

Pete Halmay

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Present: Pete Halmay, San Diego Sea Urchin Diver and President San Diego Fishermen's Working Group
Paul K. Dayton, Professor Emeritus, Scripps Institution of Oceanography
Theresa S. Talley, Coastal Specialist, California Sea Grant

PKD>> Do you want to give a little bit of your background including how you got into fishing, and maybe tell the date since we didn't do it yet.

PH>> Okay, it's December 4th, 2013. I'm Peter Halmay, sea urchin diver. I was born in Budapest, Hungary 1941 during the middle of the war. At the end of the 40s my parents decided that Europe was not a good place to raise kids under communist regime and all the other problems. We left and we traveled halfway around the world and ended up in Montréal Canada, where I started my formal education in sixth grade at the age of nine. I went from there to McGill University and graduated and wanted to see the world, so I got married. The marriage lasted three years and we were both surprised at that. Never thought we'd make it past the first month. But we ended up in Los Angeles because my wife wanted to go to school and we were picking a city in the south with a large university. So it was Miami, New Orleans or Los Angeles were the three schools, where we thought. So I ended up there and by that time I was a civil engineer. I got a job with a consulting engineering firm called---

PKD>> What year was that?

PH>> 1965. In 1965 we came down to Los Angeles. I got a job with a consulting firm called Dames and Moore. Worked in soil sciences from 65 to 1970. Went back to Florida and then got various other, another job that didn't last very long. What I found was my immediate superior at all those consulting jobs was a complete idiot. And only when I finished that part of my life and became a fisherman and fished for five years did I realize what my immediate superiors all had in common. It was me. I finally found what the problem was. So I had taken up scuba diving around '69 while I was still an engineer. And really enjoyed it. So I said in 1970 I will take a year off and go diving and I saw an ad in the paper, dive for abalone in 1970, so I jumped on a boat and started diving abalone. And here am I, in 2013 and never went back. And the problem was that, I think I was a technologist at heart and I felt staying away two or three years, the world of science and so on had zipped past me so fast that if I went back as an engineer I'd have to go back as an assistant engineer rather than pick up where I left off. I worked in soil mechanics and that was a time when we were giving properties to soil which was a new idea, that it had tensile strength, compression and so on. Before that, people called it dirt. So when I went into fishing I started as an abalone diver. And put together some old boats and so on and I really enjoyed the lifestyle. By that time I was happily divorced and I had very minor child support payments because I explained to my ex-wife but I'd rather go to jail than pay her a cent and she believed me because she knew me well enough for that. So I didn't have many responsibilities and for the first time in my life I could go to work one day or not go to work. I didn't have to be there at nine o'clock dressed in a suit and tie ready to kiss everybody's ass. I did what I wanted to. And the lifestyle really, really appealed to me. And quite frankly I said I'm going to go diving for abalone. And as an engineer I headed down to the library to figure out what the hell is an abalone? How did they dive for it? What do they do? But I knew absolutely nothing about it. I'd never heard about it before until I became an abalone diver.

PKD>> That's 1970?

PH>> 1970. I moved to Catalina Island in 71, 72. And we worked out of Avalon. We were diving abalone mainly at San Clemente Island because there was a pickup boat going out there. They picked up, and you'd go out there for 10 or 20 days. You'd make a list before you left. You'd say I need \$3000 cause I want to go down to the Yucatán, or want to buy a car. And you fished out there, you dove for abalone out there until you made whatever amount that you set out to make. And then you came back in and went off where ever you are going to go and when you came back you went back to work. So, the lifestyle was really appealing. And the work, you know, looking back 40 years now, the diving part has always been fun. It still is fun.

PKD>> What do you find interesting about the diving—has your engineering background influenced how you view the ecosystem?

PH>> People who understand what's absolutely going on on the bottom have no idea how much it changes from year to year, from area to area. So when they say let's compare this area to that area, I say well, okay, when? At what time and what are the regime conditions, the El Niño conditions, all these major factors. Plus the other 156 partial variables that vary over time. That used to be one of my favorite for phrases is the ocean is made of 130 partial variables which to me is an engineer

of the 60s, means you can't solve it. Some kid came up to me and said we can solve that with our computers now. So life has gone on, but these young guys are that far ahead of me. That the phrase I used to say means it's impossible to figure out what's going on. And because of that I think studying the ocean, or what I call reading the bottom is part science and part art. You really gotta know what you're looking for. You have an idea of what that jigsaw puzzle looks like, but it never comes out the same. The parts are always changing. They're always different, so you never really get the same result, which means that if you just count and measure along transects and so on you'll never get a true understanding of what's out there. I was just talking to someone today that somebody who said there were 142 sea urchins, or 142 abalone in one area doesn't tell you anything. If you dove through there and saw how they were, how they were placed and what condition they were in you get a much better idea. You might not know it's 142, but you say in that area all the abalones were under the rock. They were hidden in deep crevices and so on. And these are the things that you need to know whether you're hunting for them or studying them. That mere count doesn't give you the beauty of what's going on out there. And now Paul's going to ask me a harder question because that was too easy.

PKD>>How long did you dive for abalone out of Catalina?

PH>> I dove abalone from 70 to 74, '75 when I moved from Catalina Island to San Diego. And the reason I moved was that somebody said we're starting a new fishery for sea urchins in San Diego. And my brother's going to be a processor, and he said why don't you come on down because we need divers that are willing to go to work on a daily basis, there's nobody down there that does that. So I came down. And just when I came down some young graduate students had written a paper at San Diego State that said that they compared the sea urchin population in San Diego to the sea urchin population in Anacapa and their conclusion was you cannot start a sea urchin fishery in San Diego because there's not enough sea urchins. So, being a Hungarian, I said wow, that's a challenge. They're saying it can't be done. Let's go down there and do it. So I came down and the first time I drove around it was 75 or 76, I'm swimming along the bottom and all of a sudden I stopped. Because my brain was wired for abalone. I was looking for abalone because I was still an abalone diver. I said I've been swimming over sea urchins for the last half an hour but not even recognizing that that's what I'm looking for. I said I have to fix my brain out to stop looking for abalone and start looking for sea urchins. And we jumped in and in those days we dove, I started diving North La Jolla and there was no kelp there. The kelp went to Hill Street. There was no kelp above there, no giant kelp, there was palm kelp. And we started diving, you had patches of kelp and you got down around it and they were feed lines. You got down on your knees, you put kneepads on and you shoveled the sea urchins into your bags.

PKD>> Maybe before we get into the sea urchins, because the abalone fishery hasn't been recorded very well either. Why don't you talk about what your sense of place is for the species of abalones and talk a little bit about the abalone fishery. And talk about the abalone fishermen, too. I'm interested in the sociology of this community.

PH>> When we were diving for abalone my record is from the 70s, early 70s to the late 70s because I dove abalone during that period. And we mostly dove our group dove mostly San Clemente Island. So, from the ports of San Pedro, Orange County there weren't many guys. And San Diego we went to San Clemente Island. The San Pedro guys would go to the North end of the island and the San Diego guys would be going to the south of it. So the northern guys would anchor in the Northwest Harbor and the San Diego guys would anchor in the [China Cold and Pyramid] which were the nice anchorages. So since I was a Northern Diver we give them the term pussy fleet, because they had to have these real calm anchorages at night. They only worked, so they worked a lot the southern, the calm water and only went around the corner every once in a while. At that time the lee side of the island, which drops off very fast in the south and then becomes sand very fast, there's only a very thin edge around the lee side of San Clemente Island but it was loaded with green. It was just loaded. And also loaded with Moray eels so you had to stick your hand in with the Moray eels and pick the abalones that way. But there were a lot there and from what people tell me, I haven't been back in 30 years, none of that exists anymore. Neither the Moray eels nor the green abalone are there anymore. And again, they probably weren't as plentiful as we thought because it was only a narrow band. Whereas on the Windward side of the island, there was you know, the bottom went out, we drove all the way from five feet of water to 200 feet of water. My friend Ron Johnson, who died a few years ago, was probably the finest white abalone diver. Trained as a 101 airborne trained diver by those people and worked around the world looking for terrorists and chasing them up and down various places. And he became an abalone diver at the same time as I did. He was a barber from Minnesota. I was an engineer for Montréal. So right away, we had a lot in common. Nothing. And we became good friends and we both liked to drink and argue, so we remained good friends till the day he died.

PKD>> Do want to talk a little bit about though white abalone? You brought it up and it's of interest now.

