2019109045

GAVIN NEWSOM, Governor CHARLTON H. BONHAM, Director



State of California – Natural Resources Agency DEPARTMENT OF FISH AND WILDLIFE South Coast Region 3883 Ruffin Road San Diego, CA 82123 (858) 467-4201 www.wildlife.ca.gov

November 12, 2019

Governor's Office of Planning & Research

NOV 14 2019

STATE CLEARINGHOUSE

Ms. Cynthia Campana City of Lancaster Planning Department 44933 Fern Avenue Lancaster, CA 93534 ccampana@cityoflancasterca.org

Subject: Tentative Tract Map No. 71210 / Conditional Use Permit No. 15-19, City of Lancaster, Los Angeles County

Dear Ms. Campana:

The California Department of Fish and Wildlife (CDFW) has reviewed the above-referenced Tentative Tract Map No. 71210 / Conditional Use Permit No.15-19 (Project). The Tentative Tract Map's (TTM) supporting documentation includes a *General Biological Resources Report 40-Acre Residential Lancaster Project in the City of Lancaster, Los Angeles, CA*.

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

CDFW's Role

CDFW is California's Trustee Agency for fish and wildlife resources, and holds those resources in trust by statute for all the people of the State [Fish & Game Code, §§ 711.7, subdivision (a) & 1802; Public Resources Code, § 21070; California Environmental Quality Act (CEQA) Guidelines, § 15386, subdivision (a)]. CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species (Id., § 1802). Similarly, for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect state fish and wildlife resources.

CDFW is also submitting comments as a Responsible Agency under CEQA (Public Resources Code, § 21069; CEQA Guidelines, § 15381). CDFW expects that it may need to exercise regulatory authority as provided by the Fish and Game Code, including lake and streambed alteration regulatory authority (Fish & Game Code, § 1600 et seq.). Likewise, to the extent implementation of the Project as proposed may result in "take", as defined by state law, of any species protected under the California Endangered Species Act (CESA) (Fish & Game Code, § 2050 et seq.), or state-listed rare plant pursuant to the Native Plant Protection Act (NPPA; Fish & Game Code, §1900 et seq.) authorization as provided by the applicable Fish and Game Code will be required.

Ms. Cynthia Campana City of Lancaster Page **2** of **10** November 12, 2019

Project Description and Summary

Objective: The proposed Project is for a 169-lot subdivision of approximately 40.4 acres of 161 residential lots, 2 parks, and paseos in the west side of Lancaster, California. Project activities would consist of grading, installation of utilities, road construction, and eventual home, park, and paseo construction. The entire 40.4-acre site is expected to be cleared and graded prior to construction of a residential neighborhood.

Location: The Project site is located between Avenue K and Avenue K-8 on the east side of 55th Street West on western portion of the City of Lancaster (City) in Los Angeles County, California. Assessor's Parcel Numbers (APNs) associated with the Project include APNs 3204-010-054, 3204-010-055, 3204-010-062, 3204-010-063, 3204-011-033, 3204-011-034, and 3204-011-059.

Comments and Recommendations

CDFW offers the comments and recommendations below to assist the City in adequately identifying, avoiding, and/or mitigating the Project's significant, or potentially significant, direct and indirect impacts on fish and wildlife (biological) resources.

CDFW recommends the measures or revisions below be included in a science-based monitoring program that contains adaptive management strategies as part of the Project's CEQA mitigation, monitoring and reporting program (Public Resources Code, § 21081.6 and CEQA Guidelines, § 15097).

Project Description and Related Impact Shortcoming

Comment #1: Impacts to Burrowing Owl (Athene cunicularia)

Issue: The supplemental biological resources report document, *General Biological Resources Report 40-Acre Residential Lancaster Project in the City of Lancaster, Los Angeles, CA dated March 2015*, indicates that burrowing owl (*Athene cunicularia*), a state listed species of special concern, has potential to found in the suitable habitat onsite. The document indicates that two fossorial mammal burrows were found on site that were of a size that could potentially be used by burrowing owls and in 2007, the remains of a burrowing owl were found on the eastern border of the site during biological resources assessment.

