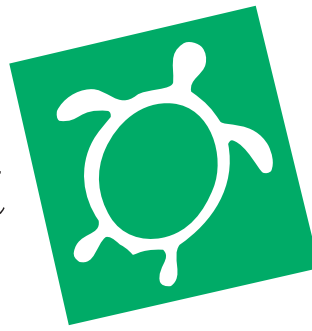


Environment



Hawai'i
a monthly newsletter

Wound-Up Wind Farms

The draft bat guidance document issued in January by the Division of Forestry and Wildlife and the Endangered Species Recovery Committee is a first step toward revising the outdated version adopted in 2015. To many wind farm representatives and consultants, however, it's a step in the wrong direction.

The document is aimed at ensuring that the dozens of wind turbines throughout the state don't jeopardize populations of endangered Hawaiian hoary bats. While it may do that, if adopted unamended, it might also end future wind energy development and severely hinder existing facilities, industry reps have said.

State wildlife managers are eager to work with scientists and the industry toward finding some middle ground. One can only hope that they succeed.

Wind Farms' Representatives Pick Apart Draft Guidance on Takes of Endangered Bats

Last month, *Environment Hawai'i* reported on a new draft bat guidance document aimed at helping the state Endangered Species Recovery Committee (ESRC) make decisions regarding the Habitat Conservation Plans and Incidental Take Licenses that are required for wind farms to incidentally harm or kill protected species.

By all accounts, the original guidance document, adopted by the committee in 2015, is in sore need of updating. But according to comments submitted to the committee in February by wind farm representatives, the new draft sets unattainable standards that are not based on the best available science.

"Simply put, adoption and implementation of the draft updated guidance in its current form, including changes to bat-related mitigation, monitoring, and siting considerations, would impede development of new wind energy and lead to increased cost of power for

state residents," wrote Marilyn Teague of AEP Renewables in her February 19 comment letter on the draft guidance document, which was issued in January by the state Department of Land and Natural Resources' Division of Forestry and Wildlife (DOFAW) and the ESRC.

AEP has an ownership interest in the Auwahi wind farm on Maui.

The state has passed legislation requiring that 100 percent of Hawai'i's electricity be generated from renewable sources by the end of 2045. Wind energy is considered by many to be key to reaching that goal, but in recent years, it has faced increasing opposition. Many existing facilities have killed far more endangered Hawaiian hoary bats than originally intended. And on North O'ahu, protests, arrests, and legal actions have surrounded the construction of the Na Pua Makani wind farm, which

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Na Pua Makani wind farm in Kahuku, O'ahu.

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Volume 30, No. II



Hawai'i

May 2020

NEW AND NOTEWORTHY

Grading at Kealakekua: Within the last few weeks, extensive grading has occurred on a 73-acre parcel near Kealakekua Bay and adjacent to land that is part of the Kealakekua Bay State Historical Park.

Owner of the parcel is the Kealakekua Heritage Ranch, LLC, whose only member is Tom Pace.

According to sources in the neighborhood, work began in mid- to late March.

On April 17, the Hawai'i County Department of Public Works (DPW) ordered Pace to stop all grading on the property. Ben E. Ishii, chief of the department's Engineering Division, wrote: "A search of our records shows that no grading or grubbing permits have been issued for this work. The grading work performed on the subject property is in violation of the Hawai'i County Code."

Ishii continued: "You are directed to cease any further work on the subject property," and instructed the landowner to submit a grading permit application within 45 days.

"Approval of the application by the State Historic Preservation Division and the Planning

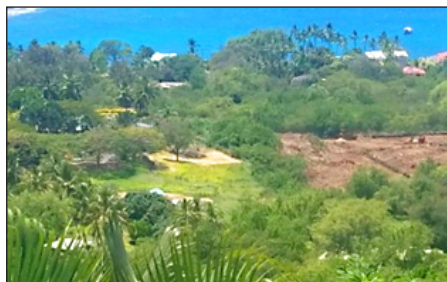


Photo shows extent of grading as of early April.

Department are required prior to the approval and issuance [of a permit] by this department."

Calls to the owner were not returned by press time.

The parcel, which is in the state Agricultural District and the county Agricultural Zone, was purchased by Kealakekua Heritage Ranch in 2017. Tax records show two existing houses on the property: one of about 1,700 square feet built in 1951, and another, of 600 square feet, built in 2018.

The latest notice is not the first Pace has received for unpermitted work on this property. In May of 2018, Pace was found to have been making improvements to his own driveway within the county right-of-way. On July 9, 2018, the DPW instructed him to obtain the required permit.

Last August, Pace workers appear to have destroyed the loading dock for the historic Gaspar coffee mill, dating back to the 1880s. The dock was transformed to rubble in a matter of days.

ROD Webinars: As with many events, the annual symposium on rapid 'ohi'a death has been cancelled. Organizers have, however, come up with a Zoom alternative.

Over a series of five Wednesdays, presentations will be given on the topics that otherwise would have been discussed at the symposium. The first two webinars, held in April, featured presentations on the distribution and abundance of rapid 'ohi'a death on Hawai'i island and on the impact of rapid 'ohi'a death on forest stands.

On May 13, Kyle Roy and Robert Peck of the U.S. Geological Survey's Pacific Ecosystems Research Center, will discuss the role of beetles in spreading the disease; on May 20, March Hughes of the USDA Forest Service's Institute of Pacific Islands Forestry will talk about treatments for trees and wood; and on May 27, J.B. Friday, with the University of Hawai'i's Cooperative Extension Service, will present on actions that members of the public can take to manage the spread of rapid 'ohi'a death.

Each webinar will be given at noon and (live) again at 6 p.m., allowing people who may be working during the day to still be able to hear the presentations.

Details on joining the Zoom presentations are available at: <https://cms.ctahr.hawaii.edu/rod/>

Betsy Harrison Gagné: The death in March of Betsy Gagné cannot be allowed to go unremarked. For decades, Betsy was the conscience of the conservation community. In recent years, she was the glue that held together the state's Natural Area Reserves System Commission, but that does not begin to describe the scope and importance of the work that she did to protect Hawai'i's unique ecosystems.

She educated. She scolded. She always was willing and eager to share her vast knowledge of Hawai'i's environment – and her views on those who threatened to harm it. And for this she was not universally loved.

In 1973, as a graduate student, Betsy was the first to come upon the po'ouli. A year later, Betsy, her late husband, Wayne, and Frank Howarth came upon the bones of flightless birds in a cave near Hana, leading to a revolution in the understanding of island avifauna. Year after year, researchers and environmentalists alike benefited from her knowledge, curiosity, and energy.

Her passing leaves an unfillable void.

