

IN THE CIRCUIT COURT OF THE FIRST CIRCUIT

STATE OF HAWAI'I

SIERRA CLUB,

Plaintiff,

vs.

BOARD OF LAND AND NATURAL  
RESOURCES; DEPARTMENT OF LAND  
AND NATURAL RESOURCES; SUZANNE  
CASE, in her official capacity as Chairperson of  
the Board of Land and Natural Resources;  
ALEXANDER AND BALDWIN, INC., and  
EAST MAUI IRRIGATION, LLC.,

Defendants.

Civil No. 19-1-0019-01 JPC

DECLARATION OF AYRON M STRAUCH

**DECLARATION OF AYRON STRAUCH**

I, AYRON STRAUCH, PhD under penalty of perjury hereby declare:

1. I am the Hydrologic Program Manager for the Commission of Water Resource Management (CWRM), State of Hawai'i.
2. As part of my job at CWRM, I monitor and study the various streams, including those on East Maui.
3. Over the course of several years, I worked on providing information to CWRM regarding establishing, implementing and monitoring measurable instream flow standards for the Petitions to Amend the East Maui Instream Flow Standards (IFS).
4. The 2018 CWRM D & O contains an in-depth analysis of 27 East Maui streams including consideration of physical characteristics of the watersheds, features of the diversions present, availability of hydrological data, instream values and users. The surface water

hydrologic units analyzed were: Honopou, Hanehoi, Waikamoi, Wahinepee, Puohokamoa, Haipuaena, Punalau/Kolea, Honomanu, Nuaailua, Piinaau, Ohia/Waianu, Waiokamilo, Wailuanui, West Wailuaiki, East Wailuaiki, Kopiliula, Waiohue, Paakea, Waiaka, Kapaula, Hanawi, and Makapipi. Some of these hydrologic units include named tributary streams that were also part of the initial petition and the 2018 CWRM D & O.

5. Twelve of the streams involved in the Sierra Club case (Koloa, Punaluu, Kaaiea, Oopuola, Puehu, Nailiihaele, Kailua, Hanahana, Hoalua, Waipio, Mokupapa and Hoolawa) were not addressed in the 2018 CWRM D & O because no one petitioned to have the particular IIFS amended as part of the contest case hearing before CWRM. Also, several of the “streams” listed by Plaintiff are tributaries of other streams and/or are not priority streams per the Hawaii Stream Assessment (Exhibit 2).

6. Streams not considered in the 2018 CWRM D & O remain in their status quo per the 1988 IIFS. Water diverted, if any, must be for reasonable and beneficial use.

7. Instream values considered and addressed in the CWRM D & O Decision include maintenance of aquatic life and wildlife habitats, recreational value, maintenance of ecosystems such as estuaries, wetlands, and stream vegetation, aesthetic values, navigation, instream hydropower, water quality, conveyance of irrigation and domestic water supplies to downstream points of diversion, and protection of traditional and customary Hawaiian rights.

8. Noninstream uses considered in the CWRM D & O include the irrigation demands of diversified agriculture and municipal uses by the Maui Department of Water Supply. The availability of alternative sources of water and the economic impact of restricting the use of surface water were also considered in the decision.

9. Measuring and monitoring stream flow is challenging in the humid tropics and funding or maintaining a hydrologic monitoring program is especially difficult across an island chain such as Hawai'i. The wet and dry season variability, episodic storm events, high gradient watersheds, steep rainfall gradients, and varied underlying geologic features make monitoring surface and groundwater resources problematic.