A review of the California Natural Diversity Database (CNDDB) indicates multiple occurrences of burrowing owl in the adjacent open spaces. Burrowing owls are also known regularly occurring throughout the Palmdale and Lancaster area. The Biological report indicates that the reconnaissance survey was conducted in January of 2015.

Specific impact: The Project may result in direct and indirect burrowing owl mortality or injury; the disruption of natural burrowing owl breeding behavior; and loss of breeding, wintering and foraging habitat for the species. Project impacts would contribute to statewide population declines for burrowing owl. Within the Antelope Valley, the species persists in low densities and continues to experience significant direct and cumulative habitat loss. In addition, a survey that

Ms. Cynthia Campana City of Lancaster Page **3** of **10** November 12, 2019

is more than 4 years old is considered outdated because it is no longer representative of the current state of the Project site and the inventory of biological species that may be present.

Why impact would occur: Impacts to burrowing owl could result from vegetation clearing and other ground disturbing activities. Project disturbance activities may result in crushing or filling of active owl burrows, causing the death or injury of adults, eggs, and young. The Project will remove burrowing owl foraging habitat by eliminating native vegetation that supports essential rodent, insect, and reptile that are prey for burrowing owl. Rodent control activities could result in direct and secondary poisoning of burrowing owl ingesting treated rodents.

Evidence impact would be significant: Take of individual burrowing owls and their nests is defined by Fish and Game Code section 86 and prohibited by sections 3503, 3503.5, and 3513. Take is defined in Fish and Game Code section 86 as "hunt, pursue, catch, capture or kill, or attempt to hunt, pursue, catch, capture or kill." Without appropriate take avoidance surveys prior to Project operations including, but not limited to, ground and vegetation disturbing activities and rodent control activities, adverse impacts to burrowing owl may occur because species presence/absence has not been verified. In addition, burrowing owl qualifies for enhanced consideration afforded to species under CEQA, which can be shown to meet the criteria for listing as endangered, rare or threatened (CEQA Guidelines, § 15380(d)).

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: To reduce impacts to burrowing owl, CDFW recommends that the Project adhere to CDFW's March 7, 2012, *Staff Report on Burrowing Owl Mitigation* as referenced in the MND. All survey efforts should be conducted prior to any project activities that could result in habitat disturbance to soil, vegetation or other sheltering habitat for burrowing owl.

Mitigation Measure #2: Permanent impacts to occupied owl burrows and adjacent foraging habitat should be offset by setting aside replacement habitat to be protected in perpetuity under a conservation easement dedicated to a local land conservancy or other appropriate entity, which should include an appropriate non-wasting endowment to provide for the long-term management of mitigation lands. CDFW recommends that the County require a burrowing owl mitigation plan be submitted to CDFW for review and comment prior to project implementation.

Mitigation Measure #3: For proposed preservation and/or restoration, the final environmental document should include measures to protect the targeted habitat values in perpetuity from direct and indirect negative impacts. The objective should be to offset the project-induced qualitative and quantitative losses of wildlife habitat values. Issues that should be addressed include, but are not limited to, restrictions on access, proposed land dedications, monitoring and management programs, control of illegal dumping, water pollution, and increased human intrusion. An appropriate non-wasting endowment should be provided for the long-term monitoring and management of mitigation lands. CDFW recommends that mitigation occur at a state-approved bank or via an entity that has been approved to hold and manage mitigation lands pursuant to Assembly Bill 1094 (2012), which amended Government Code sections 65965-65968. Under Government Code section 65967(c), the lead agency must exercise due diligence in reviewing the qualifications of a governmental entity, special district, or nonprofit organization to effectively manage and steward land, water, or natural resources on mitigation lands it approves.

Ms. Cynthia Campana City of Lancaster Page **4** of **10** November 12, 2019

Mitigation Measure #4: Project use of rodenticides that could result in direct or secondary poisoning to burrowing owl should be avoided.

