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*Andy Collins:* ...that are run by the fish and wildlife service, but it's mostly open ocean habitat, low-lying sandy atolls that you don't see their...a lot of them are islands that are named after shipwrecks because the people didn't even see them before they came upon them. So, they're relatively unknown throughout the U.S. and even in Hawaii it's surprising how few people know that part of the state of Hawaii stretches all the way out there beyond Kawaii.

*Jennifer Stock:* That must be a challenge as the education and outreach coordinator to not only educate the local island folks that live out there about that area, but the larger populace as well because we all effect it so much. So, tell me a little bit about some of the early inhabitants of these islands. I've read, you know, Polynesians have crossed the Pacific many times, the military has had some time out there. Can you talk a little bit about some of the folks that have lived out there before or used it as a holy place for..

*Andy Collins:* Sure, sure. Well, they think that the early people first arrived in Hawaii about 500 A.D. and we know from carbon dating and some of the archaeological sites on the first two high islands, Nihoa and Mokumanamana, in the northwestern Hawaiian islands that people probably lived there from about 1000 A.D. to 1700 A.D. So, for some reason they left. There is some evidence of house sites and archaeological terraces up there, particularly in Nihoa. Nobody ever lived on the second island of Mokumanamana, but they definitely lived on Nihoa and they lived there for about 700 years. It's a really inhospitable environment.

It's really dry, there's no fresh water, everything smells like bird poop; It would be a pretty rough place to live, but they lived there for 700 years and then just stopped and we don't know why. That was prior to western contact in the islands. So, 1000 to 1700 A.D., later on in that century, western explorers first discovered Hawaii and from about early 1800's to 1900's the area had a...well, it was pretty well exploited. People went up there to hunt whales. They hunted seals, sea turtles, there were a few small fishing operations up there.

At the turn of the 20th century in the early 1900's a lot of people were going to the islands to harvest seabirds and they would harvest them by the millions. I mean, these amazing pictures of people harvesting the eggs of the Laysan albatross and killing the

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birds for their feathers, for the millinery trade, and that was the first thing that really inspired protections for the area. The U.S. recognized that these islands were being exploited and that bird populations were dwindling and president Roosevelt decided to send some military up there to stop this exploitation and that was the creation of the Hawaiian Island Bird Reservation in the early 1900's, 1906, was when that happened.

*Jennifer Stock:* Can I ask, what were they harvesting the eggs for? Laysan albatross eggs, they're huge. They're almost the size of a Coca-Cola can, a soda can, and what did they use those for as well as the birds?

*Andy Collins:* They used the albumen in the egg for film plates, for the photography industry, and I don't know of any other use that they really had for them. I mean, they're not really edible. They taste like...most seabird eggs aren't very edible. I mean, it's interesting, a kind of parallel history was going on between the Farallon Islands and...

*Jennifer Stock:* Yes, it sounds very familiar with the exploitation...

*Andy Collins:* ...the Northwestern Hawaiian Islands except for, I guess, the eggs that they were harvesting on the Farallons were a little more edible than the ones from Northwestern, but they had a similar history of exploitation, but they weren't as much interested in the eggs as they were in the feathers and also the bird guano. I mean, these islands are...there are 14 million seabirds nesting out there, like I said, you get on the island and it really, really smells of bird guano and they harvested that for fertilizer. That was their primary commercial interest in the islands.

*Jennifer Stock:* Fertilizer for gardening for crops on the mainland?

*Andy Collins:* Yeah, for the fertilizer industry. I mean, they would harvest tons of high-grade phosphate...the bird guano is composed of phosphates. So, they would extract that and then process it into fertilizer for agricultural interests in the U.S. and abroad.

*Jennifer Stock:* So, I take it with some of the western exploration that there are probably some historical artifacts remaining in the area from accidents, much like shipwrecks that we have here along the coast and shipwrecks along those coral reefs because I'm sure they're

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really hard to navigate. Approximately how many shipwrecks do you think are out in the northwestern Hawaiian Islands?

*Andy Collins:*

I think they know of about 55 known shipwrecks in the area.

*Jennifer Stock:*

That seems like a small amount actually, for that large area.

