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Stormy Seas

The Western Pacific Fishery Management Council is no stranger to controversy, but this is getting ridiculous.

Just in the past few months, the federal Government Accountability Office decided to launch an investigation into council expenditures, a council-member from Guam publicly apologized for disrupting and spreading misinformation at community meetings on community-based management and marine reserves, and the council had to redo all of the votes taken at its March meeting because advance public notice requirements had not been met.

At any other agency, such a series of events might trigger a moment or two of introspection. Among some council members and staff, however, self-doubt seems as scarce as chutzpa is plentiful.

IN THIS ISSUE

Fisheries Council Approves Proposal To Raise Caps on Turtle Interactions

What's one or two more dead Pacific loggerhead or leatherback sea turtles a year going to mean for the survival of those species? According to the federal Western Pacific Fishery Management Council, probably nothing.

Conservationists, on the other hand, believe that when it comes to these two federally listed, and some say critically endangered, animals, the loss of even one animal, or its injury as a result of an encounter with fishing gear, is one too many.

PHOTO: WPFMC

On April 14, the council recommended raising the annual "hard caps" on turtle interactions (also known as takes) with Hawai'i's shallow-set longline swordfish fishery from 17 for loggerheads and 16 for leatherbacks, to 46 and 19, respectively. The new caps are tied to another recommendation made at the April meeting to abolish the annual limit of 2,120 shallow sets, an action the council predicts could result in a doubling of fishing effort, of revenue, of sea turtle interactions, and of administration and enforcement costs.

According to a spreadsheet prepared by council staff and based on discussions during a March meeting of the council's Scientific and Statistical Committee (SSC), removing the limit on sets would probably result in an increase in fishing effort to between 4,250 and 5,550 sets a year. And if that were to occur, staff calculated that loggerhead takes (either fatal or non-fatal interactions with gear) would increase to between 40 and 50 a year and the number of adult loggerhead females that would be killed would be two or three. Leatherback takes would increase to between 16 and 21, and the number of adult female leatherbacks killed would also be two or three.

Based on the results of a computer model of extinction risks, council staff determined that the turtle deaths associated with lifting the set effort limit were just shy of the level where there might be "issues" with the loggerhead population. While the predicted leatherback mortality rate exceeded that level, council staffer Eric Kingma pointed out that mortality rates for both turtles were likely to improve since there had been no loggerhead interactions and only one leatherback interaction between January 1 and the April meeting.

Dissent

The measures passed, but not without controversy. Hawai'i council members Peter Young, Laura Thielen, and Rick Gaffney and Guam member Alberto Lamorena voted against raising the caps. Young and Lamorena also voted against lifting the effort limit.

Before voting on the hard caps, Young said, "I think it's inappropriate to lift turtle caps and say it's a good thing. It encourages more interaction [with turtles]." He added that the numbers upon which the council was basing its decision were merely what was presented by council staff and did not necessarily represent the best available science.

Thielen, director of the state Department

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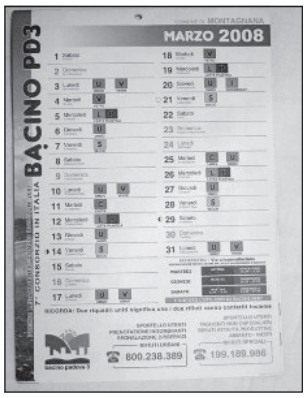
NEW AND NOTEWORTHY

Tale of Two Cities: Naples, Italy, once famous for its breathtaking beauty, has become infamous of late for its trash, which is breathtaking in an altogether different sense. In March, tests confirmed that the water-buffalo mozzarella produced in dairies outside of Naples contained levels of dioxin above what is allowed by European health regulations. Dairy owners complained that illegal nightly burning of trash in fields near their pastures was responsible for the problem.

Although the more prosperous areas of Naples are clean, trash has been accumulating in poorer suburbs for months, to the point that the newly elected leader of Italy, Silvio Berlusconi, has announced he will personally oversee measures taken to resolve the problem.



The March recycling calendar for Montagnana, Italy.

But not all Italian cities share Naples' problems. Montagnana, a small town in the Veneto region whose medieval walls are still intact, received the Italian Environmental League's award for best recycling program last year. The city government there publishes a calendar, letting residents know what types of trash will be collected on each day of the week. Wet trash (kitchen waste) is collected twice weekly; green waste, paper, plastics, and glass are collected once a week. Bulky waste is picked up once a month.

No large collection bins, no dumpsters, not even big black bags line the streets. Instead, residents simply place their recyclables into small plastic bags, set them out on the street, and the town hauls them away. According to residents, the recyclables are taken to Germany for further processing.

Early Detection Setback: Bishop Museum has the largest herbarium in Hawai'i and its weed experts and botanists are as good as any elsewhere in the state. And so it seemed only natural that, when the state Department of Land and Natural Resources wanted to support a project for early detection of invasive plant species on O'ahu that Bishop Museum had already begun working on, it would turn to the museum for help.

So when Mindy Wilkinson, invasive species coordinator for the DLNR's Division of Forestry and Wildlife, prepared the paperwork needed to clear the way for a sole-source contract with the museum, she provided extensive justification.

"The O'ahu Early Detection program," she wrote, "seeks to find plants that may become economic, environmental or agricultural threats before they 'jump the fenceline.' The program requires botanical experts to be familiar with the thousands of plant species occurring on O'ahu and be able to recognize a new species. In order to carry out the program with scientifically accepted principles, an herbarium that has specimens of all known O'ahu species is required."

Bishop Museum, which had been conducting the early detection program since its inception in 2006, was uniquely qualified for the contract, Wilkinson wrote; without its "records and resources," identification of new plants would simply be impossible.

The justification was far longer than that for many other requests filed with the procurement office and the cost, $107,145, was far below that for many requests that receive routine approval. Still, on February 25, Aaron S. Fujioka, chief procurement officer, disapproved it. "This request does not sufficiently provide justification to meet" the legal requirements for sole-source awards, he determined, finding it did not describe "how this vendor is uniquely qualified and has been determined to be the only provider of these services."

According to Wilkinson, the bureaucrat at the Department of Accounting and General Services who was handling her request insisted that "it was not vital that this work be done in Hawai'i," and that she could and should expand her review of potential contractors to include other institutions, such as the Smithsonian, that could conduct the work.

"I tried to explain that if you're trying to identify things in Hawai'i and respond to them quickly, the response time of 18 months to two years that's typical is non-optimal," Wilkinson said. DAGS, she added, "is strange and ridiculous."

Still, the work is moving forward. The two botanical technicians who were working for Bishop Museum will continue to work on the same project, but now as employees under contract to the Research Corporation of the University of Hawai'i. "They'll become part of the O'ahu Invasive Species Project," Wilkinson said.

Quote of the Month

"'It's now become sort of a derby. How much [swordfish] can you catch before you catch a certain number of turtles?"

– Paul Achitoff, Earthjustice

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BOARD TALK

Order Barring Mauna Kea Development Prompts UH to Draft Management Plan

In August 2006, Third Circuit Judge Glenn Hara reversed the state Board of Land and Natural Resources' 2004 decision to grant a Conservation District Use Permit to the University of Hawai'i's Institute for Astronomy to build six small telescope components, called outriggers, around the W.M. Keck Observatory on Mauna Kea.