Comment #2: Impacts to tricolored blackbird (Agelaius tricolor)

Issue: A review of CNDDB indicates historical recorded observations of tricolored blackbird (*Agelaius tricolor*), a threatened species listed under CESA, approximately 0.7 miles southwest and 2.4 miles northwest of the Project site.

Specific impacts: The Project could lead to the loss of foraging habitat for a CESA-listed species.

Why impact would occur: Impacts to foraging habitat could result from vegetation clearing and other ground disturbing activities.

Evidence impact would be significant: The reductions in the number of rare bird species, either directly or indirectly through foraging suppression, would constitute a significant impact absent appropriate mitigation. Furthermore, adverse impacts to tricolored blackbird may occur because the measures provided do not condition the Project to implement take avoidance surveys prior to operations, including, but not limited to, ground and vegetation disturbing activities.

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: CDFW recommends that the final environmental document include a measure conducting focused surveys for tricolored blackbirds and incorporating the results into the MND. Prior to initiation of construction within or adjacent to suitable nesting or foraging habitat, a CDFW-approved biologist with experience surveying for and observing tricolored blackbird will conduct preconstruction surveys in accordance with established protocols to establish use of nesting habitat by tricolored blackbird colonies. Surveys will be conducted within and adjacent to suitable habitat, where access allows, during the nesting season (generally March 15 to July 31). If a nesting colony is found, no activity shall occur within a 500-foot buffer of the colony until a qualified biologist determines and CDFW confirms that all chicks have fledged and are no longer reliant on the nest site.

If take of tricolored blackbird would occur from Project construction or operation, an incidental take permit (ITP) under CESA would be required for the Project. CDFW may consider the Lead Agency's CEQA documentation for its CESA-related actions if it adequately analyzes/discloses impacts and mitigation to state-listed species. For CDFW to adequately develop an accurate take analysis and identify measures that would fully mitigated for take of state-listed species, additional documentation may be required as part of an ITP application for the Project. CDFW has developed guidance for avoiding impacts to this species in rural areas as recommended in the Department *Staff Guidance Regarding Avoidance of Impacts to Tricolored Blackbird Breeding Colonies on Agricultural Fields, March 19, 2015*

Comment #3: Impacts to Swainson's hawk (Buteo swainsoni)

Issue: A review of CNDDB indicates historical recorded observations of Swainson's hawk

Ms. Cynthia Campana City of Lancaster Page **5** of **10** November 12, 2019

(*Buteo swainsoni*), a threatened species listed under CESA, about 4.5 miles east northeast of the Project site. Swainson's hawk are also regularly observed foraging throughout the Palmdale and Lancaster area.

Specific impacts: The Project will likely result in the loss of foraging habitat for a CESA-listed raptor species.

Why impact would occur: Vegetation removal and ground clearing activities will potentially result in the loss of foraging habitat for listed raptor species.

Evidence impact would be significant: Consistent with CEQA Guidelines, Section 15380, the status of the Swainson's hawk as a threatened species under CESA qualifies it as an endangered, rare, or threatened species under CEQA. The estimated historical population of Swainson's hawk was nearly 17,000 pairs; however, in the late 20th century, Bloom (1980) estimated a population of only 375 pairs. The decline was primarily a result of habitat loss from development (CDFW 2016). The most recent survey conducted in 2009 estimated the population at 941 breeding pairs. The species is currently threatened by loss of nesting and foraging habitat (e.g., from agricultural shifts to less crops that provide less suitable habitat), urban development, environmental contaminants (e.g., pesticides), and climate change (CDFW 2016). CDFW considers a Swainson's hawk nest site to be active if it was used at least once within the past five years and impacts to suitable habitat or individual birds within a five-mile radius of an active nest as significant. Based on the foregoing, Project impacts would potentially substantially reduce the number and/or restrict the range of Swainson's hawk or contribute to the abandonment of an active nest and/or the loss of significant foraging habitat for a given nest territory and thus result in "take" as defined under CESA.