PH>> The California Fish and Game Department didn't even know about the white abalone. So when records were kept, they weren't kept separately from pink abalone or some of the others. At that time there were red abalone, green abalone, pink abalone. A little later on the black abalone, we developed markets for those. And we never called them white. We always called them Sorenson's. The divers always called them Sorenson's. The white abalone was a term that I heard from

other people but the drivers said we dive Sorenson's. And they dove, maybe there was a half a dozen guys. That dove really deep. By the time I got into it, the Sorenson divers were past 70 feet. Every once in a while whereas I dove from 5 feet of water up to 70 feet every once in a while I find a few but the large concentrations were outside 70 feet. All the way to, by the time Ronnie stopped driving I think he was down to 200 feet. And what they called Sorenson bottom was a sandy bottom outside with these boulders on it. And every time they came across a boulder there would be like eight or ten large abalones on it. All very large. In my recollection, this is secondhand from my friend Johnson, that he said very few places that they see abalone Sorenson's out there that were small. They didn't see them. They were all very large. And he worried from the very beginning that you took them, they were pretty much out in the open, you came back once and then when you went back a third time they weren't there anymore. They saw this. But they envisioned this huge amount of bottom. All the bottom outside of San Clemente Island and the Cortez Banks and so on, as potential Sorenson bottoms. So they didn't worry about not going back to the same place. Off Castle rock though, he said they started diving 130 feet and went out to 140, 50, 60 70 till they were at the sand edge about 200 feet and he said there they saw all sides of it, all different sizes from, I don't think we talked very small, because we didn't think of reproduction in those times. From medium sizes to very large. And he said there he envisioned that you could go back for a long time. And they were going down to 200 feet, which meant that even with nitrox, not nitrox, they were starting to hang off on oxygen and they were cutting the dive times in half. Even then there weren't many guys that were going to do this and there never were. San Clemente Island maybe we had 80, 80 abalone divers, and maybe five or six dove Sorenson's. The rule of thumb I used, because we started diving blacks, we were in shallow, five feet of water and the surf would come and knock you on the beach, so I said if you dive shallow you get broken and if you dive deep you get bent. That was the difference between them. By that time in the 70s you were either diving very shallow, which were inaccessible because of the surf, or very deep where we hadn't been before.

PKD>> By the 70s your resource base was really getting hammered, wasn't it?

PH>> It was getting hammered. It was getting hammered and we all believed there were still large numbers of short beds where you had thousands of thousands of abalone, mainly greens, and shallow, but we had some pink short beds. But the green short beds didn't seem to be growing. By the mid-70s or late 70s you measured maybe 1000 abalones that were very close and collected a dozen. And it would take a certain mentality to just swim, my friend [Davis] would swim through a short bed in five hours to collect a dozen. He was on the bottom for five hours in very shallow water. The guys out deep hit it hard, and they were an amazing bunch of guys.

PKD>> Tell us about the deeper divers.

PH>> I always enjoyed drinking with them because they were really nuts. They dove in areas that nobody would dive. We used the Navy tables at that time, nobody had the computer so we use the Navy table and at the very bottom of the dive was the Z diver. They would make the last dive as a Z diver. So, which meant if they only went down 150 feet and came right back up again, they'd probably have to hang out for about half an hour. So you'd come by Castle Rock on your way back to the anchorage at Northwest Harbor and you'd see guys in the dark. You'd hear the compressor running, they were doing their last hang off, their last hour and a half or whatever they were doing in the dark. So it was kind of a different breed of guys and they'd come in with their 10 or 20 dozen Sorenson's and be very happy with it. But there were never very many of them, I only remember one or two dying. Diving. Others died in car accidents and liver problems and so on. And some of them, my friend Ronnie who lived to be an old man; he was 60, 65 when he died, and he died from a heart attack. Ed deNeufville (known as Nasty Ed in the fleet) came up, he was probably our most daring, best deep diver, and he taught all the guys to use oxygen because he'd been down in the Gulf diving with the oil companies down there. And he showed them how to use it. We had a hose down 15 feet hooked up to oxygen so when they did their hang off they'd change over to the oxygen. Nobody knew what the tables were so he said just cut everything in half, use the 1/10 schedule and cut it in half and that was good it was easy enough everybody could do that and they did. And not many people got hurt. They didn't get oxygen poisoning or all these issues. And therefore they were able to cut the one hour or hour and a half hang off to 30 or 45 minutes because they were making their three dives a day and the last dive was, as I said, they were starting off way at the bottom of the list where even two minutes on the bottom would force them to make a long hang off and they were a different breed. And all of a sudden the premium for white abalones disappeared. You got paid the same amount for a Sorenson as you did for pink abalone. So there really wasn't the push to go out there and risk it. Certain guys still did it, but the money wasn't there as it was in the beginning. JJ Camillo bought the white abalones, Sorenson's. He had a place called Camillo. And he would treat these guys like royalty. These drunks would come in and he'd say what you want? What do you want? Because he worked for Anthony's restaurant. They had the Star of the Sea room and one of their big specials was the Sorenson. Instead of slicing and pounding they had the whole thing because it was such a tender piece. At that time Ronnie said, you know, that son of a bitch is charging \$18 for that dinner. Can you imagine that? Who the hell is going to pay \$18. I said that's for two people, but still that's 18 bucks for Christ's sake. And they were, it was a special item. The Sorenson was a special item and you didn't find it too many places anymore because most people sliced and pounded it. And then breaded the God damn thing. So by the time you ended up with it you didn't have much. Plus the Asians started

buying abalone and they didn't care for the white meat. They like the large green abalone because it was much larger.

PKD>>Talk about the shift in abalone fisheries

PH>>The size limit for greens was 7 inches at that time. The size limit for pinks was 6 ¼. The reds were 7 ¾, if I remember. And the strange part about it is you have red abalone in San Diego. You have red abalone at San Nicolas Island and you don't have any red abalone at San Clemente Island. People say yeah, I've seen them, but no we didn't have any. So whatever caused them to settle here and settle at Nicholas and we didn't have them at Cortez either. At Santa Barbara Island we had some. So you had abalones there and none whatsoever at San Clemente Island which is where most of our production came from. So we switched from pinks and greens and Sorenson's to pinks and greens and blacks. Then greens and blacks and some pinks and so on. You could see this going down. And we thought that, we and the Department of Fish and Game thought the size limit would protect us. We were convinced that that's all you needed was a size limit. And yet, I remember guys talking on the streets here in San Diego that they harvested, I forget the record was something like 165 dozen in one day. And they were getting a buck a dozen at that time for the red abalone. And they flooded the San Diego market, took some up to the San Pedro market, then you had to take three days off because they had flooded the entire market for abalone. Just one day, one diver. And we went from the grazers, the abalones were grazing out in the flats. And we got them under ledges. Then we got them deep under ledges. Then we turned rocks. And if anybody would've paid attention, they would say, wow. We who are observing what's going on understand that things aren't going well. And that's when I committed myself to, when we started the sea urchin fishery, to paying attention to this stuff. We wouldn't depend on the Department of Fish and game who goes on research cruises once every six months and tries to push some nonsense through it that everybody opposed to it. You would have to be the guardians. You have to be taking care of the resource. And happily, the same things didn't happen in sea urchins.

PKD>>Do you see or foresee similar things happening with the sea urchin fishery, and what are your thoughts on how to avoid this sort of situation? OR HOW do you see fishing for urchin as different or similar as for abs?

