

MARITIME AND SEAFOOD INDUSTRY MUSEUM
UNIVERSITY OF SOUTHERN MISSISSIPPI

AN INTERVIEW WITH DR. ANDREW KEMMERER
FOR THE
TURTLE EXCLUDER DEVICE ORAL HISTORY PROJECT

INTERVIEW CONDUCTED BY
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BRANDON, MISSISSIPPI
MARCH 16, 2010

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Stephanie Scull-DeArme y: This is an interview for the Maritime and Seafood Industry Museum and the University of Southern Mississippi. The interview is with Dr. Andrew Kemmerer, and it is taking place on Tuesday, March 16, 2010, at 11:00am in Brandon, Mississippi. I am the interviewer, Stephanie Scull-DeArme y, and first I'd like to thank you, Dr. Kemmerer, for taking time to talk with me today. I'd like to get a little bit of background information about you, so I am going to ask you for the record, "could you state your name please?"

Dr. Andrew Kemmerer: Andrew Kemmerer. That's A-N-D-R-E-W. J is my middle initial. Kemmerer. K-E-M-M-E-R-E-R.

SS: When were you born?

AK: 2/11/1938 in Bryan, Texas.

SS: How do you spell Bryan?

AK: B-R-Y-A-N.

SS: Okay great. Well, we'll get right on to the questions that the Seafood Museum has submitted to us. I'll start with number one and ask you, "what role did you plan in introducing TEDs (Turtle Excluder Devices) to the shrimping industry?"

AK: Just about everything, from the research to management introduction. [I was] also involved in [the] international introduction of TEDs. I'll give you a little background, I don't know how much background you've had, the TED is a result of the Endangered Species Act that went into effect in 1973. Turtles were listed, as I recall, in 1979. We began an observer program – and at that time I was the director of the engineering lab. I was with the National Marine Fishing Service (NMFS) in Bay St. Louis at what used to be called "Stennis", I'm not sure what they call it now. I was in charge of the engineering laboratory then. We combined with the lab in Pascagoula which is basically a research laboratory and fisheries [are] sort of the – boat surveys for the most part, environmental studies, and gear technology. At Bay St. Louis we were involved in turtle tracking [devices], developing satellite tracking devices, porpoise tracking devices, and so forth, both in the Gulf [of Mexico] and in the Pacific. Anyway, my involvement with TEDs began probably about in the early Eighties, when I was involved in – when I became the director of the Mississippi laboratories. At that time, we were primarily doing just observers on shrimp trawlers to find out if indeed they were catching turtles. Secondly, we were doing some gear work, not a great deal, but some gear work, on ways to keep turtles out of the nets. The results of the surveys were rather startling as to the number of

turtles that were being taken. I think we had originally estimated something like 12,000. They were coming up either alive and kicking, or comatose, which meant they would recover, or dead. So, we assumed at that time that turtles would be – the comatose would recover and only the dead ones – we estimated about 12,000 turtles were being captured and killed a year by the shrimp fleet.

SS: In what area? Just the Gulf?

AK: That was the Gulf [of Mexico] and South Atlantic.

SS: Okay Gulf [of Mexico] and South Atlantic.

AK: That's where the shrimp fishery occurs. It's principally off Texas, [there is a] pretty good one off Louisiana, some off Mississippi and Alabama, and Florida. But all of the major activity is off Texas. Then in the South Atlantic, they had a pretty good shrimp fishery as well.

SS: Now where would the South Atlantic end going north?

AK: That goes up to North Carolina.

SS: Okay.

AK: So that was the range of my ultimate responsibility. Anyway, so from North Carolina to Texas the catch and mortality of turtles – we'd estimated about 12,000. That got people rather upset, obviously.

SS: In what period of time? 12,000 in what period of time?

AK: Well, that was the annual take.

SS: Annual? Okay.

AK: Annual Mortality of turtles. That was subsequently changed the National Council of Research – that's not the right name, it's not the National Academy of the Sciences. It's the research arm of the Congress. [Editor's Note: The Congressional Research Service works exclusively for the United States Congress by providing its committees and Members with nonpartisan research and policy analysis.] It became such a heated issue at that point that they required that all of our data be turned over to this research body. They did a review, and they essentially said our results were valid except for one thing: they

assumed that all the turtles would be dead after being captured. So, then the numbers went up to about 52,000 turtles being captured a year.

SS: So, they were including the alive and kicking ones in there? It went up to what number?

AK: 52,000.

SS: 52,000.

AK: Thereabouts plus or minus - I spent a number of years since I dealt with that but that was roughly the number. I remember there were a lot of shrimp boats at that time. One of the reasons for that was an awful lot of shrimpers had moved back from South America [and] Mexico because those areas had closed their fisheries to shrimping and so the boats had moved back and there were over 20,000 - I think it was around 20,000 - that were fishing.

SS: Why were those other countries closed their shrimping?

AK: So, their boats could catch the shrimp because -

SS: So, they kicked out everybody [who was] not native?

AK: Yup. That's right. So anyway, our gear work at that time had kind of focused on - this work was underway before I got there [inaudible], and they had really focused on putting some device to keep turtles out of trawls. We had [an] outstanding group in Pascagoula - actually, I want to emphasize the cooperation of the fishing industry. Without their cooperation [we] would have never been able to put observers on the boat, that was all volunteer activity, and they were really helpful. Of course, they didn't think too many turtles were being caught either. That was a surprise to all of them. It's really a matter of - and by the way there was something like, I think one number sort of kicks around, 27[,000] - 28,000 hours of observer time. So, it was a lot of time on the boats. How much do you know about the shrimp fisheries from the standpoint of how they operate and so forth?

SS: Well, let's assume that somebody's listening to this in one hundred years and they don't know anything.

