



Pacific Islands Fishery News

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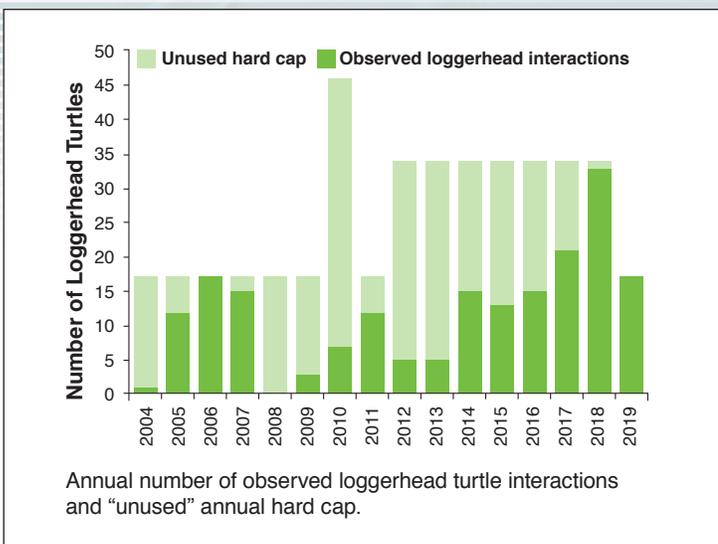
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New Turtle Limits Recommended to Re-open Swordfish Fishery

The Western Pacific Regional Fishery Management Council at its 177th Meeting held on April 12, 2019, recommended revised fleet-wide sea turtle interaction limits along with new individual trip-based interaction limits. A recent draft biological opinion (BiOp) developed by the National Marine Fisheries Service (NMFS) provided managers with basis for new limits for loggerhead and leatherback turtle interactions, potentially allowing the fishery to be re-opened this year. The fishery closed on March 19, 2019 due to interactions with 17 loggerhead turtles, all of which were released alive.

Every vessel for every trip of the Hawai'i-based shallow-set longline fishery for swordfish has a federal observer who ensures accurate monitoring of interactions with protected species. The North Pacific loggerhead population is growing annually at 2.4 percent, but a court settlement in May 2018 reduced the fishery's allowable interaction with the species from 34 to 17. The cap of 17 may be modified when NMFS finalizes the new BiOp for the fishery and issues new regulations based on the Council's recommendations.

In June 2018, the Council recommended annual limits of North Pacific loggerhead and leatherback turtle interactions consistent with what was set forth in the upcoming BiOp. The draft BiOp released on March 28, 2019 (originally promised in October 2018), requires NMFS to set an annual limit of 36 loggerhead turtles and 16 leatherback turtles for this fishery. The Council recommended these limits to be implemented under regulations for the Council's Pacific Pelagic Fishery Ecosystem Plan (FEP) and further recommended that the existing turtle interactions occurring from Jan. 1 to March 19, 2019, apply toward the new limits, essentially allowing the fishery to re-open.



The Council recommended individual trip limits of five loggerhead turtles and two leatherback turtles.

New Turtle Limits Recommended

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At its April 2019 meeting, the Council also recommended individual trip limits of five loggerhead turtles and two leatherback turtles. If a vessel reaches either of these limits during a fishing trip, the vessel would have to return to port but would be allowed to target swordfish again on the next trip. The Council's recommendation was in contrast to annual vessel-based limits of six loggerhead turtles and two leatherback turtles that NMFS proposed in the draft BiOp, which would prohibit vessels from targeting swordfish for the remainder of the year if they reached their individual limit. The Council found that this measure would create undue economic hardship to the fishery while providing little additional turtle conservation benefit.

Roger Dang, whose family has fished with longline vessels out of Hawai'i for more than 30 years, criticized the vessel limit proposed in the draft BiOp. "This is not the solution," he said. A vessel limit of two leatherback interactions would deter vessels from entering the shallow-set fishery to target swordfish and thus diminish the fleet's ability to provide swordfish for the US domestic market, he explained. "Ecuador in the last year, from 2017 to 2018, increased its production by almost 100 percent, Costa Rica 80 percent, and they're both bigger fisheries than the Hawai'i product," Dang added. "The

majority of the swordfish product in the US right now is the South American product."

"The Council's recommendation, although highly restrictive on the fleet, will allow Hawai'i vessels to continue supplying fresh, highly monitored swordfish while supporting industry-led solutions to addressing rare sea turtle interactions in the fishery," said Eric Kingma, executive director of the Hawai'i Longline Association.

Dean Sensui, the Council's Hawai'i vice chair, added, "The actions taken by the Council ensures that Hawai'i's fishermen continue to provide fresh sustainable seafood to the community and at the same time adds additional protection for sea turtles in the Western Pacific."

If the required measures under the final BiOp are inconsistent with the Council's recommended action, the Council is expected to revisit the issue at its 178th meeting in June 2019.

The Hawai'i shallow-set longline fishery operates in waters north of Hawai'i and catches swordfish that is sold both in Hawai'i and the US Mainland. It produces approximately half of the US domestic swordfish.

Oceanic Whitetip Shark Recovery Plan Kicks Off in Honolulu



Oceanic whitetip shark with pilotfish. Photo courtesy of noaa.gov.

Early in 2018, the National Marine Fisheries Service (NMFS) listed the oceanic whitetip shark species as "threatened" under the Endangered Species Act (ESA) after conducting a status review in response to a 2015 petition by the non-governmental organization Defenders of Wildlife. Scientific evidence suggests a possibility of distinct region populations, but the ESA listing at this time is for the general recovery of the species. Catch rates throughout the world have declined 80 percent (or greater), which suggests global depletion.

Chelsey Young and John Carlson from NMFS Office of Protected Resources and the Southeast Fisheries Science Center, respectively, convened a recovery planning workshop on April 23-25, 2019, in Honolulu. Experts from NMFS offices in Washington, DC, and

Honolulu and external non-governmental organizations gave presentations describing the ESA process, emerging research and a review of the previous stock assessment from 2012 (which used data up to 2009). Participants included federal and state government experts, international experts, fishermen, academics, industry partners, and Western Pacific Regional Fishery Management Council staff who all contributed to the planning discussion for the recovery of the species under the ESA.