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: CDFW released guidance for this species entitled *Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California* (2010). CDFW recommends conducting focused surveys for Swainson's hawk following the 2010 guidance and disclosing the results in the Project's environmental documentation. If "take" of Swainson's hawk would occur from project construction or operation, CESA authorization (i.e., ITP) would be required for the project. CDFW may consider the Lead Agency's CEQA documentation for its CESA-related actions if it adequately analyzes/discloses impacts and mitigation to state-listed species. Additional documentation may be required as part of an ITP application for the project in order for CDFW to adequately develop an accurate take analysis and identify measures that would fully mitigate for take of state-listed species.

Mitigation Measure #2: Permanent impacts to foraging habitat for Swainson's hawk should be offset by setting aside replacement acreage to be protected in perpetuity under a conservation easement dedicated to a local land conservancy or other appropriate entity [also see Comment #1 (Burrowing Owl), Mitigation Measure #3].

Comment #4: Impacts to Special-Status Plant Species

Issue: A review of CNDDB show that there are numerous occurrences of alkali mariposa lily (*Calochortus* stiatus) found adjacent to the Project site. Several Joshua trees (*Yucca brevifolia*)

Ms. Cynthia Campana City of Lancaster Page **6** of **10** November 12, 2019

were also surveyed on the Project site. The Biological report further indicates that the most recent survey for special-status plant species was conducted in January 2015.

Specific impact: CDFW considers plant communities, alliances, and associations with a statewide ranking of S1, S2, S3 and S4 as sensitive and declining at the local and regional level (Sawyer et al. 2008). An S3 ranking indicates there are 21-80 occurrences of this community in existence in California, S2 has 6-20 occurrences, and S1 has less than 6 occurrences. The Project may have direct or indirect effects to these sensitive species. A survey that is more than 4 years old is considered outdated because it is no longer representative of the current state of the Project site and the inventory of biological species that may be present.

Why impact would occur: Project implementation includes grading, vegetation clearing, road construction, housing construction, utilities construction, road maintenance, and other activities that may result in direct mortality, population declines, or local extirpation of sensitive plant species.

Evidence impact would be significant: Impacts to special status plant species should be considered significant under CEQA unless they are clearly mitigated below a level of significance. Inadequate avoidance, minimization, and mitigation measures for impacts to these sensitive plant species will result in the Project continuing to have a substantial adverse direct, indirect, and cumulative effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or United States Fish and Wildlife Service (USFWS).

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: CDFW recommends conducting focused surveys for sensitive/rare plants on-site and disclosing the results in the CEQA document. Based on the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW, 2018), a qualified biologist should "conduct botanical surveys in the field at the times of year when plants will be both evident and identifiable. Usually this is during flowering or fruiting." The final CEQA documentation should provide a thorough discussion on the presence/absence of sensitive plants on-site and identify measures to protect sensitive plant communities from project-related direct and indirect impacts.

Mitigation Measure #2: In 2007, the State Legislature required CDFW to develop and maintain a vegetation mapping standard for the state (Fish & Game Code, § 1940). This standard complies with the National Vegetation Classification System, which utilizes alliance and association-based classification of unique vegetation stands. CDFW utilizes vegetation descriptions found in the Manual of California Vegetation (MCV), found online at http://vegetation.cnps.org/. To determine the rarity ranking of vegetation communities on the Project site, the MCV alliance/association community names should be provided as CDFW only tracks rare natural communities using this classification system.

Mitigation Measure #3: CDFW recommends avoiding any sensitive natural communities found on the Project. If avoidance is not feasible, mitigating at a ratio of no less than 5:1 for impacts to S3 ranked communities and 7:1 for S2 communities should be implemented. This ratio is for the acreage and the individual plants that comprise each unique community. All revegetation/restoration areas that will serve as mitigation should include preparation of a Ms. Cynthia Campana City of Lancaster Page **7** of **10** November 12, 2019

restoration plan, to be approved by USFWS and CDFW prior to any ground disturbance. The restoration plan should include restoration and monitoring methods; annual success criteria; contingency actions should success criteria not be met; long-term management and maintenance goals; and, a funding mechanism to assure for in perpetuity management and reporting. Areas proposed as mitigation should have a recorded conservation easement and be dedicated to an entity which has been approved to hold/manage lands (AB 1094; Government Code, §§ 65965-65968).

