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Return of the Native?

Native forest, that is. And whether it can be restored to the point where its inhabitants – Hawai'i's unique birds and plants, more than half of which are threatened or endangered – can flourish depends in large measure on getting out the invaders.

As you'll read in our cover story, less than 3 percent of what could be useful forest bird habitat is protected against the depredations of hooved mammals. And virtually nowhere can birds nest without being vulnerable to cats, rats, and mongooses.

There is some good news in all this. The state is readying to add a huge chunk of land on the slopes of Mauna Loa to its inventory of Natural Area Reserves, land that has already been cleared of pigs thanks to the inmates of the former Kulani prison. And new rules proposed by the state for Conservation District uses would make it easier to clear invasive plants.

IN THIS ISSUE

Just 3 Percent of Forest Bird Habitat In Hawai'i Is Protected from Ungulates

By now, everyone who attends a hearing on a proposed natural area reserve or an application for a fence or any other plan to protect habitat for native Hawaiian species knows the drill. There's the predictable, earnest testimony from those who support the protection and conservation of native species. And then there's the rant of the hunters, who claim the proposal represents one more blow to their traditional rights, one more area closed to their sport, one more family who will go without meat on the table because tree-huggers value plants and birds above people.

A presentation at the recent Hawai'i Conservation Conference, held in Honolulu August 4-6, put into some perspective one of the most frequent of the hunters' laments: that they're losing ground to conservationists. One of the presenters, Steve Hess of the U.S. Geological Survey's Pacific Island Ecosystems Research Center, displayed on the big screen behind him a table showing the total area in the main Hawaiian islands that had been cleared of ungulates, the area of potential forest bird habitat; and the area where the two categories overlapped – that is, the area of forest bird habitat that is actually free of pigs, deer, cattle, goats, sheep, and mouflon.

All totaled, just 746.2 square kilometers (184,390 acres) of land in the inhabited islands plus Kaho'olawe have been cleared of ungulates. The area that could potentially be good forest bird habitat is 7,707 km² if it were ungulate free. Yet hooved animals have been removed from just 266 km² of good forest bird habitat. In other words, barely three percent of the land that could be used to protect Hawaiian forest birds, among the most endangered in the world, is protected from ungulates.

And there is virtually no significant area in the main Hawaiian islands where all mammalian pests – including cats, dogs, rats, mongooses, and rabbits – have been eradicated, Hess said. While small mammals have

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PHOTO: BEN KAWAKAMI JR./USGS

Mouflon in the Kahuku Unit of Hawai'i Volcanoes National Park

Environment Hawai'i

Volume 21, No. 3 September 2010

NEW AND NOTEWORTHY

Aha Moments: The Western Pacific Fishery Management Council's sponsorship of the Aha Ki'ole/Aha Moku movement is apparently back in full swing after a one-year hiatus when the council-backed initiative enjoyed the support of state government. Now that state funds are long gone, Wespac is picking up the slack.

Four smaller "fish and poi na lawai'a a me mahi'ai" meetings were held on the Big Island in August under the auspices of Aha Moku and the council (although the council's name did not appear on ads for the meetings). On August 14 and 21, larger mokupuni puwalu were held in Hilo and Kona; this time the ads sported the logos of Wespac and the Wespac-purchased logo of Aha Moku. A puwalu on Lana'i was scheduled for August 28. In September, puwalu were scheduled for all the remaining inhabited islands as well as Kaho'olawe. The meetings, according to the ads, are focused on "utilizing the traditional ahupua'a system of community base [sic] management of our resources" and on "best practices for natural resources management in the Hawai'i archipelago."

According to the Wespac website, the puwalu are in preparation for a statewide meeting to be held November 18-19.

In addition to Leimana DaMate, who has been paid by the council for years to work on the Aha Moku project, the council has also recently retained Roy Morioka, a former council chair, to assist with the initiative.

There are still some who question the council's involvement in a process that seeks to address land management issues. The council's jurisdiction does not begin until the state waters end, three miles from shore.

Ethics, Big Island Style: As *Environment Hawai'i* reported last year, Hawai'i County planning director Bobby Jean Leithead-Todd and Mayor Billy Kenoi dined with principals of the 'Aina Le'a development at the Mauna Kea Beach Hotel, one of the ritziest resorts in the state. Leithead-Todd said she estimated the cost of the meal at around $100.

Bobby Jean Leithead-Todd

Under Hawai'i County law, any public official receiving a gift of $100 or more must file a gift disclosure form by June 30. When that deadline passed, and no report had been filed by either Kenoi or Leithead-Todd, someone whose identity has not been publicly disclosed filed a complaint with the county Ethics Commission. At a hearing on August 11, the commission determined that since there was no proof that the meal cost more than the $100 threshold amount, there was no need for either official to file a gift disclosure statement.

In the public comments on the *West Hawai'i Today* article on the subject, one wag noted drily: "Great to find out that Mauna Kea has cheap eats."

Developer DW 'Aina Le'a, meanwhile, although it owes several contractors hundreds of thousands of dollars for work on its "affordable" housing, has been taking out full-page color ads in both the Hilo and Kona newspapers.

Who's New at Hu Honua: Hu Honua Bioenergy LLC, which is seeking a Special Management Area permit to burn eucalyptus and other woods in the old Pepe'ekeo power plant, has undergone some ownership changes recently. Municipal Mortgage & Equity, LLC, (MuniMae, for short), was the parent company of MMA Renewable Ventures, one of the two members of Hu Honua. When MuniMae was caught up in the financial chaos of subprime mortgages, it began to sell its assets at fire-sale prices, and in 2009, sold most of the assets of MMA RV to a Spanish firm, Fotowatio. That sale, however, did not include the stake in Hu Honua, which finally was sold in April of this year to an investment company called C Change.

According to Richard McQuain, the former HECO executive who is the president of Hu Honua, the company's new chief executive officer is John Sylvia of C Change, which now owns 60 percent of Hu Honua. Ethanol Research Hawai'i owns the remaining 40 percent share, McQuain said. Daniel KenKnight, who has been involved in several alternative energy projects in Hawai'i, is the sole member of Ethanol Research Hawai'i.

The Hawai'i County Windward Planning Commission is conducting a contested case hearing on the application. The hearing is scheduled for October.

Quote of the Month

"I think that the history of the people of Hawai'i is written on our land. I hope this place in the future, it will show that we took care of it."

— Joseph Camara, NARS

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Proposal to Put Kulani Land into NAR Draws Strong Public Support at Hearing

The decision of Governor Linda Lingle to shut down the state's Kulani Correctional Facility, a 200-bed minimum security prison, came down like the proverbial ton of bricks on the communities of East Hawai'i. Kulani prison, on the windward slopes of Mauna Loa volcano, had rehabilitation programs that were widely praised and not duplicated elsewhere in the state. Its inmates also had provided a workforce over the last 16 years that helped protect and restore forest lands in East Hawai'i, including some of the state's best native habitat.

In the wake of the closure – the last prisoners were shipped out in September 2009 – the Natural Area Reserves System Commission approved inclusion of some 6,600 acres that had been managed by the Department of Public Safety into the adjoining 12,000-acre Pu'u Maka'ala Natural Area Reserve. If the proposal is approved by the Board of Land and Natural Resources and the governor signs off on it, the 11 species of endangered plants and seven species of endangered birds found in the area would be afforded the highest level of protection the state can offer.