The previous Western and Central Pacific stock assessment for oceanic whitetip sharks in 2012 suggested a very high level of uncertainty in catch histories throughout the years, which can create mischaracterizations of absolute biomass. Shelton Harley, Council Science and Statistical Committee member and co-author on the 2012 stock assessment (a Secretariat of the Pacific Community scientist at the time) gave an overview of the assessment, which described a



Oceanic whitetip shark. Photo courtesy of Mark Royer: <https://www.fisheries.noaa.gov/feature-story/shark-research-and-conservation-and-around-hawaii>.

pessimistic outlook on the stock. Harley noted that characterization of productivity and depletion from the previous assessment model suggested the stock to be near extinction by now, given existing catches over the last 10 years. However, historical catch data used in the 2012 assessment were highly contingent on reporting rates of shark catch and targeting of the species for their fins in the global shark fin trade. Oceanic whitetip shark fins were ideal in Asian markets for shark fin soup. Harley also mentioned that emerging information since the last assessment suggests that direct targeting of sharks is now prohibited internationally. This information includes “shark line” modifications to international (non-US) longline gear, which may explain apparent higher catch rates in earlier years in international fleets and also may have contributed to possible catch reporting discrepancies for oceanic whitetip in earlier and recent years.

Hawai’i longline fishery data and patterns were discussed early in the workshop. Catch rates for the shallow-set longline fishery, which targets swordfish, and the deep-set longline fishery, which targets tuna, have declined. Additionally, some spatial patterns suggested high catches of oceanic whitetips in areas that are now closed to longline fisheries. Workshop participants, including Pacific Islands Fishery Science Center (PIFSC) and Council staff, noted that both the longline fisheries and oceanic whitetip interactions shift annually due to external factors such as oceanographic features and target species distribution. Experts warned spatial patterns need to be examined carefully and relative to other regions before making inferences on regular spatial patterns that suggest higher interaction risks. Furthermore, spatial closures may have contributed to the apparent decline in catch rates.

Hawai’i fishermen and fishing leaders contributed heavily to the workshop. Local fishermen in Hawai’i

have been contributing to the emergence of scientific information and often provide vessel access and voluntary data and knowledge to help mitigate shark interactions. Additionally, the Hawai’i longline fishery far exceeds the Western and Central Pacific Fisheries Commission’s (WCPFC) standards on observer coverage and compliance monitoring, which contributes to high-integrity of data available to scientists. Hawaii-based longline fisheries have 20 percent observer coverage for the deep-set fishery and 100 percent for the shallow-set fishery, provide the most accurate and compliant catch reporting in the Pacific and which far exceeds other nations and fleets (who most often do not meet WCPFC compliance requirements of 5 percent coverage).

Workshop participants conducted a brainstorming session to develop recovery action suggestions for management and research. One suggestion included adaptive management using oceanographic tools, catch data and tagging data. This could result in a product that elucidates where a higher risk of interactions with sharks exists. However, Council staff reminded the participants that such measures need to be “bottom up,” coming from the fishermen since they are contributing data willfully and do not want to encounter sharks themselves. Such scientific information should not be used as a tool for further restrictions against the best interests of the contributors. Hawai’i Longline Association (HLA) executive director, Eric Kingma, encouraged participants to consider the Hawai’i longline fishery’s long-standing leadership in compliance, observer coverage, and zero transshipment of fishery products. Kingma also noted that “further punitive regulations will only hinder innovation in bycatch reduction and de-incentivize fishery cooperation.”

Workshop organizers and participants were receptive to suggestions by Hawai’i fishermen and experts who have

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Oceanic Whitetip Shark Recovery Plan CONTINUED FROM PAGE 3

experience in fishing gear operations. The suggestions led to discussions on reducing trailing gear (leader materials and other fishing gear) and increasing the post-release survival of sharks. Cutting leader materials (which are connected to weights and terminal gear) can create a safety hazard through a “fly back” effect towards crew members. Discussion on reducing this effect while releasing sharks led to suggestions for possible mitigation measures.

The recovery planning discussion ultimately focused on international impacts and recovery goals. It was clear that the oceanic whitetip shark population has precipitously declined in many regions due to the shark fin trade in Asian markets and illegal/unreported fishing for sharks. Federal law has prohibited shark finning in US Fisheries since 2000, while catches in other fisheries frequently increased. Sharks are not targeted in Hawai‘i due to the lack of market value. Fishermen also avoid them because they hinder their catch of target species (tuna and swordfish). Many experts, including Council staff, suggested the need to present clear objectives at appropriate international levels to reach objectives comparable to those under the ESA listing. In theory, targeting of sharks in WCPFC fisheries should have ended in 2011; therefore, compliance monitoring, electronic reporting and getting international partners to increase observer coverage remain critical common goals for ensuring the protection of many species, including sharks.

NMFS will hold a similar workshop on the US East Coast. Council staff remain diligent in assisting NMFS with a recovery plan that is both fair to fisheries under Council responsibility, and also committed to recovering and protecting an important component of global biodiversity.

Fagatogo Fish Market Re-opens



The first customers arrive at Island Fisheries Inc.'s grand opening.

On Friday, April 5, 2019, the fish market facility located in the Fagatogo Marketplace at Pago Pago Harbor officially re-opened its doors to the public. The Western Pacific Regional Fishery Management Council had assisted Gov. Togiola Tulafono (2003-2013) and his administration in using Western Pacific Sustainable Fisheries Funds (WPSFF) to construct the fish market in 2009. The market addressed one of the priority needs in the American Samoa Marine Conservation Plans (MCPs) developed by Gov. Tulafono, which outlined projects and priorities for fisheries

development in the territory. Most of the WPSFF-funded projects identified in Gov. Tulafono’s MCPs have been completed.¹ The current MCP developed by Gov. Lolo Matalasi Moliga can be found online at <http://www.wpcouncil.org/fishery-plans-policies-reports/marine-conservation-plans/>.

The fish market facility contains both a walk-in freezer and refrigerator for cold storage, a table saw for larger fish, a wash-down sink and stainless steel counter prep area. There are also refrigerated glass retail display cases, air-conditioning and a floor drainage system in the market. The facility initially opened in 2010 under the management of the American Samoa Department of Commerce. In 2017, the Department of Marine and Wildlife Resources (DMWR) assumed the responsibilities of managing and leasing the facility. It actively sought fishermen



Yellowfin tuna, bigeye tuna, wahoo and marlin fillets for sale at Island Fisheries Inc.

to operate the facility, and last year agreed to a two-year lease (through 2020) with Island Fisheries Inc.

First Friday is a monthly event at the Fagatogo Marketplace that sees a number of local businesses showcasing their products to the public. It is well-attended and presents the best opportunity for a kickoff event, which was the exact reason Island Fisheries Inc.'s local lead, Dustin Snow, chose that date to launch Island Fisheries Inc.'s fish market. Snow, a local fisherman and farmer, has a vision for the fish market's direction and growth, which includes exporting fish to other US markets and providing locally-caught fish to the people of American Samoa.