Comment #5: Impacts to Streams

Issue: A review of CNDDB indicates that the Project site is likely to be subject to notification for a Lake and Streambed Alteration Agreement. *Figure 3* of the Biological report indicates that there are numerous records of alkali mariposa lily found on parcels adjacent to the Project site. Alkali mariposa lily, a shrinking population of a California Native Plant Society (CNPS) List 1B species (rare, endangered or threatened in California), is a hydrophytic vegetation that is typically sustained by an ephemeral source of water. The open areas around the Project site contain ephemeral drainages, connecting claypans, and dune geomorphology. "Soft clay pans may indicate potential water flow below and above the surface. These areas indicate that a large quantity of water flows through and pools within the area..." (LADPW 2013). The presence of claypans, and their characteristic cracked surface, is indicative of a streambed as determined by CDFW.

A review of aerial imagery appears to indicate that portions of the Project site may contain claypans and may be within a historic stream channel in a southwest to northeastern direction. The Project location may support streams subject to notification under Fish and Game code section 1600 *et seq*.

Specific impacts: The Project may result in the loss of streams and associated watershed function and biological diversity. Grading and construction activities will likely alter the topography, and thus the hydrology, of the project site.

Why impacts would occur: Ground disturbing activities from grading and filling, water diversions and dewatering would physically remove or otherwise alter existing streams or their function and associated riparian habitat on the Project site. Downstream streams and associated biological resources beyond the Project development footprint may also be impacted by Project related releases of sediment and altered watershed effects resulting from Project activities.

Evidence impacts would be significant: The Project may substantially adversely affect the existing stream pattern of the Project site through the alteration or diversion of a stream, which absent specific mitigation, could result in substantial erosion or siltation on site or off site of the Project. "Surface flow (storm water runoff) from the surrounding mountains (San Gabriel, Tehachapi) and hills across alluvial fans and through deeply excised washes makes its way from the headwaters filling vernal pool like clay pan depressions, wetlands such as Piute Ponds, percolating into sand dunes where water is sequestered for summer use to the lowest point" (LADPW 2013). Thus, the existence of claypans in the Antelope Valley is indicative of natural flow in the region.

Ms. Cynthia Campana City of Lancaster Page **8** of **10** November 12, 2019

Water diversions can impact flow regimes, decreasing the frequency of high flows. Prolonged low flows can cause streams to become graded and cause channels to become disconnected from floodplains (Poff et al. 1997). This process decreases available habitat for aquatic species including fish that utilize floodplains for nursery grounds. Undersized culverts and other stream crossings can also cause downstream channel erosion and tributary head-cutting, reduced magnitude and frequency of high flows, channel narrowing, and reduced formation of secondary channels and oxbows (Poff et al. 1997). Additionally, these structures can degrade water quality and associated wildlife habitats (Santucci, Jr. et al. 2005). Streams with such structures can have reduced abundance of anurans due to decreased availability of breeding habitat (Eskew et al. 2012). Based on the foregoing, Project impacts may substantially adversely affect the existing stream pattern and associated habitat of the Project site.

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: CDFW has concluded that the Project may result in the alteration of streams. For any such activities, the Project applicant (or "entity") must provide written notification to CDFW pursuant to section 1600 *et seq.* of the Fish and Game Code. Based on this notification and other information, CDFW determines whether a Lake and Streambed Alteration Agreement (LSA) with the applicant is required prior to conducting the proposed activities. A notification package for a LSA may be obtained by accessing CDFW's web site at www.wildlife.ca.gov/habcon/1600.

CDFW's issuance of an LSA for a Project that is subject to CEQA will require CEQA compliance actions by CDFW as a Responsible Agency. As a Responsible Agency, CDFW may consider the CEQA document of the Lead Agency for the Project. However, the MND does not meet CDFW's standard at this time. To minimize additional requirements by CDFW pursuant to section 1600 *et seq.* and/or under CEQA, the CEQA document should fully identify the potential impacts to the stream or riparian resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for issuance of the LSA.