AK: Alright well, a trawl - usually the boats pull - particularly the ones - there's an inshore trawl fishery and they fish the basin and such and they were not required to use

TEDs initially. I don't know what the status is but let me get back to – the gear work initially focused on trying to keep turtles out of nets. So, they put a barrier up across the opening of the net to try and keep them out – a large mesh type of thing – and that sort of worked, but the shrimp loss was quite high, and turtles were being tangled in the webbing across the front of the nets so that was where I really picked up and did some of the analysis of that work. One of the things I always loved was statistics and working with the numbers and that's kind of what I got involved in in a really substantial way and, anyway, it just wasn't working well. He came up with the idea, Sinkey Boone, I think on the East Coast originally, had kind of the idea, so we focused on looking at that in different ways. You can't give anybody total credit for – I don't think. There were a number of people that worked on this. Again, just a superb group and our gear people – the fact that we had one ability that so many people didn't have and that is to put divers on the nets. So, they could change things actually while the net was being towed [and] make observations and so forth and really just a super group. Plus, we have some of the best gear people in the country. One of our chief gear person – these are guys that make nets and stuff – had been with the United Nations for quite a while going all over the world (helping the build up?) with (Jim Barrett?) and [was] just an amazing guy. So, he could work with nets and gear and then our divers – also we put cameras all over the net so people weren't able to do – so we could see what was going on. It's a development of a TED initially – really the types of TEDs – now there's a lot of different designs. As Turtle Excluder Devices – a number of the environmentalists called it “the Trawl Enabling Device” [laughter], which might not be a bad name for it, but Turtle Excluder Device –

SS: What does it enable?

AK: Pardon me?

SS: What does it enable? Catching shrimp?

AK: It enables them to trawl in areas that otherwise would have been closed.

SS: Okay.

AK: The Endangered Species Act [of 1973] was a tough law. When you come down to it, it was an extremely tough law. I don't think anybody really realized the magnitude of it until it started being implemented all over the country in different situations. Several of the turtle species were in pretty tough shape.

SS: Which ones?

AK: There were five species affected in the fishery. The most common one was the Loggerhead. That's the largest heart-shaped shell turtle, and they were taken throughout the [inaudible] of the fishery. The Kemp's ridley, which was the most endangered – that was the one that was listed as endangered – the Loggerhead was considered “threatened,” which is a less severe level. The Kemp's ridley was one [of the ones] in really bad shape. Then there's others that are taken in less numbers, fewer numbers. That's Hawksbill turtle, primarily off Florida, some in the South Atlantic, that's also a hard-shell turtle in there. By the way, the Loggerhead turtle weighed about three hundred to three hundred and fifty pounds. They're big old things. When you get them on deck or get them in a net, you know you got a turtle. The Kemp's really gets up to seventy to one hundred pounds, they're quite a bit smaller. The Hawksbill is a couple of hundred pounds, a pretty good-sized turtle. The other one was a Green Turtle, they primarily eat grass and vegetation, they're an herbivore. They're primarily off Florida. Then the Leatherback, which is the only softshell turtle that we got – I don't remember if that's the only one in the world but [it's a] marine turtle. That turtle gets up to several thousand pounds. They're pelagic, they're offshore but they do come in to nest.

SS: What does “pelagic” mean?

AK: Just up in the water, away from any bottom dependents and so forth.

SS: Okay.

AK: They eat principally jellyfish, that sort of – well principally jellyfish. Gosh they're a huge animal. I watched a leatherback back come up one night – all these animals except [the] Kemp's ridley nest at night – and if you're out there, it's just an amazing thing to see, but particularly the Leatherback come up on shore, dig its nest, lay eggs, and then try and cover up the nest. The nest is a perfectly round cylinder just about in the sand, a foot or two deep. They very carefully pick up the sand and move it out and then they lay it on, oh I don't know, one hundred, one hundred and fifty eggs. Then they cover it up and then flop all around to try and disguise the fact that there's a nest there. There's a very high mortality on turtles in their nest because it takes them five, six, seven weeks, or longer, to hatch and then the turtles come out. Also, all these species of turtles – the hatchlings come out at night, except for the Kemp's ridley, which is one of the reasons it's been the most endangered. Their hatchlings come out during the day and birds just go wild, [they] start seeing those turtles coming out. The Kemp's ridley also nest during the day, but the others nest at night. They nest, oh I don't know, five times a year, a season. A season is usually in the spring and summer. That's also when they shrimp a lot, by the way, so

that's another problem. There is a corresponding thing – and that's, you know, the Loggerheads eat, they eat shrimp and, well they eat crabs and a whole bunch of other things too, but they also are out there, not just because they want to be out there at that time (and getting away?), they're out there getting food and so forth.

SS: It's not a coincidence.

AK: Yeah. So, the good old Loggerhead – they're a fascinating turtle to see. Have you ever seen a trawl in operation?

SS: No.

AK: No you've not – I have a trawl here. This was used in our training sessions with the shrimp industry. Again, we have a lot of work with the shrimpers, and this was [used] when you're showing how to put a TED in and what a TED looks like. That's a trawl.

SS: Wow.

AK: This is what you call “the float line,” and then underneath is the chain and this is underneath [telephone rings].

SS: Okay hold on just a second while – until the phone stops ringing. Cause then we can't –

AK: I will get that soon.

SS: You do need to get it? Do you need to get that?

AK: No. Unless it's you. Are they calling you?

SS: No.

AK: Okay, anyway this is a float line, that's the bottom line, and that's a heavy chain used (later?), that's designed to kick up the bottom. The TED is back here, and you can see that's a metal – I don't know if you can see that.

SS: I can. I see it.

AK: It's a metal – just a metal frame put in at an angle and there's floats at the top, and there's bars that allow the shrimp to go through and kick the turtle out, they go out the

bottom. They try the bottom and the top – they go out the bottom through a little opening. These nets [are] on small boats, they won't be that large, but all the larger offshore trawlers, the one that takes an awful lot of the turtles – that's about a hundred feet, that float's going to be about a hundred feet long. They'll tow four nets at a time. Four nets, one, two off of each outrigger, and the opening here is only about two feet, three feet max. You notice it overlaps the bottom line of the chain and what happens is the turtle isn't just scooped up. The turtle can get out of the way of the net without a problem, I mean if they want to, they cannot swim with the trawl. The trawl's going to be pulled in at a couple of knots, so it's pretty slow. The turtle can get out, but the turtle doesn't know he can get out. He just swims in front of – he, she – in front of the net, and finally he gets exhausted and falls back into it. It's either caught or kicked out by a TED.

SS: So, does the current eventually pull them toward the TED when they get tired?

AK: Yeah, they just get tired and they wash back into the net. You think in terms of it like a dip net catching the – but it doesn't. The turtle just becomes exhausted and slowly starts swimming back into our – and losing speed and being caught. Again, they could get out easily enough if they just would. Those white things, by the way, are the doors, and that's what spreads the net. They work at an angle, and they just hold the net open. Again, those things help put – two on a side, and so you've got a couple of hundred feet depth on each side of the boat, which is a tremendous amount of resistance and there's powerful engines in those boats, and very large winches. It can be very dangerous on the boats and tough to work on it. Again, the industry was quite cooperative with us, but people aboard, they'll tow them for five or six hours before they pick them up. Sometimes, if it's just the captain and not the owner, and [inaudible] in the boats are [inaudible]. Whereas somebody may have five, six, seven boats and they hire a captain – the captain, they get a little lazy, and tow the thing all night without picking it up. But usually, they'll pick it up every few hours just to get the catch out. They sort the catch first thing in the morning usually.