PH>> Urchin reproduction, the whole system, seemed to be completely different. Because we have as much sea urchin now as we did in the 70s but still more than enough. And if you had a lot more than that I think they'd start going mowing down the kelp and so on. I have a good friend Paul Dayton who seems to think there's a balance somewhere. And I said, I find it funny at his age he's still Pollyanna. And thinking that nature will right itself and everything will be beautiful with 50 million people living here. Good luck with that. But anyhow. So things aren't the same as they were when Columbus arrived. You know, things have changed and I think we have to look at things and manage it to see, because, and again we must remember we're managing people and not the population. But, looking back, the industry wasn't organized enough to say hey, what can we do? And there was a lot of finger-pointing. The commercial abalone divers said the problem is the sport guys. This sport guys said it's the commercial guys. Well, we only take four or five and we always insisted that they shouldn't have a size limit for sports because it just encourages them to throw the smaller ones down if they get bigger ones. They might kill 20 to get the biggest one. Just take the first five and get the hell out of there. So, looking back, what would I do? I said to myself, what would I do? I would say, Santa Catalina Island is for sport only. San Clemente Island is for commercial only. Let's see what happens. Let's see what happens. That's a much better island for sports. It's close to land, it's nice, and I say hey, you guys said don't do any damage, let's look at it. And a lot of people thought about the idea. It always came up that you'd have rotating islands closures. You'd start fishing this area and fish for five years, close it down, move it, rotating always keeping one entire island out of a chain of 10 islands, one island closed for a few years, but not closed permanently because that idea has some merit, but all you're doing is shifting the effort somewhere else. What you want to see is closing it to see if natural order would take place what would happen. And I saw it didn't happen at Santa Barbara Island. Where all of the sudden it was overgrown with, it looked terrible. It looked like cobwebs on the bottom after a few years and we harvested 1 million sea urchins out there, 1 million or 2 million a year and it went to zero. There were still a lot of sea urchins but they weren't feeding properly. So I thought to myself, now there's a project. You take the entire island and try to bring it back. And I don't mean sea urchins. I mean everything. You know, that the bottom looks good. Somebody asked me how do you know that the quality of sea urchins are good? And I said, it's like I go up to La Jolla and I look at the houses, look at the property I said rich people live here. Same thing with sea urchin. You look at rich habitat, rich bottom and rich sea urchins will live there. They'll be beautiful and healthy and growing well and so on. So it's the habitat you are protecting, not the individual animals. And if it's good for one is going to be good for other, because when settlement happens they think well, we fell into paradise. This is the place. So I think what you've got to protect is the habitat and the species themselves will adjust themselves. They will lead to one another. God bless their crooked MPA hearts, they figured out how recruitment happens. They can't even count the adults, now they're going to count larvae. Good for them. But you see you've got a problem, that I don't know how it happens, but I do know that there're plenty of larvae. And I think most old-time divers I talked to, mortalities occur in the first day of their settlement, or the first week or the first month. They never make it past that bottleneck. That's where they all die. And we started off lining with Schroeder and Dixon some sea urchins. And I always thought that if the sea urchin larva comes down and they hide under rocks, they're

safe. But when we turning rocks over they were there hiding with the crabs that were also hiding. They were eating them under rocks. So this competition, predator prey, goes on at every level. And I think these are the things that are baffled me and just by the time you think you've figured it out you get thrown a curve.

Which reminds me, I heard a talk by some guy and he said these modelers did a beautiful model, but the one thing that they didn't consider is the one thing they gave a probability of zero. Might be the most important thing. And once you gave it a probability of zero it no longer enters into your model. And so what happened here in San Diego, three, four years ago we had recruitment of sea urchins like I haven't seen maybe since the 70s... in 30, 40 years. All of a sudden there were baby sea urchins everywhere. Everywhere. And now that cohort seems to be growing up and we are starting to see two and three inch urchins. And why did this happen? And it's localized. It's happening in one part of the kelp bed and not in another part. However I talked to my buddy Bruce Steele and he said we've got recruitment off Santa Rosa Island. My God we haven't seen stuff like that. So you are seeing it bight-wide but in concentrated areas. Which is even more complicated. Now where are these areas and why are they there and why did... and this is not settlement. This is actual recruitment. These are all, the little guys, young up to a year and you are starting to see them and it is bight-wide.

PKD>> Tell us about the early days, the start of the sea urchin fishery in San Diego.

PH>> There are a few of my friends, most of them were abalone divers because most of us sea urchin guys started as abalone divers. Most of the older ones. Once we built it into a lucrative fishery, the second generation came along. And it's funny that when we started we didn't know how to do this. You see, we were switching over from abalones to sea urchins. And not completely. We dove abalone some days, and some other days we dove sea urchins. The Japanese processors that started the sea urchin fishery came to us and they said, this is the rumor that I've heard, that they were going to offer \$.25 a pound. And Dick Pierce who was a big processor of abalones said, don't give them \$.25 because they get like 3000. So they give them \$700 or \$800 a day or they will never dive abalone. We want them out diving abalone two days and sea urchins two days. We want to keep them diving abalones, so only offer them 8 cents. That way they will make a couple hundred bucks diving sea urchins and make that much diving abalone so I can still get my abalone divers working. And this was how the damn, so our price went from the initial offering of \$.25 to \$.08 and sure enough 10 or 12 years later was back to \$.25. It took about 10 years, eight cents, nine cents before it got back. We didn't know anything about sea urchins. We had no idea. We cracked them open and did this, us abalone divers looked at one another and said what the hell do they eat? What the hell is this? Some guy said bring in 1000 pounds. So we took an abalone iron, I should bring one, it has a bar here and some things where we measured every abalone. So it had a bar and we just turned it over and dove sea urchins with it. Then we'd say, that's not... some guys said I've got these big screwdrivers and I bent them into just the right shape. So we used screwdrivers. Then we used rakes and finally we started constructing until we got very elaborate tools to harvest them. And the bags. Well we developed all this. There was no fishery. There was nobody who would show you how the hell this was done. This was just talking on the docks. Sitting down and sharing. So there was a lot of sharing information at the very beginning because nobody knew anything. The second generation that came along said well, how do you get a bag like this? You pick up the phone and you order it and they send it to you and then we said that's not how we started. We started, in abalones, 70 was the transition from heavy gear to swimming. By the time I got in in 70, 71 there were two or three guys that wore heavy gear. They walked along the bottom and they had these huge compressors. And they went to farmers markets and swap meets to buy ski boots. Because they bought the ski boots and they strapped the weights onto the ski boots and they insisted they could travel faster. They ran faster than you could swim, was their insistence. Which was true. This is why they worked outside edge of the kelp. Catalina Island they just swept along the sand edge. San Diego they worked outside edges. Because they couldn't maneuver up and down reefs and so on with the same facility that the swimmers did. And my friend always said, the demise of the abalone industry as he was concerned was the demand regulator. That was opened up, because when you had to wear a hard hat you didn't go into sport diving. You have free diving or hard hat. Those with the two choices. And the free divers were an amazing bunch. But after that the demand regulator and at the dive shop they say you know you can get all the abalone you want. You take this course and we sell you \$200 worth of crap that you become... so sport divers in those days, and I venture to say they were at least 1 million of them in Southern California, got up to dive abalone and lobster. Those were the two, these were before the photographers and so on that do it today. Today it is not so much. What damaged, they caused enough damage to the resource so you could point your finger at one another and therefore you were blameless. It was always somebody else that was causing the problem. And I think that's wrong. I think that's wrong.

PKD>> DO you want to say more about the dynamics of the resource and your thoughts on management of the resource?

PH>> Had we looked at abalone as I suggest we look at it now area by area and try to figure out what an area is, and that's where Professor Paul Dayton and I cross paths because we've been studying a very small area for a very long time and we still have very different opinions of what's going on out there. And we're still not sure. And I change my mind and I agree

with his view and my view, but I think we've got a much better handle on the kelp beds from La Jolla to San Diego than we have anywhere else. And you better worry about it at that level. We worry about that and let the next guy worry about, because you can't say what's going on. And it's funny when you know a lot about it and you share your information with like Brice Steele at Santa Rosa Island or somewhere, you really get some interesting ideas. Some things are happening at that large-scale and some things are happening at a local scale. And these things are, you can only tease them out if you know a lot about that little area. I used to think that studying an area for 20 to 30 years would really tell you what's going on. And now that I've been studying it since 75, I think 70 years would be a good time, so you could see two or three regime shifts in the middle and everything else. And maybe when I hit 70 years I'll think it's a hundred because some other little thing will come along that you haven't seen such as this recruitment of sea urchins three years ago. I haven't seen it since the 70s when it was a bad day, when you had a huge recruitment of sea urchins and they were going to eat the kelp beds.

PKD>>> What were your thoughts on the quick lime trials- what was going on then in the fishery and what effects did you see on resources?

