



## Slow Acceleration

In many respects, Hawai'i is racing toward its renewable energy targets. But pulling up the rear, poking along at a Model-T pace, is the state's progress in reducing petroleum use in the transportation sector.

The disappointments in this area are highlighted in the top cover article, which reports on presentations at the state's recent summit on energy and resilience. The second cover also focuses on presentations – made this time at the annual Hawai'i Conservation Conference.

This month, *Environment Hawai'i* launches our annual fall fundraising appeal. Watch for it in your mail or, if you are a virtual subscriber, learn more on our home page. Please keep in mind that we rely on donations for a third of our total operating budget, and our fall campaign is our major source of gifts.

### IN THIS ISSUE

**2**

*New & Noteworthy:  
Pia Valley, Watson Suit*

**3**

*Board Talk: Fines for Damages  
To Historic Sites in Kona*

**5**

*State Rejects Shoreline Surveys  
For North Shore Lots*

**10**

*DOH Confirms Cesspool Impacts  
To Coastal Waters, Potable Wells*

**11**

*HCF Council Unveils  
Blueprint for Freshwater Security*

## Energy Experts Seek Ways to Shrink Petroleum Use for Transportation

When it comes to meeting the state's goal of becoming largely energy self-sufficient in the next few decades, "we're not gonna get too far if we don't tackle transportation," says Chris Yunker, head of the state Department of Business, Economic Development and Tourism's new Energy Systems and Transportation Program.

Two thirds of Hawai'i's petroleum imports are used for transportation. In 2014, the sector consumed the equivalent of 863 million gallons of gasoline, according to a Transportation Energy Analysis DBEDT released in August.

Unlike the electricity sector, where the state has been exceeding its renewable portfolio standard targets with the rapid expansion of residential solar photovoltaic systems, the transportation sector has some significant ground to make up.

Reducing petroleum use for transportation has been a key part of the Hawai'i Clean Energy Initiative (HCEI), a joint state-federal program created in 2008 to help the state achieve its goal of meeting 70 percent of its energy needs with clean energy by 2030. But so far, the state has

to page 8

## Conservation Conference Highlights, Part II: Snakes and Fish, Birds and Bees

The annual Hawai'i Conservation Conference, held this year in August at the University of Hawai'i-Hilo, offered hundreds of discussions on a wide range of topics.

This month, we continue to report on selected presentations.



### When Looking for Snakes, When Is Enough Really Enough?

There's good news and bad news on the brown treesnake front.

The bad news practically everyone in Hawai'i already knows. Should the snake find its way to Hawai'i and become established here, it would be a disaster – for forest birds, for power lines, for babes in their



The snakeproof fence at Andersen Air Force Base in Guam.

cribs... The list of troubles Guam has seen from the snake's introduction there could fill several books.

The good news?

At Andersen Air Force Base, on the northern tip of Guam, the U.S. Geologi-

to page 6

# Environment Hawai'i



Volume 26, No. 4

October 2015

## NEW AND NOTEWORTHY



PHOTO: U.S. FISH AND WILDLIFE SERVICE

'Oahu 'elepai'o, one of the rare species found in Pia Valley.

**Pia Valley Approval:** The state Forest Stewardship Advisory Committee (FSAC) has given its approval to the acquisition by the Department of Land and Natural Resources

of a 300-acre parcel of forested land in East Honolulu. Pia Valley, which lies in the Niu Valley area of O'ahu, is owned by the Niu Conservation Group, whose member James Pflueger has offered to donate it to the state.

When the FSAC met last month, its administrator, Irene Sprecher, informed committee members that the state "has a number of different ways [it] can manage lands – as a forest reserve, Natural Area Reserve, wildlife sanctuary, et cetera. [The Division of Forestry and Wildlife] has identified this as a potential Natural Area Reserve. But it would be a donation under the Forest Legacy program, which is our acquisition program."

As such, she said, "we would be working with some of our Forest-Legacy appropriated due diligence funding to close the project."

The area still is believed to be home to the 'elepai'o and also has two of the remaining 10 species of Achatinella tree snails. The state's Plant Extinction Prevention Program has been working to conserve 14 species of rare plants in the valley for the last 10 years, while the state's O'ahu botanist has been collecting genetic material from five rare species for two years.

In July, the Natural Area Reserve System Commission held a special meeting and unanimously voted to approve the acquisition. The state Board of Land and Natural

Resources will also need to vote before the acquisition can be closed.

Pflueger, the patriarch of the car dealership bearing his name, is best known these days for his actions leading to the deaths of seven people when the Ka Loko dam on Kaua'i was breached in 2006. Last year, in a plea bargain with the state, he was sentenced to serve seven months on one count of reckless endangerment. He was released to house arrest after serving six weeks, with the state citing Pflueger's frail health.

**Pepe'okeo Palace Update:** Last December, Scott Watson and the Hilo Project (a venture co-owned by Watson and Gary Olympia, a California lawyer) sued the Hawai'i County Windward Planning Commission over its refusal to grant changes to the Special Management Area permit covering the large house Watson is building along the Hamakua Coast, near Pepe'okeo.

In early August, 3rd Circuit Judge Greg K. Nakamura ordered the case dismissed under Circuit Court Rule 28, which allows for dismissal if the case is not served on the parties within six months of its filing.

On August 12, Watson appealed Nakamura's dismissal. In his appeal, Watson claimed that service had in fact been made by his attorney at the time, Steven Strauss. Supporting Watson's claim was an affidavit from Strauss, stating he had personally served the county's Corporation Counsel office on December 22.

Another affidavit, this one from Watson, stated that negotiations with the Planning Department had been occurring continuously since the lawsuit was filed. "Gary Olympia and I have engaged in intensive, frequent settlement efforts ... including a settlement meeting with Appellee Planning Director Duane Kanuha as recently as yesterday, August 11, 2015," Watson wrote.

Calls for comment to Kanuha's office were not returned by press time.

### Environment Hawai'i

190 Keawe Street, Suite 29  
Hilo, Hawai'i 96720

Patricia Tummons, Editor  
Teresa Dawson, Staff Writer

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 Environment Hawai'i  
190 Keawe Street, Suite 29, Hilo, Hawai'i 96720.  
Telephone: 808 934-0115. Toll-free: 877-934-0130.  
E-mail: ptummons@gmail.com  
Web page: <http://www.environment-hawaii.org>  
Twitter: Envhawaii

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

Production: For Color Publishing

Copyright © 2015 Environment Hawai'i, Inc.  
ISSN 1050-3285

#### Officers

Patricia Tummons, President and Treasurer

Deborah Chang    Teresa Dawson  
Vice President    Secretary

#### Directors

Kathy Baldwin    Mary Evanson    Valerie Monson

### Quote of the Month

*"We want to make sure  
our transportation policies  
are in concert  
with electric policies."*

— **Chris Yunker, DBEDT**

## BOARD TALK

## Board Imposes \$9,400 Fine For Damages to Historic Sites

It's not every day that the state Board of Land and Natural Resources imposes fines for damages to archaeological sites and when it has, those fines have been pretty meager. So when the Department of Land and Natural Resources' State Historic Preservation Division (SHPD) last month recommended fines for damages to several historic sites in Kona that were a small fraction of the maximum, Maui Land Board member Jimmy Gomes made clear his disappointment.

