YI use. Rent from NPS not concessionaire: 16 motel rooms turned into dorm rooms by replacement of beds with 4 bunk beds (1 up, 1 down) 16 x 8 = 128 pillows. This would not require any new building construction. Shouldn't the children have the opportunity to have an environmental educational experience in Yosemite Valley? Or will it merely be the elite visitors who can pay the increasingly upscale prices for the existing and the proposed new resort-type developments for the concessionaire (at Yosemite Lodge), to be bulldozed and built with public funds? (Preservation/Conservation Organization, Yosemite National Park, CA - #56)

There is still room in the YVP for the park to build an EE campus in Curry Village, that will really be more accessible to more students. YCS will moan about losing the business of tour bus companies, but they should put their money where their mouth is. If the park leadership thinks that the next generation of voters, consumers, citizens and park users is a special interest group, it needs to re-examine its priorities. Everyone wins with a campus in the Valley. (Individual, Yosemite National Park, CA - #57)

#84 Public Concern: Yosemite National Park should consider if alternative locations to Crane Flat would be better for the Yosemite Institute.

Alternate Location: 1. Is there a year around location that is more centrally located to NPS staff and to field trips within the park? 2. Would an alternate location be able to use the regular bus service within the park? 3. Has consideration of the new state university and its location been considered as an outside resource? 4. Is there a historical area outside of the valley that will lend itself as a good alternative to the Crane Flat area? 5. The University of California Berkley, School of Forestry has a summer camp just north of the park. Has a joint use of this site been considered? Has this site been viewed and its staff interviewed as to how their facility functions and any consideration that might help in designing and operating a larger campus on a park site? (Individual, Yuba City, CA - #47)

What alternative sites did you consider for this project? Crane Flat cries out for a regional solution to electricity and pollution control (waste water treatment). Currently, Crane Flat has a separate waste water treatment solution for each of the following locals: Gas Station—leach field, Campground Loops—5 separate leach fields, Residence 6000 (Ranger House)—leach field, Grove Parking—vault toilets, Lookout/Heliport—leach field/vault toilet. All of these systems function marginally and present constant operation and maintenance problems. Electricity is the same story; one diesel generator provides power for the gas station while a separate diesel generator provides power for the Lookout/Heliport, Ranger House (duplex) and the YI complex. It is obvious that an alternate location with existing infrastructure would be a better solution for this increased development. What about Wawona? What about outside the park? The last thing that Crane Flat needs is another stand alone utility system. Why the rush to add development to park infrastructure when the NPS can't come close to taking care of the infrastructure they have now? (Individual, El Portal, CA - #46)

#85 Public Concern: Yosemite National Park should propose alternative locations for the Environmental Education Campus.

FORESTA

I think Foresta would be a good location for the Campus, provided that the view of Big Meadow from the Big Oak Flat Road is not impacted, and the historic route of the Coulterville Road is not disturbed. (Individual, San Carlos, CA - #39)

MARIN HEADLANDS

Please retain roughly the present building footprints and consider the alternatives of expansion at other sites such as in the Marin Headlands at the Golden Gate National Recreation Area, or constructing a new campus in Martinez. (Individual, Citrus Heights, CA - #48)

MARTINEZ

If YI wants to increase capacity to educate children regarding the environment, a campus in Martinez could be considered linking to the John Muir House and his environmental values, experiences, and writings. This would also provide access to lower and middle income and other communities not well served by environmental education. (Individual, San Francisco, CA - #49)

Some potential alternate solutions: None of this should be accomplished by new development in Yosemite National Park. a. There should be no expansion at Crane Flat or development of a new campus anywhere in Yosemite. b. If YI wants to expand, a campus in Martinez could be of benefit. (Preservation/Conservation Organization, Yosemite National Park, CA - #56)

EVERGREEN LODGE

Evergreen Lodge is an existing facility just outside Yosemite National Park with a similar configuration to the existing Crane Flat Campus, but in good condition. It was recently for sale and might still be a possibility. (Preservation/Conservation Organization, Bend, OR - #56)

HAZEL GREEN

The big money behind YI should purchase land outside of Yosemite to develop. For example, why couldn't YI develop Hazel Green? They could build all of the affordable dormitories they desire and insure student diversity going by the logic presented by the NPS "planning document." (Individual, El Portal, CA - #46)

BETWEEN MARIPOSA AND EL PORTAL

I favor the development of a center for environmental education. I think that easy access to a general purpose residential center is crucial. Presuming that there will be integration with programs at UC Merced, a location between Mariposa and El Portal seems best. It is outside the park and yet close by. From that major center, other locations in the park could be used as temporary or seasonal sites, depending on the needs of the programs that are supported through the center. Locations such as Wawona or Fish Camp would involve inconvenience in travel and no better access to areas of Yosemite. During the winter, it would involve travel in snowy and icy conditions to and from Yosemite Valley, and the road would have increased traffic from Badger Pass. (Individual, Fresno, CA - #37)

#86 Public Concern: Yosemite National Park should not propose Foresta or Wawona as alternative sites for the Environmental Education Campus.

Neither Foresta nor Wawona should be considered as appropriate sites. These areas are in the Park and should not be further developed and impacted. The 1980 General Management Plan (GMP) intends Foresta to be restored, not developed. It should not be used for student or additional employee housing for the same reasons as at Crane Flat. Foresta is also Great Gray Owl territory. In the 90s many members of Friends of Yosemite Valley fought NPS proposed employee housing development in Foresta which would have greatly impacted the Great Gray Owls—let's not threaten the owls again. (Preservation/Conservation Organization, Yosemite National Park, CA - #56)

#88 Public Concern: The Environmental Education Campus Plan should locate the campus outside of Yosemite National Park.

Find another (Sierra) Institute site and establish it outside Y.N.P. (Individual, Yosemite National Park, CA - #4)

I am opposed to the construction of a campus in Yosemite NP. YNP is supposed to be protected so ecosystems, wildlife, vegetation, and natural processes are preserved and can function without our interference. Place this facility outside YNP and have small facility inside YNP for interpretation. (Individual, Houston, TX - #30)

Alternative solutions: YNI opens another campus in the Sierra and keeps a cap on growth at YI. (Individual, Yosemite National Park, CA - #41)

#89 Public Concern: The Environmental Education Campus Plan should include maps of alternative sites.

The need is to replace these aging facilities and stop putting addition funds into repairing building that need to be completely rebuilt. The question is then of location and size. I would like to see maps of the alternative sites including roads to the sites. (Individual, Yuba City, CA - #47)

#59 Public Concern: The Environmental Education Campus Plan should address the impacts to park resources from increasing Yosemite Institute students.

My first concern is that any planned growth will have a significant impact on the surrounding area. With an increase of students, there will be a larger footprint on the existing land, the students will undoubtedly need

a place to play in during their free time, which will extend into the wilderness area behind the Crane Flat Campus. Furthermore, any increase in teaching groups will have its impact on the surrounding meadows and cross country ski trails, and undoubtedly on the Tuolumne Grove of the Giant Sequoias. The fact that I saw a great gray owl in the nearby meadows two days ago makes me concerned with how the growth will affect not only the flora, but also the fauna. (Individual, Yosemite National Park, CA - #43)

I also want to be certain that, should this project move in the direction of not only replacement of present facilities but also student capacity expansion, it will not make a dangerous level of impact on our rich and valuable natural resources in Crane Flat and its surrounding areas. I believe that the team evaluating this proposal will be approaching it from a similar point of view; at least, that is my hope. I believe that there is a great opportunity in this proposal, as long as decisions concerning each step of the development are handled judiciously and in the interest of the environmental health and protection of surrounding areas. (Individual, Yosemite National Park, CA - #54)

What environmental impacts will radiate to Foresta, the Merced Grove, the Valley's east and west end with more students being bused to these places for the day? (Individual, Yosemite National Park, CA - #57)

EFFECTS ON TRAFFIC

Adding more traffic and buses to the Crane Flat area will increase traffic congestion and create more dangerous driving conditions as traffic moves to and from the Tioga Road to Yosemite Valley. (Preservation/Conservation Organization, Yosemite National Park, CA - #56)

EFFECTS ON PARK VISITORS

In other areas of the Park, often visitors and others remark that some of the existing YI groups of children are noisy and disturbing. (Preservation/Conservation Organization, Yosemite National Park, CA - #56)

EFFECTS ON STUDENT SAFETY

Another concern I have about growth there is one of transportation, especially in regards to the student safety. The majority of the programs that come to YI (Yosemite Institute), come because they want to experience Yosemite Valley. If they stay at Crane Flat, this means they will have to commute to the Valley. More time on the road [increases] their chances of being injured in a auto accident. (Individual, Yosemite National Park, CA - #43)

EFFECTS ON SCIENTIFIC STUDIES

ISBP's MAPS project has several years of baseline data that'll suffer a discontinuity with the increased disturbance of more people in the area through the whole breeding season. (Individual, Yosemite National Park, CA - #57)

#4 Public Concern: Yosemite National Park should assess the impact of the Environmental Education Campus Plan on local Native American's ability to harvest medicinal plants.

Local Indians still gather medicinal plants (Angelica, etc.) in the meadow here; what impact will more student activities have on their needs? (Individual, Yosemite National Park, CA - #57)

#92 Public Concern: The Environmental Education Campus Plan should address the impacts to Crane Flat from increased water usage and sewage disposal.

Much of our concern is the result of the proposed four-fold (or greater) increase in capacity. To go from a current capacity of 76 to 300 or more appears likely to result in unacceptable and unmitigable problems, given the constraints of the Crane Flat site. The more obvious ones are water supply, and disposal of sewage effluent. The present water supply is from a well in the meadow, so there may already be a lowering of the meadow water table. Has any attempt been made to measure this? In any event, it seems quite likely that a four-fold (or greater) increase in withdrawal of water from the meadow would have an unacceptable impact on the meadow. If sewage effluent has to be disposed of with a spray field, it appears that the site would be so taken up with other development that it would be necessary to move the

Wilderness boundary back to create enough space. This would be a terrible precedent, going counter to the very idea of establishing the boundary in the first place, which was to draw a line beyond which development will not occur. If it were to be permitted here, it would open the door to other "adjustments," with the potential for severely impacting the integrity of the designated Wilderness. (Preservation/Conservation Organization, San Francisco, CA - #53)

Increased wastewater production needs appropriate disposal – where? It already doesn't smell good up there, with the new septic system. (Individual, Yosemite National Park, CA - #57)

MONITOR AND MITIGATE

We understand the above concerns over water supply and effluent disposal are to be addressed by converting the effluent back into potable water, and recycling it back into the water supply lines. This degree of sophistication would be wonderful if it worked. What happens if it doesn't? Or if it turns out to be too expensive? We simply draw down the meadow water table, and move the Wilderness boundary? Easy solutions, and totally unacceptable! Even if the money is found to build a technological wonder, such systems have a way of breaking down, or being shut down for maintenance. What happens in those inevitable eventualities? (Preservation/Conservation Organization, San Francisco, CA - #53)

ESTABLISH TERTIARY SEWAGE TREATMENT

I strongly support Yosemite Institute, a unit of the Yosemite National Institute in its mission of environmental education. With respect to the proposed reconstruction and/or expansion of the present campus due to aging of the current structures and the increased maintenance costs associated with same, please require tertiary sewage treatment, once again to ensure that the present Crane Flat meadow will not be reduced or otherwise negatively impacted. (Individual, Citrus Heights, CA - #48)

#66 Public Concern: Yosemite National Park should limit the occupancy of the Environmental Education Campus.

As a resident of Yosemite I am against the expansion of Y.I.'s Crane Flat campus for the following reason: The old Blister Rust Camp area is too small for the proposed 300 bed spaces. (Individual, Yosemite National Park, CA - #38)

LIMIT TO CURRENT CAPACITY

Crane Flat is at a biologically sustainable carrying capacity at 80 participants. Fixing existing plumbing and creating a green campus with the same number of participants makes the most sense to me as a field instructor. (Individual, Yosemite National Park, CA - #41)

LIMIT TO 100 PEOPLE

We need to stop growing. I think we should limit occupancy to 100 people. We need to focus on quality. A sustainable campus with solar, recycled material etc is a good role model, but we need to stay connected to our environment. Two-hundred-fifty people is too much. (Individual, Yosemite National Park, CA - #58

LIMIT TO 150 PEOPLE

The size of a new campus must be carefully studied. Due to the nature of outdoor education, you have to consider where all the people are going to be outdoors every day. Due to impacts on trails, the number of trails available, and the limits of winter weather, the number of people the area could sustain would be maxed out at about 150. (Individual, Mariposa, CA - #36)

DECREASE CAPACITY

What would you like to see developed as "reasonable" alternatives for YI and NPS to consider in the redevelopment of the Crane Flat Campus? . . . Downsize use of Crane Flat by YI (<50 people). (Individual, No Address - #3)

#10 Public Concern: The Environmental Education Campus Plan should incorporate carrying capacities for park sites potentially impacted by the plan.

Carrying capacity needs to be determined scientifically, so the wilderness of Crane Flat and Yosemite Valley is at a high biological integrity, and not harmed, diminished, or altered by additional instructors and hiking groups… I see the need for carrying capacity and sustainability to be a major consideration of this NEPA Process, and not simply growth with a bigger campus. (Individual, Yosemite National Park, CA - #4)

Yosemite Valley Plan's (YVP) failure to adopt carrying capacity: The Yosemite Institute expansion proposal is another example of the failure of the Yosemite Valley Plan to adopt carrying capacity numbers for the protection of the natural environment, and instead to accommodate an ever increasing growth in visitorship, not only supported by the managers and administrators of the National Park Service (NPS), but actively promoted by NPS. (The YVP throws out the Carrying Capacity numbers instituted in the 1980 General Management Plan (GMP) and leaves it wide open.) (Individual, San Francisco, CA - #49)

Special Land Designations

#94 Public Concern: The Environmental Education Campus Plan should clarify whether any changes to the Wilderness boundaries are being proposed.

It is our understanding that the Park Service is accumulating a list of Wilderness boundary changes it would like to seek. If this is true, the public should be aware of it now so they could weigh in with their opinions. (Preservation/Conservation Organization, San Francisco, CA - #53)

#5 Public Concern: Yosemite National Park should not expand the Environmental Education Campus into any designated Wilderness.

With respect to the proposed reconstruction and/or expansion of the present campus: . . . Please allow no expansion into designated wilderness. (Individual, Citrus Heights, CA - #48)

Visitor Services

#63 Public Concern: Yosemite National Park should limit the total number of visitors allowed in the park per day.

I would like to see strict limits on the total visitors to the park on any one day, both in the summer and in the winter months. (Individual, Redding, CA - #28)

#97 Public Concern: Yosemite National Park should limit visitors and events during the off-season to allow the park to rejuvenate.

Enticement of additional visitors and groups by holding meetings, seminars, conferences, and/or colloquiums at YI facilities in or around Yosemite especially during the off-season, non-summer months would bump-up visitation. The concessionaire, Delaware North, would then further profit from the (publicly built) lodging to accommodate the participants, while the Yosemite animals and ecosystems would be further impacted. The late fall/winter/early spring is when the Valley rejuvenates so that sensitive resources can survive (or have a better chance anyway) the busy summer; to increase impacts during the shoulder seasons/off-season would be disastrous to Yosemite's ecology. (Individual, San Francisco, CA - #49)

#96 Public Concern: The Environmental Education Campus Plan should examine potential impacts of new trails in undisturbed areas.

Might new trails be built? These may bring students into places that aren't currently visited, and may attract more members of the general public, too. What's the balance between when a new trail is a good thing or a harmful thing to a quiet area like this? (Individual, Yosemite National Park, CA - #57)

#95 Public Concern: Yosemite National Park should mark the original route of the Big Oak Flat Road for pedestrian travel.

Regarding environmental education campus development, I would favor relocation away from Crane Flat. Whether or not the Yosemite Institute remains there, I would like to have the original alignment of the Big Oak Flat Road marked so that a visitor could follow it on foot from Crane Flat to Gin Flat. The Gin Flat end is in good shape, but the Crane Flat end is a mess because of erosion and developments. (Individual, San Carlos, CA - #39)

#72 Public Concern: Yosemite National Park should build a dining room similar to the former Curry Dining Room.

I would like to see a beautiful camp Curry Dining Room similar to the one that burned down. (Individual, Redding, CA - #28)

Transportation

#73 Public Concern: Yosemite National Park should assess the impact of expanding the Environmental Education Center on the traffic safety.

More employees will commute to this facility every day, which has impacts for traffic, roads closed by rockfall or snowstorms or MVA's [motor vehicle accidents] and for parking. There will certainly be more winter access and traffic problems for employees and program participants. It will not be a safe place when employees can't get to those 2-300 kids to feed them, supervise them, teach them. More transportation of all these students translates directly into more vehicular hazards. If YI uses vans, that'll surely be an added hazard. (Individual, Yosemite National Park, CA - #57)

Areas of concern that need solid research if expansion occurs: Additional bus/car traffic [could be a] serious safety hazard in snow/ice conditions. (Individual, Yosemite National Park, CA - #41)

#14 Public Concern: Yosemite National Park should evaluate the impact of expanding the Environmental Education Campus on noise pollution.

What are the important issues and opportunities to consider as Yosemite Institute and the National Park Service move forward with the project to redevelop the Crane Flat Campus? Noise pollution with added vehicle traffic. (Individual, Yosemite National Park, CA - #4)

#68 Public Concern: Yosemite National Park should consider the impacts from increased busing.

ON ROADS

As a resident of Yosemite I am against the expansion of Y.I.'s Crane Flat campus for the following reasons: The busing issue will create a great impact on the roads. (Individual, Yosemite National Park, CA - #38)

ON PARK RESOURCES

The number of bus trips that isn't mentioned in the basic EECDP information is surprising. What environmental impacts will radiate to Forests, the Valley's east and west ends, Merced Grove, etc., with more students being bused to these places each day? (Individual, Yosemite National Park, CA - #57)

ON YOSEMITE INSTITUTE PROGRAMS

Another concern I have about growth there is one of transportation . . . . If [students] stay at Crane Flat, this means they will have to commute to the Valley. . . . [Commuting] will be of logistical concern when there is too much snow on the roads to bus students elsewhere during the teaching day. (Individual, Yosemite National Park, CA - #43)

ON FUEL CONSUMPTION AND VEHICLE WEAR

If our students are mostly at BRC we will spend many hours in transport, [increasing] impacts on fuel use and van maintenance. (Individual, Yosemite National Park, CA - #58)

ON VEHICLE STORAGE AND SERVICE

What effects of an increased bus fleet? Where are buses stored and serviced? (Individual, Yosemite National Park, CA - #57)

ON AIR QUALITY

Transporting students in and out of the valley each day would add to the pollution problems you are trying to prevent! (Individual, Temple City, CA - #22)

#24 Public Concern: The Environmental Education Campus Plan should include the reasons for rejecting Crane Flat as a parking site.

Why was Crane Flat area rejected by NPS as a site for out-of-valley parking in the YVP? These reasons are in the YVP administrative record, are probably about wildlife disturbances and utility challenges—and they still apply to YI's construction, right? These should be expressly addressed in this project. (Individual, Yosemite National Park, CA - #57)

#25 Public Concern: The Environmental Education Campus Plan should specify where parking areas will be located at Crane Flat.

There have been discussions of placing "out of valley" parking at Crane Flat. Where will that be? (Individual, El Portal, CA - #46)

#28 Public Concern: Yosemite National Park should not pave any unpaved areas at the Environmental Education Campus for parking.

With respect to the proposed reconstruction and/or expansion of the present campus: . . . Do not permit the construction of any new parking lots that would result in the paving of presently unpaved areas. (Individual, Citrus Heights, CA - #48)

Park Operations

#38 Public Concern: The Environmental Education Campus Plan should address plans for law enforcement and emergency services.

How will NPS address needs for law enforcement, traffic control, response to MVA's [motor vehicle accidents], fire protection, etc., between Crane Flat and Hodgdon Meadow? (Individual, Yosemite National Park, CA - #57)

RESPONSE TO TRAFFIC ACCIDENTS

Traffic at Crane Flat will suffer more congestion with a larger facility, especially with daily bus arrivals and departures. How will NPS respond to a possible increase in car accidents? (Individual, Yosemite National Park, CA - #57)

#37 Public Concern: The Environmental Education Campus Plan should address fire protection plans for the expanded campus.

What will change for NPS regarding structural fire protection of this larger complex nine miles from a fire station? Will there be enough access around all structures to allow attack from all sides? How to keep a structural fire from spreading into the adjacent forest? . . . How will wildland fire protection strategies need to be changed to protect an expensive new facility? Will trees in or out of Wilderness need to be felled? Other fuel reduction needs? (Individual, Yosemite National Park, CA - #57)

Employee Housing

#106 Public Concern: Yosemite National Park should address the impacts of increasing the Environmental Education Campus staff on nearby communities.

What environmental impacts will radiate from this growth to El Portal, and Foresta with more employees needing housing and services, commuting, etc. to/from these places? (Individual, Yosemite National Park, CA - #57)

Increasing YI staff will mean growing the need for housing, transportation and other services in El Portal or Foresta. Their current impact on the El Portal community is generally not considered a favorable one by other residents. How is their taking over more housing mitigated? (Individual, Yosemite National Park, CA - #57)

IMPACTS ON HOUSING

#40 Public Concern: Yosemite National Park should address the cumulative impacts of increased Environmental Education Campus staffing.

Increasing YI staff will mean growing the need for housing, transportation and other services in El Portal or Foresta. Their current impact on the El Portal community is generally not considered a favorable one by other residents. How is their taking over more housing mitigated? (Individual, Yosemite National Park, CA - #57)

Housing at Crane Flat for increased staff means yet more increase in traffic, need for services, noise, night lighting, possibly pets, parking, unanticipated radiating impacts from more residents adding to disturbances. Going from 2 residents to 6-8 is a big jump in a different kind of impact from people who live in a place. (Individual, Yosemite National Park, CA - #57)

An increase in students will also mean the need for more staff. Currently, there is not enough space to house the essential staff needed for the programs, nor is there adequate housing available in the surrounding communities. More staff would mean either a larger footprint on the area, or that staff have to commute over larger distances (which is one of the reason why the most recent food services manager quit). (Individual, Yosemite National Park, CA - #43)

ON HOUSING IN NEARBY COMMUNITIES

What environmental impacts will radiate from this growth to El Portal, and Foresta with more employees needing housing and services, commuting, etc. to/from these places? (Individual, Yosemite National Park, CA - #57)

#39 Public Concern: Yosemite National Park should recognize that locating the Environmental Education Campus at Crane Flat may attract undesirable employees.

What kind of employee will YI find to live in a remote place like Crane Flat? Look at the problems that the concessioner has with turn-over, good service, and maintenance staff, and a need to hire people with sketchy histories. Should anyone worry that all the new campus can find for menial service jobs will be otherwise unemployable people, with criminal pasts? The hardships of minimum wage work in an isolated setting could mean a high turnover of undesirables. Will YI be able to get a higher quality of employee to

live or work here, in this remote setting? Can they assure that they'll find people that they want to work around kids? (Individual, Yosemite National Park, CA - #57)

#41 Public Concern: The Environmental Education Campus should identify the potential employers of campus bus drivers.

Who will their (bus drivers) employer be? (Individual, Yosemite National Park, CA - #57)

#42 Public Concern: The Environmental Education Campus Plan should address the needs of campus bus drivers.

What effects of an increased bus fleet? Where will drivers live? . . . What services will they require? (Individual, Yosemite National Park, CA - #57)

Appendix A
Content Analysis Process

Public input on the Environmental Education Campus Plan is documented and analyzed using a process called content analysis, which is a systematic method of compiling and categorizing the full range of public viewpoints and concerns regarding a plan or project. Content analysis is intended to facilitate good decisionmaking by helping the planning team to clarify, adjust, or incorporate technical information into preparing the environmental impact statement. All responses (i.e., public hearing transcripts, letters, emails, faxes, and other types of input) are included in this analysis.

In the content analysis process used for this project, each response is given a unique identifying number, which allows analysts to link specific comments to original letters. Respondents' names and addresses are then entered into a project-specific database program, enabling creation of a complete mailing list of all respondents. The database is also used to track pertinent demographic information, such as responses from special interest groups or tribal, federal, state, county, and local governments.

All input is considered and reviewed by two analysts. Each response is first read by one analyst and sorted into comments addressing various concerns and themes. Comments are then entered verbatim into the database. A second analyst then reviews the sorted comments to ensure an accurate and consistent database.

In preparing the final summary analysis, public statements are reviewed again using database reports. These reports contain all coded input and allow analysts to identify a wide range of public concerns and analyze the relationships between them. The final product includes a list of public concerns addressing the proposal, and supporting sample quotes.

This process, and the resulting summary, are not intended to replace comments in their original form. Rather, they provide a map to the letters and other input on file at the Superintendent's office in Yosemite, California. Both the planning team and the public are encouraged to review the actual letters firsthand.

It is important for the public and project team members to understand that this process makes no attempt to treat comments as votes. In no way does content analysis attempt to sway decisionmakers toward the will of any majority. Content analysis ensures that every comment is considered at some point in the decision process.

Appendix B
Demographics

Demographic coding allows managers to form an overall picture of who is submitting comments, where they live, their general affiliation with various organizations or government agencies, and the manner in which they respond. The database can be used to isolate specific combinations of information about public comment. For example, a report can include public comment only from people in California or a report can identify specific types of land users such as recreational groups, government agencies or businesses. Demographic coding allows managers to focus on specific areas of concern linked to respondent categories, geographic areas and response types.

Although demographic information is captured and tracked, it is important to note that the consideration of public comment is not a vote-counting process. Every comment and suggestion has value, whether expressed by one or a thousand respondents. All input is considered, and the analysis team attempts to capture all relevant public concerns in the analysis process. Yosemite National Park received and processed 58 letters, representing 61 signatures, for the Environmental Education Campus Plan. The letters were then forwarded to the Content Analysis Team for further analysis and public concern identification.

In the tables displayed below, please note that demographic figures are given for the number of responses and signatures. For the purposes of this analysis, the following definitions apply: "response" refers to a discrete piece of correspondence and "signature" refers to each individual who adds his or her name to a response, endorsing the view of the primary respondent(s).

Geographic Origin

Geographic origin is tracked for each response. Letters and emails were received from four (4) of the United States. The response format did not reveal geographic origin for five (5) responses. The state of residence for each individual signature was not tracked for multi-signature responses. Signatures on multi-signature responses were all assigned to the state of the person or organization originating the response. County origin for responses received from California is tracked in Table B2.

Table B1 - Geographic Origin of Response by State

Country	State	Number of Responses	Number of Signatures
United States	California	50	53
	Illinois	1	1
	Oregon	1	1
	Texas	1	1
	Unknown Location	5	5
Total		**58**	**61**

Table B2 - Geographic Origin of Response by California Counties

State	County	Number of Responses	Number of Signatures
California	Alameda	2	2
	Contra Costa	3	3
	Fresno	2	2
	Los Angeles	6	7
	Marin	2	2
	Mariposa	13	14
	Mono	1	1
	Orange	1	1
	Sacramento	1	1
	San Bernardino	1	1
	San Francisco	3	3
	San Mateo	2	2
	Santa Barbara	1	1
	Santa Clara	4	4
	Santa Cruz	3	4
	Shasta	1	1
	Sonoma	1	1
	Stanislaus	1	1
	Sutter	1	1
	Tuolumne	1	1
Total		**50**	**53**

Organizational Affiliation

Organization types were tracked for each response received on the project. Responses were received from individuals, recreation and preservation organizations.

Table B3 - Number of Responses/Signatures by Organizational Affiliation

Organization Field	Organization Type	Number of Responses	Number of Signatures
I	Individual	53	55
P	Preservation/Conservation Organization	4	5
R	Recreation Organization	1	1
Total		**58**	**61**

User Type

User types were tracked for each response received on the project.

Table B4 - Number of Responses/Signatures by User Type

User Type Code	User Type	Number of Responses	Number of Signatures
A0	Area Resident nonspecific	1	1
D	Educational Groups	22	23
H	Hikers/other foot access	1	2
X	No identified type/Not Applicable	34	35
Total		**58**	**61**

Response Type

Response types were tracked for each response received on the project. Responses were received in the form of letters and Yosemite Response Forms.

Table B5 - Number of Responses/Signatures by Response Type

Response Type #	Response Type	Number of Responses	Number of Signatures
1	Letter/Fax	45	48
6	Response Forms	13	13
Total		**58**	**61**

Delivery Type

Delivery types were tracked for each response received on the project. Responses were received by email, fax and commercial delivery.

Table B6 - Number of Responses/Signatures by Delivery Type

Delivery Type Code	Delivery Type	Number of Responses	Number of Signatures
E	Email	31	33
F	Fax	2	2
M	Mail/Commercial Delivery	7	7
U	Unknown Delivery Type	18	19
Total		**58**	**61**

Appendix C
Information Requests

Information request codes are applied to those documents with specific requests for information pertaining to the proposal. Respondents often ask for copies of the planning documents, Federal Register Notice, mailing list and other additional information. FOIA requests are handled through Early Attention designation.

For the Environmental Education Campus Plan we have two information requests:

Table C1 – General Information Requests

Letter Number	Name and Address	
4	Karen Nichols, P.O. Box 625, Yosemite, CA 95389	Request for Yosemite Institute's Crane Flat Campus Redevelopment Program and EIS.
33	Central Sierra Environmental Resource Center, P.O. Box 396, Twain Harte, CA 95383	Request to be notified when additional design plans and drafts are available.

Appendix D
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Appendix C:
Best Management Practices

Appendix C: Mitigation Measures Common to all Action Alternatives

The National Park Service places a strong emphasis on avoidance, minimization, and mitigation of impacts. To help ensure that field activities associated with the environmental education campus protect natural, cultural, and social resources and the quality of the visitor experience, mitigation measures have been developed. The following section discusses mitigation measures that would occur prior to, during, and after construction of the proposed improvements.

Prior to Construction

- The Construction Contractor shall prepare a Health and Safety Plan to address all aspects of Contractor health and safety issues compliant with OSHA standards and other relevant regulations. The Plan shall be submitted for park review and approval prior to construction.
- An Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan shall be prepared by the Construction Contractor for the project to address hazardous materials storage, spill prevention and response. The Plan shall be submitted for park review and approval prior to construction.
- A Storm Water Pollution Prevention Plan (SWPPP) shall be prepared by the Construction Contractor and implemented for construction activities to control surface run-off, reduce erosion, and prevent sedimentation from entering water bodies during construction. The SWPPP shall be submitted for park review and approval prior to construction.
- A construction work schedule shall be prepared by the Construction Contractor for the project that minimizes effects on wildlife in adjacent habitats, peaks in visitation, and noise levels near residential housing and visitor lodging areas. The work schedule shall be submitted for park review and approval prior to construction.
- The park shall develop a Communications Strategy Plan to alert necessary park and Concessionaire employees, residents and visitors to pertinent elements of the construction work schedule.
- A Cultural Resources Monitoring Plan shall be prepared by the park to ensure proper compliance with the implementation of cultural resource mitigation measures as described in this section and as stipulated in the 1999 Programmatic Agreement.
- Supervisory construction personnel shall attend an Environmental Protection briefing provided by the park prior to working on site. This briefing is designed to familiarize workers with statutory and contractual environmental requirements and the recognition of and protection measures for archeological sites, sensitive habitats, water resources, and wildlife habitats.
- Protective barriers shall be placed around areas adjacent to the project area that require special attention as identified by the park, such as specified staging areas, trees, plants, root zones, river edges, aquatic habitats, wetlands, sensitive wildlife habitats, cultural resource features, and infrastructure. Barriers shall be installed prior to construction and field inspected by natural and cultural resource personnel to verify proper placement.
- The architectural character of the new building shall be consistent with the Mission 66 houses and apartment building and would feature dark stained board-and-batten exterior siding. Ongoing consultation with Yosemite’s History, Architecture, and Landscapes Branch shall be required to maintain the appropriate character for development while minimizing adverse affects to landscape features such as topography, views and vegetation.

- Construction Contractor shall ensure that any imported soils, fills or aggregates are free of deleterious materials. Sources of imported materials shall be compiled by Construction Contractor and submitted for park review and approval prior to construction.
- The Underground Services Alert (USA) shall be informed by construction personnel 72 hours prior to any ground disturbance to enable Valley Utilities staff to verify the on site location and depth (elevation) of all existing utilities and services through field survey (potholing).

During Construction

- The Construction Contractor shall implement and comply with all requirements of the Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan prepared and approved for the project.
- The Construction Contractor shall implement and comply with all operational compliance required by the Storm Water Pollution Prevention Plan (SWPPP) issued for the project.
- Construction activities shall be monitored by qualified park natural and cultural resource specialists to ensure proper compliance with the implementation of mitigation measures described in this Appendix.
- Construction waste shall be separated into recyclable materials, green waste, and other debris that shall be placed in refuse containers daily and disposed of weekly. Recycled, toxic-free, and environmentally sensitive materials, equipment, and products shall be utilized whenever possible. Burning or burying of waste is strictly prohibited.
- Wastewater contaminated with silt, grout, or other by-products from construction activities shall be contained in a holding or settling tank to prevent contaminated material from entering watercourses or wetlands.
- Hazardous or flammable chemicals shall be prohibited from storage in the staging area, except for those substances identified in the Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan. Hazardous waste materials shall be immediately removed from project site in approved containers.
- Machinery and equipment shall be parked over containment pads designed to trap any leaking oil, fuel or hydraulic fluids and inspected daily.
- Secondary containment shall be required for all fuel storage. Routine oiling, lubrication, and refueling shall be conducted with secondary containment and is prohibited in the River Protection Overlay, water courses or wetlands at any time.
- Spill response materials including absorbent pads, booms, and other materials to contain hazardous material spills shall be maintained on the project site to ensure rapid response to spills.
- The Park Project Manager shall be immediately notified of all spills or releases of hazardous materials. Any spill release shall be digitally photographed or videotaped as part of response activities.
- Disruption of utility service will require advanced notification to the park, concessionaire and residents prior to scheduled disruptions. Unexpected interruptions due to construction activities shall promptly be reconnected.
- The Construction Contractor shall implement and comply with the Exotic Species Management Plan prepared by the park for the project.