When the doors opened for business, about 30 people were waiting in line. Island Fisheries Inc. had more than 420 pounds of tuna (yellowfin and bigeye), marlin and wahoo filets on display as well as salads (tuna and green salads), smoked marlin meat and jarred preserves. A number of *alia* fishermen who attended the opening expressed how impressed they were with the market and the potential for it to be a successful local business. The fish market had a steady stream of customers throughout the day and completely sold out by the time it closed.

The success of the initial opening carried over to the following Friday when Island Fisheries Inc. opened its doors with even more fish and more customers visiting the market. On that second day, more than 500 pounds of fish were sold along with several other products made by the company. CONTINUED ON PAGE 6

Dustin Snow making last minute preparations before opening the doors to his business for the first time.



The Fagatogo Fish Market Re-opens

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Island Fisheries Inc. owner, Dustin Snow, and his family before the grand opening.

Snow, his family and staff are optimistic about the popularity of the market and the direction the company is trending. The large turnout and demand for fish fillets have exceeded expectations. The customer base has grown dramatically, with a large buzz in the community and on social media. The fish market



Alia fisherman and Fono Representative Kitara Vaiau visit the Island Fisheries Inc. grand opening.

has added sashimi and poke bowls to the menu, and it routinely sells out its entire stock, often well before noon. The success of the business shows that there is a high demand for fillets and similar value-added seafood products throughout the territory.

On June 11, Island Fisheries Inc. reported its first export of fresh fish. The shipment of more than 1,700 pounds of tuna (mostly yellowfin) was sourced from the *Sea Hawk*, which holds an American Samoa longline limited entry permit.

The challenge for the company will be receiving a steady and reliable supply of fish from the fishermen in the local *alia*, longline and troll fisheries to keep the local market and the off-island export viable.

¹Kingma E. 2016. *Fisheries Development Projects in American Samoa, Guam and Northern Mariana Islands, 2010-2015*. Pacific Islands Fisheries Monographs No. 6. Honolulu: Western Pacific Regional Fishery Management Council. http://www.wpcouncil.org/wp-content/uploads/2013/10/PIFM6_FisheriesDev_Draft-web-rev-20160923-1.pdf

Guam Fishermen Engage in Cooperative Research

At 13 degrees North, Guam is right in the middle of the tropics where strong equatorial currents are influenced by upwelling bringing nutrients from the depths to feed the bountiful fish in the water off its shores. It is surrounded by a vibrant and healthy coral reef system and offshore underwater seamounts and banks, which support a complex biodiversity that hosts more than 100 families and 880 species of fish—more than can be found in the entire Hawaiian archipelago (~600 species).

The fringing reef, on the calmer leeward north and west side, is more accessible than the rough windward east side, allowing fishermen to fish using multiple kinds of fishing gear and methods. Fishing has always been an integral part of Guam's history and culture and remains to this day an important resource of food. Archaeological data show ancient Chamorros used tools and gear to harvest reef fishes and also pelagic fishes like mahi-mahi, marlin and tuna.

Local fishermen diligently watch the moon phases, the tides, the ripening of the *kamachile* fruits (sweet tamarind) and for the *mañahak* (juvenile rabbitfish), which appear around April-May and again around October. Using these references, fishermen chase after the seasonal runs of reef fishes such as the *atulai* (bigeye scad) and *i'e* (juvenile jacks). These runs are much anticipated and are especially popular with the community as each species has its own unique preparation. When caught in abundance, each is perfect for the village fiestas, parties and weekend BBQs at the beach. In fact, when the *mañahak* have entered the lagoons and eaten, they are called *daggi* or popcorn in Chamorro, because they "pop" when fried since they have algae in their stomachs.

Other tropical fishes are found in Guam's waters year-round, especially deep-water species like onaga, lehi, 'opakapaka and gindai. For these species, one must travel to deeper offshore waters by boat and use specialized gear like electric reels, an extra battery, deep bottom rigs, and chopped up fish for chum, as well as patience and a strong stomach. The many deep-water boat fishermen have their own special spots, discovered over many ocean trips and deep drops, that they protect.

In the early '60's, the late Kuni Sakamoto and a few others were brought from Hawai'i to explore and teach local fishermen about the deep bottom fishery. They discovered a healthy bottomfish population, and the rest is history. Now even non-traditional fishermen jump into their kayaks and paddle to deep water to not only cast and jig for shallow-water fish but



James Borja

also to catch deep-water species. Just a few months ago, Raf Vargas, fishing off a kayak in deep water caught a world record dogtooth tuna at 170 pounds!

To conserve Guam's marine resources, there has to be good, reliable data and effective management. Supported by the Western Pacific Regional Fishery Management Council, local fishermen engage in cooperative research by sharing their catch data.

Among them are brothers James and Ken Borja, who have been fishing Guam's waters their entire lives—first by rod and reel, then spear, then *talaya* (circular throw net) and later trolling for pelagic species by boat. In between, they make time for deep water fish where their prowess in catching the elusive bottomfish is well-developed and known. As third generation fishermen, their skill in catching the brightest red onaga with the longest tail was developed over many years of pragmatic and persistent fishing, learning from experience, from others and even

from the greats of Hawai'i's deep bottom fishermen. The brothers are long-time supporters of the Council, serving as members of its Guam Advisory Panel and participating in the Council's data collection efforts. Over the years, they've participated in many deep-water fish tagging programs.

James, president of the Marianas Underwater Fishing Federation, and Ken, vice chair of the Council's Advisory Panel, are also very involved with Guam's free diving spearfishing community. Several tournaments are held annually with both ensuring complete data is gathered of all the catch.

In spite of holding full-time jobs, the brothers always find time to get on the water and are always ready to share their knowledge with other fishermen. Seasoned fishermen like James and Ken represent the current generation of local fishermen who carry

the burden of maintaining and perpetuating Guam's fishing traditions and culture.

With the Council's support, local fishermen engage in cooperative research by sharing their catch data.

There are others, of course, whose weekends are dictated around their fishing schedule. Expert fishermen like Stephen Meno, Frank Camacho, Matthew Orot, the San Gil brothers, Julian Flores, Michael Dueñas, Tony Terlaje, Jesse Cura, Francis Fong and Marc Artero, also fish in deep waters, but they do so in conjunction with trolling. They troll to their bottomfishing spots and then troll back.