10. The interim instream flow standard is a numeric flow rate, or depth of flow, that must remain in the stream at a certain location. In the 2018 CWRM D & O, CWRM relied on U.S. Geological Survey estimates of median ( $Q_{50}$ ) and low ( $Q_{90}$ ) flow characteristics for total flow and base flow. Total flow is the sum of both base flow and runoff in the stream. Base flow is the ground water component of stream flow flowing from recharge. Runoff is the overland and shallow subsurface flow generated by rainfall. The  $Q_{50}$  flow is the magnitude of flow that can be expected to occur at least 50% of the time. The  $Q_{90}$  flow is the magnitude of flow that can be expected to occur at least 90% of the time. The base flow is a smaller component of the stream's total flow, but is dependent on the underlying geology, the particular watershed's incision of high-level groundwater and input from rainfall. The availability of rainfall as runoff and recharge is dependent on regional and localized climate patterns (i.e., rainfall, humidity, temperature, wind, sunlight), the watershed's size and shape, its aspect relative to the trade winds, maximum watershed elevation relative to the inversion of the temperature lapse rate, land-use/land cover, soil composition, and resource management. Large storm events provide important ecological functions in streams such as the flushing out of invasive aquatic species, transporting the larval forms of native amphidromous species to the ocean, and adding nutrients to the near shore marine environment.

11. Current research indicates that the flow necessary to provide suitable habitat conditions for recruitment, growth, and reproduction of native amphidromous species is 64% of median base flow, also known as H90.

12. In order to develop each Interim Instream Flow Standard, CWRM prepared an Instream Flow Assessment Report which addressed instream and nonstream uses per the State Water Code, HRS § 174C-3.

13. CWRM staff spent considerable time assessing and weighing instream and nonstream uses against the hydrologic conditions and instream values for each stream.

14. The information considered in regard to fish and wildlife is the presence of barriers to successful colonization (i.e., terminal waterfalls, habitat quality, competition with invasive species), the current distribution of amphidromous species, the size (e.g., width, length, natural base flow) of the stream (i.e., viability to successfully support native aquatic biota), as well as the projected abundance, diversity and distribution of biota based on species specific traits.

15. It is not practical, realistic or economically feasible to gage all streams. For example, in fiscal year 2020, CWRM added one new stream gage on Maui at the Nailiilihaele Stream in the annual U.S. Geological Survey cooperative hydrological monitoring agreement. This first year cost for the one stream gage is estimated to be \$35,000. In some instances, additional helicopter costs are incurred due to the remoteness of the gaging location. It is not only exorbitantly expensive to install gages, but it is also highly challenging to install stream gages because there is often no fixed shape to the stream, stream channel conditions change over time, the gages are often washed out in runoff events, or do not provide consistent and reliable data.

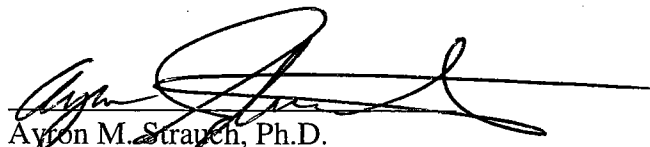
16. CWRM staff currently monitors 35 observation wells and maintain 35 stream gaging stations across the State, while each county's water supply department also monitors dozens of observation wells and reports to CWRM. Funding and personnel limitations make it extremely impractical to have gaging stations on every stream.

17. Each fiscal year, CWRM enters into a joint funding agreement with USGS for hydrologic data collection, which covers rainfall, groundwater, and stream flow monitoring. In the 2019 legislative session, CWRM was appropriated additional funding to increase monitoring of water resources. The additional gaging stations covered by the USGS agreement were approved by Commission action on August 29, 2019. (Exhibit 3)

18. In the 2019 legislative session, DLNR/CWRM sought and received funding from the Legislature to initiate an ecological study comparing partially (H90) restored streams to fully restored streams. Planning for the study is moving forward with the Division of Aquatic Resources.

19. I testified regarding the application for holdover of the water permits at the BLNR sunshine meeting on November 9, 2018 and provided information regarding the streams, and answered BLNR's questions based upon my expertise in hydrology and personal knowledge of the East Maui streams.

Dated: Honolulu, Hawaii, August 30, 2019

  
Ayton M. Strauch, Ph.D.

Civil No. 19-1-0019-01 (JPC)

**Defendant A&B/EMI's Exhibit AB-99**

FOR IDENTIFICATION \_\_\_\_\_

RECEIVED IN EVIDENCE \_\_\_\_\_

CLERK \_\_\_\_\_