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Fishy Science

Best available science — science uncorrupted by overweening economic objectives or political interests. That's the kind of science that is supposed to guide the nation's fishery management councils as they advise the federal agencies that ultimately decide such important issues as catch limits or allowable takes of rare and endangered species.

Yet, as our reports on the latest meeting of the Western Pacific Fishery Management Council document, that's not happening. Science has taken a back seat and economics is the driver.

Also in this issue: a review of Hawai'i mariculture operations, past and future; highlights of Peter Vitousek's annual gathering of environmental researchers in Hawai'i; and our regular wrap-up of actions of the Board of Land and Natural Resources.

IN THIS ISSUE

Council Maintains Bottomfish Catch Limit, Despite New Evidence It May Be Too High

I am concerned about the Deep 7 bottomfish fishery. We were overfishing in the past. We are not overfishing now. We could be overfishing in the near future if we make the wrong decision now," warned National Marine Fisheries Service Pacific Islands Regional Office administrator Mike Tosatto at the June meeting of the Western Pacific Fishery Management Council (Wespac).

A recent draft stock assessment of the "Deep 7" species of Main Hawaiian Islands bottomfish suggests that the catch limit imposed on the fishery over the past few years may be about 80,000 pounds too high. But rather than acting to reduce that limit and thus prevent overfishing, the council voted on June 26 to retain the status quo while its Scientific and Statistical Committee (SSC) further scrutinized the methods used by the Pacific Islands Fishery Science Center (PIFSC) in preparing the draft assessment.

PHOTO: NOAA/COURTESY OF DAVE ITANO

Hawaiian bottomfish.

In 2006, the National Marine Fisheries Service (NMFS) determined that the "Deep 7" species of bottomfish — opakapaka, onaga, ehu, kalekale, gindai, lehi, and hapu'upu'u — were being overfished in the Main Hawaiian Islands. A year later, the state and NMFS agreed to co-manage the fishery under an annual catch limit of 178,000 pounds. Over the years, the limit, based on PIFSC stock assessments, crept up to 241,000 pounds, then to 243,000 pounds, then jumped in 2011 to 325,000 pounds, where it remains to this day.

The current limit is based on an annual catch limit (ACL) of 346,000 pounds, which a NMFS working group determined poses a 41 percent chance of overfishing. To err on the side of caution, another NMFS advisory group determined that the ACL should be reduced by six percent to account for management uncertainty. The resulting reduced limit is referred to as the annual catch target (ACT).

In June, PIFSC research biologist Annie Yau presented the preliminary results of the most recent stock assessment to the SSC and, later, to the full council. The new assessment used the same approaches as the last one, "with one minor improvement in CPUE [catch per unit effort] standardization," the draft assessment states.

Using catch and effort data from 1948 through 2013, Yau said she found that the stock biomass has been increasing in recent years. She stated that last year, there was a 45 percent probability that the stock was in an overfished state and a 31 percent chance that overfishing was occurring.

Still, in commenting on the overall status of the stocks, she said she was confident the stock was neither overfished nor was overfishing occurring.

For her draft projections for the 2015 and 2016 fishing years, Yau determined ACLs that

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Environment Hawai'i

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NEW AND NOTEWORTHY

Environmental Courts: The 2014 legislative session was not distinguished by passage of strong new environmental laws. Still, one of the last bills signed into law by Governor Neil Abercrombie merits some attention.

Act 218 establishes a system of environmental courts within the state judiciary, which "shall have exclusive, original jurisdiction" in cases involving appeals of contested cases or challenges to rules of selected agencies that administer statutes listed in the new law. Those include HRS 6D (protection of caves), 6E (historic sites), 6K (Kaho'olawe), 128D (Hawai'i Environmental Response Law), several involving solid and electronic waste, safe drinking water, air pollution, and environmental covenants. Missing from the list are the statutes under which many environmental lawsuits are filed, including those that govern the Conservation District, the state's coastal areas, and filings with the Land Use Commission.

There is a caveat that could expand the courts' jurisdiction, however: the chief justice of the state Supreme Court "may assign to the environmental courts issues … when the chief justice determines that due to their subject matter the assignment is required to ensure the uniform application of environmental laws throughout the state or to otherwise effectuate the purpose of this chapter."

New Rules on Land Exchanges: Another bill that made it across the finish line into law involves the Legislature's review of land exchanges approved by the state Board of Land and Natural Resources. Until now, exchanges of public land for private land could be overturned only upon a two-thirds vote of either the Senate or the House of Representatives or by a majority vote in both chambers in the first regular or special session following BLNR approval of the deal.

Under Act 146 of the 2014 Legislature, such exchanges now require a majority in each chamber to approve the Land Board's action.

Correction: While on the subject of legislative action, we note that our July "Board Talk" column incorrectly stated that the Endangered Species Recovery Committee was the only remaining board within the Department of Land and Natural Resources that did not require the inclusion of a member with a background in native Hawaiian traditional and customary practices. The governor had, in fact, signed a bill making it a requirement on April 30.

Solomon Subdivision: The subdivision of a large Department of Hawaiian Home Lands lot in Waimea, leased to the mother of state Sen. Malama Solomon, has received tentative approval from the Hawai'i County Planning Department.

The subdivision was needed to legitimize the construction of at least four houses on the 125-acre lot, despite DHHL rules that generally allow no more than one house per lot.

The construction of the buildings, which include at least five outbuildings in addition to the houses, was publicized first in the *Honolulu Star-Advertiser*, in a series on DHHL lands by reporter Rob Perez. The subdivision involves creating four oddly shaped lots – laid out in such a way as to allow legal access to each lot while avoiding having more than one house on each newly created parcel.

Shepherding the process of subdivision, which also involved obtaining several variances from usual county rules for new subdivisions, was Malama Solomon, who signed the various applications and claimed to have power of attorney for her mother, Flora Beamer Solomon. In May, the county specifically asked to see evidence of that claim. A response to the request did not appear in county files by press time, yet that seems not to have delayed action on the request. (For details, see the article in the June issue of *Environment Hawai'i*.)

Quote of the Month

"You need to enter this discussion with your brain engaged."

— Mike Tosatto, NMFS

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Kona Mariculture Proposes Expansion, While Moi Operation Seeks O'ahu Permit

Mariculture is on the move in Hawai'i. At least, that's the hope of investors in two enterprises, one in Kona and one on O'ahu.

In the case of the Kona operation, Blue Ocean Mariculture LLC is proposing a 260 percent increase in the size of the open-ocean fish farm that grows out mostly kahala (*Seriola rivoliana,* or almaco jack) and a smaller amount of moi (*Polydactylus sexfilis*) in cages tethered to the ocean floor. At present, the operation consists of five pens with a total permitted volume of 24,000 cubic meters. The plan is to ratchet up to eight pens, each with a maximum volume of 8,000 cubic meters, for an increase in total volume of 38,000 cubic meters. This is intended to allow the company to increase production at its 90-acre site, due west of the Kona-Keahole airport, from the current 450 metric tons a year to around 1,100 metric tons by 2017.