On September 11, the board unanimously approved a fine of \$9,400, as proposed by SHPD, for damages Kona resident Richard Stewart caused to eight sites on his four-acre agricultural lot that are believed to be part of the historic Kona Field System. The field system is on the National Register of Historic Places and, according to SHPD administrator Alan Downer, is "one of the most important sites in Hawai'i."



PHOTO: DLNR

This photo, says SHPD, shows a damaged historic stone wall on Richard Stewart's property.

In 2013, Hawai'i County and SHPD inspectors found that a contractor Stewart hired to clear overgrowth on his parcel had used an excavator to clear most of the property. In the process, the contractor had destroyed historic agricultural mounds and rock walls and damaged a stone platform, all without a grading and grubbing permit from the county or a SHPD-approved archaeological inventory survey (AIS), which is a prerequisite for the county permit.

At the Land Board meeting last month, SHPD proposed fining Stewart \$500 per affected site, \$5,000 for damaging the Kona

Field System, and \$400 in administrative costs. Gomes immediately asked SHPD staff how it determined those fine amounts and why it was not imposing the maximum fine of \$10,000 per violation.

"Wouldn't you say this is a slap on the wrist?" Gomes asked.

Downer replied that his division had determined that the proposed fine was consistent with amounts previously assessed on the rare occasions SHPD pursued fines for violations.

"Moving forward, we should be looking at more significant penalties," he assured Gomes.

But Gomes did not want to wait.

"I'd like to start here," he said, adding that he believed the work on Stewart's property had proceeded with complete disregard for the rules.

Stewart bought the agriculturally zoned property at auction in 2007 and, according to a SHPD report to the Land Board, planned to rezone and subdivide it into six house lots. However, in 2009, SHPD advised him to refrain from any ground-altering work on the property until he received approval of an AIS.

Stewart testified to the Land Board that he didn't have the money at first to conduct an AIS, but had been able to obtain a "clearance letter" from the Hawaiian family who owned the property before he did, which stated that there were no archaeological sites or human burials onsite.

"Based on this letter, I thought it was pretty good," Stewart said. He added that he also sought out archaeologists to conduct an AIS, but they all said the brush on his property was too dense to get through.

To make the area easier to survey and to minimize any fire hazard the brush posed, Stewart said he asked the county if he could clear the vegetation.

"They said if you're doing just brush clearing, you don't need a permit," he said. With that, Stewart hired a contractor who had "a big machine that will mow the stuff from the top down."

Stewart then offered the Land Board the same arguments he made (unsuccessfully) to the Hawai'i County Board of Appeals when arguing last year against a grubbing violation for the same work: The machine had no blade, claw, bucket, or any other mechanism to uproot the vegetation; it simply "mowed" the brush from the top down, leaving chipped material in its wake. Therefore, he argued, he was not illegally grading or grubbing. (He did, however, admit that the clearing exceeded the county's one-acre limit for brush-clearing without a permit.)

Stewart told the Land Board that when he learned that his contractor had damaged archaeological sites, he felt terrible.

"Fortunately, there are no burials on that ground, no ... heiaus, no sacred sites," he said.

"I can now see under the laws that exist, that a violation may have occurred," he admitted.

He told the board that he tried to act in good faith and hoped it would consider his side of the story.

"I'm disabled and get about \$1,700 a month," he said. He also claimed that he was "basically bankrupt."

Stewart's testimony did not, in any way, sway Gomes. First, Gomes argued, one does not cut a fire break by grubbing the whole lot. And with regard to Stewart's claim that his contractor's machine was merely a very large mower, Gomes noted that he owned such a machine himself.

"I know exactly what that machine looks like. It's an excavator," Gomes said, adding that the driver would have most definitely seen the rock formations before they were damaged.

"You can't tell me he didn't see," he said.

Land Board member Stanley Roehrig, an attorney, also took issue with Stewart's claims of bankruptcy.

"You keep saying you're almost bankrupt. If you're just saying that to impress us, I don't take it lightly. ... If you have a financial statement, you should show us," Roehrig said.

Stewart, who admitted he had not gone through any federal bankruptcy or receivership, agreed that he had used "a poor choice of words."

In the end, the Land Board voted unanimously to approve SHPD's recommendation. After the vote, however, Gomes added that, for the record, he disagreed with the staff's recommendation on the fine.

"I think it should be the max. ... For me [the fine is] just a slap on the wrist," Gomes said.

(For more background, see the story in our December 2014 issue, available at [environment-hawaii.org](http://environment-hawaii.org).)



## State Spends Tens of Thousands To Remove Tsunami-Related Debris

Hawai'i has until next January to spend all of its \$250,000 portion of marine debris removal funds provided by the government of Japan following the 2011 tsunami that devastated the country's coastal regions. So far, less than \$58,000 has been spent, according to a recent report from the DLNR's Land Division to the Land Board.

The tsunami generated an estimated 1.5 million tons of marine debris, the report continues. And because that debris is expected to wash ashore throughout the Pacific for years to come, Japan gave the U.S. National Oceanic and Atmospheric Administration (NOAA) \$5 million in 2013 to help with clean-up efforts.

NOAA distributed \$250,000 each to Alaska, Washington, Oregon, California, and Hawai'i and reserved the rest of the gift for use on an as-needed basis. The states were given until January 2016 to spend their portions. Unspent amounts would then be returned to NOAA.

Alaska has already spent all of its funds and has repeatedly requested and received more, DLNR Land Division administrator Russell Tsuji told the Land Board at its September 11 meeting.

Hawai'i, on the other hand, has been slow to spend its portion.

At the meeting, where the Land Board belatedly granted its approval to receive the funds, Tsuji explained, "We have been very cautiously spending. We don't want to use the funds on non-Japan debris." He added that it's sometimes difficult to identify the origin of the debris. (Hawai'i sits at the center of the North Pacific Subtropical Gyre, making it a hot spot for marine debris.)

The DLNR, which decides how the state's portion is used, has spent \$28,000 disposing of a large steel mooring buoy that made its way to the island of Hawai'i, about \$12,000 removing a "utility transport vehicle" from O'ahu, and about \$7,000 disposing of a shipping container and conducting an invasive species survey on Kaua'i, among other things, according to the report.

The department plans some larger projects this fall, including an aerial survey of

the Main Hawaiian Islands and debris removal from Kaho'olawe's Kanapou Beach and Ni'ihau's South Shore.

At-large Land Board member Chris Yuen commented that he thought it was extraordinarily generous of the Japanese government to provide the United States with such a gift.

"They have a tsunami that destroys [their coastline] ... and they give us money. I don't know if the U.S. would do that," he said.



## Land Board Moves to Ban Commercial Take Of Sea Cucumbers

Commercial fishing of sea cucumbers—except for the aquarium trade—may soon be illegal in Hawai'i if rules that have been recently approved for public hearings emerge unchanged.

Earlier this year, the Land Board approved emergency rules banning the take of sea cucumbers when reported catches spiked after a dealer that sells to Asian markets began operations in Hawai'i. The rules, which expire in December, are aimed at protecting the local population of sea cucumbers from over-harvesting, which has occurred elsewhere in the Pacific.