Although the Land Board and UH/IfA are appealing the court's decision, on April 11, the board was briefed by UH consultant Ku'iwalu on what appears to be the university's effort to comply with Hara's order.

In his decision, Hara wrote that Department of Land and Natural Resources rules require the adoption of a "comprehensive" management plan for Mauna Kea's summit *before* a CDUP can be issued for any use. He determined that neither the university's 2000 Mauna Kea master plan nor the DLNR's 1995 management plan met rule requirements.

Now, according to Ku'iwalu principal Dawn Chang (who used to be a deputy attorney general advising the Land Board), the university has decided to develop a comprehensive management plan for the summit on its own. Although the Land Board has not officially endorsed this course of action, it does not appear to oppose it. At the April briefing, Land Board chair Laura Thielen and member Tim Johns said the university's decision to develop a plan was "a good thing." Big Island board member Robert Pacheco, who is also president of the Mauna Kea Management Board, recused himself from the matter.

Chang said the university plans to gather public comment on its plan over the next few months and seek final approval from the Land Board in December. Chang said that if the board approves the plan, the university will seek state legislation in 2009 to establish administrative rules for its Office of Mauna Kea Management, which the UH Board of Regents created when it adopted the 20-year Master Plan for Mauna Kea in 2000.

The Plan

Most of the briefing focused on the process and DLNR rules regarding the plan. As for the plan itself, Chang presented a draft table of contents to the Land Board and quickly ran through its components, which included sections on cultural and environmental orientation, community participation, existing and potential uses, and plan implementation, among others.

In short, Chang said, the university would like to build a few more telescopes and plans to remove or replace obsolete facilities. She also said the university acknowledges that it hasn't engaged the community enough.

"This has been a struggle for all of us… to develop a regulatory framework for a comprehensive management plan," she said, adding that the university is trying to give great deference to the community, which has criticized it for a lack of cultural sensitivity. She said the university will also look at relocating certain facilities and restoring areas.

> *"The [astronomy facility] developers have the money to get what they want to develop, but the managers don't have money to manage."*
> ***— Debbie Ward, Hawai'i Sierra Club***

"We want to know from the board and the public, are we on track?" she said.

Thielen expressed general approval of the approach: "as a board member…I think it's good for the university to take on a management plan. As Judge Hara pointed out…the summit area needs to be protected. It's good to not be project-driven."

Opposition

In an April 10 letter to the Land Board, the plaintiffs in the case that led to Hara's decision argued that the university doesn't have the authority to prepare a management plan for Land Board approval.

Mauna Kea Anaina Hou president Kealoha Pisciotta, Debbie Ward of the Hawai'i Chapter of the Sierra Club, Clarence Ching, and Ali'i Sir Paul Neves of the Royal Order of Kamehameha I wrote, "Under the BLNR's rules, the DLNR must prepare and BLNR must approve a comprehensive management plan for the summit of Mauna Kea. This duty may not be delegated to a third party…By contracting for UH to prepare a plan, neither the BLNR nor UH/IfA are complying with the court's order...

"Judge Hara's decision called for a conservation plan, not a development plan for construction of another observatory. The UH/IfA and University of California are moving to build the world's largest telescope, known as TMT [thirty meter telescope] atop Mauna Kea. The TMT is so big nearly every telescope on the summit could fit inside its dome. The TMT's stadium sized dome cannot fit on the summit, so the UH/IfA is proposing to build it on the north summit plateau, that is the last undeveloped view plane, comprised of pristine land, sacred landscape and one of the largest burial complexes," they wrote.

Although the board has not taken an official position on the plan or whether it will fulfill Hara's order, the group wrote, "[W]e do not think it is appropriate to simultaneously claim that BLNR is complying with the Court's order while at the same time appealing the same decision."

In a telephone interview with *Environment Hawai'i*, Ward also criticized the university's plans to seek legislative approval for administrative rules for the Office of Mauna Kea Management, which she says it has done for the past few years.

"Why do they want to go to the Legislature and not the BLNR? They want to have the authority but are not paying rent. You want rules and authority but you don't have money for management. Our point has been that without rent, we don't have money for management. The [astronomy facility] developers have the money to get what they want to develop, but the managers don't have money to manage," she said.

With regard to the management plan, Ward complained that it's being done without oversight from the DLNR.

"That doesn't seem appropriate. Judge Hara says the DLNR must come up with the plan. If the BLNR tasks UH, okay, but it should define what they want in the plan. The rules say the DLNR must create the plan," she said.

Environmental Review

While the plaintiffs' letter suggests that the Land Board and the university have already agreed on a course of action, it was clear at the April meeting that Thielen and the university disagreed over whether the plan triggers the state's environmental review law, Chapter 343.

"We're not proposing a use, but only a management plan," Chang said. When there is a new proposed use, the university will comply with all applicable regulations, she said.

"At this time, we are of the view that the master plan doesn't trigger [a chapter 343 review]. I realize there are some who have differences of opinion," she said.

Thielen pointed out that an exhibit – Exhibit 3 – within the DLNR's rules requires an environmental assessment to accompany the management plan.

Johns asked whether Thielen's interpretation was inconsistent with Chang's.

"Yes," Chang said. "Exhibit 3 is triggered by what is your proposed use."

Thielen said she "went around this a number of times" during her discussions with the university in January. "The dilemma we're in is, our rules for management plans [require] an environmental assessment. While that may or may not make sense, we need to follow the advice of our AG [attorney general]," she said.

At one point, Stephanie Nagata of the OMKM interjected, "Our plan is going to be adaptive. Would we need to do an EA every time we update? Does that seem reasonable?"

While Thielen and the university representatives continued to disagree over whether the plan triggered Chapter 343, board member Johns seemed more concerned that *some kind* of environmental information was presented to the board.

"What kind of information do we need to have before us if we don't have a Chapter 343 document?" Johns asked Chang.

"That's a good and fair question. How does the board adopt a comprehensive management plan if it doesn't have guidance?" Chang said, adding that the difficulty in providing that guidance lies in identifying all of the potential uses of Mauna Kea.

Johns said he would leave it up to the Attorney General's office to tell the board if there needs to be Chapter 343 compliance (in the form of an environmental assessment or environmental impact statement), but worried that "this could get tripped up if a Chapter 343 review is required and we don't do it."

In response to Nagata's comment, Johns added, "Our decision is not going to be driven by whether it's a hassle for you to do an EIS or EA." He also said that at some point, the board needed to be briefed on legal issues before voting on the plan.

Given that the university had scheduled approval for December, Chang promised to provide the board with an update in three months.

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Negotiations Continue With Maui Snorkel Charters

At its April 11 meeting, the Land Board authorized its chair, Laura Thielen, to continue negotiating an appropriate penalty for coral damage caused by the sinking of a Maui Snorkel Charters boat within the Molokini Marine Life Conservation District in 2006.

On January 25, the DLNR's Division of Aquatic Resources recommended that the Land Board suspend MSC's commercial operating permit for a year. If the board also wished to further penalize the company, the division stated that the board could impose a fine of up to $661,000 for damaging or killing corals and $10,618 in administrative costs.