SS: So, on a big boat, it's so big, and the engine's so powerful, they would not have any idea from, say –

AK: They're quite large. No, they don't feel it – they don't know there's a turtle in the net.

SS: A big Loggerhead – they wouldn't even feel it?

AK: No, no because they're getting hung up on stuff at the bottom and it's just not something they'd notice. So, it's quite a machine. The bottom, the spreading, I think cuts into the bottom – into the sand and picks the shrimp up.

SS: So, it's actually dragging the bottom?

AK: Oh, very much. It's hard on the bottom, and you want to make sure it's hard on the bottom or it's not going to catch the shrimp. Because the shrimp are just on the surface, or the bottom, or slightly underneath the surface by the bottom. That's what they're using primarily for brown shrimp. Now white shrimp will be a little off the bottom, but white shrimp are an inshore shrimp, for the most part, and they're caught by smaller trawlers. So, this is the primarily trawl issues, but there are some trawlers – inshore trawlers – that use trawls. They'll have a higher opening, but they work the same way. Anyway, it's a fascinating operation to watch those guys – lots of things being caught with those nets, and that's one of the problems with them.

SS: So, Dr. Kemmerer, you were on a boat counting the bycatch?

AK: Well, I had observers going out, yeah, yeah, but we had observers going out – I didn't go out very much.

SS: You didn't go out very much?

AK: No, I primarily would go out just for a short period and get off the boat just to make sure – again, my background is primary statistics and engineering. I wouldn't be able to tell one thing from another or – observers were college students, undergraduates for the most part, and they were working now themselves through school.

SS: So, they had internships maybe or were getting a stipend?

AK: Well, we were paying them, and they were working for us, and usually they were out of school for a while. It was convenient because it was in the spring and in the summer, so most of the shrimping was during that period. There were a lot of students, particularly during the summer, looking for work. We were extraordinarily lucky that we didn't have anyone be seriously hurt. That certainly says something for the industry, they took care of them, made sure they didn't get hurt. Because we could have easily been hurt. There's an awful lot of hours and a lot of different observers who were aboard, and that worked quite well.

SS: So, the observers would go out and send you the numbers, and you would crunch the numbers –

AK: They would provide the numbers and they would go in the database. There were a lot of different things associated with how those numbers were – during the initial part when we were just doing the counts on turtles, they would check – usually just one net – they would check what's being caught in that net, and if there were turtles on board, – they would do a full census on one net, and then check all nets for turtles.

SS: Oh, I see.

AK: In the latter part of it when we would put – doing our work with TEDs, we would have two nets equipped with TEDs, and the other nets would not have TEDs, so we could make comparisons [between] nets with TEDs and nets without TEDs. The shrimp loss –

SS: What was the difference?

AK: The TEDs were eliminating about ninety seven percent of the turtles. They were working well. Our target was primarily the Kemp's ridley. Now there were some very large Loggerheads who weren't able to get out – if you caught a Leatherback too, they weren't able to get out – but they were relatively few. Most of the turtles did (survive?) about ninety-seven percent of fishing. We had about a two percent shrimp loss [inaudible] if the TED was rigged properly. There was a lot of disagreement on that number, and that was a hot item, that was a difficult part.

SS: The shrimpers didn't believe that it was two percent?

AK: No. I still think there were some people making money, organizing, trying to get shrimpers together, getting donations, that's not too uncommon, telling them about all the horrible things that were going to happen to them if they used TEDs. That just didn't happen when – if a shrimper used a TED properly, they did not lose significant numbers of shrimp. It just didn't happen. There were some other advantages that [inaudible] trash for them and so forth. It claimed they would catch up a little bit. Now there were some areas that they didn't work particularly well, but for the most part, they worked quite well. Virtually all their –

SS: What areas?

AK: If there was a lot of grass they were trying to trawl through. But with a regular net with grass, they would have had a heck of a time trawling through so – we generally found overall that they worked extremely well.

SS: So, if they were going through grass, what would have happened with the TED? It would slow them down or they would catch fewer shrimp?

AK: The TED would block (paths for the?) shrimp and [inaudible] –

SS: Okay. Okay.

AK: But again, that was pretty rare.

SS: So, the grass would block the TED. Hampers shrimping.

AK: Yeah. But again, that was pretty rare. As I said, they seemed to work quite well.

SS: So, these offshore fishermen, what depths are they trawling?

AK: They trawl out to about 20[,000], 25,000. [Inaudible] six feet.

SS: How likely is it that they would run into grass at –

AK: They didn't, except off Florida for the most part. That was just some isolated areas, and they knew where the grass was. It wasn't something they didn't know – where they were fishing.

SS: Was that a shrimp-rich area?

AK: Pardon me?

SS: Would the grass be a shrimp-rich area particularly?

AK: No.

SS: So, it wasn't like they were giving up their prime hunting spot. Is there anything else you can think about your role in introducing TEDs?

AK: Well, I was overseeing, or responsible for, the development [of TEDs], and was getting the data on the capture of sea turtles. [I was] responsible for the design and

research related to TEDs, and the capture of sea turtles, and how well it worked on shrimp. Then, the initial part of starting to introduce the boats to TEDs; we started out with a whole series of workshops with the industry. Working with the industry, [and with] the associations, we set up workshops all over the Southeast. Then, when I went to the regional office, I was what they called, a “regional administrator,” then that was a “regional director.” There I was responsible both for the research and the management; setting up the regulations to implement TEDs. Then, my responsibilities were primarily to, well, oversee the whole thing, I guess.

SS: Well, keep that in mind but can we talk about introducing it to the industry? What does that look like if you can paint a picture?

AK: Yeah, yeah. Well, I thought it went quite well. We worked with Sea Grant; that was a very, very good group to work with [Editor’s Note: Sea Grant is a federal-university partnership program between the National Oceanic and Atmospheric Administration and 34 universities across the United States, Puerto Rico, and Guam]. I can’t say if there’s been one group that – it’s kind of like the Agricultural Extension Service – Sea Grant and working with the fishing industry is just an amazing group. Very capable. They would help set up workshops and we would send our gear people out to give presentations on the TEDs and how to rig them. That was one of the type of displays that we had taken [inaudible] –

SS: Exactly where did the gear people go?