Off the south coast of O'ahu, meanwhile, Randy Cates, who used to farm moi in cages off 'Ewa Beach, is wanting now to grow them in 10 surface cages suspended in an area that was dredged in the 1970s to provide fill for the Honolulu airport's reef runway. Cates is proposing to place the cages, with a total volume of 75,000 cubic meters, in the 75-acre, 50-foot-deep borrow pit just south of the runway. Cates is hoping that within two years of start-up, production will be 1.5 million pounds per year, or 750 tons – about three-fourths of the amount Blue Ocean expects to produce.

The Board of Land and Natural Resources must approve a Conservation District Use Permit (CDUP) for each of the proposals, since both involve the use of state submerged lands. On July 8, the Office of Environmental Quality Control published in its *Notice* the announcement of draft environmental assessments for both projects. The 30-day public comment period ends in early August.

PHOTO: BLUE OCEAN MARICULTURE

Surface net used by Blue Ocean Mariculture.

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Blue Ocean Mariculture: Kona Kampachi

One of the pioneers in Hawai'i mariculture was Kona Blue Water Farms, under the leadership of Neil Sims. Sims began farming kahala (kanpachi in Japanese, also known as yellowtail) around a decade ago, when he obtained a permit allowing him to install up to eight cages of 3,000 cubic meters each in waters about a kilometer north and west of Keahole Point. The original CDUP was awarded in 2003.

In 2009, the permit was changed, at the company's request, to allow just five cages, with the largest capacity of any given pen to be no more than 7,000 cubic meters. Total maximum capacity did not change.

In early 2010, Kona Blue sold its operations to Keahole Point Fish, a limited liability corporation whose sole member, according to state business records, is Blue Ocean Mariculture, LLC. In connection with the sale, the Land Board approved the transfer of the Kona Blue lease of 90 acres of state submerged lands. Lease terms, calling for payment of $2,100 a month or 1 percent of gross sales, whichever is larger, remained unchanged.

All was not well down on the farm, however. Around the start of 2006, Kona Blue had asked the supplier of its fish food, Skretting Canada, Inc. to develop a custom feed for its fish, including one feed that substituted poultry meal for some fishmeal. Kona Blue began to use the new preparation in early 2008. Not only did the feed have a lower fishmeal content – a benefit in terms of the environmental impact of farm-raised fish – but it also was apparently cheaper, saving Kona Blue about $150,000 a year in feed costs.

By October 2008, the company had complained to Skretting of slower growth in its fish, but, according to court records, Kona Blue later determined that "overstocking, strep infection, and skin flukes" caused the problems. That year, the company reported more than $6 million in fish sales to the DLNR. (Despite that, the company was not making money: for the same period, November 1, 2007, to October 31, 2008, it reported that the cost of goods sold was $8,883,506, for a net loss of around $2.8 million.)

For the next year, the feed with the poultry meal continued to be used. By the end of 2009, Skretting attorney Jeffrey C. Johnson told the court, "Kona Blue was successfully harvesting *Seriola rivoliana* at average weights over four and a half pounds, which was at or exceeding the farm's historical harvest weights."

But after Blue Ocean took over operations, it did not experience the same success rate. In November 2011, not quite a year after completing purchase of the operation, it sued Skretting in federal court. Skretting, it claimed, had reduced fishmeal content even further, replacing it with protein sources that contained less of the amino acid taurine than previous formulations and making the fish more vulnerable to infections. Skretting denied the charge, stating that the diet remained constant until Blue Ocean requested that the feed return to the formulation that did not include the poultry meal in July 2011. According to Blue Ocean, the feed with reduced fishmeal content "resulted in poor eating and slowed growth" and "increased susceptibility to bacterial infections, poor reaction to routine treatments, and abnormally high daily mortalities."

A month later, Blue Ocean switched feed providers. It claimed that "the health of the fish improved quickly and dramatically, [and] mortalities dropped."

Litigation continued through most of 2013. Last September, Magistrate Kevin S.C. Chang issued an order on various claims made by the two parties that set the terms for a negotiated settlement. Among other things, Chang found that even though Blue Ocean principal Todd Madsen, with years of experience in mariculture operations, was a sophisticated purchaser who should have read the fine-print disclaimer on Skretting product sheets having to do with variability of results from using the feed, the disclaimer was not "conspicuous." He also determined that regardless of any harm that Blue Ocean may have experienced from the millions of dollars of poultry-based feed it had purchased, it still owed Skretting around $35,000 for the high-fishmeal feed the company delivered after mid-2011.

Following Chang's order, attorneys and principals for the two companies as well as insurance managers reached a settlement filed under seal with the court, and the case was dismissed.

Over the last four years, the draft EA states, Blue Ocean has experienced a feed conversion ratio of 2.3 to 1 – in other words, it takes 2.3 units of fishmeal and fish oil produced from wild-caught fish to produce 1 unit of farmed fish. As to the use of antibiotics, a practice that is often controversial, the draft EA states that they will be used as needed, under the supervision of the U.S. Fish and Wildlife Service. However, antibiotics have not been administered to the fish since February 2011, and Blue Ocean says it "does not expect an increase in antibiotic treatment frequency under the Proposed Action."

Hydrogen peroxide, on the other hand, "is used extensively" at the farm site to control parasites on the fish. As the draft EA describes the practice, the fish are "crowded within a volume enclosed by non-permeable tarps for 30 minutes… To mitigate the risks of environmental impact, Blue Ocean continues the tarping treatment for an extra 15 minutes to reduce the amount of unreacted hydrogen peroxide released into the environment when the tarps are removed."

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Moi, Again

Randy Cates, who started up the state's first caged-moi farm in 2001, is hoping the second time is the charm. His first enterprise ended in failure after he sold 51 percent of the business to a subsidiary of Steve Case's Grove Farm, which was planning to expand the operation substantially. Unable to make that pencil out, Grove Farm took the company into bankruptcy in 2010. It ceased operation in 2011.

Now Cates is back with a new company (not yet registered, as of press time), Mamala Bay Seafood, LLC. According to the draft EA, prepared by former state Aquaculture Development Program administrator John Corbin, a Norwegian company will build the 114-foot-diameter cages, which will be suspended from stable rings at the sea surface that will also support a narrow platform from which workers can access the fish. A 72-foot-long feed barge will be permanently moored at the site as well.

The site proposed is around six miles east of the 28 acres of submerged lands that Cates leased from the state for the first moi mariculture operation. Grove Farm retained the lease after bankruptcy, paying the state $1,708 a year (minimum rent). Only in June was the lease finally terminated, with the Board of Land and Natural Resources agreeing to allow Grove Farm to leave in place four 10-ton concrete ballasts on the ocean floor, around 100 feet below the sea surface.

The former site is now available, but was not considered when the DEA was being prepared for Cates' new operation. In any case, it would be too small to accommodate the scale of production. What's more, the reef runway site is much closer to Cates' shore-side operations at Ke'ehi Lagoon.

Cates is anticipating production of 1.5 million pounds of fish a year, with a value of $6.3 million. Production at the 'Ewa Beach site was reported at between 3,000 and 6,000 pounds a week, or 156,000 to 312,000 pounds a year.

Most of the area Cates wants to lease (around 60 acres) is controlled by the state Department of Transportation under an executive order, although generally, commercial leases of airport lands requires approval by the Land Board. The DLNR controls the remainder.