Instead, based on a settlement offer by MSC representatives of $550,000 to be paid over 10 years, the Land Board directed the DLNR to negotiate a settlement that would include payment of no less than $550,000 in fines, $10,000 in administrative costs, and a permit suspension.

But instead of working within those parameters, MSC attorney Thomas Cole sent a letter March 7 to state deputy attorney general William Wynhoff making a new offer: a $250,000 upfront payment, with the remaining $300,000 to be suspended if the initial payment is made within 90 days of a completed settlement. Cole also proposed that MSC's commercial operating permit be suspended for three months, but that it be allowed credit against this for the two-and-a-half months the sunken vessel was inoperable after the 2006 event. Finally, Cole asked that any settlement state that the sinking was not a result of negligence by MSC.

Because the Land Board did not give Thielen the authority to discuss the fine suspension suggested by Cole, she had the matter brought back to the board on April 11. At the meeting, the board set new parameters on the settlement: The fine would have to be roughly equivalent in value to $550,000 paid over ten years, meaning the actual amount could be less than $550,000 if it was paid over a shorter time frame. The board also seemed fine with a three-month permit suspension giving the company the credit it proposed, and decided to remain silent on the negligence issue.

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State to Buy Easement Over Kealakekua Ranch

The Land Board has approved in principle the purchase of a perpetual conservation easement over 9,000 acres of agricultural land owned by Kealakekua Heritage Ranch, LLC, and Hokukano Ranch, Inc. for $3,968,000 or fair market value, whichever is lower.

According to a report by the DLNR's Division of Forestry and Wildlife, the property contains many forest types — mixed open forest, closed 'ohi'a lehua rainforest, open koa forest with mamane, and open koa forest – and a variety of federally listed threatened and endangered plant and animal species.

"Due to agricultural zoning, forests in Kona are threatened by conversion to non-forest uses," the DOFAW report states, adding that Kealakekua Ranch has received offers from buyers who want to take advantage of development entitlements that currently run with the property.

To purchase the easement, DOFAW has secured Forest Legacy program grants from the U.S. Department of Agriculture Forest Service totaling $3,968,000. The matching requirement will be met by the ranch's donation of the land value, which will be determined by an appraisal.

For further reading on this subject, see the two articles published in the November 2007 issue of *Environment Hawai'i*, available on the web at *www.environment-hawaii.org*.

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Board Denies Permit For Koa Timber Project

Kyle Dong, who has tried unsuccessfully for years to log koa from about 12,000 acres of rainforest north of Hilo, has been denied a Conservation District Use Permit.

In March 2001, Dong's company, Koa Timber, Inc., submitted its first CDUA, but

A young koa tree, surrounded by alien weeds and grasses, has sprouted in the path bulldozed by loggers for Koa Timber Inc.

withdrew it because of criticism over its weak environmental assessment and because one of the company's owners backed out. Twice more over the years, Dong or his affiliated companies submitted and then withdrew Conservation District Use Applications for the logging operation, which was proposed to take place within the resource subzone of the Conservation District.

In February 2007, the DLNR's Office of Conservation and Coastal Lands accepted a fourth CDUA from Dong to develop what he described as a sustainable commercial koa timber forestry operation in Hilo. The project was again roundly criticized by environmentalists and government resource management agencies, and in May 2007, OCCL administrator Sam Lemmo wrote a long letter to Dong, notifying him of the major issues that had been raised during the review period for the project's draft environmental impact statement. Lemmo's letter also explained how Dong was required to respond to those concerns.

At the Land Board's April 11 meeting, Lemmo said Dong failed to address the concerns laid out in his May letter. In June and September 2007, at Dong's request, the Land Board extended the deadline to process the CDUA. But when the board voted last year on the second extension request, at-large member Tim Johns said he wanted an update on the status of the project before granting any further requests. So when Dong asked for a third time extension last December, Lemmo responded by sending two letters requesting a progress report and warning Dong that the OCCL would recommend denial of the extension if it did not receive the report soon.

Lemmo told the board Dong has not responded to his requests and recommended that the board deny the application, which it did.

For further reading on the history of this troubled project, see our December 2003 and July 2007 issues of *Environment Hawai'i*, available on the web at *www.environment-hawaii.org*.

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Kona Motocross Track Gets Initial Green Light

Earlier this year, when a Hawai'i surfboard company proposed holding a surfing contest at the Mahai'ula section of Kekaha Kai State Park on the Kona coast of the Big Island, community members involved in the state's acquisition and management of the park argued that the area was always meant to be kept wild, free from any development or commercial use.

For these same reasons and others, Janice Palma-Glennie of the Sierra Club's Hawai'i Chapter objected on March 28 to a request by the County of Hawai'i to approve a three-year right-of-entry and authorization to undertake any necessary studies and apply for various land use designations, zoning, and approvals needed for a proposed motosport park on 250 acres of state land at Mahai'ula and Kaulana, just north of the Kona airport.

While Palma-Glennie did not oppose the development of a motosport park in West Hawai'i, she did object to the proposed site, noting that it lies across the road from the Kekaha Kai State Park entrance.

"Plans for a racing facility in Kona have ranged from a 2,500-acre NASCAR facility in the mid-1990s to a 180-acre community track a few years ago. In 2002, a 2,000-acre proposal for a 'world class' racing facility was rejected by the Legislature. What all of these proposals had in common was that they were uncannily planned to be built in the same inappropriate and controversial location," she said.

> *"Putting all the energy into that site throws more good money after bad and also eliminates the potential of finding another site."*
> ***— Janice Palma-Glennie, Hawai'i Sierra Club***

Palma-Glennie described how noise, light, and air pollution, and hydrocarbon runoff might affect the surrounding residential, university and resort development, and added that "the BLNR should not be authorizing anything in principle until after an environmental impact is completed."

While Hawai'i board member Rob Pacheco said the staff recommendation allows the county to proceed with an EIS and investigate whether or not the site is appropriate, Palma-Glennie countered, "Over the more than ten years they've been planning to do the facility there… it's really starting to divide the community. Putting all the energy into that site throws more good money after bad and also eliminates the potential of finding another site."

Paul Maddox of the Hawai'i Racing Association, which has been working on the project for more than a decade, testified that the location was actually suggested by the DLNR.

"They said go move it next to the airport, because we had originally talked about Pu'u Anahulu and out close to the hotels, which was obviously a bad idea," he said.

Despite Palma-Glennie's arguments, Pacheco moved to approve the DLNR Land Division's recommendation that the Land Board 1) support the need for a motor sports facility in West Hawai'i and 2) authorize the county to begin taking steps to determine whether the site is appropriate and seek necessary land use approvals. The division also recommended that if the county failed to complete the environmental review process and obtain land use approvals within three years, the right-of-entry would automatically be rescinded. The board unanimously approved the recommendations.

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State Closes Waters To Bottomfishing

At its March 28 meeting, the Board of Land and Natural Resources voted to approve a request by its Division of Aquatic Resource to close all state waters around the Main Hawaiian Islands to bottomfishing until August 31. The closure only applies to the "Deep 7" bottomfish species: ehu, gindai, kalekale, lehi, onaga, opakapaka and hapu'upu'u.

In May 2005, the National Marine Fisheries Service determined that bottomfish species around the Main Hawaiian Islands were subject to overfishing and required the Western Pacific Fishery Management Council to take steps to reduce bottomfish fishing mortality by 24 percent. Among a suite of other regulations, the council adopted an annual catch limit and a May-September closure, which the Land Board has honored, since bottomfishing grounds span both state and federal waters.