Efforts to collect catch data, which can be tedious, is important in many ways. It provides much needed information on the biodiversity and health of the fish and reefs around Guam. It also provides important scientific information on the catch volume taken in the waters off Guam—information that is used to gauge the fish biomass, which then determines the level of sustainable annual catch limits, that will allow fishermen in Guam to continue to fish for many generations to come.



Ken Borja with a robust haul of onaga caught during a deep bottom outing off Guam.



NOAA Fisheries' Eric Cruz collecting data from a spearfisherman.

Data Collected at the Saipan Mahi-Mahi Derby Help Better Manage Fisheries



1st Place Winner - *San Juan*

This year's 15th Annual Mahi-Mahi Tournament was held at the Smiling Cove Marina on March 30th. The annual one-day derby is one of the first fishing events in the Northern Mariana Islands before the long-awaited Saipan International Fishing Tournament, which is scheduled for July 21-22, 2019.

Despite the increase in fuel prices post-Super Typhoon Yutu, a total of

30 vessels competed in this year's derby. Saipan Fishermen's Association president, Gene Weaver, noted that "fishing enthusiasts are devoted to the sport and generally love fishing. This year proved to be successful with the number of participants." He also expressed his utmost appreciation for the continued partnerships with the Western Pacific Regional Fishery Management Council, Department of Lands and Natural Resources (DLNR), Department of Public Safety, Docomo Pacific, Marianas Pacific Distributors Inc. and DLNR Division of Fish and Wildlife's (DFW) Data Section for their continued support.

Winners for this year's tournament:

FINISH	BOAT NAME	MAHI-MAHI WEIGHT
1st Place	<i>San Juan</i>	18.7 lbs.
2nd Place	<i>Ten-Seven</i>	18.3 lbs.
3rd Place	<i>Past Time III</i>	18.2 lbs.
4th Place	<i>K-Fisher 2</i>	17.8 lbs.
5th Place	<i>Victoria</i>	17.8 lbs.

The Mahi-Mahi Derby gives the DFW Data Section a snapshot of the seasonal run of mahimahi around the Marianas.

The DFW data staff, which is funded by the Western Pacific Fisheries Information Network and the US Fish and Wildlife Service's Federal Aid in Sport Fish Restoration Program, is tasked with collecting fishery data in Saipan. This data includes information such as species types, weight, size, fishing method used, fisher's name and vendor's name. The data are shared with federal partners and local agencies to better manage fisheries.



Photos, from top: 1st Place Award - *San Juan* crew; 2nd Place Award - *Ten-Seven* crew; 3rd Place Award - *Past Time* crew; DFW data technician John Paul Palacios collecting data.

Council Partners with Saipan's Garapan Public Market

DLNR Secretary Anthony Benavente and the Garapan Public Market manager, Leroy Pangelinan, expressed their appreciation to the Council and said that the ice machine would have not been possible without its support.

Saipan recently received and installed a new ice machine at the Garapan Public Market through a collaboration involving Gov. Ralph DLG Torres and Lt. Gov. Arnold Palacios's Fishery Development plan for the Commonwealth of the Northern Mariana Islands, the Western Pacific Regional Fishery Management Council and the Department of Lands and Natural Resources (DLNR). The long-awaited machine, which can produce 980 pounds of ice per day, was purchased by a Sustainable Fisheries Funds grant from funds provided by the Hawai'i Longline Association per the bigeye tuna fishing agreements.

The aim of the ice machine is to help the community and the Garapan Public Market in maintaining the quality of produce, fish and value-added products to be sold. The added advantage for this location is that fishers and the public will have easier access from the Garapan Fishing Base launching ramp to purchase ice for their coolers and fish boxes.

DLNR Secretary Anthony Benavente and the Garapan Public Market manager, Leroy Pangelinan, expressed their appreciation to the Council and said that the ice machine would have not been possible without its support. Pangelinan noted that "one of the plans for the Garapan Public Market is to create a data sharing agreement between fishers and the market. As an incentive, fishers who participate will get a discounted rate for ice by providing their catch data to the Division of Fish and Wildlife." This data will be used by both the commonwealth and federal partners to monitor both commercial and recreational fishing activities in order to make sound fishery resource management decisions.

DLNR Secretary Benavente said the ice machine at the Garapan Public Market will expand and allow the establishment of a full-time fish market for fishers who want to enter into an agreement with the market to sell their fish.

The Garapan Public Market is located in front of the Garapan Fishing Base, across the road from Kristo Rai Church. They're open from 8 a.m. to 6 p.m. Monday to Friday and 8 a.m. to 4 p.m. on Saturday. For more information, please call (670) 233-3276.

Department of Lands and Natural Resources Secretary Tony Benavente (fourth from left) and community members test out the Garapan Public Market's new ice machine.



Would Increasing the Catch Limit for Hawai'i Kona Crab Bring the Fishery Back to Life?



In March 2019, the NOAA Pacific Island Fisheries Science Center released the new benchmark stock assessment for the main Hawaiian Islands Kona crab. This assessment showed that the stock is not overfished, with only 1.6 percent probability that this will happen. The fishery is also not experiencing overfishing, with a zero percent probability. At its 131st meeting, the Western Pacific Regional Fishery Council's Scientific and Statistical Committee (SSC) declared the assessment to be the best available for determining stock status and setting harvest limits. The Council at its 176th meeting directed staff to convene working groups to quantify the scientific uncertainty to inform the setting of an acceptable biological catch (ABC) and quantify the social, economic, ecological and management uncertainties (SEEM) in order to determine the annual catch limit (ACL).

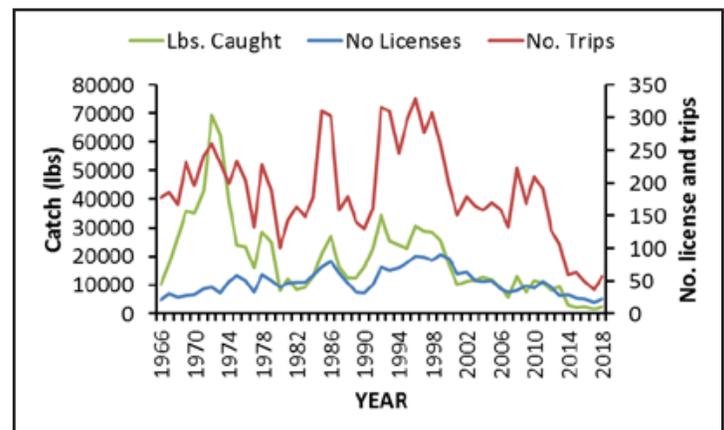
The fishery is also not experiencing overfishing, with a zero percent probability.