- All construction tools and equipment entering the park shall be cleaned by means of pressure washing and/or steam cleaning to arrive on-site free of mud or seed-bearing material. Each piece of equipment shall undergo inspections immediately prior to entry of the park.
- Clearing of vegetation and ground disturbance shall be minimized to the greatest extent possible.
- Vegetation salvage, seed collection and revegetation shall be implemented as defined in the Revegetation Plan.
- Topsoil shall be salvaged, segregated during storage, and reused in the proper location and depth. Wetland soils shall be salvaged and reused as fill in wetland areas. Stockpiles of soils infected with fungal pathogens (root rot) must not be moved and reused in non-infected areas of the park. Equipment buckets, tires and hand tools used in areas containing root rot shall be cleaned prior to removal.
- Soil and stump treatment prescriptions shall be executed according to the park's Root Rot Management Guidelines and the park's Forester. All stumps from excavations shall be disposed of in a legal manner outside of the Yosemite National Park boundary.
- Stationary noise sources shall be located as far as possible from residential housing and visitor lodging and camping areas. Construction equipment shall not be left running while standing by. All on-site work that generates noise levels above 76db at the site boundary in the vicinity of residential housing and visitor lodging and camping areas shall be done between 8am and 5pm.
- Lockable, bear proof dumpsters and food storage containers shall be delivered to the construction site by the park for construction crew use.
- Excavation sites must be monitored or covered to avoid trapping wildlife and routes of escape should be maintained. The construction site shall be inspected daily for appropriate covering and flagging of excavation sites. Each morning the project area shall be inspected for wildlife trapped in excavation pits. A qualified biologist will be available to inspect all excavations before refilling occurs.
- A Construction Contractor representative shall be designated to monitor the worksite daily for proper disposal of waste, wrappers, and food packaging.
- Site watering and slow truck speeds shall be managed as appropriate to control dust. When hauling dry materials, truck beds will be securely covered to prevent blowing dust or loss of debris.
- Appropriate signage shall be located and sequenced during construction activities to ensure safe and efficient traffic and pedestrian circulation. Information about traffic detours and recreational closures shall be provided to visitors as they enter the park at each entrance station.

Post Construction

- All tools, equipment, barricades, signs, surplus materials, debris, and rubbish shall be removed by the Construction Contractor from the project work limits upon project completion.
- The park will monitor the success of revegetation efforts. Plant materials used for revegetation shall remain alive and in a healthy, vigorous condition for a period of one year after final acceptance of planting. The project site shall be monitored by qualified park

personnel in accordance with the Exotic Plant Management Plan and Revegetation Plan. All plants determined to be in unhealthy condition shall be replaced.

- The park will monitor and remove invasive species from the project area for a period of four years post construction in accordance with the Exotic Plant Management Plan and Revegetation Plan.

Appendix D:
Special- Status Species Accounts

Appendix D: Special- Status Species Evaluation and Accounts

Special-Status Species Categories

The federal, state, and National Park Service special-status species listed in Table B-1 are categorized as:

- Federal endangered (FE): Any species that is in danger of extinction throughout all or a significant portion of its national range.
- Federal threatened (FT): Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its national range.
- Federal candidate species (FC): Any species for which there is sufficient information on their biological status and threats to propose them as endangered or threatened under the Endangered Species Act (ESA), but for which development of a proposed listing regulation is precluded by other higher priority listing activities.
- Federal Bird of Conservation Concern (BCC): Migratory and non-migratory bird species (beyond those already designated as Federally threatened or endangered) that represent the highest conservation priorities and in need of conservation action.
- State of California endangered (CE): Any species that is in danger of extinction throughout all or a significant portion of its range in the state.
- State of California threatened (CT): Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its state range.
- State of California species of special concern (CSC): Any species that may become vulnerable to extinction on a state level from declining population trends, limited range, and/or continuing threats; could become threatened or endangered.
- State of California fully protected species (CFP). Species (including federal and state listed) that are rare or face possible extinction for which the State provides additional protection. The State of California regulates the possession and taking of these species.
- State of California watch-list species (CWL): These are species that occupy much of their native range, but were formerly more widespread or abundant within that range. The populations of such species need to be assessed periodically and included in long-term plans for protection.
- Yosemite National Park sensitive or special status (PS): Identified by the National Park Service as special status or sensitive.[1]

[1] Park sensitive plants include those that are locally rare natives, listed by the California Native Plant Society, endemic to the park or its local vicinity, at the furthest extent of their range, of special importance to the park (identified in legislation or park management objectives), the subject of political concern or unusual public interest, vulnerable to local population declines, or subject to human disturbance during critical portions of their life cycle.

Table C-1. Special-Status Species Considered in This Analysis

Species	Status		Habitat Type/Occurrence	Determination	
	State	Park		Crane Flat	Henness Ridge
			PLANTS		
Chinese Camp brodiaea *Brodiaea pallida*	FT		In old, intermittent (vernal) stream channel with serpentine substrate. About 1250 feet elevation. Valley and foothill grassland (vernal streambeds, serpentinite); elevation 1260 feet (California Native Plant Society 2001).	**Removed from Further Analysis.** This species typically occurs at lower elevations than the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further	
Fed					
Mariposa pussy-paws *Calyptridium pulchellum*	FT		Sandy soils of decomposed granite, primarily in foothill oak woodlands. 1310-3600 feet elevation (USFWS 1994).	**Removed from Further Analysis.** This species typically occurs at lower elevations than the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further	
Succulent owl's clover *Castilleja campestris ssp. succulenta*	FT		Small, seasonal pools. Mostly restricted to vernal pools in the southern portion of the Central Valley of California (USFWS 1997).	**Removed from Further Analysis.** This species typically occurs in more southern regions than the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further.	
Hoover's spurge *Chamaesyce hooveri*	FT/CH		Chamaesyce hooveri is endemic to California and is restricted to the dried mudflats in the deepest portions (often middle) of Vernal Pools along the eastern edge of California's Central Valley (USFWS 1997).	**Removed from Further Analysis.** Suitable habitat for this species is absent from the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further	
Colusa grass *Neostapfia colusana*	FT/CH		Colusa grass is endemic to California and restricted to small, seasonal pools	**Removed from Further Analysis.** Suitable habitat for this species is absent from the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further	
San Joaquin Valley Orcutt grass *Orcuttia inaequalis*	FT/CH		Small, seasonal pools. This annual herb is endemic to California and is mostly restricted to vernal pools in the Central Valley of California (USFWS 1997).	**Removed from Further Analysis.** Suitable habitat for this species is absent from the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further	
Hairy Orcutt grass *Orcuttia pilosa*	FE/CH		Small, seasonal pools. This annual herb is endemic to California and is mostly restricted to vernal pools in the Central Valley of California (USFWS 1997).	**Removed from Further Analysis.** Suitable habitat for this species is absent from the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further	
Layne's butterweed *Senecio layneae*	FT		Restricted to chapparral communities on gabbroic and serpentine soils in El Dorado, Yuba and Tuolumne counties, California (USFWS 1996).	**Removed from Further Analysis.** Suitable habitat for this species is absent from the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further	
Greene's tuctoria *Tuctoria greenei*	FE/CH		Grows in the bottom of dried vernal pools in open grassland on the eastern side of the Sacramento and San Joaquin Valleys (USFWS 1997).	**Removed from Further Analysis.** Suitable habitat for this species is absent from the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further	
Red Hills vervain *Verbena californica*	FT		Along intermittent and perennial streams with serpentine substrates. 850 -1310 feet elevation. Narrowly restricted to mesic serpentine situations in in the Red Hills of Tuolumne County, California (USFWS 1994).	**Removed from Further Analysis.** This species typically occurs at lower elevations than the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further	

Species	Status		Habitat Type/Occurrence	Determination	
	State	Park		Crane Flat	Henness Ridge
Yosemite Rock Cress *Arabis repanda var.repanda*		PS	Dry forests in mixed conifer, montane, and subalpine zones	**Considered Further in this Analysis. O**ccurrences of this species occur directly adjacent to the Crane Flat campus. Refer to Chapter 3, Affected Environment and Environmental Consequences, for an analysis of effects on this species.	There are no documented occurrences of this species within the Henness Ridge area.
Fed					
Fresno Mat *Ceanothus fresnensis*		PS	This endemic plant inhabits the central Sierra Nevada in the vicinity of Yosemite. It is a prostrate shrub in the Buckthorn family (Rhamnaceae) that forms rigid mats that hug the ground in montane chaparral communities.	There are no documented occurrences of this species within the Crane Flat area.	**Considered Further in this Analysis** There are occurrences of this species at Henness Ridge. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Mountain Lady's-slipper *Cypripedium montanum* Douglas ex Lindley	CWL		Mainly northerly, occurring on slopes. Lady's Slipper grows on a wide variety of substrates in wooded communities with 60-80 percent canopy closure in mixed conifer and mixed evergreen/oak woodland plant communities. These are known to occur in Elevenmile Meadow.	There are no documented occurrences of this species within the Crane Flat area.	**Considered Further in Analysis.** While there are no reported occurrences at Henness Ridge, there are reported occurrences at Eleven Mile Meadow for this species. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Bolander's Dandelion *Phalacroseris breweri*		PS	Occurs in high elevation (5,906 to 9,600 feet) meadows.	**Considered Further in this Analysis.** While there are no occurrences of this species within the Crane Flat campus, there are occurrences adjacent to the Crane Flat campus. Refer to Chapter 3, Affected Environment and Environmental Consequences, for an analysis of effects on this species.	There are no documented occurrences of this species within the Henness Ridge area.
Whitneya *Whitneya dealbata*		PS	Shady wooded sites. Whitneya has been located across Tioga Pass Road from the Crane Flat facility.	**Considered Further in this Analysis.** While there are no occurrences of this species within the Crane Flat campus, there are occurrences adjacent to the Crane Flat campus. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	There are no documented occurrences of this species within the Henness Ridge area.
			INVERTEBRATES		
Conservancy fairy shrimp *Branchinecta conservatio*	FE/CH		Restricted to approximately ten disjunct localities each comprised of one to twenty turbid, slightly alkaline, large, deep, vernal pools and winter lakes in California grassland areas (Eng et al. 1990)	**Removed from Further Analysis.** Suitable habitat for this species is absent from the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further.	
Vernal pool fairy shrimp *Branchinecta lynchi*	FT		This species inhabits vernal pools and similar ephemeral wetlands. It is most commonly found in	**Removed from Further Analysis.** Suitable habitat for this species is absent from the project area. There is no expected direct, indirect, or cumulative effect on this species	

Species	Status			Habitat Type/Occurrence	Determination	
	Fed	State	Park		Crane Flat	Henness Ridge
				grassed or mud bottomed pools or basalt flow depression pools in unplowed grasslands (Eng et al. 1990).	from the proposed action, and this species is not evaluated further.	
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT			This endemic beetle is only found in association with its host plant, elderberry, and is restricted to fewer than 10 locations on the American River, Putah Creek and the Merced River (USFWS 2006).	**Removed from Further Analysis.** Suitable habitat for this species is absent from the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further.	
Vernal pool tadpole shrimp *Lepidurus packardi*	FE/CH			One of the more widely distributed California tadpole shrimp. Endemic to the northern Central Valley of California and found in a variety of seasonally ponded habitat types including: vernal pools, swales, ephemeral drainages, stock ponds, and reservoirs (USFWS 2004).	**Removed from Further Analysis.** Suitable habitat for this species is absent from the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further.	
				FISH		
Delta smelt *Hypomesus transpacificus*	FT	CT		This fish is endemic to the upper San Francisco Estuary, principally the upper Sacramento-San Joaquin Delta (primarily below Isleton in the Sacramento River, and below Mossdale in the San Joaquin River) and Suisun Bay. The species does not occur in Yosemite National Park, however, the park contains the headwaters of tributaries that feed into downstream habitat for the species.	**Removed from Further Analysis.** This species does not occur within Yosemite National Park. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further.	
Paiute cutthroat trout *Oncorhynchus (=Salmo) clarki seleniris*	FT			Historic range included the Silver King Creek system, Toiyabe National Forest, California. Introduced above Llewellyn Falls from downstream; later, the population below the falls hybridized with introduced rainbow trout (Behnke 1992). Introduced populations occur in other streams and lakes in California, including the North Fork of Cottonwood Creek (Mono County), Stairway Creek (Madera County), and Cabin and Sharktooth creeks (Behnke 1992). The species does not occur in Yosemite National Park, however the park contains the headwaters of tributaries that feed into downstream habitat for the species.	**Removed from Further Analysis.** This species does not occur within Yosemite National Park. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further.	
Central Valley steelhead *Oncorhynchus mykiss*	FT			Spawns in the Sacramento and San Joaquin rivers and their tributaries; the majority of native, natural production occurs in upper Sacramento River tributaries below Red Bluff Diversion Dam, but these populations are nearly extirpated; the American, Feather, and Yuba (and possibly the upper Sacramento and Mokelumne) rivers also have naturally spawning populations, but these have had substantial hatchery influence and their ancestry is	**Removed from Further Analysis.** This species does not occur within Yosemite National Park. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further.	

Species	Status		Habitat Type/Occurrence	Determination	
	State	Park		Crane Flat	Henness Ridge
Fed			not clearly known; in the San Joaquin River system, current range apparently includes only small populations in the Stanislaus, Tuolumne, and Merced rivers (tributaries) and the mainstem San Joaquin River to its confluence with the Merced River (NMFS 1996). This species occurs in the Sacramento-San Joaquin estuary and tributaries. Though the species does not occur in Yosemite National Park, the park contains the headwaters of tributaries that feed into downstream habitat for the species.		
			REPTILES AND AMPHIBIANS		
California red-legged frog *Rana aurora draytonii*	FT	CSC	Found in quiet pools in permanent streams in mixed conifer zones and foothills. Critical habitat for the California red-legged frog had been designated by the U.S. Fish and Wildlife Service northwest of the project area (Unit 5) within Yosemite National Park (final rule dated March 13, 2001, Federal Register 66:14625-14674) (USFWS 2001). However, the proposed revised critical habitat (USFWS 2005) does not include Unit 5. The last verified record for red-legged frog in Yosemite is from 1984, at a lake in the northern portion of the park. Recent surveys have found no remaining red-legged frogs.	**Removed from Further Analysis.** Suitable habitat for this species is absent from the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further.	
Yosemite toad *Bufo canorus*	FC	CSC	Inhabits high elevation (6,400 to 11,300 feet) wet meadows in the central high Sierra Nevada. Subject to wet meadow degradation within its restricted range.	**Considered Further in Analysis.** There have been no detections of this species from the meadow system at Crane Flat, and at 6,200 feet elevation is slightly below the elevation range for this species. However, Crane Flat Meadow represents potential, although perhaps marginal habitat for this species. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in Analysis.** While there are no reported occurrences, Eleven Mile Meadow may support potential habitat for this species. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Sierra Nevada yellow-legged frog *Rana sierrae*	FC	CSC	Inhabits lakes, meadow streams, and ponds in mid- to –high elevation mountain habitats between 6,000 to over 12,000 feet.	**Removed from Further Analysis.** Suitable habitat for this species is absent from the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further.	
California tiger salamander *Ambystoma californiense*	FT	CSC	Restricted to the central portion of California and lives in vacant or mammal-occupied burrows (e.g., California ground squirrel, valley pocker gopher) (Trenham 2001), occasionally other underground retreats, throughout most of the year; in grassland, savanna, or open woodland habitats.	**Removed from Further Analysis.** Suitable habitat for this species is absent from the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further.	

Species	Status			Habitat Type/Occurrence	Determination	
	Fed	State	Park		Crane Flat	Henness Ridge
Giant garter snake *Thamnophis gigas*	FT	CT		Habitat of this highly aquatic species includes primarily marshes and sloughs, sometimes low-gradient streams, ponds, and small lakes, with cattails, bulrushes, willows, or other emergent or water-edge vegetation usually present and used for basking and cover in the Central Valley of California (USFWS 1993)	**Removed from Further Analysis.** Suitable habitat for this species is absent from the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further.	
				BIRDS		
Northern goshawk *Accipiter gentilis*	CSC			Inhabits coniferous forests, usually mature, open stands to promote below canopy maneuverability and prey capture. Known to occur in Yosemite National Park.	**Considered Further in this Analysis.** Northern goshawks have been observed and could potentially nest in forested habitats on or adjacent to the project area. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** Northern goshawks have been observed and could potentially nest in forested habitats on or adjacent to the project area. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Cooper's hawk *Accipiter cooperi*		CWL		Inhabits woodlands and forests up to 9,000 feet in the Sierra Nevada. Often occurs adjacent to openings and hunts along wooded edges (NPS 1997a). Numerous recent records for Yosemite, especially in Yosemite Valley.	**Considered Further in Analysis.** The Crane Flat project site vicinity supports suitable habitat for this species. There are reported occurrences of this species from Crane Flat. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in Analysis.** The Henness Ridge project site vicinity supports suitable nesting and foraging habitat for this species. There are reported occurrences of this species at Henness Ridge. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Sharp-shinned hawk *Accipiter striatus*		CWL		Inhabits coniferous forests, usually dense stands for nesting within a mixed or patchy forest community for higher prey densities. Known to occur throughout the west slope of the Sierra Nevada, including Yosemite.	**Considered Further in Analysis.** Sharp-shinned hawk could potentially nest in forested habitats on or adjacent to the project area and have been observed at Crane Flat. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in Analysis.** Sharp-shinned hawk could potentially nest in forested habitats on or adjacent to the project area and have been observed at Henness Ridge. Refer to Chapter 3, Affected Environment and Environmental Consequences for analysis of effects on this species.
Golden eagle *Aquila chrysaetos*	BCC	CFP, CWL		Found in a wide range of elevations in the park. Needs open terrain for hunting. Feeds primarily on small mammals. Nests on cliffs and in large trees in open areas.	**Considered Further in Analysis.** Golden eagles have been known to occur in the vicinity of Crane Flat. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in Analysis.** Golden eagles have been known to occur at Henness Ridge. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Long-eared owl *Asio otus*		CSC		Known primarily to inhabit riparian and live oak woodlands and thickets in association with open grassland, meadow, or agricultural foraging habitats. Also occasionally uses high elevation coniferous	**Considered Further in this Analysis.** The Crane Flat project site vicinity supports suitable nesting and foraging habitat for this species. There are	**Considered Further in this Analysis.** The Henness Ridge project site vicinity supports suitable nesting and foraging habitat for this species. There are

Species	Status		Habitat Type/Occurrence	Determination	
	State	Park		Crane Flat	Henness Ridge
			forests, but only in association with large open grasslands or scrublands. One nesting record in Yosemite Valley in 1915 (NPS 1997b).	reported occurrences of this species from Crane Flat. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	reported occurrences from Henness Ridge. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Flammulated owl *Otus flammeolus*	BCC	Fed	Flammulated owls occur in montane regions from 6,000 to 10,000 feet. Usually found in coniferous habitats with low to intermediate canopy closure.	**Considered Further in this Analysis.** The Crane Flat project site vicinity supports suitable breeding habitat for this species. There is a reported occurrence of this species from Crane Flat. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** The Henness Ridge project site could possibly support the highest breeding density of this species in the park. There are numerous reported occurrences of this species from Henness Ridge. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Great Gray Owl *Strix nebulosa*		CE	In the Sierra Nevada, great gray owls nest in mature red fir, mixed conifer, or lodgepole pine forests near wet meadows or other vegetated openings between between 2,500 and 8,900 feet.	**Considered Further in this Analysis.** Great-gray owls have been documented at the Crane Flat site annually for nearly 40 years. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** Great-gray owls have been documented in the Elevenmile Meadow. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
California spotted owl *Strix occidentalis occidentalis*	BCC	CSC	The California spotted owl is considered a habitat specialist because of its dependence on old-growth and late-successional and its tendency toward selecting stands that have higher structural diversity and significantly large trees.	**Considered Further in this Analysis.** Suitable roosting, nesting and foraging habitat for this species occurs within the project area, with one report of a nest site located near the campus. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** Suitable roosting, nesting and foraging habitat for this species exists at Henness Ridge, with reported nest sites. Numerous observations have been made at Henness Ridge and other nearby locations including Elevenmile Meadow. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Vaux's swift *Chaetura vauxi*		CSC	Inhabits mixed-coniferous forest in Coast Ranges, Cascade, and Sierra Nevada. Often in the vicinity of water. Requires large residual snags for nesting and roosting.	**Considered Further in this Analysis.** Suitable nesting habitat for this species occurs within the greater project area and numerous observations of this species have been made at Crane Flat. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** Suitable nesting habitat for this species occurs within the Henness Ridge site. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
White-headed woodpecker *Picoides albolarvatus*	BCC		Inhabits mixed-montane coniferous in the Sierra Nevada. The dominant requisite habitat components are abundance of mature pines, relatively open canopy, and availability of snags and stumps for	**Considered Further in this Analysis.** The Crane Flat project site vicinity supports suitable roosting, nesting, and foraging habitat for this species. There	**Considered Further in this Analysis.** The Henness Ridge project site vicinity supports suitable roosting, nesting, and foraging habitat for this species. There

Species	Status		Habitat Type/Occurrence	Determination	
	Fed	State	Park		Crane Flat	Henness Ridge
				nest cavities. This species persists in burned or cutover forest with residual snags and stumps.	are several reported occurrences of this species from Crane Flat. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	are reported occurrences of this species from Henness Ridge. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Olive-sided Flycatcher *Contopus cooperi*	BCC	CSC		Inhabits coniferous forests primarily in open mixed conifer and red fir types.	**Considered Further in this Analysis.** Reported occurrences in the Crane Flat project area. Suitable nesting habitat occurs in the vicinity of Crane Flat area. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** Reported occurrences in the Henness Ridge project area. Suitable nesting habitat occurs at Henness Ridge area. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Willow flycatcher *Empidonax traillii*		CE		Inhabits mountain meadows and riparian areas from 2,000 to 9,500 feet elevation in the Sierra Nevada, with lush growth of shrubby willows. Has disappeared from much of its range, due to habitat destruction and parasitism from brown-headed cowbirds.	**Considered Further in this Analysis.** The Crane Flat project site vicinity supports suitable nesting habitat for this species. There are reported occurrences of this species from Crane Flat. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in Analysis.** While there are no reported occurrences at Henness Ridge, Eleven Mile Meadow may support potential habitat for this species. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Hermit warbler *Dendroica occidentalis*			PS	Inhabits coniferous forests throughout Sierra Nevada, Cascade, and north Coast Ranges. Preference for mature stands, particularly pine and Douglas fir, but also found in red and white fir, ponderosa, lodgepole, and other forest types.	**Considered Further in this Analysis.** Hermit warblers are a common breeding species found annually at the Crane Flat site for over 15 years. The campus vicinity contains suitable breeding habitat for this species. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** This species was recorded from the project site during surveys conducted by park staff (NPS 2007). Habitat on and in the vicinity of the project site are suitable for nesting. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Yellow warbler *Dendroica petechia*	BCC	CSC		Inhabits riparian woodlands, mixed conifer and other coniferous forest habitats, usually with substantial understory brush. In recent decades, numbers of individuals have declined dramatically in Yosemite National Park (DeSante et al. 2007).	**Considered Further in this Analysis.** Suitable nesting habitat for this species exists at Crane Flat and there have been several documented occurrences in the last few decades. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** Henness Ridge contains suitable nesting habitat and there have been several documented occurrences of this species at Eleven Mile Meadow. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
				MAMMALS		
Pallid bat *Antrozous pallidus*		CSC		Primarily found below 6,000 feet in elevation, in a variety of habitats, especially oak, ponderosa pine, and giant sequoia habitats. Roosts in rock outcrops, caves, and especially hollow trees.	**Considered Further in this Analysis.** Suitable habitat for this species occurs within the vicinity of the project area. This species has been detected at Crane Flat in the vicinity of the campground.	**Considered Further in this Analysis.** Suitable habitat for this species occurs within the vicinity of the project area. Refer to Chapter 3, Affected Environment and Environmental

Species	Status		Habitat Type/Occurrence	Determination	
	State	Park		Crane Flat	Henness Ridge
				Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	Consequences, for analysis of effects on this species.
Townsend's big-eared bat *Corynorhinus townsendii townsendii* Fed	CSC		Found in all habitats up to alpine zone. Requires caves, mines, or buildings for roosting. Prefers mesic habitats where it gleans from brush or trees along habitat edges.	**Considered Further in this Analysis.** Suitable habitat for this species occurs within the vicinity of Crane Flat. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** Suitable habitat for this species occurs within the vicinity of Henness Ridge. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Spotted bat *Euderma maculatum*	CSC		Rare throughout range, but relatively abundant in Yosemite National Park. Uses crevices in rock faces for roosting and reproduction. Forages in a wide variety of habitats, primarily for moths.	**Considered Further in this Analysis.** Although suitable roosting habitat is absent, this species has been documented in the vicinity of Crane Flat. Suitable foraging habitat exists at Crane Flat. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** Suitable foraging habitat for this species occurs in the vicinity of Henness Ridge. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Silver-haired bat *Lasionycteris noctivagans*		PS	The silver-haired bat is a forest bat, associated primarily with northern temperate zone conifer and mixed conifer/hardwood forests with available water (Pierson et al. 2006).	**Considered Further in this Analysis.** No surveys for silver-haired bats have been conducted at Crane Flat however suitable habitat exists for their occurrence and this species has been documented near the project area at Tuolumne Grove. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** No surveys for silver-haired bats have been conducted at Henness Ridge, however suitable habitat exists for their occurrence. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Western red bat *Lasiurus blossevillii*	CSC		Although the majority of records for this species are from coastal riparian habitats, males are noted to move to higher elevations in summer and have been observed at Yosemite National Park.	**Considered Further in this Analysis.** No surveys for western red bats have been conducted at Crane Flat however suitable habitat exists for their occurrence. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** No surveys for western red bats have been conducted at Henness Ridge however suitable habitat exists for their occurrence. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Hoary bat *Lasiurus cinereus*		PS	The hoary bat is the most widespread of all North American bats and is found throughout California. The hoary bat is associated with cottonwood riparian habitat, and is also found in forested areas.	**Considered Further in this Analysis.** No surveys for hoary bats have been conducted at Crane Flat however suitable non-breeding habitat exists for their occurrence and this species has been documented near the project area at Tuolumne Grove. Refer to Chapter 3, Affected Environment and Environmental	**Considered Further in this Analysis.** No surveys for hoary bats have been conducted at Henness Ridge, however suitable non-breeding habitat exists for their occurrence. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.

Species	Status		Habitat Type/Occurrence	Determination	
	State	Park		Crane Flat	Henness Ridge
				Consequences, for analysis of effects on this species.	
Western small-footed myotis *Myotis ciliolabrum* Fed		PS	Occurs mostly above 6,000 feet and in wooded and brushy habitats near water. Forages among trees and over water. Breeds in colonies in buildings, caves, and mines (NPS 1997a). Suitable habitat for this species occurs within Yosemite National Park.	**Considered Further in this Analysis.** Suitable roosting habitat for this species occurs within the forested habitats surrounding Crane Flat. Snags, large trees, and hollow trees in the vicinity of the project area represent suitable habitat for this species. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** Snags, large trees, and hollow trees in the vicinity of the project area represent suitable roosting habitat for this species. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Long-eared myotis *Myotis evotis*		PS	Wide range, from coast to high Sierra Nevada, in montane oak woodlands and coniferous habitats. Roosts primarily in hollow trees, especially large snags or lightning-scarred, live trees.	**Considered Further in this Analysis.** Suitable roosting habitat for this species occurs within the forested habitats surrounding Crane Flat. Snags, large trees, and hollow trees in the vicinity of the project area represent suitable habitat for this species. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** Snags, large trees, and hollow trees in the vicinity of the project area represent suitable roosting habitat for this species. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Fringed myotis *Myotis thysanodes*		PS	Found to at least 6,400 feet in the Sierra Nevada, in deciduous/mixed conifer forests. Feeds over water, in open habitats, and by gleaning from foliage. Roosts in caves, mines, buildings, and trees, especially large conifer snags.	**Considered Further in this Analysis.** Suitable roosting habitat for this species occurs within the forested habitats surrounding Crane Flat. Snags, large trees, and hollow trees in the vicinity of the project area represent suitable habitat for this species. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** Snags, large trees, and hollow trees in the vicinity of the project area represent suitable roosting habitat for this species. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Long-legged myotis *Myotis volans*		PS	Found up to high elevations in the Sierra Nevada, in montane coniferous forest habitats. Forages over water, close to trees and cliffs, and in openings in forests. Roosts primarily in large-diameter snags. Forms nursery colonies numbering hundreds of individuals, usually under bark or in hollow trees.	**Considered Further in this Analysis.** Suitable roosting habitat for this species occurs within the forested habitats surrounding Crane Flat. Snags, large trees, and hollow trees in the vicinity of the project area represent suitable habitat for this species. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** Snags, large trees, and hollow trees in the vicinity of the project area represent suitable roosting habitat for this species. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Yuma myotis *Myotis yumanensis*		PS	Usually occurs below 8,000 feet in elevation. Forages over open, still, or slow-moving water and	**Considered Further in this Analysis.** Suitable roosting habitat for this species	**Considered Further in this Analysis.** Snags, large trees, and hollow trees in

Species	Status		Habitat Type/Occurrence	Determination	
	State	Park		Crane Flat	Henness Ridge
			above low vegetation in meadows. Roosts in buildings, caves, or crevices. Nursery colonies of several thousand individuals may be in buildings, caves, or mines.	occurs within the forested habitats surrounding Crane Flat. Snags, large trees, and hollow trees in the vicinity of the project area represent suitable habitat for this species. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	the vicinity of the project area represent suitable roosting habitat for this species. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Fed					
Western mastiff bat *Eumops perotis californicus*	CSC		Found in a variety of habitats to over 9,800 feet in elevation. Roosts primarily in crevices in cliff faces, and occasionally trees. Detected most often over meadows and other open areas, but will also feed above forest canopy; sometimes to high altitudes (1,000 feet).	**Considered Further in this Analysis.** No surveys for western mastiff bats have been conducted at Crane Flat however suitable foraging habitat exists. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** No surveys for western mastiff bats have been conducted at Henness Ridge however suitable foraging habitat exists. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Sierra Nevada Mountain beaver *Aplodontia rufa californica*	CSC		Generally found in association with moist meadows and montane riparian habitat and occasionally with open, brushy stages of most forest types in the Sierra Nevada.	**Considered Further in this Analysis.** Suitable habitat occurs in the vicinity of the Crane Flat project area. There have been documented occurrences of this species within the project vicinity. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** Suitable habitat occurs in the vicinity of the Henness Ridge project area. There have been documented occurrences of this species within the project vicinity. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
American marten *Martes americana*		PS	Inhabits dense, complex coniferous forests with large trees and snags. Occurrence records range from 4,000 to 13,000 feet.	**Considered Further in this Analysis.** The habitat type in the project area and vicinity could be occasionally used by martens for forage, dispersal, and cover; however, existing human disturbances likely precludes denning activity. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** The habitat type in the project area and vicinity could be occasionally used by martens for forage, dispersal, and cover; however, existing human disturbances likely precludes denning activity. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.
Pacific fisher *Martes pennanti pacifica*	FC	CSC	Fishers are generally found in stands with high canopy closure, large trees and snags, large woody debris, large hardwoods, and multiple canopy layers between 2,000 and 8,500 feet in elevation.	**Considered Further in this Analysis.** The habitat type in the project area and vicinity could be occasionally used by fishers for foraging, dispersal, and cover; however, existing human disturbances likely precludes denning activity. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.	**Considered Further in this Analysis.** The habitat type in the project area and vicinity could be occasionally used by fishers for foraging, dispersal, and cover; however, existing human disturbances likely precludes denning activity. Refer to Chapter 3, Affected Environment and Environmental Consequences, for analysis of effects on this species.

Species	Status			Habitat Type/Occurrence	Determination	
	Fed	State	Park		Crane Flat	Henness Ridge
San Joaquin kit fox *Vulpes macrotis mutica*	FE	CT		Restricted to alkali sink, valley grassland, foothill woodland in San Joaquin Valley, California. Hunts in areas with low sparse vegetation that allows good visibility and mobility (Biosystems Analysis 1989).	**Removed from Further Analysis.** Suitable habitat for this species is absent from the project area. There is no expected direct, indirect, or cumulative effect on this species from the proposed action, and this species is not evaluated further.	

Key to Status
CE – California Endangered
CFP – California Fully Protected
CH – Critical Habitat
CSC – California Species of Concern
CT – California Threatened
CWL – California Watch List
FC – Federal Candidate
FE – Federal Endangered
FT – Federal Threatened
PS – Park Sensitive/Special Status
BCC – Federal Bird of Conservation Concern

Full Accounts of Special Status Species Considered Further in Analysis

PLANTS

YOSEMITE ROCK CRESS *Arabis repanda var.repanda*

Status. Yosemite National Park Sensitive

General Distribution. Dry forests in mixed conifer, montane, and subalpine zones. This park-sensitive species is poorly documented in Yosemite. It is a biennial in the Mustard family (Brassicaceae) found in dry forests in mixed conifer, montane, and subalpine zones.

Habitat and Status in the Project Area. The population mapped near Crane Flat contains about 1,550 plants, mostly seedlings.

FRESNO MAT *Ceanothus fresnensis*

Status. Yosemite National Park Sensitve

General Distribution. This endemic plant inhabits the central Sierra Nevada in the vicinity of Yosemite. It is a prostrate shrub in the Buckthorn family (Rhamnaceae) that forms rigid mats that hug the ground in montane chaparral communities. This plant is endemic to the central Sierra Nevada in the vicinity of Yosemite. It is a prostrate shrub in the Buckthorn family (Rhamnaceae) that forms rigid mats that hug the ground.

Habitat and Status in the Project Area. It is locally common in the vicinity of Henness Ridge and Chinquapin.

MOUNTAIN LADY'S-SLIPPER *Cypripedium montanum* Douglas ex Lindley

Status. California Native Plant Society Watch List

General Distribution. The geographic range is within the range of the northern spotted owl at elevations from 1500-6500 ft. Mainly northerly, occurring on slopes. Lady's Slipper grows on a wide variety of substrates in wooded communities with 60-80 percent canopy closure in mixed conifer and mixed evergreen/oak woodland plant communities.

Habitat and Status in the Project Area. These are known to occur in Elevenmile Meadow.