*Andy Collins:*

Yeah, I mean, but again, this is the middle of the Pacific. It's not like it had a lot of commercial traffic in the area. There are no harbors in the area. The harbor at Midway was artificially created. So, although there was commercial traffic going through the area, it wasn't nearly as high a volume as, say, near Lahaina near the island of Maui where a lot of the whaling vessels came back to port.

So, there was no reason for them to be hovering around the area. There were these industries there, but not nearly the kind of traffic that you have going in and out of a large port.

*Jennifer Stock:*

So, is the staff with The Marine National Monument working on any research programs out there? I'm familiar with a little bit and I'm wondering if you could share some of that the listeners.

*Andy Collins:*

Yeah, sure. Well, every year we have a few research expeditions that go into the northwestern Hawaiian Islands. We go up there for monitoring of coral reefs. We go up there for predator-tagging and large, what they call apex predators, and these are your sharks, your large jacks, groupers, and we tag them with radio receivers to find out whether they're site-specific or whether they hang out around a particular atoll or if they travel all up and down the chain. We also collect fin samples for genetic sampling for similar studies to try to find out whether all these atolls are connected as a single ecosystem or whether they're separated into different parts and need to be managed differently.

The primary focus of all of this research is how to best manage the area for protecting it in the long run. All of our research has management applications and we try to permit research that has management application that will better the resource. That's the kind of research, mostly, that NOAA is doing at this marine base research study of coral reefs, study of algae up there, study of inter-connections between atolls, and the, most of the fish life, but also there's the fish and wildlife service that conducts a lot of seabird surveys and studies up there to look at the health of the seabird population. So, National Marine Fisheries Service takes care of through the Marine Mammal Protection Act, protects monk

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seals to try to recover their population and also green sea turtles are under the National Marine Fisheries Service.

*Jennifer Stock:* Excellent. We're talking with Andy Collins from the Northwestern Hawaiian Islands Marine National Monument, just recently designated in June this year. I believe we have Claire Johnson on the line. I'm going to see if she's available to talk about her recent expedition out there. Claire are you on the air?

*Claire Johnson:* Yeah, hi Jenny and Andy. I'm happy to be on the air with you folks and just about a week and a half ago came back from a 28 day voyage out to the Northwestern Hawaiian Islands.

*Jennifer Stock:* Claire Johnson, folks, is an educator with the National Marine Sanctuary program and had the opportunity to be a part of this cruise and work with the educators that were involved on this cruise and I'm hoping she can share a little bit about the mission of the cruise.

*Claire Johnson:* Yeah, absolutely. We were on the NOAA ship, Hi'ialakai. It's about a 225 foot research vessel and I happened to be leading up a 5 member education and outreach team, which included myself and the main mission was coral benthic habitat mapping. So, they were trying to do some high-resolution mapping of Kure Atoll, which is the furthest northwestern atoll in the world and in this Hawaiian archipelago and the two secondary missions, one, as I mentioned was the education and outreach and the second one were there was a team of 16 maritime archaeologists studying some of the historic shipwrecks up in the area.

*Jennifer Stock:* Excellent, we were just talking about that a little bit, actually, before you got on, Claire, and I understand there was a new discovery made on this cruise.

*Claire Johnson:* Yeah, one of the very exciting things, particularly for our group of educators were we were basically the second set of eyes to sea this shipwreck called the Dunnottar Castle. It hadn't been seen or found since it wrecked 120 years ago and it's actually a pretty historically significant shipwreck because it's connected to the Hawaiian kingdom. It was a fortunate discovery because there were rare and very pristine flat calm conditions out at Kure Atoll that they were able to come across it sort of in a shallow area and this is nearly a 300 foot sailing vessel that sort of just was splayed out in 25 feet of water, you could swim along it, you know, 270 feet of this vessel and see...it was a pretty amazing experience and a very exciting discovery for the maritime archaeology team.

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*Jennifer Stock:* So, once they discovered it, what took place after that? Did the photograph the wreck?

*Claire Johnson:* Yeah, they did some initial survey work on the site. Yeah, they do run some transects and take some photographs and video documentation. I imagine that on a future expedition that may be another one of their sites they'd like to return to and their next level of survey is doing baseline trilateration, which is laying a baseline through the heart of the shipwreck and from there, starting to map out what some of the significant artifacts are and often they do that for ships that they're uncertain of what the shipwreck is and they did a lot of work at Kure Atoll on this unknown wreck that the records seem to indicate is The Parker, which was a whaling vessel that wrecked on the reef in 1842.

