

31 July 2017

Via Electronic Submission

California Department of Food and Agriculture
ATTN: Amber Morris
CalCannabis Cultivation Licensing
Draft Program EIR Comments
1220 N Street, Suite 400
Sacramento, CA 95814
calcannabis.peir@cdfa.ca.gov

Subject: Comments on CalCannabis Cultivation Licensing Draft Program EIR

Dear Ms. Morris:

These comments are submitted on behalf of Sequoia ForestKeeper® in response to the California Department of Food and Agriculture’s CalCannabis Cultivation Licensing Draft Program Environmental Impact Report (“PEIR”). Sequoia ForestKeeper® is a non-profit environmental organization with offices in Kernville, California, dedicated to the protection of diverse native species and their habitats through science, policy, education, and law.

Sequoia ForestKeeper® agrees with the statement in CalCannabis Cultivation Licensing Draft Program EIR Volume 2 page 28 (see below) and believes that that the waste and unreasonable use of water within forests and surrounding watersheds is critically important for retaining the native species in the forests and watersheds of California.

“(b) (1) The board may modify the requirements of subdivision (a) upon finding either of the following:

(A) That strict compliance is infeasible, is unreasonably expensive, would unreasonably affect public trust uses, or would result in the waste or unreasonable use of water.

(B) That the need for monitoring and reporting is adequately addressed by other conditions of the permit or license.

(2) The board may increase the 10-acre-foot reporting threshold of subdivision (a) in a watershed or subwatershed, after considering the diversion reporting threshold **in relation to quantity of water within the watershed or subwatershed.**

The board may increase the 10-acre-foot reporting threshold to 25 acre-feet or above if it finds that the benefits of the additional information within the watershed or subwatershed are substantially outweighed by the cost of installing measuring devices or employing methods for measurement for diversions at the 10-acre-foot threshold.” (DEIR Vol 2 page 48)

The California Department of Food and Agriculture must make sure that the quantity of water within the watershed or subwatershed is first allocated to sustaining healthy forests and species in those forests before permitting or allowing any water to be used for any other use.

If any human use of water were to jeopardize a thriving forest by removing water from that thriving forest, its ecosystems, its species, and its watersheds, those other human uses of water would be wasteful and unreasonable uses of water.

Due to climate change, air pollution, the repeated drought conditions in California, and the ever growing anthropogenic uses of water in the Sierra Nevada forests that are collectively causing the continued and massive tree die-off, California must determine the water balance or water budget in watersheds before permits are issued or renewed for wells, water diversions, water withdrawals, and water development, so the agency knows in advance whether water is available for anthropogenic uses. Managers of land in California must have regulations or laws that require water balance or water budget determinations, so permits are issued with a clear scientific basis for knowing that the permitted anthropogenic water use will not deprive the trees or other species in the forest of the water needed for its survival.

In 2014, the USFS Washington office published a directive in the Federal Register that would have required federal land managers to know how much water was available for federal lands management, but the directive was withdrawn in 2015 (see below).

The CalCannabis Cultivation Licensing Draft Program EIR Vol 2 page 48 also states that . . . measurements using the best available technology . . . capable of continuous monitoring . . . “The measurements shall be made using the best available technologies and best professional practices, as defined in Section 5100, using a device or methods satisfactory to the board, as follows:

(A) A device shall be capable of continuous monitoring of the rate and quantity of water diverted and shall be properly maintained. The permittee or licensee shall provide the board with evidence that the device has been installed with the first report submitted after installation of the device.”

The continuous monitoring could as easily contain an electronic chemical sensor to sense toxins in the down-stream water flow. While this would not detect chemicals that are absorbed into the ground at the site, it would be better than no detector on the downstream flow.