AK: To the workshops. They would be held at schools and all over; wherever they wanted to have a workshop there would be a dozen fishermen or shrimpers, or two dozen, three something dozen – whatever – would come and meet with our gear people. They would give a presentation on how to rig the TEDs, put a TED in, what a TED looked like. They would also go to the (sum?) of their boats, so there was some gear work being done at the boats themselves on the docks.

SS: How did you get the word out to the shrimpers?

AK: Through the meetings. When the regulations were published, then we had a series of public workshops. I mean public presentations on what the regulations were going to do, and we had two or three in each state, several times because the regulations changed so there were a whole bunch of formal presentations of the regulations, and they really got tough at times. But, again, the industry was quite good – I learned one thing that was kind of interesting: if you’re going to do something like that, number one, try to set up your regulations issuing at some time other than when there might be an election going on.

Those are bad because then everybody comes; the governors, all the political people get up there and stand and give talks – they're always knocking the government out – “these feds are intruding on your fishing rights” and on and on and on, so it got pretty hard at times.

SS: You can't buy that kind of publicity, can you?

AK: No, my gosh no. Anytime you get them together, we'd have 2,000 people there that were –

SS: So, the politicians take advantage of that captive audience?

AK: Well, that's right. So, you learn one thing: don't do that if at all possible. Thank goodness the number of them weren't that way, but some of them were. Don't do it at a building near a bar, or that has a bar associated with it. That's bad. Always do it at a very large facility, try to do it in a public facility, that's always a good idea.

SS: Did you have trouble with people –

AK: Have enforcement people there, particularly the state enforcement people. They were extraordinarily cooperative. They would stand around, and all the shrimpers know them so the meetings, with just a couple of exceptions, were very, very well controlled. They worked well. People were extremely upset, yes. It took a lot of grief for a lot of hours and – and make sure you're quite well prepared for just about anything. Those were kind of the rules you had to deal with. Don't drive with government cars, it was one of those things, because you may have flat tires when you go out there [laughter].

SS: Because they can identify your car and they might slash your tires.

AK: Yeah, that's always kind of a bad thing. That was the assumption. That had happened. But overall, the industry was pretty helpful. I mentioned to you once on the phone that some of the people like David Duke, who was the Grand whatever they call him of the KKK [The Ku Klux Klan], he loved to go to those meetings and raise Cain. That was [inaudible] bad because he had a way of getting to people and when you're as bad as a guy like he is – he just was a good, smooth talker and, boy, he'd really go after us in a bad way. Overall, again, I have to complement the industry. They were very, very helpful. Another thing that worked out well was the environmentalists stayed out of those meetings, thank goodness, and we didn't ask them not to, but thank goodness.

SS: What do you think would have happened?

AK: That wouldn't have been very helpful. That would have gotten some very – people would have been very upset, and it might have started some real problems. As it is, they did not – maybe it wouldn't have, I don't know, but I think it would have. I think it would have been tough. The Center for Conservation, I can't remember all the names but (Debbie Crouse?) was one of the really super ladies we worked with – the meetings, they stayed away from the public meetings. We had dozens and dozens of public meetings, I don't know what all the total number is, but I don't think anyone could ever complain that there wasn't enough effort in terms of trying to get to the industry to talk about the regulations, what they were, how it would affect them. I don't think there was anyone ever complaining about the workshops, the number of workshops, the introduction of these things to the fishing industry. In fact, I never heard any real complaints. You might hear some, I don't know, but I don't think so. I think it worked quite well, but it was still an extraordinarily difficult time. I would never want to go through it again. Never. Although I am glad I did. I met some absolutely superb people. I remember once I was at a meeting in North Carolina and these guys were getting ready to just beat the living tar out of me. I mean they were unhappy. Another shrimper came up and he said, "Hey, I know that guy. He's a good guy. Leave him alone." I still remember that. They backed off and things calmed right down. So, the industry was responsible for calming itself down. [Inaudible] –

SS: So, did they come in angry? Or did they get angry at something you said?

AK: Oh no they would come in angry. Again, there was so much misinformation being put out on the loss of shrimp, the difficulty of handling the TEDs – again, they weren't easy to handle, I'm not saying they were great, but a good shrimper can handle one without a problem because our gear people were able to work with them. Anybody that had a problem we'd set one of our gear people up to meet with him and show him what they were doing right or wrong. We were very fortunate definitely, extraordinarily fortunate, – again, we had video we could show them, how that net was behaving underneath, how the turtles were coming out; things that they had never seen before in terms of the shrimp going into the net and how they were going in, how the net was behaving underneath the water.

SS: Were they seeing other bycatch that would have cut down on the number of shrimp going out the TED?

AK: They were getting some reduction and other, but I can't – that was not a big thing to them.

SS: You didn't see that on the videos?

AK: Oh yeah you could see some of that. Sure. And some of the other fish going out the TED, but that was not a big thing. I don't remember the numbers associated with the other bycatch that went out. That was a later work that we got involved in with Red Snapper. That was, again, when I was at the regional office.

SS: About how much later was that from the initial TEDs regs?

AK: What that we did the –

SS: The snapper.

AK: Oh, the red snapper bycatch reduction devices that we put on that – I think the TEDs went into effect in, gosh, [19]97 – about 2000. No, no I'm sorry. That was 1990. I've got to get my dates right [laughter]. About [19]89, [19]90, something like that. The bycatch reduction devices went in about [19]97, [19]98, [inaudible] –

SS: About ten years difference there.

AK: Yeah. That was a real hot item, the bycatch; (again, we went?) right back through it. It wasn't quite as tough, but it wasn't easy. Because of those things, we were having problems with shrimp loss through the bycatch reduction devices, although they've got those working pretty well now I understand, but there were some initial problems.

SS: Okay. I've heard them referred to as "birds." "Problems with the birds."

AK: I think they work pretty well, but there was some shrimp loss with them. Shrimp trawl, red snapper, bycatch was a serious problem. Small red snapper just occurred in the same areas. For some reason they like the same biome as shrimp did, so [when] you find shrimp, you find red snapper.

SS: So, the bycatch, for example, before the TEDs, say they'd caught a bunch of little red snapper, would they keep them, or would they throw them back?

AK: No, they were the small ones, they weren't worth anything. Shrimpers are after shrimp. They'd keep some of the other fish they'd caught if it was valuable, but most of it was not.