BOLANDER'S DANDELION *Phalacroseris breweri*

Status. Yosemite National Park Sensitive

General Distribution. Occurs in high elevation (5,906 to 9,600 feet) meadows. This plant is endemic to the central and southern Sierra Nevada. In Yosemite it is known from meadows on the Glacier Point Road, Crane Flat, and Tamarac Flat. It is a perennial plant in the Aster family (Asteraceae).

Habitat and Status in the Project Area. The population mapped at Crane Flat consists of about 140 individuals.

WHITNEYA *Whitneya dealbata*

Status. Yosemite National Park Sensitive

General Distribution. Shady wooded sites. This park-sensitive plant is a Sierra Nevada endemic with a limited distribution in Yosemite National Park and California. It is an herbaceous perennial and member of the Aster family (Asteraceae).

Habitat and Status in the Project Area. The mapped population located across Tioga Pass Road from Crane Flat consists of about 1,600 individuals.

AMPHIBIANS

YOSEMITE TOAD *Bufo canorus*

Status. Federal Candidate, California Species of Special Concern, IUCN Endangered, USFS Sensitive

Kagarise Sherman and Morton (1993) and Drost and Fellers (1996) suggested that Yosemite toads have declined in and around Yosemite National Park. Drost and Fellers (1996) resurveyed for Yosemite toads across a transect of the Sierra Nevada mountains that documented Yosemite toad detections in the early 1900s (Grinnell and Storer 1924). In the park, Drost and Fellers (1996) reported that the Yosemite toad had disappeared from 6 of 13 localities where they had previously been present, and were observed in low numbers at most sites. In 1997, a survey of over 260 sites in Yosemite found the Yosemite toad at a total of only five sites (Fellers and Freel 1995, Fellers 1997). During 1999, the Yosemite toad was found at 14 sites out of a total of 291 sites that were surveyed. During the Yosemite Lake Survey conducted 2002-2003, Yosemite toads were detected at 74 of the 2,655 (3%) surveyed water bodies (Knapp 2003). In 2002, the U.S. Fish and Wildlife Service determined that the listing of Yosemite toad under the Endangered Species Act is "warranted" although "precluded" by other higher priority listing actions (Federal Register 2002). Current threats facing the Yosemite toad in and around Yosemite include cattle and packstock grazing, timber harvesting, recreation, disease, conifer encroachment, and climate change (Federal Register 2002).

General Distribution. The historic range of Yosemite toads in the Sierra Nevada occurs from the Blue Lakes region north of Ebbetts Pass (Alpine County) to 3 mi south of Kaiser Pass in the Evolution Lake/Darwin Canyon area (Fresno County) (Jennings and Hayes 1994). The historic elevational range of Yosemite toads is 4,790 to 11,910 ft (Stebbins 1985). Yosemite toads may be found in areas with thick meadow vegetation or patches of low willows near or in water, and use rodent burrows for overwintering and temporary refuge during the summer (Jennings and Hayes 1994). Breeding habitat includes the edges of wet meadows, slow flowing streams, shallow ponds, and shallow areas of lakes. Yosemite toads have been reported from elevations ranging from 6,400 to 11,480 ft (Karlstrom 1962).

Reproductive Biology and Breeding Habitat. Yosemite toads emerge from hibernation when melting snow forms pools near their overwintering sites (Karlstrom 1962, Kagarise Sherman 1980, Jennings and Hayes 1994). Observed emergence times range from early May to the middle of June (Kagarise Sherman 1980). They exhibit breeding behavior soon after emergence, at which time males form breeding choruses (Jennings and Hayes 1994). Yosemite toads generally breed in wet meadows or shallow portions of wetland complexes, characterized by slow-flowing runoff streams with short emergent sedges (Sadinski 2004). Egg laying typically occurs from mid-April to mid-July, depending on local conditions. Eggs are deposited in shallow water with silty bottoms in wet meadows or in shallow tarns surrounded by forest (Karlstrom 1962).

Diet and Foraging Habitat. Adult and juvenile Yosemite toads are lie-and-wait predators. They remain motionless until a prey item approaches, then strike and capture the prey with their sticky tongues (Kagarise Sherman and Morton 1984). The examined stomach contents of Yosemite toads have included beetles, ants, centipedes, spiders, dragonfly larvae, mosquitos, and moth and butterfly larvae (Grinnell and Storer 1924; Mullally 1953). They will also prey on flies, bees, wasps, millipedes (Kagarise Sherman and Morton 1984), spider mites, crane flies, springtails, owl flies, and damsel flies (Martin 1991). Yosemite toad tadpoles graze on detritus and plant material such as algae and will also eat other items such as lodgepole pine pollen. Yosemite toad tadpoles can be carnivorous and will eat other Yosemite toad tadpoles, Pacific chorus frog (previously Pacific treefrog) (*Pseudacris regilla*, previously *Hyla regilla*) tadpoles, diving beetle larvae, and dead mammals (Martin 1991).

Habitat and Status in the Project Area. Currently there are no presence/absence data for Yosemite toad at either project area. Crane Flat and Henness are located at or below Yosemite toads' lower elevation range; however the wet meadow habitats at Crane Flat or Elevenmile Meadows may potentially support individuals.

BIRDS

NORTHERN GOSHAWK *Accipiter gentilis*

Status. California Species of Special Concern, Bureau of Land Management Sensitive, California Department of Forestry Sensitive, USFS Sensitive, California Bird Species of Special Concern

Surveys in Yosemite suggest that the density of nesting goshawks in the park is high relative to areas outside the park, which probably reflects the high quality of relatively intact forest habitats in the park (Maurer 2000). Except for localized effects from development, goshawk habitats in Yosemite are relatively intact and probably support near-natural numbers of this species. Habitat loss and degradation are the primary known threats to northern goshawks (Squires and Kennedy 2006). Loss of habitat includes such factors as logging, toxic chemicals, fire suppression, disease, shooting, and falconry (Bloom et al. 1986).

General Distribution. Northern goshawks occupy temperate and boreal forests throughout the Holarctic (Brown and Amadon 1968, Squires and Reynolds 1997). In North America, they breed from boreal Alaska and Canada south in the East as far as Pennsylvania and New York and in the West to the mountains of southern Arizona and New Mexico (Squires and Reynolds 1997). In California, their core breeding range includes most of the northern Coast Ranges, the Klamath and Siskiyou mountains, across the Cascades, Modoc Plateau, and Warner Mountains, and south through the Sierra Nevada. They are year-round residents throughout all or most of the California range, though in winter some individuals remain on or near breeding territories while others migrate short distances to winter elsewhere (Keane 1999). Throughout their range, they inhabit moderately dense coniferous forests broken by meadows and other openings, between 4,920 and 8,860 ft elevation.

Reproductive Biology and Breeding Habitat. Nesting generally begins in March or early April. Northern goshawks typically nest in the largest trees of dense, north-facing stands of coniferous, mixed, and deciduous forests (Zeiner et al. 1990). During courtship, they repair old nests or build new stick nests in mature live trees. Clutch size usually consists of 2 to 4 eggs. In the Sierra Nevada, goshawks breed in elevations with mixed conifer forests up to higher lodgepole pine forests (Fowler 1988). Pairs defend their territory where they maintain one to eight alternate nest trees (Squires and Reynolds 1997). General nesting habitat characteristics include older seral stages, high basal area, high canopy closure, open understories, gentle slopes, with east to northerly aspects associated with meadow, riparian habitats, or other natural forest openings (Hall 1984, Camilleri 1982, Saunders 1982, McCarthy 1986, Woodbridge et al. 1988, Austin 1993).

Diet and Foraging Habitat. Northern goshawks forage in mature and old-growth forests that have relatively dense canopies (Beier and Drennan 1997), but also hunt among a variety of vegetative cover, including meadow edges (Younk and Bechard 1994). Goshawk studies indicate a dependence on squirrels such as the Douglas squirrel (*Tamiasciurus douglasii*) and golden-mantled ground squirrel (*Spermophilus lateralis*),

and mid-sized forest birds, such as Steller's jay (*Cyanocitta stelleri*) and northern flicker (*Colaptes auratus*) (Schnell 1958, Bloom et al. 1986, Woodbridge et al. 1988, Keane et al. 2006). Goshawks hunt from tree perches, scanning the ground and lower canopy for prey. As such, an open understory improves the chances of detection and capture of prey (Reynolds et al. 1992).

Habitat and Status in the Project Area. Northern goshawks have been observed on 155 different occasions in Yosemite, including five records in the Crane Flat vicinity (1976, 1982, 1992, and 1993) and four records in the Henness vicinity (1980, 1982, 1993, and 1994) (Yosemite Wildlife Observation Database 2009). Key breeding requirements, including suitable nesting and foraging habitat and adequate prey, probably exist in the project areas.

COOPER'S HAWK *Accipiter cooperi*

Status. The Cooper's hawk is currently listed in the State of California as a watch list species. Cooper's hawk populations declined as a result of the use of pesticides such as DDT, but have begun to recover since DDT was banned in 1972. One threat facing Cooper's hawks today is degradation and loss of habitat. Management activities such as logging may make former habitat unsuitable for breeding. Cooper's hawks are protected under the U.S. Migratory Bird Treaty Act.

General Distribution. The Cooper's hawk is a medium-sized accipiter found throughout the Sierra Nevada from the foothills to approximately 9,000 feet elevation. This species is most commonly found in low to mid-elevation riparian areas and oak woodlands, particularly in montane canyons (Garrett and Dunn 1981; Curtis et al. 2006). Less frequently it is found in dense coniferous forest communities, but is not necessarily associated with older, complex forest structure. This species is found in medium to younger forest age classes with smaller diameter trees, forest openings, and a more developed shrub cover compared to northern goshawk.

Reproductive Biology and Breeding Habitat. Cooper's hawks begin breeding as early as March. Clutch size is usually 3 to 6 eggs. The eggs hatch after 32 to 36 days, during which time they are incubated primarily by the female. Young become independent at about 8 weeks (Stoper and Usinger 1968, Peterson and Peterson 2002, Rosenfield and Bielefeldt 1993).

Diet and Foraging Habitat. Cooper's hawks are predators primarily of birds and small mammals. They also occasionally feed upon reptiles and amphibians. When hunting, Cooper's hawks usually perch in a hidden location and watch for prey. They wait until their prey is unaware of their presence, then quickly swoop down and seize it. Other small birds, chipmunks and squirrels are common prey for Cooper's hawks. The prey taken by an individual Cooper's hawk is largely influenced by the size of the bird; larger hawks eat larger prey than smaller hawks.

Habitat and Status in the Project Area. The Henness Ridge site supports habitat suitable for Cooper's hawk nesting. NPS (2007) survey results indicated that a Cooper's hawk was detected in the vicinity of Henness Ridge in 2006. Cooper's hawks have been known to occur at Crane Flat.

SHARP-SHINNED HAWK ***Accipiter striatus***

Status. California Watch List Species

Sharp-shinned hawks are found throughout wooded habitat in the park from 3,935 to 6,890 ft in elevation. Observations of this species in Yosemite are relatively rare; 33 observations are listed in the Yosemite Wildlife Observation Database (2009). The last record of a sharp-shinned hawk nesting in Yosemite Valley occurred in 1930. In Yosemite, their habitat is largely intact, except for localized habitat destruction from roads and development. Because of the species' secretive nature, particularly during the breeding season (Reynolds and Wight 1978), few data exist on the historical and current population. Declines in counts at migration watch sites in eastern North America from the 1940s to the early 1970s have been attributed to widespread use of DDT and its effects on reproduction (Snyder et al. 1973, Henny 1977, Newton 1979, Cade et al. 1988); a rebound in numbers followed the U.S. ban of DDT (Bednarz et al. 1990). Dependence on relatively large tracts of contiguous forest for nesting, at least until recently, has almost certainly affected distribution historically (Bildstein et al. 2000).

General Distribution. Sharp-shinned hawks occur across most of North America, inhabiting woodlands and forests, hunting in openings and along edges. In California, they breed in a variety of forested habitats between 3,935 and 6,890 ft elevation. In winter, they often descend to lower elevations to all but the most barren and open habitats.

Reproductive Biology and Breeding Habitat. Sharp-shinned hawks arrive on breeding territory in April and early May. Nests of the sharp-shinned hawk are typically located in dense stands of small conifers which are moist, cool, and well-shaded. They are often in areas near water with little ground cover. The nest is usually located 8 to 62 ft up in a tree (Bildstein et al. 2000), against the trunk on horizontal limbs in dense, well developed portions of the crown well below the top of the canopy (Wiggers and Kritz 1991). Breeding habitats include ponderosa pine, black oak, riparian deciduous, mixed conifer, and Jeffrey pine. They tend to select habitats containing a riparian component on a north-facing slope.

Diet and Foraging Habitat. Diet is composed almost entirely of small birds, and occasionally small mammals, reptiles, and insects. Hunting generally occurs in forest openings and edges, and brushy areas. Sharp-shinned hawks often burst in sudden flight from a perch to surprise their prey, and may also hunt in low, gliding flights.

Habitat and Status in the Project Area. Both project areas appear to contain suitable nesting and foraging habitat for sharp-shinned hawks. (Gaines 1992) noted nesting

behavior on the west slope of Crane Flat at 6,230 ft elevation. Sharp-shinned hawks have been observed on 33 different occasions in Yosemite, including three records in the Crane Flat vicinity (1978, 1990, and 1994) and two records in the Henness vicinity (1984 and 2006) (Yosemite Wildlife Observation Database 2009). The latter detection at Henness Ridge was during a site visit conducted by a Yosemite NPS biologist on 6 September 2006.

GOLDEN EAGLE ***Aquila chrysaetos***

Status. California Fully Protected, Bureau of Land Management Sensitive, California Department of Forestry and Fire Protection Sensitive, California Watch List Species, U.S. Fish and Wildlife Service Bird of Conservation Concern

Golden eagle adults, young, eggs, and nests have been protected since 1962 in the U.S. by the Bald and Golden Eagle Protection Act. They are further protected in Canada, Mexico, and the U.S. by the Migratory Bird Treaty Act. Humans have caused greater than 70% of recorded golden eagle deaths, directly or indirectly (Franson et al. 1995). Accidental trauma (collisions with vehicles, power lines, or other structures) is the leading cause of death (27%), followed by electrocution (25%), gunshot (15%), and poisoning (6%) (Franson et al. 1995). Degradation of habitat in the form of large-scale fires since 1980, mining and energy development, urbanization, and human-population growth has resulted in a decreased number of nesting pairs (Kochert et al. 1999). Recreation and other human activity near nests can cause breeding failures, but most evidence is anecdotal or correlative (Scott 1985, Steidl et al. 1993, Watson 1997).

General Distribution. Golden eagles occur over most of North America, ranging from high alpine habitats to low deserts. Nearly all nesting in the United States occurs west of the Great Plains, with the rest of the range used primarily by migrants (Palmer 1988). In California, they inhabit foothills, mountainous areas, sage-juniper flats, and desert habitats (Zeiner et al. 1990). In the Sierra Nevada, golden eagles favor grasslands and areas of shrubs or saplings, and open-canopied woodlands of young blue oaks. In late summer, they often range to above timberline (Zeiner et al. 1990).

Reproductive Biology and Breeding Habitat. In the Sierra Nevada, golden eagles breed from mid-January to late September, with a peak between late April and August. Nests are typically constructed on a cliff ledge with a good view of surrounding habitat, at elevations usually below 7,875 ft. Large trees are also used occasionally (Menkens and Anderson 1987). Clutch size ranges from 1 – 3 eggs, but is usually 2, which are laid from early February to mid-May. Incubation lasts from 43 to 45 days, and the nestling period lasts 65 – 70 days (Zeiner et al. 1990). A nesting pair of golden eagles occupies a nest site on Elephant Rock in the Merced River gorge east of El Portal, in most years.

Diet and Foraging Habitat. Golden eagles feed mostly on rabbits and rodents, but may also take other mammals, birds, reptiles, and carrion. They hunt in meadows, clearings, rock outcroppings, granite shelves, fell fields, talus, and other open or openly wooded habitats, but avoid dense forests (Gaines 1992). They employ three main strategies to

search for prey: soaring, still-hunting from a perch, and low contouring flight (Edwards 1969, Dunstan et al. 1978, Dekker 1985, Palmer 1988).

Habitat and Status in the Project Area. Whereas the local habitats of the project areas probably do not contain suitable nesting structures, both project areas are within the home range of breeding pairs and contain large snags, valued as hunting perches. In 2008, a NPS employee observed a golden eagle perched on one of the larger snags at Henness Ridge during a site visit (Ann Roberts, pers. comm.). Golden eagles have been observed on 262 different occasions in Yosemite, including two records in the Crane Flat vicinity and 11 records in the Henness vicinity (Yosemite Wildlife Observation Database 2009). Overall, the relatively intact habitats in Yosemite are beneficial to golden eagles, and recent large fires in the park have likely expanded the area of suitable foraging habitat by providing more open terrain.

LONG-EARED OWL ***Asio otus***

Status. California Species of Special Concern, California Bird Species of Special Concern

In Yosemite National Park, little is known about the status of the long-eared owl. In California, numbers of long-eared owls have been declining since the 1940's. Known factors in this decline are destruction and fragmentation of riparian woodlands, live oak habitats, and isolated tree groves, but other factors may also be present. The species' decline in southern California has been attributed to the loss of riparian and grassland habitats to development (Marti and Marks 1989, Bloom 1994).

General Distribution. The Long-eared Owl inhabits open and sparsely forested habitats across North America and Eurasia between 30° and 65°N latitude (Marks et al. 1994). Long-eared owls are found across most of the United States, but are uncommon throughout their range. In the Sierra Nevada, this species is found from blue oak savannah up to ponderosa pine and black oak habitats, usually in association with riparian habitats. In Yosemite, they are known to nest in riparian forests and oak-conifer woodlands (Gaines 1992). Long-eared owls will also use live oak thickets and other dense stands of trees for roosting and nesting (Zeiner et al. 1990).

Reproductive Biology and Breeding Habitat. Long-eared owl nest sites are typically in trees with dense canopy coverage and in proximity to meadow edges for greater hunting opportunities. In southwestern Idaho, the average height of 130 nests was 10.5 ft above ground (range 4.3-27.2 ft); most nests were located about mid-height in the nest tree (Marks and Yensen 1980, Marks 1986). Typical nests are abandoned stick nests built by another bird, such as crow, raven, magpie, or hawk (Glue 1977, Marks 1986). Nesting occurs from mid-March to mid-May, with usually 4 – 5 eggs per nest (Marks et al. 1994). Known nesting locations of long-eared owls in Yosemite are few, but include one in Yosemite Valley in 1915.

Diet and Foraging Habitat. Long-eared owls search for prey in low, gliding flights in open areas and occasionally woodland and forested habitats (Zeiner et al. 1990). Prey consists mostly of voles and other small rodents, and occasionally other birds (Marks et al. 1994).

Habitat and Status in the Project Area. Both project areas appear to contain suitable nesting and foraging habitat for long-eared owls. The species has been observed on 22 different occasions in Yosemite National Park, including two records at Crane Flat in October 1982 and June 1986, a pair observed at Henness Ridge (Gaines 1992), and nine records from Glacier Point Road (Yosemite Wildlife Observation Database 2009). Long-eared owls may be more numerous than we think; virtually nothing is known of their population status, habitat requirements, and prey in the park (Gaines 1992).

FLAMMULATED OWL *Otus flammeolus*

Status.—U.S. Fish and Wildlife Service Bird of Conservation Concern, Audubon Watch List species, Partners in Flight Priority Bird Species, American Bird Conservancy Green List, United States Bird Conservation Watch List

The flammulated owl is a small forest owl, considered a common summer resident locally (Winter 1974, Garrett and Dunn 1981), but vulnerable and possibly declining in some areas. The species inhabits montane forests from ponderosa pine to red fir forests, though they are found predominately in ponderosa pine. Flammulated owls favor small openings, and edges and clearings with snags for nesting and roosting. Predators include spotted owls, other large owls, and accipiters; eggs and young may be preyed upon by squirrels, long-tailed weasels, and other mammals.

General Distribution. The breeding range of the flammulated owl extends from southernmost British Columbia (Godfrey 1966) south to Central Mexico (Sutton and Burleigh 1940) and from the Pacific Coast Mountains (except Oregon and Washington; Winter 1974) east to the Rocky Mountains (Linkhart et al. 1998). Flammulated owls are thought to engage in long-distance migrations, wintering from central Mexico south to the highlands of Guatemala and El Salvador (Phillips et al. 1964). In California, flammulated owls breed in the North Coast and Klamath Ranges, Sierra Nevada, and in suitable mountain habitats in southern California. They occur in montane regions from 6,000-10,000 ft elevation. Migration timing and environmental cues used by flammulated owls, such as wind, temperature, and moon phase, are mostly unknown (McCallum 1994).

Reproductive Biology and Breeding Habitat. The flammulated owl is generally found in coniferous habitats with low to intermediate canopy closure. The species breeds May through October; peak breeding season occurs in June and July. Territory size is seldom more than 900 ft in diameter, and varies from 1.6 to 4 ha. Territories may be distributed singly, or in loose colonies (Ehrlich et al. 1988). In the Sierra Nevada, Winter (1974) reported that for two males, the average home range was 40 ha. Marshall (1939) found

18 males on a 3.2 mi² site, and 4 males and 1 female on a 20 ha site. Breeding densities vary from 3.2 to 5.2 males per 100 ha (Marshall 1939, Winter 1974).

Flammulated owls nest in cavities or woodpecker holes (usually northern flicker, occasionally pileated woodpecker) in aspen, oak, or pine trees. They select nest cavities 3-39 ft above ground (Bull and Anderson 1978) and may compete for nest sites with western screech-owls, American kestrels, and other secondary cavity-nesting species. In the Blue Mountains of Oregon, Thomas (1979) estimated that minimum tree dbh used for nesting was 12 in. Clutch size ranges from 2 to 5 nestlings, usually 3-4, with one brood per year; rarely two. Males feed incubating females.

Diet and Foraging Habitat. The diet of flammulated owls consists almost entirely of insects, primarily owlet moths (Noctuidae), beetles (Coleoptera), crickets and grasshoppers (Orthoptera; Ross 1969, Balda et al. 1975), and occasionally small vertebrates (Cannings 1994, Linkhart and Reynolds 1994, Oleyar et al. 2003). This diet probably forces them south of locations where low fall/winter temperatures drastically reduce insect abundance (McCallum 1994). The flammulated owl forages by hawking insects from a tree or snag, or gleaning insects from branches, trunks, or the ground. This small forest owl roosts close to the trunk of fir or pine trees; and also uses cavities in snags or trees for cover.

Habitat and Status in the Project Area. Flammulated owls are one of the least studied and least understood birds in Yosemite National Park. Very little information exists on the breeding status of flammulated owls and their habitat requirements. However, breeding habitat appears to be present at both project sites, with possibly the highest breeding density of flammulated owls in the entire park centered around Henness Ridge. Based on anecdotal observations, a breeding colony has inhabited Henness Ridge for decades. Between 1962 and 2007, 12 of 27 park-wide observations have been from the Henness area (NPS 2007). One observation was near Crane Flat at the Merced Grove on July 7, 1925. Most park observations are from May or June (Yosemite Wildlife Observation Database 2009).

GREAT GRAY OWL *Strix nebulosa*

Status. California State Endangered, California Department of Forestry and Fire Protection Sensitive, USFS Sensitive

Based on the owl's apparent restricted range in California and a 1979 state population estimate of 50 individuals from surveys (Winter 1980), the owl was listed as State Endangered under the California Endangered Species Act (CESA) on October 2, 1980, and is currently listed as such. Genetics research is currently underway which will indicate if the great gray owl in and surrounding Yosemite is a genetically distinct population or subspecies, which could potentially elevate its conservation status under the Endangered Species Act (Keane et al. 2008). Recent estimations place the state-wide population between 100-200 individuals (Winter 1980, Rich 2000) or 80 individuals

(Maurer 2006). The species limited distribution, relative isolation, and small population size in California is probably due to ecological constraints coupled with land use patterns, including development, logging, and grazing on public and private lands in the Sierra Nevada (Winter 1986). Yosemite's montane meadows are currently protected from timber harvest, grazing activities, and major developments, which has probably contributed greatly to maintaining suitable great gray owl habitat within the park. However, human activity and development in and adjacent to park meadows can disrupt great gray owl foraging behavior, which may reduce foraging success and compromise breeding success. Wildman (1992) reported that in 1987-88 visitors were present in meadows at Crane Flat at the same time as an owl from 5% to 10% of the time and flushed owls about 25% of the time. When flushed by visitors, owls typically flew into the forest, did not return to the meadow 57% of the time to resume hunting, and those that returned did so about 50 minutes after human activity had ceased. Birdwatchers caused 50% more flushes than non-birdwatchers. As is the case with all small populations, great gray owls in the Yosemite area are at high risk of population declines or extinctions in the case of cumulative disturbances, a disease, such as West Nile Virus, or habitat loss that threatens prey populations or snags suitable for nesting.

General Distribution. The great gray owl is a large forest owl that ranges across northern boreal and temperate forests in both North America and Eurasia. Throughout its circumpolar range, the species is considered rare. In California, great gray owls are restricted to the Sierra Nevada and southern Cascades. The core breeding distribution is centered on Yosemite National Park and the immediately adjacent and surrounding Stanislaus, Sierra, and Sequoia National Forests, with a few additional documented pairs in Sequoia-Kings Canyon National Park (Winter 1986, Rich 2000, Keane 2001). The California population is the southern-most population in the world, with the closest known breeding population occurring in southern Oregon (Bull and Duncan 1993). The great gray owl is apparently a habitat specialist in the Yosemite region that requires functioning wet montane meadow habitat for foraging adjacent to forest stands with high canopy closure and a significant decadent component consisting of large, standing snags – especially red and white fir – for nesting and successful reproduction, along with suitable wintering foraging habitat during the non-breeding period. In the Sierra Nevada during the breeding season, there are approximately 50 meadows used by great gray owls; including about 35 in Yosemite that have been used in the last 20 years (Maurer 2006, Keane et al. 2008). Casual observers have reported over 200 records of great gray owl observations in Yosemite National Park (Yosemite Wildlife Observation Database 2009).

Reproductive Biology and Breeding Habitat. Great gray owls are monogamous and breed from about March to August. Incubation begins in April and lasts for approximately 30 days; eggs hatch from mid-May to mid-June. The nestling period is about 3 to 4 weeks, after which the young fledge in early June to early July. The fledglings often initially fall from their nests and end up on the ground, unable to fly for another 1 to 2 weeks. During this period, the owlets make use of leaning snags to access perches and roosts up off the ground away from predators (Bull and Duncan 1993) and

remain in the vicinity of the nest stand through August. Young may be dependent on adults for food up to three months after fledging (Bull and Duncan 1993).

In the Sierra Nevada, great gray owls nest in mature red fir, mixed conifer, or lodgepole pine forests near wet meadows or other vegetated openings (Zeiner et al. 1990) between 2,460 to 8,860 ft elevation (Greene 1995). In California, almost all reported great gray owl nests have been in the tops of large diameter broken snags (Winter 1980) that are usually within about 230 to 330 ft from a meadow. In the greater Yosemite area, great gray owls tend to nest in large, broken-topped conifer snags, particularly red fir (*Abies magnifica*) or white fir (*Abies concolor*) (Maurer 1994, Greene 1995), and in lower elevations have also been found in black oak (*Quercus kellogi*) (Greene 1995, Keane et al. 2008), and very rarely in stick nests (Maurer 2006). In the park, red or white fir nest snags (n = 11) in Yosemite averaged about 46 ft high and averaged about 44 in dbh (Maurer 1994 and Greene 1995). Great gray owls can also nest on structures constructed by humans. On the Stanislaus NF, primarily in the Ackerson Meadow area, several dozen conifers were enhanced by topping a tree, usually a rot-resistant incense cedar (*Calocedrus decurrens*), and hollowing out a depression in the remaining bole. Nine of these structures were used by nesting great gray owls between 1985 and 1996 (Greene 1995). Breeding requirements include high densities of large-diameter snags, a large degree of canopy closure for adequate nestling thermoregulation and nest concealment (Greene 1995), adequate numbers of hunting perches, and vole abundance (Winter 1981, 1982). Both montane meadows and large-diameter snags have been significantly affected by management practices, specifically grazing, timber harvest, fuels management, and fire suppression (Greene 1995, Keane 2001).

Diet and Foraging Habitat. Great gray owls feed primarily on rodents in meadows, but may also take other prey items, such as birds, amphibians, and mustelids (Zeiner et al. 1990). In Yosemite, surveys found that voles (*Microtus* spp.) and pocket gophers (*Thomomys* spp.) make up 90% of the prey biomass in pellets (Winter 1986, Reid 1989). Reproductive success of the great gray owl has been shown to vary synchronously with annual prey abundance throughout its range (Hoglund and Lansgren 1968, Pulliainen and Loisa 1977, Winter 1986, Bull et al. 1988, Reid 1989, Duncan 1992). Greater vole abundance was characterized by greater vegetation height, plant cover, and soil moisture (Greene 1995).

Great gray owls forage primarily along edges of forest openings, particularly along meadow edges (Winter 1986, Franklin 1988). Over 60% of 5,338 relocations on nine adult and three juvenile radio-tagged owls in Yosemite from 1986-90 were within 330 ft of a meadow (van Riper and van Wagtendonk 2006). Winter (1986) suggested that owls require 10-12 hectares of meadow area to successfully reproduce. Greene (1995) found meadow area averaged 18.7 hectares with a range from 6.7 to 40.3 hectares at 10 reproductive sites in Yosemite and 8 in the Stanislaus NF. Great gray owls forage primarily at night and also frequently during dawn and dusk, perhaps in response to peak daily prey activity periods (Reid 1989, Wildman 1992). Diurnal foraging activity probably decreases when owls are not paired or their nest has failed (Winter 1986, Wildman 1992). Great gray owls hunt from low to moderately high (0-30 ft) perches

along the meadow edge and within the meadow habitat, making use of lower limbs of large trees of snags, the tops of young trees, or fallen logs, where they detect prey using sight or sound. Great gray owls, like many other species of owls, have exceptional hearing and can pinpoint prey even when they are not visible.

In general, great gray owls in the Sierra Nevada migrate downslope during the winter, when their prey becomes unavailable at most breeding sites due to snow cover (Skiff 1995). Many of the owls that breed in Yosemite, winter outside the park on private lands or Forest Service lands subject to multiple-use practices, making these critical wintering grounds vulnerable to significant habitat alteration due to greater logging, grazing, and development practices.

Habitat and Status in the Project Area. Both project areas contain critical habitat for great gray owls in Yosemite. Great gray owls have been observed at the Crane Flat Meadow complex almost every year since 1970 and every year since 1979 to present (2008), although reproduction has been documented there in only seven years (1952, 1986, 1972, 1974, 1991, 1992, and 1994) (Maurer 2006). Elevenmile Meadow receives much less visitation than Crane Flat and has not been regularly surveyed for owls. Thus, great gray owl observations are limited to September 1993 by the NPS forestry crew, and during surveys by great gray owl researchers during winters 1987 – 1990 (1/7-1/12 1987, 2/26-3/18 1988, 2/8-29 1990 (Skiff 1995), in September 2007 (feathers collected by Keane et al. 2008), and a vocalizing male on April 7, 2008 (Joe Medley pers. comm.). Elevenmile Meadow appears to be used by great gray owls occasionally during the breeding season and regularly during the winter. Reproduction has not been documented in Crane Flat since 1994, although survey effort since that time has been limited to 1999, and 2004 to 2008. At Crane Flat, several visitor and employee facilities, developments and activities as well as park projects occur that likely alter owl behavior and habitat use patterns (Maurer 2006). In addition, owls in this area are also at high risk of auto collision, a significant source of mortality among adult great gray owls. Since about 1990, at least 14 owls have been hit and at least 12 killed by vehicles in the greater Yosemite region, including two hit at Crane Flat in the summer of 2003 (Maurer 2006). Human development and activities, including noise and light, and automobile traffic, may impact great gray owl presence, foraging success, and reproductive success both inside and outside Yosemite (Wildman 1992, Maurer 1999).

CALIFORNIA SPOTTED OWL *Strix occidentalis occidentalis*

Status. California Species of Special Concern, American Bird Conservancy Green List, Audubon Watch List, Bureau of Land Management Sensitive, IUCN Near Threatened, United States Bird Conservation Watch List, USFS Sensitive, U.S. Fish and Wildlife Service Bird of Conservation Concern, California Bird Species of Special Concern

The California spotted owl is a year-round resident within most of its range (Davis and Gould 2008). Whereas the outline of the overall range has remained stable, populations have steadily declined (Davis and Gould 2008). The primary threat to the owl is habitat loss, degradation, and fragmentation from timber harvest, large stand-replacing wildfires,

and development (Davis and Gould 2008). A new and rising threat to the spotted owl is the recent invasion of its range by the barred owl (*Strix varia*) (Davis and Gould 2008). On April 3, 2000, the U.S. Fish and Wildlife Service received a petition to list the California spotted owl as threatened or endangered under the Endangered Species Act of 1973, as amended. On February 14, 2003, the Service announced that after reviewing the best available scientific and commercial information available, they found that the petitioned action was not warranted.

General Distribution. The California spotted owl ranges from the southern Cascades south throughout the entire Sierra Nevada, and in the central Coast Ranges. Population density in Yosemite is higher than elsewhere in the Sierra Nevada; in Yosemite density was estimated from 0.25 to 0.46 owls .62 mi^2; whereas the mean density in surrounding areas in the Sierra Nevada was estimated from 0.10 to 0.21 .62 mi^2 (Roberts 2008). Although Roberts (2008) did not calculate home ranges, owl pairs in Yosemite (1 pair per 3.5 mi^2) exceeded the mean home range estimate throughout California (6.5 mi^2; Zabel et al. 1992). Roberts (2008) estimated 315 spotted owl pairs in Yosemite, with 154 pairs in burned mixed-conifer forest and 161 pairs in unburned forest.

Most known sites with spotted owls are located at elevations from 4,265 ft to 7,220 ft (Gould and Norton 1993, Roberts 2008). In 1988 and 1989, California Department of Fish and Game conducted spotted owl surveys across 142,700 acres of forest habitat in Yosemite; and detected owls at a total of 58 sites (Gould and Norton 1993). In the summer of 2000, Steger (2000) conducted spotted owl surveys at specific sites that could be affected by the Yosemite Valley Plan/EIS, comprising Foresta (no detections), Big Oak Flat Entrance (single male), Badger Pass (two pairs within about .9 mi), Wawona (no detections), South Entrance (two pairs within 1.6 mi), El Portal (no detections), and Yosemite Valley (four detections).