PH>>> My political life began when I noticed that the kelp harvester decided to lime sea urchins. And it bothered me that this was being done. And I didn't know why. I didn't know why. But it didn't seem like you should put poison in the water to restore what you thought was a good balance. You're playing God in the kelp beds. And you weren't doing it because you liked to set order to it, you're doing it so you could harvest more kelp. That was the only reason. Once they stopped harvesting kelp they disappeared. They didn't give a rat's ass what happened out there. Screw that. We're off to do it somewhere else. And yet, you couldn't put into words why you thought it was wrong. It just seemed wrong. And every scientist would say no no no, what's going to happen is you're going to restore balance. There will be more kelp and the animals will come back and so on and in reality what was happening and it's still happening today, the same place were what they call barrens, which pissed me off royally from the very beginning because they weren't barren at all. They were loaded with sea urchins. So we started pushing the literature to say urchin dominated. They weren't barren. The idea of barren, as my friend Steve Schroeter says if you look at it carefully there's a lot of stuff that grows out there in the urchin dominated because they provide habitat for the rest of the stuff. But it's not that the mega fauna that people like. It's not the kelp. It's not all those things. It's the worms and then a whole host of other things that live out in the urchin dominated area and when they quick limed, they pumped quick lime onto those areas, the kelp bed came back the urchins came back and it became urchin dominated again five, six years later. It was the same areas where this would happen and nobody bothered thinking well we aren't doing a God damn thing. To the point where I thought all the good urchin is a dead urchin, crowded and died off. That they were all gone and now this son of a bitch up in Palos Verdes is doing it again. He got a grant to kill 4 million sea urchins in the same place where Wheeler and his pals did it 20 years ago and they reported back how great it was for about seven or eight years. Then they stopped talking about it because the urchins came back. You know, some of this bottom, they just I don't know why it is. Is it something we've done? Is it something from land that we screwed up that area or is it just something that happens? You will see it happening a lot of the flat bottom, on the flat bottom. The urchins we find on the flat bottom are moving around a lot. They haven't found a home yet. Once they find a ledge or rock pile or something they settle down and that is where we pick up quality urchins. I've had this long-term discussion with my lobster friends, why do you have to go out here Pete? I'm getting urchins in my lobster trap. I said they're no good. Yeah but there's lots of them. I said they're no good cause they don't have any gametes. They don't have any gonads. They don't have anything. Because when they are moving like that to go into the trap they're searching for food. I don't know why they can't find it very easily and then the other thing I'm looking at, we have what we call feed lines. A feed line is a concentration of urchins at the edge of the kelp forest. And everybody said they're eating their way through the kelp and they are. But they don't get better. So they never really get as much feed as you think, that the front line and so on, and what we are seeing though, is where there were abalone in the urchin dominated areas the urchins are pushing them ahead. So you have a few abalone right there at the edge still today in 2000s, and the urchins behind it pushing it along. The abalones are in front of them and we are starting to see that the abalone that came back in San Diego in large quantities was the threaded abalone. Strangely enough, because we never harvested them. They never grew to a large size and they were never taken for anything but a few shells because we had these [*Haliotis kamtschatkana*] *assimilus* [threaded] abalone and they were banded *assimilous* because they had beautiful shells. They had the green bands across it and white bands, and it was a big market for them. I remember a friend of mine Breece used to go down to the processor and go through his abalone pile to dig out these shells and there weren't very many but beautiful shells and again I don't know why the bands were there, but very clear beautiful bands across the top of the shell and we never harvested many of them. And yet they disappeared along with everything else. So, again, the disease came in. Somewhere in this mix. So while the sports and the commercials are arguing who was at fault, the disease came in. And you're going hooray, it's not us, it's a god damn disease what done it. You know, so finally we found a bad guy that we were doing everything right, but the damn disease what done it. Now what we are seeing with abalone is it's coming back. How long has it been closed? Over 20 years now something like that. And I don't know how much poaching goes on. Paul, for Pollyanna, he is not very trustful of his fellow man. We used to see a lot of shells on the bottom, you know, because if a guy poaches he just takes the meat out and leaves the shell there and we are not seeing as many. But we are seeing them come back in patches. And again, localized, and I talk about the beauty of them

coming back not from the point of harvesting them again but from having something back there that should be there. That has a place in that system. And that is where Paul, on sea otters, they would never allow that. They will never allow that. They will never have abalones that you can see. You might have abalones in somewhere with the sea otters but you will never see an abalone anymore. So that's a problem to me. That balance is something and I probably shouldn't talk here about-- sea otter hats and so on because that's where the other, my Alaska friends...

PKD>> I think you should talk about sea otters if you want.

PH>> I think it's important.

PKD>> It's very important.

PH>> It's important that nobody can believe that they can consume these huge amounts. It's a tiny beautiful animal and you can't see them eating, I don't know, hundreds and hundreds of thousands. You start multiplying what he needs to live off to protect himself and you multiply it by 2000. And you see that there's a problem along 300 miles of coast now. So we say well you have to let them expand. Well once they finish expanding then what you do? Expansion is not a solution. It's postponing it. It's what we are really good at. Not on my time. Why the hell should a 70-year-old care? It may not even happen in my lifetime, but sooner or later there will be sea otters all the way down to the Mexican border. I don't think they'll pass the border because they say that some scouts have gone south of the border but they never reported back. Is what my Mexican friends say. So they will be down there and then they will start dying. Then the sea otters will start dying because they've eaten themselves out of house and home. Then you're going to say let's do something about it. Well, Jesus Christ you should've done it 20 years ago. You have to start thinking how do you thin the herd, that you may not need 12,000 sea otters in California. You may not need that many and I'm not saying you shouldn't have any sea otters, but you should worry about them. You're dooming them to eating everything because we've seen they are eating that whole section in central California, the best part, I mean there are a lot more red abalone there than anywhere up along the coast and they've eaten all of those. Then they eat all the sea urchins. You know, you can tell that the prey is shifting to poorer and poorer and smaller animals and that's not something you would do if the others were plentiful. And yet people will point out the fact that there's patches behind them and around them where there's lots of abalones and sea urchins and so on and this is the tricky part. How do you figure out what is there? Because you have sea otter lovers that say there are plenty of abalone and sea urchins there and you have the fishery people say there's none there. And the fact that there's three sides to every story. Your side, my side and the truth. Somewhere the truth is in between those two. There's some. I don't know how much. But we should maybe get a handle on that. Maybe we should start surveying not only our fisheries that we are harvesting which is always surveyed now. If we don't make money off it we don't have to survey it. Let's survey some of these other animals and I've often thought what are these indicators that we don't harvest that might tell us something about what's going on down there much better. Because by the time the sea otter gets to some little tiny chitons or something we know they've got to pick 1 million of them to exist. They're not going to be able to do it.

PKD>> What do you think the indicator of a healthy rocky habitat ecosystem might be?

PH>> Unfortunately I'm abalone and sea urchin-centric. So if it doesn't have abalone, something is missing.

PKD>> But you can read the bottom better than I can. What would you be reading if you were just looking for a healthy bottom?

PH>> I would look at vegetation. I would look at the food supply for a lot of these animals that depend on the food supply. So all the vegetarians that need a lot of different, diverse foods, and if you are starting to see only giant kelp with nothing else on the bottom you'd say well, why? Why did that happen? Because you should have some other bottom algae also. Where I think I find the best quality sea urchins is where there is a wide variety of algae to get the choice from the red stuff to the purple growth. All these things. So I think I'm looking at a bottom where things look nice from the outside. Not so much the individual animals. The individual animals will be there and some of them will vary. You'll have a lot of one of these and a lot of one of those. My friend who does surveys up there off of point Buchon said that when the sea otters came there were specialists. Some ate only abalone and some ate only sea urchins and they would all come up and both were in plentiful supply for a while. But they liked one or the other better. And they would come up and put three big reds on their chest and eat them and they weren't very fussy about it.

PKD>> I think that still is true. I think they eat their own specialized diets.

PH>> I dove Tanner Banks many years ago and we decided to look for abalone and my first jump was 170 feet. Went from diving sea urchins at 30 feet to diving abalone at 170 feet and I didn't find any abalone there. But we saw some reefs,

tabletops and some of them were covered with purple sea urchins, only purple sea urchins and the one next to it only red sea urchins. There wasn't a mix of the two. And I always remember that because it struck me as, why did they select so and so differently. And why did we not find lots of abalone at Tanner banks where we found a lot at Cortez Banks, which is 30, 40 miles apart. Tanner banks doesn't come up as high. The Cortez comes all the way up to 12, 15 feet of water. And the Mexicans got in there in this, whenever the Magnuson was passed. And they went there with a large mothership and a bunch of skiffs and they laid out quadrants at Cortez Banks and they dove every abalone in each quadrant. They just, very systematically, about 20 divers took piece by piece until they took every one. And those poor bastards all got bent. They didn't have any idea what the hell they were doing and they'd just send them back and get two more divers. They took most of the shallow stuff. I don't know how deep they went but they took most of the shallow. My son asks me, what do you mean by shallow? Under 100 feet is shallow to me.

PKD>> They took all the abalones?

PH>> They took a lot. They took an awful lot. Because, I don't know, the line between Mexico and the United States was going to change and that was either going to be an American side or Mexican side and they said you might as well take them now. And they didn't have enough of a market there but they shipped them down to Mexico and brought them across the border and our processors bought them all. I think, if I'm not mistaken, they were taken down to a much smaller minimum size than we ever did. So minimum size does have a role in protecting the resource. It just can't be all of it. In addition to that you've got to look at the bottom, you've got to look at it area by area. And year to year. What may be important, what may be the factor in your model that you're not considering this year maybe you should consider it and maybe five years from now it may not be important again. So this modeling idea is on my mind because the information isn't there in numbers, you're better off looking at trends. You study a whole bunch of different species and what trends over five, 10, 20, 50 years. What's going on?

PKD>> Getting back to those observations of monocultures, why do you think you have species-specific monocultures on those tabletops?