So, now that they know that they're pretty sure this is the Dunnottar Castle, I'm not entirely certain what type of surveys they'll do on the next round, but most of the time they're running baseline transects and doing trilateration to get a sense of laying out where the artifacts are and then they take that information back on the ship and they sketch out these beautiful maps or charts of the wreck site underwater and that can be used not only for education and outreach, but to further their research and survey work.

*Jennifer Stock:* Excellent. That's super exciting. I hope that we'll be able to keep track of that through the sanctuary's website. Claire, can you talk about, this is your first time out there and I'm sure it was pretty exciting. Did you have any moments of just pure amazement while you were in the water?

*Claire Johnson:* Absolutely. You know, I was born and raised in Hawaii, living on the big island my whole life and like Andy had mentioned, being a member of the Hawaii community and I hadn't even heard about these northwestern Hawaiian Islands growing up and just found out about them in the last ten years or so and immediately was drawn to wanting to have an opportunity to get out there and fortunately for me, the opportunity was on this mission and to see fish that I've never seen in the main Hawaiian Islands and to see them in abundance was pretty amazing. We saw tons of endemic species in Kure Atoll and at Pearl and Hermes Atoll where we were doing our work.

We actually conducted quite a few Reef Environmental Education Foundation surveys, which are basically counting fish so that we

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can give data on the species abundance and diversity. So, we completed 60 reef fish surveys at 13 sites at Kure Atoll and definitely for me the highlight was swimming with some of the top apex predators such as the Galapagos shark and the white-tipped reef sharks, the giant trevally, which in Hawaii is known as the ulua. Those were pretty neat encounters and because the conditions were so flat calm at Kure Atoll we had a pretty rare opportunity to do some snorkeling and fish surveys on the outer reef crest where basically, you know, however many feet out it starts to drop off of where the atoll ends and we were seeing just large schools of some of these apex predators.

We tentatively nicknamed a spot Jackson 5 because we saw five types of jacks. Jacks and giant trevally and giant amber jacks and on and on and just amazing to be out there with these large predatory fish and seeing the endemic fish as well.

*Jennifer Stock:* What do you think some of the educators that participate in this cruise will do after this experience?

*Claire Johnson:* One of the educators, her name is Patricia Greene, she's a NOAA teacher at sea for this expedition and lives in the Florida Keys, she's going to be developing a lot of lesson plan and background material that compares the Florida Keys to the northwestern Hawaiian Islands in terms of the coral reef ecosystems and sort of the remote ocean wilderness of the northwest Hawaiian Islands as compared to the more inhabited impacted coral reefs of the Florida Keys and she had some other ideas of comparing the endangered Hawaiian monk seal to the endangered manatee and the different conservation efforts that are being taken to help protect these incredible species. So, there will be a variety of lesson plans and activities. Many of us will be giving presentations at regional and national conferences to share the information of the maritime archaeology research and the mapping team's work as well as our own personal accounts of this unbelievably area that, fortunately for us, is becoming better well-known and getting more protection.

*Jennifer Stock:* That's a great...Claire is there a way for other teachers to find out about other opportunities like this NOAA teachers at sea program? Is there a website...

*Claire Johnson:* Yeah, the NOAA teacher at sea is T-A-S, for teacher at sea, dot NOAA, N-O-A-A, dot gov, G-O-V, or government and also if people want to follow along and sort of read some of our personal accounts and read mission logs and in-depth articles and see really compelling imagery, we did have an expedition website that was

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covering this, which can be found at sanctuaries dot NOAA dot gov backslash mission. So, I highly encourage educators and just the general public, if this is something you want to see, you can look at some maps and images of these ulua, the giant trevally and the amber jack.

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*Jennifer Stock:* I actually checked out those logs along this cruise and I definitely recommend folks to read these if you have the opportunity. They're really well written and have wonderful photos to go along with it to describe the mission of this cruise. So, that's excellent. Claire, thanks so much for joining us today and I'm sure we'll have you on again for some other topic.