The Risk of Overfishing (denoted by P*) Working Group met on April 12, 2019, and quantified the scientific uncertainties based on the standardized criteria under four dimensions: 1) assessment information; 2) uncertainty characterization; 3) stock status; and 4) productivity and susceptibility. The P* Working Group is comprised of fishermen, fishery scientists and fishery managers. It quantified the scientific uncertainties and concluded that there is a 12 percent reduction from the overfishing limit (OFL). The SEEM working group met on May 2, 2019, and quantified uncertainties from the SEEM dimensions using new standardized criteria that allowed for a consistent process. The working group suggested using the social, economic and ecological dimensions

to specify the ACL and the management uncertainty from monitoring and compliance to set the annual catch target (ACT). The group quantified zero uncertainties for the social, economic and ecological dimensions and a reduction of eight percent for the management uncertainties. This would result in an ACT set at a 30 percent risk of overfishing, which would translate to an ACL of 28,324 pounds. The current ACL is only 3,500 pounds.

This information will be used by the SSC to set the ABC and by the Council to set the ACL and possibly an ACT for the main Hawaiian Islands Kona crab for the fishing years 2020 to 2023. The SSC and the Council meetings are June 18-20 and June 25-27, 2019, respectively.

The commercial Kona crab fishery catch (in pounds), effort (number of trips) and participation (number of licenses) have declined since the late 2000s (see below). In 2018, the commercial Kona crab fishery landed 2,561 pounds from 22 commercial marine license holders over 57 trips. With the potential increase in the harvest limits, would this trigger the revival of the Kona crab commercial fishery? This fishery suffered from the unintended effects of the state statute that banned the take of female Kona crabs (Act 77 of 2006). A cooperative research effort with Kona crab fishermen showed on average the ratio of male to female is 50:50. This means that on any given trip, fishermen are throwing back half of their catch to comply with the no-take of females regulation. The discard amount could be more in order to comply with the minimum size and regulations. The commercial fishery is not economically viable with a 50 percent discard rate.



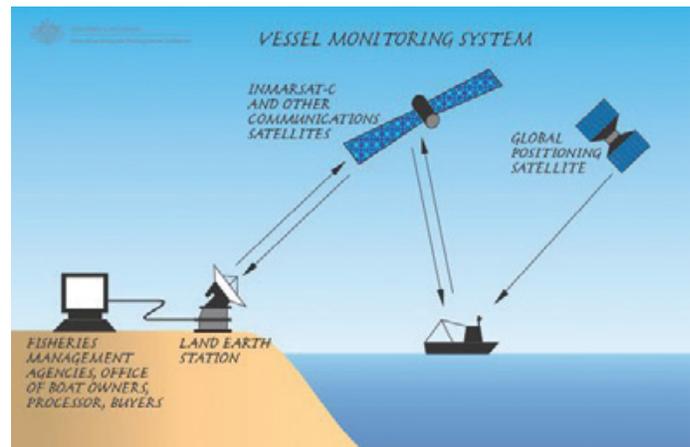
Time-series of catch (pounds), participation (number of licenses) and effort (number of trips) in the main Hawaiian Islands Kona crab fishery.

Council Supports New Technologies to Improve Fishery Management

The Western Pacific Regional Fishery Management Council has long been on the forefront of implementing new technologies into its regional fisheries to help both the fishermen and the fishery resource managers. Nearly a quarter-century ago in 1994, the Council recommended a final rule for the National Marine Fisheries Service (NMFS) to implement an electronic vessel monitoring system (VMS) for pelagic longline fisheries in the Western Pacific, making it the first region in the United States to do so. Vessels operating in pelagic fisheries of this region are required to carry VMS equipment installed by NMFS, which gives the identification and location of a vessel as monitored by satellite. The implementation of this technology was meant to monitor permitted vessels without placing extra reporting responsibilities on the fishermen, ultimately to ensure that there is no illegal fishing in closed areas as well as to expedite determining vessel location in case of emergency.

More recently, the Council has made considerable efforts to develop and deploy a progressive web data entry application for fishermen to ultimately assist in the management of commercial bottomfish fishery data collected in the Hawai'i Archipelago. A parallel process is in the works for the Hawai'i longline fishery harvesting pelagic species. The application will allow fishermen to manage their commercial license information and access fishing trip and catch data, as well as provide easy access to pertinent information for resource managers. The goal of incorporating electronic reporting into regional commercial fisheries is to make the data easier for fishers to enter and more accessible for managers. By simplifying the required process to input and summarize fisheries data, fishers will be able to better track their fishing efforts and managers will be able to have a more accurate indicator as to the status of a particular fishery at a given time. The Council hopes to have a functional version of the application within the next six to eight months. Outreach and education associated with electronic reporting is ongoing.

Not only interested in emphasizing the importance of fisheries data entry and access, the Council has also been supporting projects that involve more complicated fish species identification and size estimation via machine learning for fisheries in the main Hawaiian Islands. An algorithm is being developed to rapidly classify and estimate catch of bottomfish and coral reef fish species from digital images in an automated manner before making the information available on a user-friendly, web-based application. This tool will be used to facilitate fish detection and classification through an open source machine learning framework that uses neural networks.



The Council continues to support innovative technologies such as electronic vessel monitoring systems to deter illegal fishing and assist with locating vessels in an emergency. Courtesy nationalgeographic.com.

The automation of fish identification through machine learning will reduce the burden on scientists to manually identify and measure every single fish that comes into the market and will likely reduce errors in fisheries data associated with misidentification or duplicate counts.

For non-commercial fisheries, typically a major source of uncertainty for fishery resource managers, technology associated with data collection has been making notable headway as well. In 2017 in the Mariana Archipelago, the Council supported a one-year project to better understand the nature of the non-commercial spearfishing fishery, increase participation in non-commercial spearfishing surveys and test an online data reporting system (formerly www.ispearfish.org). Approximately 700 surveys were conducted on non-commercial spearfishing trips in the Marianas, with nearly three-quarters taking place on Saipan and the remaining conducted on Guam. The survey program resulted in a significant increase in interviews with usable catch data compared to collection programs already in place, and the associated online reporting system notably reduced the time lags in transferring information among interested parties.