SS: So, this little snapper going back in the water, was it going in alive or –?

AK: Dead. No, they're dead.

SS: It was dead. Okay. It was not going to go back in and live to be that age.

AK: They're dead. Because they would pile them up on –

SS: Wow. Just thrown away.

AK: You'd get lots of bycatch in shrimp, so they'd have to sort through the catch, and that's what they'd do in the morning, and on into, well, late morning [inaudible] sort the shrimp out of the rest of the bycatch and then put the bycatch over to the side. If you want to find dolphin, for example, on the Gulf [of Mexico] or [inaudible], look for a shrimper because they're back there just having a feast.

SS: [laughter] On the bycatch getting thrown back in. Okay. Well, we touched on the second question, "How were TED's viewed in the early days?" You said there was a lot of resistance but there were a few people who embraced it.

AK: Well, who realized they have to use them. There're still problems with them – enforcement's a real problem, because they can tie them shut, and they shouldn't because doggone turtles come up – they float up to the beach and they're dead. There's a bunch of shrimpers in that area and all of a sudden you see some dead turtles. It isn't hard for people to put two plus two together, that there's shrimpers operating offshore, and there's turtles ending up on the beach, dead. We started a beach patrol looking for – they're [on] just about every stretch of beach in the country now – they have periodic, not periodic, they're fairly often, "Beach Bycatch –" I can't remember what the name of them are, but they walk the beaches looking for dead animals.

SS: Did they then write it down?

AK: Yeah. They (found them?); turtles and also marine mammals, and that's one of the big things they're looking for. Dolphins and so forth, and some of those are recoverable. A dolphin, if they haven't been there long, then they can recover those, and they'll call up places like the main research facility at Gulfport. They'll send out rescue people and they get dolphins and small whales.

SS: Small whales?

AK: Yeah, at times; whales are very rare, but – now those aren't bycatch shrimp. The

dolphin are not bycatch in the shrimp trawl by any means, but there are animals being caught by other things.

SS: So, the beach patrol, they're looking for anything on the beach – it doesn't matter if it's–

AK: They record it, yeah. They record it –

SS: From a TED for example –

AK: They're not looking specifically at TEDs. They're looking for just what's happening. There may be a pollutant that's out there, but they're just patrolling the beaches as a means of evaluating what's going on. So, if you find a lot of turtles all in an area and there's been a lot of shrimping activities, it's pretty clear what's happening.

SS: So that would be a signal flag. Send enforcement out, we've got to check those TEDs.

AK: Yeah. Yeah.

SS: Are they volunteers or are they paid employees?

AK: They're volunteers in most areas. In some places they're paid, if it's a key area we can't get volunteers for.

SS: What are key areas? What would be examples?

AK: Oh, I can't give you a good example now – off the Barrier Islands, for example, that's one key area they try and cover that completely. A lot of the Texas beaches and all the way from North Carolina around – just about any place there's a nice beach.

SS: So, are they looking on the offshore side of the Barrier Islands or on the mainland?

AK: Yeah, the offshore.

SS: Off-shore side of the Barrier Islands. Okay. How are TEDs viewed today by the shrimping industry?

AK: Well, there's several types of TEDs they call – [they] have the so-called “soft TEDs” which are used by some people in some areas, which is just instead of the hard (grid-like

that?) frame; it's made of webbing and there's different designs for that. I don't think they work that well. I think there's really substantial shrimp-loss, but some shrimps prefer them over the hard TED. They were used – initially we had, well, there was a law – I can't remember the (name?) of the law now that went into effect. It was a good law and I think it [inaudible] through the United Nations. It would require shrimpers of all countries importing shrimp into the United States that had trawling operations and where there were captured turtles, they would have to use TEDs. We sent people out to help enforce that. We would send our – this was primarily operating out of the regional office – we would train their people and go out with their enforcement and their coastguards and so forth to help with enforcing and show them how to enforce and what they [should] look for. We also put on workshops in those various countries. This [was] all the way from China and India to forty countries. I think there's something like fifteen countries now that are using TEDs, [or] are supposed to be using TEDs, under international law.

SS: Boy, that doesn't seem like many. But it's better than it was, right?

AK: Yeah, they weren't [inaudible]. I think the other counties just simply aren't – I can't tell you why, I simply don't know, it's been too long since I've been involved, but – Mexico uses them – you know, that's a good example. Mexico has problems with enforcement, sure. They've got problems with drugs; they've got problems with enforcement of the TEDs. Then in Central America, South America – so that was some interesting times and from an international standpoint as well. I had just a super guide and regional (office,?) (Chuck Gorbis,?) I don't know if you've got his name and so – I don't know if you ever go a hold of him –

SS: I haven't yet but I will.

AK: He can tell you some good stories about what happened in some of those countries because he spent a lot of time under some very horrible conditions working with TEDs. The nice thing about people in [the] fishing industry, once you can get through to those people, they're pretty good people overall. They really are. They're rough but they're hardworking and once they think you know what you're talking about – and our guys did that we sent over – they work (well?) and pretty well. I think that happened here too. You send out somebody like me to try and show someone how to use a TED, forget it. I was involved mainly involved with – the gear people would show me their best design, I would take those numbers and work those numbers up and tell them whether they were working well or not. They could see it, again, they could see what was happening – turtles going out and the shrimp being kicked out. I couldn't do that. I couldn't sew a TED into a net like those guys could. That takes a real different kind of – well, it's a real knack to sew that webbing together.

SS: Sure, yeah. We have talked a little bit about number four: “What were the challenges faced in developing TEDs?” Can you think of anything you would want to add to that?

AK: (There are?) different groups in the shrimping industry and trying to reach those different groups was always a tough part. The Mexican-American, and some of those folks – there weren’t a lot of those – they tended to stay away from the meetings; you had to work with them separately. Especially the Vietnamese, they had moved over – a number of people [inaudible] Vietnam when they migrated to this country after the war. They got into the shrimp industry in a very big way. They started (naturally?) just working on the boats because they didn’t know much about it. Then they’d buy a boat, finally, then their whole family would live on a boat, then they’d start their own processing plants. So, they were pretty isolated groups of people that you’d have to sit down and work with because they were – they just did not come to a formal public hearing. Plus, they’re English wasn’t all that great.

SS: Right. How’s your Vietnamese?