Virtually all of the area makai of the reef runway has been designated in rules of the DLNR's Division of Boating and Ocean Recreation as a zone for use by recreational (not commercial) thrill-craft. If Cates is to be assigned a lease for the area he desires, the DLNR would need to withdraw the area from the thrill-craft zone.

In fact, Cates is seeking to ban craft of every kind from the area he proposes to lease. However, he says in the DEA, this probably will not inconvenience many people; monitoring of the area turned up very few users over a period of time and surveys indicated that most of those polled thought the area was a restricted-traffic zone since the attacks of September 11, 2001.

> *"[T]he federal government hasn't lost a dime on them."*
>
> ***— Sam Chi, NOAA general counsel***

The targeted density of fish is 10 kilograms per cubic meter. This, according to the DEA, is low with respect to densities elsewhere: "Ocean cage operations in other parts of the world can commonly reach densities of 50 kg/m^3, depending on the site." (Information on the densities at the Blue Ocean Mariculture operation were not included in its draft EA.)

The feed conversion ratio – pounds of feed delivered to the fish divided by pounds of fish produced – is around 2 to 1. This, the DEA says, "is generally considered acceptable for culture of a new marine fish species." The feed is to be purchased initially from Skretting, Inc., whose fishmeal components are "sourced from sustainably managed fisheries," per the DEA.

There is no discussion in the draft EA of how Cates intends to capitalize his business. In his earlier operation, he received loans totaling around $3.8 million from the National Marine Fisheries Service. By the time Grove Farms took the fish farm into bankruptcy, very little had been paid down on the principal, according to Sam Chi, with the National Oceanic and Atmospheric Administration's Office of General Counsel.

However, another company owned by Steve Case, Visionary, LLC, had co-signed for the loans. "At the end of the bankruptcy," Chi told *Environment Hawai'i,* "Visionary picked up the tab. It's still paying down the principal, but the federal government hasn't lost a dime on them."

— Patricia Tummons

PHOTO: BLUE OCEAN MARICULTURE

Workboat with spar pod

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Groups Fight Expansion Into Federal Waters

While commercial-scale mariculture in state waters appears to be ramping up, the use of federal waters for such purposes was, as of press time, still being litigated.

In August 2011, KAHEA: the Hawaiian-Environmental Alliance and Food & Water Watch (FWW) sued the National Marine Fisheries Service over the agency's issuance a month earlier of a one-year Special Coral Reef Ecosystem Fishing Permit. The permit allowed Kona Blue Water Farms to deploy an experimental fish cage — called a CuPod — and raise and harvest some 2,000 kahala in federal waters off Kawaihae Harbor on the island of Hawai'i. It was the first aquaculture operation ever permitted in federal waters.

The groups, concerned about the precedent being set, argued that NMFS lacked authority to issue such a permit because aquaculture is not considered fishing under the Magnuson-Stevens Act or the Western Pacific Fishery Ecosystem Plan, both of which guide NMFS actions. Also, they argued, a full environmental impact statement — rather than an environmental assessment — should have been prepared for the project, and anything short of an EIS would be a violation of the National Environmental Policy Act (NEPA).

NMFS countered that because the project's scope was so limited, there would be no significant environmental impacts. Therefore, it argued, an EIS was not necessary.

In late April 2012, U.S. District Judge Susan Oki Mollway found in favor of NMFS. By then, Kona Blue had finished its experiment and the permit was terminated. As a result, Mollway also found that the claim that NMFS had violated NEPA was moot.

KAHEA and Food & Water Watch appealed to the 9th U.S. Circuit Court of Appeals, which supported the lower court's ruling — except on the matter of mootness. The appeals court found that the permit was the kind of action that could be repeated while avoiding legal review. It remanded that matter back to the District Court.

Both sides filed briefs for summary judgment. KAHEA and FWW have asked the court to order NMFS "not to issue any further Special Permits for the propagation or rearing of aquatic organisms, or the harvesting of such organisms, unless it is accompanied by an EIS that evaluates the likely impacts from this permitting process in terms of growth of such facilities in Hawai'i and the concomitant environmental, socioeconomic, and cultural effects, including FAD [fish aggregating device] effects on the ecosystem and on fishermen that encounter the facility and that typically fish in and around nearby FADs."

On July 7, Mollway heard oral arguments, but by mid-July she had not issued any decision.

In the midst of the litigation, NMFS issued a second one-year experimental fishing permit to Kampachi Farms, LLC, a new company formed by Neil Sims, who sold Kona Blue Water Farms to Blue Ocean Mariculture, LLC.

The permit, which basically allows the work undertaken in the first permit to continue, expires in October. According to Kampachi Farms' website, the experiment was expected to conclude by May.

> *"To me it's really a no-brainer to want aquaculture in the U.S. and Hawai'i."*
>
> ***— Alan Everson, NMFS***

In its comments on the permit, FWW again argued that a full EIS should be done. Because the draft EA for the project stated that it was likely that the cage would serve as a fish aggregating device, "impacts of this to commercial fishermen and recreational users are highly uncertain and controversial, and will likely harm public safety. They are thus 'significant' and mandate an EIS," wrote FWW senior staff attorney Zachary Corrigan.

Corrigan continued that the cage could become untethered and cause a safety hazard.

"While the Draft EA briefly mentions that it is a distinct possibility, it fails to mention that the Beta Trial [the first permitted project] suffered a loss of both of its cages on its first attempt. … The company was forced to sink one cage. The other one … was lost and reported as a navigational hazard," he wrote.

He also claimed that, based on his analysis of records obtained via a Freedom of Information Act request, far more fish had escaped the CuPod in the first trial than had been reported.

"Farming of carnivorous finfish in open waters presents issues with disease transfer between wild and farmed fish populations; depletion of wild-fish populations to feed farmed fish; pollution from fish wastes and excess feed; fish escapes that can alter and weaken wild fish populations through interbreeding or competition for food, habitat, and mates; as well as social and economic effects on coastal communities, fishermen, and indigenous peoples," he wrote.

NMFS attorney Fred Tucher said at a recent Western Pacific Fishery Management Council meeting that KAHEA and FWW tried to add the new permit to the ongoing federal case, but were unsuccessful. They have also submitted a Freedom of Information Act request for documents regarding the permit, he said.

"They may sue us. I don't know. The second action is pretty much completed. I can't anticipate what they're going to do at this point," Tucher said.

One of KAHEA's and FWW's concerns is the proliferation of offshore fish farms throughout the region without an adequate assessment of potential impacts. While no commercial-scale projects are being proposed for federal waters around Hawai'i, NMFS is working to change that.

The National Oceanic and Atmospheric Administration (NOAA), NMFS' parent agency, aims to increase aquaculture production in the United States from about a half million metric tons a year to 1.5 million metic tons a year by 2025, according to the agency's 2007 Marine Aquaculture 10-year plan. What's more, NOAA has determined that cage culture can be done sustainably, said James Morris of NOAA's National Centers for Coastal Ocean Science at a panel discussion on aquaculture at last month's Hawai'i Conservation Conference.

"We just need to be really smart about how we do it and when we do it," he said.