To ensure sea cucumbers continue to be protected after December, the Department of Land and Natural Resources' Division of Aquatic Resources proposed on August 28 to take rules banning commercial harvest to the public. However, the rules exempted collecting of up to 3,600 animals by aquarium collectors. DAR also proposed a requirement that anyone taking sea cucumbers register with the department.

"The proposed closure of the commercial consumption fishery will end the one existing dealer who was in operation at the time of the emergency rule adoption," a DAR report to the Land Board states.

At the Land Board's meeting, board member Chris Yuen asked whether the registration requirement would turn individuals harvesting sea cucumbers for their own use or consumption into violators. Kaua'i Land Board member Tommy Oi echoed Yuen's concern.

"More and more, we're putting regulations on the everyday people because of illegal commercial taking. Why should every Tom, Dick, and Harry be subject to something commercial guys illegally

did?" Oi asked before suggesting that the division simply impose a daily bag limit rather than require registration.

The rules, as proposed, do include a daily bag limit of three sea cucumbers for non-commercial human consumption and seven sea cucumbers for non-consumptive use "provided that [they] are released alive and in good health immediately after use. (The latter bag limit conditions address the non-lethal use of sea cucumber guts to treat wounds. Sea cucumbers, which can eject their guts as a defense mechanism, can also regenerate the organs.)

Board member Ulaia Woodside added her concerns about the justification of the maximum take for the aquarium trade. In DAR's report to the Land Board, the division recommended closing the commercial fishery "due to the continued concern that a sustainable take level is unknown at the present time. Without this information, there is uncertainty as to whether any level of commercial take is sustainable." However, when discussing take of the animals by aquarium fishers, the report states, "The current data indicates that this level of take is not a concern and can likely occur without adverse impact to sea cucumber populations."

For confidentiality reasons, data on aquarium harvest of sea cucumbers were not provided to the Land Board. Woodside, for one, asked to see some data, after the public hearings conclude, supporting DAR's proposed maximum take level.

DAR's report notes that since 2008, a handful of aquarium fishers has taken 1,500 to 3,500 sea cucumbers per year. Yet, to preserve the industry, the division proposed a take of 3,600 animals.

That number, Woodside said, "does feel a little out of thin air." When she asked whether the board could later adjust the maximum take level, DAR staff said the board could do that so long as the issue was discussed during the hearings.

To better assess an appropriate aquarium take level, Yuen said he'd like DAR to provide the board with the fishery's catch reports in executive session when the matter comes back for final approval.

The Land Board ultimately approved public hearings on the rules on the condition that they first be amended so individual, non-commercial fishers don't need to register. Land Board chair Suzanne Case asked DAR to instead use the public hearing process to explore ways the public can voluntarily provide information on the non-commercial harvest of sea cucumbers. — *T.D.*

## State Rejects Proposed Shoreline Surveys Fronting O'ahu's Sunset Beach, Pipeline

William Kernot, who owns and operates vacation rentals fronting some of the most famous surf spots on O'ahu's North Shore, is facing yet another winter without the shoreline protection he had planned to install for the past several months. The state Department of Accounting and General Services (DAGS) last month formally rejected his two applications for shoreline certifications for his homes fronting Sunset Beach and the world renowned Pipeline surf break.

Kernot has appealed the determinations.

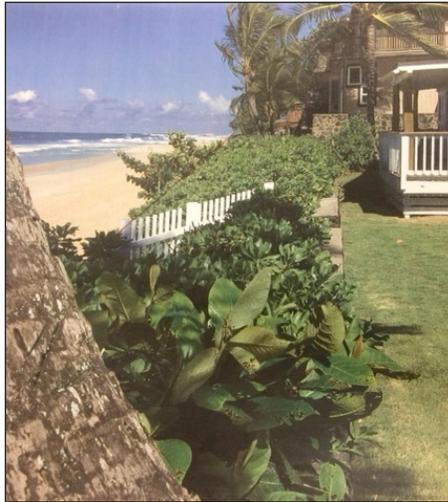
For his Sunset home, Kernot hopes to install a scour blanket over the toe of a dilapidated rock berm fronting the property. (Scour blankets can be made of geotextile material or loose stone.) But DAGS chief land surveyor Reid Siarot, who inspected the shoreline in February with Andy Bohlander, the shoreline specialist with the Department of Land and Natural Resources' Office of Conservation and Coastal Lands, determined that the shoreline was further landward than what Kernot's surveyor, Jamie Alimboyoguen, had delineated. Siarot also found that a rope fence and a portion of wooden stairs were seaward of the shoreline.

On February 19, Siarot instructed Alimboyoguen to revise the shoreline on the map and photos and to resolve the apparent encroachments. Although the rope and stairs were removed, Kernot chose not to amend his proposed shoreline. Instead, his attorney, Greg Kugle, presented Siarot with several arguments why DAGS should approve the shoreline as submitted.

In a June 23 letter, Kugle noted that Alimboyoguen had placed the shoreline along the top of the sand dune fronting the Sunset property, which was about half way up an erosion scarp created in 2013 after a severe erosion event.

"This shoreline location corresponded with the shoreline as determined by Mr. Sam Lemmo and his staff at the [DLNR's Office of Conservation and Coastal Lands]," Kugle wrote.

"OCCL's determination should be afforded deference in this instance," Kugle wrote. Kugle also took issue with DAGS's decision to take into account an October 2014 survey made by coastal engineer Joseph Little for the scour blanket Kernot



William Kernot's property fronting the Pipeline surf break.



William Kernot's property fronting Sunset Beach.

plans to install. When Siarot directed Alimboyoguen in February to revise the shoreline, Siarot advised that it should coincide with the shoreline determination Little had made. Little had determined that the line between the Conservation District and the Urban District sat at the top of the erosion scarp.

In his letter to Siarot, Kugle pointed out that Little was an engineer, not a licensed land surveyor, and therefore, was not qualified to determine the shoreline. Furthermore, Little's map "was prepared for purposes of obtaining permission from the city and DLNR to install a scour blanket as an emergency control measure to be located within the shoreline setback area. Mr. Little's 'top of the scarp' line

runs through or mauka of two very large, very old coconut trees that would not be standing or surviving if they were makai of the shoreline. This is further evidence the 'top of the scarp' line is not the shoreline," he wrote.

Kugle wrote that the beach fronting Kernot's property sustained severe erosion in October and December 2013, as did many properties in the area.

"The erosion of the beach created the scarp. This was not the case of waves running up through the vegetation to the top of the scarp. Rather, it was caused by waves eroding the bottom of the dune, causing the top or edge to retreat, on a roughly 45 degree angle. The erosion continued in a similar fashion during August to October 2014, when the storms Iselle, Julio and Ana hit Hawai'i."

In Kernot's defense, Little also wrote Siarot in June, complaining that his shoreline determination was being taken out of context. Siarot, however, was undeterred. On July 22, he informed Kernot that DAGS would not be amending its determination.

As for Kernot's home at Pipeline, Siarot's January survey of the area again found that the debris line was further landward than the shoreline Alimboyoguen had proposed. Rather than revising his maps as Siarot requested, Kernot disputed his determination.

In a March letter to Siarot, Kernot noted that state law defines the shoreline as the upper reaches of the waves at the highest tide during the season when waves are highest, except for storm and tsunami waves. Kernot argued that the debris line noted by DAGS in January resulted from a passing storm. He also argued that because a rock revetment fronted his property, the shoreline could not be found to be any further landward than the revetment.

