



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

October 28, 2019

Governor's Office of Planning & Research

OCT 28 2019

STATE CLEARINGHOUSE

Dr. Jan Green Rebstock
City of Los Angeles
Public Works, Bureau of Engineering
Environmental Management Group
1149 S. Broadway, 6th Floor, Mail Stop 939
Los Angeles, CA 90015
Jan.green.rebstock@lacity.org

Subject: Notice of a Draft Environmental Impact Report for Citywide Cat Program Project, City of Los Angeles, County of Los Angeles, California

Dear Dr. Green Rebstock:

The California Department of Fish and Wildlife (CDFW) has reviewed the above-referenced Notice of Availability of a Draft Environmental Impact Report (DEIR) for Citywide Cat Program (Project). 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; 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 and Game Code §1900 et seq.) authorization as provided by the applicable Fish and Game Code will be required.

Project Description and Summary

Objective: The Project consists of:

- 1) Directly engaging in spaying and neutering, or providing funds to subsidize the spaying and neutering, of any cat in the City of Los Angeles to prevent them from having litters of kittens, regardless of the cat's status as either owned pet, stray, or feral. This includes spay and neuter of free-roaming cats that may be returned by their caretakers or a rescue organization to where they were found, relocated to a working cat program, or adopted;
- 2) Changing the Los Angeles Administrative Code from "pet sterilization" to "animal sterilization" to allow feral cats or stray cats to receive funding;
- 3) Implementing a Trap-Neuter-Release (TNR) program;
- 4) Releasing spayed/neutered cats to free-roaming status, changing the permitted number of cats per-house from three to five, and requiring houses with more than three cats to keep them inside;
- 5) Publishing Program guidelines and ecological conservation measures; and
- 6) Creating a City of LA Working Cat Program to remove cats from the streets.

Location: The Project involves implementing a TNR program that would be implemented throughout the City of Los Angeles, comprising over 465 square-miles.

Comments and Recommendations

CDFW offers the comments and recommendations below to assist the City of Los Angeles (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.

Project Description and Related Impact Shortcoming

Comment #1: Impacts to Wildlife

Issue 1: The 1.0-mile buffer where cat releases would be prohibited was applied and mapped inconsistently in the DEIR.

Issue 2: The 1.0-mile buffer in the DEIR does not include sensitive biological resources just outside of the City's boundaries.

Issue 3: The 1.0-mile buffer provided in the DEIR does not appear adequate to reduce impacts to sensitive biological resources.

Specific impact:

Issue 1: The DEIR states, "The City will also provide program implementation guidelines and ecological conservation measures for the proposed Project to include recommendations not to release trapped cats within a 1.0-mile buffer surrounding ESAs in the City." Figure 4.2-2a, City of Los Angeles Environmentally Sensitive Areas is the only figure provided in the DEIR that includes the 1.0-mile buffer. This figure is not consistent with Figure 4.2-2b, City of Los Angeles Environmentally Sensitive Areas Detailed, which includes substantially more area marked as being environmentally sensitive, with no 1-mile buffer. The DEIR defines Environmentally

Sensitive Areas (ESA) as “For the purposes of this EIR, ESAs include the following and are mapped on Figure 4.2-2a and 4.2-2b (note that a 1-mile buffer has been added to depict the estimated average free-roaming cat home range for cats dwelling within any ESA areas; see Appendix M for input data for this estimate).”

The 1.0-mile buffer was only applied to Figure 4.2-2a and not 4.2-2b. Both maps include the same categories in the legend [County Significant Environmental Areas, U.S. Fish and Wildlife Service/National Marine Fisheries Service Critical Habitat, CDFW Areas of Conservation Emphasis Landscape Vegetation (erroneously called Sensitive Natural Vegetation Communities – see <https://www.wildlife.ca.gov/Data/VegCAMP/Natural-Communities#environmental%20review>), Rim of the Valley Corridor Boundary, State Park Lands, U.S. National Forest Boundary, Environmentally Sensitive Habitat Area, Steelhead and Black Abalone Critical Habitat] but the two maps are drastically different and would result in two very different Projects. For example, the Rim of the Valley overlay seems to be left off Figure 4.2-2a, even though it is included in the legend. It is unclear why the Rim of the Valley boundary depicted in Figure 4.2-2b results in a drastically different Project than the boundary in Figure 4.2-2a, with miles of area adjacent to sensitive biological resources not being included in the 1-mile buffer. If the 1-mile buffer is only being applied to the areas identified in Figure 4.2-2a, this would result in significantly more biological impacts.