Environment Hawai'i

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Hilo, Hawai'i 96720

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Environment Hawai'i is published monthly by Environment Hawai'i, Inc., a 501(c)(3) non-profit corporation. Subscriptions are \$65 individual; \$100 non-profits, libraries; \$130 corporate. Send subscription inquiries, address changes, and all other correspondence to

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Twitter: [Envhawaii](https://twitter.com/Envhawaii)

Environment Hawai'i is available in microform through University Microfilms' Alternative Press collection (300 North Zeeb Road, Ann Arbor, Michigan 48106-1346).

Production: Tim Officer

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ISSN 1050-3285

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Quote of the Month

"One of things I say tongue-in-cheek, I say, 'Wind energy is the best thing that's ever happened to bats.' ...Thirty years ago, we didn't have anyone working on bats."

— David Smith, state
Division of Forestry and
Wildlife administrator

From the Archives

The Roots of Ranching in Hawai'i: From Vancouver to Parker and Beyond

On the occasion of completing 30 years of continuous publication – a milestone that will be attained in June – Environment Hawai'i will be reprinting from time to time articles that we believe display the breadth and the depth of the reporting that characterizes our best work.

The following article was originally printed in our September 2002 edition and was the first installment of a three-month series on the impact of cattle and other ungulates on Hawaiian forests.

Christmas morning, 1857. At the Seamen's Bethel in Honolulu, the Reverend S.C. Damon was conducting divine services, an event duly applauded by the yet-young *Pacific Commercial Advertiser*.

"This is a new feature in the celebration of Christmas at these islands, and a very praiseworthy imitation of the custom in other countries," its editorialist wrote.

As the pious worshipped, a custom of another sort, one with a much longer history in the islands, was observed a few blocks distant at the Robinson & Co. wharf. The schooner *Mary* had just berthed from Kawaihae. On board were 27 wild bullocks, 48 sheep, 80 barrels of Irish potatoes, 13 barrels of tallow, 10 bullock hides and one bale of wood.

"A large crowd of idlers" had collected about the wharf, the paper reported, watching the cattle as they were unloaded and driven down Honolulu's dusty streets to a slaughterhouse on the outskirts of town.

Horsemen stood by to keep the unruly animals in line. As the cattle were being driven, "one fellow, with particularly short and sharp horns, made a sudden detour to the right and into the open entrance of W.F. Allen's store, where a number of gentlemen were quietly smoking their after-breakfast cigars and chatting over the current news."

The customers made a run for it. "We have an indistinct notion that there was some tall traveling done in an

incredibly short space of time," the report of the event continued. "However, after the bovine customer had abruptly retired – without even asking the price of hides and tallow – we discovered one gentlemen, whom we had previously supposed to have a tendency to rheumatism, snugly perched on the top of the bookkeeper's desk, not far from the ceiling."



Bovine Beginnings

When it came to the running of bulls, the streets of mid-19th century Honolulu could hold their own against those of Pamplona. "Pedestrians taxed their calorie and adrenalin reserves by jumping walls, rushing through gates, and running desperately before furious bovines," historian Richard Greer has written. "It was said that hardly a resident had not experienced at least one such exhilarating encounter."¹

Not only did residents of the town have the cattle – wild and otherwise – of O'ahu to contend with, for nearly two decades, they had had to put up with shipments of wild cattle, or bullock, brought for slaughter to Honolulu from Hawai'i and, to a much less extent, from Maui, and Kaua'i. Here they were butchered, with the meat sold fresh (6 cents a pound) or salted (6 1/2 cents a pound). To be sure, a small number of cattle were butchered and consumed on the islands where they were grown, but by the 1850s, Honolulu had become the port of choice for whalers and other vessels provisioning in the islands. When it came to trade in beef and beef products, and practically every other island commodity as well, O'ahu was the clearinghouse.

Although it isn't clear exactly when cattle were first brought to O'ahu, some accounts report that Don Francisco de Paula Marin, who eventually established a ranch in Wai'anae, was slaughtering

beef in the first years of the 19th century. An 1812 visitor described the capture of two wild cows on that island.² By 1816, the cattle were enough of a nuisance to cause people to fence their gardens and houses. An engraving of Honolulu done that year shows thatch houses surrounded by pickets with oxen grazing just beyond. Fifteen years later, what Greer describes as "the Great Cattle Menace" was in full flower.³

"Its early manifestation was relatively mild – a bovine invasion from the eastern dry plain into the cultivated plantations behind Honolulu. To stop this, in 1831, the Hawaiians (including chiefs) worked on a stone wall running down from Punchbowl. It was to be six feet high, six feet thick, and about a mile and a half long." The wall ran from the king's residence (near the present site of St. Andrew's Cathedral) up to Punchbowl, along the eastern side of the hill to Makiki, and then down Punahou. (Not all labor was voluntary: those professing allegiance to the Pope were forced to work on the wall as punishment for their beliefs.)

As cattle began to be brought in to the port of Honolulu, slaughterhouses developed along the waterfront. By 1846, wild cattle were regularly stampeding down roads, menacing pedestrians and riders alike. At least two men were killed by rampaging bulls.

The creatures that plagued Honolulu were the descendants of cattle brought to Hawai'i by Captain George Vancouver in visits to the islands in 1793 and 1794. Vancouver presented the livestock to Kamehameha, from whom he extracted the promise that there would be no killing of the animals for at least 10 years.

Captain Amasa Delano, visiting Maui in 1806, reported the introduction of cattle to that island. "They had very recently brought to this island one of the bulls that Capt. Vancouver landed at Owhyhee," Delano wrote. "He had made very great destruction amongst their sugar canes and gardens, breaking into them and their cane patches, and tearing them to pieces with his horns and digging them up with his feet. He

Continued on next page

would run after and frighten the natives, and appeared to have a disposition to do all the mischief he could, so much so that he was a pretty unwelcome guest among them.” Delano added that he had been told by other captains who had recently visited the islands that cattle on Hawai'i had increased to the point that they were frequently killed for the beef.⁴

Around 1814, Kamehameha ordered a large wall to be built to protect the farms in the Kailua-Kona area from wild cattle. Another, the Wall of Kauliokamoa, was built between about the same time and for the same reason in Waikoloa – to protect the king's lands.

Nuisance or not, the king claimed ownership of all the wild cattle, which were to be killed only by his agents who shared with him profits from sales of hides and tallow. One of the earliest such agents was John Palmer Parker, who went on to found the Parker Ranch. Parker arrived in the islands in 1815 and by the early 1820s was reported by observers to be killing cattle on the slopes of Mauna Kea.

In 1823, Joseph Goodrich ascended Mauna Kea, noting “immense herds of wild cattle.”

The only advantage to them, he wrote, was that they provided employment for people, “principally foreigners,” who shot them and salted the meat.