DAGS apparently disagreed with his assessment in this case, as well, and rejected his application on September 8.

Both homes sit along Ke Nui Road, which in 2013 and 2014 experienced erosion so severe that the U.S. Army Corps of Engineers granted landowners there a Nationwide Permit to install protection structures, including armor stone, lava rock boulders, or sand bags. The permit expires on March 18, 2017.

Kernot is not the only Ke Nui property owner to have DAGS reject his certified shoreline application recently. On August 23, the department rejected that of Stephen McGillin, who owns the lot next door to Kernot's Pipeline property. — *T.D.*

*HCC from page 1*

cal Survey has established a geographically closed population of the snake. With no new snake entry possible – thanks to a snake-proof fence – and no snakes able to leave, researchers have the ability to study the efficacy of control tools at known snake densities. And from that, reported Amy Yackel Adams, it has been possible to develop a means of determining when the rapid response teams established to respond to reports of snake invasions on other islands can say, with certainty, that their work there is done.

Yackel Adams, with the U.S. Geological Survey in Fort Collins, Colorado, along with Bjorn Lardner stationed on Guam from Colorado State University, tackled the difficult subject of how you prove a negative. How, that is, you can state, with a high degree of confidence, that something (the brown treesnake) doesn't exist in a given area.

And their research was put to the test a year ago September on the island of Rota, in the Commonwealth of the Northern Mariana Islands, when a brown treesnake was caught in an interdiction trap there.

The event triggered “a litany of questions, ranging from how did that snake get to Rota, presumably a snake-free island? to was it a lone individual, or part of an incipient population? And how long should our rapid response continue?”

The event marked the first time a snake had been caught in an interdiction trap on a Mariana island, she noted, “and I was tasked with figuring out how long we respond. The answer needed to be justified – hence, quantifiable. But how much uncertainty is tolerable?”

The BTS Rapid Response Team jumped into action. “Successful eradication is best implemented when it's ready and prompt, with a team ready to deploy the day a sighting occurs,” she said.

“To detect whether a colonization has occurred is difficult,” she went on to say, “especially for cryptic species like the brown treesnake and ones that occur at low density.”

Furthermore, “rapid response is costly and cannot continue indefinitely. So when do you call it enough?” she said. “If you don't search long enough, you might say there's no incipient population, which allows the population to expand.” While you can confirm the presence of a population through detection, she continued, “the absence of a population can only be inferred probabilistically.”

To determine the probability of encountering a snake in an incipient population, Yackel Adams turned to the closed population of snakes in the fenced-in area of five hectares at Andersen AFB. Researchers had established 27 transects through the area, and each snake had been individually tagged. While it was “geographically closed,” she said, it remained “demographically open,” with the snakes reproducing naturally.

By conducting surveys along transects far enough apart to ensure “we won't see the same snake twice” in the course of an evening, Yackel Adams and her colleagues were able to determine snake densities and the probabilities associated with detecting a snake at a given level of effort.

In the closed BTS area, with a population of 117 snakes in five hectares, the average density was 24 snakes per hectare, she said. At that density, she and her fellow researchers “would expect to find 8.2 snakes on a given night” when they walked 5.94 kilometers of transects, for a detection probability of 0.07 percent.

But there was a confounding factor that prevented this formula from being applied in Rota – or anywhere else, for that matter: what Yackel Adams called satiation.

“On the island of Rota, there's a lot more prey than exists on Guam. Guam has rodents at densities of one to 16 rats per hectare,” she noted. On Rota, “there are 9 to 96 rats per hectare.”

“So this will have a bit of an impact on the detection probability. A lot more prey is available.” The tools developed in Guam, a “prey-limited situation,” had to be adjusted downward in a prey-rich situation.

“Poisson distribution provides the answer,” she said. “It provides the probability of a given number of events in a fixed interval of space and time, provided you have a known average rate and independence between events. Simply put, you can determine the probability of finding at least one snake.”

On Rota, personnel with the Rapid Response Team walked no fewer than 639 kilometers, without finding a single snake. “With 95 percent certainty,” Yackel Adams said, “we would have detected at least one snake given that level of effort, if the density was .16 snakes per hectare or more.” If the density was as high as one snake per four hectares, the likelihood of detecting at least one snake, with that same level of effort, would be 99 percent, she noted.

“This is the first time rapid response has ever quantified the level of certainty associated with a given effort,” she concluded.

With more work, she said, the method could potentially be transferred to invasive species other than the brown treesnake.



## Parrotfish Need More Protection

Talks on fisheries management rarely are quite as straightforward as the report that Edward DeMartini gave on parrotfish in Hawai'i.

The state, he said at the end of his talk, “should seriously consider banning nighttime scuba spearfishing.”

Just as rare was the enthusiastic applause that greeted his blunt recommendation. (That and other recommendations he made were his own, DeMartini took pains to note, and not necessarily those of his employer, the National Marine Fisheries Service.)



Parrotfish

PHOTO: WIKIPEDIA.ORG

DeMartini looked at the sizes and ages of five species of parrotfish that are commonly taken by fishers.

“There are dozens of important reef fish,” he said, “and not much is known about their life history. Especially lacking are rates of growth and sexual maturity.”

When determining which species to study, he continued, “you have to consider whether it's economically or culturally important, and, ideally, also whether it has an important function within the ecosystem.”

“One of the groups of fishes which have great ecological importance are parrotfish,” he said, calling out their role as “habitat engineers.”

Of the seven species of parrotfish in Hawai'i, five are commonly caught by fishers, and all are recorded under the single name of uhu. Given the differences among the five species in their sizes at maturity, DeMartini said, “We should be hesitant to manage uhu as a single-species taxon.”

“The two large-bodied species greatly dominate commercial landings, in terms of

biomass,” DeMartini noted, with smaller-bodied species making up a smaller portion of the overall catch.

“The fishery is highly selective, with most of the take occurring through the use of nighttime scuba spearfishing,” he said.

All of the parrotfish are “female first sex-changers,” he pointed out, which creates some special challenges for managing the fish.

“Both of the large species” – spectacled and red-lipped parrotfish – “mature on average at a size that’s several inches greater than the minimum legal size” of 12 inches, he said, adding that the current legal minimum size protects less than 20 percent of redlip parrotfish.

DeMartini concluded with a series of personal recommendations for state fishery managers, including:

- Improve catch records;
- Change minimum size limits – notably by increasing the minimum size for the two largest species to 14 inches;
- Conduct more thorough censuses and improve creel and market surveys for size and species composition for all species, but “especially for multi-species groups like parrotfishes;” and, finally
- Seriously consider banning nighttime scuba spearfishing.

Last year, the state Board of Land and Natural Resources passed new rules for the island of Maui that prohibit the take of spectacled and red-lipped parrotfish altogether and set the minimum take size of two other species of uhu at 14 inches. Elsewhere, such takes continue to be legal. The Land Board has also banned scuba spearfishing in waters off West Hawai'i.



## ‘Akohekohe Juveniles: Homeless and Sick?

Of Hawai'i's many rare and endangered birds, the ‘akohekohe (*Palmeria dolei*) has had one of the more stable populations. Found now only on the upper slopes of windward Haleakala, its population has held steady at around 3,800 individuals for years.