The NMFS' final rules on the bottomfish fishery, which also require all non-commercial bottomfish fishers to have a federal permit, became effective on April 1. Because the Land Board does not yet have the authority to close fishing areas without going through its long and often arduous rule-making process, bills were introduced at the Legislature this year to give the DLNR that power to more easily adopt rules responding to a federal determination of overfishing.

Even so, last March, DAR requested the bottomfishing closure in anticipation of an early federal closure, which came on April 16, 2008. According to a DLNR press release, commercial catch data indicates that the current fishing season's total allowable catch of 178,000 pounds was reached in mid-March.

—T.D.

Wespac from page 1

of Land and Natural Resources, agreed. "Similar to Peter Young, I'm voting no. Before I can support an increase, I would like more information," she said.

Guam member Manuel Duenas, however, argued that the council's decision is merely a jumping off point that will lead to a new biological opinion – and, ultimately, new fishing rules – by the National Marine Fisheries Service. "If [its] scientists can come up with new numbers, good!....This is what it takes to get things going," he said.

Adding to the fireworks was an exchange between Young and council chair Sean Martin, who is also president of the Hawai'i Longline Association. It was HLA's proposal to NMFS, in February 2007, that set in motion the council's efforts to loosen the shallow-set fishery regulations. Although Martin had voluntarily recused himself from voting on any of the shallow-set fishery action items, he continued to chair the meeting and participate in discussions. Concerned about arguments Martin had made during the discussion on whether the best available science was being used, Young said, "I think you're trying to convince us [to feel a certain way]. If you're recusing, it would be helpful to not try to do that."

In a less controversial vote, the council unanimously decided (except for an abstention by NMFS Pacific region director William Robinson) to recommend that the service change the way caps are implemented. At present, they are calculated annually. As soon as either cap is reached (on sets, or on turtle interactions), the fleet is to shut down immediately for the rest of the calendar year. Under the recommended plan, the caps would be calculated on a multi-year basis. So instead of having the fishery shut down after 16 loggerhead interactions, they'd have a limit of 48 over three years.

The council also recommended the following regarding the shallow-set fishery:

◆ Require the NMFS and council staff to fully analyze turtle-fishery interaction numbers and associated adult female mortalities and require a comprehensive review of that analysis by the SSC prior to final action.

◆ Abolish the shallow-set certificate program that tracks how many sets are made each year.

◆ Do not implement a time-area closure. Although there isn't one now, last year, when determining the scope of the supplemental environmental impact statement for amendments to its Pelagic Fisheries Management Plan, the council voted to evaluate whether or not a time-area closure should be imposed on the swordfish fishery.

LETTER

Data Aren't Lacking on Black-Footed Albatross

In support of maintaining the standard of comprehensive and accurate reporting that we all value so much in this publication, we would like to offer a few corrections and additions to the article entitled "Groups Seek Federal Listing For Black-footed Albatross" published in April 2008. Mr. Paul Dalzell's evaluation of the quality and quantity of data available for use in making a scientifically informed decision about listing the species appears to have been made without any actual information about those data. In fact, it may be impossible to name any other vertebrate with a similar world population size and life history for which so much is known. [Dalzell is the senior scientist for the Western Pacific Fishery Management Council.]

Over 75 percent of the entire global breeding population of this species is directly counted each year and has been since 1991 at three of the birds' most important nesting islands and atolls (Midway, Laysan, and French Frigate Shoals). Many thousands of these albatrosses have been banded at each of these sites since the early 1960s, and a mark-recapture study involving the resighting of 2,000 adult breeders every year at each of these three breeding colonies is giving us very good information about changes in adult survival. This study was designed by some of the nation's most respected avian demographers. The stability of the population in the face of all the anthropogenic stresses affecting it is the subject of an intensive status assessment due to come out very shortly after undergoing a rigorous peer-review process.

Mr. Dalzell's assertion that "There seems to be no correlation between black-footed albatross populations and longline growth" is not supported by a recent paper by Veran and her colleagues. Their findings supported the idea that longline fishing has an impact on the Black-footed Albatross population by demonstrating a significant relationship between adult survival and longline fishing effort. (Veran et al. 2007. Quantifying the impact of longline fisheries on adult survival in the black-footed albatross. *Journal of Applied Ecology* 44:942-952.)

Regarding the regulatory process for addressing petitions under the U.S. Endangered Species Act (ESA), we would like to provide some clarification and additional information. Our review of petitions is limited to determining whether or not the petitioners have provided substantial information that the species in question is facing one or more threats to its continued existence. Our evaluation is conducted in accordance with federal regulations (50 CFR 424.14(b)), which provide a clear standard of scientific accuracy and documentation that must be met for information in a petition to be determined "substantial." We found that the petitioner [Turtle Island Restoration Network and Center for Biological Diversity] had indeed provided reliable, substantial information on several threats to the Black-footed Albatross, and these are not limited to mortality in the Hawai'i-based pelagic longline fishery. That finding (along with a detailed analysis of the petition) was published in the Federal Register, and can be found at *http://www.gpoaccess.gov/fr/index.html* by employing a simple search for "page 57278" in Volume 72 (2007). This published notice included the opening of a 60-day public comment period on our finding, during which time all interested parties were welcome and encouraged to provide information. With the publication of our finding, we initiated the next step in the process: a review of all available information to determine whether listing the Black-footed Albatross under the ESA is warranted. This review, now underway, will consider all comments and scientific information received during the comment period, the comprehensive, peer-reviewed status assessment of the species that currently is nearing completion, and other information in our files. The results of our review will be published in the Federal Register as well.

We hope that this additional information about study and monitoring of the Black-footed Albatross and the U.S. Fish and Wildlife Service's process under federal regulations for making listing determinations provides an improved understanding of this issue for the readers of *Environment Hawai'i.*

Beth Flint, Ph.D.
Holly Freifeld, Ph.D.
U.S. Fish and Wildlife Service

◆ Require council staff, the Pacific Island Fisheries Science Center, and the NMFS Pacific Islands Regional Office to create a pilot project to investigate whether video monitoring is an effective substitute for 100 percent, on-board observer coverage, which is now required of the shallow-set fishery.

◆ Require council staff to work with the NMFS to describe in the draft supplemental environmental impact statement on the FMP amendments the different incidental take statements for various U.S. pelagic fisheries operating in the western Pacific region.

◆ Direct council staff working with the NMFS to describe in the DSEIS other fisheries in Hawai'i and California that may be impacted by the council's decisions.

◆ Continue turtle conservation efforts and ask the NMFS "to include successful results in an environmental baseline as well as credit the results as they may offset the impacts of the Hawai'i shallow-set fishery as appropriate." A February 2008 informal draft supplemental EIS prepared by council staff states that the council's conservation efforts in Japan have resulted in "over 100,000 loggerhead hatchlings conserved and released over the past four years that would have otherwise been lost."

Turtle Credits?

While no members of the public offered testimony on the suite of measures relating to the Hawai'i-based shallow-set longline fishery, Earthjustice attorney Paul Achitoff told *Environment Hawai'i* during a break in the meeting, "It's now become sort of a derby. How much [swordfish] can you catch before you catch a certain number of turtles? It demonstrates that the council doesn't have much comprehension of the Endangered Species Act or conservation sensitivity."