The foreigners may have done the hunting, but it was the labor of Hawaiians that brought the hides and meat to market. The hides were crudely cured at the site of slaughter with salt brought from Kawaihae salt pans.

They “soon became stiff as boards and just as unwieldy,” writes Bernice Judd. “One or two of them made a cumbersome burden for a man. Before the Kawaihae road was made passable for carts, the natives were ordered by the chiefs to carry the hides to the seashore in the same way that they had had to carry logs of sandalwood. On the return trip to Waimea, they were compelled to take bags of salt.”⁵

In 1825, the Scotsman James Macrae, who accompanied Lord Byron on the voyage of the *Blonde*, ascended Mauna

Kea. Along the way, he encountered two bullock hunters – one a Welshman, the other a “Prussian blacksmith” — at an elevation he estimated to be about 12,000 feet above sea level, on the windward side of the island of Hawai'i. Cattle, Macrae reported, “have now increased to some hundreds.” Other estimates place the number of cattle around the same time at more than 1,600.

Within a few years, unnumbered thousands of wild cattle roamed the Big Island. Records from a court case heard in 1861 indicate that in 1829, William Hughes, one of the bullock hunters employed by Governor Adams (Kuakini), reported killing 40,000 cattle.⁶

To facilitate trade in cattle, Kuakini and his entourage moved to Waimea in 1830. Using the forced labor of 40 men found to have broken the *moe kolohe* (seventh commandment), he had built a cart road linking Waimea and Kawaihae. Down it were carried casks of salt beef, bales of hides, and barrels of tallow in ever increasing numbers.

In the first seven months of 1840, the export value of bullock hides alone — \$18,500 (representing 9,250 hides) — outstripped the value of any other single export from the islands. (Sugar was a close second, with sales totaling \$18,000. Just one year earlier, the top export was sandalwood, with a value of \$21,000; exports of bullock hides and sugar amounted to \$6,000 each. A year later, sandalwood had disappeared as an item of trade.)



Counting Beeves

On the island of Hawai'i, trade in cattle and cattle products – hides, horns, bones, salt beef, and tallow — grew rapidly. Almost all of it derived from the wild herds. By 1840, Kuakini was concerned that the bullock population needed time to recover and so imposed a five-year kapu on the slaughter of wild cattle solely for hides and tallow. But the scarcity of the animals apparently was a result not so much of reduced numbers as it was reduced visibility. *The Polynesian* carried a report of

a traveler to Mauna Kea in its July and August editions of 1840. On rough lava outcrops and “chimnies” dotting the plain on the approach to the summit, the unidentified traveler wrote, “were herds of bullocks, which scampered off at our approach, and plunged down their rugged sides with a rapidity which defied pursuit. Their only object in frequenting this region, where there is no trace of vegetation, is to avoid the pursuit of the hardy hunters or to lick the snow.”

In any event, it isn't clear how sweeping Kuakini's kapu was; on May 13, 1840, Kamehameha III signed an agreement with one Moses B. Fuller allowing Fuller to “engage in the business of tanning leather for the King of Waimea on the Island of Hawai'i.” (The “king of Waimea” was almost certainly Kuakini; Moses Fuller ended up marrying J.P. Parker's daughter.) The agreement also granted to Fuller the right to “cut and to draw all the bark necessary for the business.” And in 1843, *The Friend* reported exports of more than 10,000 hides. Nearly all of these would have come from the island of Hawai'i.

By the 1830s, herds of wild cattle roamed the major islands, while private herds were amassed using animals from wild stock. The earliest agreements allowing pasture use of the king's lands are unrecorded. By the late 1830s, however, the king and other chiefs were regularly committing to paper the agreements struck with cattle owners allowing private herds to graze on their lands.

On O'ahu, one George H. Bush received rights to graze his cattle on “that range of land situated between Waititi and Wailae [sic].”⁷ The American-born businessman William French, who, with J.P. Parker, was to become one of the most important cattlemen in the islands, obtained a pasture lease from Kukuanaoa and John Young for land in Halawa, O'ahu. In return, French was to pay “one dollar and a half annually for one beeve,” with French agreeing to pasture no fewer than 300 cattle on the land for a period of 15 years. Most leases also reserved to the ali'i rights to

Continued on next page

trees and water.

As with French's lease, payment was usually based on the number of head of cattle. In the case of an agreement allowing Hawaiians to graze on the *puali*, or isthmus, of Maui, the king was to be paid annually "one tenth part of the increase of said cattle." Also, most leases contained requirements that the owners of the cattle keep the herds away from crops cultivated by the natives, or "kanakas." For example, a lease from Hoapilikane to William Sumner for "the upland and mountains of Moanalua," O'ahu, provided that "if the cattle destroy the plantations of the common people, the owner thereof shall pay to the full amount of the damage done."

By 1845, the mixed blessings of cattle were becoming apparent. Minister of the Interior G.P. Judd noted in his annual report, "It is satisfactory to state the rapid increase of national wealth in the multiplication of cattle throughout all the islands. It would be an unwise policy to discourage that multiplication, but regulations are required to prevent the injury to agriculture arising from the encroachment of cattle on cultivated lands."

The damage inflicted by cattle on the residents of Honolulu and the potential threats to agriculture feared by Judd were impossible to ignore. Ever more stringent laws were passed in the second half of the 1800s to control livestock and allow Honolulu society to go about its business without the rude inconvenience of cattle drives down city streets. When the O'ahu Railway linked the wharves to the slaughterhouses in 1889, the practice pretty well came to an end.

But even as the cattle problem was removed from the city, in the hinterlands of the islands, out of sight and all but out of mind, the devastation wrought by cattle continued unabated.



Upland Devastation

A study by Holly McEldowney in the early 1980s attempts to determine what Waimea must have looked like before the arrival of cattle. She describes it

as a "gardened landscape" that, based on early descriptions, included "evergreen hills and extended plain diversified with thick wood, open pasture, low shrubbery and fruitful plantation."⁸

By the end of the 1840s, that landscape had been forever altered. After 1844, with the death of Kuakini and the lifting of the tabu on the rendering of wild cattle, Waimea became less a center of agriculture and more a "cattle pen," as described by the Rev. Lorenzo Lyons, who lived in Waimea while attending to the needs of Christians throughout the northern part of the island. Writing in 1847, Lyons observed that two-thirds of Waimea had been converted into government pasture land. "People are compelled to leave their cultivated spots and seek distant corners of the woods beyond the reach of the roaming cattle, sheep and goats," Lyons wrote in his journal, paraphrased by his granddaughter. "But the cattle follow, and soon destroy the fruit of their labors."⁹

The *Mahale* of 1848 and laws allowing foreigners to purchase land in 1850 only made matters worse, McEldowney writes. "Many native residents were legally awarded parcels too small to totally support their households, while the surrounding lands, which had been an additional source of garden lands or supplemental foods, were converted to pasturage. If unable to buy or lease additional lands, these residents were forced into commercial enterprises or to leave Waimea."