From 2004 to 2006, Roberts (2008) investigated patterns of occupancy and reproduction of spotted owls within burned and unburned mixed-conifer forests in Yosemite. The survey sites were distributed randomly along an elevation gradient (4,640 to 7,990 ft) on the west slope of the Sierra Nevada. Using nocturnal surveys (116 hours) between April and July 2004 to 2006, Roberts (2008) detected 19 spotted owl nesting pairs, two single males, and 22 fledglings; and fitted 30 adults and five subadults with unique number and color leg bands.

Reproductive Biology and Breeding Habitat. The California spotted owl is considered a habitat specialist because of its dependence on old-growth and late-successional forests (Forsman et al. 1984, Gutiérrez and Carey 1985, Gutiérrez et al. 1992, Verner et al. 1992a) and its tendency toward selecting stands that have higher structural diversity and significantly more large trees than those generally available (Moen and Gutiérrez 1997). The California spotted owl nests and roosts in forests and woodlands characterized by high basal areas of trees and snags (>24 in diameter at breast height [dbh]), dense canopies (≥75% canopy closure), multi-layered canopy, and downed woody debris (Bias and Gutiérrez 1992, Gutiérrez et al. 1992, Verner et al. 1992b, LaHaye et al. 1997, Moen and Gutiérrez 1997, Roberts 2008). Large, old trees have been identified as the key

component for providing nest sites and cover from inclement weather and adding structure to the forest canopy and woody debris to the forest floor (Davis and Gould 2008). In addition, a range of tree sizes between 4 in and 20 in dbh that contribute to a multi-layered understory is probably important for allowing the nestlings to efficiently thermoregulate (Barrows 1981, Weathers et al. 2001, Roberts 2008).

Roberts (2008) reported that California spotted owl reproductive success in Yosemite was best explained by a model that combined the positive effect of total basal area for live trees ≥4 in dbh) and the negative effect of elevation. Reproductive success was higher at burned sites compared to unburned sites, with an average of 0.58 and 0.35 fledglings produced per nest, respectively (Roberts 2008). In the Sierra Nevada, the spotted owl predominately occur in mixed-conifer forest, and to a lesser extent, red fir (*Abies magnifica*) forest at higher elevations (Davis and Gould 2008) and oak woodlands at lower elevations (Guiterrez 1992, Verner et al. 1992a). Spotted owls do not build their own nests, rather they use suitable, naturally occurring sites in trees. In Sierra Nevada conifer forests, nests are usually in tree cavities (66%) or on broken-topped trees or snags (Verner et al. 1992a). Less often, they are platform nests which consist of abandoned raptor or common raven (*Corvus corax*) stick nests, squirrel nests, dwarf mistletoe (*Arceuthobium* spp.) brooms, or debris accumulations in trees. In oak woodlands, spotted owls predominately use platform nests (59%; Guiterrez 1992). Nest trees in conifer forests are typically large (mean dbh of 46.7 in, Steger et al. 1997b); whereas those in oak woodlands are smaller (mean dbh of 24 in, Steger et al. 1997a).

Breeding occurs from about mid-February to mid- or late-September, by which time the young are largely independent of their parents (Gutiérrez et al. 1995). Spotted owls may be sporadic breeders, with many pairs nesting when weather and prey conditions are favorable, thereby spreading the risk of reproductive investments over several breeding seasons (Noon and Franklin 2002). The female spotted owl lays 1-4 eggs and incubates them from early April through mid-May (Gutiérrez et al. 1995). The incubation period averages 30 ± 2 days (Forsman et al. 1984). The female leaves the nest only briefly during incubation to defecate, regurgitate pellets, defend the nest site, or receive prey from the male (Gutiérrez et al. 1995). Therefore, the male does nearly all of the hunting and feeds the female and brooding young during incubation and early brooding periods (Gutiérrez et al. 1995). The young generally leave the nest when they are between 34–36 days old over several days usually between mid-May and the end of June (Forsman et al. 1984). Both parents care for and roost near the young through August (approximately 60–90 days post-fledging), although one parent may roost apart (Gutiérrez et al. 1995). During August and September, parents spend less time with their young, at which point the young are developing their flying and hunting skills, but able to capture their own prey (Gutiérrez et al. 1995). In October, juveniles begin dispersing away from their natal areas during which they are extremely vulnerable to mortality from starvation or depredation with a survival rate of approximately 33% (Blakesley et al. 2001).

Diet and Foraging Habitat. The California spotted owl forages in similar habitats as selected for breeding and roosting, but will also hunt in more open stands, with canopy closures typically ≥40% (Call et al. 1992). Foraging habitat is typically decadent and

includes snags, old trees, and large downed logs. Spotted owls prey mainly on small to medium-sized mammals, primarily rodents in the Sierra Nevada. It mostly consumes northern flying squirrels (*Glaucomys sabrinus*) in the higher elevations (conifer forests) and woodrats (*Neotoma* spp.) at lower elevations (burned mixed-conifer, oak woodlands and riparian forests) and throughout southern California (Verner et al. 1992a, Roberts 2008). Downed woody debris in higher-elevation forests of the Sierra Nevada is strongly associated with underground fungi, which are important food for spotted owl prey species, such as northern flying squirrels (Davis and Gould 2008). Meyer et al. (2007) reported that northern flying squirrels in Yosemite select large trees and snags for nesting. In general, woodrats prefer forests with a brushy understory of shrubs or saplings, and a higher than average number of snags and downed woody material (Sakai and Noon 1993, Innes et al 2007). In mixed-conifer forests, woodrats are more abundant in stands with an abundance of large (≥13 in dbh) oak trees (Innes et al. 2007).

Habitat and Status in the Project Area. At both Crane Flat and Henness Ridge sites, suitable roosting, nesting, and foraging habitat exist for the California spotted owl. Between 1940 and 2007, casual observers reported 69 observations of California spotted owls in Yosemite National Park (Yosemite Wildlife Observation Database 2009), including nine in the Crane Flat area and 10 in the Henness area. At Crane Flat, a spotted owl nest is located in the near vicinity of the project area. A female spotted owl was detected on April 24, 2007 during a great gray owl survey (Keane et al. 2008). At Henness, a pair of spotted owls was confirmed and a nest site was located in 1988 (Gould and Norton 1993). Spotted owls have continued to use the Henness area for nesting (Roberts 2008). At nearby Elevenmile Meadow, spotted owls were detected on June 11, 2007 and August 7, 2007 during great gray owl surveys (Keane et al. 2008), and were subsequently detected summer 2008 (Keane, unpublished data). Spotted owls were confirmed at other nearby locations accessed from the Glacier Point Road, including Monroe Meadow (near Badger Pass), McGurk Meadow, and Dewey Point (Gould and Norton 1993, Roberts 2008).

VAUX'S SWIFT *Chaetura vauxi*

Status. California Species of Special Concern, California Bird Species of Special Concern

Vaux's swifts require older trees and hollow snags for nesting and roosting habitat. Threats to the species include logging, and factors that reduce abundance of pileated woodpeckers may in turn reduce cavity availability. "Forest health" management activities reduces incidence of heartrot and aerial insects. To maintain nest and roost trees over time, both live and dead-large diameter hollow trees should be maintained, as well as green trees with some indication of decay to replace those that fall or become unsuitable (Bull and Collins 2007). Nest boxes (11.5 ft tall and 12 in square) put 30-50 ft above the ground in trees are successfully used for nesting (Bull 2003) and provide a short-term alternative to large-diameter hollow trees for nests and roosts.

General Distribution. Vaux's swifts breed from southwestern Canada through the western United States to Mexico, Central America, and northern Venezuela. In winter, northern migrant populations of this species overlap southern residents (Bull and Collins 2007). In Yosemite National Park, Gaines (1992) reported that Vaux's swifts are probably widely distributed in old-growth forests where standing, hollow snags afford suitable nesting sites.

Reproductive Biology and Breeding Habitat. Hollow trees are the species' favored nesting and roosting sites (chimneys are used on occasion), making this swift vulnerable to loss of old-growth forest. Indeed, recent declines in Vaux's swift populations have been documented in the Pacific Northwest where mature forest is dwindling (Bull and Collins 2007). They feed in flocks or singly during the breeding season, pursuing insects on the wing and capturing them in their beaks. Each parent makes up to 50 trips per day, delivering more than 5,000 small insects from dawn to dusk (Bull and Collins 2007).

Diet and Foraging Habitat. Like other swifts, the Vaux's is almost entirely insectivorous, hawking a variety of ants, bugs, flies, moths, spiders, and aphids from the air. They forage in air over forest canopy, grasslands, and water (the latter especially in the morning and evening). They dive through forest canopy and pause near branches, perhaps feeding on insects in the trees. They are usually seen foraging over mature forests at 65-165 ft height (Bull and Collins 2007).

Habitat and Status in the Project Area. The Vaux's swift probably inhabits both proposed study areas: Crane Flat and Henness Ridge, as both areas appear to have suitable nesting habitat. Out of 21 park-wide observations, Vaux's swifts have been observed at Crane Flat on six different occasions (Yosemite Wildlife Observation Database 2009). The lack of observations at Henness probably reflects fewer people reporting wildlife observations in that part of the park, rather than absence of the animal. Nesting Vaux's swifts were not discovered on the west slope of the park until 1968, when a pair was observed entering a dead red fir snag at Crane Flat (Gaines 1992). Gaines (1992) suspects that the population is widely distributed in old-growth forests where standing, hollow snags afford suitable nesting cavities. Peak counts include 20 to 30 individuals detected at Crane Flat from July 15-21, 1985.

WHITE-HEADED WOODPECKER *Picoides albolarvatus*

Status. USFWS Birds of Conservation Concern, American Bird Conservancy Green List, United States Bird Conservation Watch List

Though no trends are detectable from the small number of Breeding Bird Surveys within its range, the species has declined locally due to habitat degradation, including clear-cutting, removal of snags which provide nesting sites, planting of even-age stands, fire suppression, and forest fragmentation (Raphael 1983). The species persists in burned or cutover forest with residual snags and stumps; thus populations are more tolerant of disturbance than those species associated with closed-canopy forest (Raphael et al. 1987,

Hanson and North 2008). The species is relatively tolerant of human activity in nest vicinity, so long as the nest itself is not disturbed (Garrett et al. 1996)

General Distribution. Except for a small extension into the Okanagan Valley of British Columbia, the White-headed Woodpecker is endemic to the U.S., where it has a fragmented distribution in the mountains of Washington, Oregon, Idaho, California, and extreme western Nevada, in the vicinity of Lake Tahoe. The white-headed woodpecker is non-migratory and generally considered a resident species across its range (Garrett et al. 1996).

Reproductive Biology and Breeding Habitat. In California, the white-headed woodpecker is a fairly common resident species in the Sierra Nevada and mountains of the southern part of the state. In the Sierra Nevada, the species occupies mixed-montane coniferous forest of ponderosa pine, sugar pine, white fir, red fir, Douglas-fir, and black oak and in high-elevation lodgepole pine and western white pine forests (Gaines 1992, Garrett et al. 1996). The dominant requisite habitat components are abundance of mature pines (with large cones and abundant seed production), relatively open canopy (50–70%), and availability of snags and stumps for nest cavities. Understory vegetation is generally sparse within preferred habitat. Local populations are abundant in burned or cut forest where residual large-diameter live and dead trees are present (Raphael 1981, Raphael and White 1984, Raphael et al. 1987).

Diet and Foraging Habitat. The white-headed woodpecker inhabits mixed-coniferous forest where it forages primarily on invertebrates (primarily adult and larval insects, especially ants [Hymenoptera], beetles [Coleoptera] and scale insects [Homoptera]), and conifer seeds (Beal 1911). Though white-headed woodpeckers glean for insects on trunks and branch surfaces and flakes and chips bark from the tree, they generally do not drill deeper into living or decaying wood (Garrett et al. 1996).

Habitat and Status in the Project Area. The white-headed woodpecker is present at both Crane Flat and Henness Ridge project sites, where suitable roosting, nesting, and foraging habitat exist. The Yosemite Wildlife Observation Database (2009) contains records at both sites (7 from Crane Flat and 1 from Henness Ridge). In June 2003, at the Crane Flat Campground, an observer watched an adult white-headed woodpecker carry food into a nest cavity (Yosemite Wildlife Observation Database 2009). At Henness, white-headed woodpeckers have been seen regularly during site visits in 2006 and 2007; and was detected during bird surveys during summer 2007 (NPS2007).

OLIVE-SIDED FLYCATCHER *Contopus cooperi*

Status. California Species of Special Concern, California Bird Species of Special Concern

The olive-sided flycatcher is well sampled by Breeding Bird Surveys, which show that while the species is still abundant in the state, populations have declined steadily from 1968 to 2004 (Sauer et al. 2005). Likewise, migration data from Southeast Farallon

Island also show significant declines over a 25 year period (1968-1992) (Pyle et al. 1994).

The most significant threat to the olive-sided flycatcher is habitat degradation and loss on both breeding and wintering grounds (Widdowson 2008). In Lake Tahoe Basin, flycatcher abundance decreased with increased levels of localized development (Manley et al. 2006). In the southern Sierra Nevada where habitat has remained essentially unchanged, declines probably have resulted from destruction of forests on wintering grounds in Central America (Marshall 1988).

On the breeding grounds, olive-sided flycatchers require suitable snags for nesting, perching, foraging, and singing (Widdowson 2008). They may depend on forest fires and other natural disturbances that create patchy habitats, forest openings, and abundant forest edge (Widdowson 2008). Fire suppression policies from the past 50 to 100 years have probably degraded available olive-sided flycatcher breeding habitat. Habitat quality as a limiting factor is probably exacerbated by the fact that the genus Contopus has the lowest reproductive rate of all North American passerines (Widdowson 2008). Thus, high survivorship is essential to the maintenance of stable populations (Altman and Sallabanks 2000).

General Distribution. The olive-sided flycatcher breeding range extends from Alaska across Canada south into the United States where it occupies forested areas. In California, the general outline of its historic breeding range is largely unchanged from what it is today. However, local extirpations have been reported for a few areas (Marshall 1988, Raphael et al. 1988).

Reproductive Biology and Breeding Habitat. Pair formation generally begins in May and may last up to two weeks (Bent 1942). In Oregon, most nest-building begins during the first week of June; with the earliest date being 20 May and the latest date 19 July (Altman 1999). Clutch initiation date depends of latitude and elevation; in California, Bent (1942) reported that out of 48 nests, the peak of egg-laying occurred between 9-25 June. One brood is raised per season. In Oregon, most young fledge between mid- to late-July (Altman 1999).

Open-cup nests are generally placed out toward the tip of a horizontal branch where overhanging branches provide protection from predators and weather (Altman and Sallabanks 2000). Nest heights range from 5 to 111.5 ft, usually from about 29.5 to 49 ft high in the West (Altman and Sallabanks 2000). In California, nests are usually in conifers, but have been found in a variety of species, including willows (*Salix* spp.), alders (*Alnus* spp.), oaks (*Quercus* spp.), and eucalyptus (Smith 1927, Grinnell and Miller 1944, and Altman and Sallabanks 2000). In the Sierra Nevada, the species is most abundant in open mixed conifer and California red fir (*Abies magnifica*) forest than in closed-canopy forest (Beedy 1981).

Diet and Foraging Habitat. The olive-sided flycatcher diet is composed almost entirely of insects, 83% of which are bees and wasps, indicating a very high degree of

specialization (Beal 1912). Olive-sided flycatchers forage in unobstructed canopies with high perches (Altman and Sallabanks 2000). Grinnell and Miller (1944) described their foraging and singing-post perches as apical tips of snags that protrude above the surrounding canopy. Altman (1999) observed that most foraging bouts took place from the upper third of trees or snags.

Habitat and Status in the Project Area. The olive-sided flycatcher inhabits both proposed study areas: Crane Flat and Henness Ridge and both areas appear to contain suitable nesting habitat. Olive sided-flycatchers have been observed several times at Crane Flat (e.g., six observations, Yosemite Wildlife Observation Database 2009). In the Henness area, this species was documented by Museum of Vertebrate Zoology (MVZ) on June 12, 1915, noted on May 19, 1919 in the Yosemite Wildlife Observation Database (2009), and detected during breeding season bird surveys (National Park Service 2007).

WILLOW FLYCATCHER *Empidonax traillii*

Status. California State Endangered, American Bird Conservancy Green List, Audubon Watch List, United States Bird Conservation Watch List, U.S. Forest Service Sensitive

Of the three willow flycatcher subspecies that breed in California, (Phillips 1948, Unitt 1987), two of these subspecies, *E. t. brewsteri* and *E. t. adastus*, are possible in Yosemite National Park, whereas the third species, *E. t. extimus*, is a federal threatened species that is not found in the park. The willow flycatcher is identified in the Sierra Nevada Forest Plan Amendment Notice of Intent (1998), as one of seven aquatic, riparian, and meadow-dependent vertebrate species at risk in the Sierra Nevada bioregion. The willow flycatcher is recognized by the Forest Service Pacific Southwest Region as the highest-priority landbird species in the Sierra Nevada bioregion because it is considered to have "... the highest probability of being extirpated from the bioregion in the near future" (USDA Forest Service 1996).

Early in the 20th century the species was described as "common" through much of the Sierra Nevada (Grinnell and Miller 1944), but by 2003, Green et al. (2003) were able to tally just 315 Sierra territories known to have been occupied at some time since 1982. Bombay et al. (2001) estimated population growth rates in the range of 0.768 to 0.869 in their Sierra study area, indicating a continuing population decline. In a comprehensive review of possible causes of Willow Flycatcher decline in the Sierra Nevada, Green et al. (2003) determined that reduced fecundity due to high rates of nest predation, rather than poor survival of adults or recruitment of juveniles, was likely the primary demographic cause. Cain et al. (2003) found that standing water around nests is a deterrent to predation by mammalian predators, and Green et al. (2003) suggested that high rates of nest predation are a result of gradual desiccation of meadows, resulting from livestock trampling, road construction, human recreation, harvesting of adjacent timber, forest thinning for fire control, fire suppression, water diversions, mining, and perhaps climate change.

In Yosemite, the species has also clearly declined. Willow Flycatchers nested commonly in Yosemite Valley at least into the early 20th century (Grinnell and Storer 1924) and were "vocal, conspicuous birds" in suitable habitat throughout the lower elevations of the park until at least the 1930s (Gaines 1992). But the species has not nested in Yosemite Valley since 1966 (Gaines 1992), and in the late 1980s Gaines (1992) estimated there were fewer than 30 pairs remaining in the greater Yosemite area. Further declines have been evident from the Monitoring Avian Productivity and Survivorship (MAPS) program (DeSante and Kaschube 2006, DeSante et al. 2007), which began in Yosemite National Park in the early 1990s. At Hodgdon Meadow willow flycatchers were captured every year between 1991 and 1997, but the number of captures has declined through the 1990s (Siegel et al. 2008).

In 2006 and 2007, Siegel et al (2008) conducted a nearly comprehensive two-year inventory of willow flycatcher breeding habitat throughout the park. Their goal was to locate all remaining willow flycatcher territories in Yosemite rather than merely estimate the size of the park's breeding population. They therefore identified and surveyed every one of the park's most promising habitat patches. During the two-year study, willow flycatchers were detected two times at only one of the 71 sites; and both detections were of nonterritorial birds at Wawona Meadow (Siegel et al. 2008). Siegel et al. (2008) concluded that willow flycatchers no longer breed in Yosemite. The apparent extirpation of willow flycatchers from the park may be attributed to a combination of factors, such as anthropogenic meadow dessication due to past grazing (Green et al. 2003), current climate change (Siegel et al. 2008), and disrupted metapopulation dynamics, i.e. that suitable habitat within the park is insufficient to sustain a viable population without immigration from neighboring areas (Gaines 1992).

Across most of North America, willow flycatchers are frequent hosts of the brown-headed cowbird. Willow flycatchers are at greater risk of cowbird brood parasitism where pack stations, corrals, supplemental feed, livestock holding facilities, livestock herds, campgrounds, picnic areas, rural communities or other brown-headed cowbird-associated locations occur within at least 5 mi of occupied willow flycatcher sites (Rothstein et al. 1980, Verner and Rothstein 1988). Brown-headed cowbirds are frequently observed in Yosemite taking advantage of unnatural food sources at pack stations, stables, campgrounds, and in park residential areas.

General Distribution. The willow flycatcher is a neotropical migrant that breeds in riparian and moist meadow willow thickets in the U.S. and southern Canada (American Ornithologists' Union 1983). The willow flycatcher winters from Mexico to northern South America. Currently, about half of the willow flycatcher breeding population in California occurs in the Sierra Nevada (Zeiner et al. 1990, Kus et al. 2000). Most willow flycatchers in the Sierra Nevada are found at elevations from 1,200,to 9,515 ft although most of the known willow flycatcher sites (88 percent) occur between 3,935 to 7,875 ft (Serena 1982, Harris et al. 1988, Stafford and Valentine 1985).

Reproductive Biology and Breeding Habitat. The willow flycatcher nests most typically in willow thickets in or adjacent to low- and mid-elevation meadows or riparian stringers

covering at least 0.4 ha, usually considerably more (Bombay et al. 2000). Nests have also been found in willow thickets adjacent to lakes, marshes, and creeks. Less frequently, Willow Flycatchers have nested in patches of riparian deciduous shrubs other than willows. Nesting areas, at least in the early part of the breeding season, generally are characterized by extensive surface water (Harris et al. 1988, Sanders and Flett 1989, but see also McCreedy and Heath 2004) and substantial openings, either large and continuous or small and numerous, in the forest canopy. In the Sierra Nevada, breeding occurs from late May/early June to September. Willow flycatchers fledge young between approximately July 15 and August 31 and fledglings remain in territories for two to three weeks post-fledging (Stafford and Valentine 1985, Sanders and Flett 1989). Historical records from the Yosemite area suggest willow flycatchers bred commonly in the park below 5,000 ft and less frequently at higher elevations (Gaines 1992). An average of three to four eggs are laid in an open-cup nest typically placed about 6.5-13 ft high on the edges of a patch of shrubs, with a high density of leaves (Sanders and Flett 1989, Bombay 1999). Willow flycatcher nests are frequently parasitized by brown-headed cowbirds. Parasitism occurs more often in lowland habitats than in higher elevations of the Sierra Nevada (Harris 1991), apparently due to differences in breeding period of cowbirds and willow flycatchers at higher elevations (Verner and Ritter 1983).

Diet and Foraging Habitat. Willow flycatchers forage by either gleaning insects from vegetation while flying, or by waiting on an exposed perch and capturing insects in flight (Ettinger and King 1980, Sanders and Flett 1989). Deciduous trees and shrubs interspersed with open areas enhance the quality of foraging habitat.

Habitat and Status in the Project Area. Evidence suggests willow flycatchers have nested in Crane Flat within the last 20 years. From 1990 to present, six willow flycatchers have been captured and banded at Crane Flat (1993 (1 indiv.), 1994 (2 indiv.), 1996 (2 indiv.), and 2001 (1 indiv.)) during Monitoring Avian Productivity and Survivorship standard operations (Siegel, unpubl. data). In 1994, one individual was identified as a female with a mature brood patch, suggesting she was brooding young locally at Crane Flat (Siegel, unpubl. data). The willow flycatcher also may have inhabited Elevenmile Meadow based on habitat characteristics, but its presence there is purely speculative at this point.

HERMIT WARBLER *Dendroica occidentalis*

Status.—Audubon Watch List, American Bird Conservancy Green List.

General Distribution. Hermit warblers (*Dendroica occidentalis)* inhabit coniferous forest communities along the north Coast, Cascade Range, and Sierra Nevada in California. In the Sierra Nevada, they are found in red and white fir, Jeffrey and lodgepole pine, ponderosa pine, and giant sequoia. They are closely associated with coniferous forest types and avoid areas with high deciduous volume and are generally absent from riparian areas and clearcuts and other openings.

Reproductive Biology and Breeding Habitat. This species nests high up in the canopy, and thus is generally associated with mature forests with dense canopy and multi-storied structure (Pearson 1997).

Diet and Foraging Habitat. This species forages high up in the canopy, and thus is generally associated with mature forests with dense canopy and multi-storied structure (Pearson 1997).

Habitat and Status in the Project Area. Hermit warbler is a common breeding species at Crane Flat, evidenced by 633 individual captures by the Crane Flat MAPS station between 1990 and 2006. Hermit warblers are also a common breeder at the Henness Ridge area. NPS bird surveys conducted in 2007 documented seven individuals, including singing males, in the Henness Ridge area (NPS 2007).

YELLOW WARBLER ***Dendroica petechia***

Status. California Species of Special Concern, American Bird Conservancy Green List, Audubon Watch List, IUCN Near Threatened, US Bird Conservation Watch List, US Fish and Wildlife Service Bird of Conservation Concern, California Bird Species of Special Concern

Human population growth and resulting habitat degradation threaten yellow warbler populations given their sensitivity to decreases in deciduous habitat, riparian habitat heterogeneity, and riparian corridor width (Saab 1999). Destruction of riparian habitats and nest parasitism by brown-headed cowbirds have led to declines in lowland populations of yellow warblers. In Yosemite, the Monitoring Avian Productivity and Survivorship Program documented a significant decline in yellow warbler captures between 1993 and 2006 (Siegel et al. 2006).

General Distribution. Breeding range of the yellow warbler extends over most of North America, and wintering range extends to northern South America. In California, yellow warblers breed over much of the state where suitable breeding habitat occurs. Some yellow warblers winter in extreme southern California.

Reproductive Biology and Breeding Habitat. Yellow warblers breed primarily in riparian woodlands from coastal, valley and desert lowlands, up to 7,875 ft in the Sierra Nevada. Other breeding habitat includes montane chaparral, ponderosa pine, and mixed conifer where substantial amounts of brush occur (Zeiner et al. 1990). Breeding occurs from mid-April to early August, with peak activity in June. Three to six eggs are laid in an open cup nest placed from 2 to 16 ft above the ground in a shrub or deciduous sapling. Nesting territories often contain heavy brush understory for nesting and tall trees for foraging and singing (Zeiner et al. 1990).

Diet and Foraging Habitat. Food of yellow warblers consists primarily of insects and spiders that are gleaned from the canopy of deciduous trees and shrubs. Occasionally, insects are hawked from the air, or berries are eaten.

Habitat and Status in the Project Area. The yellow warbler inhabits both proposed study areas: Crane Flat and Henness Ridge and both areas appear to contain suitable nesting habitat. Yellow warblers have been recorded two times at Crane Flat (Yosemite Wildlife Observation Database 2009) and three individuals were detected at Elevenmile Meadow in May 2007 during bird surveys (National Park Service 2007). Between 1993 and 2006, 21 yellow warbler captures occurred at Crane Flat, including several juvenile birds and several individuals exhibiting breeding condition (females with brood patches and males with cloacal protuberances) (Siegel, unpubl. data).

MAMMALS

PALLID BAT *Antrozous pallidus*

Status.—California Species of Special Concern, Bureau of Land Management Sensitive, USFS Sensitive, Western Bat Working Group High Priority

The pallid bat has experienced population declines and could be seriously threatened, particularly at lower elevations, at least in southern California (Miner and Stokes 2005). Pallid bats tend to roost in large groups and are sensitive to disturbance, making them vulnerable to mass displacement. Threats to roosts, hibernacula, and maternity colonies include vandalism, recreational activities, e.g., rock climbing, forestry practices, e.g., timber harvest, and demolition, modification, eradication, and exclusion of man-made structures (Rambaldini 2005). Foraging habitat can be lost or degraded by prescribed fire and development (Rambaldini 2005). The pallid bat occurs in Yosemite, but their status is not well known. There are eight museum specimens for pallid bats for Yosemite National Park, all from Yosemite Valley (MVZ, YNP), collected between 1934 and 1940 (Pierson et al. 2006).

General Distribution. The pallid bat is found from southern British Columbia and Montana to central Mexico and Cuba, and east to Texas, Oklahoma, and Kansas. Throughout California, the species inhabits primarily low to mid elevations, although it has been found up to 11,155 ft in the Sierra Nevada (Barbour and Davis 1969; Record from Chagoopa Plateau, Sequoia National Park). Habitats range from desert to coniferous forest and non-coniferous woodlands; relevant toYosemite, the species shows an association with oak habitat (Rainey and Pierson 1996), mixed decidous forest, e.g., Yosemite Valley and Wawona, and giant sequoia habitat (Pierson and Heady 1996, Rainey et al. 1992). For roosting, pallid bats show a high reliance on hollow trees, but will also use rock crevices and outcrops, abandoned mines, caves, buildings, and bridges (Barbour and Davis 1969, Hermanson and O'Shea 1983, Lewis 1996, Orr 1954, Pierson et al. 1996, Pierson et al. 2001). In Yosemite, the species occurs to at least 6,200 ft (Pierson and Rainey 1993, 1995, Pierson et al. 2001, Pierson and Rainey unpubl. data).

Reproductive Biology and Breeding Habitat. The pallid bat gives birth to one to two young per year but usually two, with birth occurring in May to June. This species is quite versatile in its choice of roosting sites, and has been documented using tree hollows (both oak and ponderosa pine), rock crevices, caves, abandoned mines, and other anthropogenic structures such as buildings and bridges (Barbour and Davis 1969, Hermanson and O'Shea 1983, Lewis 1996, Orr 1954, Pierson et al. 1996, Pierson et al. 2001, Pierson and Rainey unpubl. data). This species is gregarious, and roosts in nursery colonies of typically between 30 and several hundred individuals.

Diet and Foraging Habitat. The pallid bat feeds primarily on large, flightless arthropods such as scorpions, Jerusalem crickets, cicadas, wolf spiders and centipedes (Pierson et al. 2006). Large cerambycid beetles, particularly *Prionus californicus*, and ten-lined June beetles (*Polyphylla decemlineata*) are also major prey items (Johnston and Fenton 2001, Orr 1954, Pierson et al. 2004).

Habitat and Status in the Project Area. The pallid bat has been detected at Crane Flat, but probably occurs at Henness too, as both project areas appear to have suitable habitat. The detection at Crane Flat occurred in July 2004 and consisted of a lactating female pallid bat in the vicinity of the campground (Pierson et al. 2006).

TOWNSEND'S BIG-EARED BAT *Corynorhinus townsendii townsendii*

Status. California Species of Special Concern, Bureau of Land Management Sensitive, IUCN – Vulnerable, U.S. Forest Service Sensitive, Western Bat Working Group High Priority

The Townsend's big-eared bat has experienced population declines and could be seriously threatened, particularly at lower elevations, at least in southern California (Miner and Stokes 2005). This species is particularly sensitive to human disturbance events and may abandon roost sites after human visitation (Humphrey and Kunz 1976). Like most North American bat species, both roosting and foraging habitat is threatened by timber harvesting practices and loss of riparian habitats (Sherwin 2005).

General Distribution. The Townsend's big-eared bat occurs throughout the west and is distributed from the southern portion of British Columbia south along the Pacific coast to central Mexico and east into the Great Plains, with isolated populations occurring in the central and eastern United States (Sherwin 2005). In California, the majority of records are from low to moderate elevations, though the species has been found to almost 9,840 ft in elevation. In the Sierra Nevada, maternity colonies have been found to up over 4,920 ft in elevation. The Townsend's big-eared bat is concentrated in areas with mines (particularly in the desert regions to the east and southeast of the Sierra Nevada) or caves (in the northeast portion of California and karstic regions in the Sierra Nevada and Trinity Alps) as roosting habitat (Pierson and Fellers 1998).

In Yosemite, Townsend's big-eared bats have been detected at Mirror Lake (Pierson and Rainey 1993), Wawona (Pierson and Rainey 1995), and at the barium mine on USFS land in El Portal. This mine is fenced and protected from disturbance.

Reproductive Biology and Breeding Habitat. Mating generally takes place in winter roosts from October to February (Sherwin 2005). Females form maternity colonies, comprised of a few to several hundred individuals, between March and June; and each typically gives birth to a single pup from May to July each year (Sherwin 2005). The gestation period varies from 56 to 100 days. Young bats are capable of flight at 2.5 to 3 weeks of age (Pierson and Fellers 1998). Males appear to remain solitary during the maternity period (Sherwin 2005). All known nursery sites in the Sierra Nevada occur at relatively low elevation (the highest being at 5,410 ft along the Yuba River), although males have been detected much higher (Pierson et al. 2001). Szewczak et al. (1998) reported on two nursery roosts in the White Mountains at elevations higher than 5,575 ft.

Diet and Foraging Habitat. The Townsend's big-eared bat feeds primarily on small moths, with over 90% of its diet composed of lepidopterans (Sherwin 2005). Foraging associations include edge habitats along streams, adjacent to and within a variety of wooded habitats (Fellers and Pierson 2002, Sherwin 2005).

Habitat and Status in the Project Area. No surveys for the Townsend's big-eared bat have been conducted at either project area, however suitable habitat exists and the occurrence of this species is likely.

SPOTTED BAT *Euderma maculatum*

Status.—California Species of Special Concern, Bureau of Land Management Sensitive, Western Bat Working Group High Priority

Little is known about possible threats to spotted bats because of lack of knowledge of this species (Chambers and Herder 2005). As with most bat species, threats include habitat destruction or alteration, disturbance, sensitivity to pesticides and other pollutants, and overexploitation, particularly recreational rock climbing, dam construction, urbanization, and livestock grazing (Chambers and Herder 2005).

General Distribution. Although considered one of North America's rarest mammals (Zeiner et al. 1990), the spotted bat is widely distributed throughout much of the western U.S., with its range extending as far north as southern British Columbia, and as far south as Durango, Mexico (Pierson et al. 2006). In the Sierra Nevada, spotted bats are widely distributed in habitats ranging from desert scrub to montane coniferous forest, with acoustic detections up to >9,840 ft (Pierson et al. 2006).

Studies conducted in Yosemite National Park have shown that spotted bats are relatively abundant in many areas where suitable cliff-roosting habitat is prevalent. The majority of detections are from relatively open foraging settings (*e.g.*, wet meadows) at lower elevations (*e.g.*, Yosemite Valley and Wawona) and from a number of sites up to >9,840

ft (Pierson and Rainey 1993, 1995, 1996, Pierson et al. 2001). Yosemite Valley had the highest population of spotted bats of any location surveyed in California (Pierson and Rainey 1995, 1996). Surveys have revealed spotted bats foraging on the north side of El Capitan Meadow, just below El Capitan, Bridalveil Meadow, Leidig Meadow, and the Ahwahnee Meadow (Pierson and Rainey 1993). Pierson and Rainey (1993) suggest that spotted bats roost on or near Half Dome and El Capitan.

