

## *A Stampede of Zebras*

“When you hear hoofbeats, think horses, not zebras.”

That guidance to physicians may be gold for identifying most of the maladies presented in emergency rooms and clinics. But when it comes to rat lungworm disease, it has led to missed or belated diagnoses of an infection that can lead to devastating, life-altering consequences for growing numbers of residents and visitors.

The state’s treatment guidelines seem to require that the disease be far advanced before diagnosis is confirmed and pharmaceutical remedies are prescribed. The result has been deep mistrust of the state among rat lungworm victims and a lively discussion of folk treatments, everything from diatomaceous earth to black walnut oil.

As the state Department of Health looks to have treatments confirmed by trials on primates – not likely to occur anytime soon – the Hilo Medical Center, which probably sees more rat lungworm victims than any other hospital in the nation, has released its own guidelines for treatment at an earlier stage, calling for the use of over-the-counter pinworm medications.

Maybe this will be ineffective against the most serious infections. But in any event, to cite another medical injunction, it can do no harm.

## Rat Lungworm Disease: a Public Health Crisis the State Is Struggling to Address

“Infectious disease is going to have a larger impact than terrorism on our future,” Lieutenant Governor Josh Green said in his introductory remarks to the 6th International Workshop on *Angiostrongylus* and *Angiostrongyliasis*, held last month in Hilo.

In his official capacity, Green regularly receives updates on security threats to the state. Because he also moonlights as an emergency room physician, Green has witnessed the harmful effects infectious diseases have had here and abroad, as well.

Green cited his recent experience in Samoa, where he helped vaccinate a population that had seen measles vaccinations rates plummet in recent years, leaving it vulnerable to an epidemic of the life-threatening disease. He then called out the state’s epidemic of dengue fever a few years back and the outbreak of zika in South America. “All of these have had a much greater impact on the loss of life, on the development of newborns, and on

economics across the globe.”

During the course of the workshop, it became apparent that the state’s efforts to address neuro-angiostrongyliasis, the disease caused by the rat lungworm, *Angiostrongylus cantonensis*, were too little and too late for many of those who count themselves its victim.

When a presenter asked how many in the audience had been infected with rat lungworm disease, approximately two dozen raised their hands. But in response to the next question – how many had had their diagnoses confirmed – the show of hands was far less.

That gap between the self-diagnosed but unconfirmed and those whose diagnosis had been given official recognition by the state Department of Health (DOH) was a near-constant theme of the workshop. In Hawai'i, an official diagnosis requires confirmation of the presence of rat lungworm DNA by a PCR test of spinal fluid, but generally no testing is

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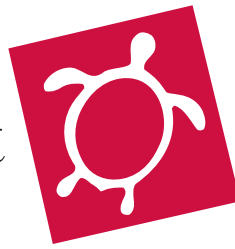
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*Angiostrongylus cantonensis.*



## NEW AND NOTEWORTHY

**Tibouchina Biocontrol:** The state Department of Agriculture has released a draft environmental assessment for the statewide release of a small Brazilian beetle, *Syphraea uberabensis*, to control *cane tibouchina*, a noxious weed, and related species.

According to the draft EA, noticed in the Office of Environmental Control's January 23 *Notice*, the beetle "is a natural herbivore of *Tibouchina herbacea* in the plant's native range in Brazil." Tests to



Cane tibouchina.

see whether the beetle might harm other species of plants, including those having economic or environmental value in Hawai'i, showed it was unlikely to affect those species.

"Because *S. uberabensis* is specialized on a few species of melastomes, all of which are invasive, the environmental consequences of its release are expected to be beneficial to the native forests and agricultural economy of Hawai'i, and adverse effects are expected to be negligible," the draft EA states.

Comments on the draft document are due by February 24.

**Three Strikes:** The National Marine Fisheries Service has determined that all three of the false killer whales hooked by the Hawai'i deep-set longline fleet last November were released with serious injuries that would likely result in their deaths. That brings the 2019 total of false killer whale interactions in federal waters around Hawai'i that resulted in mortalities or serious injuries (M&SI) to five.

Under federal regulations, two M&SI interactions within one year triggers the closure of a large section of fishing ground south of the Main Hawaiian Islands known as the Southern Exclusion Zone (SEZ). The zone was closed early last year and remains closed for now.

When or whether NMFS decides to reopen the SEZ this year remains to be seen. The Hawaiian false killer whale take reduction team, which advises NMFS, was scheduled to meet via teleconference on January 31 to discuss the circumstances surrounding the whale interactions and possible amendments to the federal take reduction plan, among other things.

On the high seas around Hawai'i, outside the 200-mile U.S. Exclusive Economic Zone, the fleet hooked an additional eight false killer whales and one blackfish. Two of the animals died on



False killer whale.

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### Quote of the Month

*"[T]hese parasites can't reproduce, can't survive, without the rats. If you cut out the rat part of the equation, these things won't exist. If we're ever successful in eradicating rats, we'd get rid of not just rat lungworm, but a lot of other diseases."*

— *Sarah Park, M.D., state epidemiologist*

the lines, four were released with serious injuries, one — caught in December — had yet to receive an injury determination by press time, and the rest were released with non-serious injuries.

All four of the whales determined to have been seriously injured on the high seas were cut free or escaped with at least 10 meters of fishing line attached. In all of those cases, the captains ordered the crew to cut the lines, but in one case, the line broke beforehand.

(For more on this, see our January 2020 article, "Hawai'i Longliners Continue to Hook False Killer Whales in Federal Waters," available at [environment-hawaii.org](http://environment-hawaii.org).)

## Dogs Vulnerable to Rat Lungworm Infection

In Hawai'i, it would seem, dogs have received better treatment for rat lungworm disease than humans.

For several years, Dr. Albert Mina, a veterinarian in Hilo, has been treating dogs presumed to have been infected with rat lungworm larvae. Last year, working with Dr. Sue Jarvi at the University of Hawai'i-Hilo College of Pharmacy, Mina began to send blood products from dogs showing typical symptoms (i.e. weakness in the hind legs) to Jarvi's lab, where the samples would undergo testing for the presence of rat-lungworm DNA.

"The turnaround time for PCR testing is pretty good," Mina reported to the audience at the rat lungworm workshop, "generally between 24 and 48 hours. By the time we get the results, we usually have already started treatment with steroids and dewormer. Also pain meds, usually a narcotic type of pain reliever. A lot of times we start to see improvement within two days."

From February through November, Mina tested 26 dogs, 12 of which tested positive for infection, 11 tested negative, and results for three were inconclusive.

Ten of the dogs that tested positive for the disease responded successfully to treat-

ment, Mina said. "One was euthanized due to failure to respond to treatment," he noted, adding that the disease was far advanced when the animal was first brought in for treatment. The other dog that died was 15 years old and had terminal



Heartworm preventative medication may clear rat lungworm infections in dogs.

neoplasia in addition to the rat lungworm infection.