The bird is relatively long lived, with a life expectancy of at least 12 years. And it has a high nest success rate relative to other forest canopy birds.

“But with a high survival rate and high nest success, why is its population not increasing?” asked Alex Wang, a graduate student at the University of Hawai'i-Hilo who has been working with the birds for



PHOTO: WIKIPEDIA.ORG

‘Akohekohe

several years.

One of the problems Wang has identified is the presence of disease – specifically, avian malaria – at the lower range of the ‘akohekohe’s habitat, around 1,700 meters elevation.

“Because of the introduction of mosquitoes and disease,” Wang said, “the birds are restricted to high-elevation refugia.”

But ‘akohekohe are nectivores, feeding primarily on the nectar of ‘ohi’a blossoms. ‘Ohi’a nectar makes up between 50 and 75 percent of the birds’ diet, Wang said.

Wang developed a hypothesis: ‘Akohekohe juveniles move to lower elevations in the summer months, following ‘ohi’a blooms, where they are exposed to malaria. This, he continued, could explain the bird’s static population.

To test this, he outfitted several birds with transmitters and for two months, the life of the batteries, he followed them around the forest with a handheld antenna.

He then quantified ‘ohi’a blossoms by elevation, from 1,450 meters up to 1,950, on two transects. “I counted ‘ohi’a blooms at all stations,” he said – to the gasps of his astonished audience.

The blooms “decreased dramatically at high elevation sites during the summer,” he found, “but there was no corresponding increase in low-elevation sites.”

He found no support for the idea that juveniles emigrated to lower elevations for food. However, he added, “‘akohekohe pairs are aggressive and territorial. Their home ranges don’t overlap.”

While Wang didn’t find any adults at lower elevations, he said, he did find juvenile birds covering wider areas and “descending into potential malaria zones.”

“What I found corroborates the high adult survival and high nest success already documented,” he explained in a follow-up email, “but what I found different was that there is likely low juvenile recruitment back into the probably saturated population.”

“The high adult survival,” he concluded,

“fits with the ‘akohekohe’s high philopatry” – its fidelity to a small home range at high elevation. The “high juvenile output,” he said, will contribute to the bird’s reproductive success “only if the juveniles don’t go to lower elevations.”



## Of Earthworms and Pigs

While there are plenty of studies on the effects of feral pigs on native ecosystems in Hawai'i, Noa Kekuewa Lincoln, a researcher with the University of Hawai'i's College of Tropical Agriculture and Human Resources, has investigated the way those pigs interact with the ecosystems – specifically, the relationship between pigs and earthworms.

Earthworms, Lincoln pointed out, are not native to Hawai'i but were here by the early 1800s. About 35 species are now found in the islands and they make up the largest fraction of macrofauna found in Hawaiian soils.

Pigs eat them, and although earthworms make up somewhere between 1 and 4 percent of gut content in pigs on Hawai'i island, they are the primary source of protein for the pigs, he said. “Hence, the vast majority of rooting in forests may be ... pigs looking for earthworms.”

Lincoln examined earthworm biomass under a range of canopy species. “Within the same site,” he reported, “earthworm density can vary dramatically.” Under some species of eucalyptus and redwood, he continued, “there are no earthworms. But you could walk two feet and go from no worms to choke!” Tropical ash canopy is apparently one of the most preferred areas for earthworms.

Koa also shelters few earthworms, but native forests generally fall “in the middle of the spectrum.” Pasture, especially kikuyu grass, has more.

“So I looked at this in terms of pig rooting,” Lincoln said. “Almost all the rooting we were seeing is in direct correlation to the amount of earthworms in the soil.”

Also, he went on to say, “the impacts of rooting aren’t equal under different forest canopies. ... If you have a tropical ash forest on a steep slope, expect lots of rooting and erosion.”

“If we think about pig rooting correlating to time spent in forest areas, this has big implications for how we designate and manage forests,” he said. “If we set up eucalyptus forests as hunting areas, the hunters will be disappointed.” On the other

**Energy from page 1**

fallen short of meeting its goals for the transportation sector.

HCEI's 2011 Road Map identified four ways to achieve its target to shrink petroleum use for ground transportation by 70 percent by 2030: reduce vehicle miles traveled (VMT), expand the use of renewable fuels, improve vehicle efficiency, and expand the market share of electric vehicles (EVs). Although the Road Map's 2015 targets for renewable fuel use and vehicle efficiency have been exceeded, the state is far from meeting those for VMT and EVs. Overall, rather than reducing its petroleum use for ground transportation, Hawai'i has increased it by five percent between 2010 and 2014.

Between 2010 and 2013, "VMT increased quickly as the economy recovered," the analysis states. Now, to reach the Road Map's VMT target of 5,370 miles per capita (it's now about

7,596 miles per capita), the average per-capita miles driven by Hawai'i residents would need to be reduced about 1,100 miles by 2030, according to the analysis.

When it comes to expanding the presence of EVs, Hawai'i just isn't seeing the growth anticipated by the HCEI 2011 plan. Although the state has made "significant investments" in 160 public charging stations that can accommodate 364 vehicles across the state, "with just over 1,000 EVs added statewide last year, the 2015 EV goals of 4,000 in sales and 10,000 on the road are unlikely to be met," the report states.

The Transportation Energy Analysis, prepared for DBEDT by the International Council on Clean Transportation, identifies 22 specific tactics that could reduce petroleum consumption by 62 million to 72 million gallons a year (mgy) by 2030. But that accounts for only about eight percent of the state's current petroleum use.

Transit-oriented development accounts for most of the reduction, about a third, followed by vehicle efficiency, which is expected to reduce petroleum use by 16 mgy, the report states.

Increasing the number of EVs is the smallest part of ICCT's plan to reduce petroleum use in the transportation sector. All of the tactics to expand EVs — providing state rebates, requiring EV rental prioritization for government workers, and implementing time-of-use and EV charging rates — are expected to result in a reduction in petroleum use of less than one mgy. As a result, those tactics have been identified as "secondary targets."

**Modeling EV Impacts**

DBEDT's Transportation Energy Analysis assumes that only 43,000 EVs will be on the road in Hawai'i by 2030. But at the Asia Pacific Resilience Innovation Summit

hand, "if we're going to try to lower pig populations in an area," he said, it's a waste of time if those efforts are focused on areas invaded by tropical ash or other trees that enhance rooting.

"There's lots of speculation that before earthworms were introduced, pigs in Hawai'i were much smaller, and were limited by protein availability in their diet," he said. "As everything has moved toward pasture grasses, we've greatly increased earthworm habitat, presumably increasing the abundance and vitality of pigs as well."

Conversely, he concluded, if pastureland is converted back to native forest, "it may lower pig vitality by altering overall land use."



## Hawai'i's Bees: An Experiment In Translocation

Hawai'i has some 60 species of native *Hylaeus* yellow-faced bees, seven of which are candidates for protection under the federal Endangered Species Act. In an effort to boost the population of one candidate species, *Hylaeus anthracinus*, found on the Kona coast of the Big Island, Karl Magnacca undertook to translocate several hundred of them from Puako, where they are relatively abundant, to three sites at Pu'uohonua o Honaunau National Historic Park in South Kona.