Fisheries technology is not just evolving in the realm of electronics and other futuristic data reporting tools. One of the most basic examples of fisheries technology that is constantly growing and changing is fishing gear and their modifications. For example, the Council and its partners are exploring the utilization of "tori lines," long protruding rods with streamers and other eye-catching distractions, in protected species mitigation to help coax seabirds away from baited hooks during the setting of longlines. Another example of a fishing gear improvement in order to avoid protected species interactions is a line-cutting device developed by the fishers at Hawai'i Fresh Seafood. Caleb McMahan demonstrated this line-cutting device, yet to be officially named, to Council staff in March 2019. He noted its promise in reducing potentially fatal interactions with sharks in the future. Discovery of such mitigation methods helps the Council identify useful tools to help fishers remain below thresholds associated with protected species interactions.

Supporting Local Community Capacity-Building through Scholarships

The Western Pacific Regional Fishery Management Council's US Pacific Island Fisheries Capacity-Building Scholarship Program was initiated in 2015 to address a lack of local capacity in fisheries science and management in the US Pacific Islands of American Samoa, the Commonwealth of the Northern Mariana Islands (CNMI) and Guam. This college scholarship program was developed by the Council's Education Committee and is co-funded by the National Marine Fisheries Service in an effort to support the aspirations of those island governments to effectively manage their fisheries and marine resources by enhancing the hiring pool of qualified, local college graduates as well as the capacity of their current staffs. Since the program's inception, the Council has awarded scholarships to up to three individuals from the three US Pacific territories each year. Individuals who are accepted into the program are required to return to their home islands to work for the designated local fishery agency for a period equal to the number of years in which they were enrolled in the scholarship program. Prior to the initiation of this program, the Council had a similar scholarship through a partnership with the American Samoa Coral Reef Advisory Group (CRAG), which supported the cost of sending qualified American Samoa Community College students to receive their bachelor's degree in a marine science-related field with the agreement that they return to American Samoa to work for one of CRAG's partner agencies.



Keena Leon Guerrero (center)

In four years, four students have graduated from the Council's scholarship programs and have returned home to work for their local governments. In CNMI, Carey Demapan and Keena Leon Guerrero have both graduated from Hawai'i universities and returned home where they now work for the Department of Land and Natural



Carey Demapan

Resources (DLNR) in the Division of Fish and Wildlife (DFW). In American Samoa, Fa'asalafa Kitona and Valentine Vaeoso graduated and have returned to work for the Department of Marine and Wildlife Resources (DMWR) and the National Park Service (NPS), respectively.

Carey Demapan was born and raised on the island of Saipan. Before she received the Council's scholarship, she had already participated in Council activities. In 2014, Carey gave a presentation in Washington DC at the First Stewards Symposium and Living Earth Festival on the impacts of climate change on Sugar Dock, a culturally significant landmark on Saipan. After earning her associate of science degree in natural resource management, she was awarded the Council's US Pacific Island Fisheries Capacity-Building Scholarship in 2016 and enrolled at the University of Hawai'i at Hilo (UH Hilo) where she graduated in 2017 with a bachelor of science degree in marine science. That summer, Carey completed an internship at the Council office in Honolulu where she worked with Indigenous Program Coordinator Charles Ka'ai'ai on the Council's lunar tide calendar and assisted with the annual high school summer course. Upon graduating from UH Hilo, she returned to her home island of Saipan and was hired to work at DLNR where she is currently serving as the public outreach specialist for the department's DFW Sea Turtle Program. In that role, Carey engages communities to promote turtle conservation. Her goals are to increase the public's general knowledge of sea turtles and use that knowledge to reduce poaching. In her free time, she enjoys softball, volleyball and stand-up paddling. Carey plans to continue her educational journey and earn a master's degree in resource management or water quality.

Keena Leon Guerrero was also born and raised on Saipan. She attended schools on Saipan and Guam before graduating from Mountain View High School in Boise, Idaho, in 2013. After her high school graduation, Keena enrolled at Hawai'i Pacific University. She was awarded

the Council's scholarship to complete her final two years of school there and graduated cum laude with a bachelor of science in marine biology in May 2017. During her internship with the Council, she worked on education and outreach on marine protected areas on Tinian and Rota. After graduation, Keena did a second internship for the Council working with CNMI Council Member John Gourley on a life history program, collecting samples from fish markets and analyzing otoliths and gonads of various fish species. When she returned home to Saipan, she was hired by DLNR as the DFW Data Section fisheries biologist. She learned first-hand from the fisheries staff and working with community partners while on the job. Her plan was always to continue her education and that became a reality when she was selected this year as one of the Council's scholarship recipients again. Keena will be enrolling at the University of Hawai'i at Mānoa this fall where she will work toward earning a master's degree in



Fa'asalafa Kitiona (right)

marine biology. She looks forward to completing another step in her educational path and returning to Saipan once again to implement the knowledge she gains working in fisheries management.

Fa'asalafa Kitiona is a graduate of the American Samoa Community College. She comes from a fishing and farming family – her grandfather is one of the pioneer fishermen in American Samoa. She received a bachelor of science degree in marine science from UH Hilo in the spring of 2017 and returned to work for DMWR in the CRAG office where she serves as the priority watershed coordinator. In that position, Fa'asalafa is responsible for the implementation of the Faga'alu Village Management Plan and coordination between the local and federal agencies for the activities and tasks in that plan. She works closely with other villages to develop climate change resiliency and watershed management plans for their respective watersheds. In addition to her watershed management duties, she also assists the CRAG staff with its ongoing coral reef monitoring efforts, participating in partner agency meetings to address sources of pollution and contributing to the US Coral Reef Task Force's Priority Watershed Working Group's efforts. Her internship at the Council was working with staff to evaluate potential climate change impacts on fisheries performance.

Valentine Vaeoso is also a graduate of the American Samoa Community College. She was a recipient of the Council and CRAG's shared scholarship. Like Demapan and Kitiona, she graduated from UH Hilo, earning a bachelor of science degree in marine science in the spring semester of 2017. Valentine was hired to work at NPS of American Samoa through its partner nonprofit organization, American Conservation Experience, as a marine ecologist. Her responsibilities have included assessing the crown-of-thorns starfish threat and assisting with eradication efforts. She conducts assessments of coral bleaching in NPS waters and surrounding areas and processes long-term temperature data from sites on Tutuila and Manu'a. She also performs fresh and saltwater quality monitoring and assists with fish and coral surveys conducted by NPS. Valentine's main interest is marine conservation through public awareness, and she enjoys educating the communities of American Samoa on ways to protect the environment, and the importance of the marine ecosystems.