In the 1850s, then, a sort of double-whammy was at work in what had been, until recently, the lightly exploited lands of Kohala and Hamakua. With their land tenure secure, private ranchers increased the size of their herds – and the grazing pressure on their lands. Meanwhile, McEldowney notes, "the wild herds multiplied as a result of a decrease in hunting pressure. Thus the total number of domestic and wild cattle increased, causing a rise in their overall impact."

While most of the studies of the effect of cattle have focused on the island of Hawai'i, similar effects were being seen on every island. By 1857, according to

one estimate, the islands' cattle population, wild and domestic, numbered nearly 50,000, and was increasing at a rate of 30 percent a year.¹⁰ With consumption of about 3,000 head annually, the net annual increase was more than 9,000, the article – by an unnamed (and innumerate) author – continued. On Kaua'i, "the average price of full-grown beeves (wild) is \$5 per head. This island has become overstocked with cattle, and they are now being slaughtered for their hides and tallow."



Lands for Cattle

The next few years saw the ascendancy of sugar across the archipelago – and with it, growing interest in the protection of forests as watersheds. But in those areas where sugar planters had no interest in either land or water, ranching was generally regarded as the next best use of land, be it public or private. As the Crown Lands Commission sought to enrich the kingdom's treasury through the exploitation of its lands, ranchers were able to expand their private holdings many times over by obtaining leases to, or purchasing outright, vast tracts of government lands.

In 1861, Charles C. Harris – later to become finance minister – purchased what was advertised as "about 300,000" acres at Kahuku, Ka'u, at a cost of 1 cent per acre. The land had been sold at auction by Richard Armstrong, minister of public instruction, apparently to raise funds for public schools. At the time, 2,500 goats were on the land along with "some sheep and cattle," while "the mountain portion is said to abound in pulu," Armstrong's ads for the property stated. Upon survey, the land turned out to consist of 184,298 acres, but it still appears to represent the largest single tract of land conveyed by the government of Hawai'i to an individual – and went far to establish Harris' near-monopoly on the pulu trade. Other substantial grants of ranch land made in this period include nearly 40,000 acres to J.P. Parker, 46,500 acres on Moloka'i to Charles

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Reed Bishop, and 61,038 acres of Ni'ihau to J.M. and E. Sinclair.

In 1860, Prince Lot Kamehameha, then minister of the interior, announced to the Legislature his policy with respect to government lands. "Agents have been appointed to take charge of the government lands on Hawai'i and in consequence certain proceeds have been received from properties which formerly were useless so far as the public revenue was concerned. My general system of disposing of the government lands has been to lease rather than sell large tracts. By that arrangement, a permanent revenue is secured." (Lot Kamehameha was also president of the Hawai'i Graziers' Association, formed in 1856 to address problems of strays and cattle rustling and to promote the livestock industry.)

Within the next two decades, a pattern of land use emerged that was

unchallenged, for the most part, through the end of the 20th century. Sugar planters obtained the choice agricultural lands on each of the main islands and

the rights to develop water for fluming or irrigation from windward mountain slopes. The rest went to the ranchers.

— **Patricia Tummons**

1. Richard A. Greer, "The Nuisance Factor in Early Honolulu," *Hawaiian Journal of History*, Vol. 23 (1989).
2. Ross Cox, *Adventures on the Columbia River* (London, 1831), vol. 1, pp. 62-64. Referenced in *Ranching in Hawai'i: A Guide to Historical Resources*, by Jean C. Whelan (Honolulu, 1988).
3. *Ibid.*
4. Captain Amasa Delano, *A Narrative of Voyages and Travels in the Northern and Southern Hemispheres* (Boston, 1817), pp. 389-390.
5. Bernice Judd, "Early Days of Waimea, Hawai'i," *Hawaiian Historical Society Annual Report*, XL (1932).
6. At issue in the case was ownership of wild and unbranded cattle. The government claimed to own half the animals and had issued a license to kill them to R.C. Janion, while the king had granted similar rights to John Young Kanehoa, to whose father, John Young, had been entrusted the care of the cattle brought by Vancouver.
7. The lease, dated November 5, 1839, describes the boundaries as follows: "from the cattle pen [in Waikiki] to the river of Great Waialae, where Yankee Jim hid himself. Lands belonging to natives are not included." Yankee Jim was probably Jim or Jem Vowles, described by Gavan Daws as "the notorious bar-room brawler." *Honolulu – The First Century* (doctoral dissertation, University of Hawai'i, 1966), p. 224.
8. Holly McEldowney, Report 16, "A Description of Major Vegetation Patterns in the Waimea-Kawaihae Region during the Early Historic Period," in Jeffrey T. Clark and Patrick V. Kirch, eds., *Archaeological Investigations of the Mudlane-Waimea-Kawaihae Road Corridor, Island of Hawai'i: An Interdisciplinary Study of an Environmental Transect*, Bernice Pauahi Bishop Museum, 1983, published by the state of Hawai'i Department of Transportation.
9. *Makua Liana*, the journals of Lorenzo Lyons, compiled by Emma Lyons Doyle (Honolulu, 1953), p. 47.
10. *Pacific Commercial Advertiser*, July 23, 1857.

Bats from page 1

community members have argued was built far too close to residences.

The draft guidance document seeks to at least deal with the bat concern. DOWFA administrator and ESRC chair Dave Smith said at an ESRC workshop in early March that he wanted more discussion to occur on the document, and that there was no timeline for when a final version would be approved. Given the comments received so far, it won't be anytime soon.

Cost Prohibitive

One major criticism levied by Teague and other industry representatives is that the new draft guidance document proposes costly new monitoring and mitigation burdens.

Teague claims that if adopted by the ESRC, they would cost wind farms in Hawai'i 400 percent more than it costs them to comply with current guidelines, "thus rendering future potential projects or repowering of existing projects economically infeasible."

Eric Pendergraft, president of Na Pua Makani Power Partners, LLC, stated in his February 24 comment letter that the draft guidance's adaptive management recommendations that would limit

turbine operations to minimize bat take "would lead to commercial impacts that would prevent us from providing reliable power to our client."

Also, based on a preliminary analysis of other proposed mitigative measures, he stated that his facility would need to install about 200 acoustic monitors, which "exponentially increases the cost to the operation."

And that's just the acoustic monitors.

Because research has found that acoustic monitors can fail to detect up to 75 percent of bats in a given area, the draft guidance recommends that wind farms supplement them with thermal monitors.

At an ESRC meeting in January, when asked by committee member Jim Jacobi whether she considered using thermal monitors, a consultant for the Pakini Nui wind farm on Hawai'i island said she had not used them at the site because "the cost is prohibitive."