In a poster presentation at the Hawai'i Conservation Conference, Magnacca noted that a century ago, the bee occurred widely along the leeward coasts of Hawai'i island,



from South Point, in Ka'u, up to South Kohala. Now, the isolated South Point population "is extremely small," he wrote, and "Recent extensive surveys have found no surviving populations in South Kona and only a few suitable sites."

"This combination of large-scale declines and extirpation from historic sites with continued high numbers in some areas makes *H. anthracinus* ideal for testing translocation as a conservation tactic," Magnacca wrote. And although translocation has been done for birds and plants, until Magnacca translocated the bees, it had not been attempted for any native insect.

Magnacca, supported by the O'ahu Army Natural Resources Program, chose three sites in Pu'uohonua o Honaunau to release the bees captured at Puako, beginning last January. One site, Alahaka Bay, had a good mix of native vegetation and relatively few ants. Another site, at the start of the coastal trail, had vegetation quality described by Magnacca as "medium" and

abundant big-headed ants (*Pheidole megacephala*). The third site, at the royal grounds, had "low" quality vegetation and also many big-headed ants.

Six months later, the 100 bees that had been released at Alahaka had become an established population, with nesting observed in coral rocks, Magnacca reported.

"Bees were not able to establish at the other two sites even after a second, larger release in April 2015," Magnacca wrote. "This suggests that the presence of large numbers of aggressive ants is the biggest barrier to [the bees'] existence in their historic range."

Could ant control help out the bees? Magnacca was asked.

"Unfortunately, there doesn't seem to be a good way of controlling ants," he replied by email. "Sheldon Plentovich did some experiments eradicating them from offshore islets on O'ahu and found that they tend to just be replaced by other species, which are sometimes even worse. If big-headed ants are in one area, if you get rid of them, it might be ant-free for a couple of years, but then long-legged ants show up and soon they've taken over.

"And of course, on the main islands, it's much more difficult to get rid of them, because there's usually a nearby population they can move back in from over land. You could keep them under control, but that would require a huge effort of baiting — and, of course, as soon as you stop they come back." — **Patricia Tummons**

and Expo held in late August in Honolulu, Carlos Perez, director of Hawaiian Electric Company's Customer Technology Applications division, suggested that the state could see 100,000 to 200,000 EVs on Hawai'i's roads in the next few decades.

And recent modeling work by Yunker's office suggests that such large numbers of EVs could not only help reduce petroleum used for transportation, but may also help the electricity sector.

Currently, the state's utilities are sometimes forced to curtail the influx of electricity generated by solar photovoltaic systems because they produce more than the grids can handle. The utilities do not generally store that "wasted" energy, but they are exploring ways to do so. At the summit, Yunker said EVs can greatly benefit the electric grid if they are charged in the middle of the day, thereby decreasing the amount of renewable energy storage the utilities would need.

The idea of using EVs to shave peak loads and, thereby, reduce the amount of renewable energy storage needed is not new. But only recently has DBEDT been able to quantify how EVs would affect storage needs.

With its new modeling tool that can evaluate the combined impacts of thousands of energy technologies, DBEDT has determined that about 120,000 EVs charging off-peak on O'ahu could create a 20 percent swing in storage costs, according to Yunker.

At a briefing on the model, held immediately after the summit, Yunker described a scenario in which Maui and O'ahu grids are connected by a cable. If 70 percent of the electricity came from renewable sources and EVs made up 15 percent of passenger vehicles, the model determined that 1,682 megawatt hours (MWh) of storage would be needed if EVs charged at night. But if they charged during "smart charge" hours, the peak load would be reduced by more than 100 MWh, and the storage need would also shrink considerably, he said.

Because of the synergy among so many of the clean energy technologies, "how you do these things is really important," he said. "We want to make sure our transportation policies are in concert with electric policies."

Because the state supports EVs, it's important to understand the impact and benefits of achieving higher levels of EV penetration, especially with high levels of renewable energy on the grid, Yunker says. "Understanding what could happen helps us to develop policies on integrating [EVs] that increase their benefit to Hawai'i," he

told *Environment Hawai'i*.

Although growing the number of EVs may only be a secondary target for DBEDT, HECO is moving on its own to make that happen.

In 2013, Perez reported, HECO started working on establishing up to 25 EV fast chargers by July 2018. (Fast chargers, or Tier 3 chargers, can fully charge a depleted EV battery in about half an hour. It normally takes about seven hours.) The first was installed at Dole Plantation on O'ahu. Others will be installed at Kapolei, Hawai'i Kai, and on the island's windward side.

"The Dole one is getting used quite a bit, a lot of it to do with the tourist traffic to the North Shore," he said.

In 2010, HECO launched a pilot project to encourage EV charging during off-peak hours with special discounted electricity rates. Limited to 1,000 O'ahu customers, 300 Maui County customers and 300 Hawai'i island customers, the program offered two different rate schedules for EV owners that could save them about 6 cents per kilowatt hour if they charged during off-peak periods.



## DOT Saves Big With Energy Efficiency

"Energy efficiency is the first fuel," said Public Utilities Commissioner Lorraine Akiba, moderator of the Asia Pacific Resilience Innovation Summit's panel on efficiency. And with the state's new goal of generating 100 percent of its net electricity from renewable sources, efficiency is a critical component and "the number one grid resource," she said.

As organizations such as Hawai'i Energy and Honeywell work to improve efficiency in homes and businesses, the state Department of Transportation is in the midst of undertaking the largest energy efficiency project in the state: a massive overhaul of its airports, harbors, and highways.

The project, which will remedy years of deferred maintenance, is expected to reduce the department's annual utility bills by 30 to 50 percent, saving several hundred million dollars over the next 20 years, according to Larry Augustine of Johnson Controls, Inc., which is implementing the work.

Augustine, a presenter at the recent summit, reported that the upgrades at the state's 12 airports will cost \$150 million and are expected to reduce energy use by 45 percent, saving the department

\$518 million over the entire 20-year term of Johnson Controls' contract. Those upgrades, which include replacing 74,500 light fixtures and installing about 9,000 photovoltaic panels, among other things, are two months ahead of schedule, he said.

A fact sheet released last month by the state Energy Office about the airports project notes that over the term of the contract, the energy saved could power 126,206 homes.

Similar upgrades at the state's harbors, which have not yet begun, will reduce energy use there by 53 percent and save the state \$28.4 million over the contract term, Augustine said. And those for the state's highways, which began a few months ago, will reduce energy use by 43 percent, saving a total of about \$126 million, he said.

As efficiency technology continues to advance and become more affordable, Armstrong said, state facilities have a lot of room to reduce energy use even further. At the Honolulu International Airport, for example, all of the lights Johnson has replaced or is replacing are not LED, but high-efficiency fluorescents.

If the project were to start over today, "we would be doing LED," he said.

The potential to expand energy efficiency in residences and businesses is similar, according to some of the other panelists. Colin Bishopp of Renew Financial, a company that provides financing for efficiency or renewable energy projects, noted that every year, three to four percent of homeowners have something in their home break that relates to either their energy or water use.

"By the time it breaks again, technology advances so rapidly, we're going to need to be able to catch them again" to make sure they install the most energy efficient device, he said.