A question was raised about the effectiveness of monthly heartworm treatments protecting dogs against rat lungworm disease. Mina said that 10 of the 12 dogs he saw with the disease were not on regular heartworm prevention treatments. Jenee Odani, a veterinary extension agent with the University of

Hawai'i, said that of the two dogs with rat lungworm disease that she had seen on O'ahu, one was on a "worm pill."

In response to a follow-up email from *Environment Hawai'i*, Odani said that most heartworm prevention medications can kill migrating rat lungworm larvae. "Dogs not receiving any heartworm prevention are susceptible to becoming infected with rat lungworm every day of the month," she wrote. "Dogs that take a heartworm preventative that is cleared quickly from the bloodstream will be susceptible to RLW infection for more than 20 days in a month. On the other hand, dogs that take a heartworm preventative that maintains high blood levels for a longer period of time may only be susceptible to infection for less than three days per month."

She added, however, that all this "is very variable, as measured half-lives of the different medications vary considerably between dogs. But this is the likely explanation of why some dogs that take heartworm medication can still get rat lungworm and why more dogs not on heartworm prevention would get it than dogs that are." — **P.T.**

### Worm from Page 1

done until the level of white blood cells showing a response to parasites in spinal fluid reaches 10 percent, or when there are 10 of those cells, called eosinophils, per microliter. This diagnostic threshold is often crossed only after the larvae are well established and the opportunity for effective early treatment has passed.

Since the state added rat lungworm disease to the list of reportable diseases in 2007, the DOH has counted 64 laboratory-confirmed cases and 40 probable cases. A probable case is one that was not lab-confirmed, but the individuals had symptoms consistent with those of the disease, eosinophils in spinal fluid, and a history of contact with snails or slugs.

The disease was known in Hawai'i well before it was reportable. According to the DOH, from 1959 to 1965, there were 19 documented cases of rat lungworm disease in Hawai'i. Incidence of

the disease ramped up starting in 1996, when the semi-slug *Parmarion martensi* was first detected on O'ahu and the Big Island. That species of gastropod seems to be able to harbor a higher concentration of rat lungworm larvae than most other snails and slugs. As the semi-slug has spread across the Big Island district of Puna north to Hilo and beyond, so, too, have the documented cases of rat lungworm disease.

In 2019, the DOH confirmed a total of eight cases of rat lungworm disease (five residents, three visitors). All are believed to have received their exposure to the rat lungworm larvae while on the Big Island.

### A Case Study

Just how damaging this failure to diagnose *Angiostrongyliasis* early can be was brought home in dramatic fashion by the presentation – the first of the workshop

– made by a young couple, Mark LeRoy and Maya Parish, who live in Hawi, on the northern tip of the Big Island.

On January 9, 2019, LeRoy ate a salad made with lettuce grown in their own garden. It had been a wet winter in North Kohala, and for the first time, the semi-slug was showing up in the area.

LeRoy had washed the lettuce, but, he said, he had noticed a slug in the salad and maybe even ate a juvenile slug, which, though small and hard to detect, can also carry the larvae. "I thought about forcing vomiting, but didn't. Maybe I should have," he said.

Nine days after eating the salad, LeRoy experienced his first symptoms, which included a feeling of strong pressure on his upper middle back and chest, headache, cough, tingling in neck, toes, feet, and hands, and fever.

He was in Honolulu at the time and

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**Worm from page 3**

went to the emergency room at Queen's Hospital. A spinal tap showed an elevated eosinophil count, but not high enough to warrant the confirming PCR test, and LeRoy was discharged with a prescription for pain and nausea.

Three days later, and with no abatement in the symptoms, LeRoy went to the emergency room at the North Hawai'i Community Hospital in Waimea. He told the doctor that he suspected he had rat lungworm disease. No spinal tap was done. Again, he was discharged with a prescription for pain and a muscle relaxer.

Both symptoms and the pain intensified.

On January 25, LeRoy and Parish made multiple visits to doctors and to the Waimea hospital, seeking treatment. The ER doctor "was impatient and did no blood work. I was discharged with no treatment whatsoever," LeRoy said.

They called the Department of Health. Again, they received no relief.

By January 28, "Panic was setting in," Parish said. "Mark began vomiting and shaking," she said, and for the third time, they drove to the emergency room in Waimea. Only then did the attending physician begin to give credence to the claim that LeRoy was suffering from rat lungworm disease. He was given steroids and pain relievers and was advised that Dr. Jon Martell in Hilo was the most knowledgeable physician on the island when it came to diagnosing and treating the disease.

"At 2 in the morning, we drove from the North Hawai'i Community Hospital to Hilo to see Dr. Martell," Parish said. "We arrived in Hilo on January 29 at 4 in the morning. We called Dr. Martell's office and were told he doesn't see patients."

At this point, Will Chapple, a family physician in Waimea, returned a call that LeRoy had left with his office. He had looked at the results of the bloodwork done at Queen's hospital and agreed to see LeRoy later that day. "It was the first time we truly felt helped," Parish said.

Chapple prescribed Vicodin for pain, Ambien for sleep, and dexamethasone for inflammation. Parish called him "our hero at a desperate time."

But the symptoms continued to worsen. There were new symptoms in-

volving cognition. LeRoy became unable to distinguish between past, present, and dream states. Chapple then prescribed the anthelmintic Albendazole, but the pharmacy in Waimea did not have it in stock.

LeRoy and Parish made a fourth visit to the Waimea hospital, where they waited four and a half hours before leaving, with no doctor having seen LeRoy. "We felt desperate for care," Parish said.

Over the next week, LeRoy said he "experienced pain like I had never experienced – level 9-10 pain. I felt I was being electrocuted from inside of my body out. Screaming at the top of my lungs. It was very scary."

On February 11, while in Chapple's office, LeRoy had a massive pain attack. Chapple sent him to the North Hilo Community Hospital – the fifth time in three weeks. A lumbar puncture showed an eosinophil count of 7 percent, still not high enough to warrant a PCR test, under Department of Health standards.

LeRoy was hospitalized for a week. The DOH finally ran a PCR test of his spinal fluid on February 18. At that time, he became Hawai'i's second confirmed case of rat lungworm disease for 2019.

Even after diagnosis and discharge, LeRoy continued to experience symptoms. He and his wife sought relief from "different healing modalities," as they put it—including acupuncture, naturopathic remedies, mushrooms, massage therapy, and nutritional supplements.

To this day, LeRoy has lingering symptoms, including numbness in his legs, weakness, fatigue, and tingling in his skin.

**A New Protocol**

On the five emergency room visits and three visits to doctors they made, LeRoy and Parish took with them a written record of his exposure to a slug suspected of harboring rat lungworm larvae as well as a print-out of the Department of Health's guidelines for diagnosing and treating rat lungworm disease.