Reproductive Biology and Breeding Habitat. Spotted bats breed in late summer with females giving birth to a single pup in early summer (May or June) (Chambers and Herder 2005). Limited information suggests that spotted bats roost non-colonially, predominantly in crevices in high cliff faces (Wai-Ping and Fenton 1989). Surveys in the Sierra Nevada suggest that they are most abundant in areas with fractured rock (Pierson and Rainey 1996, 1998a, b).

Diet and Foraging Habitat. Spotted bats feed primarily on large (.2-.5 in) moths, particularly Noctuids (Chambers and Herder 2005). Most observations suggest spotted bats forage alone (Wai-Ping and Fenton 1989), sometimes maintaining exclusive feeding areas (Leonard and Fenton 1983), and other times using a "trapline" strategy (Woodsworth et al. 1981). Individuals generally forage 15-50 ft off the ground in large elliptical paths, with axes of 655-985 ft (Wai-Ping and Fenton 1989, Navo et al. 1992, Pierson and Rainey 1996). The spotted bat is capable of long distance and rapid flight, thus foraging ranges can be large. Radio-tracking studies in Arizona documented this species traveling up to 25 mi each night (Chambers et al. 2005). In montane habitats, the spotted bat forages over meadows, along forest edges, or in open coniferous woodland.

Habitat and Status in the Project Area. Spotted bats have been detected in close proximity to Crane Flat, at the Tuolumne Grove (Pierson et al. 2006). However, because this species is thought to be an obligate cliff-dweller, and is known to travel large distances from its roost sites to forage, it is highly unlikely that it would be found roosting in the project areas. However, the spotted bat probably forages in or near both project sites.

SILVER-HAIRED BAT *Lasionycteris noctivagans*

Status. Western Bat Working Group – Medium Priority

Availability of suitable trees for maternity roosts appears to be a limiting factor for silver-haired bats (Mattson et al. 1996). In Yosemite, the species has been documented in Yosemite Valley (Pierson and Rainey 1993), on the South Fork of the Merced River in Wawona, at Kiosk Creek in the Mariposa Grove, and in the Merced Grove (Pierson et al. 2001).

General Distribution. The silver-haired bat is a forest bat, associated primarily with northern temperate zone conifer and mixed conifer/hardwood forests with available water (Pierson et al. 2006). The species ranges from southern Alaska, throughout southern Canada, most of the United States, and into the San Carlos Mountains of northeastern

Mexico (Kunz 1982). In California, the species distribution is concentrated in the northern half of the state, with most of the breeding records occurring in the upper Sacramento drainage (Rainey and Pierson 1996), the Trinity Mountains and northern coast ranges (Pierson and Rainey 1998b), and the northern Sierra Nevada. Some individuals of this migratory species may over-winter in southern California (Pierson et al. 2006).

Reproductive Biology and Breeding Habitat. Maternity roosts are typically found in tree cavities, most of which have been excavated by woodpeckers (Mattson et al. 1996), and under flaking bark (Barbour and Davis 1969, Betts 1996, 1998, Campbell et al. 1996, Rainey and Pierson 1996, Vonhof 1996). As is the case with most bats in Yosemite, silver-haired bats have a primary mating period in the fall before entering hibernation. In these fall-breeding bats, sperm are stored by the female until ovulation occurs in the spring (in New Mexico; Druecker 1972). Gestation is approximately 50-60 days (Druecker 1972) and in British Columbia parturition is estimated to occur in late June or early July (Schowalter et al. 1978, Nagorsen and Brigham 1993). Kunz (1971) reported a median parturition date of 16 June and a lactation period of approximately 36 days. Silver-haired bats produce 1-2 offspring per year (Kunz 1982), which are capable of flight at 3-4 weeks old (Kunz 1971).

Diet and Foraging Habitat. The silver-haired bat forages above the canopy, in forest clearings, and in riparian habitats along water courses (Kunz 1982, Barclay 1985, 1986, Rainey and Pierson 1996). Radio-tracking has shown that the species can travel considerable distances from roost sites to foraging areas (Rainey and Pierson 1996). Silver-haired bats tend to specialize on Lepidopteran moths, but are known to prey on a wide variety of insects, including Diptera, Homoptera, Hemiptera, Hymenoptera, and Coleoptera (Whitaker et al. 1981, Kunz 1982, Barclay 1985, 1986, and van Zyll de Jong 1985). In a study in the upper Sacramento River drainage, Rainey and Pierson (1996) found the bulk of the diet dominated by Lepidoptera and Trichoptera.

Habitat and Status in the Project Area. No surveys for silver-haired bats have been conducted at Crane Flat or Henness, however suitable habitat exists for their occurrence. The species has been documented near the Crane Flat project area at the Tuolumne Grove in February 1993 (Yosemite Wildlife Observation Database 2009) and at the Merced Grove (Pierson et al. 2006).

WESTERN RED BAT ***Lasiurus blossevillii***

Status. California Species of Special Concern, U.S. Forest Service Sensitive, Western Bat Working Group High Priority

Loss of riparian habitats and the use of pesticides threaten both roosting and foraging habitats of red bats (Bolster 2005). Controlled burns may also be a significant mortality factor for bats that roost in leaf litter during cool temperatures (Bolster 2005).

General Distribution. The western red bat is broadly distributed from southern British Columbia in Canada, though much of the western United States, through Mexico and Central America to Argentina and Chile in South America (Bolster 2005). In California, the majority of records are from the coastal areas from the San Francisco Bay area south, plus the Central Valley and bordering foothills, with a limited number of records from southern California, extending as far east as western Riverside and central San Diego Counties (Pierson et al. 2006). There are a few records from higher elevations and the east side of the Sierra Nevada (Constantine 1998, Pierson et al. 2000). This species roosts in foliage and breeding females appear to be highly associated with lower elevation riparian habitats, particularly relatively intact stands of cottonwood and sycamore in the Central Valley and southern coastal areas (Pierson et al. 2000). Winter populations of both sexes are concentrated along the central and southern coast (Pierson et al. 1999). Grinnell (1918) suggested that red bats in California were sexually segregated in summer, with males moving to higher elevations, a pattern more recently noted in other species (e.g., Cryan et al. 2000). Western red bats (most likely males or non-reproductive females) have been documented up to 8,200 ft in the Sierra Nevada (Pierson et al. 2000 and 2001).

The first record of a western red bat in Yosemite was the capture of three individuals (two adult males and one nulliparous female) over the South Fork Merced River on 16 September 1998 (Pierson et al. 2001). Since that time the species has been documented acoustically at multiple localities up as high as Siesta Lake at 7,982 ft (Pierson et al. 2001). Acoustic detections have been obtained in association with black cottonwood in both Yosemite and Sequoia National Parks.

Reproductive Biology and Breeding Habitat. Western red bats mate in late summer or early fall (Bolster 2005). Females become pregnant in spring with a gestation period of 80-90 days (Bolster 2005). Females have litters with up to five pups per year (Bolster 2005). Western red bats roost on the underside of overhanging leaves. Recent studies in the Central Valley found that summering populations are substantially more abundant in remnant stands of cottonwood/sycamore riparian that extend >165 ft back from the river than they are in younger, less extensive stands (Pierson et al. 1999).

Diet and Foraging Habitat. Red bats forage on a number of insect taxa, flying at both canopy height and low over the ground (Shump and Shump 1982). Studies have reported diets consisting of primarily small moths, in addition to a variety of other insects, primarily orthopterans (Ross 1961), and also Homoptera, Coleoptera, Hymenoptera, and Diptera (Shump and Shump 1982). Red bats apparently arise from hibernation on warm days to feed (Shump and Shump 1982).

Habitat and Status in the Project Area. No surveys for western red bats have been conducted at Crane Flat or Henness, however suitable habitat exists for their occurrence.

HOARY BAT *Lasiurus cinereus*

Status. Western Bat Working Group: Medium Priority

Lack of information on the basic ecology and population trends of the hoary bat is one of the greatest threats to the conservation of this species. Known threats include loss of roosting habitat and foraging habitat and the use of pesticides. In Yosemite, no roost sites for this species are known, however hoary bats are well documented at many locations in the park, including Dusy Basin at 11,235 ft, Yosemite Valley, one mile east of Merced Lake (Museum of Vertebrate Zoology collection), Wawona, Tenaya Lake, Merced Grove, Mariposa Grove, and Tuolumne Grove (Pierson et al. 2001, 2006).

General Distribution. The hoary bat is the most widespread of all North American bats, occurring widely across most of North America from north-central Canada, south into southern Mexico (Shump and Shump 1982b). This species is found throughout California, with records from the Central Valley to > 8,200 ft in the Sierra Nevada. The hoary bat is associated with cottonwood riparian habitat, and is also found in forested areas. In their study in Oregon, Perkins and Cross (1988) reported a strong association with old growth Douglas fir forest. Hoary bats are known to undergo long distance seasonal migrations (Cryan 2003), with concentrations of bats appearing along the California coast in the fall (Dalquest 1943, Tenaza 1966) and in southern California in the winter (Vaughan and Krutzsch 1954). Data from the Central Valley and the Sierra foothills (Pierson et al. 2000) suggest that this species migrates through the Central Valley and adjacent foothills in the spring and the fall.

Reproductive Biology and Breeding Habitat. No breeding females have been found in California, and the majority of records (and all midsummer records) are males (Pierson et al. 2006).

Diet and Foraging Habitat. The hoary bat forages along river and stream corridors, over open bodies of water, over meadows, in open forest habitat, and above forest canopies (Kalcounis et al. 1999). The species feeds primarily on .2-1.2 in moths (Ross 1967, Black 1974), but is also known to consume Coleoptera, Hymenoptera, Isoptera, and Odonata (Ross 1967, Barclay 1985, van Zyll de Jong 1985, Barclay 1986). Rolseth et al. (1994) reported that juveniles foraged primarily on smaller insects like chironomids. In California, in the upper Sacramento River drainage, the diet of this species was dominated by Lepidoptera (Rainey and Pierson 1996).

Habitat and Status in the Project Area. No surveys for hoary bat have been conducted at Crane Flat or Henness, however suitable nonbreeding habitat exists for their occurrence. Hoary bats have been documented in the Tuolumne Grove, located adjacent to the Crane Flat project area.

WESTERN SMALL-FOOTED MYOTIS *Myotis ciliolabrum*

Status. Bureau of Land Management Sensitive, Western Bat Working Group: Medium Priority

Threats to the western small-footed myotis include a lack of information on the species population status, trends, and distribution, precluding effective management. Further, recreational activities, e.g., rock climbing, may impact roosting bats in rock crevices; and insect control activities may impact the prey base of these bats. The distribution of the western small-footed myotis in Yosemite is poorly known. It appears to be far less common in Yosemite than farther south in Sequoia and Kings Canyon National Parks (Pierson et al. 2006). It has, however, been detected at elevations as low as Yosemite Valley and near Bass Lake outside the Park and as high as Tioga Road Bridge over Yosemite Creek and Yosemite Creek Campground (Pierson et al. 2001).

General Distribution. The western small-footed myotis occurs in western North America, ranging north from British Columbia, Alberta, and Saskatchewan, Canada, south to Mexico (Holloway and Barclay 2001). In California, the species occurs in a wide variety of habitats, primarily in relatively arid wooded and brushy uplands near water, and ranges from sea level to at least 8,860 ft elevation (Zeiner et al. 1990). The species has been found on both west and east sides of the Sierra Nevada (Zeiner et al. 1990), and is known to roost primarily in rock crevices (Pierson et al. 2006).

Reproductive Biology and Breeding Habitat. Maternity colonies, usually consisting of 12 to 20 individuals, have been found in buildings, caves, and mines. The species generally has one young per litter (Hall 1946, Koford and Koford 1948, Findley et al. 1975). The females mate in the fall, gives birth to young from May through June, and lactate through July (Zeiner et al. 1990). Most young are capable of flight by mid-August (Zeiner et al. 1990).

Diet and Foraging Habitat. The western small-footed myotis feeds on a variety of flying insects, particularly Lepidoptera, but also Diptera, Hemiptera, and Coleoptera (Jones et al. 1973, Whitaker et al. 1981, Woodsworth 1981, Warner 1985). The species exhibits a slow and maneuverable flight (Schowalter and Allen 1981, Norberg and Rayner 1987) with erratic flight patterns when pursuing aerial insects (Dalquest 1948, Fenton et al. 1980). The species has been observed foraging among trees and over natural water courses and man-made water holes (Pierson et al. 1996).

Habitat and Status in the Project Area. No surveys for western small-footed myotis have been conducted at Crane Flat or Henness. While not a common feature in the project areas, rock crevices may provide suitable roosting habitat.

LONG-EARED MYOTIS *Myotis evotis*

Status. Bureau of Land Management Sensitive, Western Bat Working Group: Medium Priority

General Distribution. The long-eared myotis bat *(Myotis evotis)* is found across much of western North America, from British Columbia south to California and New Mexico. It is found in a wide range, from the coast to the Sierra Nevada, and in montane oak woodlands. This species has potential to occur in all areas of the park.

Reproductive Biology and Breeding Habitat. Long-eared myotis lives in coniferous forests in mountain areas and roosts in small colonies in caves, buildings, and under tree bark.

Diet and Foraging Habitat. This species is insectivorous. They prey mainly on moths, but their diet also includes beetles, flies, and spiders. They can take prey from the air as well as from surfaces, and can forage throughout the night.

Habitat and Status in the Project Area. Roosting habitat for this species potentially occurs in forested habitats surrounding Crane Flat. Focused bat surveys have not been performed to verify the presence or absence of this species in the local vicinity; thus, is presumed present based on the availability of suitable habitat. Surveys of site structures completed in summer 2002 revealed no evidence of bat use of structures associated with the Crane Flat campus. Snags or other trees in the vicinity of Crane Flat provide suitable habitat for this species. Surveys have not been conducted specifically for this species in the vicinity of Henness Ridge area. Snags, large trees, and hollow trees in the vicinity of Henness Ridge provide suitable roosting habitat for this species.

FRINGED MYOTIS *Myotis thysanodes*

Status. Burau of Land Management Sensitive, Western Bat Working Group: High Priority.

General Distribution. The fringed myotis bat *(Myotis thysanodes)* is found in much of California, up to British Columbia, and is scattered across several southwestern states and into Mexico. It is found to at least 6,400 feet above msl in the Sierra Nevada, in deciduous/mixed conifer forests.

Reproductive Biology and Breeding Habitat. The fringed myotis roosts in caves, mines, buildings, and trees, especially large conifer snags.

Diet and Foraging Habitat. The fringed myotis feeds over water, in open habitats, and by gleaning from foliage.

Habitat and Status in the Project Area. Roosting habitat for this species potentially occurs in forested habitats surrounding Crane Flat. Focused bat surveys have not been performed to verify the presence or absence of this species in the local vicinity; thus, is presumed present based on the availability of suitable habitat. Surveys of site structures completed in summer 2002 revealed no evidence of bat use of structures associated with the Crane Flat campus. Snags or other trees in the vicinity of Crane Flat provide suitable habitat for this species. Surveys have not been conducted specifically for this species in the vicinity of Henness Ridge area. Snags, large trees, and hollow trees in the vicinity of Henness Ridge provide suitable roosting habitat for this species.

LONG-LEGGED MYOTIS *Myotis volans*

Status. Western Bat Working Group: High Priority.

General Distribution. The range of the long-legged myotis bat *(Myotis volans)* includes most of western North America, as far north as Alaska and south to central Mexico. It prefers forested mountainous areas and is sometimes found in desert lowlands. The species is found up to high elevations in the Sierra Nevada in montane coniferous forest habitats. The long-legged myotis bat was recently recorded in the park (Pierson et al. 2001). These sightings were recorded at Cascades Creek and Yosemite Creek.

Reproductive Biology and Breeding Habitat. Long-legged myotis bat roosts primarily in large-diameter snags. The species forms nursery colonies numbering hundreds of individuals, usually under bark or in hollow trees.

Diet and Foraging Habitat. Long-legged myotis bat forages over water, close to trees and cliffs, and in openings in forests.

Habitat and Status in the Project Area. Roosting habitat for this species potentially occurs in forested habitats surrounding Crane Flat. Focused bat surveys have not been performed to verify the presence or absence of this species in the local vicinity; thus, is presumed present based on the availability of suitable habitat. Surveys of site structures completed in summer 2002 revealed no evidence of bat use of structures associated with the Crane Flat campus. Snags or other trees in the vicinity of Crane Flat provide suitable habitat for this species. Surveys have not been conducted specifically for this species in the vicinity of Henness Ridge area. Snags, large trees, and hollow trees in the vicinity of Henness Ridge provide suitable roosting habitat for this species.

YUMA MYOTIS *Myotis yumanensis*

Status. Bureau of Land Management Sensitive, Western Bat Working Group: Medium Priority

General Distribution. The Yuma myotis bat *(Myotis yumanensis)* is found across much of the western United States and into western Canada, usually below 8,000 feet in elevation. Mist-net bat surveys were conducted in Yosemite Valley in 1993 at Mirror Lake, Cook's Meadow, El Capitan Meadow, Yosemite Creek below Yosemite Falls, Cathedral Picnic Area, and Cascades Picnic Area (Pierson and Rainey 1993, 1995; Pierson et al. 2001). Yuma myotis bat was captured at Mirror Lake, El Capitan Meadow, the Yosemite Creek site, and both the Cathedral and Cascades Picnic Areas. This species was also found in recent mist-netting surveys in Yosemite Valley and Wawona (Pierson and Rainey 1993, 1995), and in hand-net or visual surveys at bridge crossings at Cascades and Wildcat Creeks (Pierson et al. 2001). There have also been several sightings throughout Yosemite Valley. Suitable habitat also occurs throughout the Merced River gorge, upper Merced River, and along portions of the South Fork.

Reproductive Biology and Breeding Habitat. Yuma myotis bat roosts in buildings, caves, or crevices; nursery colonies choose caves, mines, buildings, or under bridges.

Diet and Foraging Habitat. The species forages over open, still, or slow-moving water and above low vegetation in meadows. The species skims low over water to snatch up flying insects.

Habitat and Status in the Project Area. Roosting habitat for this species potentially occurs in forested habitats surrounding Crane Flat. Focused bat surveys have not been performed to verify the presence or absence of this species in the local vicinity; thus, is presumed present based on the availability of suitable habitat. Surveys of site structures completed in summer 2002 revealed no evidence of bat use of structures associated with the Crane Flat campus. Snags or other trees in the vicinity of Crane Flat provide suitable habitat for this species. Surveys have not been conducted specifically for this species in the vicinity of Henness Ridge area. Snags, large trees, and hollow trees in the vicinity of Henness Ridge provide suitable roosting habitat for this species.

WESTERN MASTIFF BAT ***Eumops perotis californicus***

Status.—California Species of Special Concern, Bureau of Land Management Sensitive, Western Bat Working Group: High Priority

Like most other North American species of bat, the western mastiff bat is threatened by low fecundity, high juvenile mortality, long generational turnover; loss of clean, open water; loss of riparian vegetation; pesticide application (Siders 2005). More specific threats include construction activities that impact cliffs or boulders, rock climbing, and human disturbance.

General Distribution. The subspecies that occurs in North America, *E. p. californicus*, ranges from central Mexico across the southwestern United States (parts of California, southern Nevada, Arizona, southern New Mexico and western Texas) (Eger 1977, Bradley and O'Farrell 1967). The western mastiff bat is found along the west side of the Sierra Nevada, primarily at low to mid-elevations, but has been detected up to 9,840 ft in the summer (Pierson et al. 2006). The species is found in a variety of habitats, from desert scrub and chaparral to montane coniferous forest. Its presence is determined by the availability of significant rock features offering suitable roosting habitat (Pierson et al. 2006).

In Yosemite, greater western mastiff bats have been detected in Yosemite Valley in Bridalveil meadow, El Capitan Meadow, Leidig Meadow, Cook's Meadow, Ahwahnee Meadow, Stoneman Meadow, Wosky Pond, and wetlands near Happy Isles. They were also detected in a few upland habitats east of El Capitan meadow and Sentinel Beach Picnic area (Pierson and Rainey 1995). Yosemite Valley has the highest population of the greater western mastiff bat in any localities surveyed in California (Pierson and Rainey 1995). In addition, the species has been captured in Wawona (Pierson and Rainey 1995).

Reproductive Biology and Breeding Habitat. The western mastiff bat mates in the late winter/early spring and gives birth to a single young in the early to mid-summer (Siders 2005). Most young are born by early July, although parturition dates vary extensively and births are not synchronous, even within colonies (Siders 2005). Maternity colonies comprise predominately adult females, however some colonies may contain both adult males and females at all times of the year (Siders 2005).

Diet and Foraging Habitat. The diet of western mastiff bats consists primarily of moths (Lepidoptera), but also includes beetles, crickets, and katydids (Siders 2005). The species may forage in flocks, regularly 100-200 ft over the substrate; and can forage considerable distances from their roosting sites (Siders 2005). Foraging habitats include dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, agricultural areas, and high elevation meadows surrounded by mixed conifer forests (Siders 2005).

Habitat and Status in the Project Area. The western mastiff bat most likely forages in or near Crane Flat or Henness. However, no surveys for the species has been conducted at either project area.

SIERRA NEVADA MOUNTAIN BEAVER *Aplodontia rufa californica*

Status. California Species of Special Concern, IUCN Near Threatened

Habitat degradation from livestock grazing, invasion of exotic plants, fire, and human activities in fragile coastal habitats are factors contributing to declines in mountain beaver populations (Fitts et al. 2002, Fellers et al. 2004, Wake 2006). Ground disturbance from human recreation and logging activities can cause collapse of the burrow systems and nest chambers that are vital for mountain beaver survival.

General Distribution. The mountain beaver is endemic and restricted to western North America. Currently seven subspecies are recognized (Dalquest and Scheffer 1945, Hall 1981), including the isolated population *A.r. californica* that extends through much of the Sierra Nevada Range in eastern California into the western extreme portion of Nevada (Arjo 2007). Mountain beavers can be found up to 9,840 ft elevation in portions of the Sierra Nevada Range; however, they are more commonly found at lower elevations in humid, densely vegetated understory areas (Feldhamer et al. 2003). Mountain beavers are confined to well-vegetated, moist, cool environments – a function of their poor ability to concentrate urine and low tolerance for temperature extremes (Nungesser and Pfeiffer 1965).

Mountain beaver habitat in Yosemite is found in sandy loam soils that are dominated by one or more of the following woody plants: dogwood (*Cornus* spp.), labrador tea (*Ledum glandulosum)*, willow (*Salix* spp.), and alder (*Alnus* spp.) (Todd 1990). Common herbaceous plants include cow parsnip (*Heracleum lanatum*), corn lily (*Veratrum californicum*), broad-leaved lupine (*Lupinus latifolius*), fireweed (*Epilobium* spp.), and

various grasses. Todd (1990) estimated that mountain beavers occupy approximately 200 to 550 sites in Yosemite National Park. By extrapolating the number of mountain beaver sites to the numbers of animals, Todd (1990) estimated from 400 to 6,600 adults living in the park.

Reproductive Biology and Breeding Habitat. Male onset of reproductive activity for mountain beaver occurs in November and December (Hubbard 1922, Pfeiffer 1956, Lovejoy et al. 1978, Carraway and Verts 1993). Mountain beavers are not reproductively capable until after their second year, and have low reproductive rates (Pfeiffer 1958). Although little data is available on reproduction of the southern subspecies, the large latitudinal range in distribution of mountain beaver may suggest local variation in reproductive traits (Pfeiffer 1958, Zielinski and Mazurek 2006). In both the *A. r. pacifica* and *A. r. rufa* subspecies, breeding usually occurs from late January to early February. Estimated parturition of 2−4 pups after a 28−30 day gestation is late March to early April, with weaning occurring at the beginning of June (Lovejoy and Black 1974, Arjo, unpublished data). Nest chambers are located from one to 4.6 ft below the ground surface (Zeiner et al. 1990).

Diet and Foraging Habitat. Mountain beavers are strictly herbivorous and are coprophagic, reingesting certain fecal pellets for maximum nutrition (Feldhamer et al. 2003). Sword fern (*Polystichum munitum*) and salal (*Gaultheria shallon*) are clipped year-round as a food and bedding source (Neal and Borrecco 1981). Good forage cover (e.g., ferns, forbs, and shrubs) as well as large amounts of small diameter woody debris or uprooted stumps are areas usually selected by mountain beaver (Todd 1992, Hacker and Coblenz 1993). Willow (*Salix* sp.), alder (*Alnus* sp.) and fir (*Abies* sp.) dominate areas preferred by mountain beavers in the higher elevations of the Sierra Nevada Mountains (Arjo 2007).

Mountain beavers feed on vegetative parts of plants including thimbleberry, salmonberry, blackberry, dogwood, salal, ferns, lupines, willow, and grasses. They forage underground, above ground, under snow, on the surface of snow, and up to 14.8 ft high in trees and bushes. Vegetation is stored near a burrow entrance or in underground chambers (Maser et al. 1981). Mountain beavers in the Sierra Nevada require abundant riparian plants for harvesting but species composition is relatively unimportant (Todd 1990).

Habitat and Status in the Project Area. Suitable habitat for mountain beavers occurs at both project areas, especially at Henness where the species likely inhabits the drainages on either side of the ridge. There are seven observations of mountain beavers from Chinquapin and Yosemite West; the species is also known to occur in the streams that drain from the meadows and ski slopes at Badger Pass (Monroe Meadow) (Yosemite Wildlife Observation Database 2009). In the Crane Flat vicinity, a mountain beaver was observed at the Merced Grove in June 1981 and nearby on the Big Oak Flat Road in May of 1981 (Yosemite Wildlife Observation Database 2009).

AMERICAN MARTEN *Martes americana*

Status. The marten is not currently protected under ESA. Collection of pelts has reduced populations in many parts of the species range. The destruction of coniferous forest habitat has also led to decreased numbers. In spite of these threats, American martens are not protected, but are currently only listed as a USFS sensitive species.

General Distribution. The American marten *(Martes americana)* is found in coniferous dominated montane forests of the north Coast Ranges, Cascade Range, and Sierra Nevada (Kucera et al. 1995). In the southern Sierra Nevada, the species is most closely associated with lodgepole pine forests. Occurrence records range from approximately 4,000 to 13,000 feet above msl in elevation with an average elevation of 8,300 feet above msl (Schempf and White 1977). This species is thought to occur in low densities throughout its range (Kucera et al. 1995).

Reproductive Biology and Breeding Habitat. Martens den and find cover in hollow trees, downed logs, and cavities in rocks.

Diet and Foraging Habitat. Martens forage for mice and other small mammals on the forest floor and in open barren habitats.

Habitat and Status in the Project Area. American marten has been documented at both proposed study areas, Crane Flat and Henness Ridge. Both sites appear to contain suitable habitat, however, the majority of marten observations in the park occurs at higher elevations. An American marten observation was recorded in October of 1946 at Crane Flat and two observations (1992 and 1996) have been recorded since then in the near vicinity along the Big Oak Flat Road (Yosemite Wildlife Observation Database 2009). In the Henness area, this species has been documented three times (1957, 1974, and 1975) at Badger Pass, including one observation at the nearby water tank (Yosemite Wildlife Observation Database 2009).

PACIFIC FISHER *Martes pennanti*

Status. Federal Candidate, California Species of Special Concern, Bureau of Land Management Sensitive, U. S. Forest Service Sensitive

Three petitions were submitted to list the fisher in the western United States under the federal Endangered Species Act, 16 U.S.C. § 1531 *et seq*. (Beckwitt 1990, Carlton 1994, Greenwald et al. 2000). Following the Greenwald et al. (2000) petition, USFWS determined that a listing of the West Coast population segment of the fisher was "warranted but precluded by other, higher priority listing actions" (12-month finding for a petition to list west coast distinct population segment of the fisher; Proposed Rule, Federal Register April 8, 2004). In January 2008, the Center for Biological Diversity submitted a petition to list the Pacific fisher as an endangered or threatened species under the California Endangered Species Act (Center for Biological Diversity 2008). The petition seeks to "demonstrate unequivocally that the Pacific fisher has experienced a significant diminution of habitat and range in the state of California, and is vulnerable to

extinction". This petition is currently under review by California Department of Fish and Game.

Threats to the fisher in the Sierra Nevada include more than a century of logging with concurrent road building, rapid population growth, development and trapping prior to 1946 (Duane 1996, McKelvey and Johnson 1992, Lamberson et al. 2000, Campbell 2004, Zielinski et al. 2005). The fisher occurs at lower elevations than the American marten, where the species is in closer proximity to human development and forest-altering activities (Zielinski et al. 2005). Truex et al. (1998) concluded that "for all intents and purposes the southern Sierra is a demographically closed population." This conclusion is supported by the recent genetic work by Wisely et al. (2004), which found that populations from northern California and the southern Sierra Nevada are highly differentiated, and there is little migration among populations from north to south (Wisely et al. 2004).

In Yosemite National Park, field surveys conducted in 1999 and 2000 verified the presence of one fisher in the park (Campbell 2004) and surveys in 2007 verified the presence of one fisher in the southern part of the park by a research team led by Richard Truex (unpubl. data). In the past decade, there have also been six road kills (including a lactating female) and about 15 unverified sightings of fisher. Vehicle-related accidents cause the greatest number of known adult fisher mortalities in the park.

General Distribution. Fisher populations are present in low numbers, or absent throughout most of their historic range in Montana, Idaho, Washington, Oregon, and California (Heinemeyer and Jones 1994). In recent decades, a scarcity of sightings in Washington, Oregon, and the northern Sierra Nevada may indicate fisher extirpation from much of this area (Zielinski et al. 1996, Aubry and Raley 1999, Carroll et al. 1999). In California, the fisher's range has been reduced to roughly 50 percent of its historic range (Zielinski et al. 1997a, Zielinski et al. 2005). In particular, researchers have failed to detect fishers north of Yosemite National Park during extensive surveys using remote cameras and track plates, suggesting that the fisher is extirpated or occurs at extremely low densities in the central and northern Sierra Nevada (Truex et al. 1998, Zielinski et al. 1997b, 2000, 2005a, Campbell 2004). This has effectively isolated fishers in the southern Sierra Nevada from fishers in northern California by a distance of roughly 265 mi (Lamberson et al. 2000, Zielinski et al. 2005), which is more than four times greater than the observed maximum dispersal distance for fisher of 65 mi (Arthur et al. 1993, York 1996).

In the Sierra Nevada, the fisher occurs from roughly 1,970 ft – 8,530 ft with occasional sightings up to 9,840 ft (Grinnell et al. 1937, Zielinski et al. 1997a). Studies on the habitat use of fishers in the western United States demonstrate that the fisher is strongly associated with mature and late successional forests (Aubry and Houston 1992, Buck et al. 1994, Dark 1997, Jones and Garton 1994, Mazzoni 2002, Powell and Zielinski 1994, Seglund 1995, Truex et al. 1998, Carroll et al. 1999, Campbell 2004, Zielinski et al. 2004a, 2004b). In particular, fishers are generally found in stands with high canopy closure, large trees and snags, large woody debris, large hardwoods, and multiple canopy

layers. Records at the MVZ in Berkeley, California for specimens collected in Yosemite indicate that fishers were most commonly found between 5,905 and 6,890 ft in elevation. In recent years, the majority of reported fisher sightings and road kills have occurred along the Wawona and Big Oak Flat Roads near Henness Ridge and Crane Flat.

Reproductive Biology and Breeding Habitat. The breeding season for the fisher begins in late February and lasts until mid-April, although some births occur as late as May (Frost et al. 1997). Gestation, including delayed implantation, is approximately 338 to 358 days with the period of active pregnancy following implantation lasting approximately 40 days until birth (Frost et al. 1997). Kits are born in early to mid-spring, and raised entirely by the female (Powell and Zielinski 1994). Kits subsist exclusively on their mother's milk until 8-10 weeks old, and by 10 weeks the kits wean (Powell 1993, Powell and Zielinski 1994). After about four months, the kits begin killing their own prey; by one year kits will have developed their own home ranges (Powell 1993, Powell and Zielinski 1994). Fishers have low annual reproductive capacity; not all fishers produce young every year. Truex et al. (1998) documented that of the females in their study area in the southern Sierra Nevada only about 50-60 percent successfully gave birth to young. In their study area on the North Coast, however, reproductive rates fluctuated from 73% of females giving birth in 1995 to only 14% in 1996.

Natal dens, where kits are born, are most commonly in tree cavities at heights of greater than 20 ft, while maternal dens, where kits are raised, may be in cavities closer to the ground so active kits can avoid injury in the event of a fall from the den (Lewis and Stinson 1998). Most natal and maternal dens are in large conifers or oaks, which may be live or in snag form (Truex et al. 1998). Natal and maternal dens collectively are defined as rest sites where kits are observed prior to juvenile dispersal (Truex et al. 1998). Females have to be selective because they must find a suitable cavity with an entrance hole small enough to dissuade access by males and to protect their young from predators (Zielinski et al. 2004a). In three studies that described 75 natal and maternal dens in California, all dens were in cavities of very large live or dead conifer or hardwood trees, and all were standing except one white fir (*Abies concolor*) log (Truex et al. 1998, Higley and Matthews 2006, and Self and Callas 2006). Truex et al. (1998) reported that of a total of 19 denning sites in the North Coast, eastern Klamath, and southern Sierra Nevada, eight were in live hardwood trees, six were in live conifer trees, four were in conifer snags, and one was in a conifer log. Overall the average diameter at breast height (DBH) was 45.2 in for conifers and 24.6 in for hardwoods. The minimum sized conifer den tree was an 32.3-in live white fir, while minimum sized hardwoods were in 15.8-in live black oak and live oak. Habitat conditions surrounding natal and maternal den trees included canopy closure that ranged from 70 to 100% and basal area that averaged 248 ft^2/ha for North Coast sites, 205.4 ft^2/ha for the Southern Sierra site, and 196.2 ft^2/ha for Eastern Klamath sites (Truex et al. 1998).