At a hearing on the proposed NAR expansion held in Volcano Village on July 12, most of the criticism took aim not at the idea of adding the prison land into the NAR system, but at the governor's decision to close the prison and to turn the prison buildings and some 1,100-plus acres of land formerly managed by the DPS – including some 900 acres of cleared pasture, interior roads, and the site of the Mauna Loa Boys School – over to the state Department of Defense, which plans to operate a Youth Challenge Academy on the site. Emma Yuen, the NAR staffer who moderated the meeting and who had drawn up the supporting materials, explained that the decision to site the state DOD facility on former prison land was not something over which the Department of Land and Natural Resources had any control.

The overwhelming sentiment of the crowd at Cooper Center was in favor of the proposal, although for some, it did not go far enough. Rick Warshauer, who has worked for decades to protect Hawai'i ecosystems, noted that since the pasture area had fallen into disuse, many native plants have begun to regenerate there. In addition, he criticized the plan to carve out the interior roadways (making management difficult) and the boys school area (a small area two miles mauka of the main prison, built in the 1950s but, according to a former prison employee, never used because it was too cold).

Most of the others who testified also strongly supported the proposal, including Native Hawaiian sovereignty activist Gerald Markel, who described the idea as a "wonderful plan… This works for us."

The proposal would involve no new fences – the DPS had fenced off the entire 7,244-acre site years ago – and would not result in any decrease in the areas open to hunters. Still, a few hunters found fault with the plan. Steve Arraujo suggested that natural resource managers did more harm than good when they cleared fence lines or used herbicide. He suggested also that the state push the federal government to delist several of the species of endangered birds found in the area. Hunter Patrick Pacheco tossed out the chestnut, dear to the hearts of hunters, that pigs keep the forest clear.

Another set of concerns was raised by members of off-road clubs. Wayne Blyth of the Mauna Kea Recreational Users Group agreed that the area was certainly worth preserving, but "we're concerned about public access. Conservation means responsible use." Kulani's closure provided an opportunity to connect Stainback Highway and other roads to more mauka areas. Ed Ung of Rock Island Riders described himself and his cohorts as "staunch conservationists" – but, he warned, "Don't tell me I can't go in there."

When all was said and done, however, the testimony was overwhelmingly supportive of the proposal to protect the area's high quality natural values and annex it to the Pu'u Maka'ala NAR.

Joseph Camara, a young NARS technician and one of the last speakers of the evening, may have summed up proponents' sentiments most eloquently. "I think that the history of the people of Hawai'i is written on our land," he said. "I hope this place in the future, it will show that we took care of it."

— P.T.

The crowd at the Cooper Center, Volcano.

Testifier Renate Gassmann

BOARD TALK

Opponents of Ka'ena Point Fence Are Denied Contested Case Hearing

On August 12, the state Board of Land and Natural Resources denied the requests of Summer Kaimalia Nemeth and Huang Chi Kuo for a contested case hearing over a 600-meter predator-proof fence that resource managers plan to build to protect native seabirds and plants within the Ka'ena Point Natural Area Reserve and State Park.

In January, the Land Board unanimously approved a right-of-entry to the U.S. Fish and Wildlife Service and Hawai'i chapter of The Wildlife Society to construct the fence, which received broad support from the surrounding communities, as well as the Office of Hawaiian Affairs. But Nemeth, concerned about the cultural impacts of the fence, and Kuo, concerned about its biological effect, both requested a contested case hearing. Both are also associated with fishing interests.

In its report to the board recommending denial of the requests, the Department of Land and Natural Resources' Division of Forestry and Wildlife noted that the decision to grant a right-of-entry for conservation management at Ka'ena Point – a decision taken by the board last January – was neither a quasi-legislative nor an adjudicatory action. Therefore, DOFAW administrator Paul Conry argued, the matter fell outside the purview of the Hawai'i Administrative Procedures Act, which governs contested case hearings. Instead, Conry wrote, the Ka'ena Point Ecosystem Restoration Project — which includes the fence and is a collaborative effort that includes the DLNR's Natural Area Reserves System and its Division of State Parks — falls under "internal management," as it is "part of on-going management efforts aimed at the preservation and recovery of native vegetation and wildlife within the Ka'ena Point Natural Area Reserve."

Conry's report also pointed out that Kuo lacked standing because his arguments focused on environmental impacts, which should have been raised during the environmental assessment process.

"Mr. Kuo does not have standing to challenge the EA through a petition for a contested case hearing," DOFAW stated.

In her testimony before the board, Nemeth disagreed with DOFAW's reasoning, and added that a full environmental impact statement should be conducted for the fence. She also claimed DOFAW staff failed to give her adequate notice of her opportunities to testify on the fence project.

PHOTO: KA'ENA POINT ECOSYSTEM RESTORATION PROJECT

Ka'ena Point

In written testimony, Nemeth pointed out what she believed were several procedural violations. For example, she argued that the fence does not have a valid Conservation District Use Permit.

"They state that the project falls under the existing CDUP which was created in 1982 for the formation of several NAR throughout the islands of Hawai'i. Nowhere in this outdated CDUP is there a mention of any type of construction within a NAR," she wrote.

Marti Townsend of KAHEA: the Hawaiian-Environmental Alliance agreed and added that the fence should have its own CDUP.

DOFAW, however, argued in its report, "The question of whether the 1982 CDUA [Conservation District Use Application] covered this project is subsumed in the issues regarding the EA. ... The EA stated that based on conversations with staff from the DLNR Office of Conservation and Coastal Lands, a new CDUA would not be required for this project. Instead, the project was permitted under [the existing CDUP]."

Big Island Land Board member Rob Pacheco reminded Nemeth that the board was only deciding on the contested case issue and could not revisit its decision to grant the right-of-entry that day. He did, however, have some concerns about DOFAW's decision to deny Nemeth a contested case hearing, since petitioners seeking to retain their ability to exercise their traditional and customary practices have been granted standing in other cases.

After an executive session with the board's attorney, Pacheco said he understood DOFAW's position better. The board then voted unanimously to approve DOFAW's recommendation to deny the contested case requests.

After the vote, Nemeth said she intends to file an appeal and asked that all activity on the fence cease until the case is resolved.

(For more on this issue, read our February 2010 "Board Talk" column, available at www.environment-hawaii.org.)

Board Approves NWHI Cruise, Seal Aid, Cetacean Sampling

Almost 100 percent of them suffer from malnutrition. ... We know it's a lack of them being able to get enough resources," Charles Littnan, a monk seal researcher with the National Marine Fisheries Service's Pacific Islands Fisheries Science Center, told the Land Board August 12.

That day, the board approved Papahanaumokuakea Marine National Monument research permit to Littnan to continue seal-enhancement activities, including captive feeding and care of prematurely weaned, undernourished, or otherwise endangered young seals, and treatment for parasitic worms.

Hawaiian monk seals are critically endangered; the mortality rate among seals younger than three years old, in particular, is especially high.