PH>> Well, I don't think the settlement can be selective. So it's got to be that they don't make it. They just don't make it past that first period for whatever reason, and they seem to be the same so I don't know if it's competitors. There are a few more of them and they wipe out all the other guys from there. It's... I couldn't figure it out. And that's why it stayed in my mind for so long. What is it? What is it? Because they looked very similar. I was diving for hydrocoral up there and a guy, Pedro, in a boat came up to me and said hey you, he said you got abalone? I said no I'm not diving for abalone, I'm diving for hydrocoral. What's that? I go, so he turns to his crew members and says the stupid son of a bitch is collecting colored rocks. There's abalone all over the bottom and he's collecting colored rocks. He couldn't get over it. And he left like, what an idiot. What an idiot. But at Tanner we had burgundy coral, different corals than the Cortez. So a lot of things are different in different areas. And we had a multicolored, half purple, half rose coral that was a beautiful round piece. A chunk of it would be purple and you never saw that at the Cortez Banks. And again, a lot of this stuff I learned from my friend Johnson. Although we started off together, we started diving very differently after we started. Later on we went to, we dove coral together, hyper coral, and I got him in.

PKD>> Talk about the early urchin market in San Diego—what the demand was and how you guys met it, working with the processors, how grading the quality of urchin came to be...

PH>> When I came to San Diego to start diving sea urchins, there weren't any real divers down here. There were a few abalone divers and so on and I would invite them down. Abalone at that time was closed two months of the year. So I'd say you aren't doing a damn thing why don't you come on down here we'll dive abalone, then we'll go down to Tijuana every weekend and go to the horse races and drink tequila, and then you know, go have a month off. So a lot of them came down here. And at that time we didn't have that many good divers. So the processor needed a certain amount of sea urchins to be able to process. So I had to talk my friends into coming down so we could bring in a few thousand. I brought in about two or 3000 a day and I thought he needed something like five or 6000 for him to bring in a shop crew. And it was a Chinese guy, Bill [Young] was the only processor here at that time for sea urchins. And he was an abalone guy. He was buying abalone from the guys and selling it to the Asian community. He was a translator in the second world war. For some reason he spoke fluent Chinese and fluent Japanese so they used him as a translator. One day I went in there and I said Bill, you know the guys in Santa Barbara they are getting \$.20 a pound and we're only getting \$.15 here. What's the problem? He says 1 minute. I'll call the guy up. This was a guy who is fluent in English. Hello, I have here one diver fellow, the diver fellow said you pay \$.20. I pay \$.15. Ah! I tell big diver fellow he big liar. All of a sudden he went into this pidgin talk to talk to one of his fellow Asians. Said, ah, the diver fellow, big liar. But, they were all hooked up. They were all hooked up to one another. And none was going to pay more than the other. So one day I walked into his plant. He said let me show you something. A guy just started a little bit after me who retired at 76, which is my threshold. The oldest sea urchin diver

retired at 76 and I'm at 72 now so I'm only four years away. When I was 30 years old that didn't seem like a big hurdle. At this age, four years is, I might not make it. But he brought me in and Bill said take a look at this. He said, this is John's sea urchins. You see it's gold and fat. I said this is yours, it's skinny and brown. So you see the difference? I said no. He said John's is gold. And beautiful color and fat. Yours is skinny. So you see the difference? No. What do you mean? I said how much you pay for that? He said eight cents. I said how much you pay for that? He says eight cents. I said explain to me what the difference is. He says come into my office. And that was the day we started. He said, if you bring in this quality I'll give you two cents more. If you bring in a certain quantity by the month, not per day, I will give you another two cents. And that was the start of grading sea urchins. And the minute I started trying to harvest better quality my production went down. If I just took everything, as I did, I would pick about 2000 pounds. I went to about 1200 or 1300 right away.

PKD>>How do you think this affected the sustainability of the resource, and the fishery on the whole?

PH>>I'll go back to the idea of why that graduate student in the early 70s, that group of guys... fantastic. I looked at their survey methodology and everything and they did, they threw these random transects, they threw thousands and thousands of them and what there was, there were a lot more patches where they got zeros here than in Anacapa. So it told him that there weren't as many. What he didn't consider is, he knew nothing at all about fishing, so how is he going to give advice to fishermen whether they should go there or not, and to me we never harvested, and we still don't as much at San Diego as we did at the islands or elsewhere. We average about 50%. A good day at San Diego is about 50% what it is outside. So, the guy was absolutely right. The population is about half of what it is elsewhere. But it's persistent. So that's, so you don't look at if you are establishing a fishery you don't look at huge quantities, you look at persistence. Because the idea is if you don't export it you may not need to harvest 3,000,000 pounds a year. We used to harvest up to 2 ½ million pounds in San Diego. Now we harvest about 600 to 1,000,000. Somewhere in that range. And that's been steady for 10, 15 years now. So we see that as probably the production that's sustainable and yet you have these huge recruitment things. So you can have some peaks. But now what controls the sea urchin fishery is our market.

PKD>> Explain about the market and how its changed.

PH>> We can't sell that many anymore. To start the sea urchin fishery in the early 70s, there were a few things that happened. One, the kelp bed grew up to be very lush. We had a beautiful kelp bed, therefore the quality of the sea urchin was good. We had the Magnuson Act that was passed around that time, which meant that the Japanese no longer wanted to harvest, build bigger and bigger ships. They decided to concentrate their efforts in buying from Third World countries like the US. And they built up these central markets. PG and various other central markets. The purpose was let's let other people do the harvesting and we will just buy it from them at \$.50 on the dollar. And the third thing that happened is Nixon had the Bretton Woods agreement. Where too many Japanese cars were coming this way and nothing was going that way, so they floated the dollar. And that meant that the price of sea urchins now doubled in one day as the dollar... So these three came together to begin the sea urchin fishery. And all of a sudden the buyers could afford eight to ten cents to the divers because the money they were getting at the other end had doubled. And it's a funny idea that you don't think of it that way, but what Nixon wanted, what the Bretton Woods was about, let's start shipping stuff to Japan and get paid for it so we floated our dollar. Had I foreseen it I wouldn't have sold my gold for \$32 an ounce. Another wise move. So now our fishery has changed to a domestic fishery. Another thing, if I remember abalone, one of the rules was you couldn't ship abalone out of the state. I just vaguely remember that. They decided to control it by saying you're not going to export our abalone, and that was a pretty smart move. Because, had we started shipping to Japan the thing would've, you know, they would've paid top dollar. They would've paid \$1000 a dozen and we would've hunted down the last one. And what masked the population decline in abalone is the price kept going up and up and up. I dove black abalone for \$.80 a dozen. And it went to, I don't know \$100 a dozen later on. Black abalone we harvested in very shallow water and you could see it at low tide where they were and you dove in and we passed rules that said you had to drive, had to use dive gear because the guys were walking along the beach and prying it off. And some guy said, let's put a limit on it. Instead of getting as many as you can, get 20, only 20 dozen per day. We were getting 40 to 60 dozen, getting paid four bucks a dozen. When we limited it to 20 dozen the price went up to eight or \$10. We said we should have done this earlier. So, by limiting the number as a good conservation measure, you---

PKD>> This (catch limit) was initiated by the fishermen?

PH>> The fishermen were pushing for a 20 dozen limit. We were seeing too many people that weren't divers getting into business and they even hired flunkies. They'd give them five bucks an hour, or wine or dope or whatever and they'd walk along the beach picking it up. At the same time, at the same time you could get black abalone for lobster bait. A much smaller size, unlimited amounts. So at San Clemente Island there's big LA which is a cove where you can bring your boat in very shallow and when you brought the skiff in their there was a wheelbarrow, the lobster guy had left a wheelbarrow and you pushed the wheelbarrow along collected sixty or 80 dozen blacks, pushed them back to the boat put them in the traps