Diet and Foraging Habitat. Fishers are opportunistic, generalist predators with a diverse diet, including birds, porcupines (*Erethizon dorsatum*), snowshoe hares (*Lepus americana*), squirrels (*Sciurus* spp., *Tamiasciurus* spp., *Glaucomys* spp.), mice and voles (*Clethrionomys gapperi*, *Microtus* spp., *Peromyscus* spp.), shrews (*Blarina* spp., *Sorex*

spp.), insects, carrion of deer (*Odocoileus* spp.), vegetation, and fruit (Powell 1993, Martin 1994, Powell and Zielinski 1994, Zielinski et al. 1999, Weir et al. 2005, Bowman et al. 2006). Throughout most of its range, snowshoe hare and porcupine are important components of the fisher's diet (Bowman et al. 2006). Although mammals were still the most frequent prey found in fisher scat from the southern Sierra, reptiles, especially the alligator lizard *Elgaria*, constituted a major prey item, occurring in 20.4 percent of all observed scat and 37.7 percent of scat collected in spring (Zielinski et al. 1999). Also unique to the southern Sierra Nevada and northern California, fishers were found to potentially feed on hypogeous fungi (false truffles) (Grenfell and Fasenfest 1979, Zielinski et al. 1999).

Foraging habitat for the fisher depends on conditions that support abundant prey populations and reduce fisher predation (Powell 1993). The fisher is among the most habitat-specific mammals in North America (Buskirk and Powell 1994). Fishers inhabit forest or woodland landscape mosaics that include conifer-dominated stands, and avoid entering open areas that have no overstory or shrub cover (Buskirk and Powell 1994). Late-successional coniferous or mixed forests provide the most suitable fisher habitat because they provide abundant potential den sites and preferred prey species (Allen 1987). The presence of large conifers and hardwoods is a highly significant predictor of fisher occurrence (Carroll et al. 1999). There are two possible reasons for the importance of large hardwoods to fishers: (1) cavities, which are frequently used as resting and den sites, are more common in hardwoods than in conifers, and (2) large hardwoods produce mast (acorns), which may in turn stimulate higher prey densities (Powell and Zielinski 1994). Density of overhead cover is another predictor of fisher occurrence (Carroll et al. 1999). Landscapes with high levels of overhead cover may protect fishers from predation, reduce the amount of energy fishers expend when traveling between foraging sites, provide more favorable microclimates, and increase prey numbers or prey vulnerability (Buskirk and Powell 1994, Powell and Zielinski 1994). Fishers also use habitat where shrubs contribute to "overhead" canopy (Buck et al. 1994, Dark 1997, Seglund 1995). Riparian corridors (Heinemeyer and Jones 1994) and forested saddles between major drainages (Buck 1983) may provide important dispersal habitat or landscape linkages for the species. Riparian areas are important to fishers because they provide important rest site elements, such as broken tops, snags, and coarse woody debris (Seglund 1995).

Habitat and Status in the Project Area. Fishers have been detected at or nearby both project areas, which is not surprising since both areas contain both micro- and macro-habitat features required by fishers for resting, denning, and dispersing. However, the fisher is a highly elusive, fast, nocturnal animal, making it difficult to determine its status in Yosemite, much less in the project areas. Only eight fisher natal and maternal dens are known in the Sierra Nevada, none of which are located in Yosemite. While protection of den sites is essential, it is important to note that location of den sites is difficult and time consuming. Project-level surveys are unlikely to locate new den sites. Depending on the detection method, it can take up to 21 days to confirm or deny the presence of fishers in an area (Zielinski et al. 1996).

Appendix E:
Representative Site Photographs

APPENDIX E: REPRESENTATIVE PHOTOGRAPHS OF CRANE FLAT AND HENNESS RIDGE

This appendix contains photographs taken from key viewpoints around the Crane Flat and Henness Ridge sites. The photographs provide a visual representation of the descriptions contained in the Scenic Resources section of Chapter 3. The viewpoint from which the photograph was taken, as well as a brief description of the view, is provided for each photograph. Figures are provided at the end to show the locations and direction of each viewpoint.

CRANE FLAT PHOTOGRAPHS

Photo CF-1: View of buildings and parking lot at Crane Flat entrance off Tioga Road from Viewpoint A

Photo CF-2: View of parking area and disturbance along Tioga Road from Viewpoint B

Photo CF-3: View to south of Tioga Road adjacent to Crane Flat from Viewpoint C

Photo CF-4: View of old wellhead and a social trail leading to the campus from Viewpoint D

HENNESS RIDGE PHOTOGRAPHS

Photo HR-1: View of Henness Ridge Road and roadside embankments at entrance to the site from Viewpoint B

Photo HR-2: View of sand shed on south side of Henness Ridge Road from Viewpoint B

Photo HR-3: View to north of Wawona Road adjacent to Henness Ridge site from Viewpoint D

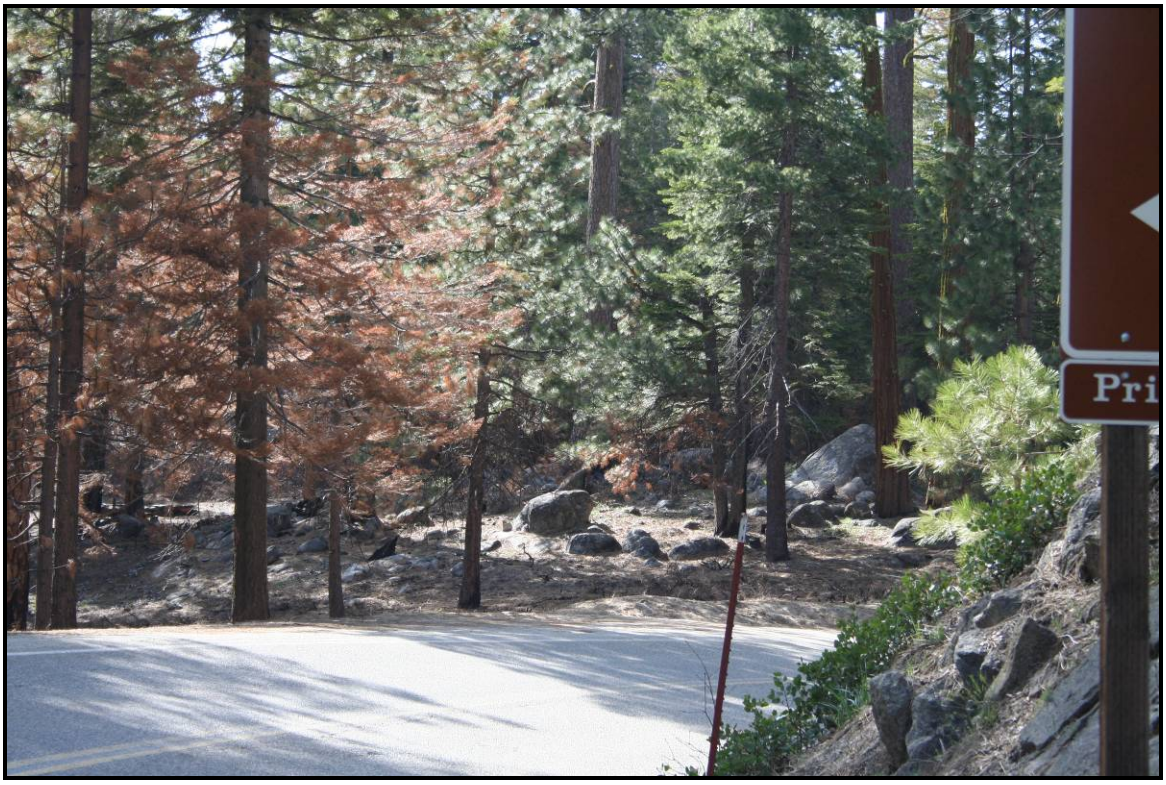

Photo HR-4: Looking north toward Henness Ridge site from Viewpoint F

Photo HR-5: View of vegetation and clearing disturbances at Yosemite West Road-Henness Ridge Road intersection from Viewpoint G

Appendix F:
Air Quality Impact

AIR QUALITY

This appendix provides background information on air quality to support the air quality analysis in Chapter 3 of the Environmental Impact Statement. Results of vehicle emission modeling (URBEMIS) and energy use emissions are provided at the end of this appendix.

ATTAINMENT/NONATTAINMENT DESIGNATIONS

The U.S. Environmental Protection Agency and the California Air Resources Board designate whether counties in California are in attainment of federal and state (respectively) ambient air quality standards for criteria air pollutants. **Table 1** shows the current attainment status of Tuolumne and Mariposa Counties. As shown in **Table 1**, portions of Tuolumne and Mariposa Counties located within Yosemite National Park are designated nonattainment for national and state ozone standards. The portion of Mariposa County within Yosemite National Park is also designated nonattainment for the state particulate matter (PM-10) standard. Both counties are designated either attainment or unclassified for the remaining national and state standards.

While air quality in a given air basin is usually determined by emission sources within the basin, it also can be affected by pollutants transported from upwind air basins by prevailing winds. For descriptive purposes, emissions sources are typically categorized as stationary, mobile, or area. Generally, stationary sources refer to emissions sources associated with industrial or commercial processes; mobile sources refer to on-road and off-road motor vehicles; and area sources refer to a wide range of sources that are individually minor but are more substantial in the aggregate. Consumer use of paints and pesticides is an example of an area source. Another category of emissions sources is referred as a "fugitive" source. Fugitive sources refer to those sources that emit pollutants to the atmosphere through some means other than through a smokestack or tailpipe. A vehicle traveling over an unpaved road is an example of a fugitive source of dust.

Table 1. Tuolumne and Mariposa Counties Attainment/Nonattainment Designations

Pollutant	National	State
Tuolumne County		
Ozone	Nonattainment	Nonattainment
Particulate Matter (PM-10)	Unclassified	Unclassified
Fine Particulate Matter (PM-2.5)	Attainment/Unclassified	Unclassified
Carbon Monoxide	Attainment/Unclassified	Attainment
Nitrogen Dioxide	Attainment/Unclassified	Attainment
Sulfur Dioxide	Unclassified	Attainment
Lead (Particulate)	No Designation	Attainment
Mariposa County		
Ozone	Nonattainment	Nonattainment
Particulate Matter (PM-10)	Unclassified	Nonattainment*
Fine Particulate Matter (PM-2.5)	Attainment/Unclassified	Unclassified
Carbon Monoxide	Attainment/Unclassified	Unclassified
Nitrogen Dioxide	Attainment/Unclassified	Attainment
Sulfur Dioxide	Unclassified	Attainment
Lead	No Designation	Attainment

Designation applies to the portion of Mariposa County that lies within Yosemite National Park.
Source: CARB 2008

Estimated air emissions from sources located within Yosemite Valley for the year 1998, which is the most current year for which emissions inventory data is available, are summarized in **Table 2**.

Table 2. Estimated Air Emissions in Yosemite Valley (1998)

Source	Emissions (tons/year)					
	PM-2.5	PM-10	CO	SO2	NO2	VOC
Stationary Sources						
Fuel Oil Boilers/Furnaces	0.2	0.3	1.2	1.7	4.8	0.1
Liquid Propane Gas Heating/Cooking	0.1	0.1	0.3	0.0	1.8	0.1
Generators	0.3	0.3	1.1	0.3	4.9	0.3
Fireplaces	1.4	1.5	11.1	0.0	0.1	10.1
Fuel Storage Tanks/Refueling	0.0	0.0	0.0	0.0	0.0	1.6
Subtotal	**2.0**	**2.2**	**13.7**	**2.0**	**11.6**	**12.2**
Area Sources						
Campfires	6.0	6.5	53.2	0.0	0.0	7.2
Subtotal	**6.0**	**6.5**	**53.2**	**0.0**	**0.0**	**7.2**
Mobile Sources						
Visitor and Employee Vehicles, Buses, NPS, and Concessioner Vehicles	—	167.5	568.2	6.3	84.2	50.9
Total	**8.0**	**176.2**	**635.1**	**8.3**	**95.8**	**70.3**

PM-2.5/PM-10=particulate matter less than 2.5 microns and 10 microns, respectively; CO=carbon monoxide; SO2=sulfur dioxide; NO2=nitrogen dioxide; VOC=volatile organic compounds.
Source: NPS 2000

AIR QUALITY MONITORING DATA

Federal, state, and local agencies operate a network of monitoring stations throughout California to provide data on ambient concentrations of air pollutants. **Table 3** summarizes recent monitoring data from monitoring stations in the vicinity of Crane Flat and Henness Ridge. Ozone levels are measured at the Turtleback Dome monitoring station, which is located approximately six miles east of Crane Flat at approximately 5,300 feet above sea level. The nearest PM-10 measurements are taken at the Yosemite Village monitoring station in Yosemite Valley (approximately 4,000 feet above sea level). As shown in **Table 3**, exceedances of state and national standards for ozone and state standards for PM-10 have been recorded on occasion within the last five years of available data (i.e., 2002–2006). In addition, the ozone standard has recently been lowered to .075 ppm that may lead to more exceedances in the future.

Table 3 indicates that ozone concentrations in the park exceed the state standard on an average of four to 15 days per year. Elevated ozone concentrations are a summertime phenomenon, with most of the exceedances of the state standard in July, August, and September and only occasional exceedances in June and October. Ozone concentrations in Yosemite National Park are largely a function of pollutant transport from the San Joaquin Valley, Sacramento, and, to a lesser extent, the San Francisco Bay Area.

Table 3 shows that exceedances of the state 24-hour-average PM-10 standard occurred during all five years for which data are available (i.e., 2002–2006) in Yosemite Village. No exceedances of the less stringent national 24-hour standard of 150 micrograms per cubic meter were either measured or estimated to occur during the last five years of available data. Measured annual concentrations also exceeded the state's annual PM-10 standard of 20 micrograms per cubic meter during the years 2002 and 2003. Annual data for the remaining years (i.e., 2004–2006) is currently unavailable.

Table 3. Recent Ozone and PM-10 Concentration Data for Yosemite National Park

Pollutant	National Standard	State Standard	Monitoring Data By Year*				
			2002	2003	2004	2005	2006
Ozone Monitoring Data							
Station: Yosemite National Park–Turtleback Dome							
Highest 1-hour average, ppm	NA	0.09	**0.106**	**0.135**	**0.137**	**0.105**	**0.100**
Days over state standard*			15	6	6	6	4
Days over national standard			0	1	1	0	0
Highest 8-hour average, ppm	0.08	0.07	**0.095**	**0.102**	**0.089**	**0.085**	**0.084**
Days over national standard			24	10	8	5	3
Particulate Matter (PM-10) Monitoring Data							
Station: Yosemite Village–Visitor Center							
Highest 24-hour average, $\mu g/m^3$ (national/state)**	150	50	76/**72**	66/**58**	133/**124**	78/**73**	104/**97**
Days over state standard (measured/estimated)***			3/18	1/5.8	2/ND	2/ND	2/ND
Days over national standard (measured/estimated)			0/0	0/0	0/0	0/0	0/0
Annual geometric mean, $\mu g/m^3$ (national/state)**	NA	20	26	21	ND	ND	ND

*"Days over standard" refers to the number of days in a given year during which the ozone concentration over at least one hour exceeded the hourly state or national standard.

**State and national statistics may differ due to variations in sampling equipment, locations, references and equivalent methods.

***PM-10 is usually measured every sixth day (rather than continuously like other pollutants). Measured days is based on days that a measurement was greater than the standard. Estimated days mathematically estimates how many days concentrations would have been greater than the level of the standard had each day been monitored.

NA = Not applicable; ND = No data available; ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter. Values shown in **bold** type exceed the applicable standard.

Source: CARB 2008

REFERENCES

California Air Resources Board (CARB)

2008 Available on the Internet at <http://www.arb.ca.gov/homepage.htm>.

National Park Service (NPS)

2000 *Final Yosemite Valley Plan/Supplemental Environmental Impact Statement.* Yosemite National Park, November.

8/7/2008 12:00:07 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\Kurt Legleiter\Application Data\Urbemis\Version9a\Projects\Yosemite Institute Alt 1.urb924

Project Name: Yosemite Institute - Alt 1

Project Location: Mountain Counties Air Basin

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.00	0.00	0.00	0.00	0.00	0.00	3.23

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.03	0.10	0.36	0.00	0.05	0.01	42.80

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.03	0.10	0.36	0.00	0.05	0.01	46.03

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00	3.23
Hearth							
Landscape							
Consumer Products							
Architectural Coatings							
TOTALS (tons/year, unmitigated)	0.00	0.00	0.00	0.00	0.00	0.00	3.23

Area Source Changes to Defaults

Cords of wood burned per year per wood fireplace changed from 0.28 cords per year to 12 cords per year

Days used per year per wood stove changed from 82 days to 243 days

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Yosemite Institue	0.03	0.10	0.36	0.00	0.05	0.01	42.80
TOTALS (tons/year, unmitigated)	0.03	0.10	0.36	0.00	0.05	0.01	42.80

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

8/7/2008 12:00:07 PM

Analysis Year: 2010 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Yosemite Institue		9.94	1000 sq ft	2.21	21.97	162.40
					21.97	162.40

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	45.0	2.4	97.0	0.6
Light Truck < 3750 lbs	0.0	4.1	86.5	9.4
Light Truck 3751-5750 lbs	0.0	1.5	98.0	0.5
Med Truck 5751-8500 lbs	37.0	1.1	97.8	1.1
Lite-Heavy Truck 8501-10,000 lbs	0.0	0.0	64.0	36.0
Lite-Heavy Truck 10,001-14,000 lbs	0.0	0.0	41.7	58.3
Med-Heavy Truck 14,001-33,000 lbs	0.0	11.1	22.2	66.7
Heavy-Heavy Truck 33,001-60,000 lbs	0.0	0.0	0.0	100.0
Other Bus	18.0	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	0.0	67.2	32.8	0.0
School Bus	0.0	0.0	0.0	100.0
Motor Home	0.0	5.0	85.0	10.0

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	50.0	20.0	20.0
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Yosemite Institue				2.0	1.0	97.0

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\Kurt Legleiter\Application Data\Urbemis\Version9a\Projects\Yosemite Institute Alt 2.urb924

Project Name: Yosemite Institute - Alt 2

Project Location: Mountain Counties Air Basin

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.00	0.04	0.04	0.00	0.00	0.00	50.47

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.11	0.55	0.96	0.00	0.20	0.05	193.82

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.11	0.59	1.00	0.00	0.20	0.05	244.29

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.00	0.04	0.04	0.00	0.00	0.00	50.47
Hearth							
Landscape							
Consumer Products							
Architectural Coatings							
TOTALS (tons/year, unmitigated)	0.00	0.04	0.04	0.00	0.00	0.00	50.47

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Yosemite Institue	0.11	0.55	0.96	0.00	0.20	0.05	193.82
TOTALS (tons/year, unmitigated)	0.11	0.55	0.96	0.00	0.20	0.05	193.82

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2010 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Yosemite Institue		0.81	1000 sq ft	34.57	28.00	576.84
					28.00	576.84

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	36.0	2.4	97.0	0.6
Light Truck < 3750 lbs	0.0	4.1	86.5	9.4
Light Truck 3751-5750 lbs	0.0	1.5	98.0	0.5
Med Truck 5751-8500 lbs	28.0	1.1	97.8	1.1
Lite-Heavy Truck 8501-10,000 lbs	0.0	0.0	64.0	36.0
Lite-Heavy Truck 10,001-14,000 lbs	0.0	0.0	41.7	58.3
Med-Heavy Truck 14,001-33,000 lbs	0.0	11.1	22.2	66.7
Heavy-Heavy Truck 33,001-60,000 lbs	0.0	0.0	0.0	100.0
Other Bus	36.0	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	0.0	67.2	32.8	0.0
School Bus	0.0	0.0	0.0	100.0
Motor Home	0.0	5.0	85.0	10.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Rural Trip Length (miles)	16.8	7.1	7.9	50.0	20.0	20.0
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Yosemite Institue				2.0	1.0	97.0

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\Kurt Legleiter\Application Data\Urbemis\Version9a\Projects\Yosemite Institute Alt 3.urb924

Project Name: Yosemite Institute - Alt 3

Project Location: Mountain Counties Air Basin

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.00	0.06	0.05	0.00	0.00	0.00	71.93

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.12	0.55	0.95	0.00	0.19	0.05	190.98

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.12	0.61	1.00	0.00	0.19	0.05	262.91

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.00	0.06	0.05	0.00	0.00	0.00	71.93
Hearth							
Landscape							
Consumer Products							
Architectural Coatings							
TOTALS (tons/year, unmitigated)	0.00	0.06	0.05	0.00	0.00	0.00	71.93

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Yosemite Institue	0.12	0.55	0.95	0.00	0.19	0.05	190.98
TOTALS (tons/year, unmitigated)	0.12	0.55	0.95	0.00	0.19	0.05	190.98

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2010 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Yosemite Institue		0.56	1000 sq ft	49.27	27.59	568.38
					27.59	568.38

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	36.0	2.4	97.0	0.6
Light Truck < 3750 lbs	0.0	4.1	86.5	9.4
Light Truck 3751-5750 lbs	0.0	1.5	98.0	0.5
Med Truck 5751-8500 lbs	28.0	1.1	97.8	1.1
Lite-Heavy Truck 8501-10,000 lbs	0.0	0.0	64.0	36.0
Lite-Heavy Truck 10,001-14,000 lbs	0.0	0.0	41.7	58.3
Med-Heavy Truck 14,001-33,000 lbs	0.0	11.1	22.2	66.7
Heavy-Heavy Truck 33,001-60,000 lbs	0.0	0.0	0.0	100.0
Other Bus	36.0	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	0.0	67.2	32.8	0.0
School Bus	0.0	0.0	0.0	100.0
Motor Home	0.0	5.0	85.0	10.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4

8/7/2008 12:06:37 PM

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Rural Trip Length (miles)	16.8	7.1	7.9	50.0	20.0	20.0
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Yosemite Institue				2.0	1.0	97.0

EMISSIONS SUMMARY

	TONS/YEAR			
	VOC	NOX	PM10	PM2.5
YOSEMITE VALLEY (TOTAL)	70.3	95.8	176.2	8
ALT 1				
MOBILE	0.03	0.1	0.05	0.01
ELECTRICITY USE	0.00	0.02	0.00	0.00
GAS USE	0.00	0.00	0.00	0.00
HEARTH	1.69	0.02	0.26	0.25
TOTAL	1.72	0.14	0.31	0.26
ALT 2				
MOBILE	0.11	0.55	0.20	0.05
ELECTRICITY USE	0.00	0.01	0.00	0.00
GAS USE	0.00	0.04	0.00	0.00
HEARTH	0.00	0.00	0.00	0.00
TOTAL	0.11	0.60	0.20	0.05
CHANGE:	-1.61	0.46	-0.11	-0.21
ALT 3				
MOBILE	0.12	0.55	0.19	0.05
ELECTRICITY USE	0.00	0.01	0.00	0.00
GAS USE	0.00	0.06	0.00	0.00
HEARTH	0.00	0.00	0.00	0.00
TOTAL	0.12	0.62	0.19	0.05
CHANGE:	-1.60	0.47	-0.12	-0.21

ALTERNATIVE 1 : SPACE HEATING-WOOD HEARTH

HEAT SOURCE:	WOOD-BURNING HEARTH	
RATE	12	CORDS
LBS/CORD	2458	
AVG. TONS/YR WOOD USE:	14.75	

	ANNUAL EMISSIONS (TONS/YR)					
	ROG	NOX	CO	SO2	PM10	PM2.5
WOOD-HEARTH EMISSION FACTORS (LBS/TON)	229	2.6	252.6	0.4	34.6	33.3
EMISSIONS (TONS/YR)	1.69	0.02	1.86	0.00	0.26	0.25

Wood-burning emissions were calculated based on emission factors derived from the URBEMIS2007 computer program and usage rates provided by NPS. CO2e expressed in metric tons/year.

ELECTRICITY USAGE

	DAILY USAGE RATE				Estimated	Est. Offsite	Estimated Annual Emissions (tons/year)			
	SUMMER	WINTER	ANNUAL (Estimated)		PV Cell Capture	Demand	ROG	NOX	PM10	PM2.5
	kw-hr/day	kw-hr/day	kw-hr/yr	mw-hr/yr	percent	mw-hr/yr				
ALT 1	70	140	36960	36.96	0	36.96	0.0002	0.0213	0.0000	0.0000
ALT 2	70	140	36960	36.96	0.5	18.48	0.0001	0.0106	0.0000	0.0000
ALT 3	172	343	90640	90.64	0.9	9.064	0.0000	0.0052	0.0000	0.0000

Based on usage rates provided by NPS; Alt 3 assumes 90 percent of electricty usage would be provided by onsite PV cells.

Emission Factors (lbs/mw-hr)	
ROG	0.01
NOX	1.15
PM10	0.04
PM2.5	0.04

Source: South Coast Air Quality Management District 1993 CEQA Air Quality Handbook

Appendix G:
State Historic Preservation Officer Concurrence

STATE OF CALIFORNIA – THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov

March 25, 2009 In reply refer to: NPS090202A

David V. Uberuaga
Acting Superintendent
Yosemite National Park
P.O. Box 577
Yosemite, CA 95389

Re: Determination of Eligibility for Four Buildings at Yosemite Institute Campus, Crane Flat, Yosemite National Park

Dear Mr. Uberuaga:

Thank you for your letter of 29 January 2007 requesting my comment and concurrence for the Determination of Eligibility for four buildings at the Yosemite Institute Campus at Crane Flat in Yosemite National Park. You are consulting with me in order to comply with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f), as amended, and its implementing regulation at 36 CFR Part 800.

The National Park Service (NPS) commissioned a Historic Resources Assessment (HRA) of these buildings at Crane Flat, which was completed by Environmental Science Associates and Architectural Resources Group in 2004. In this report, NPS concludes that these four buildings (Building numbers 6013, 6014, 6015, and 6017) are individually eligible for listing in the National Register of Historic Resources (NRHP).

- Buildings 6013 and 6017 appear eligible under Criterion A for their association with the Civilian Conservation Corps (CCC) from 1934 to 1943, and with the Blister Rust camp at the same site from 1946 to 1967.

- Buildings 6014 and 6015 appear eligible for listing in the NRHP under Criterion A for their association with the Blister Rust camp from 1946 to 1967.

- The HRA contends that all four buildings retain historic integrity.

I concur with the determination of eligibility for all four buildings. The significance of Buildings 6013 and 6017 through their construction and use by the CCC is clearly stated. I also concur that all four buildings are also significant for their use as the base camp for the NPS efforts to fight blister rust between 1946 and 1967.

However, the HRA could have made a stronger argument for this second period of significance by detailing the threat posed to the park and lumber industry by the blister rust as well as the importance of early efforts to eradicate the *Ribes* species (especially black currants) from the park as a method of controlling blister rust. This information would provide a better context for the role the buildings at Crane Flat played in the eradication efforts and why they are significant and eligible for the NRHP.

Thank you for seeking my comments and considering historic properties as part of your planning. If you have any questions or concerns, please contact Mark Beason, Project Review Unit historian, at (916) 653-8902 or mbeason@parks.ca.gov.

Sincerely,

Susan K Stratton for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

MWD:mb

Appendix H:
Traffic Impact Analysis Report

Transportation Impact Analysis Report (TIAR) for the Yosemite Institute – SWCA Environmental Consultants

Draft Report

Prepared For:

SWCA ENVIRONMENTAL CONSULTANTS

Prepared By:

omni · means ENGINEERS · PLANNERS

TRANSPORTATION IMPACT ANALYSIS REPORT (TIAR)
FOR THE YOSEMITE INSTITUTE

DRAFT REPORT

Prepared For:
SWCA Environmental Consultants

Prepared By

OMNI-MEANS, LTD.
ENGINEERS & PLANNERS
3530 Mineral King Avenue, Suite A
Visalia, California 93291
(559) 734-5895

July 2008

55-6236-04
(R1216TIS001.DOC)

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FIGURES

TABLES

INTRODUCTION

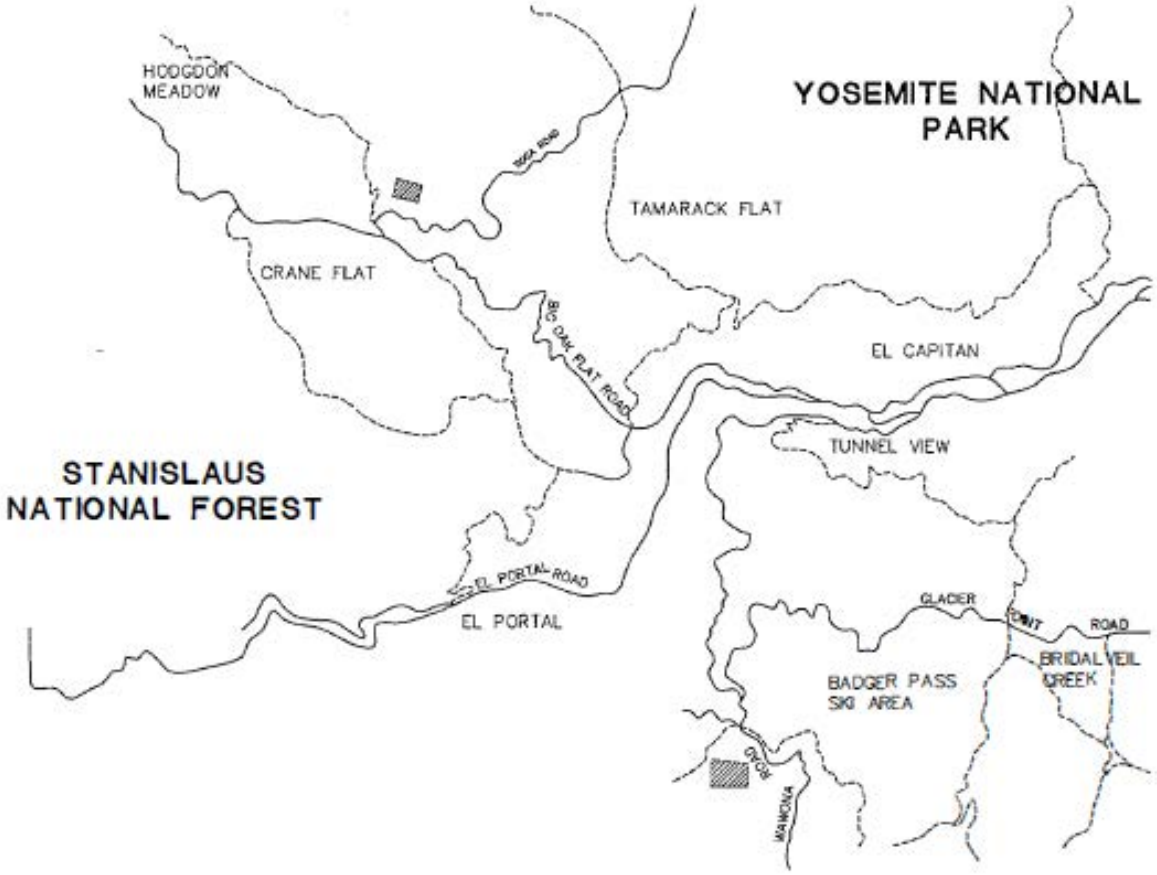
This report has been prepared to present the results of a traffic impact analysis report (TIAR) performed by OMNI-MEANS for a proposed construction of an educational campus in or near the Yosemite National Park. This TIAR acts as a supporting document for the Yosemite Institute Environmental Impact Statement (EIS) prepared by SWCA Environmental Consultants. Two sites (Henness Ridge and Crane Flat) have been identified for the location of the educational facility. The term "project", as used in this report, refers to the proposed construction of a 250 bed educational facility and support buildings. The project vicinity map is shown on Figure 1.

The project sites, including the existing Crane Flat campus and the proposed Henness Ridge site, are generally located near the western edge of Yosemite National Park. The Crane Flat campus is located approximately 15 miles from Yosemite Valley and approximately one mile from the Tuolumne Grove of Giant Sequoias. The existing facilities at the Crane Flat campus include remaining buildings from a summer camp for the Civilian Conservation Corps, the parks Old Blister Rust Camp, buildings moved to the site after World War II and other miscellaneous structures. The Crane Flat campus currently has 84 overnight accommodations and provides food service in structures owned by the National Park Service and operated by Yosemite Institute. The Crane Flat campus site is located northwest of Yosemite Valley near the intersection of Tioga Road and Big Oak Flat Road (State Route 120) and is situated in a mixed fir forest at an elevation of approximately 6,200 feet.

The Henness Ridge site is located just west of the intersection of Wawona Road (State Route 41) and Henness Ridge Drive at approximately 6,000 feet elevation. The site is also near the western park boundary and is neighbored by the Mariposa County community of Yosemite West and is surrounded by private forested lands to the north. The site is mostly undeveloped and is used to support National Park Service road maintenance activities. The site was historically logged and includes a railroad grade and remnants of the old Wawona Road. The existing dirt roads currently provide for informal access to park features such as a historic fire tower and nearby forest. The site provides a winter wilderness experience, secluded from high-use visitor areas, as well as a high country experience to all visiting students. Henness Ridge is located near Eleven-mile Meadow, Monroe Meadow and Dear Camp Trailhead.

Yosemite Institute proposes the construction of a 250 bed environmental education campus with associated support facilities. The new campus would provide improved facilities and services to students and would aid in fulfilling the National Park Service educational mission. The campus seeks to create a learning center that immerses students in the Yosemite experience to inspire them to become life-long stewards of the Park and the environment. To achieve this, the facility would be designed to house students for multi-night visits in a location separated from the other types of existing development but within walking distance of the natural and cultural resources that define the Park.

In this report the analysis of the project was assumed to occur at each site. For example, under "Project" conditions, the proposed project was assumed to take place at the Crane Flat campus and at the Henness Ridge site even though that will not be the case because only one project location will be developed. These two sites are far enough apart in distance that development of one site would have minimal impacts on the other site. The purpose of providing the "Project" scenarios together was done to consolidate the two alternatives and prepare only one report for the same project.



LEGEND

STUDY AREA

Yosemite Institute Environmental Impact Statement Figure 1

Vicinity Map

EXISTING ROADWAY SYSTEM

Roadways that provide primary circulation in the vicinity of the project sites include Big Oak Flat Road, Glacier Point Road, Henness Ridge Drive, Tioga Road and Wawona Road. Explanations of each road segment are listed below.