Speaking to the need for both thermal and acoustic monitoring, ESRC member Melissa Price said at that meeting, "at the end of the day what really matters from a species perspective is, is this population stable or are you tanking it? Because of the actions that are taking

place at this site and the only way to get at whether the overall population at your location is increasing or decreasing is with some sort of monitoring of the population and for bats that's thermal and acoustic."

With regard to mitigation, the draft guidance proposes that the minimum management area for each bat killed be increased from 40 acres to 97 acres. Teague and others have argued that this increase is not scientifically justified. She complained in her letter that the draft guidance relies on "the unjustified ~150 percent [core use area] increase to calculate a similarly unjustified research mitigation cost of \$125,000 per bat." Under the original guidance document, it was \$50,000 per bat.

She argued that the mitigation value of research is tied to whether it contributes to the likelihood and extent of bat recovery. She added that the U.S. Fish and Wildlife Service, which also authorizes HCPs and incidental take permits, "has refused to accept bat research as mitigation. Unless the USFWS is willing to do so, and that willingness is reflected in the guidance, there is zero incentive for applicants to spend money on research. The guidance must

Continued on next page

clearly set forth the USFWS position on this issue.”

At the bat workshop in March, Michelle Bogardus of the Fish and Wildlife Service—who is also an ESRC member—said it was highly unlikely that her agency would accept research as mitigation for bat takes.

‘Impossible to Satisfy’

More so than the increased costs, the draft guidance’s proposed restriction on

Teague also had this to say: “Although the draft updated guidance states that ‘population sizes are unknown, and it is generally accepted that it is not feasible at this point in time to ascertain an actual population estimate for a single island or the entire state,’ it calls for assessing project impacts on the species, and making permitting decisions based on population analyses, by (a) assuming that bat populations on each island are stable or slightly increasing (0 to 1 percent an-

Best Available Science

The comment letters on the draft guidance document were meant to inform discussion at an ESRC bat workshop held at the University of Hawai'i at Manoa on March 5 and 6. A common complaint by industry representatives was that the guidance’s authors did not use the best available science.

With regard to the island population and growth trend estimates in the draft guidance, Theresa Menard, who undertook the modeling those estimates were based on, explained to workshop attendees, “This is our first effort at modeling Hawaiian hoary bats. More modeling is needed before relying heavily on this effort.”

ESRC member Jim Jacobi described it as a necessary first step, given that obtaining accurate population information of such a cryptic animal is going to be really hard to get.

A number of scientists who have been studying the bats over the past few years presented some of the results of their research, much of which was paid for by the wind farms as part of their bat take mitigation.

Researchers have found that the bats primarily eat moths, as well as a wide variety of termites. David Johnston of H.T. Harvey & Associates said that prey availability is likely a driving factor in the bats’ distribution. Still, he admitted, “I don’t think we have solid data to say this. Generally, this seems like it might be true. Much is still unknown about diet and foraging ecology.”

Even so, he recommended designing intact habitats featuring plants that attract the bats’ favorite foods. “I would advocate going down to the species level.” In his research on bat diets, “a common widespread moth in some habitats like grassland was eaten far more than any other moth. It’s a grass specialist. Then you can plant specific plants which will produce certain prey,” he said.

With regard to how much a bat needs to eat a night, Johnston said it depends on its energetic needs. “A lactating female may eat as much as her weight in a night,” he said.

“People assume the bats go out every

Continued on next page



Hawaiian hoary bat.

how much bat take should be allowed on a given island has the potential to kill future wind farm development, at least on O‘ahu.

The document suggests that until scientific evidence proves otherwise, it should be assumed that the bat population on O‘ahu is 1,000, on Maui it’s 1,500, and on Hawai‘i island it’s 5,000. It further recommends that additional bat take should not be authorized if cumulative take levels exceed the annual growth rate of the population on the island. For O‘ahu, preliminary modeling results included in the guidance suggested that the population might not be able to sustain take of more than 10 bats a year.

Teague and Tetra Tech, which consults for a number of local wind farms, have argued that those island population estimates are not scientifically justified.

nual population growth), (b) assuming that compensatory reproduction from project mitigation does not occur, and (c) assuming that an annual rate of take that exceeds the annual rate of increase of a population is likely to cause a decline in the population. Of course, unless one knows the population in question, it’s not possible to determine whether projected take will exceed an assumed rate of population growth.”

Since the draft updated guidance assumes that it is not possible to produce any additional bats through mitigation, the standard that cumulative take not exceed the annual growth rate “is impossible to satisfy,” she added.

“In short, the draft updated guidance establishes a population-based test that has no scientific support and that is impossible to satisfy, meaning zero additional wind farms could be permitted in Hawai‘i,” she wrote.

night. ... In fact, they do not. It may not go out because it's made the decision it's not worth foraging. I'm not going to put a reason on it. Bats are very complex animals. ... Its need will change by season and by reproductive condition. Males and females have completely different needs.

"A male presumably could use much lower [insect] densities and get away with it, whereas a female might have to be much more efficient if she's lactating," he said.

The bats primarily reproduce in warm lowlands, look for big, shady trees to rear pups, and tend to use the smallest area that supports them, but will move if they have to, retired USGS bat expert Frank Bonaccorso said.

It's well known that the bats give birth to twins, but, he continued, "We don't know if they are more likely to successfully rear one or two. You can get into some misleading side tracks by using proxy data. But we don't know. The best scientific data available is what we've got to work on.

"It's a challenging bat. It is a more or less solitary rooster, and they roost very cryptically. Some are hole-nesters, or cave nesters, or live in human structures."

Kristina Montoya Aiona, a master's student at the University of Hawai'i at Hilo, has taken the lead on some of the roost research being conducted by the USGS on Hawai'i island. She described just how difficult it is to find where they go to sleep.

She and her team have been able to conduct 486 tracking events, following dozens of bats to dozens of roost stands and trees in East Hawai'i.

"The level it takes to get to that, 486 tracking events, we usually have two teams of two personnel, eight to twelve to fourteen hours a day. It took about 150 personnel hours per roost, an incredible amount of effort to get to these roost trees and stands," she said.

While the draft bat guidance document emphasizes management of native forest in mitigation efforts, Aiona said that 'ohi'a was the only native tree bats were seen in. Other roost tree species included eucalyptus, macadamia, lychee, mango, ironwood, and gunpowder.

Some bats had multiple roost lo-

cations. The mean height of roost trees was 21 meters. Mean perch height was 14 meters off the ground. And they tended to perch facing southward and westward. "I think it's interesting. I don't know quite what it tells us," she said of the perch direction.