Under Littnan's proposal, "seals would be cared for in shore pens or transported to the Ford Island Research Facility in Honolulu with the intent to release them back to their natal site or Nihoa Island," a report by the DLNR's Division of Aquatic Resources states. If the Ford Island facility is not up and running in time to receive seals needing help, Littnan said, some could be housed temporarily at the Waikiki Aquarium or the Kane'ohe Marine Corps Base. He also noted that there are plans to open a captive care facility at the Natural Energy Laboratory Authority of Hawai'i site in Keahole, Kona.

Littnan said that about four to five seals a year in the Northwestern Hawaiian Islands are found prematurely weaned.

To alleviate the chronic malnutrition that juveniles experience, Littnan plans to administer anti-parasitic medication to them at

Laysan (up to 41 seals), Lisianski (up to 29 seals), and French Frigate Shoals (47).

"[I]t has been noted that young seals infected with ... tape worms ... tend to be in poorer body condition than those uninfected. While parasites are likely not a primary cause of mortality in monk seals, they may further compromise animals already in ill health due to food limitation, thereby increasing their likelihood of dying," DAR's report states.

Littnan said that the worming trial is "not a silver bullet," but is a relatively quick and easy way to ease some of the stress on juvenile seals, up to 70 percent of which can die within a given year.

Proposed Exemptions

In addition to Littnan's permit, the Land Board approved two other monument permits on August 12: a research permit to Jay Barlow and Erin Oleson of the NMFS to identify and biopsy cetaceans as part of the 2010 Hawaiian Archipelago Cetaceans and Ecosystem Assessment Survey, and a conservation and management permit to allow the National Oceanic and Atmospheric Administration's research vessel *McArthur II* to enter the monument.

> *"Almost 100 percent of them suffer from malnutrition."* — ***Charles Littnan, PIFSC***

While she did not testify against either the monk seal or cetacean permits, Marti Townsend of KAHEA: the Hawaiian-Environmental Alliance, strongly opposed the issuance of the ship permit, noting that there have been three vessel groundings in the monument within the five years she has been monitoring the permitting process. She also stated that she had concerns about the DLNR's decision to exempt ship operations from environmental review.

In its submission to the Land Board, DAR explained that existing exemptions for the DLNR "appear to apply" to ship operations. To further clarify which activities are exempt from the state's environmental review law, the DLNR recently submitted to the state Office of Environmental Quality Control proposed exemptions for a number of its divisions, including DAR.

Although discussion of the proposed exemption list (awaiting approval from the state Environmental Council) was not on the board's agenda, Townsend pointed out that the list includes all monument permits, as well as every other type of permit or license the division issues.

"These exemptions are so extremely broad, it's laughable. ... If you're going to exempt everything, what's the point? You may as well overturn the law. Maybe that's what this administration wants," she said.

In an August 6 letter to the OEQC, which Townsend also submitted to the Land Board, KAHEA called the DLNR's proposed exemption lists "ridiculously overreaching" and argued that ship operations "do not satisfy any of the existing exemption classes and no environmental review has been conducted for ship operations in Papahanaumokuakea. Approving this permit would therefore be illegal. Yet, instead of simply conducting the environmental assessment, DLNR proposes the exact opposite of protecting this refuge by exempting not just ship operations, but every proposal to access the most fragile and highly protected marine ecosystem in the archipelago."

(In a separate letter to the OEQC and to the DLNR, KAHEA, Life of the Land, Hawai'i's Thousand Friends, Hawai'i Community Stewardship Network, and several other environmental groups and individuals recommended that the Environmental Council reject the DLNR's proposed exemptions. Although the agenda had not yet been announced as of press time, the Environmental Council had scheduled to meet, for the first time since the summer of 2009, on September 14. For more on the subject of the exemption lists, see our June 2010 cover article and the write-up on Page Two of our August issue.)

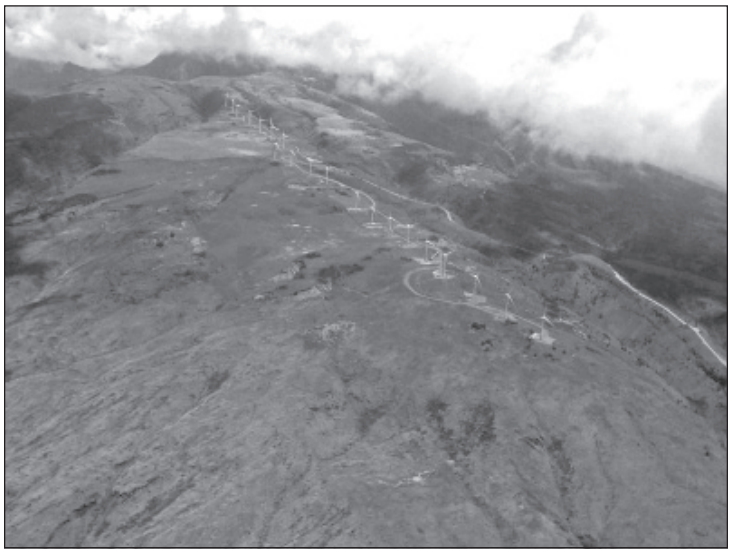

PHOTO: KAHEAWA WIND POWER

Kaheawa Wind Power project

> *"These exemptions are so extremely broad, it's laughable."* — ***Marti Townsend, KAHEA***

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Second Maui Wind Farm Wins Conservation District Use Permit

Not all big energy projects are controversial. When the Land Board approved a Conservation District Use Permit for a second wind farm on Maui last month, no one from the public showed up to testify, although representatives of the wind farm company, Kaheawa Wind Power II, LLC, were present to answer questions from the board.

The 21-megawatt, $100 million farm will span 333 acres of unencumbered state land at Ukumehame along the access road that leads to the existing 30-MW Kaheawa Wind Farm I. In addition to erecting 14 GE 1.5 MW turbines, the company plans to use a battery system to stabilize the amount of power to Maui's small electricity grid. Both projects are owned by First Wind Energy, which is also developing a 30-MW wind farm at Kahuku on O'ahu's North Shore.

The company is still negotiating terms of a lease for the two state parcels for Kaheawa II and must complete a Habitat Conservation Plan and secure a federal Incidental Take Permit and state incidental take license before construction can start.

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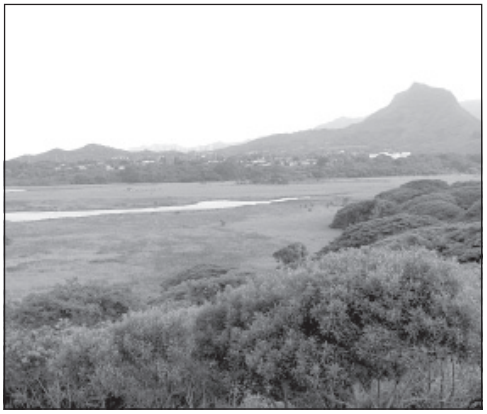
Kawai Nui Restoration Project Finally Clears Funding Hurdle

Division of Forestry and Wildlife administrator Paul Conry was officially on vacation, but came to work June 10 anyway, to celebrate.

At long last, with the Land Board's approval of a partnership agreement with the U.S. Army Corps of Engineers, a much anticipated 80-acre wetland restoration and habitat enhancement project for Kailua's Kawai Nui



A view of the marsh from Na Pohaku O Hauwahine looking toward the proposed waterbird habitat project site.