"I had all the symptoms, and I was communicating them, but the doctors weren't able or willing to connect my symptoms to a diagnosis. They were only connecting a blood test ... as the single means to consider that I had rat lungworm, despite all the evidence," LeRoy said.

If he were to present himself today to the Hilo Medical Center's emergency room, it's just possible that treatment under the hospital's newly released protocol could have saved him a year of pain and suffering.

On January 15, Martell, the hospital's chief medical officer, released the new protocol for early treatment.

And the new protocol?

It's the use of an ordinary, over-the-counter pinworm medication, pyrantel pamoate, as soon as someone suspects they may have ingested an infected slug or snail.

"Information we learned from the recent international rat lungworm conference ... has encouraged us to strengthen our treatment protocol," Martell said. The updated guidance is intended "to improve the process for patients and providers."

The new advisory is based on an unpublished study of the effectiveness of anti-worm (anthelmintic) drugs conducted by researchers at the University of Hawai'i Hilo's Daniel K. Inouye College of Pharmacy. In that study, pyrantel pamoate immobilized rat lungworm larvae in lab conditions. "This data suggests the potential of immobilizing ingested *Angiostrongylus* larvae as well, which could then be expelled through stool without causing an infection, if given early," the hospital's press release stated.

Martell added: "Based on this recent research, we will inform patients that pinworm medication might have benefit if taken immediately after accidental consumption of a snail or slug. The potential, though not proven, benefits appear to outweigh the minimal risk of the treatment. Snails and slugs in east Hawai'i often carry the parasite and the pinworm medicine is available over the counter and safe if given as instructed on the package.... The sooner you take the pinworm medication the more likely it is to help."

The hospital also recommends that if any part of the snail or slug that caused the rat lungworm exposure is still available, it be tested for the presence of larvae. Also, he added, "absolutely go to see your primary care provider within a couple of days for assessment and possible use of additional treatment."

Finally, Martell noted that last September, the Queensland (Australia)

*Continued on next page*

children's hospital updated its guidelines on the use of Albendazole, a prescription anthelmintic, in children. (Australia has, like Hawai'i, seen an uptick in recent cases of rat lungworm disease.)

Those guidelines call for early administration of Albendazole (within seven days of exposure, but not later than 14 days from the time of exposure) once a day for seven days. (The Queensland pediatric guidelines may be viewed online at "Paediatric guideline: Snail and Slug Ingestion: Prophylaxis against *Angiostrongylus cantonensis* infection.")

### Caution at the DOH

"What we worry about is people taking this medicine and assuming they're fine. That's the concern."

The caution over the new Hilo protocol was voiced by Sarah Park, M.D., the state epidemiologist, in an interview with *Environment Hawai'i*.

"Everything we do has to be evidence-based," she added. "Pinworm medicines are safe as long as they're used according to directions. There's that. But is this something we want to put out there? It's difficult."

There's "the risk that people will assume doing this will protect them. We can't guarantee that. ... We don't know if it will be effective.

"That doesn't mean I'm saying 'No, don't do it.' I'm not saying yes. We're on the fence. We need to discuss this, look at different perspectives, understand that if this is to be recommended, how will it be recommended," she said.

Above all, she said, there needs to be *in vivo* research, research involving primate animals, and not just *in vitro* testing of the sort that has been done so far.

In the meantime, the state Department of Health guidelines, released in 2018 after nearly two years of study by a team of physicians and other experts, set a high bar for diagnosis while offering few options for treatment.

Under those guidelines, a "presumptive diagnosis" of rat lungworm disease requires three elements: suggestive symptoms and signs; eosinophils in the spinal fluid; and an exposure history.

LeRoy had all three, and yet, because his eosinophil count didn't reach the Department of Health's threshold for the lab work – real-time polymerase chain reaction (RTi-PCR) – that would have confirmed the diagnosis, treatment

was delayed. It wasn't until more than a month had passed from the time of his initial exposure, and a second spinal tap, that the Department of Health relented and green-lighted the lab work, even though the eosinophil count in his spinal fluid was below the threshold called out in the guidelines.

Park explained why the guidelines are written the way they are. "If a clinician feels, and we feel, that there is a concern, we have tested when the level of eosinophils is below" what the guidelines call for.

But, she added, "There's a huge caveat. Often even when we do a test, we get a negative" for the presence of rat lungworm DNA in the spinal fluid. In those cases, if there is still a concern by the clinician that the patient has rat lungworm disease, "we advise them to get another specimen in about a week's time. If you do the [lumbar puncture] too early, sometimes the test is negative."

What's more, the guidelines are lukewarm when it comes to administering Albendazole. "The addition of Albendazole ... may provide additional benefits, although there is limited evidence of this in humans," they say.

A year and a half after those guidelines were published, the authors appear to have changed their thinking on the drug. Vernon Ansdell, a professor in the Department of Tropical Medicine at the John A. Burns School of Medicine in Honolulu and lead author of the guidelines, stated in his poster presentation at the conference that the treatment of rat lungworm infections with Albendazole "appears to be safe, when combined with high dose corticosteroids, and effective, if given within the first 7-14 days after infection."

The Department of Health has indicated that the guidelines will be updated by the fourth quarter of this year.

Park noted that even treatment with Albendazole has not been shown to be effective against rat lungworm infections through *in vivo* studies. "Part of the problem, too, is that Albendazole is not readily available. There's just one company that makes it in the United States, and it's prohibitively expensive," she noted.

The DOH itself has no capacity to do this research. "I hope there will be research scientists – maybe at the National Institutes of Health or the Centers for

Disease Control – to help elucidate what could be done," Park said.

### Unspent Funds

For many years, many of the people in East Hawai'i most intimately involved with research, diagnosis, and treatment of rat lungworm disease have been associated with the Hilo Medical Center and the Daniel K. Inouye College of Pharmacy at the University of Hawai'i-Hilo.

In 2017, the Legislature was considering a bill to give UHH nearly \$1.4 million over two years to support this work. The bill made it to conference, but ultimately did not pass. Instead, the Department of Health received an appropriation of \$2 million over two years to address rat lungworm disease.

In the first year, the DOH proved incapable of spending the full amount. In a report to the Legislature, then-DOH administrator Virginia Pressler stated that "a portion of the funding did go unused. It was supposed to fund a coordinator position for the initiative" – a "widespread, multifaceted public outreach and education campaign" – "but the department was unable to fill the position. The funding lapsed and was returned to the general fund." That portion was \$270,000, or 27 percent of the total appropriation for the year.

### Go for the Rats

Park was asked if the DOH was monitoring the spread of the semi-slug, *Parmarion martensi*, throughout the state, since the virulence of rat lungworm infection seems to track pretty closely with the invasion of the semi-slug into new areas.

"Unfortunately, we can't eradicate the slugs," she replied. "Actually, I'd point out that these parasites can't reproduce, can't survive, without the rats. If you cut out the rat part of the equation, these things won't exist. If we're ever successful in eradicating rats, we'd get rid of not just rat lungworm, but a lot of other diseases."