Issue 2: The DEIR omits known sensitive biological resources that occur just outside of City boundaries. The entire Palos Verdes Hills area, parts of which have a Natural Communities Conservation Plan (NCCP), are not included in the DEIR analysis. Additional areas of concern include the Port of Los Angeles (adjacent to California Least Tern), Los Angeles River, Los Angeles Airport (burrowing owl and El Segundo Blue Butterfly), Verdugo Mountains, National Forest Land, Santa Monica Mountains, Simi Hills, Hollywood Reservoir, Eagle Rock Reservoir (potential restoration for habitat being discussed), Scholl Canyon, among many others.

The DEIR maps Critical Habitat for endangered species within City boundaries, not actual species occurrences. In doing so, the DEIR analysis omits many locations of sensitive species (e.g., California gnatcatcher, snowy plover roosts, least tern nesting sites, and Palos Verdes blue butterfly). The DEIR analysis also omits areas restored as mitigation habitats, such as the constructed salt marsh at Cabrillo Beach, and areas proposed for habitat restoration such as Eagle Rock Reservoir and the Los Angeles River. Omitting these known resources from the DEIR analysis presents an incomplete picture of Project biological impacts.

Project-related activities may trespass onto adjacent land and result in the loss of protected wildlife habitat. Project implementation includes activities that may result in direct mortality, population declines, or local extirpation of sensitive species.

Issue 3: The DEIR analyzed 16 studies' mean/median values for free-roaming cats home range area, and then uses an average of all 16 mean/median values to calculate a single value for home range. This means half of the cats will have a home range that is larger than the listed median (middle) values. Goltz, et al. (2008) reports a mean/median home range of 3,503.95 acres for the male territory. This translates to 5.5 square miles, and this is just the median/mean and not the maximum range. The DEIR only proposes a buffer of 1-mile, which is the mean/median home range value for 16 studies' averages combined. Impact from cats can be reasonably expected up to the maximum documented median/mean home range of 5.5 square miles and should be evaluated to include an unaveraged maximum home range value.

Why impact would occur: The use of averages without disclosing a maximum value, error values, sample sizes, or differentiating between median and mean calculations for home range, does not allow CDFW to fully analyze potential impacts from the segment of cats with larger than median/mean home ranges. The DEIR should include data on the sample size and confidence for each study value referenced and analyze statistical outliers.

The DEIR assumes short-term impacts to endangered species. According to the DEIR analysis, the number of cats will increase in the short run, resulting in additional risk to endangered species in the Project area.

Inadequate avoidance, minimization, and mitigation measures for impacts to sensitive, rare, or listed 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).

The State of California (14 Cal. Code Regs., § 251.1) considers feeding of free-roaming cats harassment of wildlife and is prohibited where wild animals would have access to this artificial food. Subsidizing free-roaming cats, in or near natural areas with food, enables cat populations to persist in greater numbers in localized areas that could result in increased predation on native wildlife.

Evidence impact would be significant: CDFW has a responsibility “to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves (Fish & Game Code, § 1580).

CDFW considers adverse impacts to a species protected by CESA to be significant without mitigation under CEQA. As to CESA, take of any endangered, threatened, candidate species, or State-listed rare plant species that results from the Project is prohibited, except as authorized by state law (Fish and G. Code, §§ 2080, 2085; Cal. Code Regs., tit. 14, § 786.9).

CDFW cannot authorize the take of any fully protected species as defined by State law. State fully protected species may not be taken or possessed at any time and no licenses or permits may be issued for its take except for collecting those species for necessary scientific research and relocation of the bird species for protection of livestock (Fish & G. Code, §§ 3511, 4700, 5050, 5515). Any species designated as fully protected under the Fish and Game Code is prohibited. CDFW recognizes that certain fully protected species are documented to occur on, or in, the vicinity of the project area, or that such species have some potential to occur on, or in, the vicinity of the project area, due to the presence of suitable habitat.

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: The Project Area should extend, at a minimum, 5.5 miles both within and beyond the City boundaries to show a more accurate assessment of the potential affects of the Project. Any areas with sensitive biological resources outside of the City limits should have a 5.5-mile buffer that extends into the City to further restrict cat releases/feeding adjacent to these areas.