Achitoff, who represented the Center for Biological Diversity and the Turtle Island Restoration Network in the litigation that led the NMFS to place the current restrictions on the fishery, said that he's not surprised at the council's decisions.

"I've always assumed the longline industry and the council would push [for looser restrictions]…and say, 'Look at our mitigation.' I'm surprised it took this long," he said.

Achitoff said he has no idea how the council staff derived the proposed new caps. He has long believed both caps should be set at zero, he said.

With regard to the council's request that the NMFS incorporate the results of council-sponsored conservation efforts into its review of the fishery, Achitoff said, "I can't say I've ever seen a biological opinion that allows credits…I don't think it makes rational sense. It's not how you do the analysis."

According to PIRO deputy administrator Mike Tosatto, however, the idea of conservation credits is not new and is being seriously considered by government resource management agencies, including the U.S. Fish and Wildlife Service and the NMFS.

"I look at it like a needle on a gauge. If the needle is pointing down and if we're doing something to point that needle upward, why can't we get credit? Fishing deflects the needle downward, conservation pushes it upward….Why not take that cumulative impact [into consideration]?" Tosatto told *Environment Hawai'i*.

He added that although the NMFS has no policy or rules regarding conservation credits, the council's proposal will be considered in the biological opinion NMFS must prepare on the proposal. (A biological opinion, or BiOp, determines whether or not a proposed federal action will further jeopardize a listed species.) Tosatto acknowledged that determining how or whether the council's loggerhead turtle conservation efforts in Japan counteract the Hawai'i fishery's impacts won't be easy.

"It would be nice if it were a Petri jar where everything is equal…. [but] we're affecting two different life cycles," he said, referring to the fact that the fishery interacts mostly with juveniles, while the conservation efforts are focused on hatchlings.

Next Steps

All of the decisions made at the council's April meeting were re-dos of council votes made at the meeting in Guam and Saipan held March 17-21. According to the *Federal Register*, the council office had sent its agenda to the NMFS in early February, but the service didn't publish the notice until March 21. Because the Magnuson-Stevens Fishery Conservation Act requires advance notification of council meetings, the council was forced to reconsider all of the actions taken at the March meeting.

The council must still take final action on all of its April decisions at a second meeting, which Kingma said would be in either June or October. Once final decisions are made, the council will submit a DSEIS to the NMFS, which will release it to the public for comment. At the same time, the NMFS will begin preparing a BiOp in accordance with the Endangered Species Act.

Now that the council has indicated its preferred course of action, Tosatto says, the NMFS will work with council staff to ensure that the DSEIS includes, as much as possible, the same information that might be used in a BiOp.

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Investigations Mount Over Council Spending

Over the past year, the council has received several Freedom of Information Act requests from individuals and organizations — including council member Young, Kaua'i activist Maka'ala Ka'aumoana, Tina Owens of the LOST Fish Coalition, and *Environment Hawai'i* – seeking detailed information about council expenditures, in particular, those related to the Ho'ohanohano I Na Kupuna Puwalu series held in 2006 and 2007. The meetings, sponsored mainly by the council and organized in cooperation with the Association of Hawaiian Civic Clubs, were a crucible for state legislation passed in 2007 establishing a committee to investigate community-based natural resource management.

In recent years, the use of council staff and funds to help craft state legislation has become a source of great concern among several local non-profit organizations. In February, prompted by their complaints, U.S. Rep. Henry Waxman wrote a letter to the Government Accountability Office asking it to investigate the council's expenditures to "verify whether the council and its executive director are properly using and accounting for government funds." In March, the GAO agreed to start an investigation later this year and to work with the Inspector General's office, which is also investigating the council, to avoid any duplication of effort.

Pending the results of those investigations, members of the public continue to seek expenditure information on their own. In March 2008, *Environment Hawai'i* published an article on the inadequate response it has gotten to its November 2007 FOIA request for documents regarding puwalu-related expenses. And judging by testimony given at the council's April meeting, it appears that Owens and Ka'aumoana have also been left wanting.

Testifying by phone, Owens said her questions to the council had not been adequately addressed and she complained about how difficult it has been to get documents from the council. As an example, she said that she had asked for a copy of a council budget given to members at the March meeting, but was told by council executive director Kitty Simonds that it was not for distribution.

At the April meeting in Honolulu, Owens asked which council program had provided money for the puwalu series, and also asked about Simonds' alleged profit sharing. (In 2006, the *Cascadia Times* newspaper reported that Simonds' salary includes an annual profit sharing payment of $20,000.)

Simonds responded that the puwalu was a series of meetings intended to engage the community in fishery management, which she said is a fundamental job of the council. Therefore, she said, money for the series came from all programs, including those for the fishery ecosystem plan, information collection, and indigenous fishing rights, among others.

As for her alleged "profit sharing", Simonds said that is simply what her 401(k) retirement program is called.

Ka'aumoana testified that although she understands Simonds' explanation about the puwalu funding, she still hoped to see travel budgets, as well as a general budget for 2007. She added that she has not received documents that puwalu coordinator Leimana DaMate promised to provide.

Simonds said she would check into the DaMate issue. She also suggested that because the various FOIA requests ask for many of the same things, "We can ask the government to do one document [to answer] all the FOIAs."

How much you make?

While discussing miscellaneous issues with council members, Simonds revealed that Owens had sent an email to the council's entire staff, except for Simonds, listing all of its paid positions and associated salaries and asking each staff member how much they were getting paid. Although the list did not include any names, Simonds says that based on the position title, "Now, each staff member knows what the other makes and they didn't before."

Although council member Manuel Duenas worried that this would cause animosity among staff members, Silas DeRoma, general counsel for the National Oceanic and Atmospheric Administration, said that the council is treated as though it were a federal agency subject to disclosure laws and that salary information can be obtained by the public.

An Apology on Guam

At the council's March meeting held in Guam and the Commonwealth of the Northern Mariana Islands, Guam member Manuel Duenas apologized to the council for his role in a series of complaints by government officials that council representatives from Guam were spreading false or misleading information about marine conservation programs and insulting and intimidating invited speakers at public informational meetings.

Between January and March, NOAA Coral Reef Conservation Program Manager David Kennedy received four letters from government and conservation group representatives in Guam and Pohnpei alleging that council representatives had disrupted a series of community meetings in November 2007 on Guam, Rota, and Saipan regarding marine preserves and community-based management.

According to a February 4 letter from Evangeline Lujan, who works for Guam's planning bureau and is a member of the U.S. All Island Coral Reef Committee, "Off-island guests were flown in to foster discussion and share their experiences with community-based marine protected area management. Council representatives disrupted the meeting to the point that concerned community members were forced into silence, while invited guests eventually walked out."

In a March 7 letter to Kennedy, Paul Bassler of Guam's Department of Agriculture wrote that his department and the council both seek to conserve and manage fisheries resources. "This is why the department is astounded by WESPAC's actions on Guam. WESPAC representatives should be partnering and cooperating with the department and other local resource agencies…. Instead, WESPAC representatives continually undermine the mission and goals of the jurisdiction and directly oppose the jurisdiction and their efforts."