A levee cuts across the lower end of the marsh to protect nearby residences from flooding.

Marsh will have the funding it needs.

"We have been working with the Army Corps of Engineers, the county, partners in the community and our Legislature for 15 years to bring this project to life," Conry told the Land Board that day.

In 1990, the Legislature ordered the transfer of Kawai Nui Marsh from the City and County of Honolulu to the state, but disputes over which government would be responsible for maintaining the marsh's flood control infrastructure delayed that transfer for nearly 20 years. The dispute jeopardized about $5 million in federal funds that had been appropriated for the waterbird project that the Army Corps and the Kailua community had devised in the meantime.

The city, the Legislature and the Land Board finally agreed to the transfer terms in 2007, the environmental process was completed in early 2009, and, in March, Gov. Linda Lingle approved the release of the state's share of project funds.

According to a DOFAW report to the Land Board, the project will restore 37.8 acres of habitat for the endangered Hawaiian duck (koloa), stilt ('ae'o), moorhen ('alae 'ula), and coot ('alae ke'oke'o). It will also include 24 acres of 11 terraced shallow ponds, a berm, a solar-powered water supply system, and, if funding permits, predator control fencing.

"The project also becomes the foundation for other educational, environmental, cultural, recreational, and ecotourism opportunities in the marsh," the report states.

The agreement would commit the state to providing 25 percent of the $6.43 million project's costs, less design and engineering costs it has already paid, for a total of about $1.36 million. The Corps would cover the rest.

State Rep. Chris Lee (51st District - Lanikai, Waimanalo) told the board, "Kawai Nui is a real diamond in the rough. This has been going on about as long as I've been alive."

The board unanimously approved the agreement.

A contract for the project was scheduled to be awarded this month, with construction to begin in January and be completed in December 2011.

(For more background on this project, read the following articles, available at www.environment-hawaii.org:

- Cat's Chronicles: "Big Plans for the Big Water," December 2001;
- "As City, State Deadlock on Marsh Transfer, Kawai Nui Restoration Groups Forge Ahead," January 2007;
- "Arguments over Flood Control at Kawai Nui Echo Those Made by Fasi, Waihe'e in 1989," and "State Does What it Can With Limited Resources at Kawai Nui," March 2007;
- *Board Talk*: "Army Corps, City Assess Kawai Nui Hazards," December 2007.)

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Steve's Ag Logging Case Drags On and On and ...

On occasion, the fight over logging violations that occurred on the Big Island in the late 1990s has been ugly. Exchanges during the Land Board's more recent discussions suggest it won't get prettier any time soon.

In March, Land Board chair Laura Thielen threatened to raise her department's proposed fines if the loggers didn't at least try to compromise. In April, she screamed at one of the attorneys representing the loggers, her face flushing in an instant.

"Sit down right now!" Thielen hollered at attorney Douglas Ing, as he attempted to correct her interpretation of what had transpired during the March Land Board meeting. Thielen told his clients — loggers Steve Bacskiewicz and Raymond and Wesley McGee — that Ing had admitted to the Land Board that they had illegally logged state land. (Actually, Ing admitted only that the loggers had logged in the area of dispute; he did not agree the land belonged to the state.) When Ing stood up to dispute her characterization of what he had said, she lost it, leaving the rest of the board — and the room — to sit in silence while she collected herself.

To say that the loggers have frustrated the state is an understatement. In the late 1990s, logging company Steve's Ag Services (owned by Bacskiewicz), assisted by the McGees, logged nearly 1,000 koa and other trees from Conservation District and state lands in Ka'u and South Kona without permission from the state. In 2003, the Land Board fined the loggers more than $1 million for cutting trees on state land.

A contested case hearing followed, but questions raised by Ing over the state's ownership of the property led the Land Board to dismiss the case without prejudice and direct the DLNR to pursue a quiet title action for the land in court, which it did in 2007. The loggers appealed the action in U.S. District Court, but lost in November 2009.

After the court's decision, the DLNR thrice sought a revised and reduced set of fines — the most recent being a $105,000 fine against each logger, $409,423.44 in damages, and $53,870.80 in administrative costs — but the loggers refuse to give in. When the Land Board approved the fine recommendations in April, Ing requested contested case hearing. In the meantime, Steve's Ag and the McGees have appealed the U.S. District Court's decision on ownership to the 9th U.S. Circuit Court of Appeals.

In May, the Land Board granted the contested case hearing, in part. Despite objections from the loggers' attorney, Chris Bennett, the board chose to exclude the issue of the property's ownership from the hearing, since that matter had already been decided on by a federal court.

(For more background on this dispute, read the following articles, available at www.environment-hawaii.org:

- "Poachers Take Timber Valued at $1 Million," January 2003;
- "Damon Estate Contests Fines for Illegal Logging in Ka'u," May 2003 *Board Talk*;
- "Damon Estate Hopes to Avoid Fine,

Proposed Conservation District Rules Receive Praise, Criticism from Public

Before the state established rules to restrict uses within the state's Conservation District, which covers about half of the land in Hawai'i or approximately two million acres, projects like O'ahu's Kapa'a Quarry, golf courses, Sea Life Park, and Hawai'i Loa College were built without needing to obtain a permit from the Board of Land and Natural Resources.

Rules adopted in the 1970s established subzones within the Conservation District, as well as a permitting process to regulate uses within those zones. Revisions in 1994 identified what kinds of uses are allowed in each subzone, established standards for those uses, and included approval criteria, such as compatibility with the environment.

The regulatory framework is about to change again, soon. After years of dealing with controversies over things like illegal vacation rentals, shoreline hardening and the exercise of traditional and customary practices, this past summer, the Department of Land and Natural Resources' Office of Conservation and Coastal Lands devised a new set of rules to fix some of its problem areas and better deal with future projects.

"We're like a big county," OCCL administrator Sam Lemmo said at a recent public hearing. "We have a huge area of responsibility ... [but] we have a small staff [of about six people]."

In July and August, the OCCL held informational and public hearings on the proposed revisions, and the response has been decidedly, but understandably, mixed. They propose new uses (telecommunication towers, wilderness camps and renewable power projects) and new standards for shoreline setbacks, single family residences, and nonconforming structures, but they make it easier to remove invasive plants and trees that are dead, dying, diseased or pose a safety threat.

Lemmo says the public hearings on the outer islands have been difficult. The O'ahu meeting, however, held August 12, was relatively subdued, with most of the audience choosing to submit written comments later or simply sit and listen.

In response to concerns that have been expressed about energy projects in the Conservation District receiving preferential treatment, Lemmo said, "It's identified as a use. You can apply for it. It doesn't mean it's gonna happen." Still, he continued, the use was added in support of the state's goal of meeting 70 percent of its energy demand with

Restore Logged Lands in Ka'u," June 2003 *Board Talk*;

- "Damon, Park Service to Restore Logged Land," September 2003 *Board Talk*;
- "Record Fine for Illegal Logging in South Kona, Ka'u," August 2003 *Board Talk*;
- "Koa Loggers at Center of Two Violation Cases," May 2005 *Board Talk*;
- "Koa Logger Countersues Damon Estate, Claims Trust Kept Conservation Land Secret," June 2005;
- "Loggers Seek Dismissal of $1.5M Violation Case," August 2005 *Board Talk*;
- "Koa Loggers File Complaint Against Board, Attorney General," August 2007 *Board Talk*;
- "Board Delays Closing Steve's Ag Logging Case," February 2010 *Board Talk*;
- "Board Again Defers Action on Logging Case," April 2010 *Board Talk*.)