Mitigation Measure # 2: CDFW recommends the City apply for coverage under an incidental

take permit for Project impacts to CESA-listed species. CDFW also recommends the City consider developing an associated Habitat Conservation Plan if the City believes that there will be long-term benefits. Enforceable mitigation measures, monitoring, and adaptive management measures should be in place, especially if free-roaming cat populations do not decline.

Mitigation Measure #3: The City must fully avoid all impacts to fully protected species.

Comment #2: Impacts to Nesting Birds

Issue #1: All birds, when nesting, are protected under the Migratory Bird Treaty Act. However, the DEIR presumes no impacts on migratory birds in urban areas, which are not identified in the DEIR as environmentally sensitive.

Issue #2: The Project may impact burrowing owls.

Specific impacts: Feeding cats does not stop them from killing or injuring wildlife, and they frequently do not eat what they kill. The possibility for disease transmission among feral cats and wildlife is a serious concern where feral cats are abundant.

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. Ground-nesting birds, such as burrowing owl, are particularly susceptible to being killed by cats.

According to the home range values listed in Appendix M, Table M-1, the highest median home range is 3,504 acres (or 5.5-mile territory). Impacts to wildlife can reasonably be expected to occur within a cat's 5.5-mile maximum territory size. Given that 50 percent of cats will have a larger home range than the median value, CDFW recommends using the highest home range value, not the highest median/mean value.

Why impact would occur: Impacts to nesting birds could result from both cat feeding and cat releases. Project-disturbance activities could result in mortality or injury to nestlings, as well temporary or long-term loss of suitable nesting and foraging habitats. Harassment by cats during the bird-breeding season could result in the incidental loss of breeding success or otherwise lead to nest abandonment.

Impacts to burrowing owl could result from both cat feeding and cat releases. Project disturbance activities may result in the death or injury of adults, eggs and young. The Project may remove burrowing owl foraging habitat by encouraging feral cat occupation of habitat that contains burrowing owl, or, that supports essential rodent, insect, and reptile that are prey for burrowing owl.

Evidence impact would be significant: Migratory nongame native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (Title 50, § 10.13, Code of Federal Regulations). Sections 3503, 3503.5, and 3513 of the California Fish and Game Code prohibit take of all birds and their active nests including raptors and other migratory nongame birds (as listed under the Federal MBTA). Proposed Project activities including (but not limited to) feeding and releases of feral cats, and disturbances to native and nonnative vegetation, structures, and substrates, cannot be constrained to only occur outside of

the bird breeding season (which generally runs from February 1 through September 1 (as early as January 1 for some raptors)) to avoid take of birds or their eggs.

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. 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 avoid Project impacts to birds, the City should use the maximum values for cat home ranges (5.5-mile territory) and ensure releases of cats will not occur within this area.

Mitigation Measure #2: To reduce Project impacts to burrowing owl to less than significant, CDFW recommends that the Project adhere to CDFW's March 7, 2012, Staff Report on Burrowing Owl Mitigation (<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83843>). All survey efforts should be conducted, and results included in the DEIR to allow CDFW to analyze impacts, avoidance, minimization and mitigation measures.

Comment #3: Definition and Mapping of CDFW Sensitive Natural Vegetation Communities and Sensitive Species

Issue 1: The DEIR states "The California Department of Fish and Game's Significant Natural Areas Program is no longer in operation. The areas of Conservation Emphasis is now used by the Department. The ACE program identifies relative biodiversity values across the state."

The CDFW Areas of Conservation Emphasis website (CDFW, 2019) states, "The ACE maps provide a coarse level view of information for conservation planning purposes, ranging from ecological research and modeling to local land-use planning and conservation decision-making. However, they do not replace the need for site-specific evaluation of biological resources and should not be used for regulatory purposes."

Issue 2: Using California Natural Diversity Database (CNDDDB) occurrences as the extent of occupied habitat for state sensitive plants and animals, and not analyzing on-the-ground suitable habitat by species, provides an incomplete picture of biological resources.