and got, I don't know, \$100 worth of lobster out of it. But there was a rule that said if you used it for bait you were allowed unlimited amounts and so on. And at that time, I fished lobster for one year, and we went to get the black abalone and I made a bet with my deckhand that you couldn't take five steps without stepping on in abalone. And he stood there for I don't know how long and you couldn't. It was, covered the entire area and two or three deep. We thought, this was a resource. And all of a sudden the market for black abalone grew up. And we started selling quite a bit. And the price kept going up and up. It was an Asian market. They were juicing them and by that time they were shipping it out of the state. But a funny thing happened. If you dove abalone at San Clemente Island, the sheephead's population was enormous. And they'd follow you around. You'd look behind you and there'd be 70 or 80 sheep head following you around and if you didn't take the abalone that you harvested and stuck it one to another you had it outside the bag, they'd eat it up. You'd turn around and it was gone. So you had to be careful that there was no openface in your bag otherwise a sheep head would get it. And we started diving black abalone. And my recollection is that the sheephead wouldn't touch it. If you pried one off and left it faceup the sheephead would look at it and after a year or two of us diving I think they started getting a taste for it. I don't think that was one of their prey species. Because they never got to eat them. So we trained these stupid, well, I have come to the conclusion that every animal in the ocean is smarter than man. That's one thing. And they know, they have adapted to whatever they live in, they've adapted to it. And we're just visitors there. We never really adapt very well. But I think they started eating, first of all, the sheephead, none of those fish go in to that four, 5 foot deep water with the surf. That's not a place, that's where all the abalone were. At San Clemente Island there were very few blacks past 10 or 12 feet. You go in at extreme high tide get your 10 or 20 dozen and it was just something you had to do, you couldn't sell more than 20 dozen at a time. We started selling downtown to Korean markets and you had to bring in pinks and greens if they were going to buy your 20 dozen blacks. But out of Avalon we'd take the flight, the seaplane out, bring them down to the downtown markets in Little Korea and sell them abalone and black abalone and so on. When we came in with 80 dozen or whatever would store them up in receivers, bring in 80 dozen. He put the word out in a Korean newspaper and we'd say well, where are they? As we dumped the abalones on the floor they were gone just that fast. 80 dozen disappeared in like half an hour. The people were, the Asian market was huge, huge in Los Angeles for abalone. So, this huge market and the increase in price masked the fact that the divers weren't doing very well. They weren't doing as well. When I started, 10 dozen was a good day. A few years before, 20 dozen was a good day. Then five dozen a day was good, then two dozen a day was good until guys were getting, diving off San Diego they were getting seven or eight abalone in one day. From, and this was in a short period, from 70 to 78, somewhere in that period you saw this huge decline. It was evident to a guy. But it wasn't evident because he got paid \$200 for his dozen instead of \$20. So all of a sudden the price is still good. He said hey, Pete, the price is still good.

PKD>> And do the guys limit urchin as well as abalone?

PH>>If you dove sea urchins you were kind of a low class. Abalone divers were, my friend Archie called himself a gentleman diver. I'm a gentleman diver. Pete picks that shit. Pete also paid the fucking rent, asshole. You're a gentleman. He was a gentleman diver right down to his work form, he said if you are diving he wore his hard hat heavy gear, he says you weren't a line tender. You are part of a ritual that you sat on the edge of the boat and you helped with the pier, it they'd hold their hands up like this they put the gloves on his hands and they would do it. Coming out they would do the same thing and hand him a kleenex so he could wipe his nose. It was a ritual of coming in and going back out. And with the demand regulator and all that you didn't need all that stuff. We needed deckhands that the beginning because we were bringing in these mountains of sea urchins and you needed it for that. But, you didn't need somebody to be there in case everything went wrong and you couldn't get your ass up from the bottom. The guys that dove heavy gear and they trained us that way, we had a bag line on the bottom. And the guys would walk back to the bag line, hook up the bag of abalone, tug the thing and take another bag. And they would do this until they were finished. So they always go out and come back. And we waited, floating holes came along when we started diving shallow. We always wore, used sinking holes, or we leaded the floating holes. So what happens is you lead it so that the hole was about two feet of the bottom and you just run out a long that thing and set out a pattern and come back and go out. You could really cover the bottom very systematically with the holes, with the floating holes you have no idea where you are. And you would always come back to the boat. So when I started diving sea urchins here in 75, I did the same thing. I had 60 pound bags and I'd come back, tug it and go back and fill up five, \$600 worth, maybe 10 bags and then I'd take a little break and go do it again. And when we talked about diving for sea urchins, there was a lot of kelp. And inside the kelp there were holes. In every one of those holes in the kelp around the edge were sea urchins. So, you'd get up and you'd look and you'd put the boat at the middle of it, pick that, look around for another hole, so you worked these edges because people think that sea urchins occur throughout kelp bed. Well, 80% are along the edges, or where you have discontinuance, reefs, ledges and so on. That's where they are. If you have nothing there you could swim over a lot of bottom without finding any sea urchins. And I think the same with abalone. Except by the time I arrived at the abalone scene in early 70, those grazers who by and large were gone except at San Nicolas Island where we still saw them way outside, you know, three, four miles off the island in that area in 90 feet of water or something like that, we saw a big, big grazers. And they were few and far between. And everything at San Nicolas Island grew big. The pink abalones were big. The reds were huge. The sea urchins were the same way. We saw a lot of very large. The sheep head

were large. Everything was big there. I don't know if there just were allowed to grow larger because it took more years to get them. I don't know. But I remember Jim Carter, we are diving one day, and we are working 90 feet of water and I came back with two abalones or something like that and he had none. I said what happened? He's I finally found one, but he was lodged in ice because the water temperature at Nicholas goes down into 40 so he was diving. He said let's get the hell out of here. We thought we were going to kill them there. We used to go to San Nicolas Island from Clemente when there was a south swell coming in to the island you couldn't work. So August, September, October there was a south swell and we'd go to Nicholas to dive for a while. And again the pickup boats would follow us around and that was another mistake. With the pickup boat you could do a lot of damage. At San Clemente Island we had maybe 30, 40 guys diving abalone that would offload. And they'd stay out there for days or weeks. I think the record is something like 90 days, some guy stayed out for three months without going back in. And he bought a car, paid cash. He was going to stay out there till he could buy a car and the processor gave him the money for a car. Neither the car dealer nor nobody else had seen somebody bring cash to buy a car. But, it was, so we did stuff that you'll never see again. Some of it was good. Some of it was bad. And like my friend Parrish said, in hindsight I should have had better foresight.

PKD>> Just changing the subject a little in terms of the people that get into the business---

PH>> The abalone business?

PKD>> Yeah, you know, they got in as young people and trained themselves or was there an East Coast sort of system where you had second and third-generation fisherman training them?

PH>> No. No. There was nobody training. Again, I'm talking the 70s. As I said when I got in I went to the library to learn. There was no training nor willingness of the abalone divers to bring a new one in. To give you an example, Jimmy, I forget Jimmy's name. He was a longshoreman. They came from all walks of life. They weren't, with sea urchins guys you saw a lot of young guys coming in. With abalone guys you saw longshoreman, you saw engineers, you saw a lot of different people. And I think they had done different things and were attracted to the lifestyle. We were at San Clemente Island diving for four years and finally Jimmy says, hey, Pete, how are ya? My partner turns to him and says Jimmy said hello to us. He said I wasn't going to talk to you until you were at least four years in the business because some guys come and go. We don't talk to them. You know, it was that type of people. And one guy was a cop. There were all different. So none of them were very young people. And they had done something and they knew how to adapt to things. They saw a problem or a way to do things and they adapted. But, abalone wasn't rocket science. You made your money at the end of the holes. If you weren't willing to put in the hours on the bottom, you came and went.

PKD>> Some of them in the early 70s when we first started were pretty hostile and aggressive. They weren't pleasant.

PH>> No, abalone divers got a bad reputation and deservedly so. There was a black fleet that came out of Santa Barbara and, a lot of good friends of mine, and when they came into Avalon they hid their wives and daughters and so on because they would turn the town upside down. And they were all heavy drinkers. It was kind of a requirement. When I got into the abalone business the guy said, are you left-handed and I said no, why? He says everybody I know in the abalone business is either left-handed or has a gun and people brought their guns out. People brought their guns out and you wondered whether they would use it or not.

PKD>> Somebody pointed their gun at me once.

PH>> Yeah. No, it wasn't uncommon. We had the boats in Seal anchorage, which has a rock outside. And you anchor up next to a wall face that's two, 300 feet high, just rocks breaking down and we are anchored up there maybe 15 boats and the guy came in and shot some pretty heavy artillery at the rocks and he came down and starts laughing his head off. I said Jesus Christ but I guess we were far enough away, but, you know he just thought it was the funniest thing in the world to see the rocks coming down on top of the boats. No, there were a bunch that, and I don't know, you know, I saw the thing, there was a comic that had this guy, and in it there were some abalone divers that killed sea otters. There was a comic in the papers, I forget the name of it and every diver they looked like a French Canadian, what you call them fur trappers, they have a hat on and a beard and they all talk nasty. And you know, here comes the God damn abalone diver. You know, it's because the sea otters that, I think, started the reputation that they were bad because they brought this to people's attention and nobody would believe them. Finally the Department of Fish and Game believed what they said well there's nothing left. These guys were right. That they sided with them. There's a whole group in the Morro Bay Marine biologist from Fish and Game that said they are absolutely right. You know, once the sea otters had been going through there there's nothing left. From that reputation I think the guys were looked at. But a lot of it had to do with the drinking, which was a big part of that lifestyle was the drinking. And I don't know.