Although all of the letters mentioned the alleged disruptions and dissemination of misinformation at the November 2007 meetings, Bassler notes that such activities by council representatives began two to three years ago, when they would "host meeting/forums on Guam focusing on local management issues, such as the abolishment of Guam's marine preserves or providing misinformation to the public about local resource management… The department and other resource agencies have made several attempts to rectify the misinformation spread by WESPAC. However, they disregard our corrections and continue to misinform the public. Because of this, considerable time with limited staff is dedicated to providing accurate information to the public."

In an undated letter to council chair Martin, Kennedy requested that Martin provide a written response to the allegations made in the letters and that the issues be discussed at the council's meeting to be held March 17-21.

According to a press release by Scott Foster, director of communications for the Honolulu-based Western and Central Pacific Network, on March 17, "Duenas apologized to his council peers for any embarrassment he may have caused….Duenas' apology for 'embarrassing' the council was made not once, but three times during the course of the [council] meetings…. Duenas asserted that he was acting not as a council member when taking the offensive actions, but rather in his role as president of the Guam fishermen's cooperative."

After Duenas' apology, Foster said, Simonds "attempted to downplay the issue, which had involved the Governor of Guam and other officials, by calling it 'a tempest in a teapot.'" ***— Teresa Dawson***

Two-Mile-Deep Hilo Bore Hole Reveals Vast Stores of Fresh Water

We're bringing coals to Newcastle." That's how Don Thomas, a geochemist with the University of Hawai'i's Department of Geology and Geophysics, described recent findings in a presentation to the state Commission on Water Resource Management last March.

Thomas' Hawai'i Scientific Drilling Project, which began boring a 11,541-foot-deep hole into the ground near the Hilo airport in the late 1990s, has discovered that despite current ideas about island aquifers, freshwater can be found in artesian aquifers and pillow lavas far, far below sea level, deeper than 10,000 feet.

While this discovery doesn't save the day for rainy Hilo, which has "got all the water it needs," Thomas said, the find is causing scientists to rethink a long-accepted paradigm of freshwater recharge on islands.

As most textbooks would explain it, freshwater is stored in perched aquifers, dikes, or basal aquifers, and in those basal aquifers, freshwater extends slightly below sea level until, eventually, it transitions into salt water.

But according to Thomas, that's not the whole story.

Using a cookie-cutter bit tipped with tiny diamond chips, the team drilled through a thin layer of Mauna Loa lava down to lava from its older sister volcano, Mauna Kea. The purpose of the hole was to allow scientists to better examine the volcanism that produced Hawai'i, since it is not well understood, Thomas said. The project team wanted to explore the deep structure of the Big Island and, among many other things, characterize its water resources.

From the core left by the drill, similar to the ice cores taken from polar regions, scientists sampled rocks and water, made geophysical measurements, and discovered some astonishing things. For one, the Hilo side of the island is sitting on a 1,500-foot layer of gravel and sand. "Not very comforting," Thomas said.

But more important, at least to hydrologists, is that there are multiple layers of freshwater and salt water below sea level. At the Hilo bore hole, fresh water extends from 300 to 500 meters, he said, and below that, down to 1,500 meters, lies cold salt water. But deeper still, artesian aquifers were found and an old Mauna Kea soil and ash layer was found to be discharging one billion gallons of freshwater a day into the ocean. Pillow lavas at the greatest depths also contained fresh water, he said.

"There is ten times more freshwater in Mauna Kea than current models would have predicted," he said. "What the hole shows is that there are different mechanisms for storing water." What's more, the deep soil and ash aquifer isn't just a receptacle for old, stored water that was slowly buried as the island subsided. It's being recharged by rainfall.

Spurred by the results from Hawai'i island, the project team plans to drill a similar hole through Haleakala where east and west Maui intersect to discover any hidden water sources there. While Hilo doesn't need the extra water, Maui – where fights over freshwater have plagued the island for decades – does. But at the March meeting, to prevent anyone from jumping to conclusions, Thomas warned that Haleakala is older than Hawai'i's volcanoes and has undergone more weathering, which may affect runoff and percolation on the island.

What was found at the Hilo bore hole "doesn't mean there's all kinds of [underground] water on Maui. At this point, we don't understand the hydrology of any of the islands," which is why he and his colleagues want to continue their work, Thomas said. "I don't want to say we are going to … find what we found at Mauna Kea and Mauna Loa. I can only say that [island hydrology is] not what we thought it was."

'What does it mean?'

Roy Hardy, hydrology program director for the Water Commission, says while the presence of deep freshwater has been common knowledge for some time, the implications for water resource management are taking longer to understand.

CWRM first became involved with the Hilo project because staff worried about the drill going too deep and hitting a geothermal layer.

"We put in a lot of conditions for mitigating that," he says.

Over the years, the project has sent a number of reports to the commission and "we knew about these things in 2003, but it was kind of like, 'What does it mean?' From 2003 until now, they've been analyzing [the cores]. It's one of those long academic studies and they're now coming out with a better conceptual model [on the hydrology]," he says.

Hardy says the commission plans to mention the Hilo findings in the Water Resources Protection Plan, which it is preparing as one of the components of the state Water Plan.

"There may be other areas where big mountains butt against each other. It would appear that water from the lower aquifer is not ancient water. It looks like it's actively getting recharge. We have to rethink how much recharge is getting into the upper aquifer as opposed to the lower. Right now, we only have the recharge going into upper aquifer," he said.

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Commission Tightens Grip On Waters of Central Maui

It seemed kind of mundane until you all burst into applause," Water Commission chair Laura Thielen said after its vote March 13 to designate the West Maui watersheds known as Na Wai 'Eha as a surface water management area, the first such designation since the Water Code was passed in 1987.

In 2006, Earthjustice, representing Hui O Na Wai 'Eha and Maui Tomorrow Foundation, Inc. filed a petition requesting that the commission either recognize the watersheds of Waihe'e, Waiehu, 'Iao, and Waikapu Streams (collectively, Na Wai 'Eha) as part of the 'Iao Ground Water Management Area, or designate the four watersheds as a surface water management area. At its March meeting, the commission determined that because there are "serious disputes" over the surface water resources, it should designate Na Wai 'Eha as a surface water management area.

Whether for ground or surface water, designation as a water management area requires all users of water from that area – except for people or entities with appurtenant rights, for domestic water use by individuals and those using catchment systems –to have a permit from the Water Commission.

To get one of those permits, they must show the use meets several criteria:

- The use can be accommodated by the source.
- It is a reasonable-beneficial use.
- It will not interfere with any existing legal use of water.
- It is consistent with the public interest; land use designations, as well as county general and land use plans and policies.
- It will not interfere with the rights of the Department of Hawaiian Home Lands.

Within one year of the published notice that the area has been designated, all existing users of Na Wai 'Eha water who want to continue their use must file a permit application with the Commission on Water Resource Management. While new use applications can be submitted at any time, any existing user who fails to meet the one-year deadline will be considered a new user. New uses will only be accommodated once all the needs of existing users have been met.

While Thielen called it an historic decision, she quickly added, "Being the state, you can be assured it's not going to be quick." The Legislature had just announced the DLNR's budget, which includes a significant number of cuts in positions at its Division of Aquatic Resources and at the Commission.