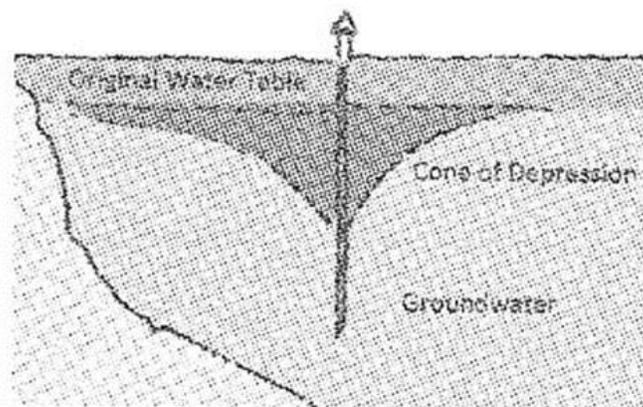
DROUGHT AND HUMAN WATER USES STRESS FOREST SPECIES

Given the ongoing drought that has so far killed 102 million trees in the southern Sierra, forest management agencies that manage forests in California should be required to analyze the water balance of the forest, considering all water in and water out of the watershed ecosystem, including water wells, water diversions, water withdrawals, and water development that might remove water from the trees and species that the agency is charged with protecting.

We particularly applaud the Forest Service's recognition and declaration of the inherent connection between surface and groundwater resources in the U.S. Forest Service's proposed Groundwater Directive, published in the Federal Register on May 6, 2014 at 79 Fed. Reg. 25,815. <https://www.federalregister.gov/documents/2015/06/19/2015-15151/proposed-directive-on-groundwater-resource-management-forest-service-manual-2560>. These resources are often managed separately, creating a problematic dichotomy. Managing surface and groundwater resources as a unified whole is particularly important in National Forests, where the headwaters of many rivers are found. Declining groundwater levels on these lands would decimate their flows and the value to visitors, ecosystems, and downstream users. Including groundwater in planning efforts for National Forests will also benefit fishing and recreation on and around important rivers and springs throughout the country. **Unfortunately, The US Forest Service withdrew a proposed directive on groundwater resource management on June 19, 2015.**

Forest managers allow human water use without knowing the water balance. Wells cause a "cone of depression" in the aquifer, an actual depression of the water level around the well that could stress the trees that forest management agencies are charged with protecting.

The "cone of depression" in the aquifer around a well, which could be stressing the trees, was first scientifically documented in 1938. (See endnotes for additional citations to the cone of depression.^[1])



Well with cone of depression.

(The Man Who Thought He Owned Water by Tershia d'Elgin, describes and illustrates the cone of depression on pages 68.)

The “cone of depression” is well documented in scientific literature and supports the assertion that wells and diversions could be stressing the trees that forest managers are charged with protecting. Water wells in the Sierra Nevada are located and placed in isolated fracture pockets using fracture drilling techniques.

Forest managers must develop a comprehensive inventory of surface and groundwater resources of water in the watersheds as a way to establish a baseline for assessing the impacts of projects that enable wells, diversions, withdrawals, or water development to prevent withdrawals from impacting the trees they are supposed to be protecting, and before authorizing use permits that enable the withdrawal of water from the aquifer by wells, spring water diversions, and other water development.

Forest managers must consider all human water uses permitted as one of the causes that continue to exacerbate the tree die-off in California. Managing nature while ignoring human damage has created this legacy of decay.

Is the massive tree die-off in California being caused only by the drought and climate change, or is the die-off being exacerbated by the limited water supply held in the granitic structure of the mountains where tree roots must penetrate to reach their needed water supply when surface water flows are intermittent? When water wells are drilled into the fractured rock aquifer below where tree roots penetrate, are trees being deprived of life sustaining water?

“Nature is not the only culprit. Humans helped set the destruction in motion.” (LA Times 2017/01/28) <http://www.latimes.com/local/california/la-me-sierra-dead-trees-20170128-story.html>

Invisible human straws are the root of the problem and have been overlooked by government researchers as factors in California’s massive tree die-off; groundwater wells, water diversions, and surface withdrawals also remove water from the root zone of trees.

CONCLUSION

Forest managers, including the USFS, USDI, CalFIRE, California Department of Food and Agriculture, and others, must consider the total water balance in the forest—the flow of water in and out of a system—(WATER IN = WATER OUT), including, but not limited to the anthropogenic uses of water in the forests of water wells, water diversions, water withdrawals, and water developments that serve people who have established in forested areas of California.