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Mauna Kea Fence To Protect Palila Habitat

On July 8, the Land Board approved a request by DOFAW to authorize the board's chair to negotiate and sign a $253,000 contract with Crane Construction and Fencing to build a six-mile portion of a fence on Mauna Kea in palila critical habitat.

The fence is part of a $900,000 U.S. FWS-DOFAW project to help manage critical habitat for the endangered bird, whose population has declined significantly in recent years. Last year, the agencies agreed to spend that money on fencing most of the birds' critical habitat on Mauna Kea and removing all feral ungulates.

PHOTO: JACK JEFFREY, USED WITH PERMISSION

Palila

At the board's meeting, DOFAW administrator Conry asked that the board's chair be authorized to extend the contract and/or issue an additional request for proposals for additional fencing, but the board chose not to. According to the meeting's minutes, "[Deputy attorney general William] Wynhoff said he didn't feel comfortable with an agenda item authorizing a contract for six miles to change it to 16 more miles and respectfully suggested coming back again."

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Chair to Develop, Sign MOA For Army Use of State Land

On May 13, the Land Board authorized its chair to develop and sign a memorandum of the agreement between the U.S. Army Garrison of Hawai'i and the DLNR. As of last month, the agreement had not yet been finalized, but according to a DOFAW report to the board, the MOA would establish a framework that would facilitate the Army's use of nearly 11,901 acres of state lands — including land in Natural Area Reserves, Forest Reserves, State Parks, Na Ala Hele trails, and unencumbered areas — for its endangered species stabilization efforts, which it must conduct if military training in West O'ahu's Makua Valley is to continue.

To defray costs incurred by the state in dealing with the Army's activities, the MOA would require the Army to pay DOFAW approximately 5 percent of its environmental division's annual budget for work on state lands, as well as a fee to use the state's Pahole Rare Plant Facility for storage and horticulture.

"Transfer of funds is contingent upon the successful execution of a Cooperative Agreement or the development of some other process to transfer federal funds from the Army to the state," the report states.

Even with an MOA, the Army would be required to obtain the necessary permits (i.e., NARS Special Use Permit) and/or licenses to conduct endangered species restoration on state lands. ***— T.D.***

clean energy by 2030 and reducing its greenhouse gas emissions to 1990 levels by 2020.

Public testimony touched on a variety of issues, with only one testifier arguing that no new uses be allowed in the Conservation District.

With regard to the proposed rule change that would give property owners two years to apply for a permit to replace or reconstruct a demolished or destroyed structure, Tantalus resident Jim Case argued that was too short a time for someone who may have just lost their home due to a disaster.

Mark Fox, director of external affairs for The Nature Conservancy of Hawai'i, wanted to make sure that invasive algae was considered an invasive plant under the rules. He also sought some clarification about when a permit would be required for invasive plant removal.

Under the proposed rules, removal of invasive plants and trees for maintenance purposes would merely require written concurrence from the DLNR (although the department and the Land Board would reserve the right to require a site plan and/or departmental/board approval if the action might impact natural or cultural resources). However, watershed or conservation projects, which might include the removal of invasive plants, would require a Conservation District Use Permit from the Land Board.

"When is the line crossed?" Fox asked – that is, when does a project go from a category A use (requiring written concurrence) to a D use (requiring a board permit) when removing invasive plants.

Clifford Mirikitani expressed concerns with the OCCL's proposal to require structures on coastal properties to be set back 40 feet plus 70 times the average annual erosion rate (70 being the average life of a structure). He said incorporating an erosion rate in the setback could unfairly penalize a property owner whose erosion rate is being accelerated by adjacent or nearby shoreline structures.

Former deputy attorney general Yvonne Izu thanked the OCCL "for getting it this far." She said she worked with the office on some of the rule revisions nearly a decade ago. Marjorie Ziegler of the Conservation Council for Hawai'i also supported the proposed rules, in general. She said she particularly liked the rules making it easier to control invasive plants.

KAHEA's Marti Townsend, on the other hand, accused the OCCL of rushing the rule revisions and urged it to "step back" and try to collaborate with interested parties on a new rule package.

Public hearings on the rules concluded last month. The deadline to submit comments to the OCCL is September 7. The DLNR plans to submit the revised rules to the Land Board for approval before the end of the year. The proposed rule amendments may be found at http://hawaii.gov/dlnr/occl. ***— T.D.***

Conference from page 1

been removed from islets, a proposed predator-proof fence at O'ahu's Ka'ena Point Natural Area Reserve would be the first area of meaningful size (around 50 acres) to protect albatross and wedge-tailed shearwaters from all of them, he noted. (Whether the fence will be built is not settled at this time: for more on the subject, see Teresa Dawson's "Board Talk" column, elsewhere in this issue.)

Kaho'olawe, where goats have been eradicated, still has cats and rats. Removing these animals would be "logistically challenging," he says, because of remaining unexploded ordnance on the 115.5 km² island used for years as a training area for Navy bombers. Still, he adds, Kaho'olawe may become increasingly important as a refuge for seabirds and possibly native plants displaced by sea level rise or as habitat for additional populations of birds threatened with extinction should their existing habitats be wiped out by disasters.

Repeat Performances

The last century saw repeated, concerted efforts to clear forests of ungulates. Pigs and goats were eradicated from Lana'i, only to be replaced with axis deer, mouflon, and pronghorn antelope, thanks to the state's deference to sport hunters. (The antelope died, but mouflon and deer continue to limit the recovery of vegetation on the island.) Hess notes that in the 1930s, when the Mauna Kea Forest Reserve was fenced, nearly 47,000 feral sheep and more than 2,200 other ungulates were removed by foresters and workers in the federal Civilian Conservation Corps. But, he adds, "populations rebounded when sport hunting became a major management goal of territorial wildlife biologists." By statehood, the forest reserve was in dire condition – which, however, didn't stop the state from introducing mouflon-sheep hybrids to improve hunting opportunities. A federal court order in the famous *Palila* case requires the state to eradicate sheep and mouflon from the mountain, and by Hess's count, more than 87,000 sheep have been taken from Mauna Kea over the last 75 years. But eradication remains a distant goal. The fence put up 70 years ago is in disrepair and animals continue to migrate into the forest reserve. Each year, the state, through contracted aerial hunts, continues to remove hundreds of mouflon and sheep from the mountain.

Eradication of goats from Hawai'i Volcanoes National Park began in 1968, but wasn't accomplished until 1984. In 1989, Haleakala National Park became goat-free. One year later, the last goat was taken from Kaho'olawe.