Big Oak Flat Road is a regional two-lane State Highway that provides for east-west travel within Yosemite National Park. Outside the park, this road connects to Highway 120. Big Oak Flat Road is about 18 miles long. It leads from the Big Oak Flat Entrance Station through Hodgdon Meadow and Crane Flat and intersects the El Portal Road one mile downstream from Pohono Bridge on the Valley floor (the Big Oak Flat Road also provides access to the Valley from the Tioga Pass Entrance). Big Oak Flat Road may be used as a through route in conjunction with other major park roads and is maintained for year-round access. The topography changes from mountainous on the east end of the road to rolling at the west end. The paved roadway width ranges from 26 to 30 feet.

Glacier Point Road is a winding two-lane roadway that can only be accessed from Wawona Road. The roadway extends east from Wawona Road, past Badger Pass Ski Area, to Glacier Point. Glacier Point is best easily-accessed, high-elevation viewpoint of the Yosemite Valley. The park facilities are reached by a paved, 16 mile road that forks west from State Highway 41 at Chinquapin Junction, 8 miles south of the Wawona Tunnel entrance to Yosemite Valley, and 18 miles north of the southern entrance to the national park at Mariposa Grove. The surrounding land is generally quite densely forested with ponderosa pine but also has scattered grassy meadows, small lakes, streams and granite outcrops.

Henness Ridge Drive is a winding two-lane local road that is accessed from Wawona Road. The roadway extends from Wawona Road to the community of Incline, some 16 miles to the west. The roadway ranges between 22 and 26 feet wide and is provides primary access for residential lots, logging, campsites and park operations. The Henness Ridge campus site is proposed to be accessed from Henness Ridge Drive, approximately 500 feet west of Wawona Road.

Tioga Road (State Route 120) is a two-lane regional highway that accesses east-west travel through Yosemite National Park. The roadway varies between 28 and 34 feet wide and is considered a Class 1 park road. Tioga Road terminates at State Route 49 west of Stanislaus National Forest and continues east to State Route 395 near Mono Lake. Primarily access from Tioga Road within the Park consists of rural communities, logging, campsites and park activities. Tioga Road provides the only access to the park from the east and accommodates trans-Sierra traffic while it is open during the summer and early fall months. No access is available during the winter season. The road extends from the Tioga Pass Entrance on the east to the intersection with Big Oak Flat Road at Crane Flat on the west. The road provides direct access to the high Sierra Nevada, Tuolumne Meadows, White Wolf, Crane Flat, and the rest of the park via connections with other roads. The road is characterized by rolling sub alpine highlands, with sections of mountainous terrain, valley flats, and sub alpine meadows. At 9,945 feet above sea level, Tioga Pass is the highest elevation traversed by any road in the park.

Wawona Road (State Route 41) is approximately 27 miles long within the park. At the south park boundary, this road connects to State Highway 41. Wawona Road is the principal access to Wawona, Mariposa Grove, Badger Pass Ski Area, Glacier Point, and Yosemite Valley and

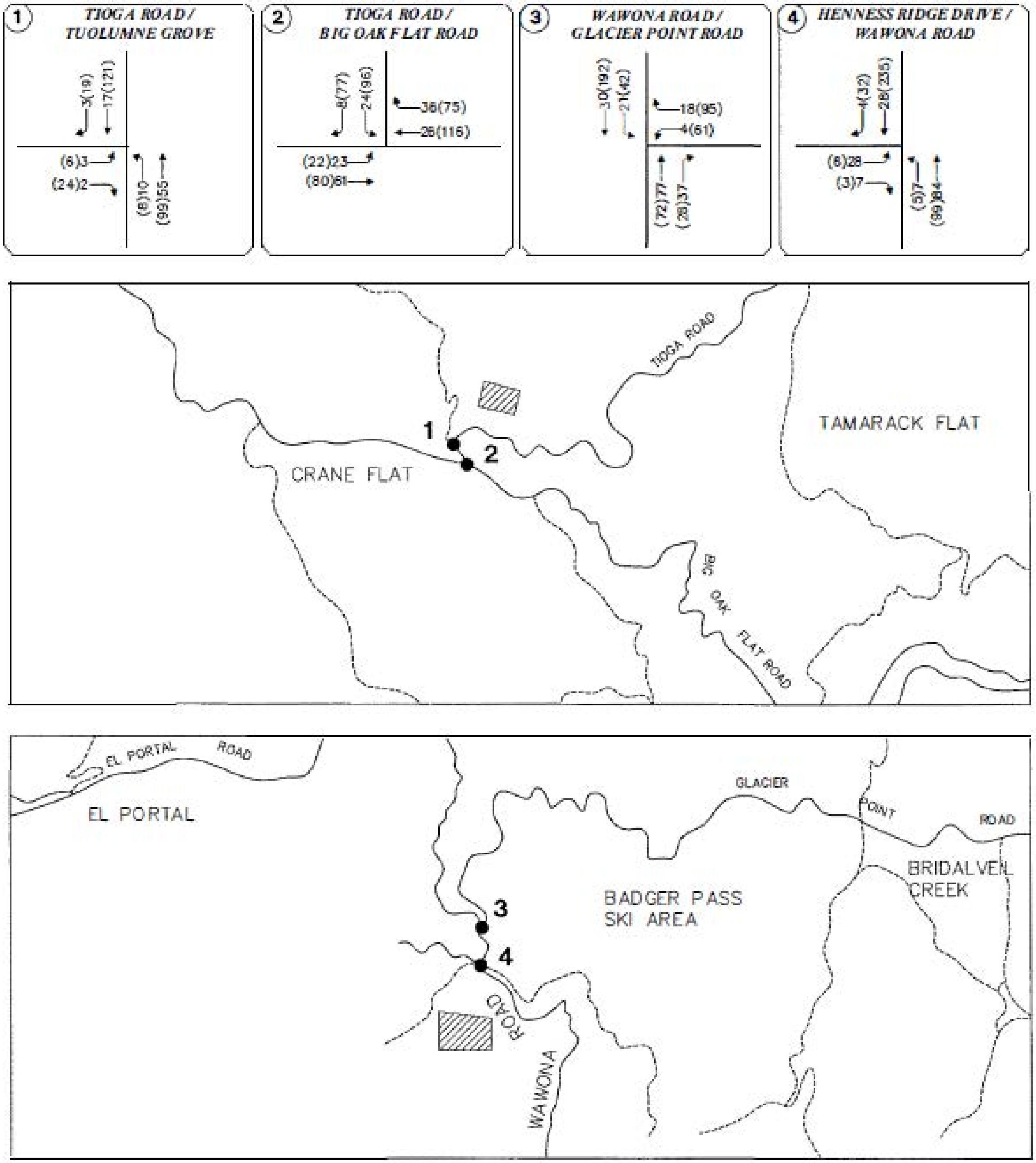
is maintained for year-round access. Throughout its length, the 24-foot-wide road travels over mountainous terrain with steep grades and is surrounded by moderate to dense forest. The Henness Ridge campus site is proposed to be accessed from Henness Ridge Drive, approximately 500 feet west of Wawona Road.

EXISTING TRAFFIC VOLUMES

Based upon conversations with project partners, four intersections were identified as critical intersections and were studied for the EIS. Traffic data was obtained from turning movement counts conducted in June of 2008. Future data was developed based upon historical data on neighboring state highways and is described in a subsequent section of this report. The four intersections were studied to determine the peak AM and PM turning movements. The following intersections were identified as a critical for this study:

- Tioga Road/Tuolumne Grove
- Tioga Road/Big Oak Flat Road
- Wawona Road/Glacier Point Road
- Wawona Road/Henness Ridge Drive
- Project Driveways

At the study intersections, existing weekday AM and PM peak-hour traffic volume counts were conducted by Metro Traffic Data, Inc., on June 17, 2008, during peak visitor period (i.e., during summer with all roads open). The AM peak hour is defined as one-hour of peak traffic flow counted between 7:00 AM and 9:00 AM and the PM peak hour is defined as one-hour of peak traffic flow counted between 4:00 PM and 6:00 PM. These peak periods were chosen due to anticipated arrivals and departures of the proposed educational facility. Figure 2 shows the existing AM and PM peak hour intersection traffic volumes and Figure 3 identifies existing lane geometrics and control at the study intersections.



LEGEND

STUDY AREA

● COUNT LOCATION

XX – AM PEAK HOUR VOLUMES

(XX) – PM PEAK HOUR VOLUMES

Yosemite Institute Environmental Impact Statement Figure 2

Existing Traffic Volumes

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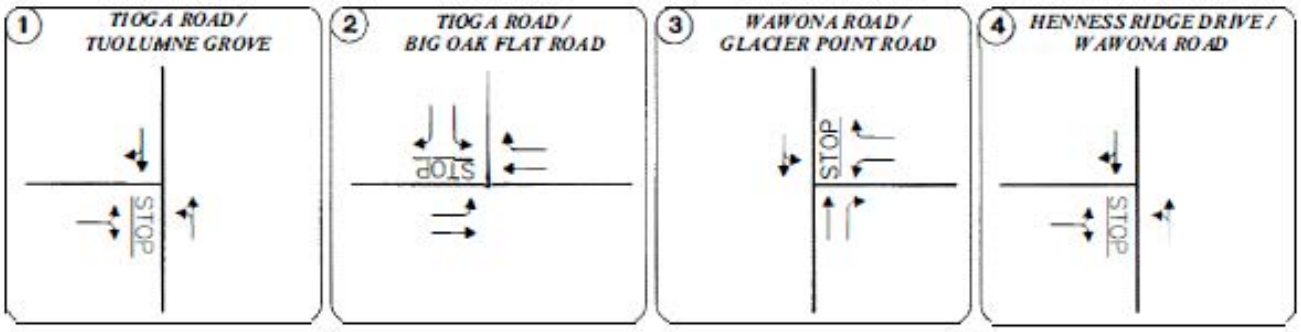
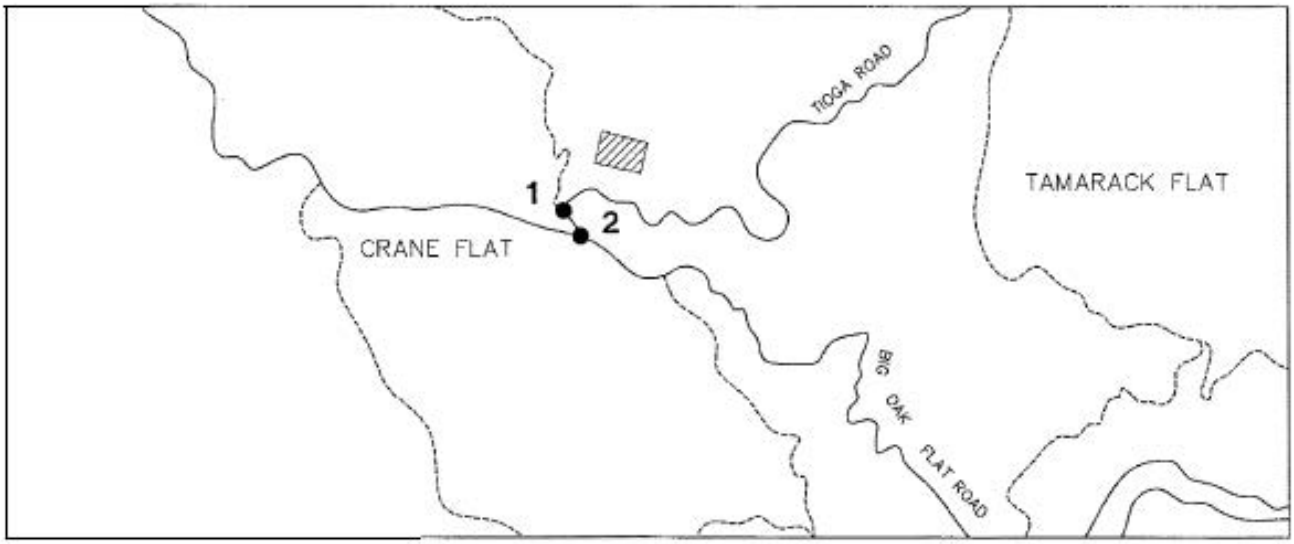
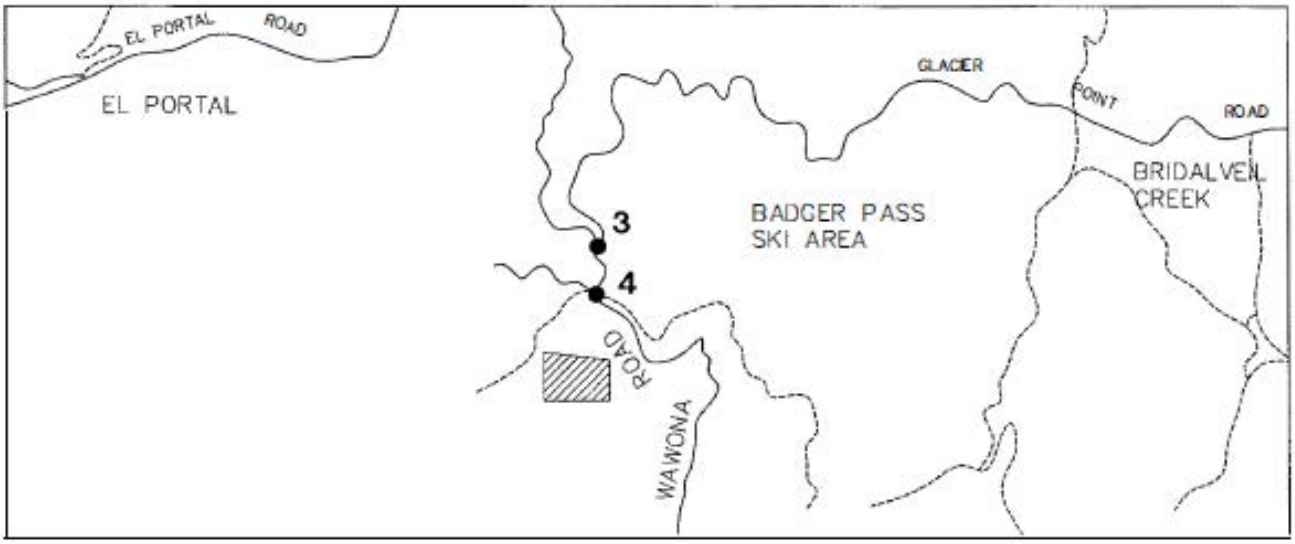






LEGEND

STUDY AREA — XX – AM PEAK HOUR VOLUMES

COUNT LOCATION — (XX) – PM PEAK HOUR VOLUMES

Yosemite Institute Environmental Impact Statement Figure 3

Existing Lane Geometrics and Control

LEVEL OF SERVICE METHODOLOGY

Traffic operations have been quantified through the determination of "Level of Service" (LOS). LOS is a qualitative measure of traffic operating conditions, whereby a letter grade "A" through "F" is assigned to an intersection or roadway segment representing progressively worsening traffic conditions. LOS was calculated for different intersection control types using the methods documented in the *2000 Highway Capacity Manual*. LOS definitions for different types of intersection controls are outlined in Table 1.

The Federal Highway Administration (FHWA) has designated LOS "C" as the minimum acceptable LOS standard on federal facilities in general[1]. However, discussions with the FHWA indicated that LOS standards vary by facility type, i.e., urban freeways, mountainous roads, etc. In this report, a peak-hour LOS of "C" is taken as the threshold for acceptable traffic operations at the study intersections. All intersection turning movement volumes and LOS worksheets are contained in the Appendix.

To determine whether "significance" should be associated with unsignalized intersection LOS, a supplemental traffic signal warrant analysis was also performed. The signal warrant criteria employed for this study are presented in the *Manual on Uniform Traffic Control Devices* (MUTCD). Specifically, this study utilized the Peak-Hour Volume Warrant 3 for Rural Areas. Though utilization of this warrant may indicate that signalization would be required, the final decision to provide this improvement should be based upon further studies utilizing the additional warrants presented in the MUTCD.

Actual peak hour factors (PHF) were calculated using the peak hour count data. The analysis of LOS is based upon peak rates of flow occurring within the peak hour because substantial short-term fluctuations typically occur during an hour. Common practice is to use a peak 15-minute rate of flow. Flow rates are usually expressed in vehicles per hour, not vehicles per 15 minutes. The relationship between the peak 15-minute flow rate and the full hourly volume is given by the PHF as shown in the following equation:

$$PHF = \frac{\text{Hourly volume}}{\text{Peak rate of flow within the hour}}$$

When 15-minute periods are used, the PHF is computed as:

$$PHF = V / (4 \times V_{15})$$

Where:

V = peak-hour volume (vph)
V_{15} = volume during the peak 15 minutes of flow (veh/15 minutes)

Typical peak-hour factors for freeways range between 0.80 and 0.95. Lower factors are more typical for rural freeways or off-peak conditions. Higher factors are typical of urban and suburban peak-hour conditions. At the study intersections in Yosemite National Park, the AM PHF ranged between 0.72 and 0.80 and the PM PHF ranged between 0.81 and 0.95.

Heavy vehicle percentages were also applied to the capacity analysis. AM and PM heavy vehicle percentages were developed based upon data collected during the peak hour analysis. Heavy vehicles include large trucks and motor homes. AM peak hour heavy vehicle percentages ranged between 4 and 9 while the PM peak hour heavy vehicle percentages ranged between 3 and 7.

1 *Maiser Khaled, Director National Programs – FHWA California Division*

TABLE 1
LEVEL OF SERVICE CRITERIA
FOR INTERSECTIONS

LEVEL OF SERVICE	TYPE OF FLOW	DELAY	MANEUVERABILITY	STOPPED DELAY/VEHICLE (SEC)		
				SIGNALIZED	UNSIGNALIZED	ALL-WAY STOP
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	≤ 10.0	≤ 10.0	≤ 10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10 and ≤ 20.0	>10 and ≤ 15.0	>10 and ≤ 15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted	>20 and < 35.0	>15 and < 25.0	>15 and < 25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35 and ≤ 55.0	>25 and ≤ 35.0	>25 and ≤ 35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55 and < 80.0	>35 and < 50.0	>35 and < 50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	> 80.0	> 50.0	> 50.0

References: 2000 Highway Capacity Manual

EXISTING TRAFFIC OPERATIONS

Existing peak-hour intersection traffic operations were quantified applying existing traffic volumes and existing intersection lane geometrics and control identified in Figures 2 and 3. Table 2 presents the existing AM and PM peak hour intersection LOS.

TABLE 2
EXISTING CONDITIONS:
INTERSECTION LEVELS-OF-SERVICE

			AM Peak Hour			PM Peak Hour		
No	**Intersection**	**Control Type**	**Delay (sec/veh)**	**LOS**	**Warrant Met?**	**Delay (sec/veh)**	**LOS**	**Warrant Met?**
1	Tioga Road/Tuolumne Grove	TWSC	8.9	A	No	9.6	A	No
2	Tioga Road/Big Oak Flat Road	TWSC	9.4	A	No	10.2	B	No
3	Wawona Road/Glacier Point Road	TWSC	9.1	A	No	10.3	B	No
4	Henness Ridge Drive/Wawona Road	TWSC	9.6	A	No	10.6	B	No

Legend: *TWSC = Two-Way Stop Control.*
Average Delay = Worst-Case Intersection Movement Delays for TWSC Intersections.
LOS = Worst-Case Movement Level-of-Service for TWSC Intersections.
Warrant = MUTCD Peak-Hour Warrant-3.

As indicated in Table 2, all of the study intersections are currently operating at LOS "B" or better conditions during both AM and PM peak hour periods.

APPROVED/PENDING PROJECTS DESCRIPTION & TRIP GENERATION

Within the vicinity of the project, two projects have either been approved or are pending approval to be developed. Yosemite West development is an approved/pending project that includes 119 residential houses and condos that are located on Henness Ridge Drive west of the proposed Henness Ridge Campus. Total project trip generation is equal to 74 peak hour trips with a potential daily total of 838 trips. The average trip rate of 4.96 per unit was used with 52% entering and 48% exiting. The second approved/pending project includes 84 recreational homes with associated services located on the Big Oak Flat Road about five miles east of the proposed Crane Flat campus. The entire development is estimated to generate 596 daily trips, including 42 AM peak hour trips and 53 PM peak hour trips. The average weekday rate of 36.6 was used with varying in/out percentages.[2]

APPROVED/PENDING PROJECTS TRIP NATURE, DISTRIBUTION, AND ASSIGNMENT

The approved/pending projects are expected to "generate" trips to the traffic network or from other locations within and beyond Yosemite National Park. Directional trip distribution for approved/pending projects generated trips were estimated based upon use of historical trip distribution patterns, existing traffic flow patterns, geographic location of the project sites and location of other similar destinations. The following identifies approved/pending projects trip distribution for the proposed Yosemite Cascades development:

- 30% to/from Tioga Road north of Big Oak Flat Road
- 40% to/from Big Oak Flat Road west of Tioga Road
- 30% to/from Big Oak Flat Road east of Tioga Road

2 *Traffic Impact Analysis of Proposed Yosemite Cascades Development in Mariposa County* (TJKM Transportation Consultants – October 25, 2005).

The following identifies approved/pending projects trip distribution for the proposed Yosemite West development:

- 35% to/from Wawona Road north of Henness Ridge Drive
- 40% to/from Wawona Road south of Henness Ridge Drive
- 20% to/from Glacier Point Road north of Wawona Road
- 5% to/from Henness Ridge Drive east of Wawona Road

Trip path assignments were developed based upon origin and destination of trips, location of intersections and driveways, access restrictions at the study intersections and driveways, and on-site circulation patterns.

EXISTING PLUS APPROVED/PENDING PROJECTS CONDITIONS

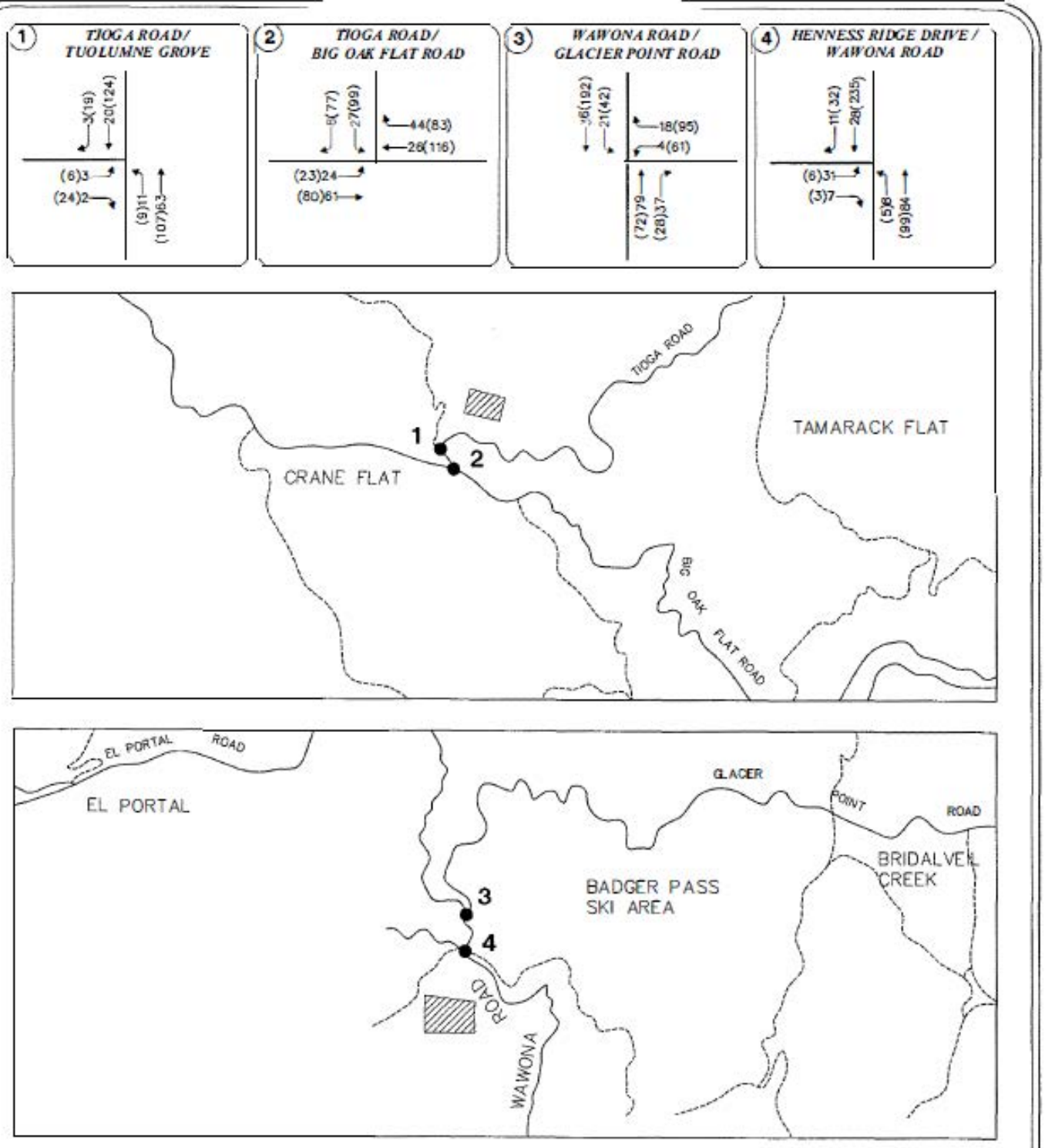
Applying *TRAFFIX 7.9* computer software, "Existing plus Approved/Pending Projects" peak hour traffic conditions were simulated by superimposing new trips generated by the "Approved/Pending Projects", as identified in Table 3, over "Existing" base traffic volumes at the study intersections. No improvements to the roadway system were assumed. The resulting "Existing plus Approved/Pending Projects" peak hour intersection traffic volumes are shown on Figure 4. Table 4 presents the resulting peak hour intersection LOS.

TABLE 3
EXISTING PLUS APPROVED/PENDING PROJECTS CONDITIONS:
INTERSECTION LEVELS-OF-SERVICE

			AM Peak Hour			PM Peak Hour		
No	**Intersection**	**Control Type**	**Delay (sec/veh)**	**LOS**	**Warrant Met?**	**Delay (sec/veh)**	**LOS**	**Warrant Met?**
1	Tioga Road/Tuolumne Grove	TWSC	9.0	A	No	9.7	A	No
2	Tioga Road/Big Oak Flat Road	TWSC	9.6	A	No	10.4	B	No
3	Wawona Road/Glacier Point Road	TWSC	9.5	A	No	10.6	B	No
4	Henness Ridge Drive/Wawona Road	TWSC	10.2	B	No	11.2	B	No

Legend: *TWSC = Two-Way Stop Control.*
Average Delay = Worst-Case Intersection Movement Delays for TWSC Intersections.
LOS = Worst-Case Movement Level-of-Service for TWSC Intersections.
Warrant = MUTCD Peak-Hour Warrant-3.

As indicated in Table 4, all study intersections are forecasted to operate at LOS "B" or better under "Existing plus Approved/Pending Projects" conditions during both AM and PM peak hour periods.



Yosemite Institute Environmental Impact Statement Figure 4

Existing plus Approved/Pending Projects Traffic Volumes

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PROJECT TRIP GENERATION

Project trip generation was developed based upon discussions with the Yosemite Institute and National Park Service.[3] Several assumptions and factors were considered while developing peak hour trip generation. For purposes of this analysis, OMNI-MEANS developed the worst case peak hour trip generation from the proposed project and applied it to the actual AM and PM peak hour traffic counts. Below is a summary of anticipated trip generators, including students, instructors, employees, and deliveries. Table 5 identifies peak hour trip generation for the proposed education facility.

At either site, the educational campus will house 250 students. According to sources, the summer months (June through August) average 2,250 students a month and the remainder of the year (September through May) average 1,500 students per month). School buses with a capacity of 50 students are used to transport the students to/from the Yosemite Valley. Therefore, five bus trips in and five bus trips out would account for student trips. In the busier summer months, students would typically switch sites between the educational facility and the Yosemite Valley on Wednesdays.

TABLE 4
PROJECT TRIP GENERATION

	Peak Hour	
Trip Generator	**Trips In**	**Trips Out**
Students (50/bus)	5	5
Instructors/Employees	5	5
Deliveries	4	4
Total Trips	**14**	**14**

It is anticipated that 16 instructors/employees would arrive/depart on the Wednesday that the students switch facilities. The instructors stay overnight at the facility with the students. Assuming two to three persons per vehicle (carpooling), five AM peak hour trips would arrive and five PM peak hour trips would depart.

In addition to student and instructor/employee trips, the educational facility receives deliveries during the week and the trips are consolidated mid-late morning between 9:30 AM and 3:00 PM. OMNI-MEANS has assumed a busy day with four deliveries at the educational facility. Again, these four deliveries per day were assumed to occur at the same time of the other trips in order to assess the worst case peak hour scenario.

PROJECT TRIP NATURE, DISTRIBUTION, AND ASSIGNMENT

The proposed project is expected to "produce" trips primarily on roadways within the Yosemite National Park (particularly from Yosemite Valley) and nearby unincorporated areas of Mariposa and Tuolumne Counties. Directional trip distribution for the two project sites were estimated based upon discussions with the Yosemite Institute and Yosemite National Park, existing traffic flow patterns, geographical location of the project site, capacity of adjacent roadways and alternative routes to the site, etc. All project driveways are proposed to allow for assigned trips into and out of the proposed project site. All four intersections are stop controlled "T" intersections.

Given the location of the project sites within Yosemite National Park, trip distribution was estimated for several directions, or gateways, including those on Big Oak Flat Road, Tioga Pass Road, Henness Ridge Drive, Glacier Point Road and Wawona Drive.
For the Henness Ridge campus alternative, which is on Henness Ridge Drive just west of Wawona Road, the following assumptions were made for directional trip distribution:

3 Moose Mutlow, Yosemite Institute; Ann Roberts, National Park Service (April 3, 2008).

- 80% to/from Wawona Road north of Henness Ridge Drive
- 10% to/from Wawona Road south of Henness Ridge Drive
- 5% to/from Glacier Point Road east of Wawona Road
- 5% to/from Henness Ridge Drive west of Wawona Road

For the Crane Flat campus, near the intersection of Big Oak Flat Road and Tioga Pass Road, the following assumptions were made for directional trip distribution:

- 80% to/from Big Oak Flat Road east of Tioga Pass Road
- 10% to/from Tioga Pass Road north of Big Oak Flat Road
- 10% to/from Big Oak Flat Road west of Tioga Pass Road

EXISTING PLUS APPROVED/PENDING PROJECTS PLUS PROJECT CONDITIONS

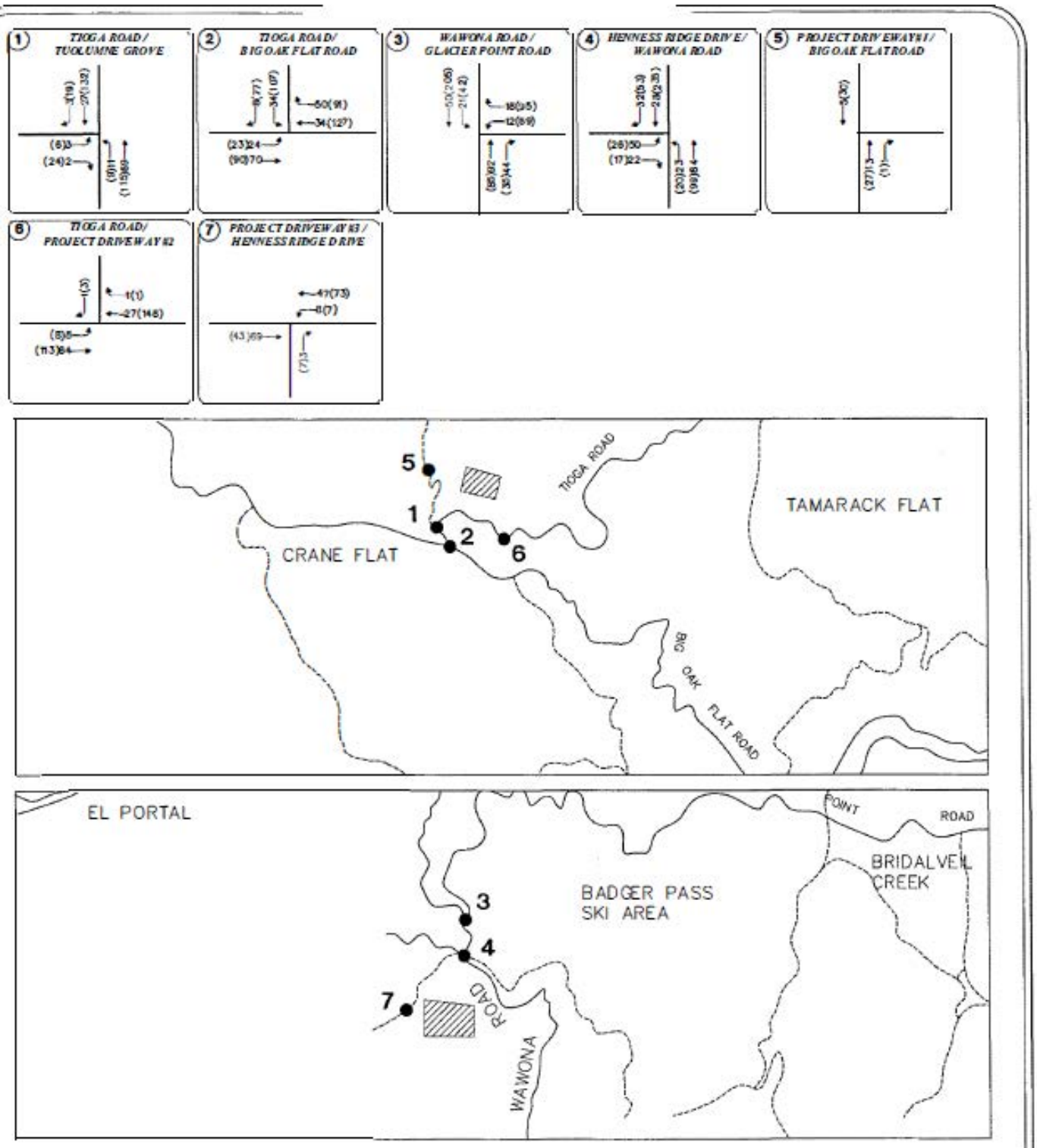
It should be noted that the project driveways were assumed to have shared lanes into and out of the project site, i.e., left/thru/right lanes on all approaches. Applying *TRAFFIX 7.9* computer software, "Existing plus Approved/Pending Projects plus Project" peak hour traffic conditions were simulated by superimposing new trips generated by the proposed project over existing base traffic at the study intersections and lane geometrics and controls as shown in Figures 2 and 3. The resulting "Existing plus Approved/Pending Projects plus Project" peak hour condition intersection traffic volumes and lane geometrics and control are shown on Figures 5 and 6. Table 5 presents the resulting peak hour intersection LOS.