*Claire Johnson:* Absolutely. Thank you so much for the opportunity and I look forward to hearing the rest of you and Andy's conversation online.

*Jennifer Stock:* Excellent.

*Claire Johnson:* Alright, thank you.

*Jennifer Stock:* Take care.

*Claire Johnson:* Buh-bye.

*Jennifer Stock:* Alright. So, Andy are you still there?

*Andy Collins:* Yes.

*Jennifer Stock:* Okay I wanted to make sure I got the right line there. I know that this was an opportunity you typically do and I think, I'm sure

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Claire's pretty grateful that you had the opportunity to let her go as well since you've been so busy with the monument designation. We're all going to be vying for that position, you know, at some point. So, I want to just talk about one thing Claire mentioned before we get on a break in just two minutes. She kept talking about top apex predators and I've heard you mention that as well and can you describe what top apex predators means and how does is that unique in this ecosystem?

*Andy Collins:*

Sure. Well, probably one of the biggest defining features of the northwestern Hawaiian Islands is that because it's been relatively untouched, I mean, there have been these periods of exploitation in the past, but for the most part, it's a natural system without human modification and so the coral reefs there have what scientists would count as a natural distribution of fish species including predators and what that means when you get into northwestern Hawaiian Islands is that there are large amounts, up to 50 percent of all the fish biomass in any given area are these large predators and we're talking, like, gigantic jacks, 150 pounds, what they call ulua, which are jack trevallies as well as sharks and groupers and these are fish that are apex predators because they're at the very top of their food chain. There's really nothing else that eats them. They eat each other, essentially, but you get in the water up there and you're surrounded by these giant fish that have absolutely no fear of you.

You immediately know that you're part of the food chain and when you go to other areas around the world, any other coral reefs, you don't see these fish. You don't see this number of fish, this number of large fish, generally because that's the first thing that's fished out when humans go into coral reef environments is these large fish. They're highly prized as game fish and the main Hawaiian Islands. So, that's one of the big things that's unique about that area, particularly from a scientific perspective because it's one of the few areas in the world that has had such little impact and so it changes the way that we really think about the natural distributions of predators in any environment, in any marine, coral reef marine environment and so scientists are looking at this like, "Wow." You know, this is a natural untouched ecosystem. Look at the preponderance of predators. Why don't we have that in other areas and so we're starting to use that as kind of a baseline by which to examine other areas.

*Jennifer Stock:*

It's wonderful that there's still an ecosystem like that to compare against and I'm really glad to hear it. We wanna go back to..we were just talking about some of the research and comparing that

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this ecosystem is amazing in regards to the fact we can compare it because of the top predators there to other areas that have suffered more from fisheries. Do you think the northwestern Hawaiian Islands has this as a threat in its region? Is there fishing taking place in that area?

*Andy Collins:*

There is a small active bottom fishery in the area. By small, we're talking about 8 vessels and so as part of the creation of the Marine National Monument and the proclamation put forth by the president is it specifies the phase out of over five years of that fishery. Other than that there has been pretty minimal recreational access. It's very, very difficult to get to this area. IT's 140 miles to the first, to Nihoa, the first kind of rock that sticks up out of the ocean from any port and so anybody that's going up there for recreational access needs to have, well first off, a pretty large boat and a lot of gas...

*Jennifer Stock:*

Yeah.

*Andy Collins:*

...and you're exposed. You're out in open ocean. So, the remoteness itself has protected it from fisheries, but in the past there have been fisheries up there that have been shown to demonstrate long term impact. Around the turn of the century there was the black lipped pearl oysters up there and they were hit pretty heavy over a 10 or 15 year period and that fishery hasn't recovered even though it basically shut down within 10 years, it only now 100 years later is starting to show any kind of recovery. So, one thing that we do know about the ecosystem, particularly the shallow water areas is that it takes a long time to recover it. All the nutrients are tied up in living stuff.

It's not like the northeast fisheries or something like that where you have a lot of upwelling and nutrients in the water. It's generally nutrient poor and everything's tied up in living organisms. So, when you start to impact that, it takes a while for it to recover.

*Jennifer Stock:*

That's one thing I do find amazing about that region in general is all those seabirds that are breeding out there, they're really in nutrient-poor waters. They really gotta fly pretty far to get food for their chicks on the nest.