"Yes, the semi-slug is concerning for a number of reasons," she continued. "But we can find this parasite in a number of other mollusks. ... I just want to make sure people aren't so focused on the semi-slugs that they think, if I just seek the property clean of the semi-slugs, I'll be fine.

"It really just boils down to the rats."

— Patricia Tummons

## Fast Facts about Rat Lungworm Disease

In the normal life cycle of rat lungworm (*Angiostrongylus cantonensis*), snails and slugs eat rat feces that contain the first-stage lungworm larvae. Those larvae develop to the third stage in the snails. When rats eat the snails, the larvae develop into adults in the central nervous system of the rats and reproduce in the pulmonary system lungs of the infected animals. Eggs hatch in the lungs and first-stage larvae are then coughed up and excreted. Snails and slugs eat the rat feces, starting the cycle anew.

When humans eat infected snails or slugs – either accidentally, for example, by eating produce that has been inadequately washed, or deliberately, say, on a dare – the larvae enter the bloodstream and migrate to the brain, where they die. The migrating larvae can bring on the symptoms of tingling often reported by victims of the disease. The worms eventually die in the victims' brains, but pain and symptoms can last for months and even years. In some cases, victims have died.

The more larvae are ingested, the higher the parasite load, and the more severe the symptoms.

Water catchment systems, frequently used in the Big Island district of Puna, can also be a source of infection. Drowned slugs can shed live larvae, which can infect humans if the water is not sufficiently filtered.

Rat lungworm larvae can also end up in other animals, including freshwater prawns or frogs that eat slugs and snails. These can also be a source of human infection if they are eaten raw.

Infection with rat lungworm larvae is termed angiostrongyliasis, a type of eosinophilic meningitis. (Eosinophils are white blood cells that develop in response to parasitic infections; meningitis is the inflammation of the lining around the brain and spinal cord.)

Many of the most frequently asked questions about rat lungworm disease and related issues have been tackled by researchers at the Daniel K. Inouye College of Pharmacy at the University of Hawai'i-Hilo. They host a website with FAQs: [pharmacy.uhh.hawaii.edu/rat-lungworm-frequently-asked-questions](http://pharmacy.uhh.hawaii.edu/rat-lungworm-frequently-asked-questions).

<http://pharmacy.uhh.hawaii.edu/rat-lungworm-frequently-asked-questions>

## Patron Who Finds Snail in Sandwich Sues Big Island Health Food Store

Just days before the 6th international workshop on rat lungworm convened last month, rat lungworm was in the news. On December 31, a customer at Island Naturals, a health foods store in Hilo, had found a half-eaten slug in one of the two sandwiches she had purchased there.

Less than two weeks later, the woman and her husband, Chaunda and Shea Rodrigues, and Z.R., their 13-month-old son with whom Chaunda had shared her sandwich, filed a civil suit against the store, seeking unspecified damages. The lawsuit alleges a “manufacturing defect in the sandwich products,” negligence, and a breach of implied warranty. They seek general and special damages, among other things.

According to the lawsuit, “after consuming approximately half her sandwich, Plaintiff Chaunda took another bite and felt something stick in her top left jaw. She removed the item from her mouth and discovered it was a 2.5-inch slug. She inspected the rest of her sandwich and found the other part of the slug still inside. The realization of what she had consumed caused her to vomit.”

On January 1, Chaunda went to the emergency room at Hilo Medical Center, where she was prescribed Albendazole. The following day, she took the “entire plate with the slug (frozen within three hours of the incident) to the Jarvi Lab” at the Daniel K. Inouye College of Pharmacy at the University of Hawai'i-Hilo. There the slug tested positive for the presence of rat lungworm DNA.

According to the lawsuit, both Chaunda and Shea experienced some health effects. However, after taking Albendazole for a week, the symptoms have dissipated, Chaunda told *Big Island Now* web news on January 19.

When the incident was first publicized in early January, Island Naturals owner (and state senator) Russell Ruderman apologized. “Among the many things we’re doing as a result is we’ve revised our safety precautions, but we’re also going to stop using local leaf lettuce in any of our kitchens,” he said in a statement to news outlets.

In attempting to explain how the slug got into the sandwich, Ruderman said that the store was unable to obtain lettuce from its usual supplier. A kitchen

worker decided to take lettuce from the store’s produce aisle and then washed it inadequately before using it.

But what constitutes an adequate vegetable wash?

Argon Steel, a researcher at the Daniel K. Inouye College of Pharmacy at the University of Hawai'i-Hilo, presented the results of a study he and colleagues had done of more than 40 different proposed vegetable cleaning treatments. The testing was *in vitro*, meaning that rat lungworm larvae were exposed to the washes directly to see how they responded over a period of seven days.

They tested three categories of treatments: common household products; consumer vegetable washes; and commercial crop washes. Commercially available “veggie washes,” Steel said, showed little ability to kill the larvae. Salt water, Epi-Clean, and botanical extracts such as those made from ginger, garlic, or moringa, had practically no effect. Crop washes “don’t take effect quickly and aren’t terribly effective,” he noted.

Some of the stronger alkaline solutions – such as a 25 percent bleach solution (household laundry bleach is less than one third as strong) and chlorine – were effective, as was dodecylbenzene sulfonic acid. All are health hazards. None of them is available to the average consumer.

One of the difficulties researchers faced was determining just when the larvae are dead. Often they will become immobile when exposed to chemicals. “But loss of motility is not a measure of mortality,” Steel said. “It could indicate just a temporary quiescence in response to stress.” The chemical propidium iodide was used to tell the difference between dead larvae and those that were merely knocked out.

Given the lack of effective wash treatments, Kay Howe, who has developed programs to educate the public about rat lungworm, recommends cooking or freezing locally grown produce, to be safe. “Any foods that are to be eaten raw should be easy to peel or clean and dry well, like tomatoes and peppers,” she said.

(Howe became an expert in the disease after her son became gravely ill in 2008. In recognition of her efforts, the audience at the workshop gave her a standing ovation.)

— P.T.

## BOARD TALK

## Board Settles Helemano Land Fight For a Fraction of Appraised Values

At its January 10 meeting, the Board of Land and Natural Resources accepted Dole Food Company's offer of \$39,000 to settle a dispute over whether the company inadvertently sold the state 58.54 acres in Central O'ahu that the state already owned. This, despite testimony from the Department of Land and Natural Resources' (DLNR) Land Division that Dole's offer was "simply too low."

The lands were part of a 2018, \$15 million purchase of 2,822 acres that now make up the state's Helemano Wilderness Area. In preparing the maps necessary to add those lands to the 'Ewa forest reserve, staff with the Department of Accounting and General Services (DAGS) discovered last year that the parcel was "not a lot of record, but rather a remainder parcel created from the boundaries of surrounding parcels. It

was discovered that the parcel was never actually conveyed by the state and had remained under government ownership," according to an October 25, 2019, report to the board by the DLNR's Division of Forestry and Wildlife (DOFAW).