The Council's scholarship programs and the graduates they have produced have been applauded by the agency heads of those two island areas. DMWR Director and Council Member Henry Sesepasara believes the Council's scholarship programs have assisted the local island governments with hiring qualified local people, which has helped to alleviate the need for off-island hires for specialized jobs within the agencies. He feels the graduates's connection to their home islands is a critical part of not only building but also sustaining capacity in the fisheries and marine resource management agencies of the US Pacific Islands. CNMI's DLNR Secretary Anthony Benavente echoed Sesepasara's support for the Council's scholarship program. He said the program addresses educational programs and opportunities in marine science and fisheries, which are either limited or completely absent in the US Pacific Island territories. Benavente commended the scholarship program for growing the local human resources which have in turn improved the fisheries management capabilities of those local governments.



Valentine Vaeoso

Council Advisory Panels Plan for Upcoming Term 2019-2022

Earlier this year, members of the Western Pacific Regional Fishery Management Council's Advisory Panel (AP) met to discuss their concerns and map out what they plan to work on in their current term. The development of an AP Plan is part of the Council's objective of effectively integrating the AP into the Council process. The AP is essential to the Council, providing advice on fishery management issues and input into fishery management planning efforts. The Council's AP consists of four sub-panels—American Samoa, Guam, the Commonwealth of Northern Mariana Islands (CNMI) and Hawai'i—reflecting the archipelagic-based management in the Fishery Ecosystem Plans in the Western Pacific.

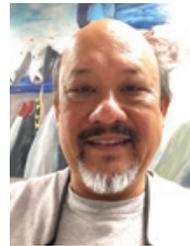
Each of the sub-panels met with Council staff in Honolulu to brainstorm priorities and issues that are affecting fisheries in their area. From there, the sub-panels took each of those priorities and issues and developed a goal for how they would like to see those issues resolved. Then they assigned tasks and activities to meet that goal, along with a timeline for meeting the goal and a projected outcome. AP members volunteered to lead the efforts for different activities.

The goals and activities described ranged from providing additional fishing opportunities to educating the broader community on the fisheries in their island area. The American Samoa sub-panel will be working on proposals to diversify their fisheries by including fresh fish marketing locally and potentially by export. The Guam sub-panel is interested in addressing shark depredation in their fisheries and will work with Council staff to develop proposals and implement potential projects. The CNMI AP agreed to work with the government on developing infrastructure to support fisheries and future development. Meanwhile, the Hawai'i sub-panel is revisiting the dynamics of the deepwater shrimp and uku fisheries to determine how to better manage these fisheries through data collection.

The Council's vision is for the AP members to work actively within their communities as the liaison between fishery managers/scientists, and the public. The AP Plan will help the Council work with the communities and solicit their advice and recommendations to the Council on fishery issues. The goal is for management decisions to be based on community input as well as for communities to be informed and willing to follow fishing management decisions.

Advisory Panel Chair and Vice Chairs Appointed

The Council recently appointed Clayward Tam to be the overall Chair of the Advisory Panel (AP). Tam has been an AP member for several years, works with the Pacific Islands Fisheries Group and has fisheries experience with the State of Hawai'i Division of Aquatic Resources. A long-time advocate for fishermen, Tam takes over the helm for the 2019-2022 AP term.



Clayward Tam

To help him in his duties, the Council also appointed vice chairs representing each of the AP sub-panels:

- American Samoa: William Sword
- CNMI: Richard Farrell
- Guam: Ken Borja
- Hawai'i: Gil Kualii



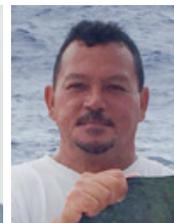
William Sword



Richard Farrell



Ken Borja



Gil Kualii

Each of the vice chairs has been a staunch fishery supporter in his island area and will provide leadership and direction under Tam's guidance. Get to know your AP chair and vice chairs and provide comments and suggestions to them and the entire AP!

For more information on the AP, visit the Council's website at www.wpcouncil.org.

2019 US Pacific Island Fisheries Capacity-Building Scholarship Program Announces Three Winners

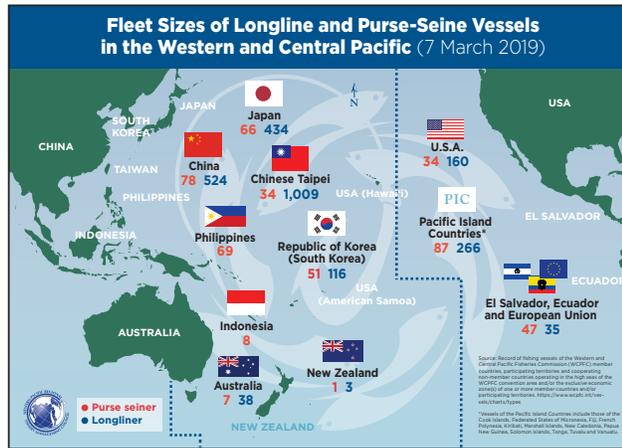
The recipient from the Commonwealth of the Northern Mariana Islands (CNMI) is Keena Leon Guerrero, who will be enrolling at the University of Hawai'i at Mānoa this fall where she will work toward earning a master's degree in marine biology. Leon Guerrero was a previous recipient of the US Pacific Territory Capacity-Building Scholarship, graduating from Hawai'i Pacific University with a bachelor of science degree in marine biology in 2017. She is currently working for the CNMI Department of Land and Natural Resources as the Division of Fish and Wildlife's Data Section fisheries biologist. She was born and raised on Saipan.

New Outreach Resources

The two recipients from American Samoa are Alphina Liusamoa and Fuamai Tago. Both students graduated from the American Samoa Community College in spring 2019 with an associate of science degree in marine science. Liusamoa graduated from Manu'a High School, and Tago is a graduate of Nu'uuli Vocational and Technical High School. The students will be attending an internship at the University of Hawai'i at Mānoa in June before departing in August to work toward their bachelor of science degrees in marine science at the University of Hawai'i at Hilo.



American Samoa recipients Fuamai Tago (left) and Alphina Liusamoa (right) with the American Samoa Department of Marine and Wildlife Resources director, Henry Seseapasara.



seine vessels in the Western and Central Pacific. The third poster highlights the regulated commercial fishing areas of the US EEZ in the Western Pacific. The large display explored various life history characteristics of 'opakapaka and swordfish that are used to improve stock assessments. To download the posters and display, go to www.wpcouncil.org.

Palgrave Studies in Natural Resource Management has just announced the release of *Tradition-Based Natural Resource Management: Practice and Application in the Hawaiian Islands* by Ed Glazier. The book offers an overview of bottom-up management of natural resource management that can be applied globally; spotlights Native Hawaiian advocacy for traditional management of the island's natural resources; and provides a framework for resource managers, scientists and policymakers as well as indigenous populations.