*Andy Collins:*

Yeah. I mean, they do. They have quite amazing ranges. As you know, the albatross travel all the way to Alaska or the upwelling areas off of the California coast just for a lunch run, you know?

*Jennifer Stock:*

Yeah.

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- Andy Collins:* A couple weeks and then they bring food back for their chicks. A lot of the other birds up there do forage in the near shore waters, but they're not nearly as, like I said, nutrient-rich as the California coastline. So, food is a scarce resource up there.
- Jennifer Stock:* So, also Claire mentioned something about endemic species and endemic species are organisms that exist only in one specific area. There's a lot of endemic species in the Galapagos and she was saying they were seeing lots of endemic species out at Kure Atoll. What types of species...are these fishes, corals, other types of invertebrates?
- Andy Collins:* Well, pretty much everything. Anywhere between 25, depending upon the family or the grouping of animals, there's anywhere between 25 and 50 percent of the organisms up there are endemic species found nowhere else on Earth. Across the whole ecosystem, it's about 25 percent of all species are endemic, found nowhere else, and the reason for this is because of the isolation of the whole Hawaiian archipelago, it's taken for anything to get here and establish itself and reproduce is pretty rare. I think prior to human contact they estimated that one species arrived and established itself every 10,000 years because of the isolation, but once they get there and then establish themselves then they speciate out. They adapt to their environment and become unique species and so that's the reason why there's such a high proportion, one of the highest rates of marine endemism in the world in the northwestern Hawaiian Islands and you'd see it in the fish, you see it in the invertebrates, the crabs, the other species of crustaceans and everything and so it's very unique and very fragile because of that. It's, you know, there are species that are irreplaceable.
- Jennifer Stock:* So, most of these islands, the islands themselves are managed by the U.S. Fish and Wildlife Service and some of them are also managed by the state of Hawaii, is that correct?
- Andy Collins:* Yeah. The last island, Green Island and Kure Atoll is managed by the state of Hawaii as part of the, interestingly enough, it's a part of jurisdiction of the city and county of Honolulu.
- Jennifer Stock:* That's a long per diem there.
- Andy Collins:* Yeah, but the rest of the islands themselves are managed by the Fish and Wildlife Service, but everything up there with the new monument designation is included within the monument with the exception of Green Island on Kure Atoll.

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*Jennifer Stock:* Now with the islands themselves, I've read a little bit about them and there's been invasive species that have been on and the Fish and Wildlife Services has been very aggressive at attacking...getting rid of those so the native species can come back and survive. How are some of those efforts going with, especially on Laysan Island? I know there's a grass or something that's very...been attacking certain areas and now they've eradicated a certain part and now Laysan ducks are coming back. Can you talk a little bit about that?

*Andy Collins:* Yeah, sure. I think Laysan Island in particular is one of the greatest stories of restoration to be found anywhere. At one point in time in the early 20th century there was...people went up there to harvest birds and harvest eggs and the guano. They introduced rabbits which ate every single thing on the island and pretty much turned the whole island into a giant sand-blown spit.

Almost all the vegetation was erased from the island and certain...after that other species were introduced, not the native species, and so the island at one point in time was really heavily impacted by alien and invasive species and over the course of, wow, decades, the Fish and Wildlife Service slowly and methodically removed all these invasive species and replanted with native species that they had a fossil record that they were found there and today, I think virtually all non-native species are removed from the island. The native Laysan ducks, which prior to their recent...they established another colony at Midway, but prior to that they were only found on Laysan Island where at one point there were throughout the entire Hawaiian archipelago, but at the turn of the century they were only found on Laysan and now they're really healthy, they're doing well, but the other endemic species, land birds that were found on that island are all, with the exception of the Laysan finch, are all gone. Even a couple of the species were witnessed by the last of the Laysan rail being blown off the island by a sandstorm were witnessed by a tanager expedition in 1923.

So, right now, the island itself is in amazing shape and the Fish and Wildlife Service has done an incredible job at keeping on top of that and making sure no new species are established.

*Jennifer Stock:* What are some of the ways they prevent new species from getting established? With biologists coming on and off the island from the mainland, I'm sure there's opportunities there. So, what are some of the ways they prevent new introductions?