Feral pigs and cattle have been removed from the national parks, some state reserves, and the Hakalau Forest National Wildlife Refuge on the Big Island. Eradication of the ungulates at Hakalau was a long, protracted effort (from 1988 to 2004), Hess notes, "due in part to the large size of one management unit, interspersed areas of continued sustain-yield hunting, high densities of pigs, and relatively late use of snares." (Hess was too kind to mention that the Piha tract – what he describes as the "interspersed areas of … hunting" – is owned by the state, which does

UNGULATE-FREE AREAS

Island	Ungulate-free (km²)	Potential Forest Bird Habitat (km²)	Ungulate-Free Forest Habitat (km²)
Hawai'i	399.2	5,932	151.0
Maui Nui	343.4	545	122.1
Kaho'olawe	115.5	0	0.0
Maui	220.8	446	106.0
Moloka'i	7.4	88	6.1
Lana'i	0.0	11	0.0
Kaua'i	0.7	447	0.4
O'ahu	3.0	783	2.4
Grand Total	746.2	7,707	266.0

SOURCE: STEVEN HESS, USGS

not even attempt to control pigs, cattle, weeds, or any other threat to natural resources in the area.) Keeping pigs out of the refuge "requires maintenance in perpetuity," Hess said.

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Kahuku Mouflon

Over the years, resource managers have devised ways to remove sheep, goats, and pigs from forest areas. Developing an efficient way to eradicate mouflon – which don't herd and can leap over high fences – is a work in progress.

But thanks to work done by the National Park Service at the 469 km² Kahuku unit of Hawai'i Volcanoes National Park, removal of mouflon from this area, acquired in 2003, might happen on an accelerated timetable.

Just eight mouflon were introduced to Mauna Loa in 1968, Hess said during his second presentation at the conservation conference. With the population doubling every 3-4 years, there were an estimated 2,586 mouflon on the former Kahuku Ranch by 2003. The grazing pressure of the animals put at risk the native Hawaiian plants found there, including many that are listed as endangered or threatened, said Hess. Numbers of the animals have declined thanks to hunting pressure over the last decade, but as the population decreases, it gets harder and harder to remove the remaining numbers, he noted. "We need more effective control efforts," he said.

That need drove Hess and colleagues to study the home ranges of mouflon and attempt to discover ways to bait them. In the process, he discovered that the animals "don't get around much." Bait stations set up to lure the animals with feed took two months to gain acceptance and because of the small home ranges, Hess and his team learned that they needed to be spaced less than a kilometer apart.

Much more needs to be done before the National Park Service can settle on an eradication strategy for mouflon. The work of Hess and his colleagues continues. But with the knowledge gained thus far about mouflon behavior, that goal is years closer to being realized.

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The Nasty Side of Cats

Ungulates are herbivorous. Their threat to Hawaiian birds is serious because of the damage they inflict on native vegetation. Feral cats, however, are carnivores, with birds among their favored prey. Despite the menace they pose, removing cats from the wild is extraordinarily hard – and not only because they are intelligent and resourceful.

Feral cats *look* like domestic cats. Genetically speaking, they are identical. And therein lies one of the biggest obstacles to controlling them. The images most people have of cats and the fond associations they have with them make it hard for many folks to think of these animals as anything other than rascally cartoon characters, cuddly kittens, or cherished companions.

But cats living in the wild have survival skills that make them a lethal threat to many of Hawai'i's rare and endangered birds. At sea level, feral or abandoned cats have decimated shearwater colonies on Maui. At higher elevations, they are known to prey on ua'u (Hawaiian petrels, or *Pterodroma sandwichensis*), the Hawaiian goose, or nene (*Branta sandvicensis*) and palila (*Loxioides bailleui*). According to the U.S. Geological Survey's Pacific Islands Ecosystem Research Center, up to 11 percent of palila nests are preyed upon by cats each year.

PHOTO: USGS PIERC.

A feral cat outfitted with a radio collar helps researchers understand cats' behavior on Mauna Kea.

Toxoplasmosis, a disease carried by cats, can be fatal to birds and has even been known to kill an endangered Hawaiian monk seal.

At the conservation conference, Hess discussed some of the remarkable findings he and colleagues have made about the behavior of feral cats on Mauna Kea. After trapping feral cats and fitting them with radio collars, the scientists released them, monitoring their movements and activities. According to Hess, some males had home ranges of up to 8 square miles, the largest home range yet reported in the world. (Home ranges of female cats averaged about 3 square miles.) As Hess notes in a fact sheet on feral cats (available on the USGS PIERC website, http://biology.usgs.gov/pierc), "the significance of these large home ranges and daily movements is that cats threaten nesting birds from great distances. In addition, several cats may hunt in the same area, exposing birds to threats from a host of different cats over a short period of time." For palila, whose entire range is just 54 square miles, "each male cat represents more than 10 percent of this area." At night, when birds have settled on their nests, they are especially vulnerable to the mostly nocturnal cats. Yet another factor making palila nestlings exceptionally exposed is their long development period – twice as long as that of continental songbirds.

Colonial Cats: Cheryl Lohr of the University of Hawai'i at Manoa described her efforts to compare the costs of managing stray cat colonies by either trap-neuter-release (TNR) programs or trap and euthanasia (T&E). In recapping the history of cat colonies on O'ahu, Lohr cited Mark Twain's observation in 1866, when, visiting Honolulu, he saw "tame cats, wild cats, singed cats, individual cats, groups of cats, platoons of cats, companies of cats, regiments of cats, armies of cats, multitudes of cats, millions of cats."

The situation is little changed today. On O'ahu, hundreds of cat colonies exist, several of them managed under the TNR program. Using a computer model of what might be a typical cat colony, Lohr estimated that an intensive T&E program could eradicate a colony in a year, whereas a TNR program would take at least 20 years to be eradicated – assuming no new recruits. If as few as 3 percent of pet cats are released and join a colony in a given year, the effect of a T&E program would be wiped out in just four years, given cats' high reproductive rate. Although TNR programs are nearly two and a half times more expensive than T&E, Lohr said, given the ongoing abandonment of cats, perhaps the best policy to deal with the problem is to educate pet owners on the need to keep cats indoors, and spay or neuter them. In a discussion that followed Lohr's presentation, she noted that it is a waste of time and money to include males in TNR programs. So long as even one intact male cat exists in a colony, all unneutered females are likely to reproduce.

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The Scourge of Weeds

Is there anything in native ecosystems that strawberry guava doesn't f&*k up?"

That was the question asked by Charles Chimera in his HCC presentation on the puzzling absence of epiphytes and bryophytes – mosses, ferns, lichens, and the like – from strawberry guava (*Psidium cattleianum*), also known as waiawi, one of the worst invasive plants in Hawaiian forests. Many past studies have looked at the impact of strawberry guava

PHOTO: U.S. FOREST SERVICE

Dense strawberry guava thicket in Hawaiian forest.

on forest structure, shifts in vegetation, changes in soil chemistry, and the like. Chimera, who works with the Pacific Cooperative Studies Unit of the University of Hawai'i, has been casting his view upward, onto the trunks and branches of trees.

Chimera studied epiphytes in two wet forests where waiawi has invaded: one on Tantalus, O'ahu, another at Kipahulu, in Maui. Trunks of 'ohi'a (*Metrosideros polymorpha*) are typically carpeted with epiphytes. Those of waiawi are bare. One possible explanation Chimera offered was the very structure of the bark. 'Ohi'a bark is rough, giving epiphytes and bryophytes a surface they can easily cling to. That of waiawi is smooth and peeling.