NMFS' Pacific Islands Regional Office has recently established a working group, consisting of a few dozen representatives of government agencies and industry, to establish a standardized permitting process and monitoring protocol in hopes of facilitating aquaculture growth in Hawai'i.

"The United States imports 90 percent of its seafood, mostly from China and other Asian countries. … We have a $10-12 billion seafood trade deficit in this country. To me it's really a no-brainer to want aquaculture in the U.S. and Hawai'i," PIRO's Alan Everson said at the conference.

Until the permitting process changes, Kampachi Farms, at least, is unlikely to grow its kahala commercially in Hawai'i, said Gavin Key, a researcher for the company. Kampachi Farms' decision to establish its commercial facility in waters off Mexico was "almost entirely due to permitting issues," he said. Hawai'i is, however, "a fantastic place to do research," he added.

— Teresa Dawson

Bottomfish from page 1

reflected a range of overfishing probability levels that were based on possible catches from 2014 (the season won't end until September). For example, if the council wanted an ACL that posed a 50 percent chance of overfishing and the 2014 catch was 325,000 pounds, the 2015 ACL would be 316,000 pounds, with a target catch somewhat lower than that. (Yau did not include any ACTs in her presentation.)

To manage with just a 41 percent risk of overfishing, and based on a 2014 catch of 325,000 pounds, the ACL would be 264,000 pounds, Yau reported. That would result in a target catch of around 248,000 pounds. (At press time, the 2014 catch was a little under 290,000 pounds.)

But Wespac's science advisors chose not to recognize the Science Center's work as the best available scientific information. Instead, the SSC recommended that the council maintain the current catch limits while it further analyzed the CPUE standardization change in the stock assessment report.

Before Wespac members voted on whether to support the SSC's recommendation, Tosatto of NMFS urged the council to tread carefully.

"I need the council to know it has many options before it, and you need to enter this discussion with your brain engaged because this is one of the important pieces of business we have," he said.

SSC representative Charles Daxboeck noted that the PIFSC model would lead to an 80,000 pound reduction in the ACL and suggested that an SSC subcommittee hold a one- to two-day meeting to examine the CPUE standardization.

"Given the new assessment confirms the status of the stock has improved, the SSC does not foresee [problems with sticking to the] 2011 stock assessment until CPUE standardization concerns are resolved," he said before recommending that the council set the 2015 Acceptable Biological Catch (ABC) and corresponding ACL at 346,000 pounds.

Maui-based commercial bottomfish fisherman Layne Nakagawa testified in support of the SSC's recommendations.

"I don't think as a commercial fisherman I can handle an 80,000 pound decrease. It'll put me out of work for about six months," he said.

Council staff proposed that in light of the improved condition of the stock, the council should accept the SSC's recommendations. Tosatto, however, took exception to the SSC's characterization that the stock had improved over the last decade.

"In the last decade, we were overfishing. We have a 45 percent chance we're … overfished now. We are barely out of the woods, not on solid ground with this stock," he said.

He admitted that there "is reason to look hard at this stock assessment" and that his agency would be submitting the report for peer review. Still, he said, he wanted the SSC to remain focused on its task of determining the best available science and not to worry about whether it will result in a lower ACL.

"There is a very good chance we will be using this stock assessment to set an ABC for this fishing year," he said.

NMFS attorney Fred Tucher added his own concern about the SSC's proposal that in effect, rejects the 2014 draft stock assessment as the best available science. He noted that under National Standard Guidelines adopted by NMFS, a report need not undergo peer review to qualify as the best available science.

"It's desirable, but not necessary," he said.

Should the SSC, using its own model, come up with a drastically different outcome from the PIFSC stock assessment, Tosatto is going to be put in the difficult position of having to choose one or the other and then explain his choice, Tucher noted.

"We are required under National Standard Guidelines to take into account the latest information," he said. "Please keep that in mind."

In the end, the council approved the SSC's recommendation; Tosatto voted in opposition.

Grace Period

In addition to voting to maintain the current bottomfish catch limit, Wespac directed its staff to prepare an amendment to its Hawai'i Fishery Ecosystem Plan to establish a grace period allowing seafood dealers and markets to possess bottomfish for seven days after a fishery closure. The longline fishery has a similar grace period.

Council staff member Mark Mitsuyasu said that in the past, when the bottomfish fishery neared its annual catch limit, dealers stopped buying fish to avoid violating the ban on possession. Fishermen were coming up against deadlines depending on who they were selling to, he said.

Council member Mike Goto, whose family runs the Honolulu fish auction, said he remembered the last time the fishery closed.

"[We were] literally standing over fish and buyers were trying to figure out what was in their best interest," he said, adding that a grace period would help.

— Teresa Dawson

A Guide to the Alphabet Soup

ACL or "Annual Catch Limit": By 2011, the Magnuson-Stevens Act required all fishery management councils to set ACLs for all managed fisheries, except those with annual life cycles (that are not being overfished) and those managed under international agreements. ACLs are meant to prevent overfishing. Councils may not choose an ACL that exceeds the recommendation from its Scientific and Statistical Committee (SSC).

ABC or "Acceptable Biological Catch": Before setting an ACL, each fishery council's SSC must first determine an acceptable biological catch level that takes into account a fish stock's life history, reproductive potential, vulnerability to overfishing, and scientific uncertainty. The ABC also reflects an acceptable risk of overfishing, not to exceed 50 percent. Using the ABC as a starting point, the committee may set the ACL equal to the ABC or may set a reduced level based on social, economic, ecological, and management uncertainty factors. The ACL cannot exceed the ABC.

ACT or "Annual Catch Target": Once the ACL has been determined, the council has the option to reduce it further to create a buffer, again, against things like management uncertainty and harmful social, economic, or ecological impacts. That reduced number is the ACT. In the case of bottomfish, a Wespac working group determined that the ACL should be reduced by 6 percent to account for management uncertainty.

For Further Reading

For more history on bottomfish management in the Main Hawaiian Islands, see the following articles available at www.environment-hawaii.org.

- "Council Adopts New Limits on Hawai'i Bottomfish Catches," July 2011;
- "Council Once More Increases Quotas for Bottomfish in Main Hawaiian Islands," September 2009;
- "Bottomfish Restrictions May Do Little for Stocks in Main Hawaiian Islands," August 2007;
- "Council Plan for Bottomfish Takes Little Heed of State Efforts," April 2007.

Federal Fishery Council, Whale Expert Clash Over Fishing Impacts on False Killer Whales

At the Western Pacific Fishery Management Council's meeting in June, Pacific Islands Fisheries Science Center (PIFSC) research ecologist Amanda Bradford presented new data on the ranges of Hawaiian false killer whales (FKW), which the council then seized on as proof that the Hawai'i longline fishery has a negligible impact on the insular stock, which is federally listed as endangered.

Using satellite tracking data, as well as sighting data from the Cascadia Research Collective, the PIFSC has determined that individuals from the pelagic stock can occur in relatively shallow waters close to shore, that the Northwestern Hawaiian Islands stock ranges as far south as O'ahu, and that the insular stock consists of three clusters. Of greater importance to the council, the data also show that the insular FKW move further offshore on the leeward sides of the islands than they do on the windward sides. Bradford said they range as far off as 115 kilometers on the leeward sides and only 51 km off windward sides.