Hawai'i Energy's Michael Chang added, "Hawai'i renovates a lot more than it builds new. ... The potential, it's there." However, he said, "you can't force people to do things they don't want to do, but maybe you can influence them."

Providing attractive financing options is one way. Bishopp described a number of federal and state programs that allow homeowners or businesses to pay for efficiency upgrades or renewable energy installations through their electricity bills or property taxes.

"You need utility on-bill [financing] to get to renters," he said. "You can't just have one tool, you need multiple tools."

— *Teresa Dawson*

## DOH, UH Studies Find Growing Evidence Of Cesspool Impacts to Coast, Potable Wells

With Governor David Ige's signing of Act 120 in June, the state Department of Health edged closer to tackling the public health threat posed by the tens of thousands of cesspools scattered throughout the islands that discharge an estimated 50 million gallons a day of raw sewage into the ground. Act 120 allows owners of eligible cesspools to claim up to \$10,000 in tax credits for costs associated with upgrading to a septic or aerobic treatment system or with connecting to a sewer system. (To qualify, a cesspool must be near drinking water wells or within 200 feet of the shoreline, streams or wetlands, or it must be connected to multiple residential dwellings.)

But Act 120 has its limitations, according to Robert Whittier of the DOH's Safe Drinking Water Branch. The act caps the tax credits in a given year to \$5 million and they expire in five years.

With upgrades to individual cesspools likely to cost about \$25,000 to \$30,000, the \$25 million in total credits allowed by the act will likely cover only about 2,500 of the 6,900 qualified cesspools that the DOH has identified, he said last month at a lecture at the University of Hawai'i at Manoa.

What's more, concerns remain over whether the credits are best applied to cesspools within 200 feet of coastal or surface waters and whether converting a cesspool to a septic system — which would require a leach field — would offer any improvement in areas with porous, rocky soil.

Whittier pointed out that if a single person in a remote area had a cesspool within 200 feet of the coast, upgrading it probably wouldn't be as valuable as converting cesspools in an area like Waialua, O'ahu, where there is a large cluster of them, albeit half a mile from shore.

By converting those in Waialua, "you're going to get a bigger bang for your buck," he said.

He added that there are ongoing discussions about how to best implement Act 120 and that the DOH has identified high-risk areas that need to be focused on.

According to Dr. Roger Babcock, a civil engineering professor at UH who attended Whittier's talk, in addition to focusing on high-risk areas, the department may also need to provide guidance

on what kind of upgrades should occur and where.

A septic system pumps waste from a holding tank onto a leach field, where the waste is spread out and filtered in the soil. But that type of system is fairly limited in areas with a high concentration of similar systems and soils that don't allow the dispersal field to do its work, he said.

"There may be no improvement, especially if you have a high density [of onsite disposal systems]. Like on the Big Island, where you have very poor soils and you essentially have just [waste] injection [into the ground], septic is not going to help at all," he said, adding that people there would be better off installing an aerobic treatment plant, which doesn't necessarily cost more than a septic system.

Hawai'i island has by far the most cesspools of any other island. And in places such as East Hawai'i's Hawaiian Paradise Park (HPP), with more than 4,000 cesspools and "absolutely no soil," according to Whittier, aerobic systems may be the only way to prevent the continued contamination of the subdivision's drinking water wells.

HPP, which is not served by the county water system, has about 250 potable wells and is home to about 4,500 residents. Last year, the University of Hawai'i and the DOH sampled 32 of those wells and found that half of them tested positive for total coliform and a quarter of them tested positive for *E. coli* bacteria, both of which indicate contamination by sewage.

The incidence of bacteria detection increased near the coast and after a heavy rain, Whittier said. He also stressed that researchers did not test for longer-lived viruses. (More than 100 types of viruses have been detected in human fecal matter.)

Given the results, Whittier said the DOH strongly urged HPP residents to use ultraviolet light disinfection systems to treat their drinking water.

More recent studies by the University of Hawai'i are revealing additional areas that would likely benefit from a large-scale cesspool upgrade. For example, along O'ahu's South Shore, UH researchers Henrieta Dulai and Christina Richardson have sampled the coastal waters off Black Point, which has never been connected to the Honolulu sewer system,

and Wailupe Peninsula and Kawaikui Beach Park, which have.

In the Black Point samples, they found elevated levels of total nitrogen, total phosphorous, and a nitrogen isotope ( $\delta^{15}\text{N}$ ) that has been found to be a good tracer of sewage pollution.

And modeling by the University of Hawai'i, later validated with actual  $\delta^{15}\text{N}$  measurements from a separate study, shows that the coastal waters of West Hawai'i have five to ten times the amount of sewage-related nitrogen found in East Hawai'i. The UH researchers predicted higher levels of nitrogen in West Hawai'i because East Hawai'i gets much more rain and, therefore, more dilution of its leached wastewater, Whittier said.

"We want to start replacing existing cesspools in critical areas," Whittier said. Kahalu'u, O'ahu, is an obvious place to start. Last year, the area received a lot of media attention when a bather got a serious skin infection after wading in a lagoon there and subsequent tests by the DOH found bacteria levels that were the equivalent to those found in the Ala Wai canal after one of the islands most massive raw sewage spills.

In the Kahalu'u case, not only did the DOH find a measurable impact of disposal systems on surface waters, it also verified an adverse health impact, Whittier said.

So what else is being done to address the problem?

Whittier said the DOH is also in the midst of revising its wastewater regulations to prohibit new cesspools.

Last year, then-Gov. Neil Abercrombie chose not to sign administrative rules for the DOH that would have banned new cesspools and phased out old ones, and a House Bill aimed at doing the same died this past legislative session.

Unfazed, the DOH held public hearings in August on rules that would not only ban new cesspools, but also provide the framework for the tax credit program authorized by Act 120. The department's website states that the rules are expected to be approved by the end of the year, before the tax credit program is set to start. But according to one Wastewater Branch staffer, the division has no idea when the rules will be ready for the governor to sign

— T.D.

## Hawai'i Community Foundation's Council Unveils Blueprint for Freshwater Security

A lot of research has been released over the years about the impacts of climate change on Hawai'i. Scientists have found a drastic increase the number of "fire weather" days over the past several decades. They've predicted an increase in the severity of coral bleaching events, as well as contraction of habitat where native forest birds can take refuge from avian malaria. The list goes on.

But "the big one" that spurred the Hawai'i Community Foundation to step outside its normal role of providing students with scholarships and grants to non-profits, and into the role of shaping water policy, was a finding two years ago that annual rainfall had plummeted precipitously between 1980 and 2010, according to Josh Stanbro, director of the foundation's environment and sustainability program.

Aquifers provide the majority — and, on O'ahu, the vast majority — of the water used in the state, some 450 million gallons a day. That's equivalent to about nine supertankers, Stanbro told the state Commission on Water Resource Management at a briefing last month on the HCF's new blueprint for freshwater security.

The growing body of research suggesting freshwater will become scarcer and/or harder to capture in the decades to come as a result of climate change, "coupled with demands from an ever-increasing population, and new threats to existing sources of water (sea level rise and contamination at areas such as Red Hill), indicate that Hawai'i is entering an era of increasing uncertainty regarding our long-term water security," the HCF's "Blueprint for Hawai'i's Water Future" states.