In a June 21 memo to DOFAW administrator David Smith, state surveyor Reid Siarot explained that the land came to be treated as a private parcel due to a mis-interpretation of the northerly boundary of an adjacent piece of land sold by the Hawaiian government to James Robinson, Robert Lawrence, and Robert Holt in 1852. Dole and its predecessor owners have interpreted that northerly boundary to be along the south bank of Poamoho Stream. However, Siarot wrote, the metes and bounds description of that parcel, Grant 973, states that the boundary is along the

south bank of Poamoho Gulch.

"This portion of land" — the 58.54 acres between the gulch and stream banks — "was always under ownership of the government of Hawai'i, currently as the state of Hawai'i," he wrote.

Title Guaranty, which prepared the title report for the 2018 sale, disputed Siarot's argument that a mis-interpretation had occurred. After meeting with DLNR staff

In a July 3 letter to Smith, Siarot rebutted Hirano's arguments, stating among other things that tax assessment records "cannot be used to correctly locate the limits of Grant 973," and arguing that some of the maps Hirano was relying on were either inaccurate or irrelevant. "[T]here is no evidence that [the north boundary of Grant 973] would have run along the south bank of the stream, as Mr. Hirano asserts," Siarot concluded.

### Recourse

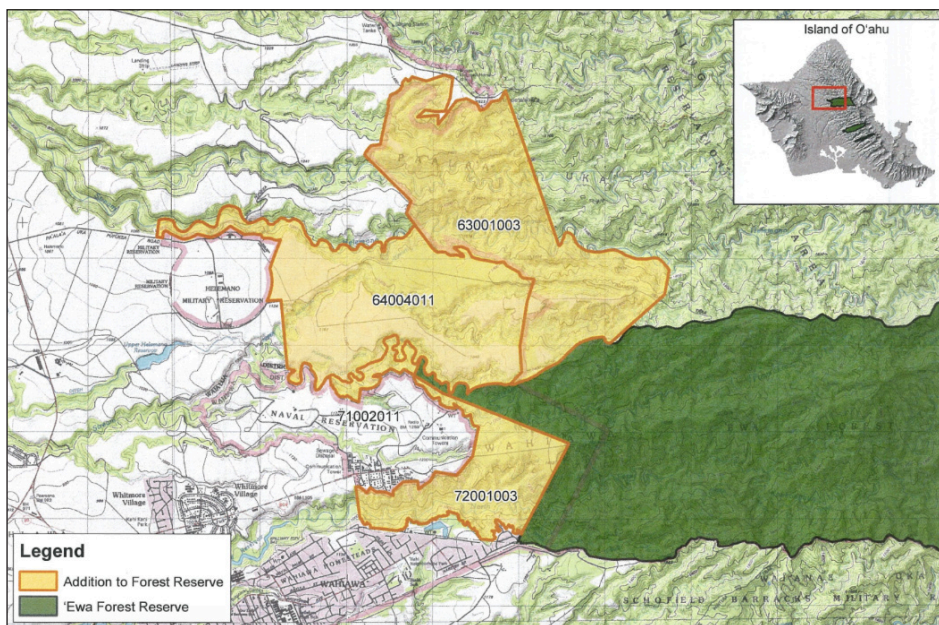
Based on DAGS's findings, the state filed a claim with First American Title Insurance Company in February 2019. Initially, the claim involved the 58.54-acre parcel (aka Parcel II), as well as a portion of another parcel that was part of the 2018 purchase. However, after DAGS revised its assessment in July, the state chose to pursue a claim only for Parcel II. The state claimed a loss of \$710,000.

In a July 19 letter to state deputy attorney general Julie China, attorney Aimee Hui, representing the insurance company, rejected the state's claim.

Hui pointed out that the state's title insurance policy states that losses due to a discrepancy or conflict in a boundary line, "which a correct survey or archaeological study would disclose," are not covered.

She continued that First American is not liable for issues relating to how the purchase was achieved or the price negotiated, but that it would cover losses if the title were found to be vested with an entity other than the state. However, she wrote, "That is not the case here."

She added that the state could not rely on the preliminary report issued by Title Guaranty to make its claim, because that report "is not a representation regarding condition of title, it is not an abstract of title, and it cannot be relied upon as such."



The state contends that Parcel 710032011 in yellow has always belonged to the Hawaiian government and was "created" by a mis-interpretation of the boundary of adjacent lands.

to hear its case, Title Guaranty senior vice president and legal counsel Lorrin Hirano argued in a May 22 email that there are a number of official maps that contradict the department's interpretation.

One such map shows that the Poamoho gulch and stream banks are "clearly the same boundary," Hirano wrote. He added that his company had overlaid the metes and bounds from Grant 973 onto the current tax maps and found that the northern boundary of the grant is mostly northward of the 58.54-acre parcel, as well as a portion of another parcel included in the Helemano Wilderness Area.

"[W]e found nothing in the tax records dating back to the 1930s that would indicate that the northern boundary of Grant 973 is substantially to the south of what the current tax maps show," he wrote.

*Continued on next page*

With its title insurance claim denied, DOFAW turned to Dole for reimbursement.

In our November 2019 “Board Talk” article, *Environment Hawai'i* determined that the state paid about \$308,000 for Parcel II, based on a statement from the DLNR that because the purchase was part of a bulk sale, “the valuation was spread evenly over each acre.”

However, according to a January 10 DOFAW report to the board, the division hired John Child & Company to conduct a supplemental appraisal of Parcel II. The company, which had done the initial appraisal for the bulk purchase, determined that the parcel was worth \$661,200.

“The conveyance tax certificate for the acquisition had allocated \$570,000 of the total purchase price to the subject parcel. DOFAW subsequently sent a letter to Dole requesting a refund of \$570,000 for the value of the subject parcel,” DOFAW’s report states.

After meeting with the state, the title company, and the Trust for Public Land in August to discuss the matter, Dole hired its own appraiser, Benavente Group, LLC, which determined that Parcel II was worth only \$117,000 as of June 2017.

“Dole offered a counterproposal of \$39,000 to fully settle all claims by the state with respect to this matter, which DOFAW accepted, subject to approval by the Department of the Attorney General and the BLNR,” DOFAW’s report states.

“A lawsuit would be based on interpretation of a relatively complex set of historical maps and documents and would rely on opposing experts who are all well-respected surveyors and abstractors,” the report continues. It adds that despite aid from the DLNR’s Land Division and the

attorney general’s office in the Helemano purchase, “The issue concerning the title of the property was only discovered after the acquisition was complete and in-depth historical research was completed for the subject parcel.”