At the commission's March meeting, attorneys for Hui O Na Wai 'Eha and Maui Tomorrow, for the Office of Hawaiian Affairs, and for County of Maui all testified in support of the designation, as well as several members of the community and activist groups. Attorneys representing Alexander & Baldwin/Hawaiian Commercial & Sugar and Wailuku Water Company, as well as staff from both companies, attended the meeting, but did not testify.

After the commission's vote, Maui County corporation counsel Jane Lovell asked how the commission would deal with the fact that one party – Wailuku Water Company – controls the diversion system that currently provides the county with water for its municipal system. When the 'Iao aquifer was designated as a groundwater management area, the county and a housing developer both applied for water from the same source, Shaft 33, which was located on land owned by the developer. Because the permit application had required signatures from both entities, the county's existing use application — which lacked the developer's signature — was rejected and the county was lumped in with the new use applicants. While the 'Iao aquifer was able to accommodate the county's use, Lovell seemed worried about how the Na Wai 'Eha permitting process would play out, since it would seem that some existing water use applicants would need to obtain signatures from WWC.

"We don't want every user to have to get a signature from the diverter," she said.

Earthjustice attorney Kapua Sproat also raised the signature issue at the commission's April meeting during a discussion of a new draft permit application for existing uses.

While the draft permit application was a

Conservation Alliance Holds Forum On Climate Predictions for Hawai'i

How is climate change going to affect Hawai'i?

Little by little, scientists here and abroad are tackling that question. A lot has already been done, from Chip Fletcher's work on coastal erosion and flooding in Honolulu to Dennis LaPointe's, Carter Atkinson's and Tracy Benning's work on the forest's shrinking malaria-free zone to Jason Baker's, Charles Littnan's and David Johnston's predictions on how rising seas will shrink monk seal and green sea turtle habitat in the Northwestern Hawaiian Islands.

Last March, the Hawai'i Conservation Alliance sponsored a forum on some of the latest research as part of the alliance's effort to educate scientists and land managers about climate change so they can incorporate predicted effects into natural resource management here.

Held at the University of Hawai'i's East-West Center, the forum was a chance to hear from both local and mainland scientists on the various ways climate change may affect the world's natural resources in general, and Hawai'i's in particular. Later that week, HCA members met at the U.S. Fish and Wildlife Service office in Honolulu to develop a climate change response strategy, which will be presented at this summer's annual conservation conference this July 29-31.

Precipitation

As National Oceanic and Atmospheric Administration climatologist Henry Diaz put it, the models used by the Intergovernmental Panel on Climate Change show that Hawai'i is in an "increase-decrease dichotomy" when it comes to rainfall predictions under the most idealistic global warming scenarios. In other words, the models show a decrease in precipitation north of the island chain, an increase to the south, but directly over the islands, the models don't agree on what will happen.

Diaz and other climate modelers who spoke at last March's forum suggested that, even if the 20-plus models used by the IPCC did agree, they aren't refined enough to predict small-scale, regional changes. Typically, global climate models have a resolution of 150-300 kilometers.

"Hawai'i almost fits inside *one* box," Diaz said, referring to the global grid used by the IPCC models, where one box equals one data point.

So, Diaz, in cooperation with Thomas Giambelluca and Oliver Timm of the University of Hawai'i, is working on ways to better predict climate change impacts on weather in Hawai'i.

At the time the forum was held, there was little to report in the way of results. As Timm said, the group is still working on selecting the right model to use for Hawai'i, running different ones dozens of times to see how well they match up with observed weather data.

Using one promising model, Timm said, it appears that for one region in Hilo, there may be one more inch of rain a month as a result of climate change impacts on trade winds.

But even with the right model, predicting what rainfall will be throughout different climatic regions across the island chain will be difficult. How will dry Wai'anae or Pu'u Wa'awa'a be affected differently from Mt. Wai'aleale, the wettest place on earth?

Diaz said the tremendous local variation in annual rainfall – which can vary from 10 inches to more than 200 inches – will complicate things, as will the fact that the islands get most of their rainfall from just a handful of rainstorms a year. Between 1961 and 2003, he said, ten percent of the annual rainfall events accounted for 50 percent of total annual rainfall.

"The background noise in the system will make it difficult to predict change," Diaz said. Even so, he did say that high and mid-level elevation changes in precipitation are possible with a two to three degree Centigrade change in temperature.

Giambelluca added that temperatures are not only increasing, they're doing so rather quickly in some instances, noting that high-elevation nighttime temperatures have gone up 0.79 degrees Fahrenheit per decade over the past 30 years.

Also, he said that Hawai'i's temperature normally tracks the Pacific Decadal Oscillation (an El Niño-like pattern that affects temperatures over long periods of time), but over the last 25 years, the temperature here has been departing from the PDO index, which may be another sign of global warming.

He added that the weather phenomenon known as the trade-wind inversion, which is associated with less precipitation, has also in the last 25 years become more frequent and may become more so with global warming.

The Ocean

While climate modelers have their hands full with Hawai'i's unique weather system, Fletcher, a University of Hawai'i coastal geologist, has already made some highly publicized predictions about potential sea level rise effects on O'ahu. Earlier this year, when the East-West Center hosted President Bush's international climate talks, environmentalists and students took to the streets, marking them with blue chalk to indicate which parts of Honolulu Fletcher predicts will be below sea level if global warming causes ocean levels to rise another meter, which it is predicted to do later this century.

At the March forum, Fletcher showed pictures of areas that are already threatened by saltwater inundation – cars driving through ocean-flooded streets in Mapunapuna, and an open manhole along the Ala Wai canal just inches from overflowing.

In addition to calling for a statewide retreat from Hawai'i's disappearing shorelines, Fletcher said that government agencies with jurisdiction over coastal areas that will be affected by sea level rise need to start working better together.

On a broader scale, Stanford University chemical oceanographer Ken Caldeira offered some predictions about what high levels of carbon dioxide might do to the world's coral reefs and other calcium carbonate-reliant or-

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non-action item on the agenda and the commission did not vote on whether or not the landowner signature would be required, Hardy says that the commission had taken a position on the matter when it decided the dispute over Shaft 33.

"The result was, hey, the commission requires it," he says.

Even so, the commission plans to consult with its attorney on the matter.

"The commission doesn't want to encourage disputes," Hardy says. "We have some ideas. We may make a change [but] have to clear it with the AG [attorney general]."

With regard to the ongoing contested case hearing on a petition by the Maui Tomorrow Foundation and Hui O Na Wai 'Eha to amend the interim instream flow standards of Na Wai 'Eha, hearing officer and commission member Lawrence Miike is expected to complete his recommendations to the commission some time this summer. Commission stream program manager Ed Sakoda said at the March meeting that if the flow standards are not amended before the Na Wai 'Eha surface water use permits are issued, interim permits might be issued instead. The commission would then have five years from the time the use applications were filed to amend its flow standards and issue final permits. ***— T.D.***

ganisms. Right now, our carbon dioxide output is on track to reach an atmospheric concentration level of about 550 parts per million in the next few decades, a level not seen on this planet since the dinosaurs went extinct, he said.

Based on computer simulations of ocean chemistry under various levels of atmospheric CO_2, Caldeira and other scientists with the Carnegie Institution's Department of Global Ecology have calculated that if current emission trends continue, by 2050, 98 percent of reef habitats will have become too acidic for reef growth.