PKD>> One other question that comes to my mind often when I talk to fishermen is the idea that if you are a fisherman you deserve a certain amount of the resource. But nobody's talking about limiting the number of fishermen, which must be pretty important to you because you've got a finite resource and if you've got three times as many fishermen nobody can make a business. Do you have any thoughts on that?

PH>> Very serious thoughts. When we started this idea of restricted access, limited entry was in the early 80s. The first was abalone that we restricted. And I was opposed to it. I had a gut feeling that this is somehow not right. Because what it was doing was putting fences around each fishery and so on, that it made you fish in a fashion that you normally wouldn't. You became an abalone diver or a sea urchin diver or a lobster fisherman. And by restricting it that way it prevented you from not doing it every day. Now, because you were an urchin guy you dove sea urchins 200 days, or abalone 200 days. Otherwise before that, you put different gear on the boat, you fished different things. So, looking at it through the prism of what didn't work, I think it has to be community-based. The community says you can't be an abalone diver, but you can fish sardines, for example, or so on. As you get into the fishery you should have all these hats, that you don't concentrate so much of your effort doing any one thing and therefore you say we're getting low on abalone---

PKD>> But you're just pushing my question back now to how many people do you have in your community. I agree with your philosophy of being able to switch off, but still if you had three times as many fishermen in your community you're still going to have a problem.

PH>> I don't see that as a problem because you're not making enough money to attract young people. You'd have to, but you're absolutely right, you have to limit it but it has to be done at the community level rather than at the state, or somebody in Washington DC determining what is the right amount. They can't tell. And you can't attract young people without making it profitable and making it different. For example, if the processor comes to me and says I'm only paying \$.50 for sea urchins, I would like to not go out and get them for \$.50 because you are throwing half of them in the trash. But I can't do that. So I have to say I'm gonna go do something else now. I'm going to go fish for something else. So you have to give these people these avenues. So, you wouldn't find out, with individual fisheries. You get a broad picture. Again, you're coming back to management of the kelp bed. What is there here? What's the right number of people and what kind of mix does your society have to be able to harvest properly. And shift some guys over here and there. But yeah, you could limit it, but not limit it to any one thing. Limit it to your community population. And I don't think, you know, diving is hard work. There aren't many that would be good at it and will stay with it for very long. My friend Henry Davis says to be a really good diver you have to have a high threshold of misery. You have to love putting on a cold wet suit in the morning when it's raining. And jumping into water. If you can't do that, you won't succeed. But I'll tell you right now, I'm nowhere near what I used to do 40 years ago, but I still enjoy it just as much.

PKD>> And you still go out regularly?

PH>> Now, I go out a lot of days. I was out yesterday and I was the only boat out there because it was pretty shitty out there and my wife said, how did you do? I said financially or competitively? Competitively I was number one. Financially, I did not pay for the fuel. But it's become important to the old man to be number one. And I have to wait till nobody goes out to be number one. Because any dummy with his hands tied behind his back can outpick me. I'm lowering the catch per human effort for the whole fleet just by going out. But I go out more days than most. I go out any day I can because I enjoy it. And it also keeps me away from doing chores at home. Painting and lawnmowing. Who the hell cares. And you know what? When I was here at the dedication of the building and I talked to a lot of old guys that were you know, in their 60s. And I said how come you're not retiring? He says are you kidding me, he says I get to travel all the time, meet my friends and we go to London and Rome and so on. What, I'm going to give that up to stay at home and mow the lawn? I don't think so. I'm going to drag this out as long as I can. Because they were doing it mainly because of the comraderie. All their friends were doing it. Now you've got to be stuck at home. And you know, and I always say that aboard the boat I'm the captain. I have a deckhand. He does anything I ask him to do. If I go home I've got a boss. And I'm the deckhand. And I'll never get her job. You know, this is established in society that the wife is the queen of the castle and we are just some flunky that they hired to bring in, paint that things and none of the stuff I'm good at. I enjoy diving. So I'd rather go out, make the money and pay somebody to weed and cut and so on. The lifestyle is very, you get caught up in it so that it's hard to leave it. Even for retirement. And I always think that maybe one day I will be an artificial reef out here.

PKD>> I have...

PH>> I did, I'm not answering your question. But the question you are asking is more difficult than you think. It isn't an easy answer. Whereas I don't want to limit young people from getting into the fishery, you're absolutely right, there's a finite number that can do it. But how do you limit it that it's the right amount? And I don't think catch shows are a way to do it. I think getting a bunch of rich kids that have rich parents buying their kids a \$300,000 permit is going to make it---

PKD>> You been able to launch the sport diving question by fishing for urchins. But now if you're thinking about a community that's fishing for everything they can and you've got 10 divers, say, they can make a pretty good living switching back and forth in their community, and you've got 10 more divers trying to be commercial, or you've got 100 divers trying to be commercial and take your job away from you and you've got sport divers out there whose parents are rich who have the money to spend on gear and time and fuel. Even if they get skunked, they're not getting skunked. They are getting a lot of resources. It gets pretty complicated. And everybody complains about the poor management, but nobody's talking about how to fix it.

PH>> Well, everything is simple until you bring people into it and all of a sudden it gets very complicated. If you leave people out, and if you bring people into it, who's going to be the guy that decides you're in, you're out, you're in, you're out? Or do you just pick numbers? Because in my mind you tell people they can't do it, they're going to do it anyhow because you don't have the policing anyhow.

PKD>> Apart from that the sportspeople can be controlled with licenses and areas that they can fish.

PH>> Area would be the way to control it.

PKD>> Area approach and license. So you have limited entry and a lot of places you have to have lotteries to get your licenses for different things. And so that's how the sports world gets controlled, but I don't see that happening with the commercial people very well.

PH>> There aren't very many in it. The number of commercial fishermen in all of California is somewhere around five or 6000. That's in the entire state. And you're seeing them getting older. So at some point you're going to need new people coming in and who are these new people? It's all restricted access now.

PKD>> And how are they trained?

PH>> You bring up a very good point. I appeared... well, you helped me with it, Paul. A lot of people I asked about an apprenticeship program. I think people like me would like to think that we learned something the last 40 years that we can pass on to the next generation. And there is no mechanism right now. So I appeared in front of the Fish and Game Marine resources committee with the idea of an apprenticeship program. They said well that's not up to us it's up to the industry, the sea urchin commission and so on. Those guys said we don't want any new people. We just don't want them, that's all there is to it. We're not going to train anybody. We're not going to train them to be better than me. I'm not going to train anybody. And yet, when I talk to people, there's a big emphasis now being placed on junior colleges. I think there's a lot of knowledge that the would-be fishermen can learn there at a junior college that would prepare them better. And then you need to work on a boat with some older guys.

PKD>> But the apprenticeship business is thousands of years old. As a philosopher training, you know, skill. And the sense of place. A sense of business and everything else. In the East Coast you have the parents doing it because it's a family thing. Here we don't have that and training doesn't exist and they go out and take chances. Their boats flip over. They ground. They get hurt.

PH>> But more than that, Paul, it's a culture. You don't want to do something wrong, not because you're going to be arrested, not because you're going to be caught, because you're never going to be caught. It's a culture that says I'm going to do things---

PKD>> It's like your Sicilian friend, we don't go out and fish the spawning habitation because we have a brain. And suddenly you have people that are dominating the field with no brain. They think, they don't even think about wiping out the spawning aggregations and it's going on everywhere. It goes on in the East Coast, two, that's where the Cod and Halibut were wiped out that way. So, you're absolutely right it's the culture and how do we fix that?

PH>> Well, you've got to teach the love of the resource, of fishing as a way of life, as an avenue to the resource. And it's easy. The trouble is it takes 10 years. I think to really absorb that culture it takes 10 years. But, I'm looking at it from my point of view, I didn't get that way when I first started. It was just getting, do this, do that but after a while you get this idea that I would like this to continue for a long time.

PKD>> Part of your culture that's important to both of us is kind of training them to look after the resource.

PH>> Yes. Yes.

PKD>> Not wiping out spawning aggregations, not wiping out spawning aggregations of the abalone that there is a culture for that. It's important.

PH>> Right. What I thought about that, I've given a lot of thought, is the collection of--- Is it okay if I talk?

PKD>> Yeah.