She did note that the tracking focused a lot in lowlands, along roads and hiking trails, because the teams were able to track the bats more efficiently. "In upland forest, it's more difficult to track. I don't want to have the take-away be they're not roosting up there. They are just more difficult to track there," she said.

Jacobi asked her how much more effort it will take to have confidence to describe roost habitats and have them be used in management strategies.

"I hope this year we can at least double our numbers. For management, the takeaway for roosts is, we talk a lot about foraging habitat. Roosting habitat might not be the same thing," she said.

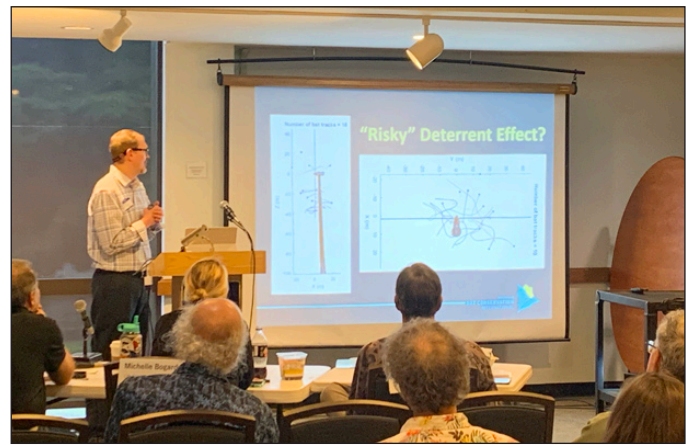
Next Steps

It's unclear how all of the latest research — and the industry's comments — will be incorporated into the draft bat guidance document. But DOFAW's Smith recognized the role the wind energy industry has played in generating that research.

"One of the things I say, tongue-in-cheek, I say 'Wind energy is the best thing that's ever happened to bats.' ... We were able to leverage a lot of resources from the companies. ... Thirty years ago, we didn't have anyone working on bats. [Today] we had nine people [from DOFAW] here focusing on this thing," he said of the workshop.

"The goal for me is we make wind energy work and wind up with more bats in the process ... I gotta believe we can do both," he said.

ESRC member Price asked what the chances were of getting research that will answer questions about three key issues: population, population trends,



At a workshop in March, Michael Schirmacher of Bat Conservation International discusses the efficacy of bat deterrent technologies.

and limiting factors.

One participant pointed out that the tools to observe bats are getting better. Researchers are able to sample longer and the tools to do so are getting cheaper. There are also new modeling techniques for converting some of the data already collected to "see if we can't generate [bat] densities and basic extrapolations from that," he said.

Michael Schirmacher of Bat Conservation International said managers on the mainland are facing the same problem there with assessing populations of hoary bats, which are also solitary roosters and vulnerable to strikes by wind turbines. At least Hawai'i's populations are restricted to islands, he said, adding "If you can't do it here, you can't do it anywhere."

Johnston supported Smith's sentiments about the industry partnership. "This has been a wonderful opportunity to move the science. Our map is much better. Our tools are smaller, cheaper, and better. ... In the near future we [will have ability] to do much, much more," Johnston said.

For future monitoring efforts, Smith said his agency is going to look island-by-island for projects that can allow for collaborative projects that will produce "better work for cheaper. ... I really see a trend of things getting better."

He said he hoped to convene similar scientific forums on bats, at least one in the next year.

(For more background, see our "Part 1" cover story in our April 2020 issue, "Draft Guidance Would Further Curb Number of Bats Wind Farms Can Kill.")

— Teresa Dawson

BOARD TALK

COVID-19 Pandemic Impacts Spur DLNR To Consider Rent Deferrals, Fee Waivers

Surf schools, concessionaires, and other businesses that pay rent or fees to the Department of Land and Natural Resources have pleaded for leniency, as government orders issued to control COVID-19 have hampered or eliminated their ability to operate.

On April 9, via Zoom, heads of the department's Land Division, Division of State Parks, and Division of Boating and Ocean Recreation (DOBOR) briefed the Board of Land and Natural Resources on how the coronavirus pandemic is affecting their permittees and lessees, as well as the divisions themselves.

Department director and Land Board chair Suzanne Case said the agency does not have the authority to waive rent, but it can defer payments. She said some divisions are willing to do so for lessees or permittees who apply for federal funds allocated to the Payroll Protection Program.

In late March, President Trump signed the CARES Act, which provided \$350 billion to the program for loans covering payroll, rent and other business expenses. Due to high demand, those funds were exhausted within two weeks. On April 24, the president approved a bill allocating another \$310 million to the program, but those funds were expected to dry up even more quickly.

Case said her department would grant rent deferrals on a case-by-case basis to businesses that prove they are experiencing financial hardship. Rent deferrals would only last as long as the hardship and the divisions would not impose any late fees, "as long as the payments resume with a payback schedule at the end of the deferral," she continued.

For businesses that can't operate at all because of state and/or county orders banning non-essential business, the divisions may not charge rent or fees so long as those orders are in effect.

The beach concessions at Duke Kahanamoku beach in Waikiki, fronting the Hilton Hawaiian Village, for example, had to shut down because of a directive issued by Honolulu Mayor Kirk Caldwell. Hilton Hawaiian Village

usually pays about \$600,000 a year to the DLNR in rent and permit fees, according to Land Division administrator Russell Tsuji.

"When I think about it, personally, a waiver might be warranted for the time period of the closure," Tsuji said.

From all of its properties across the state, the Land Division generated roughly \$17 million in fiscal year 2018-2019, Tsuji said. With less than a quarter to go in the 2019-2020 fiscal year, he said his division has seen a 12 percent decline in revenue due to COVID-19. "I anticipate as much of 30 percent or more going into FY21," he said.

DOBOR receives an average of \$300,000 to \$400,000 a month in rents, according to division administrator Ed Underwood, who said he, too, is willing to consider deferrals.

"If people are still mooring their boat, those rates are going to continue. It's where we have prohibited commercial operations [that] we're modifying payments due," Case said.

Like Tsuji, Underwood also envisioned waiving fees it collects from surf schools, kayak companies, and the like for commercial use of the ocean. For those, he said, "we're prorating their commercial fee for March and waiving it for April. ... We shut them down completely. We didn't think it was fair to make them pay."

With all of the state parks now closed, the same situation is occurring with concessionaires and companies that collect parking and entry fees. The Division of State Parks is also losing income from camping permits, said administrator Curt Cottrell.

"Our camping permit income averages \$95,000 a month," he said. With the quarantines and shut-downs due to COVID-19, people from around the world who have paid for camping permits are asking for refunds totaling \$150,000 to \$200,000, he said.

In total, he said his division is facing a \$500,000-a-month income loss, which will affect its ability to pay salaries and fringe benefits for 43 employees whose

pay comes from the State Parks special fund. "Our first quarter payroll cost is \$820,000. We're short to make payroll," he said.