Despite the new data, she said, the Science Center will be keeping the stock boundary fixed for now. The current boundary extends 140 kilometers out around all islands. However, she continued, the PIFSC has formed a working group to assess the new data while a peer group will review boundary amendment recommendations. Revised boundaries will be included in the draft 2015 stock assessment review, she said.

Two weeks before the Wespac meeting, the National Marine Fisheries Service (NMFS) announced its preliminary finding that the Hawai'i deep-set (tuna-targeting) and shallow-set (swordfish-targeting) longline fisheries are likely to have a negligible impact on the insular FKW stock. With that finding, it went on to state its intent to issue a three-year incidental take permit to the fisheries. The permit, issued under the Marine Mammal Protection Act, would cover the fisheries' incidental takes of insular FKW, as well as those of humpback and sperm whales.

In comments on the proposal, Wespac executive director Kitty Simonds wrote, "[T]he Council concludes that the fishery M&SI [mortality and serious injury] estimate for the … stock is overestimated and very likely to be less than 10 percent of the potential biological removal (PBR) based on the available scientific information." PBR is the number of whales a fishery may kill or seriously injure within a specified time period without jeopardizing the stock. The annual limit for MHI false killer whales is currently set a 0.3 individuals.

Simonds argued that the assumption that the insular stock extends out 140 km is "overinflated," given data Bradford presented showing that the whales did not venture further from windward shores than 51 km.

"All false killer whale interactions that NMFS has assigned to the insular stock have occurred on the windward sides of the MHI and far from areas where insular animals have been tracked with satellite tags," Simonds wrote.

In his comments on the proposed permit, Cascadia Research Collective biologist Robin Baird could not have disagreed more with Simonds. Rather than being less than 10 percent of PBR, Baird estimated that the total Hawai'i fishery take of MHI false killer whales likely exceeds PBR.

He cites recent work by PIFSC statistician Marti McCracken that estimates that 0.45 MHI false killer whales are seriously injured or killed for every 1 million hooks set. Baird noted that the mean number of hooks set between 2008 and 2012 was 1,308,039, while the maximum number was 1,893,507.

Baird also pointed out that the prevalence of scars consistent with fishery interactions on MHI false killer whales is enough to suggest that "the individual rate of fishery interactions … may exceed that for pelagic false killer whales, where M&SI is known to exceed PBR."

What's more, because all sexed whales with fishery-related scars have been determined to be female, the estimates of M&SI may be negatively biased, he argued.

"[I]f a female involved in a fatal fisheries interaction has a dependent calf, it is probable the calf may not survive, thus effectively resulting in two mortalities," he wrote.

Baird further argued that the MHI false killer whale population is not stable or increasing, and, in fact, sighting data suggest that the population is decreasing. He also stated that given the small PBR of 0.3 whales/year and the "relatively small overlap between the fishery and the populations' range," there aren't enough federal observers on fishing vessels to produce a reliable estimate of M&SI by Hawai'i longliners.

Finally, he stated that too little consideration has been given to the role persistent organic pollutants may be having on FKW mortality rates. A study released this year on a 24-year-old female Hawaiian FKW that stranded in 2010 found that the whale was "highly contaminated" with PCBs and DDTs "well above the range of other free-ranging adult females." Other studies have found dozens of Hawaiian false killer whales to have PCB levels that exceed acceptable levels.

"As such, this source of human-related mortality should be considered in the negligible impact determination," Baird wrote.

The comment period closed on July 14. The NMFS had not issued the permit by press time.

Secret Data

Once again at the Wespac meeting, council members and Scientific and Statistical Committee representative Charles Daxboeck alleged that data collected by Baird and used by NMFS to determine the PBR for Hawaiian FKW stocks have not been made available for independent review by the SSC.

Daxboeck argued that data upon which public policy decisions are made should be readily accessible and that the council should be able to "get the data on which PBR is based."

"Some of it is proprietary from Cascadia consulting. It has not been released," he said.

To this, PIFSC research ecologist Erin Oleson pointed out that the PBR is based on the number of individuals in the NMFS photo catalogue and is not based on any private analysis Baird might have done.

The PBR is based on photos of individual animals that are publicly available, and "anybody can look at each individual animal," she said.

Daxboeck had no reply.

Despite Oleson's clarification, the council voted to recommend that NMFS include a clause in all of its future contracts and permits to ensure that "all data used for public policy consideration are readily accessible." The council also recommended that NMFS "obtain the scientific data upon which the MHI insular false killer whale stock assessment report is based, and cautions NMFS upon relying on such calculations until such data are obtained and independently reviewed."

NMFS Pacific Islands Regional Office administrator Mike Tosatto abstained from both votes.

(For more background on this, see the Wespac articles in our May 2014 issue, available at *www.environment-hawaii.org*.)

— T.D.

Fishery Council Seeks Cultural Take Of Threatened Green Sea Turtles

Apparently, some people can't wait for the National Marine Fisheries Service to decide whether to remove the Hawaiian population of green sea turtles from the federal list of threatened species. Several months ago, a green sea turtle was found dead on Maui's Ma'alaea Beach with a wound to its head and its meat gutted and removed, according to a report from the National Oceanic and Atmospheric Administration's Office of Law Enforcement.

Kitty Simonds, executive director of the Western Pacific Fishery Management Council, is also impatient with NMFS. The Association of Hawaiian Civic Clubs submitted a petition to delist the green sea turtle in February 2012. Under federal law, NMFS was supposed to have decided by February 16 of last year, but had not made a finding by press time. (According to the website of the Maunalua Hawaiian Civic Club, which made the proposal for the turtle delisting petition to the larger association, Simonds is its founder and president, another council staffer, Mark Mitsuyasu, is its vice president, and yet a third staffer, Charles Ka'ai'ai, serves as a director.)

At Wespac's March meeting, held in Guam and the Commonwealth of the Northern Mariana Islands, Simonds provided some background to a new proposal to seek ways, other than delisting, to allow people to harvest green sea turtles.

In the 1980s, Wespac, NMFS's Charles Karnella, and the U.S. Fish and Wildlife Service met in the CNMI to discuss the possibility of allowing cultural take of green sea turtles, Simonds told the council. She said the effort died because "it was determined that there were no economics involved in this. People weren't starving because they couldn't eat turtle."

With the delisting petition lingering in NMFS's offices, Wespac directed its staff to "review the Endangered Species Act delisting process and initiatives and report on innovative approaches that may allow for traditional harvest and cultural uses of green turtle under the ESA."

Simonds explained that "there is something in ESA that allows for cultural take. … It's good to revisit since we haven't talked about it in 20 years."

NMFS Pacific Islands Regional Office administrator Mike Tosatto abstained from voting on the matter.

At Wespac's June meeting, council staff member Asuka Ishizaki briefly reviewed the various ways the council could open the door to allow the cultural take of green sea turtles. The council could seek an exemption to the prohibitions on takes in the Endangered Species Act, it could seek permits for "enhancement of survival," or it could seek permission to use confiscated materials. "This would be limited to use of bones or shells, not a way to obtain meat," Ishizaki said of the last option.