In the Foreword, Kitty M. Simonds, executive director of the Western Pacific Regional Fishery Management Council, writes: "From the resurgence of non-instrument navigation and traditional voyaging canoes to familiar activities like baby lua'u and other pa'ina (celebratory feastings), Ed shows that continuing and reclaiming the indigenous culture occurs on many levels and involves both Native Hawaiians and those who have come to call Hawai'i home."

For more information go to <https://www.palgrave.com/us/book/9783030148416>.

Several new posters and a display were created for the 176th Council Meeting in March 2019. One poster illustrates a composite three-month fishing effort in the Pacific Ocean, both domestic and foreign, in relation to several countries' exclusive economic zones (EEZs). The second poster compares the fleet sizes of longline and purse-

Council Family Updates

At the 176th Council meeting, the Council supported the following advisory body changes:

- **Myles Driscoll** is joining the Guam Advisory (AP) sub-panel, replacing Felix Reyes who was hired as the council coordinator for Guam.
- **Ray Tebuteb** is being appointed as a CNMI AP sub-panel member.
- **Ashley Tomita**, NOAA Pacific Islands Fisheries Science Center (PIFSC), is joining the Pelagic Plan Team.

- The Archipelagic Plan Team welcomes three new members: **Paul Murakawa**, and **Annette Tagawa**, Hawai'i Dept. of Aquatic Resources (DAR); and **Stephanie Dukes**, NOAA PIFSC.
- The Education Committee welcomes four new members: **Pauline W.U. Chinn**, Univ. of Hawai'i; **Jon Fernandez**, Guam Dept. of Ed (DOE); **Magdalene Leauanae**, American Samoa DOE; and **Asapmar Ogumoro**, CNMI Public School System.
- The Fishery Data Collection and Research Committee welcomes three new members: **Chelsa Muña-Brecht**, CNMI Dept. of Ag; **Tyrone Taitano**, Guam Bureau of Statistics and Plans; and **Brian Neilson**, HI DAR.



Amy Vandehey

Amy Vandehey has joined the Council staff as its outreach and education coordinator. Vandehey has been involved in outreach and education efforts in Oregon and Hawai'i since 2005. Her primary duties include producing publications and news media resources, coordinating and promoting meetings and events, and overseeing the Council's education and outreach initiatives such as the scholarship program, educational resources and Education Committee. A native of Oregon, Vandehey holds a master's degree in marine resource

management and a bachelor's degree in zoology from Oregon State University.



CNMI Coordinator Floyd Masga with new Education Committee member Asapmar Ogumoro (right).



2019 Council Calendar

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View us on Instagram (wpcouncil)

June

12
American Samoa Archipelago Fishery Ecosystem Plan Advisory Panel, Tutuila, American Samoa

13
Mariana Archipelago Fishery Ecosystem Plan Advisory Panel, Saipan, CNMI

18-20
132nd Scientific and Statistical Committee meeting, Honolulu

20
Hawai'i Archipelago Fishery Ecosystem Plan Advisory Panel, Honolulu

21
11th Conference of the Pacific Community, Noumea, New Caledonia*

24
Fishery Data Collection and Research Committee, Honolulu

24-27
178th Council meeting, Honolulu

July

11-15
International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean 2019 Plenary (Chinese-Taipei)*

11-18
North Pacific Fisheries Commission committee meetings, Japan*

15-26
Inter-American Tropical Tuna Commission and Agreement on the International Dolphin Conservation Program meetings, Bilbao, Biscay, Spain*

20-21
Saipan International Fishing Tournament, Saipan, CNMI*

21-25
National Marine Educators Association Conference, Durham, N.H.*

29-Aug. 2
International Symposium on Deep-Sea Corals, Cartagena, Colombia*

August

7-15
Western and Central Pacific Fisheries Commission meeting, Pohnpei, Federated States of Micronesia*

19-30
3rd Session of the UN Marine Biodiversity of Areas Beyond National Jurisdiction Conference, New York City, N.Y.*

* Meetings are not hosted by the Western Pacific Regional Fishery Management Council

Recipe

Grilled Swordfish on a Bed of Orzo and Spinach Topped with Watercress Beurre Blanc



Preparation

Marinate swordfish in herbs and olive oil for 2 hours. Cook orzo, cool down and set aside. Blanch spinach and strain out water. Sauté onions, shallots, garlic and lemon in pot. Deglaze with white wine. Reduce to half. Add chicken stock. Reduce to half and then add heavy cream. Reduce until thick. Strain sauce and blend in blender with butter and watercress. Sauté spinach with orzo and garlic and butter, to taste. Grill swordfish 1½ minutes each side.

Plating

Set orzo and spinach at center of the plate, place fish on top and pour sauce over the fish. Garnish with fresh watercress.

Courtesy of Chef Nico Chaize, Nico's at Pier 38, Honolulu

Serves 2

Ingredients

2 7-oz swordfish steaks
rosemary
thyme
basil
olive oil
orzo
spinach
1 cup onions, diced
½ cup shallots and garlic
1 lemon, whole, peeled
2 cups white wine
3 cups chicken stock
4 cups heavy cream
½ cup butter
1 bunch watercress, fresh

Upcoming Events

132nd Scientific and Statistical Committee meets June 18-20 at the Council office, 1164 Bishop St., Suite 1400, Honolulu. Major agenda items include the acceptable biological catch for the main Hawaiian Islands (MHI) Kona crab and the Territory bigeye tuna catch and allocation limits.

178th meeting of the Western Pacific Regional Fishery Management Council convenes June 25-27 at the Laniakea YWCA, Fuller Hall, 1040 Richards St., Honolulu. Major agenda items include final action for specifying annual catch limits for the MHI Kona crab, final action on precious coral essential fish habitat amendment, final action on managing loggerhead and leatherback sea turtle interactions in the Hawai'i-based shallow-set longline fishery, and final action on Territory bigeye tuna catch and allocation limits.

Fishers Forum "Fishing in the Future: Emerging Technologies in Fisheries" takes place from 6 to 9 p.m. on June 25 at the Ala Moana Hotel, 410 Atkinson Dr., Honolulu. This free, family-friendly event includes information booths, presentations, refreshments, door prizes, complimentary



parking and more. Come meet and talk story with fellow fishermen, and learn about new fishing technologies and how they can help you.

For more information on these events, go to www.wpcouncil.org or contact the Council at info@wpcouncil.org or (808) 522-8220.