Caldeira presented a map of what the ocean chemistry will be with an atmospheric CO_2 concentration of 550 ppm that shows how areas where corals can survive will not only shrink dramatically, but they will move to places where they've never been before.

Local coral reef consultant Rick Grigg asked how such levels could be bad for reefs when 550 ppm is about the level that existed when corals first formed. Caldeira responded that the emission *rate*, not the atmospheric level, is what will kill corals, as well as other species that need calcium carbonate to survive. It takes a long time for the ocean to interact with sediments and to neutralize gases that it absorbs, he said.

"If humans had released [carbon dioxide] 100 times slower, it wouldn't be a problem," Caldeira said.

Species

In 2004, the journal *Nature* published an article that claimed the world could lose about 25 percent, or roughly 1 million, terrestrial species as a result of climate changes between now and 2050. Conservation International researcher Lee Hannah, one of the article's co-authors, discussed how climate changes might affect Hawai'i, which has been described as the endangered species capital of the world.

While he pointed to the work by Dennis LaPointe of the U.S. Geological Survey's Volcano field office and others on the startling shrinkage predicted for the malaria-free zone of the Big Island and Kaua'i's Alakai swamp, Hannah also highlighted the positive: The Big Island has a large elevational gradient that allows for upward movement of species displaced by warmer temperatures. Also, Hawai'i has steep drop-offs to deep water, which may alleviate coral bleaching caused by rises in sea temperatures, he said.

Whatever happens to the climate and waters around Hawai'i, Hannah concluded, there won't be a sea change in the way managers try to protect species.

"Conservation tools will be pretty much the same, but managers will need to be able to deploy them in a dynamic environment," he said. ***— T.D.***

At Exploited, Embattled Pu'u Wa'awa'a, Signs of Hope Grow along with the Trees

Outwardly, Pu'u Wa'awa'a has not changed much in the last century or so. The furrowed cinder cone once known as Muffin Hill remains one of the most prominent landmarks in North Kona. Even in dry times, the vegetation in the creases remains verdant, making the hill appear painted with dark green stripes.

But the changes that have occurred since the last lessee, F. Newell Bohnett, packed up and left are dramatic. Not all of them are visible; many, if not most, have to do with the way the ahupua'a, or land division, is managed. For these changes to become apparent at a landscape scale will take decades.

Other changes may not be visible so much as they are felt. The public, which, except for hunters, was shut out for nearly a century, is now welcome to pass through the gates that link Pu'u Wa'awa'a Ranch to the Mamalahoa Highway. Hiking trails lead to the summit, with its breathtaking panoramic views. A printed visitor guide points out the unusual plants and geological features of the area.

Most of the mauka areas of the vast area once known as Pu'u Wa'awa'a Ranch remain off-limits. But first-hand looks at these places, where many of the rare plants of the area are showing signs of a comeback, often await people who volunteer on scheduled work days.

An advisory council meets regularly, discussing volunteer projects and possible fund-raising events. For the last couple of years, a run-for-the-dry-forest has been held in the fall. At the January council meeting, ideas for future fund-raisers included a camp-under-the-stars night and possible use of the several houses Bohnett built as vacation rentals.

A healthy Clermontia is about to burst into bloom at an enclosure near the Pu'u Wa'awa'a forest bird sanctuary.

A Slow Comeback

Mike Donoho is proud of the accomplishments that are occurring at Pu'u Wa'awa'a. "We've got $32,000 from the Hawai'i Tourism Authority for fencing and $127,000 from

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the Natural Resources Conservation Service" for relining a reservoir, he says while driving a visitor around the upland areas of what was once the largest single tract of land leased out by the state.

At the summit, Donoho, who is the on-site manager for the state Department of Land and Natural Resources' Division of Forestry and Wildlife, parks the truck and we walk over to an area on the north slope of the furrowed cinder cone. The summit itself is grassed over and free of trees, but on the north slope, below a fence to keep out the sheep and pigs, a forest is taking shape. Hundreds of individuals of native trees found only in the North Kona area are thriving, though only a few years old.

Near the forest bird sanctuary, carved out of Pu'u Wa'awa'a Ranch in the late 1980s, a new cabin accommodates staff and volunteers, allowing them to work full days instead of having to drive hours each work day simply to get to and from the remote site. In yet another fenced-off tract, barely an acre in size, some of the rarest, most endangered dry forest trees are flourishing.

Changing Regimes

As Bohnett's lease with the state, which owns almost all of the ahupua'a, neared its conclusion in 2000, members of the community who were concerned about the decades of abuse that this area had seen pulled together and formed an association to protect Pu'u Wa'awa'a. With the backing of scientists, such as Peter Vitousek of Stanford University, and prominent native Hawaiians, such as Hannah Springer, they were able to obtain commitments of millions of dollars for managing the 100,000-plus ahupua'a.

The plans hinged on the state granting the group a lease. And while some in the state Division of Forestry and Wildlife were encouraged by the prospect of a new lessee who would restore the land, rather than ravage it, a number of DOFAW staffers were outraged, regarding it as a slap in their collective face.

When the proposal came before the Board of Land and Natural Resources for a decision in November 2001, it failed, and the funds that had been promised for improvements vanished. The board did, however, transfer management of the area that once made up the ranch from the DLNR's Land Division, which oversees its leases and most other unencumbered lands, to DOFAW, which received the bulk of it to manage as a forest reserve, and to the Division of State Parks, which received the coastal portion, at Kiholo Bay.

With a little help from friends, the once forested slopes of Pu'u Wa'awa'a are again dotted with native trees.

DOFAW and State Parks then prepared an ambitious management plan, but without the needed funds to carry it out, Pu'u Wa'awa'a was again a stepchild of the state, full of promise, but poor in prospects.

Boom Times

Nowadays, funds still fall far short of what is needed to manage Pu'u Wa'awa'a, much less restore the former dry forests that once led botanist Joseph Rock to rhapsodize over its incredibly rich flora.

But the land is benefiting, not only from Donoho's 24-7 presence (he lives in one of the ranch houses), but also from a work crew hired (with state funds) by a watershed partnership called the Three Mountain Alliance. (The alliance was formed by members of the highly successful Ola'a-Kilauea Partnership, whose members decided last year to expand its scope to more than a million acres on the slopes of Mauna Loa, Kilauea, and Hualalai. Members of the alliance include the state departments of Public Safety and Land and Natural Resources, the National Park Service, landowner Kamehameha Schools, the Nature Conservancy of Hawai'i, the U.S. Fish and Wildlife Service, the U.S. Forest Service, and the Natural Resources Conservation Service of the U.S. Department of Agriculture.) In addition, the state and the Forest Service have signed an agreement making Pu'u Wa'awa'a part of the Forest Service's experimental forest, which means it stands to benefit from the research and management expertise and resources that the Forest Service can bring.

To be sure, thousands of sheep still fearlessly roam Pu'u Wa'awa'a's arid lands and invasive plants – silver oak, fountain grass, apple of Sodom, lantana, kalanchoe, to name but a few – are abundant.

But in a few areas, one can glimpse what Pu'u Wa'awa'a was in its glory days – and, with luck, hard work, and generous funding – may yet become again.

— Patricia Tummons

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