TABLE 5
EXISTING PLUS APPROVED/PENDING PROJECTS PLUS PROJECT CONDITIONS: INTERSECTION LEVELS-OF-SERVICE

			AM Peak Hour			PM Peak Hour		
No	**Intersection**	**Control Type**	**Delay (sec/veh)**	**LOS**	**Warrant Met?**	**Delay (sec/veh)**	**LOS**	**Warrant Met?**
1	Tioga Road/Tuolumne Grove	TWSC	8.9	A	No	9.7	A	No
2	Tioga Road/Big Oak Flat Road	TWSC	9.7	A	No	10.5	B	No
3	Wawona Road/Glacier Point Road	TWSC	9.5	A	No	10.6	B	No
4	Henness Ridge Drive/Wawona Road	TWSC	10.3	B	No	11.2	B	No
5	Project Driveway #1/Big Oak Flat Road	TWSC	8.6	A	No	8.8	A	No
6	Tioga Road/Project Driveway #2	TWSC	8.8	A	No	9.6	A	No
7	Project Driveway #3/Henness Ridge Drive	TWSC	8.6	A	No	8.9	A	No

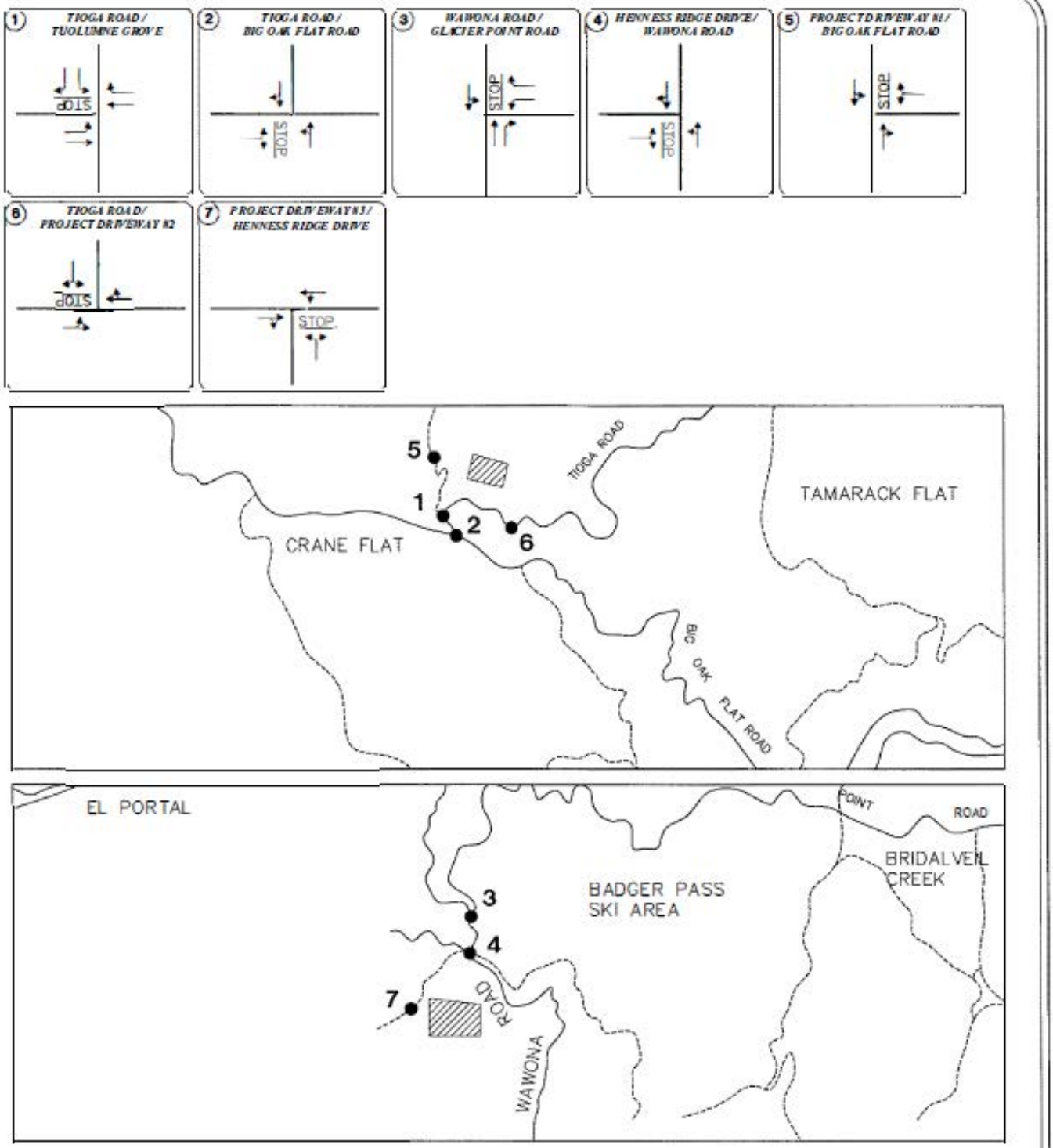
Legend: *TWSC = Two-Way Stop Control.*
Average Delay = Worst-Case Intersection Movement Delays for TWSC Intersections.
LOS = Worst-Case Movement Level-of-Service for TWSC Intersections.
Warrant = MUTCD Peak-Hour Warrant-3.

As shown in Table 5, under "Existing plus Approved/Pending Projects plus Project" conditions, all of the study intersections are projected to operate at LOS "B" conditions or better during both the AM and PM peak hour periods.



Yosemite Institute Environmental Impact Statement Figure 5

Existing plus Approved/Pending Projects plus Project Traffic Volumes



Yosemite Institute Environmental Impact Statement Figure 6

Existing plus Approved/Pending Projects plus Project Lane Geometrics & Control

FUTURE CONDITIONS

GENERAL

The year 2030 is used as the "cumulative analysis year" in this study. Generally, future model traffic forecasts are developed with use of a county or group of counties regional travel demand forecast model. However, because Yosemite National Park is owned by the federal government, traffic models are typically not maintained by regional transportation planning agencies (RTPAs). Instead, federal lands are generally represented by "gateways", which are areas outside of the RTPA's planning area. The gateways are shown as a "node" and the numbers are hard coded into the job script. As such, neither the Madera nor Mariposa County traffic models were utilized for this report. Instead, Year 2030 traffic volumes were forecasted utilizing a two percent growth rate derived from existing and historic traffic counts. This rate was compounded continuously and represents a 56% increase over base conditions, which is a conservative estimate for this analysis.

YEAR 2030 BASE CONDITIONS

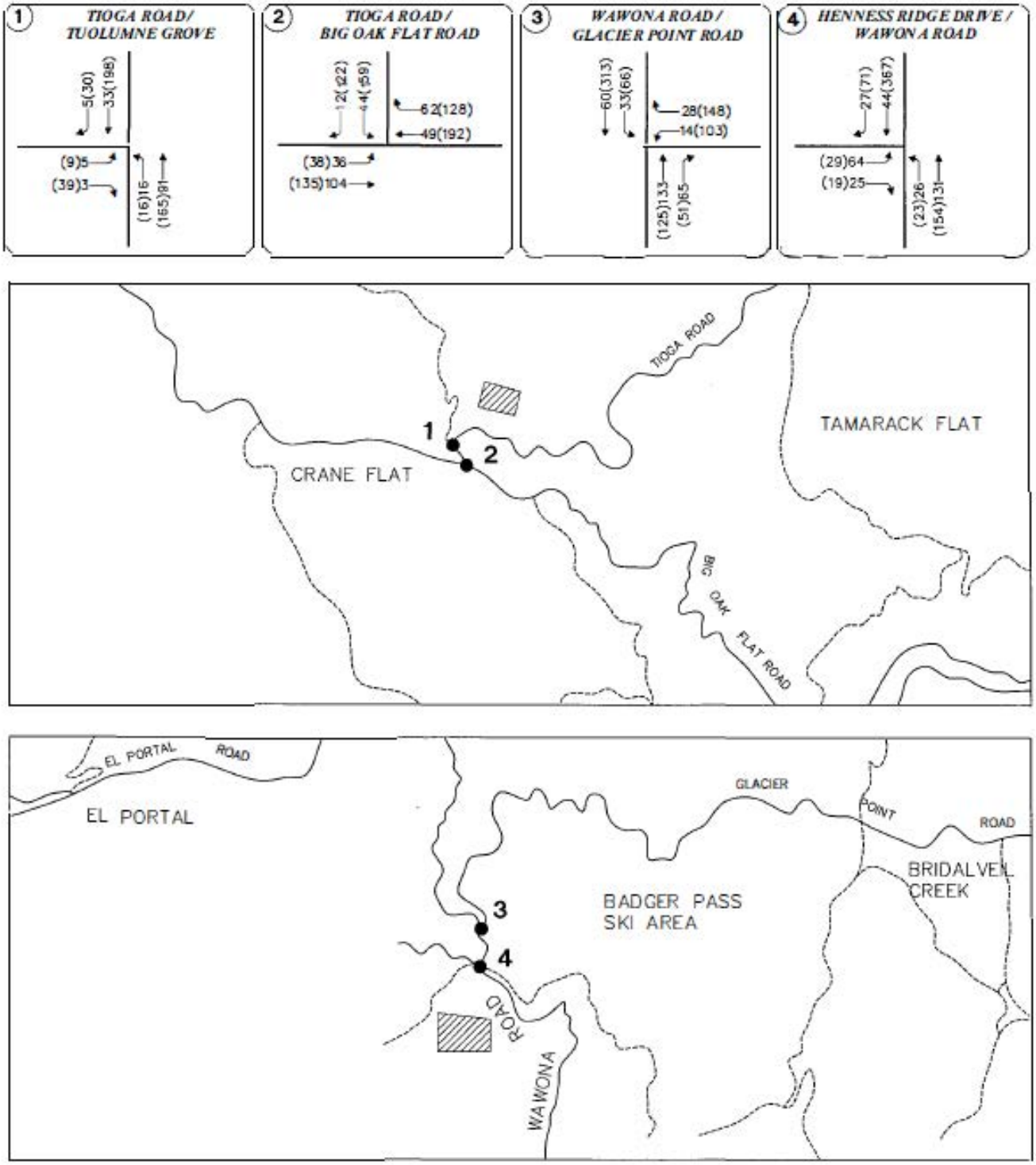
"Year 2030 Base" peak-hour intersection traffic operations were quantified applying "Year 2030 Base" traffic volumes plus intersection lane geometrics and control (shown on Figures 7 and 8). Table 6 presents the "Year 2030 Base" peak hour intersection LOS.

TABLE 6
YEAR 2030 BASE CONDITIONS:
INTERSECTION LEVELS-OF-SERVICE

			AM Peak Hour			PM Peak Hour		
No	**Intersection**	**Control Type**	**Delay (sec/veh)**	**LOS**	**Warrant Met?**	**Delay (sec/veh)**	**LOS**	**Warrant Met?**
1	Tioga Road/Tuolumne Grove	TWSC	13.1	B	No	11.2	B	No
2	Tioga Road/Big Oak Flat Road	TWSC	12.0	B	No	10.9	B	No
3	Wawona Road/Glacier Point Road	TWSC	10.3	B	No	10.4	B	No
4	Henness Ridge Drive/Wawona Road	TWSC	11.7	B	No	15.5	C	No

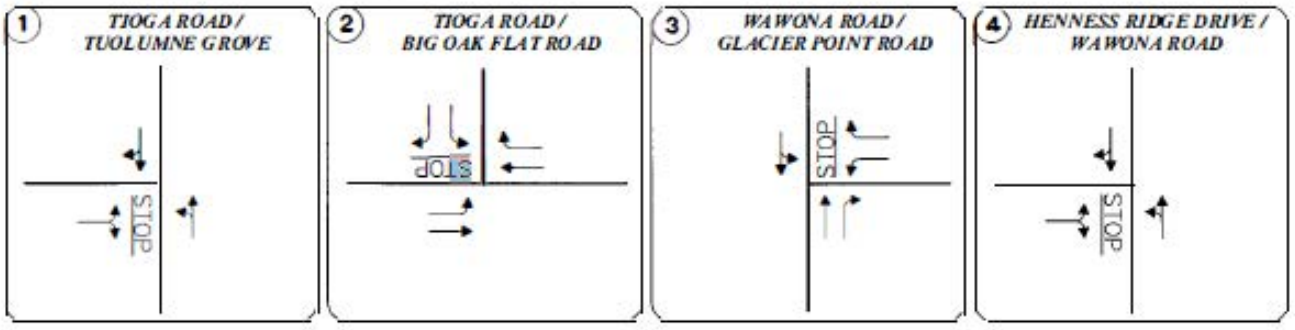
Legend: *TWSC = Two-Way Stop Control.*
Average Delay = Worst-Case Intersection Movement Delays for TWSC Intersections.
LOS = Worst-Case Movement Level-of-Service for TWSC Intersections.
Warrant = MUTCD Peak-Hour Warrant-3.

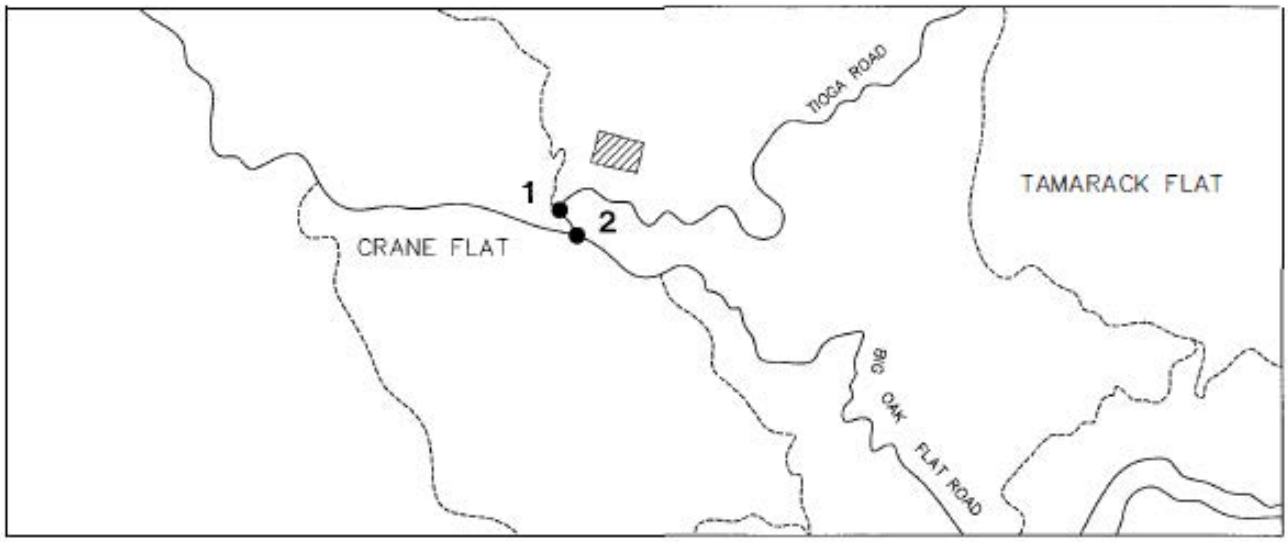
As shown in Table 6, all study intersections are forecasted to operate at peak hour LOS "C" conditions or better under both "Year 2030 Base" AM and PM peak hour periods.

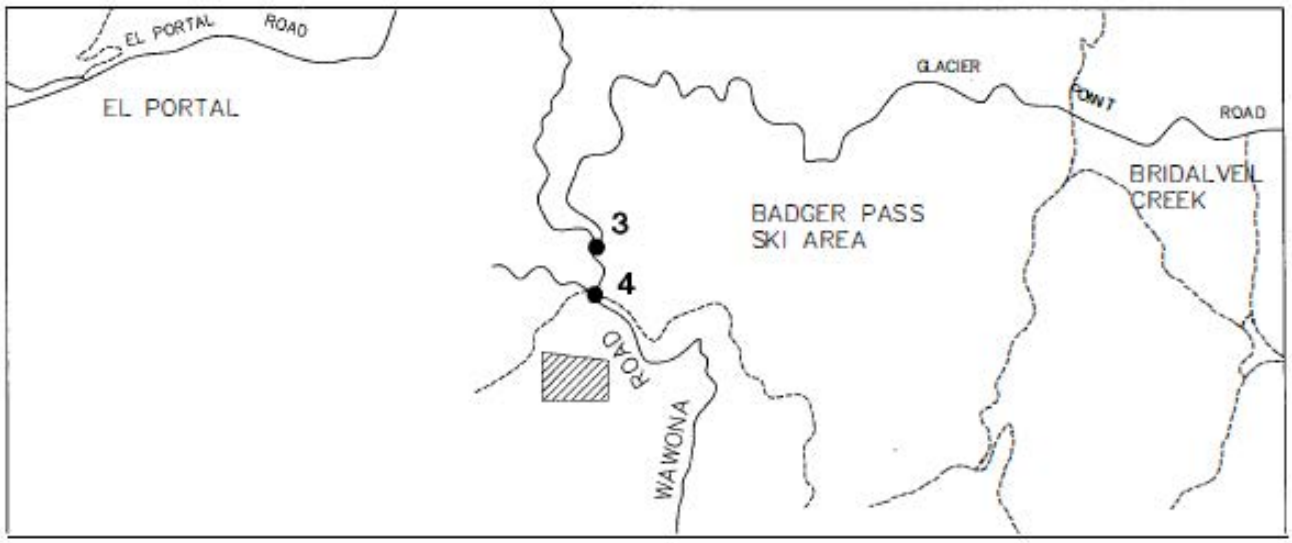


Yosemite Institute Environmental Impact Statement Figure 7

Year 2030 Traffic Volumes







LEGEND

STUDY AREA — XX – AM PEAK HOUR VOLUMES

COUNT LOCATION — (XX) – PM PEAK HOUR VOLUMES

Yosemite Institute Environmental Impact Statement Figure 8

Year 2030 Lane Geometrics and Control

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YEAR 2030 BASE PLUS PROJECT CONDITIONS

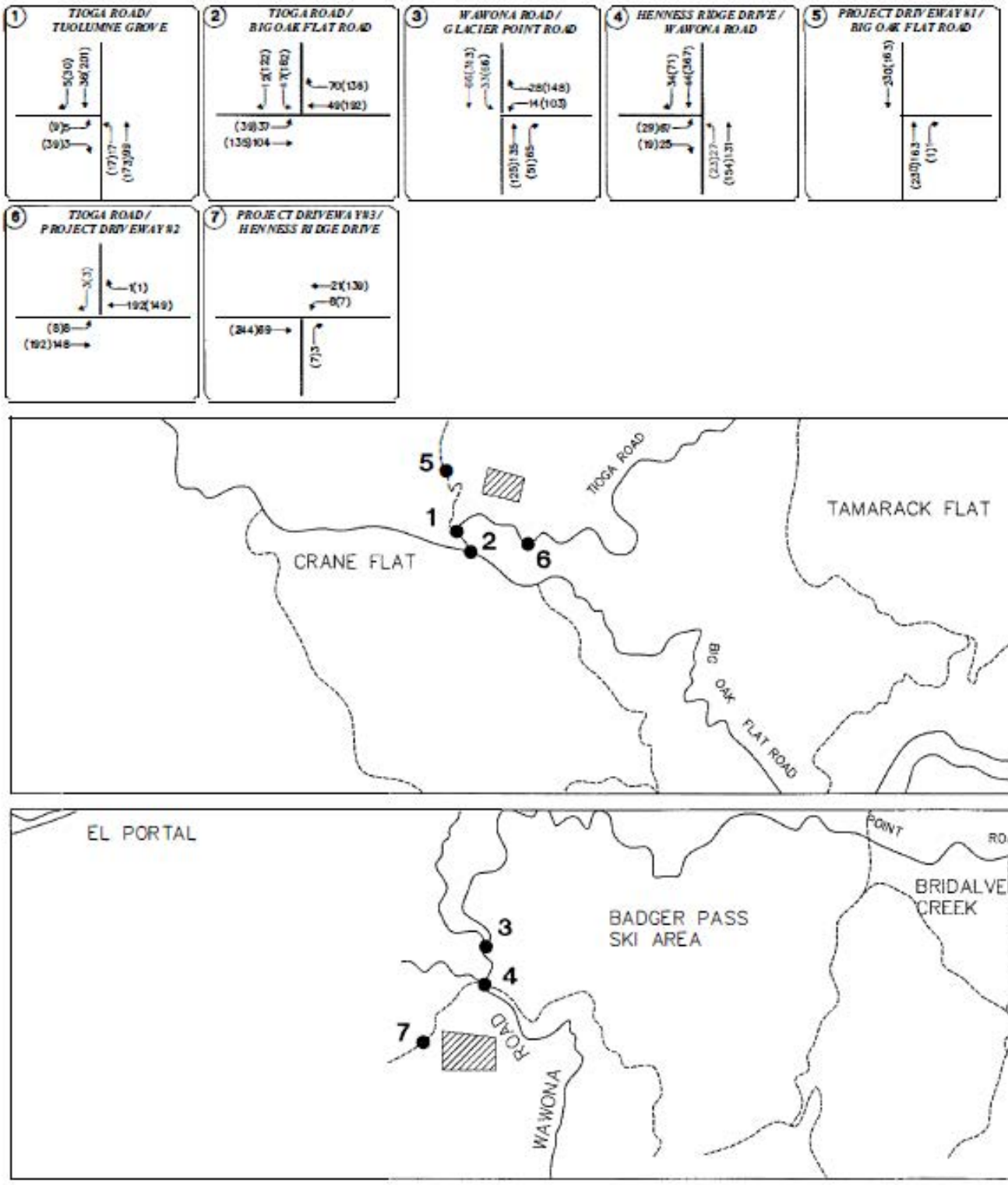
"Year 2030 Base plus Project" peak-hour intersection traffic operations were quantified applying "Year 2030 Base plus Project" traffic volumes shown in Figure 9 and "Year 2030 Base plus Project" intersection lane geometrics and control shown in Figure 10. Table 7 presents the "Year 2030 Base plus Project" peak hour intersection LOS.

TABLE 7
YEAR 2030 BASE PLUS PROJECT CONDITIONS:
INTERSECTION LEVELS-OF-SERVICE

			AM Peak Hour			PM Peak Hour		
No	**Intersection**	**Control Type**	**Delay (sec/veh)**	**LOS**	**Warrant Met?**	**Delay (sec/veh)**	**LOS**	**Warrant Met?**
1	Tioga Road/Tuolumne Grove	TWSC	13.3	B	No	11.3	B	No
2	Tioga Road/Big Oak Flat Road	TWSC	12.1	B	No	11.0	B	No
3	Wawona Road/Glacier Point Road	TWSC	10.3	B	No	10.4	B	No
4	Henness Ridge Drive/Wawona Road	TWSC	11.8	B	No	15.5	C	No
5	Project Driveway #1/Big Oak Flat Road	TWSC	10.9	B	No	10.9	B	No
6	Tioga Road/Project Driveway #2	TWSC	10.0	A	No	9.9	A	No
7	Project Driveway #3/Henness Ridge Drive	TWSC	8.6	A	No	10.1	B	No

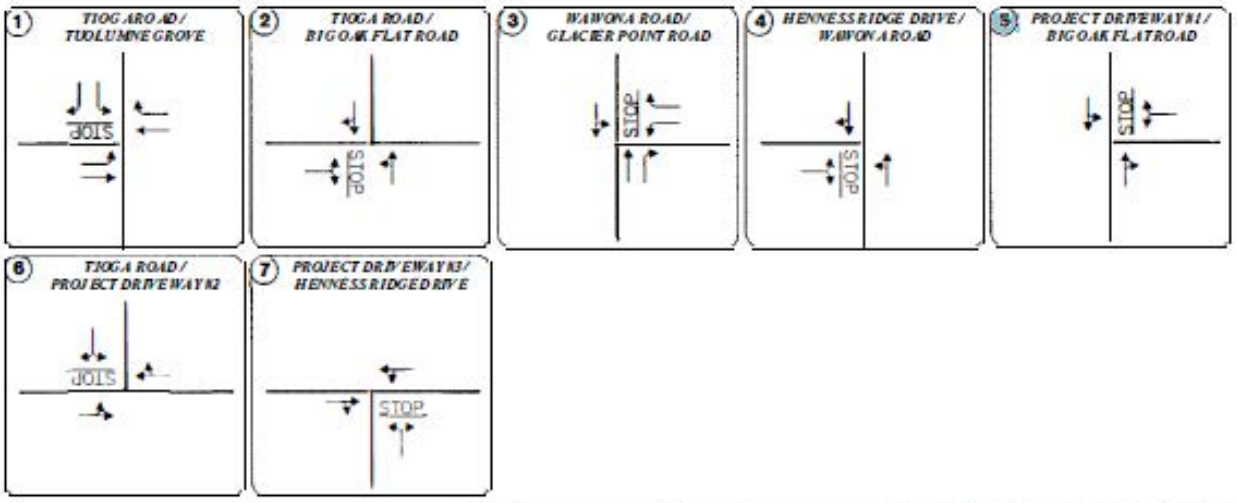
Legend: *TWSC = Two-Way Stop Control.*
Average Delay = Worst-Case Intersection Movement Delays for TWSC Intersections.
LOS = Worst-Case Movement Level-of-Service for TWSC Intersections.
Warrant = MUTCD Peak-Hour Warrant-3.

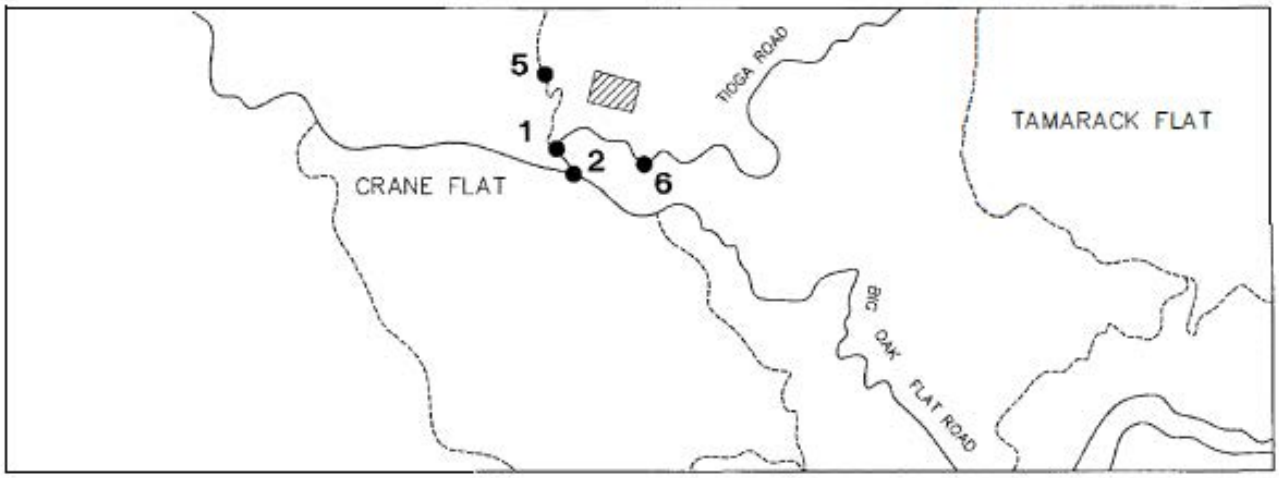
As shown in Table 7, all of the study intersections are anticipated to operate at LOS "C" conditions or better under both "Year 2030 Base plus Project" AM and PM peak hour periods. In addition, none of the study intersections is forecast to meet the peak hour warrant under this scenario.

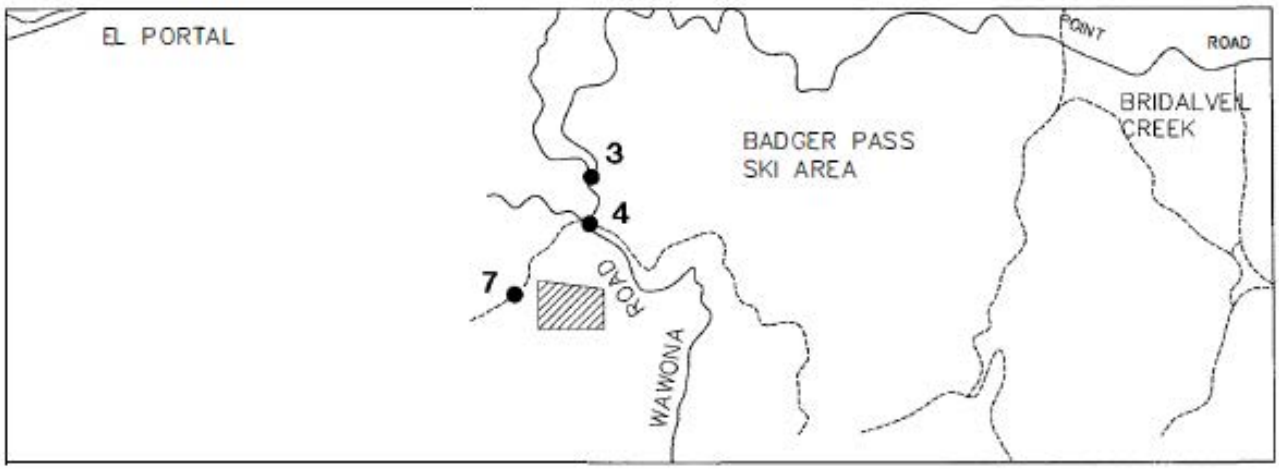


Yosemite Institute Environmental Impact Statement Figure 9

Year 2030 plus Project Traffic Volumes







LEGEND

STUDY AREA — XX – AM PEAK HOUR VOLUMES

COUNT LOCATION — (XX) – PM PEAK HOUR VOLUMES

Yosemite Institute Environmental Impact Statement Figure 10

Year 2030 plus Project Lane Geometrics and Control

RECOMMENDED MITIGATION MEASURES

All of the study intersections are projected to operate at acceptable LOS "C" or better conditions through Year 2030. Unacceptable intersection LOS conditions were not observed under exiting or future conditions with or without the project. Therefore, recommendations are identified only for conditions with the project.

EXISTING CONDITIONS

Under the "Existing" conditions scenario, no mitigation measures are recommended.

EXISTING PLUS PROJECT CONDITIONS

Under "Existing plus Project" conditions, the following mitigation measures have been identified:

Project Driveways: It is assumed throughout this analysis that all project driveways will have stop controlled intersections as they approach the public roadway. Analysis in the report indicates that shared movements are acceptable for traffic operations. However, should separate turn channelization (i.e., turn lanes) be required, they should built to conform to National Park, Mariposa County or Tuolumne County road improvement standards. Required improvement work shall be done in accordance with the applicable sections of the road improvement standards and such other special provisions prepared by the project engineer and approved by County Officials and or Yosemite National Park.

YEAR 2030 BASE CONDITIONS

Under "Year 2030 Base" conditions, no mitigation measures were identified to be needed.

YEAR 2030 BASE PLUS PROJECT CONDITIONS

Under "Year 2030 Base plus Project Conditions" conditions, mitigation measures recommended under "Existing plus Approved/Pending Projects plus Project" conditions are assumed to be in place. Therefore, no mitigation measures are recommended under this scenario.

CONCLUSION

Based upon the analysis presented in this report, traffic impacts that are anticipated from the project would have a less than significant impact on transportation and circulation at either the Crane Flat or Henness Ridge sites. Therefore, there is not an environmentally preferred alternative from a transportation or circulation standpoint.

Appendix I:
List of Agencies and Organizations Receiving this Document

American Alpine Club
Bioscience & Natural Resources Library, UC Davis
Bureau of Land Management
Bureau of Land Management
California Air Resources Board
California Department of Fish & Game
California Department of Transportation
California State Library, Sacramento
California State Water Resources Control Board
Caltrans Central Reg Env Analysis Office
Central Sierra Environmental Resource Ctr
Civic Center Library, San Rafael
Delaware North Corporation, Yosemite NP
Department of the Interior, Regional Solicitor
El Portal Town Planning Adv Committee
Exec. Dir., Sierra Club
Federal Highway Administration
Friends of the River/American Rivers
Friends of Yosemite Valley
Government Information Shields Library
Groveland Community Services Dist
House Subcomm. on National Parks & Public Lands
Inyo National Forest
Madera County Board of Superivsors
Mariposa County Board of Supervisors
Mariposa County Chamber of Commerce
Mariposa County Dept of Public Works
Mariposa County Fire Department
Mariposa County Planning Department
Mariposa County Visitors Bureau
Mariposa Public Utility District
Mariposans for Environmental Responsible Growth
Merced County Assn of Governments
Mono County Board of Supervisors
National Park Service - DSC Technical Info Ctr (TIC)
National Park Service- CCSO
National Park Service- DSC- PDSNational Park Service- Pacific West Region
National Park Service- Water Resources Div
National Parks Conservation Assoc National Office
National Parks Conservation Association
NPS, Denver Service Center - Planning
Oakhurst Public Library
Office of Assemblyman Dave Cogdill
Sacramento County Public Library
Salazar Library, Sonoma State University
San Francisco City Public Library
San Francisco Planning Department
San Francisco Public Utilities Commission
Sequoia & Kings Canyon National Parks
Sierra Club Yosemite Committee
Sonoma County Library
Stanford University Green Library
Stanislaus Council of Government
Tuolumne County Board of Supervisors
Tuolumne County Visitor Bureau
UCLA Maps & Govt Information Library
United States Attorney's Office, Fresno
University of Library Tech Services
University of Minnesota
US Army Corp of Engineers
US Army Corps of Engineers
US EPA / Region IX
US Fish and Wildlife Service, Sacramento
USDOI Office of Env Policy & Compliance
USFS Groveland Ranger District
Virginia Lakes Pack Outfit
Wawona Area Property Owners Association
Wawona Town Plan Advisory Committee
Yosemite West Homeowners Association