In arguing for the settlement, DOFAW pointed out that the fair market value of the 2,882 acres had been determined to be \$16.56 million, which is \$1.4 million more than what the state paid for them. So even if the higher appraised value of \$661,200 were subtracted from the total fair market price, the state still would have paid less than fair market value for the total acquisition, the division wrote.

### **Moving On**

At the board’s January 10 meeting, DOFAW’s Smith said that if the state were to press its case, the outcome would be uncertain. “I’d just as soon settle it and be done with it. Land Division thinks we should continue to negotiate. We think we should just settle and move on,” he said.

In a January 9 memo to the board, Ian Hirokawa, special projects coordinator for the Land Division, expressed his office’s significant concerns that the proposed settlement amount was too low given the appraisals done. Even though the total purchase price for the acquisition is less than the fair market value adjusted to exclude Parcel II, he continued, “[a]t no point during the acquisition process was it discussed that the parcel was being gifted to the state due to a potential title issue. Furthermore, the seller executed a warranty deed with the state, with the seller warranting the title to the subject parcel. Given this background, we do not believe there is adequate justification to accept the

proposed settlement amount.”

Hirokawa also took issue with the fact that DOFAW’s recommendations to the board regarding the settlement did not include any further action on the denied insurance claim.

“The department conducted reasonable due diligence in obtaining a title report and a title insurance policy to safeguard against unforeseen issues that may arise, such as in this very instance. With respect to the justification provided by the title insurer to deny the claim, we note that there is no evidence any appropriate disposition, formally approved and executed in writing, by the state of its interest in the subject parcel to a private party. To accept this justification would essentially acknowledge that the state could divest itself of fee interest in public lands by merely a survey or mapping error,” he wrote before urging the board not to waive any potential claims against First American and to allow the DLNR to pursue those claims.

After discussing the matter in executive session, Land Board member Chris Yuen made a motion to approve DOFAW’s recommendation to accept Dole’s settlement offer.

“Looking this over, there is a good faith dispute between the parties as to ownership of the property. The state has a good case. Dole has some case,” he said.

He also said the state’s appraised value of \$661,200 was much too high, given that the property consisted of a steep gulch. During the executive session, Yuen noted, the deputy attorney general informed the board that Dole, before selling the lands to the state, had offered Parcel II for sale between \$78,000 and \$100,000 and had no takers. “That indicates to me the property’s value, the \$117,000 appraisal, is not far off and not greatly lowballed. Given the uncertainties of success and cost of litigation, the proposed settlement ... is reasonable,” Yuen said.

The board then unanimously approved his motion.



## **Board Imposes Maximum Fine For Illegal Vacation Rental in Kona**

**O**n January 24, the Land Board fined Caroline Killeen and her family trust \$17,000 for using their oceanfront home

*Continued on next page*

PHOTO: DEPARTMENT OF LAND AND NATURAL RESOURCES



Helemano Wilderness Recreation Area.



in South Kona as a vacation rental for the last decade.

Rules for the state Conservation District, in which the home was built, prohibit the rental of single family residences for a period of less than 180 days. In addition, the Conservation District Use Permit for this home includes a condition barring any kind of rental or commercial use.

The DLNR's Office of Conservation and Coastal Lands initially proposed fining only Caroline and her husband, Gary. However, at the Land Board's meeting, Caroline's son, Bill Wedemeyer, informed the board that Gary died in 2010. Also, OCCL administrator Sam Lemmo reported that the trust is actually the current property owner. It also owns the lots on either side of the house.

"We were searching some alleged illegal transient vacation rentals in Kona. This just came up in our search," Lemmo said. The home had been listed on the VRBO (Vacation Rentals By Owner) website for an average of \$250 a night with a minimum stay of three to seven nights.

"We know transient vacation rentals are an issue all over the state," Lemmo told the board. "Generally, these types of activities sort of can alter the nature of a residential community in a bad way [with] a lot of traffic coming in and out of these places and create quite a nuisance."

Wedemeyer testified on behalf of his mother, who lives in Arizona. "She's 83 with a heart condition. ... This was their home that they loved. This was their primary residence. When Gary had cancer in 2009, they went to the mainland. I was the only one here to keep an eye on the house," he explained.

Wedemeyer and his wife, Carol, were listed on the VRBO website as the owners and managers of the property. Renting the house out part-time was his mother's way of keeping it in the family, he said.

"I'm here to apologize. I'm not here to say she was wrong on her behalf. She felt we had no choice," he said, adding that he wasn't aware that the house was in the Conservation District.

Now that the family has had to cease using the home as a vacation rental, "we don't know what to do. ... She can't rent the house out. We can't all be down there watching the place," Wedemeyer said, adding that while his siblings often vacation there, none of them live nearby.

Carol Wedemeyer said the house may be sold.

"My family's been here since the 1600s. I'm a Wedemeyer. This is my home. Sad to say, this precious piece of property ... now is being taken away because of the situation," said Bill, whose father, Herman, was a former Honolulu city council member, state representative, professional football player, and actor in the original *Hawai'i Five-O* series.

Land Board member Chris Yuen said that the Conservation District Use Permit was recorded in the Bureau of Conveyances and would have shown up in the title search when the family bought the property. (According to Carol Wedemeyer, her husband purchased the property first, then transferred it to the Killeen Trust.)

"I don't know what you personally know, but the mechanisms were there that any buyer after the original permittee should be aware [that] rentals were prohibited," Yuen told Bill Wedemeyer.

"It wasn't meant to be a rental. They loved that home. They lived in it for 15 years as a primary residence," he replied.

"I understand what you're saying. At some point, it was used as a rental," Yuen said.

The board approved a motion by Yuen to accept the OCCLs' recommendation to impose the maximum fine for a single violation — \$15,000 — plus \$2,000 in administrative costs.

"They rented this out for quite a number of years and probably earned considerably over \$15,000," Yuen said. He added that while he understood the decision the family made and the dilemma they are in, the Land Board is obligated to enforce the conditions of its permits and its rules, regardless of the circumstances of the individuals.

The OCCL's Lemmo pointed out that the family could petition the state Land Use Commission to take the land out of the Conservation District, or ask the Land Board to approve an amendment to the Conservation District Use Permit, so that long-term rentals, at least, would be allowed.

Yuen said the former option was a tougher road, but amending the permit conditions to allow a long-term rental "is not a huge process."

Board member Tommy Oi, a former DLNR land agent from Kaua'i, complained that illegal vacation rentals were too common and supported the maximum fine. "This is happening too much. Don't tell me you never know was Conservation when you bought place. ... You would know what you could do. We gotta set examples," he said.



PHOTO: NOAA

Hawaiian green sea turtles at French Frigate Shoals.



## Turtle Nesting, Post-Walaka

"You will have a lot of females wasting a lot of energy, digging down, and they will dig all night. And they will hit that hard pack, hit the bottom, and they'll dig and they'll dig and they'll dig and eventually give up or lay a nest that's going to fail," said Charles Littnan, director of the Pacific Islands Fisheries Science Center's protected species division, at the Land Board's January 24 meeting.