To make up for the losses, he said he is looking to suspend four county lifeguard contracts for state parks, which cost the division \$3.3 million a year. He added that his division has also asked to suspend fourth-quarter invoices. "That will save us a little bit of bank we can roll over into the first quarter in the fiscal year," he said.

His division had planned to increase its park fees, but that effort has been suspended, he said.

Case said the state Department of Transportation is also proposing to defer rents for April, May, and June, and require repayment to occur next January through June.

"I want to emphasize, the state does not have a source of funds. We don't have the benefit of the federal fund," she said.

Board member Chris Yuen said he was concerned about how DLNR staff was going to determine whether or not a business was experiencing financial hardship. "It seems like you have hundreds of situations. It's going to be really hard to evaluate on any kind of a case-by-case basis. Some businesses are obvious. They're shut down." In other cases, he continued, business are not shut down, but their revenue has declined significantly.

Tsuji said he never envisioned his staff having the authority to determine whether or not a business gets a rent deferral. Those decisions would be left up to Case, after reviewing material presented by staff, he said. "We're looking mainly at the deferrals at this time, with conditions of having applied for funding that's out there," he said.

"Some food businesses have gone into major home deliveries and are doing great. ... Our Sand Island businesses, how are we going to handle that?" Yuen asked, noting that all of the business there are covered under one master lease.

Tsuji noted that the executive director of the Sand Island Business Association, which holds the lease, was the first to ask his division for rent relief. Tsuji said he directed him to have its tenants apply for the federal funding.

Continued on next page

The 113-lot Sand Island Industrial Park generates \$8 million a year in lease rent, which makes up a huge portion of the Land Division's income and goes into a Land Development Special Fund. That fund is the sole source of revenue for the division and for the DLNR's Office of Conservation and Coastal Lands, and it also supports the Commission on Water Resource Management and other agencies.

The simplest thing would be for the tenants to talk to their banks about a loan, Case said. If the banks approve loans to the tenants to cover rent, "if the payments qualify it's a possibility of it becoming a grant," she said.

She said her department would consider the rent deferrals and fee waivers one month at a time. "We want to just watch the situation closely. Even if this stay-at-home thing stopped soon ... it might be a while before business [ramped up]," she said.

"Everybody's got to lobby the federal government," Yuen added. "Hawai'i is going to be probably among those hurt most badly. ... There's only one entity in the country that can make up this hole," he said.

"It's obviously a very, very hard situation. We really feel for everyone who's impacted, particularly the businesses we want to come out on the other end of this," Case said.

Tsuji informed *Environment Hawai'i* that his division has recently sent letters to tenants who have sought rent waivers offering them the ability to instead defer the equivalent of two months

rent with repayment occurring next January through June, similar to the DOT's plan.

"For those with periodic rental payments (quarterly, semi-annual or annual) which are our long-term leases, we gave the option of choosing the above, or just to move the periodic payment in full (like semi-annual payment) back two months. The tenant needs to choose and send the selection back to us, which we are currently awaiting," he stated.

As of press time, only one business, the Westridge Shopping Center in Aiea, O'ahu, had received a rent deferral from the Land Division. The DLNR had not provided any information about deferrals or waivers for the other divisions by press time.



Legacy Land Projects Win Approval, But Full Funding Isn't Guaranteed

On April 24, the Land Board approved grant awards to ten projects under the state Legacy Land Conservation Program, knowing that only the top two were likely to receive any money.

The program has a spending cap of about \$5 million. Because \$1.5 million is deducted every year to pay down the debt service associated with the state's purchase of lands at Turtle Bay on O'ahu's North Shore, only \$3.5 million is available every year to purchase the fee or easements over other lands worthy of

protection.

While Gov. David Ige sought legislative approval this year to raise the spending ceiling to \$10.2 million, the suspension of the current session due to the coronavirus has left a number of potential awardees in limbo.

Dave Smith, administrator for the DLNR's Division of Forestry and Wildlife, explained that his agency usually asks the board to approve a suite of projects even if funding isn't available for all of them, just in case any of the highest-ranked projects fall through.

Smith suggested that this year, funding for even the top-ranked projects isn't secure. "I wanted to note that due to the fiscal situation, we don't know how this is going to play out. We have contract restrictions [and] other fiscal hurdles going forward with regard to actually expending these funds. ... We'll see if we can get the funding allocated," he told the board.

Although she did not specifically mention coronavirus impacts to state resources, DLNR director and Land Board chair Suzanne Case later explained, "There's a lot of budget review going on. We don't know what the next step is. DOFAW wanted to go ahead and move things forward at this level, but where they go from here, we don't know."

Legacy Land program specialist David Penn noted that his agency had received 20 written testimonies, half of which were against a proposal to acquire 1,363 acres at Kaunamano, located in Ka'u on Hawai'i island. That proposal, which sought \$2.4 million in Legacy Land funds, was ranked first by the Legacy Land Conservation Commission, which advises the Land Board.

The applicant is the Ala Kahakai Trail Association, which recently purchased 2,200 acres at nearby Waikapuna with assistance from the Legacy Land program.

A DOFAW report on the Kaunamano property states that it stretches almost two miles from the shore to the 600-foot elevation. "In ancient times, the land supported a thriving community with vast resources including fertile soil, prime fishing grounds and underground freshwater springs. The land contains a high concentration of cultural sites including two large settlement areas at Pa'ula and Pauku, numerous heiau,

Continued on next page



Land Board members and staff discuss via Zoom how to deal with the effect COVID-19 is having on the ability of tenants and permittees to pay rent and fees to the Department of Land and Natural Resources.

habitation caves, a rock paved anchialine pool, a lua training area associated with the nearby makahiki grounds, and almost three miles of the ala kahakai trail. Since the plantation era, the land has been used for cattle grazing," it states. It is currently leased to Kuahiwi Ranch.

The second-ranked project is the purchase by Moloka'i Land Trust of 1,818 acres at Mapulehu. The trust applied for \$1.1 million in Legacy Land funds.

"The lower property contains the platform of 'Ili'iliopae Heiau, which was a training area for Kahuna and a sacrificial heiau. The lower property was also used for kalo cultivation and was likely to some extent in lo'i along Mapulehu Stream and its tributaries. The upper property is largely watershed, which was likely more robust before western contact, the introduction of cattle and other invasive species, and climate changes that reduced precipitation on East Moloka'i," the report states.

It also notes that both projects meet all nine of the program's preservation purposes, including agricultural production and the protection of the watershed, habitat, and cultural and historic sites.

Both areas are also vulnerable to development. According to Davianna McGregor of the Moloka'i Land Trust, despite the efforts that have been made to preserve the land at Mapulehu, its owner has recently put it on the market for more than \$3 million.