Respectfully submitted,

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[ⁱ] **Other references to the Cone of Depression**

[The significance and nature of the cone of depression in ground-water bodies](#)

CV Thesis - Economic Geology, 1938 - economicgeology.org

Abstract In nature the hydraulic system in an aquifer is in balance; the discharge is equal to the recharge and the water table or other piezometric surface is more or less fixed in position. Discharge by wells is a new discharge superimposed on the previous system.

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[Controlling cone of depression in a well by microprocessor control of modulating valve](#)

RW Brophy, RJ Kadwell - US Patent 5,147,559, 1992 - Google Patents

A method for removing floating immiscible liquids from a well containing both the floating immiscible liquids and water, where the floating immiscible liquids and water meet at a water interface, by controlling a **cone of depression** within the well. A removal system for removing

[Cited by 54](#) [Related articles](#) [All 2 versions](#) [Cite](#) [Save](#)

[CITATION] Depression-focused transient groundwater flow patterns in Manitoba

A Lissey - Geological Association of Canada Special Paper, 1971

[Cited by 107](#) [Related articles](#) [Cite](#) [Save](#)

[CITATION] The **cone of depression** and the area of diversion around a discharging well in an infinite strip aquifer subject to uniform recharge

RH Brown - US Geological Survey Water-Supply Paper C, 1963

[Cited by 21](#) [Related articles](#) [Cite](#) [Save](#)

[\[PDF\]](#) narotama.ac.id

[\[PDF\]](#) [The source of water derived from wells](#)

CV Thesis - Civil Engineering, 1940 - ejournal.narotama.ac.id

... The essential factors controlling the action of an aquifer appear to be (1) the distance to, and character of, the re-charge; (2) the distance to the locality of natural dis-charge; and (3) the character of the **cone of depression** in the given aquifer. ...

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[Hydrologic effects of stress-relief fracturing in an Appalachian valley](#)

GG Wyrick, JW Borchers - 1981 - pubs.er.usgs.gov

... Tests of wells near the valley center indicated a change in storage coefficient as the **cone of depression** caused by pumping reached the confined-unconfined boundaries; the tests also indicated barrier-image effects when the cone reached the impermeable boundaries. ...

[Cited by 97](#) [Related articles](#) [All 3 versions](#) [Cite](#) [Save](#) [More](#)

[Ground-water resources of Kings and Queens Counties, Long Island, New York](#)

HT Buxton, PK Shernoff - US Geological Survey water-supply paper, 1999 - cat.inist.fr

... In eastern Queens County, where pumpage for public supply averages 60

Mgal/d, all three major aquifers contain a large **cone of depression**. The

saltwater-freshwater interface in the Jameco-Magothy aquifer already extends ...

[Cited by 28 Related articles All 4 versions Cite Save More](#)

[\[HTML\] google.com](#)

[\[HTML\] Groundwater: the water budget myth](#)

JD Bredehoeft, SS Papadopulos... - Scientific Basis of Water ..., 1982 - books.google.com

... D0. We drill a well and begin to pump water from the aquifer on the island. A **cone of depression** develops and expands outward from the well. Figure 4.3 shows this **cone of depression** a short time after pumping has begun. If ...

[Cited by 184 Related articles All 3 versions Cite Save](#)

[Environmental impact assessment of risk associated with groundwater overdraft remediation in cone of depression, Jining, China](#)

BTI Ong, L Shu, P Liu - Environmental geology, 2007 - Springer

Abstract In this paper, a simple scenario and probabilistic approach is used to assess the potential groundwater risk due to proposed overdraft remedial actions in **cone of depression**, Jining City, China. Focusing on the concentrations of Chloride ions (Cl⁻) and total hardness

[Cited by 9 Related articles All 9 versions Cite Save](#)

[\[PDF\] ndep.state.nv.us](#)

[The water budget myth revisited: why hydrogeologists model](#)

JD Bredehoeft - Ground Water, 2002 - Wiley Online Library

... Page 2. analyzes the impact of pumping independent of the initial (virgin) hydraulic head.

The **cone of depression** is calculated as a function of time. This **cone of depression** is then superposed upon the existing hydraulic head (or water table). ...

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