Littnan was describing one of the new hurdles threatened Hawaiian green sea turtles at Tern Island face following Hurricane Walaka, which swept through French Frigate Shoals in the Northwestern Hawaiian Islands in 2018. The hurricane left the island with shallower sand deposits than the turtles require for successful nests.

Over the course of two meetings last month, researchers who have received permits to access the Papahānaumokuākea Marine National Monument briefed the Land Board on their work over the years.

Littnan reported on the turtles' challenges during the first full nesting season, post-Walaka.

French Frigate Shoals is where 96 percent of Hawaiian green sea turtles nest, and the storm devastated the small islets there, wiping out East Island altogether. But by the next year, East Island had re-emerged and sand had also accreted at Tern Island, another popular nesting site. Littnan said that this past season, about 263 green sea turtles nested at Tern and 106 nested at East. In the past, about 500 turtles would nest at East.

With regard to the sand restoration at Tern, "initially, it looks great. There's more habitat for turtles and you had more animals that were nesting there," Littnan

*Continued on next page*

said. However, a lot of that habitat was, in his words, junk.

Before the hurricane, most of the turtles nested along a line of vegetation on the island. The area was flat, with deep sand. The storm ripped out most of that vegetation, and the layer of sand that later accreted was no more than ten inches deep.

With their preferred nesting area gone, the turtles ventured to other parts of the island and many got trapped behind dilapidated seawalls, he continued. (Decades ago, the island was a naval base and, later, a U.S. Coast Guard station.)

"We were removing at least two turtles per week from behind seawalls and some of these were massive females that take five or six people to move," Littnan said.

By the end of the season, there were a lot of nests, but very few that hatched, he said.

The problems seen on East Island were slightly different. The island used to be the top nesting site for the turtles, according to Littnan, and while it reemerged, "it's still not anywhere near what it was." As a result, carrying capacity is now an issue. Land Board members exclaimed, "Whoa," and "Hoo!" upon seeing photos of just how many turtles were trying to nest on the small island.

Littnan said that the problem is that early nesters will lay eggs that will simply be dug up by the next wave of nesters.

If the habitat is of similar poor quality to that of Tern, that will just make matters worse. "They can dig down 15-20 inches, but they're digging into the water table. ... Of the successful nests they think were laid, a lot were wave-washed or inundated by sea water," he said.

He added that counting the number of turtle nests was how his agency monitored the turtle population. With so many nests now possibly being unsuccessful, it may need to find another way to estimate the population, he said.

One bright spot: Scientists documented significant nesting activity at Lisianski, which is one of the more northern islands in the archipelago. Although the turtles probably nested there historically, it hadn't been documented before. "Hopefully, they're reestablishing themselves for a little more resiliency," he said.

Littnan said it will likely take two to three years to understand the impacts Walaka had on the turtles and monk seals. He added that because turtle populations are so resilient, it may even take five to

ten years before scientists see any notable effects from the habitat loss.

In addition to having to contend with the effects of sea water inundation on nests, the turtles' overall population will likely suffer greatly as a result of climate change. Warmer temperatures during egg incubation will cause many of the hatchlings to turn out female. Littnan said that researchers are probably going to start seeing massive collapses of turtle populations as a result of over-feminization, with pockets of sustained populations due to local environmental stability.



## Board Grants Entry Permit To Maintain Kaua'i Ditch System

Last year, when renewing several revocable permits to water users in the process of acquiring long-term leases from the Land Board, the DLNR's Land Division reported that one longtime permittee was dropping out. The East Kaua'i Water Users' Cooperative, which used the water it diverted for agricultural purposes, informed the division that it simply could not afford to complete the steps necessary to secure a lease (compliance with the state environmental review law and the development of and financial contribution to a watershed management plan) and to operate the old sugarcane plantation irrigation system that fed its lands.

According to cooperative president Jerry Ornellas, "The system includes Wailua Reservoir, fed by a diversion on the North Fork of the Wailua River, Upper Kapahi Reservoir, fed by Kapa'a Stream, and all related lateral ditches. It also includes the ditches on the [state Agribusiness Development Corporation's] Kalepa lands which are fed by Hanamaulu Ditch under an agreement with Grove Farm for water delivery."

The 21-mile system serves more than 12,500 acres of agricultural land and its repair and maintenance is critical for farmers who depend on it, Hawai'i Farm Bureau executive director Brian Miyamoto stated in testimony to the Legislature last year on a bill (House Bill 769) that would have transferred a portion of the system to the state Department of Agriculture (DOA).

"Since the demise of plantation opera-

tions across the islands, we have seen the erosion of irrigation systems. Ditches that carried water fell into disrepair with major leaks in the system, and in cases such as Ka'u, cracks in tunnels created enough losses that there is no longer significant flow of water," Miyamoto wrote.

After the Land Division's Ian Hirokawa explained to the Land Board last October that HB 769 failed and that his agency did not have the staff or expertise to take over the system, board members expressed their concern about the possibility that the system would fall into irreparable disrepair if abandoned, pulling the state further away from its food sustainability goals.

On January 10, as a stop-gap measure, the division recommended that the board grant a right-of-entry permit to Seymour Resources Hawai'i, Inc., a family-run company that would serve as an interim manager of the system until a long-term solution could be worked out.

"There's kind of a lot of potential different actions in play," Hirokawa said. He mentioned a revived attempt this year to get the Legislature to transfer the system to the DOA. "If no other agency comes forward, we're going to move forward with studies to shut down the system," he said.

In support of the proposed permit, Hirokawa said the Land Division wants a manager in place to address public health and safety issues in the meantime, because reservoirs and ditches can't just be abandoned. The manager would also ensure the system remains viable, he added.

Seymour would not be distributing water to anyone, he continued, adding that his division is working with the cooperative to secure a longer-term operator.

"We're not paying them for this. We're simply giving him access to the system," he said. The division asked that the Land Board waive the cooperative's permit requirement to conduct a Phase I environmental site assessment, since that would be an expensive undertaking and the historical use of the system was limited to agricultural uses.

"You're requesting a waiver of the Phase I as to the prior user. So, in other words ... you're saying you checked it out. You think it's a situation that calls for one," asked Land Board chair and DLNR director Suzanne Case.

"It's a ditch. The reservoir looks like a

*Continued on next page*

PHOTO: DAN DENNISON



Wailua Reservoir, Kaua'i

standard operation,” Hirokawa replied. He said his division’s staff had inspected the intakes.

To company manager Brad Seymour, Land Board member Chris Yuen asked, “Maybe it’s a little rude question of the applicant, okay, what’s in it for you?”

Seymour said he grew up on Kaua’i and his father worked for the sugar plantation. “When I look at the east side of Kaua’i, the only way to have viable agriculture is this system. ... I would like to see agriculture over subdivisions,” he said.