AK: [Inaudible] Vietnamese, they were tough. They’re English was not – I mean there were some that had very, very good English, clearly, but the Vietnamese in particular were nice to work with, they were nice people. They were nice people I should say. Those were, I don’t know, just some of the challenges – just spending the time going to all those meetings, that was a bore, but it was well worth it – meet some really super people. You always wonder whether you’re going to walk away from it too, but they were very, very – I won’t say that they weren’t happy to see me, but they were very good. We never had a riot or anything of that nature.

SS: How did the early TED models compare to the later models and what’s being used now?

AK: I think they’re pretty similar. I don’t think they’re all that different.

SS: You’ve talked a little bit about protest against TED regulations –

AK: Well, there was one group that was organized out of Louisiana that got a lot of support throughout the Southeast, they had a lot of political clout but the guy that ran it, he was a great, big Cajun boy. He gave up his boat and everything else just to run all these sessions, and he was good at it. I still remember him; he was quite a guy.

SS: So, he was organizing protests?

AK: Oh gosh, he was organizing all kinds of things. He got in with some of the congressmen and then they started [inaudible]. For example, there were initially protests against the use of TEDs or blockades in the early days – on using TEDs. So, they'd stop the introduction.

SS: How did they do that?

AK: Why did they do it?

SS: How?

AK: They just stop the introduction of the – Congress would come out with a law saying, “you cannot enforce that.”

SS: The state would try –

AK: No, no. This was through the federal Congress. They would set up a law to stop it. We had a period of time when they allowed them to have hour-tow times in lieu of TEDs. Because if we had no more tally of turtles with short trawls, an hour trawl, well you can imagine how impossible that would be to enforce. But we had to enforce it. It drove the Coast Guard nuts; it really got on our enforcement people – nuts. Because it was virtually unenforceable. How do you keep track of somebody – you'd have to sit there and watch a particular trawler.

SS: One boat?

AK: Well, you might watch a couple of boats.

SS: And there were what? Did you say 50,000 boats?

AK: No, 20,000.

SS: 20,000 boats. Okay.

AK: About 15,000. 20,000. They weren't all in the same areas, they were spread up all over the place. From North Carolina all the way around, so a lot of places, and they weren't all operating at the same time.

SS: So, thinking that they could–

AK: Hour-tows. Plus, you know, a guy would go broke doing an hour-tow. He couldn't make money because he needs to leave that net in. If the net's up on deck, they're not making money. They're losing money, so they couldn't function that way. That was an absurd law that if implemented – just by – it wouldn't work. They'd go broke doing it. Well, the industry said “Hey, we wouldn't want that long” because it couldn't be enforced. Well, I finally got thinking, [Inaudible] the environmentalists worked on that one. So, you had both representatives from the fishing industry, particularly this one group from Louisiana. On the one hand you'd have them working (in?) pretty effective through some of the congressmen. Then some of the environmental organizations worked on the other end getting it shifted back. That's how Congress works. As I said, it was a really interesting time.

SS: So, it was legal ping-pong for a little while.

AK: Yes, it was.

SS: The thinking around an hour-tow would be that a turtle wouldn't drown in an hour if it was caught in a net?

AK Yes. Yes.

SS: Okay.

AK: We didn't have any mortality according to our numbers with an hour tow, although the National Academy of Sciences' study found that – they assumed that any turtle caught in the net would drown, as I mentioned from the very beginning. It was kind of a (silly?) rule. So, an hour-tow, if you look at their best scientific advice, was violating the law in itself, and that was part of the arguments that the environmentalists were using. Plus, it was totally unenforceable.

SS: Okay. That's the first time anybody's ever talked to me about legal ping-pong like that. Get a law, change a law.

AK: Inshore – and this is one of the reasons I don't – I don't know what's happening with the inshore boats now, but those boats have relatively short tow-times because they're towing in areas with lots of junk and trash for the most part. Near little bays and they're fishing for white-shrimp and for the most part – these shrimp's life cycle is inshore where the shrimp nets are washed in. They grow inshore. They start inshore, the small larvae,

and then they start moving offshore. The big shrimp are offshore, as they become adults again and go back through that whole cycle where they produce the eggs which come in inshore – fertilized eggs – where they grow and go back offshore. Now the white shrimps are a little different because they don't go as far offshore. The white shrimp, they're primarily in the Mississippi Sound, that was a good place, you see the small trawlers operating there. Their tow-times are pretty short, so we did not require them initially to use TEDs. I don't know what the law is now.

SS: They're using them now.

AK: Oh, are they?

SS: They are required to use them now. I guess their tow-times are shorter because their nets are smaller, [so] they fill up quicker?

AK: No, they just – it's the nature of the fisheries. They can't handle as much; their winches are smaller and they just – the whole fishery is designed on a shorter tow time basically. Where the big boats are offshore – the big boats, again, are using four nets. The small boats inshore are often using just one net, sometimes two. They're a lot easier to handle than four nets. Can you imagine bringing up four of those nets with weights and heavy chain, and all that swinging back and forth, and heavy cable. They're not bringing them in very often.

SS: Yeah, especially in rough seas. They'd be banging around a lot.

AK: Yeah, or anything. They're just hard to bring in, hard to handle, [to] get them up. They have to know what you're doing.

SS: Well, you've talked about number eight, also your involvement in forcing compliance. Is there anything you'd want to add to that?

AK: I can't think of anything.

SS: Okay.

AK: We had workshops for enforcement people. The states did not enforce TEDs initially, because that's not part of state law because this is a federal thing. I don't know where they stand now but the states were quite cooperative in working with our people. Especially going to the workshops and some of the public hearings I had, they were strangely – it was welcome to see those guys walk in –

SS: You felt safe?

AK: Because everybody knew them, where they didn't know the feds, but they sure knew the state guys.

SS: So that kept them in line?

AK: It helped. It helped.

SS: Maybe prevented some assaults.

AK: Well, I think it helped. I think the whole setup was – we were pretty careful where we had the workshops and how we set them up, particularly the public hearing.

SS: Do you know how compliance regarding the use of TEDs has changed over the years?

AK: Oh, I don't know, I think it's probably a lot better, but I think there's [inaudible] still people tying their TEDs up. I don't have any question about that, it's so easy to do.

SS: Okay. We talked about eleven also, "Does your agency engage with other agencies involved with the enforcement?"

AK: Well, Fish and Wildlife Services was responsible for turtles when they're on the beach, that's a funny set-up, when they get up on the beach, that's the Fish and Wildlife Service. When they're in the water, that's us, the National Fishery Service. That's kind of a funny arrangement. So, we worked with the Fish and Wildlife Service, but they didn't have much to do. Really the marine areas are where it was the toughest, but they do get (called in?) enforcement on the beaches if somebody's – of course we did too – if somebody's digging up the eggs or something like that, which is pretty rare.