Establishing management mechanisms with a scientific basis will be essential to any cultural take scenario, she said. The NMFS is currently reviewing the status of green sea turtles nationwide and what the agency decides with regard to green sea turtle populations in the Western Pacific "will dictate the way we move forward," she said. While the delisting petition sought to make the Hawai'i population a distinct population segment, "I don't know how the rest of the Pacific will be divided out," she said.

In any case, she continued, it's very clear in the ESA that any kind of take, if permitted, would have to allow the species to head toward recovery.

The council later voted to direct its staff to develop a white paper for managing green sea turtles under the council's archipelagic fishery ecosystem plans and to solicit input from each of the island areas.

Habitat Loss

So why is NMFS taking so long to decide whether to delist the Hawaiian green sea turtles?

Simonds thinks she knows – and she's not impressed.

"We've kind of heard through the Washington wireless, the coconut wireless [that] the concern by NMFS is the climate change concern: Our honu nest mainly at French Frigate Shoals and given that … the Northwestern Hawaiian Islands is slowly going to be gone … where will the turtles go?" she said.

"They'll find a new home," she said, noting that the NWHI Hawaiian monk seals have found a new home and, she claimed, are thriving in the Main Hawaiian Islands. "They're fat, sassy, cute ..." she said.

Should the green sea turtles lose ground in the NWHI, "they just might come home to the Main Hawaiian Islands. … Anyway, I just don't think that the climate change argument is a good one. That's just my personal opinion," she said.

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Spiny Lobster, Parrotfish Catch

The Annual Catch Limits that are set for species under council management are intended to prevent overfishing. For 2013, reported catch amounts exceeded the ACLs for several species throughout the Western Pacific, including parrotfish, spiny lobster, non-Deep 7 bottomfish, mollusks, crustaceans, squirrelfish, and surgeonfish in Hawai'i.

In the case of the parrotfish, or uhu, fishing take was more than double the ACL of roughly 33,000 pounds.

At the council's June meeting, staff member Marlowe Sabater explained that the "overages" in Hawai'i can be attributed to improved catch reporting that has followed the state's implementation of its Civil Resources Violation System, which penalizes licensed fishers who fail to file required catch reports.

Despite the high catches, council staff, with the support of the Scientific and Statistical Committee (SSC), proposed to increase catch limits for a number of the same species whose ACLs were exceeded.

When council member and Hawai'i Division of Aquatic Resources biologist Alton Miyasaka asked why the council would want to increase the ACLs for the Hawai'i stocks that had overages, the SSC's Charles Daxboeck repeated that the overages were simply due to better data capture and better catch reporting.

"I guess we're victims of our own good advances in catch reporting in a more real-time basis and more information on how these things are being caught," Daxboeck said.

Council member Julie Leialoha, also from Hawai'i, agreed that, yes, perhaps the council is a victim of its own success, but went on to advise caution regarding increasing the ACL for parrotfish and spiny lobster, in particular, without further monitoring.

She said that when she first saw the numbers, the huge overage of the parrotfish ACL immediately got her attention. And while the overage for spiny lobster was relatively small, the fragility of the population concerned her as well.

Sabater said he understood Leialoha's concerns. He noted that until now, there were no scientific reference points for parrotfish or spiny lobster.

"This is the first scientific exercise to get that reference point," he said, adding that when the ACL's were initially set, they did not include the time period in which the state instituted its reporting penalty system.

Annual Vitousek Gathering in Hilo: Like 'Drinking from a Fire Hose'

The lecture hall at the University of Hawai'i at Hilo was packed to the rafters for two days in June. Under the direction of Stanford University's Peter Vitousek, one of the foremost figures in the study of Hawaiian ecosystems, around 200 researchers, scientists, and students had come together, as they have for more than 20 years, to hear short synopses of some of the cutting-edge research being conducted on the land, under the sea, and in the air enveloping the Hawaiian archipelago.

And short means very short. No one was allotted more than 10 minutes, with most having just five in which to describe their work. Vitousek himself was the timekeeper, making sure that the ambitious schedule of 73 talks would stay on track in a process he likened to "drinking from a fire hose."

The presentations covered a wide variety of disciplines. As Vitousek explained: "The most important way we can honor the extraordinary place we are working, the extraordinary interaction of people and land … is to do work … across the broadest range of understanding we have."

"Push yourself to understand talks that don't come easily," he exhorted those present. "Push yourself to express the things you're interested in… Push yourself to connect."

We present here summaries of just a few of the presentations.

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Marine Subsidies For Montane Soils

For millennia, seabirds nesting high in the mountains of Hawai'i fertilized the forests with their nitrogen-rich guano. With seabird populations now diminished to a fraction of past levels, do they still contribute in any measurable way to soil fertility?

Julia Rowe, a Ph.D. student in the Department of Natural Resources and Environmental Management at the University of Hawai'i, is seeking to answer just that question. Over the last year, she has been studying levels of nutrients in soil at upper Limahuli and Hono o Napali, on the north shore of Kaua'i.

Rowe set up plots five meters in diameter in areas where Newell's shearwaters and Hawaiian petrels were present and in comparable areas where there were no birds. By tracing isotopes of nitrogen, Rowe is able to determine what percent of nitrogen-based nutrients from marine sources are in the soils and available to plants.

"To be frank," she said at the Vitousek gathering, "I was surprised to see any differences between seabird and non-seabird areas." Later, she told *Environment Hawai'i,* she had thought that with seabird numbers so low and rain so high in the areas studied, most of the nitrogen and other nutrients brought in by the birds would leach from the soil before being taken up by plants.

Yet, despite her low expectations, she did find a difference. Most nutrients (total nitrogen, nitrate, and ammonium) were higher in the seabird plots, she reported, although only ammonium was present at a higher level that was statistically significant.

Looking at the isotopic ratios in soil and leaves, she found 'ohi'a leaves to have significantly higher concentrations of marine-sourced nitrogen. At the seabird sites, 29 percent of the nitrogen in 'ohi'a was traceable to marine sources. In uluhe, the contribution was much lower – only 14 percent. Rowe offered a tentative explanation: "The uluhe samples and the soil cores I took would be accessing N from a shallow area, whereas the 'ohi'a roots will be deeper. The nitrogen that makes it down this far may be accessible to the plant, whereas the nitrogen towards the surface *may* get washed away faster, though I can't say for sure." She also noted that ferns have low nutrient needs in general, which could help explain why they do not draw up that much nitrogen in the first place.

As to why seabirds preferred some areas over others, Rowe said she had not yet finished analyzing the vegetation community in the plots. "All the areas were at similar elevations and had generally the same vegetation, same precipitation. Everything I can measure looks pretty much the same at all the plots," she said.

Most likely, "there are simply not enough birds to be able to take advantage of all the suitable habitat," she said. "Birds are still getting wiped out by cats, rats, and other predators. Other seabird folks I have talked to say the density of seabirds could be a lot higher."

"The reason I do this project," Rowe volunteered, "is that over the last 10 years or so that I have been living on the islands, I've been hearing people talk about the forests, abandoned terrace gardens of the native Hawaiians, and other ecosystems. People wonder how these systems thrived when there are so few inputs of nutrients and the nutrient levels are so low…. But seabirds used to be much more cosmopolitan. They would have been

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"It's evident that has a role, not only for parrotfish, [but also for] menpachi, surgeonfish, as well as the mollusk," he said. "We're still digging into it, but pretty sure the CRVS is involved in the high upswing."