PH>> Collection of information. Get the young guys understanding by collecting information. Collecting the data on sizes, populations and so on and what's out there. Because when you first start you don't have any secrets and then the second part is sharing it with the other young guys. You start sharing the stuff, so, and it might not take 10 years. Two or three years later they'll say you know, what we should be doing, what we should be doing in order to maintain these things is certain things, and you've also got to teach them marketing. To sell one sea urchin for five dollars is much better than selling 10 sea urchins for \$.50. Let's not harvest that many, because we won't be making as much money. So bring the business aspect, but the aspect of learning what's out there. When I started collecting data and recording it in Excel files I started thinking differently. And my deckhand, Kenny, measures 60 sea urchins every day. Every day for the last nine or 10 years measures 60 sea urchins. And this man says things like, you know about a quarter of them were 83 mm, or 84 mm? That's one or 2 mm above the minimum size. This has sunk in to his head and he talks in millimeters. I said, what that's guy talking about? Instead of saying 3 ¼ inches because he measures each one. But he's able to see this. So the young guys coming in and measuring and looking at stuff will start thinking that way. They say wow, there are so many of them close to the minimum size, which when they start talking to one another they say why is that? You know we've got a population of 17-year-old guys here. Nobody older than 17? What happened to this population and so on. And I think, so data collection is mandatory, not whether you like to do it, it becomes part of fishing. Catching fish and knowing about the habitat and all the other things. So you fill out this thing on a daily basis that is a requirement. And if you have an apprenticeship program four or five years by the end of four or five years it becomes natural. This has got to be the new fishermen. The guy that doesn't depend on the state or the federal authorities, but collects the data. And he works with scientists. And I think there are scientists that are willing to work with them and happy to work with them and I think that will form, it's not the regulators and it's not the politicians. By the time they do things they only want to get involved in things after it's too late. Let's do something about abalone? Why, because there aren't any more. Now's a good time. They should have started it in 1970 when we saw signs. We saw signs. And so the idea is, I think this is easy. And part of the social capital is the collection of data. But the more important part is the sharing. Sharing among, and this to me is intergenerational. My guys don't want to share. This is mine. We fishermen, as you said, have a bad habit of using the possessive pronoun. My area. My sea urchins. So, we tend to think of it that way. And we've got to start thinking, our, but I don't think can think of it anywhere past a small community. Let's not expand the community anywhere. Let me give you an example. If you dived for sea urchins and there are three guys on the boat, you say okay, you work here, you work the back, you work over here. You decide how to do that. When it comes to paid boat share, over the last 30 years it's become standard that it's 30%. The biggest decision is how much money are you going to give away to the owner of the boat and that's been pretty well steady. So, on an individual boat they've decided how they are going to share that dive squad, how they're going to share the money from that day and so on. So now you have 15 boats. Let's expand it. In this harbor we have 15 boats. How do we, with customary practices, make those 15 boats work together? We've done it at that level and it's worked out all right. So let's expand it. It's not a huge problem to expand it. The guy says you know, we need more divers or we don't need more divers. They can figure out that Jesus Christ, the resource is inexhaustible, let's add a couple more divers or let's work with the next port over and then in the El Niños what happens and so on that you make these, but I think you can work a port. I think there are so many in this port, and that's all there will be here.

PKD>> When they tell you at the state that they can't mandate that, then I think they're right that they can't really mandate that, but the port people can do it. So really you're going to have to come back to your community.

PH>> Yes, and come back to the community fishing association. It's a lot more than fishermen. See, fishermen are part of it. People that buy fish, all the way from boat to throat. Everybody in between should have something to say. We want to be able to buy sea urchins, the chefs have to be part, so how do you make this, we call it the community fishing association but it could be a community association regarding fish. So, how do you make this? And Magnuson has some rules. If you establish a community fishing association you get quotas and so on. But they haven't defined what is a community fishing association. To me, by leaving it up to you to define it should put you in a pretty good position. You'll have to go to the management council and persuade them that in San Diego you've decided that this is what a community fishing association looks like. And they will get the authority to do these decisions.

PKD>> There's sort of two things because once you've done that you need to be able to, you can't just have permits for one

fish after another. The fishery has to have a joint permit. So you can switch back and forth---

PH>> The community, somebody determines---

PKD>> But then you've got the other problem that the San Pedro divers are going to come in and take your well-managed resource. And that I think somebody else at the state does have to regulate.

PH>> Right, because what they should do is mimic what you are doing and do it there. But somehow, in my mind rather than worrying about that, establish your stuff and let it happen and then you say look, it doesn't work. We thought, we tried but they wouldn't come here, but it doesn't work therefore you have to set some limits. And you can set too many limits because we may not have any harvestable products here and they will have it over there. But you know, McCall I think it was that came up with this idea for fishery management that said you would take the whole biomass of harvested and if it's above 30% you just let them do whatever the community wants. Below 30% you shut it all down. You can't fish lobster, you can't do anything, you're done. This was a little gratuitous but I think this is what you're getting at. That the whole biomass has to be good. And if there's a lot of this, the community fishing association, go over there, get that because..., don't be harvesting this. And at the end of the day you want to bring in as many different species to your community as you can. Different, and not too many of any because you can only sell, if you can only sell 1000, don't bring in a million. And I think, I don't like quotas because they're set by the state, you know, they pull it out of their ass. So most of these quotas don't make sense. But at the community level you can put, what do the Alaskans call it? Target, their target harvest rates or something, you know you can set a target for your area, within your community. And halfway through you say wow, I guess the target was set too low or too high. You should be able to modify at your level, but I think you have to set targets for all these things. So by setting those targets 10 more guys get in, it'll make a mess none of us will get in. So you limit the number of people instead of saying you can't get that, start off with handlining anchovies. You can start off with some other level.

PKD>> Still then it would be good to have Steve Schroeter or somebody to manage the data so that you can keep in touch with it

PH>> Absolutely. Absolutely. I see that advisor as being part of the community fishing association.

PKD>> So you need a Steve Schroeter.

PH>> You need someone not only that manages it, but tells you when you have to bite the bullet and it's somebody you trust. It's not somebody that doesn't like fishermen and is saying it to get rid of you. The guy says hey, guys, it looks to me like the numbers aren't lining up like they should. But give you an alternative. Not say all right everybody go home. Don't pay your rent for six months or whatever. Here's what I suggest. So it's a guy that you trust, that you say we can go to him.

PKD>> It's pretty unusual for fishermen to trust a scientist.

PH>> Yes it is. But I think if you start off the next generation as working in this fashion, well I don't see why you say that, Paul. It only took us 30 years to see eye to eye. Seems like it happened overnight. And a government that robs Peter to pay Paul will always get the support of Paul.

PKD>> True enough. Because we're going to need to quit for various reasons. I'm trying to make sure we sort of covered things and you've covered everything that you had on your own. Is there anything else that you think I should ask you for the record?

PH>> Is there a future in fishing in the United States? I worry a lot about that. That we think that we can buy our fish from Indonesia and somewhere and therefore solve the problem. And we're ignoring the pollution and all the other issues that are far greater and the ocean acidification and all these things. We're ignoring them. So my friend Bruce Steele said, he posited an idea, how do we take ocean acidification into management of our fisheries? What can we do that we just don't ignore it until it happens? What can we do, and of course little things like lowering your carbon footprint or natural stuff, but what do you do when you manage fisheries? My idea was at least collect a lot of good data on ocean acidification that fishermen can do and Bruce says no, you can't do that because you can't check the pH because it's going to be set to such standards and so on. So, you can't do that, but I don't worry about that. That's fine for a scientist. If a fishermen is collecting the pH data he's aware of the problem. He's thinking pH is one of the guiding things. And the numbers may not be very good, but his realization that these numbers have to be taken into account. So, collecting data is partly to use it in management and partly to make you a better steward. And so, so I think we have to take these things into account if we're going to have commercial fishing in the United States. We have to be better fishermen. And if we're not and we leave it to

Indonesia to supply our fish, they'll kill every God damn turtle because they don't care. They don't care. And there's a half a million of them that are trying to put bread on the table. So you can't preach to them. So let's make sure we have commercial fishing. Let's make sure we have commercial fishing of the 21st century that looks at big problems. Don't be building a God damned thing along the waterfront that's 6 inches above high tide. Just think a little bit before you do that. All these things that whether we believe it's going to happen or not, let's plan for. And let's plan for it in our management. Don't leave it up to the state or the feds to think about that. Think at your local level where you can make these changes and make the changes. And above all, if you're going to be respected by the outside world, you better take some steps to conserve what you're doing. Even though they may not be necessary. To show that we are not only getting together to maximize production, we are getting together because if we see problems, let's avoid them. Let's look for problems that we think may happen and avoid them. And I think it's up to us to learn, we fishermen, to learn how to do that without, I'll do it until the guy slapped me upside the side of the head. Let's do it before. And the other thing is I haven't had this much respect for old people. 30 years ago I didn't respect them this much. I respect them a lot today.

PKD>>> I think we can turn things off.