SS: I interviewed Tom (Mackalwayne?) and he grew up in Pascagoula and he could remember in his childhood people digging up turtle eggs and eating them. He said that the eggs are particularly desire for pastry because they're so rich in oil –

AK: Oh, is that right [laughter].

SS: That they make the best pastry.

AK: They're about the size of a ping-pong ball for the most part. I don't know, I've never eaten a turtle egg.

SS: Well apparently, I know, as long ago as seventy years in Pascagoula they were eating turtle eggs.

AK: Well, that used to be a desired – turtle eggs used to be desirable. Turtles themselves were desirable to people, you see. Turtles.

SS: I think they probably still do in other countries, you know?

AK: To some degree, but there are some pretty tough laws internationally that – they're not supposed to, but in some countries, they take a lot of things they're not supposed to, so –

SS: China. I saw a documentary on turtles and in a Chinese market there was an area, probably three times as big as this room, tubs of turtles. They're crawling out, you know, trying to get out. Somebody's there kicking them back in the tubs. [Inaudible] –

AK: Well, they may be small turtles right. I mean those freshwater turtles –

SS: Yeah.

AK: Yeah, that's freshwater turtles.

SS: Oh, freshwater turtles aren't under the same kind of pressure?

AK: No, no, no, no, no, no, no, no.

SS: Okay, good. That's good.

AK: There's all kinds of freshwater turtles. That's a tortoise's endangered species. There may be some – that's a big ol' turtle, but that's usually in the west: California, Arizona, New Mexico, and areas like that. I used to have one in my backyard because I grew up in Tucson. Well, I was born in Bryan, my father was a professor in College Station at Texas A&M, then we moved to Arizona where he was with the University of Arizona. So, I grew up with turtles in the backyard. As kids, we used to keep these big old desert tortoises, they were big turtles but – well big – fifty pounds would be a big turtle to a kid. Not as big as these loggerheads or leatherbacks by any means, but –

SS: Did you stand on their backs and they would ride you around the backyard?

AK: No, they weren't quite that big.

SS: Not that big? Were they your pets? You caught food for them?

AK: Oh yeah. They just stayed there and we got them food. They were vegetarians and I don't remember what we fed them, but they would hang around, they didn't have any desire to leave the backyard. Those were endangered species. There may be some other endangered turtles as well, but there's lots of turtles in this area. [Inaudible], snapping turtles.

SS: Yeah. I'm constantly stopping and picking them up from the road and setting them back off –

AK: Yeah, those are just turtles. Those are freshwater or they're just terrestrial turtles. There's a number of terrestrial turtles running around. Snapping turtles – my dog had a snapping turtle out there once and [inaudible] she was going nuts because the turtle would snap at her and she'd try and jump over or want to pick it up and the turtle would snap at her.

SS: She couldn't get a hold of it, huh?

AK: No. She was going nuts until I got out there and took the snapping turtle and put the snapping turtle away over the fence; I got rid of that thing in a hurry, so, anyway, those are [the] different types of turtles.

SS: How do you think TEDs have affected the shrimping industry?

AK: It certainly has not affected their catch. The shrimping industry has gone through some very, very difficult financial periods with the importation of shrimp from other countries. Boats coming back in, as I mentioned to start with, it was in the seventies, for the most part, when all the boats came out of the other countries [and] came back here. There were too many shrimpers for the number of shrimp that were out there. The importation of wild-caught shrimp – then really the culture of shrimp – and most shrimp that you get now in the restaurants and so forth are cultured shrimp, like catfish, they're raised in ponds and so forth. In fact, there's a number of shrimp culture operations (going on in?) the United States. I don't know how many now, but there were a number in Texas – there are a number in Texas, I believe. I don't know of any in Mississippi or Alabama, but there are a number of them.

SS: Are they cheaper to get than wild-caught?

AK: Yeah. Yeah.

SS: So that's competition –

AK: Especially for foreign countries to import shrimp. So that's [inaudible]. The domestic shrimper has a tough time; it's not the money operation it used to be. It used to be they'd buy one boat, they'd do well, and then they're able to buy another boat, and another boat, and another boat. If they really worked hard and were smart, and knew what they were doing, they could make a lot of money and grow old and do well in the industry. That's certainly not the case now.

SS: So probably the TED has no effect on the shrimping industry either way?

AK: I don't really think the TED really affected the industry. I think economic times have affected it very, very badly.

SS: So, you wouldn't think that the TED actually improved the shrimp catch?

AK: No not really. Not really. To a degree, yes, but not enough to really – I wouldn't say that was a big thing. That was not a big (trawl?).

SS: Okay. Your numbers didn't show that?

AK: It showed a reduction in bycatch, yes, but not to the degree that it was a terrible help to the – or a significant help to the industry.

SS: It's funny how the scientists and the anecdotal shrimper would differ because you have the numbers and you're saying there was no significant positive effect, but I've talked to a shrimper who says that he thinks he gets more shrimp using a TED than he –

AK: Oh, is that right? Super. [laughter].

SS: Yeah. Yeah! Right.

AK: I'm glad to hear that.

SS: Yeah. That's the culture, you know.

AK: That's right. Who knows how true all that is but I'm glad they're feeling that way? Again, there was so many fear tactics going on at the onset of the introduction of TEDs to the industry, and so many people saying you're going to lose all these shrimp and –

SS: Why did they do that?

AK: Why do they do it for anything? If you're trying to put through a new law, or a new requirement, even though it's a positive thing, you're always going to have somebody out there that – especially for TEDs it was a scary thing for shrimpers. Some people, they made money out of running around, getting people together, getting them to donate money to them – for running around, doing their thing with lobbying Congress.

SS: How have TEDs affected the sea turtle population?

AK: Well, TEDs have been very, I think, very positive. Kemp's ridley have come back very nicely, but there's been an ongoing program for – oh what do you call it – well they're protecting the turtle all the way – or they're taking the turtle – Kemp's ridley, I don't know how much you've heard about that, but we had a joint program with Mexico to start with Ridleys where they would put people on the beach joining with the Mexicans and when the turtles came up, they'd be watched nesting, and then the turtle eggs would be brought up and dug up and then put into a fenced area and then raised there. When the eggs hatched, and they generally all hatched [at] about the same time, that was kind of a thing in nature, they all come out at the same time – then they'd be released, and they'd be released in a way and at a time hopefully where they wouldn't be eaten by birds and everything, or all the fish. That same thing was started (at our Galveston laboratory?) where they brought up some eggs of turtles from Mexico and then they would release the turtles off of Galveston. Now some of those turtles are coming back – quite a few of them are –

SS: They've come back to Galveston where they were released. That's so cool.