If the Kaunamano purchase goes through, ranching would continue on the property. Kuahiwi Ranch testified in favor of the project, as did the Office of Hawaiian Affairs, the Trust for Public Land, The Nature Conservancy of Hawai'i, state Rep. Richard Creagan, and other groups and individuals. A number of people, mainly Ka'u residents, testified against the proposal, expressing their concern that they would be denied access to the shoreline.

Thomas Dean Kaniho, who says he was born and raised in Ka'u, stated in his testimony, "I have talked to many other people here in Ka'u and we are requesting that no more lands be put into Ala Kahakai Trails so-called hands. It's not right that they can dictate and control lands they never paid for and in fact the Waikapuna Lands are paid for by us! The taxpayers of Ka'u! And they allow none to enter those lands that many deemed necessary to survive. Many residents

have fished that area and now are told it's KAPU! Keeping people off of land that they nurtured, lived and died on! I find this shameful."

Because the Waikapuna and Kaunamano lands are actively ranched, they are gated to keep the cattle in, Ala Kahakai Trail Association member Keoni Fox explained to the board.

He said most of the public access through Kaunamano is for fishing and the ranch does allow for pedestrian access. Once the lands are purchased, he said the association wants to make the historical trail available for use by the community for subsistence fishing and gathering.

He said that over the years, a lot of the properties along the coast had been purchased and access excluded. "There's a lot of sore feelings. I can understand where that comes from," he said. With regard to how long-term access will be managed at Kaunamano, he said the association wants to hear from the community before making decisions.

He added that there are a lot of sensitive sites on the property and the association wants to make sure they are protected from visitor use or overuse. He said konane boards that were once "all over the place" at the ancient fishing village have been looted.

Finding the balance between facilitating access and protecting sites is a challenge, Land Board member Chris Yuen acknowledged, adding that he hoped the association deals with it in a way that doesn't exclude the public.

"People are going to misbehave.



PHOTO: THE TRUST FOR PUBLIC LAND

Ancient stone path at fishing village connected to Ala Kahakai Trail.

They'll find a way to do it. The looting occurred with limited, restricted public access," Yuen pointed out.

In the end, the board moved to approve a motion by Yuen to accept DOFAW's recommendations, with an amendment that any contract the state makes with the association for the Kaunamano purchase contain a clause requiring that after some community engagement, reasonable, managed mauka-makai and lateral public access be allowed.

"I want to make sure the public has access, especially if we're funding something with public money," he said.

"It's not going to be a free-for-all. People will have to go through a gate," Case said.

Fox said he was fine with the amendment. "I don't have any concerns over pedestrian access, more concerns over vehicular access. We have liability. [We pay] \$6,700 a year in insurance for Waikapuna," he said. —T.D.

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Lahaina Sewage Treatment Plant Needs Clean Water Permit, High Court Says

For decades, Maui County has been pressured to seek a Clean Water Act permit for discharges of partly treated effluent from its Lahaina sewage treatment plant into nearshore waters. The effluent is pumped into injection wells deep into the ground, where it mixes with groundwater that then flows into the sea.

In 2012, four environmental groups – the Hawai'i Wildlife Fund, the Sierra Club-Maui Group, the Surfrider Foundation, and the West Maui Preservation Association – sued the county in federal court after dye-tracer studies definitively showed a connection between pollutants in the waters off Kahekili Beach and the effluent.

Federal Judge Susan Oki Mollway in Honolulu District Court found in the plaintiffs' favor. The county took the case to the 9th Circuit Court of Appeals, which affirmed Mollway's decision.

Then, in an action that spurred controversy among Maui County Council members and the administration of Mayor Michael Victorino, in 2018 the county appealed the decision to the Supreme Court, which heard arguments in the case last fall.

Finally, on April 23, the high court released its ruling. While it disagreed with the appellate court over the scope of the Clean Water Act, it did find that the connection between the source of the pollution – the sewage treatment plant – and the nearshore navigable waters was direct enough to require the plant to obtain a permit.

"Because the Ninth Circuit applied a different standard," the majority of the justices agreed, "we vacate its judgment and remand the case for further proceedings consistent with this opinion."

David Henkin, the attorney for Earthjustice who argued the case before the high court, described the decision as "a huge victory for clean water" and a rebuke of the Trump administration – which sided with the county – in its efforts to "blow a big hole in the Clean Water Act's protections for rivers, lakes, and oceans."

According to Earthjustice, the case will first go back to the 9th Circuit, which will probably remand it to the Honolulu District Court. The court will then have to decide whether the discharges meet the test established in this ruling by the Supreme Court – that is, whether the discharges from the plant are the "functional equivalent" of direct discharges to the ocean.

"We expect the lower court will conclude they are, in which case the county will need to get a Clean Water Act permit," Earthjustice stated in its press release.

A Super Majority

The Supreme Court ruling was not a close one. Six justices agreed with the majority opinion, written by Justice Stephen Breyer. Only Justices Clarence Thomas, Samuel Alito, and Neil Gorsuch dissented, with Gorsuch joining in Thomas's dissent and Alito authoring his own.

The ruling is highly critical of the position staked out by Maui and the Trump administration: "Maui and the Solicitor General argue that the statute's permitting requirement does not apply if a pollutant, having emerged from a 'point source,' must travel through any amount of groundwater before reaching navigable waters. That interpretation is too narrow, for it would risk serious interference with

the [Environmental Protection Agency's] ability to regulate ordinary point source discharges."

"Consider a pipe that spews pollution directly into coastal waters," the ruling continues. "There is an 'addition of' a 'pollutant to navigable waters from [a] point source.' Hence a permit is required. But Maui and the government read the permitting requirement not to apply if there is any amount of groundwater between the end of the pipe and the edge of the navigable water... If that is the correct interpretation of the statute, then why could not the pipe's owner, seeking to avoid the permit requirement, simply move the pipe back, perhaps only a few yards, so that the pollution must travel through at least some groundwater before reaching the sea?"

One of the drivers that pushed the county onto the course of its several appeals was concern over possible fines, were it to be found to have violated the Clean Water Act.

At the time of Judge Mollway's ruling in 2014, the county was potentially liable for fines of as much as \$100,000 per day. The penalties at that point "already exceed \$100 million," Henkin said then in a news release from Earthjustice.

The majority justices did acknowledge this, albeit somewhat obliquely. "We expect that district judges will exercise their discretion mindful, as we are, of the complexities inherent to the context of indirect discharges through groundwater so as to calibrate the [Clean Water] Act's penalties when, for example, a party could reasonably have thought that a permit was not required." — **P.T.**

Since 1992, *Environment Hawai'i* has reported on the link between water quality and effluent from the Lahaina sewage treatment plant. All articles available for viewing at www.environment-hawaii.org.