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*Andy Collins:* Yeah, they have some of the most stringent biological protocols anywhere. When you go to visit these islands, particularly in Laysan and some of the more sensitive areas that don't have any non-native species, you have to basically buy all new clothes that have never been worn. You freeze them for 48 hours, put them in Ziploc bags, put them into a cooler or a 5 gallon bucket and that's the only thing, right before you get to the island you change into those new clothes and that's what you wear on the island. Any type of soft material, you can't, you have to have frozen or new.

That basically prevents seeds or insects from getting on to the islands. So, there are these biological controls in place that are very stringent to prevent introduction of non-native species.

*Jennifer Stock:* That's amazing. How about for the water, as well? Is there any threat there from ships coming through there? How do they deal with that?

*Andy Collins:* Yeah, well since the establishment of the reserve in 2001 and some of the biological protocols that NOAA has put in place for the marine environment over the last 3 or 4 years, we've instituted things like vessel hull inspections where before a vessel goes up there, we investigate the hull, basically scuba dive down and look at it and investigate it for any type of attached barnacles or a non-native...or seaweed or things like that which may attach themselves and become established up there. Scuba gear is treated in chlorine, chlorinated water solution between the main Hawaiian Islands and the northwestern Hawaiian islands, but also between areas of the northwestern Hawaiian Islands because we're talking 12,000 miles of distance along the whole chain and there's the potential for introduction between one area and another area by, what we call, human accelerated introduction.

So, we're very careful and we try to have these protocols in place to prevent any kind of human facilitated introduction of alien organisms.

*Jennifer Stock:* Excellent. That's wonderful to hear and I think that's just one of the most fascinating things is that we tend to forget how things travel and it's great to have those protocols in place to prevent that from happening. So, out at Kure Atoll, one thing I wanted to ask before we moved on to the land was, isn't the water temperature a little different out at Kure Atoll as compared to the other islands? Isn't it colder out there?

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- Andy Collins:* Oh yeah.
- Jennifer Stock:* Why is it colder out there?
- Andy Collins:* Yeah, well you're...as you move away from...Hawaii is, even though when people come out to Hawaii, they consider it tropical, we're actually sub-tropical. Our waters aren't anywhere near as warm as the Caribbean or places further south. We're actually pretty far north into the north Pacific, but as you move further up the chain into the northwest, those islands are tilting, they're moving further and further north into cooler and cooler waters. So, when you get out to Kure Atoll, that's the most far-northerly coral atoll in the world.
- Temperatures there, corals are at the very, very edge of their ability to deal with cooler waters and so it's the point called the "Darwin Point." It's the point at which corals is just barely able to survive and they're barely able to grow at a rate at which keeps them near the surface because beneath them there's this ancient volcano that's still crumbling and submerging down into the ocean, but the corals are keeping it at the surface. In places like Midway and Kure, there's rock underneath a coral cap of about several hundred feet of dead coral and that's the only thing keeping that island near the surface.
- Jennifer Stock:* That's amazing.
- Andy Collins:* Yeah.
- Jennifer Stock:* So, each of these islands are old volcanoes that now have coral reefs on top of them that are holding them up, basically towards the surface.
- Andy Collins:* Right.
- Jennifer Stock:* Once you go past Kure, does the sea floor drop off to deeper water?
- Andy Collins:* Beyond Kure, there's actually a whole string of the, what they call the Emperor Seamounts and these are submerged parts of the Hawaiian chain. If you understand the geology of Hawaii, all of the islands formed from a hotspot around the big island where we still have an active volcano and then they drift to the northwest. Once they get past Kure, the water gets too cold for corals to grow and the islands sink and so past Kure there's a whole string of submerged islands and prior coral atolls.

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You're looking at older than thirty million years. They're basically underwater seamounts stretching all the way up to Kamchatka Peninsula in the Aleutian trench where they, again, get sucked down underneath the plate there and get re-melted down into magma again. So, it's a giant conveyor belt.

*Jennifer Stock:* How long do you think Kure has before it start to goes under that conveyor belt?

*Andy Collins:* Geez, I don't know. I don't know what the answer to that one is. Probably not more than another million years or so. I don't think it would be that much longer than that.