“That’s terrific,” Yuen replied before asking Hirokawa why the board wasn’t being asked to let the company deliver water to farmers while they maintain the system.

First of all, the permit was a stop-gap measure, Hirokawa said. If or when the company becomes a contractor for the division and gets paid for its work, “I don’t know if we would pay them without having people pay for the water,” he said.

“That’s also a water permit question, which drove this shutdown in the first place,” Case added.

Yuen suggested that the board could issue a water use permit, but Hirokawa said the same issues that bedeviled the co-op remain.

Under the permit, Seymour would simply do things like clear fallen trees out of the ditches and maintain water levels in the reservoirs.

Former Land Board member Keone Downing testified in support of the Land Board giving the company an opportunity to understand the system. If the company ever bids to be a long-term manager of the system “he’ll know what it costs. ... He’s from Kaua’i. I know he probably plans to live and die there. He’ll come up with something fair for people to succeed,” Downing said.

The board then unanimously approved the permit.



## Board Denies Contested Case Over East Maui Water Permits

At its January 24 meeting, the Land Board voted to deny — for a second time — a contested case hearing request on an item heard at its October 11 meeting.

At that October meeting, during her testimony in opposition to revocable permits that would allow Alexander & Baldwin and East Maui Irrigation Co. to continue diverting water from East Maui streams to agricultural lands in Central Maui and the county Department of Water Supply, Sierra Club of Hawai’i executive director Marti Townsend asked for a contested case hearing.

The board voted during the meeting to deny her request and approve the permits. Even so, the Sierra Club of Hawai’i, represented by attorney David Kimo Frankel, later submitted a written petition for a contested case hearing.

On January 24, the DLNR’s Land Division submitted a lengthy written explana-

tion to the board about why the petition should be denied.

The division first pointed out that a trial date of May 1 had been set for a lawsuit the organization filed in 1st Circuit Court after the board denied its 2018 request for a contested case hearing on the A&B/EMI permits.

The division then argued that the organization’s recreational, aesthetic, and environmental interests in several of the diverted East Maui streams were not “constitutionally cognizable property interests.” Neither was simply being a beneficiary of the public trust and/or ceded-land trust, it stated.

The Sierra Club did mention that some of its members draw water for farming and residential purposes from streams in the permit license areas. “While that may indicate a constitutionally cognizable property interest exists, no additional information or justification is provided beyond that general statement,” the division stated.

The division stated that the petition didn’t specify how the permits harmed the Sierra Club members’ right to a clean and healthful environment. The right to a clean and healthful environment is a constitutionally protected property interest, according to a 2017 Hawai’i Supreme Court decision regarding a Public Utilities Commission proceeding regarding a power purchase agreement with Maui Electric Company.

The court held in that case that the Sierra Club, which sought to participate in the proceeding but was denied by the

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PUC, “had a substantive right to a clean and healthful environment because, in that particular instance, the right was defined by a law relating to environmental quality,” the division wrote.

Citing the *Maui Electric* case in its petition, the Sierra Club stated that its members have rights to a clean and healthful environment under the state constitution, “which mandates a contested case hearing whenever the state makes binding decisions under laws relating to environmental quality, including control of pollution and conservation, protection and enhancement of natural resources.”

The Land Division held a different view. “If *Maui Electric* were to be read as broadly as Sierra Club suggests, it is not inconceivable that virtually everything that the Department of Land and Natural Resources does would be the subject of a contested case hearing. We do not believe that the Hawai'i Supreme Court could have intended such a Draconian result that would severely hamstring the ability of the Department of Land and Natural Resources to accomplish any action without a contested case hearing — from the mundane to the controversial — if any single member of the public would seek to object to a given action,” the division wrote.

Even if the Sierra Club had a valid property interest in this case, the division argued that ample due process had been provided via the Land Board's public meeting in October.

“The cost for retaining hearing officers and court reporters can be thousands of dollars for even one-day contested case hearings and may go into the many tens-of-thousands of dollars. ... Sierra Club has failed to justify why the Department of Land and Natural Resources should bear such costs and spend many hours of staff time on a contested case hearing of relatively limited import,” the division added.

### **Rebuttal**

At the Land Board's January 24 meeting, Frankel argued that the Sierra Club does have property interests that would warrant a contested case hearing.

Hawai'i Revised Statutes 7-1, “one of the oldest laws on the books,” Frankel said, states that people shall have a right to drinking water, running water, and the right of way. “That is a right, a property interest as the Supreme Court described,” he said.

He added that the board's decision to grant the permits last year allowed A&B/EMI to divert 13 streams to the point where all of the water is drained from them 60 percent of the time. “That is fundamentally wrong,” he said.

Frankel argued that neither the Land Board nor the state Commission on Water Resource Management had fully examined the impacts the diversion structures have on native stream life.

Land Board member Chris Yuen asked Frankel, “If we granted the contested case hearing, what do you contemplate happening with the water in the time period between granting the petition and some decision being made? Are the diversions illegal? Can the diversions continue during that time frame, particularly with respect to the public water system and people growing crops?”

Frankel replied that the Sierra Club would never attempt to prevent the county from receiving water for current domestic purposes. However, if the contested case hearing were granted, A&B would have no legal right to take public water from public land, he said. He then reminded the board that the companies have alternative sources of water. “There is a significant amount of water that flows west of Honopou, which is the end of the [permit] area. ... That water continues to be available, as well as a number of groundwater sources,” he said.

“Your position would be there could be

no diversions of the license area pending the outcome of the contested case hearing without the consent for Sierra Club. That is your position,” Yuen tried to confirm.

“I think so,” Frankel replied.

Land Board and Water Commission chair Suzanne Case then argued that the commission's June 2018 decision on the interim instream flow standards of about two dozen of the streams A&B and EMI divert did, indeed, analyze, stream-by-stream, whether the structures are impairing mauka-makai movement of organisms.

Frankel countered, “It doesn't talk about individual structures and how they should be removed and altered.”

Even so, Case said the Water Commission is reviewing plans for removing or modifying some structures in the streams, with an eye to making sure there are migratory pathways where wildlife was considered important.

That did not allay Frankel's concerns about animals being entrained in the diversion structures that will likely remain under the Water Commission's approach.

He acknowledged that the Water Commission's decisions with regard to the East Maui streams have been a huge step forward from where things were. “That doesn't mean it's close to where we need to be. ... These streams should be free and flowing,” he said.

Case attributed her impasse with Frankel to a “philosophical difference,” and the board ultimately approved a motion by Yuen to deny the petition.

Earlier in the meeting, the board denied, also for the second time, Frankel's request for a contested case hearing on a permit issued last year to Resort Trust Hawai'i for use of a beachfront parcel abutting the Kahala Hotel & Resort. The Land Division offered arguments similar to those it raised against the Sierra Club's petition.

—*Teresa Dawson*