In the end, the council – except for Miyasaka – voted to increase the ACL for parrotfish, among other species. It also voted to lower the ACL for spiny lobsters in all areas, given social, ecological, economic and management uncertainties.

Upon Leialoha's suggestion, the council also directed its staff to work with the Hawai'i Division of Aquatic Resources (DAR) to closely monitor the spiny lobster and parrtofish fisheries and to get a better understanding of the effect the new ACLs have on these stocks, as well as the impacts of the CRVS on catch trends.

Parrotfish play an important role in coral reef ecosystems, stimulating coralline algae by grazing, according to Maui DAR biologist Russell Sparks. To protect parrotfish from overfishing, DAR has proposed strict bag limits for the islands of Maui and Lana'i. Currently, there are none.

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Slim Pickings

As occurred at its march meeting in Saipan and Guam, Wespac failed to make public at or by its June meeting in Honolulu all of the documents relating to agenda items. Again, only a portion of the documents provided to council members were made available on the council's website or at the meeting.

On its website, no documents relating to agenda items on American Samoa, protected species, or administrative matters were posted. This despite the fact that the council took nine actions regarding American Samoa and five actions regarding protected species.

Only a handful of documents were posted for the rest of the agenda sections. No reports from the council's various committees, especially its influential Scientific and Statistical Committee, were posted either. The council often bases its votes on recommendations from these committees. ***— T.D.***

delivering N and P across all of the islands and in almost every ecosystem."

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Dryland Agriculture Area Found at Kaupo

The dryland agriculture systems of Kohala and Kahikinui that fed so many thousands of native Hawaiians are well documented. Recently, however, yet another such area has been discovered near Kaupo, on the southern flank of Haleakala.

Oliver Chadwick, a professor in the Department of Geography and Environmental Studies Program at the University of California, Santa Barbara, described just how the discovery was made.

"Patrick Kirch was fooling around with Google Earth," Chadwick reported. "There was a whole field system he had never seen before in Kaupo, on leeward Maui." Kirch, an archaeologist at UC Berkeley, is one of the foremost experts in the Polynesian settlement of the Hawai'i islands. Kirch, Chadwick, and Vitousek have collaborated closely in the study of the dryland agricultural systems of the Hawaiians before western contact.

Although in most people's minds wetland taro cultivation is closely associated with Hawaiian agriculture, dryland systems may have been just as important, if not more so. "It may well be that the maximum production, the increase in production that allowed Hawaiian culture to flourish, came from these dryland systems," Chadwick said.

Kaupo is on a relatively young "outflow feature" of Haleakala, he noted, with an age range from less than 5,000 years old to about 140,000 years old. "That matters," he continued, "because … if we get ages as great as what is in the surrounding area – from 350,000 to 400,000 years old – then we get into nutrient limitations because of the length of time leaching was occurring."

Kirch stated in a follow-up email that the Kaupo field system seems to have been more intensive than that in Kahikinui. "Early missionary census data indicate a considerably higher (denser) population in Kaupo than Kahikinui," he wrote. "In addition, we know from Hawaiian oral traditions that Kaupo was the 'royal seat' of King Kekaulike in the 1700s, which also speaks to its importance."

The area "joins Kahikinui, Kohala, and Kona as one of the substantial dryland agricultural areas on Maui and Hawai'i islands capable of producing considerable surplus per agricultural worker in support of the larger Hawaiian culture," Chadwick concluded.

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Wekiu Bug Update

For more than a decade, concerns that telescope development near the summit of Mauna Kea would have a damaging impact on the global population of wekiu bugs have been voiced by opponents of further telescope construction. The bug is found only at high elevations on the mountain; at one point its population was thought to be so reduced that it was proposed as a candidate endangered species.

But Jessica Kirkpatrick, resource management assistant at the Office of Mauna Kea Management, has put to rest notions that the wekiu bug and telescopes are incompatible. Kirkpatrick and colleagues Fritz Klasner and Jesse Eiben have been monitoring for invasive species of arthropods on Mauna Kea for the last couple of years as part of an ongoing cooperative program of the OMKM, Bishop Museum, UH-Manoa, and UH-Hilo to identify possible threats to the wekiu bug.

Last year, she, Klasner, and Eiben found, was a banner year for the bugs, "with the highest capture rates and concentrations ever documented." Some of the highest capture rates, they report, "were immediately outside of [telescope] facilities, areas that have been previously disturbed."

While most of their work was focused on censusing wekiu bugs and looking for threats to them, recently their work has shifted to arthropod monitoring more generally, looking especially for potentially invasive species.

The work is paying off. In 2013, inspections discovered two species of ants (including the big-headed ant) in shipments of equipment. (The deliveries were rejected.) Sticky traps caught one wasp, suspected to be a species introduced in 1939 for biocontrol of brown- and black-widow spiders.

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Post Mortem on Koa Looper Outbreak

On January 8, 2013, Natural Area Reserve System staff first noticed a huge swath of defoliated koa trees on the Hamakua Coast of the Big Island. A helicopter survey a few weeks later confirmed that more than 20,000 acres of koa had lost foliage due to an outbreak of the koa looper moth – the first such outbreak on the island since 1953.

For the next few months, said Robert Peck of the Hawai'i Cooperative Studies Unit, the moth continued to chew its way up the mountain and across the island. "By mid-May," Peck said, "it was safe to say that most large tracts of koa had been, if not entirely defoliated, at least partly so."

The moth is endemic to Hawai'i and at least 14 outbreaks had been observed since 1890. But none of them had been well studied. Peck and several of his colleagues determined to do just that, taking a close look at the koa moth outbreak at Hakalau Forest National Wildlife Refuge, on the windward slope of Mauna Kea. "We wanted to describe the dynamics of the koa moth outbreak – determine patterns of defoliation and tree survival, quantify the nutrient pulse and its effect on understory plants, and identify its impact on the food web," Peck said.

PHOTO: DLNR

Koa Looper Moth (*Scotorythra paludicola*)

At the time their study began, in March, no defoliation had occurred yet at Hakalau. By April, they were noticing a few caterpillars on the koa trees. "In mid-May, we got a pulse, and over the course of the next six weeks, the numbers built up, then tailed off by the end of July," Peck said.

When the outbreak was at its peak, he continued, "at times, caterpillars were dripping off the trees." The caterpillars declined only when there was no more koa foliage to consume, Peck said. "That's when they began to spill over to other plants — things they wouldn't normally eat."

Stephanie Yelenik of the U.S. Geological Survey studied the effect of frass from all those caterpillars on understory plants and soil. "A lot of koa were greatly defoliated,"

she reported. "Caterpillars were eating up koa leaves and phyllodes and it was coming out as frass," a polite term for feces.

With koa being a nitrogen-fixing tree, soil under koa trees already have high levels of nitrogen, so, Yelenik continued, "if you have a lot of frass falling on a system that has a lot of nitrogen, are we going to see a pulse – and does it even matter?"