Not only does strawberry guava reduce plant diversity on the forest floor, Chimera said, it also reduces it in the upper forest strata – "a loss that could contribute to a decline in invertebrate and bird populations dependent on habitat provided" by these organisms.

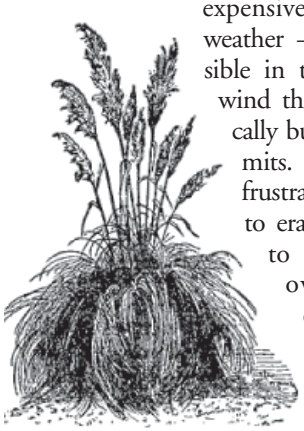
Most important of all, he concluded, the loss of bryophytes and epiphytes, combined with the decline in understory cover that occurs in invaded forests, could modify the hydrological cycle, leading to more runoff, less soil moisture, and diminished aquifers.

Pampas Grass: Long a favorite of landscapers for its showy tufts and billowing base, Pampas grass has become the bane of native ecosystems outside its home range of South America. In Hawai'i, two varieties are found: *Cortaderia jubata* and *C. selloana*. The former was first noted in the late 1980s in upcountry Maui and in Haleakala National Park. The latter, which is sterile unless both male and female plants are present, was not thought to be much of a threat here – until (naturally) both sexes were recently found.

Brooke Mahnken, Stephanie Miller, Teya Penniman, and Michael Ade of the Maui Invasive Species Committee have been devising methods to control Pampas grass on Maui for more than a decade. Given its ability to cling to steep slopes and to inhabit a broad range of habitats – from low and dry to high and wet – the challenges to eradicate *Cortaderia* spp. on the island are formidable, as Mahnken explained to his audience at the HCC.

Mahnken reviewed in particular the efforts to eradicate Pampas grass from high-value native forests in East Maui. In 2008, MISC established a field camp in a high-elevation cloud forest at Honomanu, accessible only by helicopter. Each year, MISC staff criss-cross the area, pulling out young plants and poisoning mature ones while mapping the precise location of each individual. In the course of three years (2008-2010), 236 mature plants were discovered and killed, wiping out the Honomanu infestation.

As difficult as the East Maui work was, wiping out infestations elsewhere will test the mettle of even the most ingenious weed-whackers. Pampas grass grows on the sides of steep cliffs in the West Maui mountains. While spraying from helicopters might poison some plants, the technique is risky and expensive in the best weather – and impossible in the rains and wind that more typically buffet the summits. But the most frustrating obstacles to eradication have to be the landowners who continue to believe that Pampas grass alone can satisfy their desire for landscape drama. Even though the plants are on the state list of noxious weeds, landowners have to give their consent before MISC workers can go onto their property to remove the offenders. The low-hanging fruit – Pampas grass in all its glory, heads heavy with thousands of fertile seeds waiting to be carried off by the trades, waving to the MISC workers as they head to the hills – can't be picked at all.



ART: FLORIDA CENTER FOR INSTRUCTIONAL TECHNOLOGY

Pampas Grass

— Patricia Tummons

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Large-Scale Rat Trapping May Aid Cyanea Recovery

Even if ungulates and cats are eradicated from a forested area, rodents — which eat the seeds and fruit of native plants and compete with native fauna for food and habitat — can still limit recovery.

Traps and diphacinone bait are some of the most commonly used tools to control rodents in Hawai'i's natural areas. But while aerial toxicant dispersal appears to work well for insular areas, like offshore islets, it may not be the silver bullet in all cases. As rat expert Stephen Mosher said at the conservation conference, "We need to know where traps fit."

Since 1997, the O'ahu Army Natural Resources Program has been using both traps and toxicants. In May 2009, in an effort to find an alternative to toxicants, Mosher, who works both with the Army and with the University of Hawai'i's Pacific Cooperative Studies Unit, tested the efficacy of a large grid of snap trap boxes, based on rat control practices currently employed by New Zealand's Department of Conservation.

Members of the O'ahu Army Natural Resources Program (including Mosher), joined by University of Hawai'i' botany graduate student Richard Pender, set more than 400 snap traps across 26 hectares in an Army-controlled area known as the Kahanaiki Management Unit, a *Cyanea superba* reintroduction site in the mixed-mesic forest of O'ahu's Wai'anae mountains.

(Years ago, the U.S. Fish and Wildlife Service tasked the Army with stabilizing the populations of 29 endangered species, including *Cyanea superba*, that are jeopardized by military training activities in Makua Valley, which is adjacent to Kahanaiki Valley. As part of its stabilization efforts, the O'ahu Army Natural Resources Program has planted some 250 *Cyanea superba* plants in Kahanaiki Valley. In 2005, according to a FWS report, survivorship ranged from 35 percent to 80 percent. The report also notes that in addition to invasive plants, feral pigs, and fire, rats are considered one of the main threats to *Cyanea superba*.)

In addition to the traps, the Army/UH team set up tracking tunnels, which were checked daily, as well as motion-sensing cameras to document *Cyanea superba* fruit predation in both the Kahanaiki unit and in their adjacent control site, the state's Pahole Natural Area Rerserve.

Based on their tracking data, they found that rat activity at Kahanaiki averaged 28 percent compared to 41 percent at Pahole, according to Mosher's conference abstract.

Although the team managed to trap 805 rats over the next year, they had problems with slugs constantly eating the bait,

whether it was peanut butter, chocolate, coconut, or wax with food additives, Mosher said. Sprinkling salt around the trap wouldn't help because the forest is pretty messy and damp, he said. He tried putting salt on the peanut butter, but that didn't help, since the slugs would eat the bait, then die on the trap.

He added that the rat control did not appear to affect invasive wolf snail (*Euglandina rosea*) populations and preliminary results suggest that the trapping may have improved lama (*Diospyros sandwicensis)* seedling recruitment and reduced lama seed predation.

Mosher admitted that the trapping effort, which now includes about 480 traps, is a work in progress and that determining its impacts on endangered tree snails in the area (*Achatinella* spp.) will require long-term monitoring. However, Pender's efforts to determine whether large-scale rodent control can reduce predation on fruit of the endangered *Cyanea superba* subsp. *superba*, also known as haha, suggests that traps alone can make a significant impact in certain areas.

As Pender reported at the conference, he and his team (Mosher, the Army's Lalasia Bialic-Murphy, and UH's Aaron Shiels) monitored 36 cyanea trees in Kahanaiki and 42 trees in Pahole every three days for predispersal fruit predation, and found that 47 percent of the fruits in Pahole had been eaten, compared to only four percent in Kahanaiki.

The cameras showed that black rats (*Rattus rattus*) were responsible for a lot of that predation. The 13 cameras set up in Kahanaiki documented eight visits to cyanea trees, while the nine cameras at Pahole captured 22.

To measure post-dispersal fruit predation, the team placed mature fruit in the tracking tunnels and checked them daily. They found that rats removed 86 percent of the fruits in Pahole, compared to only 17 percent in Kahanaiki.

To determine whether rodents were killing or dispersing the seeds, the team fed fruits to captive black rats and house mice (*Mus musculus*). Pender said they found that rats killed all of the seeds, while the mice were "generally disinterested" in the fruit.

In addition to the rat predation, Pender said, research has shown that slugs eat 49 percent of cyanea seedlings.