Specific impacts:

Issue 1: The DEIR did not analyze Sensitive Vegetation Communities and deferred to using the ACE model. CDFW is concerned the DEIR did not explain how ACE was used in the DEIR analysis. ACE is a model that identifies large scale biodiversity scores for a subset of species. and the ACE tool description states, "Note that ACE does not replace the need for site-specific evaluation of biological resources and should not be used for regulatory purposes." In other words, ACE is not sufficient to determine impacts to biological resources for a Project. ACE is a model that scores the state-wide conservation value of an area based on biodiversity and species richness. In CEQA analysis, impacts to a single sensitive species can be considered

significant regardless of an area's species richness or biodiversity scoring. ACE was not designed to detect CEQA-level biological impacts.

In 2007, the State Legislature required CDFW to develop and maintain a vegetation mapping standard for the state (Fish and 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>.

Issue 2: Relying on the CNDDDB for species occurrences, without conducting an accurate, species-specific habitat suitability analysis, runs the risk of overlooking habitat that is potentially occupied by sensitive species. Since CNDDDB is only a positive sighting database, any areas that have not been surveyed, or were surveyed but the data was not sent to CNDDDB, will show no data for sensitive species being present. ACE general maps, without manipulating the metadata for species specific habitat suitability predictions, is not an adequate tool for determining Project biological impacts.

Why impact would occur: CDFW considers vegetation communities, alliances, and associations with a statewide ranking of S1, S2, S3, and some S4 as sensitive and declining at the local and regional level (Sawyer et al. 2008). An S3 ranking indicates there are 21 to 80 occurrences of this community in existence in California, S2 has 6 to 20 occurrences, and S1 has less than 6 occurrences. The Project may have direct or indirect effects to these sensitive vegetation communities. For the DEIR to determine the rarity ranking of vegetation communities potentially affected by the Project, the MCV alliance/association community names should be provided as CDFW only tracks rare natural communities using this classification system.

Evidence impact would be significant: Project impacts may result in substantial adverse effects, either directly or through predator/prey/pollinator modifications, on a vegetation community identified by CDFW as sensitive.

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: CDFW recommends avoiding any sensitive natural communities found on the Project. If avoidance is not feasible, the Project proponent should mitigate at a ratio sufficient to achieve a no-net loss for impacts to special status plant species and their associated habitat. Impacts for S2 communities should be mitigated at a higher ratio due to its higher rarity rank. All revegetation/restoration areas that will serve as mitigation should include preparation of a 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 (Assembly Bill 1094; Government Code, §§ 65965-65968).

Mitigation Measure #2: Some areas of the Project have already been mapped to the alliance level and are available at <https://www.wildlife.ca.gov/Data/VegCAMP/Reports-and-Maps>. At a minimum, the DEIR should incorporate these previously mapped areas and include any S1 to S3 ranked vegetation community as a sensitive resource.

Mitigation Measure #3: CDFW recommends conducting a detailed, species-specific habitat suitability analysis utilizing best-available information including vegetation maps using alliance-based mapping and species-specific habitat overlays.

Comment #4: Model and DEIR Analysis

Issue #1: The DEIR makes assumptions based on a model. The DEIR does not include any sampling or monitoring to 1) demonstrate the baseline assumptions of the model are correct or 2) demonstrate the short- and long-term predictions of the model are accurate.

Issue # 2: The model used in the DEIR appears to have significant errors.

Specific Impact:

Issue #1: Based on the model, the DEIR assumes the Project will be self-mitigating. The DEIR assumes the number of cats will initially increase, but over time, will decrease. However, studies indicate that trap/neuter/release programs generally do not result in lower numbers of free roaming cats (Castillo et al., 2003, Lepczyk, et al., 2010, Longcore, et al., 2009).

Issue #2: The two formulas of the model that are used for each of the four subpopulations appears to transpose the juvenile sterilization rate with the adult sterilization rate. This error means that the DEIR assumes juvenile cats are sterilized at the much lower adult sterilization rate in the case of owned cats and at the much higher adult sterilization rate in the case of stray and feral cats. The error appears replicated from a typographic error in the original paper on which the model is based. The results of this model erroneously show a no project condition resulting in the owned subpopulation increasing 350% over 30 years, due to the use of the low annual adult sterilization rate for the juvenile owned cats (Evans, et al., 2019). This affects the no project baseline and the analysis that compares Project alternatives to this incorrect baseline.

Why impact would occur: The DEIR does not include any validation or sampling to ensure the assumptions made in their model are accurate. The DEIR relies on a literature review based on studies, in which it is uncertain whether these results were validated on the ground for model accuracy.