*Jennifer Stock:* So, it's fairly slow moving. It's not too quick.

*Andy Collins:* No. Yeah, but the whole chain is moving with, what we call it, about as fast as your fingernail grows. The whole Hawaiian chain is drifting to the northwest atop the Pacific plate at about 3.2 inches per year. Totally imperceptible to us, but that's about how quick the islands are drifting to the northwest.

*Jennifer Stock:* Excellent. Listeners, you're listening to KWMR in Point Reyes Station at 90.5 FM and 89.3 in Bolinas. This is Ocean Currents with Jennifer Stock. I'm talking with Andy Collins from the Northwestern Hawaiian Islands Marine National Monument. Andy, so this is a new designation and I'm curious what the significance of this is? I've heard many people say this is one of the most monumental acts of conservation, marine conservation, and I'm sure there's a lot still up in the air since it's so new, but what does this mean as far as protection goes from what you've been working on for the past five years?

*Andy Collins:* Yeah, well I think everybody likes to quote the president in that it's, "This is a big deal." It's a huge...the northwestern Hawaiian Islands are 140,000 square miles of ocean and shallow coral reef habitat. It's larger than the Great Barrier Reef. It's larger than 46 of our 50 states. It's just a gigantic area that's now protected and that is...and we're talking complete protection.

I mean, you cannot even go into that area unless you have a permit or if you're having innocent passage, basically, passage without interruption you can transit through the area, but if you're going into that area to conduct any type of research or to do any type of activity, you need to have a permit. So, everything is strictly regulated and to have such a vast area like that that is essentially

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closed to almost all extractive uses and has strong protections in place is a totally novel concept in our conservation, marine conservation history. We don't have any other areas of that magnitude that are protected like that and that's a significant step. I think it really shows that, you know, we're willing, as a country, to look at areas and to consider areas that we don't...that were essentially left to nature that we need those protected areas in order to preserve the health of our oceans in general.

So, from one perspective from the United States it's a gigantic move. It's a gigantic step in that direction, but also internationally it demonstrates that, you know, it's important to have these areas that are preserved for future generations and for overall marine conservation.

*Jennifer Stock:* It's an amazing example. What is the size of the Great Barrier Reef in Australia, just to compare?

*Andy Collins:* Just slightly smaller than us.

*Jennifer Stock:* So, you guys are the biggest now, huh? That is amazing. It is a big deal.

*Andy Collins:* I don't know exactly what the size of the Barrier Reef is, but it's a completely different ecosystem. They're dealing with very different issues down there. That's a Barrier Reef adjacent to populated areas whereas we have very a remote area, which...the majority of which is actually very deep sea habitat and totally unexplored. The northwestern Hawaiian Islands, the shallow water areas is a very small part of this whole ecosystem.

We've protected everything from the abysmal depths, down to the bottom of the ocean, all the way up into these shallow water areas. So, we have extensive protection across...just across very different ecosystems from these unexplored depths all the way up to the much more well-known shallow water areas.

*Jennifer Stock:* So, one of the things that we've talked about on other shows here is marine debris and even though this ecosystem is so in tact and so healthy, I'm sure it is not unaffected by marine debris in the ocean and especially drift nets and what not. Can you talk a little bit about the marine debris program that goes out to clean up these drift nets?

*Andy Collins:* Sure. Yeah. There's...the northwestern Hawaiian Islands have been likened to a picket fence in the windstorm in the middle of the

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Pacific. It acts like a rake for all these debris, marine debris, plastic, nets, and such that are swirling around in the north Pacific and they manage to land on these shallow water areas, into the coral areas because it's the only shallow water for thousands of miles and they get hooked on the coral reefs and these are everything from lighters and household trash and household plastics and bottles to trawl nets from fisheries that we don't even have here in Hawaii. We don't have any type of trawl net fishery in Hawaii.

So, these are coming from the entire Pacific rim from the Alaska fisheries, California fisheries, Japanese, the Korean fisheries. So, every year we estimate there are about 40 to 80 tons of these nets that get transported into the northwestern Hawaiian Islands and get hooked on reefs and so, over the last 6 years there has been actually, sorry, over the last 9 years there has been a program in place to go up there and remove these nets, particularly because they represent a critical entanglement hazard to endangered species like the monk seal and the green sea turtles, but the divers go up there for three months at a time. It's extremely hard work.