"Between rats and slugs, there's little chance for recruitment. ... For the restoration of this species, we need to take these two out of the equation," he said. ***— T.D.***

DHHL Edges Closer To Cleanup Of Contaminated Soils in 'Ewa

By the end of the year, the state Department of Hawaiian Home Lands expects to be ready to hire a contractor to remediate a hazardous waste site on its lands in 'Ewa.

When the state bought 1,100 acres of former sugarcane and pineapple plantation land — "as is" — from Campbell Estate in 1994 for nearly $32 million, it didn't know that a small portion of that land was heavily contaminated with dioxins, simazine, ametryn, pentachlorophenol, arsenic, atrazine, and trifluran. And to this day, the state leases land surrounding that site — a former O'ahu Sugar Company pesticide mixing and loading (PML) site — for agriculture. The primary tenant, Aloun Farms, grows fruits and vegetables on the leased land.

In September 2004, the Department of Land and Natural Resources approved the transfer of 318 acres of that land, including the contaminated site, to the Department of Hawaiian Home Lands, which plans to build 1,000 affordable single-family homes and 1,000 multi-family units there.

Although the PML site has not been used since 1994 and has been fenced off for several years, the fencing has not prevented stormwater runoff and truck movement from carrying contaminated soil offsite. A June 2010 memorandum by DHHL consultant Enviroservices & Training Center, LLC, notes that high levels of dioxins have been found in soil that is three feet deep in a nearby ditch, and arsenic has also been found outside the 0.6-acre site in concentrations that exceed what the federal government has determined to be acceptable levels.

Last year, the DHHL received a $200,000 brownfields cleanup grant from the Environmental Protection Agency and also secured a $1.97 million Hawai'i Brownfields Cleanup Revolving Loan Fund to remediate the site. The June draft Response Action Memorandum laid out five possible remediation alternatives, ranging from no action to complete excavation. The preferred alternative is to place an impermeable cap over the entire site.

The public comment period ended July 31, and according to DHHL community outreach coordinator Darrell Ing, Enviroservices and the state Department of Health are preparing a final Response Action Memo-

PHOTO: DHHL

Pesticide mixing tank between the storage building and tanks.

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randum. Once it receives DOH approval, Enviroservices will prepare a work plan, Ing says, adding that he expects the project will go out to bid by the end of the year.

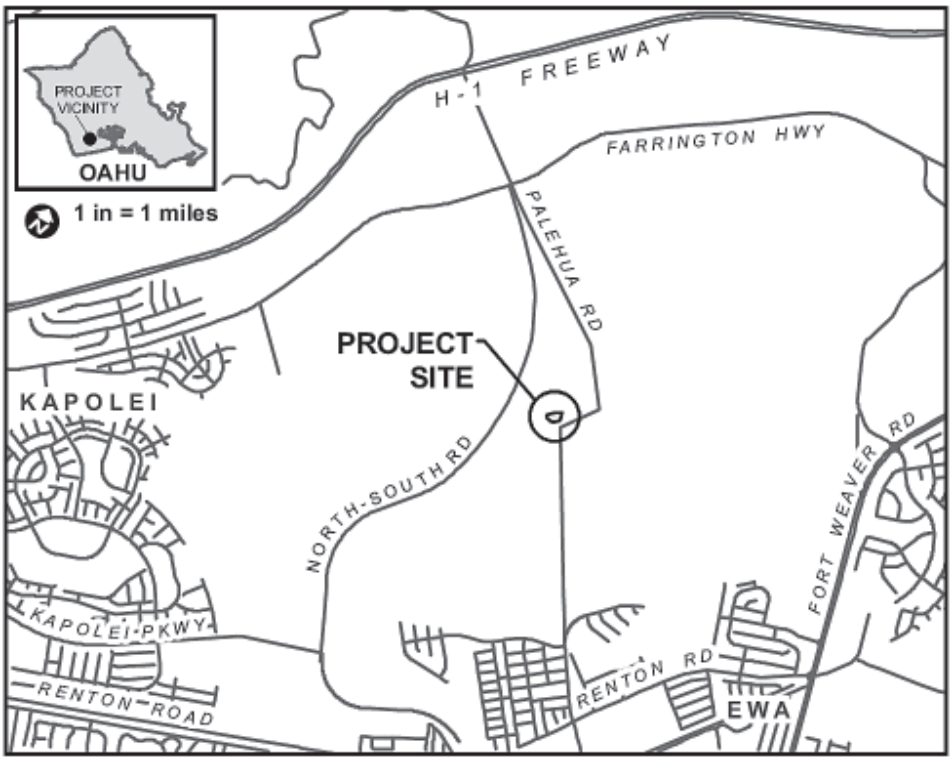
He says the department received about a half dozen comments from the public, most of which were in support of the preferred alternative, although a couple of comments favored complete excavation and offsite soil treatment.

According to the draft memo, the proposed alternative is the cheapest (aside from no action), while excavation is the most expensive. Capping the site would cost an estimated $1,695,000 with annual operation and maintenance costs of $15,000. Excavation, on the other hand, could cost anywhere from $6.8 million to $16.8 million with annual O&M costs of $10,000.

While excavation would best protect human health and the environment over the long term, the short-term effects (handling large volumes of soil, contaminated runoff and fugitive dust during excavation) and exorbitant costs make capping the site a better option, the memo concludes.

Before capping, the DHHL plans to excavate the contaminated soils that have been found outside the project area and place them inside. The total volume of dioxin- and arsenic-contaminated soil within the site is approximately 2,830 cubic yards. The total volume of dioxin-contaminated soil in the ditch is approximately 311 cubic yards.

According to the draft memo, capping the site will involve much more than slapping on a thick liner, covering it with soil and planting shrubs on it. Once all of the contaminated soils are in one place and compacted, a visual barrier will be placed on top, followed by clean, low permeability soil, which will be compacted again to form a two-foot thick layer. Geotextile fabric would then be installed, followed by a 60-mil geomembrane liner, and another layer of compacted, low-permeability soil.



MAP: DHHL

A metallic barrier tape grid would then be placed across the filled areas, followed by yet another layer of low-permeability soil that, when compacted, will be another two feet thick. Finally, a 6-inch layer of top soil would be placed on top and possibly vegetated.

"Various geomembrane industry sources have suggested that, with good periodic maintenance practices, the life expectancy of a HDPE geomembrane liner in buried applications can be up to 200 years," the draft memo states.

Ideally, the cap will eliminate the possibility that contaminants will leach into the groundwater and be drawn into downgradient wells, where they could then pose a threat to human health and any marine life that live where that groundwater discharges into the sea.

According to the memo, existing data indicate that the groundwater beneath the site has not been affected by the contaminants at the spill site. Also, no drinking water wells are located within one mile of the site and the nearest surface water body, the West Loch of Pearl Harbor, is approximately 1.6 miles away.

(For an in-depth look at this site, read the cover story and sidebars in our July 2001 issue, and the "Board Talk" item in our November 2004 issue. All are available at www.environment-hawaii.org. For more information on the project, see the DHHL fact sheet at hawaii.gov/dhhl/publications/ekii/FINAL_Jun10_FactSheet_4pgs_11x17.pdf)

— T.D.

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