So in 2013, the HCF assembled a council of 18 individuals from both public and private sectors and charged them with devising a plan to mitigate those impacts. The Fresh Water Council, as it's called, includes scientists; members of the farming, ranching, natural resource protection, and native Hawaiian communities; former and current heads of the Department of Land and Natural Resources; representatives of county water supply departments; a law professor with expertise in native Hawaiian and water issues; and a representative from the U.S. Army Corps of Engineers.

The council met throughout 2014, doing site visits, reviewing research, hearing presentations by water experts and draft-

ing recommendations on a water security plan. Earlier this year, it adopted the final blueprint, which, according to the HCF, is intended to guide its own investments and actions in addition to giving policy- and decision-makers solutions "that have broad, multi-sector support in the fresh water community and [which] should be adopted in the near term."

"The non-profit sector has not been as helpful as we could. We're trying to bring our resources to bear," Stanbro said.

The blueprint's main goal is to provide an additional 100 mgd of freshwater availability by 2030. Forty mgd would come from increased efficiency that would reduce total daily aquifer use by eight percent; 30 mgd would come from increased recharge resulting from improved storm water capture and a doubling of protected watershed areas; and the last 30 mgd would come from vastly increasing the use of treated wastewater while reducing the amount of wastewater discharged into the ocean. (According to a study commissioned last year by HCF, 141 mgd of wastewater was treated in Hawai'i, 85 percent of which was discharged directly into the ocean.)

Stanbro noted that the state Legislature this year passed bills addressing some of the

areas targeted by the blueprint. He pointed to Act 42, which allows counties to establish user fees that would help pay for stormwater management. And Act 229 appropriated \$8.6 million for the state Department of Transportation's Airports Division "to conduct a feasibility study on the use of water scalping technology in state airport facilities and, if funds are available, develop a process design for the processing portion of the implementation of water scalping technology." (Water scalping is the process of extracting usable water from sewage.)

The council has explored the possibility of establishing a secure source of funds to maintain and improve freshwater security. It conducted a poll of Hawai'i residents to assess the kinds of water security measures (i.e., watershed protection) for which they would be willing to pay a nominal fee of \$1 or \$5 a month.

The results were so encouraging that the council is including a pilot "water security and innovation fund" in its 2016 proposed policy actions.

The fund, which would be administered or contracted by the DLNR or the state Department of Business, Economic Development, and Tourism, "should be seeded with a minimum general fund appropriation of \$5 million and matched by a minimum of \$1 million in non-state funds," the blueprint states. An advisory group, similar to the state's Legacy Land Conservation Fund, would be established to manage distribution of grants from the



Sign me up for a  new  renewal subscription at the  
 individual (\$65)  non-profits, libraries (\$100)  
 corporations (\$130)  economic downturn (\$40)

To charge by phone, call toll free: 1-877-934-0130

For credit card payments:    
 Account No.: \_\_\_\_\_ Exp. Date: \_\_\_\_\_  
 Phone No.: \_\_\_\_\_  
 Signature of account holder: \_\_\_\_\_  
 name \_\_\_\_\_  
 address \_\_\_\_\_  
 city, state, zip code \_\_\_\_\_  
 email address \_\_\_\_\_

Mail form to:  
 Environment Hawai'i  
 190 Keawe Street  
 Suite 29  
 Hilo, HI 96730

We are a 501(c)(3) organization. All donations are tax-deductible to the extent allowed by law.

Address Service Requested

Printed on recycled paper 

water security fund.

The blueprint includes several other measures that the council recommends the state adopt or implement by 2018 (see sidebar). Stanbro noted that the Water Commission itself, as well as its staff, contributed greatly to the blueprint, “teaching us and providing information to us [so we can] dovetail with the priorities of our partners.”

Water Commissioner Jonathan Starr, for one, was grateful for the HCF’s efforts.

“When I first saw you present this a couple months ago, I was really happy. I never saw anything like this coming from the non-profit sector,” he told Stanbro.



## Safety Concerns Drive Decision To Bar Public from Kaua'i Site Visit

After consulting with state attorneys, Water Commission staff decided that only commission members and representatives of Earthjustice, the Agribusiness Development Corporation, and the Kekaha Agriculture Association may attend the limited site visit of the Koke'e and Kekaha irrigation systems planned for October 20 and 21.

At a commission meeting in August, questions were raised about whether members of the public or others not directly involved in the waste complaint and petition to amend interim instream flow standards filed in 2013 by Earthjustice could join the site visit if they provided their own transportation.

A deputy attorney general representing the ADC objected to the attendance of anyone not a party to the case and suggested that should others be allowed, they provide the agency with indemnity and assurances of their fitness to participate. By all accounts, some of the stops on the site visit are difficult to reach.

## Highlights of Water Blueprint

The Hawai'i Community Foundation's "Blueprint for Hawai'i's Water Future" recommends that the following policies be implemented by 2018.

**Provide** tax incentives or rebates to land-owners who employ rain barrel or catchment systems to water their landscaping.

**Encourage** the use of xeriscaping or non-potable water for landscape irrigation.

**Institute** a tiered pricing system that discourages the use of potable water for landscaping.

**Require** all state Department of Health-regulated potable water systems to annually report to the Water Commission on their leak detection systems and plans to achieve national standard leakage rates by 2030.

**Codify** legislatively that water for “bona-fide agriculture/irrigation purposes” need not be regulated by the state Public Utilities Commission.

**Upgrade** irrigation ditch systems to enclose pipes and line reservoirs and cost-share such projects with private landowners “with a priority on those systems that convey pumped groundwater.”

**Pass** legislation authorizing counties to establish storm water utilities and supporting fees.

**Support** policies and/or incentives that encourage retention basins, low-impact development best practices, constructed wetlands, and reservoir sustainability. Begin by approving and implementing the Waikiki Risk Mitigation Project, which aims to retain floodwaters in upper Manoa and Palolo valleys.

**Create** a pooled insurance program for reservoirs.

**Allow** hydropower to be a permitted use on agriculture-zoned land.

**Provide** for a de-silting effort for reservoirs statewide.

**Increase** the scale and quality of forest stewardship through watershed partnerships.

**Double** the amount of protected/actively managed watershed areas to 211,125 acres.

**Revise** state Department of Health water reuse guidelines “in a manner that makes it more user-friendly and expands the potential uses of reused water, but continues to ensure the health and safety of residents.”

**Update** state and county rules for new construction to encourage the use of greywater for landscaping, “while allowing existing facilities and homeowners to retrofit current plumbing systems.”

**Make** it a priority for counties to adopt the 2012 Uniform Plumbing Code update.

**Encourage** counties, at the time of zoning approval, to require the appropriate levels of water quality for the type of use proposed. For example, golf courses, parks, schools, or roadway landscaping should be required to have dual water lines and use reused water “where imminently available.”

**Consider** the use of scalping plants to increase treatment decentralization and water reuse.

At the commission’s meeting last month, staffer Dean Uyeno confirmed that the site visit would be limited to the Water Commission, the petitioner (Earthjustice on behalf of Po'ai Wai Ola) and the responders (KAA and ADC).

Uyeno also noted that the KAA’s Landis Ignacio recently reported that parts of the irrigation system and roads have been damaged by rain. As a result, some sites will be removed from the site visit agenda.

— T.D.