Mitigation measure #2: Any LSA Agreement issued for the Project by CDFW may include additional measures protective of streambeds on and downstream of the Project. The LSA may include further erosion and pollution control measures. To compensate for any on-site and off-site impacts to riparian resources, additional mitigation conditioned in any LSA may include the following: avoidance of resources, on-site or off-site creation, enhancement or restoration, and/or protection and management of mitigation lands in perpetuity.

Filing Fees

The Project, as proposed, could have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final (Cal. Code Regs, tit. 14, § 753.5; Fish & Game Code, § 711.4; Pub. Resources Code, § 21089).

Conclusion

We appreciate the opportunity to comment on the project to assist the City in adequately analyzing and minimizing/mitigating impacts to biological resources. CDFW requests an

Ms. Cynthia Campana City of Lancaster Page **9** of **10** November 12, 2019

opportunity to review and comment on any response that the City has to our comments and to receive notification of any forthcoming hearing date(s) for the project. If you have any questions or comments regarding this letter, please contact Felicia Silva, Environmental Scientist, at <u>Felicia.Silva@wildlife.ca.gov</u> or (562) 430-0098.

Sincerely,

Erinn Wilson Environmental Program Manager I

cc: CDFW

Victoria Tang – Los Alamitos Felicia Silva – Los Alamitos Andrew Valand – Los Alamitos Kelly Schmoker – Glendora Audrey Kelly – Los Alamitos Dolores Duarte – San Diego

Scott Morgan (State Clearinghouse)

References:

- Bloom, P. H. 1980. The status of the Swainson's hawk in California, 1979. Bureau of Land Management, Sacramento, CA, USA.
- California Department of Fish and Wildlife [CDFW]. March 20, 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (see https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959&inline).
- California Department of Fish and Wildlife [CDFW]. March 7, 2012. Staff Report on Burrowing Owl Mitigation (see <u>https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83843</u>).
- California Department of Fish and Wildlife [CDFW]. June 2, 2010. Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California (2010). (see <u>https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83843).</u>
- California Department of Fish and Wildlife [CDFW]. 2016. Status review: Swainson's hawk (*Buteo swainsoni*) in California. Report to the California Fish and Game Commission, Sacramento, CA, USA.
- California Department of Fish and Wildlife [CDFW]. 2018. A status review of tricolored blackbird (*Agelaius tricolo*) in California. A Report to the Fish and Game Commission, Nongame Wildlife Program Report 2018, California Department of Fish and Game, Sacramento, CA, USA.
- Eskew, E. A., S. J. Price, and M. E. Dorcas. 2012. Effects of river-flow regulation on anuran occupancy and abundance in riparian zones. Conservation Biology 26:504–512.
- Los Angeles Department of Public Works (LADPW). 2013. Antelope Valley Integrated Regional Water Management Plan 2013 Update.
- Poff, N. L., J. D. Allan, M. B. Bain, J. R. Karr, K. L. Prestegarrd, B. D. Richter, R. E. Sparks, and

Ms. Cynthia Campana City of Lancaster Page **10** of **10** November 12, 2019

J. C. Stromberg. 1997. The natural flow regime: a paradigm for river conservation and restoration. BioScience 47:769–784.

Santucci, Jr., V. J., S. R. Gephard, and S. M. Pescitelli. 2005. Effects of multiple low-head dams on fish, macroinvertebrates, habitat, and water quality in the Fox River, Illinois. North American Journal of Fisheries Management 25:975–992.

Sawyer, J.O., Keeler Wolf, T., and Evens J.M. 2008. A manual of California Vegetation, 2nd ed. ISBN 978 0 943460 49 9.

Smith, D. W. and W. L. Verrill. 1998. Vernal pool-soil-landform relationships in the Central Valley, California. p. 15–23. *In* C. W. Witham, E. T. Bauder, D. Belk, W. R. Ferren, Jr., and R. Ornduf (eds.) Ecology, Conservation, and Management of Vernal Pool Ecosystems. California Native Plant Society, Sacramento, CA, USA.