The model used in the DEIR analysis is a deterministic model, which means there is only one possible output. There is also no evaluation of uncertainty pertaining to the model assumptions or the statistical confidence in the output of the model. The model design appears to not allow for a larger population size of stray/feral cats in thirty years.

Evidence Impact would be significant: Without an accurate model that has been validated, the results and impact analysis are incomplete. CDFW is unable to verify the accuracy of the model predictions or make specific recommendations for avoidance and/or minimization.

Recommended Potentially Feasible Mitigation Measure(s):

Mitigation Measure #1: CDFW recommends the DEIR include a corrected model analysis along with the error analysis. Validation based on sampling should also be included.

Dr. Jan Green Rebstock
City of Los Angeles
October 28, 2019

Mitigation Measure #2: CDFW recommends that the DEIR contain a short- and long-term monitoring plan that includes tracking released cats to assess realistic home ranges. In addition, the DEIR should ensure adequate indoor cat rescue facilities are available to prohibit the need to release these cats within the City. In addition to the City committing to 20,000 additional sterilizations per year for the next 30 years (roughly a \$60 million commitment), CDFW recommends the City also commit to fund monitoring, adaptive management, enforcement, vaccinations, flea control, and all other project elements.

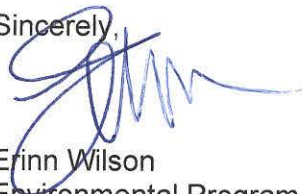
Filing Fees

The Project, as proposed, would have an impact on fish and/or wildlife resources, 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. (California Code of Regulations, tit. 14, § 753.5; Fish and Game Code, § 711.4; Public Resources Code, § 21089).

Conclusion

We appreciate the opportunity to comment on the project to assist the City of Los Angeles in adequately analyzing and minimizing/mitigating impacts to biological resources. Questions regarding this letter and further coordination on these issues should be directed to Kelly Schmoker-Stanphill, Senior Environmental Scientist (Specialist), at (626) 335-9092 or Kelly.schmoker@wildlife.ca.gov.

Sincerely,



Erinn Wilson
Environmental Program Manager I

ec: CDFW

Victoria Tang – Los Alamitos
Kelly Schmoker-Stanphill – Glendora
Andrew Valand – Los Alamitos
Joseph Stanovich – Los Alamitos
Dolores Duarte – San Diego

Scott Morgan (State Clearinghouse)

References:

California Department of Fish and Wildlife, 2018. Updated Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities. Retrieved from: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959>.

California Department of Fish and Wildlife, 2019. Areas of Conservation Emphasis. Retrieved from: <https://www.wildlife.ca.gov/Data/Analysis/Ace#523731772-connectivity---new-june-2019-update>.

Castillo, D., & Clarke, A. L. (2003). Trap/neuter/release methods ineffective in controlling domestic cat" colonies" on public lands. *Natural Areas Journal*, 23(3), 247-253.

Evans, B.S., Lepczyk, C.A., and Marra, P.P. 2019. Cat Population Modeling to Inform Environmental Impact Analysis: A Review of Methods and Results Presented in the City of Los Angeles Citywide Cat Program Draft Environmental Impact Report.

Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Nongame-Heritage Program, California Department of Fish and Game. October 1986.

Lepczyk, Christopher & Dauphine, Nico & Bird, David & Conant, Sheila & Cooper, Robert & Duffy, David & Hatley, Pamela & Marra, Peter & Stone, Elizabeth & Temple, Stanley. (2010). What Conservation Biologists Can Do to Counter Trap-Neuter-Return: Response to Longcore et al. *Conservation biology : the journal of the Society for Conservation Biology*. 24. 627-9. 10.1111/j.1523-1739.2009.01426.x.

Longcore, T , Rich, C. and Sullivan, L. M. (2009), Critical Assessment of Claims Regarding Management of Feral Cats by Trap–Neuter–Return. *Conservation Biology*, 23: 887-894. doi:[10.1111/j.1523-1739.2009.01174.x](https://doi.org/10.1111/j.1523-1739.2009.01174.x)

Oberbauer, T., M. Kelly, and J. Buegge. 2008. Draft Vegetation Communities of San Diego County. March 2008. http://www.sdcanyonlands.org/pdfs/veg_comm_sdcounty_2008_doc.pdf

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