They go out and they survey for reefs attached....for nets attached to the reef and when they identify these, then they dive down carefully detach them from the corals and then haul them on to these zodiacs and bring them back to the ship and it's completely back-breaking work. You're in the water all day long in dangerous environments being chased by sharks and pulling these reefs up. They removed, last year, prior to last year I think they removed 127 tons of nets in one year. Last year they had a little bit of a shorter season and removed about 50 tons of nets, but it's a severe problem and, you know, we don't know exactly what the long term solution is because we can't keep going up there every year and removing these nets.

It's very expensive, but we need to look at ways to change the way that we deal with our rubbish and deal with our trash and deal with our derelict fishing gear so that we can prevent these nets from getting into an environment in the first place.

*Jennifer Stock:*

Absolutely. So, one thing, we're coming up close to the end of the show, which I feel like we've just started with this topic because I'm so fascinated by these islands, but one thing I just would like to ask my guests from here on out for Ocean Currents is what is the one thing you would like to tell people about their role in protecting the ocean as a whole?

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*Andy Collins:*

Yeah, I think the most important thing that I try to get across to people is to, you know, consider yourself connected to the ocean. I mean, whether you live in Kansas or whether you live on the coasts, you are connected to the ocean through rivers that flow into the ocean, through gas exchange with the atmosphere. I mean, everybody's connected to the ocean. So, consider your behavior when it comes to marine debris, you know, make sure you take care of your trash because even if it gets into the river, eventually it's gonna get down to the ocean and those plastics can remain in the environment for years.

If you do live in coastal communities, you know, make sure to get out and explore your marine environment. So, we're terrestrial beings, you know. It's hard for a lot of people to really connect with the ocean because of that, but you should make an attempt to get out there and get wet and explore your marine environment to really understand what's happening in your shore environment and get involved. There's always meetings about how to manage your coastal areas or, you know, how to conserve rivers that connect to the oceans and, you know, consider yourself as part of the ecosystem and connected to it and do your part to understand as well as to help take care of it.

*Jennifer Stock:*

Excellent. Thank you so much. How about any ways for people to learn more about the Northwestern Hawaiian Islands? There's that book "Archipelago." I was wondering if...we only have two minutes left, but can you talk just about some ways people can learn more about this area?

*Andy Collins:*

Sure. Well, there are lots of great books out. She was mentioning "Archipelago" by Susan Middleton and David Littschwager. You can get that from Amazon. That's a good way to explore. Also, our website, Hawaii Reef dot NOAA dot gov is an excellent way to a lot of resources...a lot of posting from these research expeditions so you can connect with the researchers firsthand in what they're doing. There's also another book called "Isles of Refuge" by Mark Rauzon, R-A-U-Z-O-N.

That's a great reference of the history of the area, in particular, but there aren't many other books that are actually written about the northwestern Hawaiian Islands because many people haven't been there, but I would start there and next time we have an expedition, log onto the website and follow it and learn more and ask questions and...this new national monument is your resource as much as it is the people of Hawaii and it's a national treasure and international treasure. So, bear that in mind and learn as much as you can.

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- Jennifer Stock:* Thank you so much, Andy. I would also like to tell listeners that on your website there are amazing videos that have incredible imagery that, when I watch them I am brought to tears because it is so beautiful and so colorful and so vibrant and alive and I highly recommend listeners to check out the website, Hawaii Reefs...is that what it is again?
- Andy Collins:* Yep. All one word: [hawaiiireef.NOAA.gov](http://hawaiiireef.NOAA.gov).
- Jennifer Stock:* Excellent. Please check those videos out and get a personal...a visual connection with this wonderful resource that is out in the middle of the Pacific and newly protected for future designations. Andy, thank you so much for joining us. I hope we can touch base again in the future and hear about some of the exciting new discoveries and highlights of the future of the monument.
- Andy Collins:* Yeah, well thank you, Jenny.
- Jennifer Stock:* Excellent. I will talk to you soon.
- Andy Collins:* Aloha!
- Jennifer Stock:* Alright, aloha!