There were "a lot of caterpillars, and a lot of frass," Yelenik said. "You could even hear it falling." "Frass fall" for the duration of the outbreak was estimated to range from 2,000 to 6,000 kilograms per hectare. That translates into around 192 kilograms per hectare of nitrogen – "equivalent to nitrogen fertilization for food crops," Yelenik said.

At Hakalau, some koa stands consist of trees that were planted over what were once fields of pasture grasses. With the flush of nitrogen, one obvious question was what would happen to the non-native grasses. "There was a concern that these pasture grasses that remain in the restored areas might experience a spurt of regrowth," Yelenik noted.

She and her colleagues then looked at whether nitrogen from the frass fall was making its way into several different plant species, including exotic grasses and native plants. "We took samples of grass and natives over time, in both open areas and under koa," she said. "In general, we're picking up more N in koa stands."

Paul Banko of the USGS studied the way in which birds at Hakalau responded to the koa moth outbreak. "There was very heavy defoliation throughout the study area," he said, "but still a lot of variation." In the stands of planted koa, among trees with a diameter larger than 8 centimeters at breast height (dbh), "a tremendous amount of biomass was consumed," Banko reported. "In other stands, the biomass consumed was less – but the koa is also less dense in those areas."

After 25 weeks, the trees were producing new foliage, with larger trees producing more than smaller trees and seedlings, he said. The type of foliage regenerated also varied. "Larger trees produced fewer true leaves and more phyllodes than younger trees," he said. "Is that due to the larger trees having greater nutrient reserves? Or is it more expensive for the tree to produce true leaves than phyllodes?" An answer awaits another day.

Bird activity predictably decreased as the defoliation increased. However, Banko said, "during the outbreak, caterpillar ingestion went way up." ***— P.T.***

BOARD TALK

Agribusiness Corporation Receives Lands For Aquaculture, Renewable Energy Purposes

Over the past few months, the Land Board has been transferring pieces of land on O'ahu — large and small — to the state Agribusiness Development Corporation (ADC). Unlike the Land Board, the ADC is free from requirements to dispose of leases via public auction or to set rent at market value.

At its June 14 meeting, the Land Board approved the transfer of 3.6 acres in Honouliuli that are currently held by tenants who run a rendering plant and a fish food plant.

The ADC is interested in the fish food plant, run by Island Commodities Corporation, "for a growing aquaculture industry in the state," a Department of Land and Natural Resources Land Division report states.

On July 11, the Land Board withdrew about 91 acres from a parcel in 'Ewa, O'ahu, set aside two years ago to the Department of Agriculture. At the department's request, the Land Board transferred the land to the ADC, which is interested in using it for renewable energy development, a Land Division report states.

At its July 25 meeting, the Land Division recommended transferring 147 acres of Conservation and Agricultural land in Mokuleia, O'ahu, to the ADC. A portion of the land is leased to Hawai'i Fish Company, Inc. According to the staff report, the ADC plans to issue a direct lease to the company once the transfer is completed. The board had not decided on the matter by press time.

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Land Board Gets Influx Of New – and Old – Members

The Board of Land and Natural Resources is one of the most powerful boards in the state. But one of its newest members apparently didn't even want to be on it, not at first.

The way it's supposed to go, interested people submit applications for a vacant spot on the Land Board and a selection committee forwards a list of the three most qualified to the governor. The governor picks one candidate who must then be confirmed by the Senate.

According to Hawai'i island attorney Stanley Roehrig, it didn't happen quite that way for him. Roehrig said at his first meeting as a Land Board member, "I would not have volunteered. The governor asked me to be on the Land Board." And he did not exactly jump at the chance.

"I had to chew on it a while," especially after the new financial disclosure bill became law, he said. "I'll try to do my best to contribute to this," he continued.

He added that he's told the friends who'd also encouraged him to join the Land Board that he's not going to show them any favoritism.

"I'm going to do it in the public interest. . . . Some of you will tune me up in due course and I accept that," he said.

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Later in the meeting, however, during discussion of a University of Hawai'i study of buoys in Hilo Bay and Kona, Roehrig seemed to show at least some favoritism to a member of the public, Glenn Shiroma, who had submitted testimony critical of the DLNR's handling of the matter.

Roehrig asked Kevin Yim of the DLNR's Division of Boating and Ocean Recreation what he thought of Shiroma's testimony. Yim did not seem particularly concerned about any of the points Shiroma had made.

Roehrig then went on to point out that Shiroma was "a very nice guy," albeit "very uptight." Roehrig added that he knows Shiroma's family well. "I just want you to know that," he said.

Yim conceded that Shiroma was "a very intelligent man," but sometimes " goes overboard" with his comments.

To this, Roehrig said, "We're in public service. We're supposed to be polite and professional. If we get personal with everybody who disagrees with us, I don't think that's right. … All his whole family used to campaign for me when I was a legislator. … I have a lot of aloha for his family."

Land Board chair William Aila assured Roehrig that his staff had has always been professional with Shiroma.

Roehrig replaces Robert Pacheco as the board member representing the Big Island. He has recently been joined by three more new members. O'ahu board member Reed Kishinami, who chose to leave the board rather than file the newly required financial disclosures, is being replaced by Ulalia Woodside, a former member of the DLNR's Natural Area Reserves System Commission. She is also the member designated to represent Hawaiian cultural interests.

At-large member Wesley Furtado, who serves as vice president of the ILWU, also resigned after the financial disclosure law went into effect. His spot as well as another at-large vacancy will be filled by Vernon Char and Christopher Yuen, both of whom are attorneys.

Yuen previously served on the Land Board from 1990 to 1998 as the Hawai'i island representative.

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TMT Sublease Wins Initial Approval

Thirty-Meter-Telescope opponent Kalani Flores was not about to miss his opportunity again. At the Land Board's June 27 meeting, where he orally requested a contested case hearing on a proposed sublease between the telescope developer and the University of Hawai'i, he submitted a written petition as well.

At that meeting, the Land Board entertained a recommendation to dismiss his June 13 request for a contested case hearing on the matter, as well as that of activist Dan Purcell, because they had both failed to follow up their oral requests with the required written petition within 10 days.

At the board's June 27 meeting, it approved a Land Division recommendation to issue a sublease to the TMT International Observatory, LLC, but stayed the consent until the contested case hearing process ran its course. In addition to Flores and Purcell, the Office of Hawaiian Affairs, Paul Neves, Clarence Kukaukahi Ching, Kealoha Pisciotta, Mauna Kea Anaina Hou, and Harry Fergerstrom requested a contested case hearing on the sublease.

OHA later rescinded its request. The Land Board was scheduled to hear a recommendation from its Land Division to deny all of the other contested case hearing requests at its July 25 meeting.

Although the DLNR will not be receiving any portion of the millions of dollars in rent the University of Hawai'i is expected to receive from the TMT, outgoing Hawai'i island Land Board member Rob Pacheco, who made the motion to approve the sublease, seemed comfortable that the state was receiving substantial rent for the use of the telescope site. All of the rent the university receives from its telescope sublessees goes into a Mauna Kea management special fund.

Office of Mauna Kea Management's Stephanie Nagata noted that the TMT would be contributing $2.2 million to the management of the mountain. ***— T.D.***