AK: Yeah. I don't know if it's something about genetics or wherever, they sort of know where they were released. Anyway, they do come back there. That used to be a major area for Kemp's ridley all along that beach and then they were wiped out. Not just because of bycatch, but because of the fact that they were easy to see, the eggs were highly desirable, there were dogs – there's all kinds of things that like to dig up turtles.

SS: Right. Racoons.

AK: Yeah. So, there's a high mortality one there in the nests. But if they protect the nests, protecting the hatchlings, release the hatchlings under control – they've done quite well so – but the TED has helped, I'm sure of that. The numbers that we did have initially showed that the nestings of loggerheads have gone up substantially in some areas, but I understand there are some problems down in other areas. I don't know what's going on with them. A lot of the assumption is that some of the foreign capture of these animals is having a significant impact on the total population overall of loggerheads. I don't know what's going on there; I haven't been close enough to it to find out. Initially, they seemed to help a great deal, the numbers coming back were all very, very positive.

SS: And these other things were going on at the same time, the protecting the eggs and the hatchlings? So, there's more than one variable really?

AK: Kemp's ridley. Kemp's ridley. Well, that was just on Kemp's ridley.

SS: Just on Kemp's? Okay.

AK: Only on Kemp's ridley. Not on the other turtles.

SS: Okay.

AK: That is because Kemp's, at that time, was the only endangered species. That was the one that was in most trouble. There were only [inaudible] a few thousand nesting females left in the world, so that was a concern. Now the numbers are up considerably. Up to the point of being delisted.

SS: Do you have any idea [of a] ballpark figure?

AK: No.

SS: That's alright, you don't have to. Just to ask, I guess, the obvious question, "why are sea turtles important? Why care if they're going extinct or not?"

AK: They're part of our environment, our national heritage. They're an animal to take care of. They're something that delight people. There are people that spend hours and hours waiting for turtles to come up on the beach, and there are sea turtle watchers, if you will. So, there's money being made for that reason.

SS: It's a tourist industry.

AK: Oh yeah, in some areas. It's just part of our natural ecology, so, other than that I mean – and it doesn't do anybody any good to let them all die. So, I can't eat species of animals or tree or plant that we have – I think they need to be protected. The Native Species Act has been a very positive act overall.

SS: Okay. Do you know what the penalty is for netting a sea turtle?

AK: Pardon me?

SS: The penalty for netting sea turtles, do you know what kind of penalties are out there for netting them?

AK: I don't know what the penalties are, but they can be very, very significant. They can be where they can take the boat, they usually give the boat back, but they can take the catch if they find a trawler that does not have TEDs working properly, they can cause that boat to come inshore. They can lose their entire catch, which could be – because some of the trawlers are offshore freezer trawlers. Shrimp trawlers used to operate with ice, and now most of them are freezer trawlers. The ice, they go out for a couple of weeks and keep piling ice and turtles and – I mean ice and shrimp on top of things and by the time they came inshore, the shrimp at the bottom are in pretty sorry shape. So, you could take an entire catch, that might be 20,000 dollars-worth of shrimp. Pretty serious for the shrimper. That can happen, plus a penalty, plus their gear, which is worth a lot. Just a lot of things can happen. Now just how much of it happens, I don't know. I imagine it gets pretty serious on the second or third offense, but it's hard to catch people doing those sorts of things. You've got to be out there, and if they know the Coast Guard is operating an area, or our enforcement people are in the area, they're going to be a little more careful than otherwise, so – but it's telltale, you know, if they start catching turtles, they're going to end up on a beach, some of them. So, having a lot of dead turtles around, it's just – so, enforcement is always going to be a problem.

SS: So, what should we do if we find a turtle on the beach?

AK: Well, it should be reported to the State. The State's got a means of – they know what to do with it. Don't ask me what – I've been out of that world for too long.

SS: You know, I didn't know that. I actually found one in Gulfport once. It was pretty big, about like this, I don't know what kind it was.

AK: On the beach [inaudible]?

SS: It didn't have a soft shell; it was definitely a hard shell. When I look at the photographs –

AK: If it was that big, [inaudible] it was caught by a shrimper some place.

SS: I learned, I guess from talking to John Mitchell, that it might have still been alive and just in a coma, and, you know, needed kickstarting. But I couldn't budge it, it was too big for me to move at all, and I didn't know that I should call someone about it, so –

AK: Oh sure

SS: I think that maybe, you know, part of trying to save the turtles would be a bit of making it known to the public, "if you find one, call this number," because I would have. We've gone through the questions that were asked by the museum, if I had been interviewing you and it had been strictly for the center for Oral History, I would have started off with question number sixteen and seventeen. If you feel up to it, it's twelve-thirty now, do you want to –

AK: Keep going.

SS: Okay. Can you tell me where you grew up and a little bit about what your childhood was like? That's going to be of interest to people in the future.

AK: Okay. I was, as I said, I was born in Bryan. Lived there until I was about six years old, in [inaudible]. Then we moved to Arizona, and, I don't know, I fell in love with the outdoors environment. I used to try and work outside all the time, initially as a kid I used to mow the lawns, later on I got a job at a ranch, which I dearly loved, then later I'd start working with – during the summers I worked with the Game and Fish Department, the parks service, and others doing work outside and up in the mountains, [inaudible], fighting fires, doing all that kind of stuff, and I just fell in love with it. When I started out engineering in college, – I don't know, I just didn't – that wasn't very exciting. So, I got into their wildlife department, which was a lot more fun, and the fisheries, which I really liked and worked for the (major professor?) there at Arizona. You wonder, "what do you do with fish in Arizona?" but there's interest.

SS: [laughter] Is that Arizona University?

AK: Yeah, University of Arizona.

SS: University of Arizona.

AK: You got to be a little careful (with it?) – there’s a lot of universities (not in Arizona in the same light?), but – Then the [inaudible] and I wanted to – ended up after I got a master’s degree, and there was some Airforce in there too, I wanted to fly fighters and they found some cancer in me so I couldn’t do that, so I ended up –

SS: They found – oh cancer. So, you washed out of pilot training?

AK: Yeah, just before I was scheduled to leave. So, I had to spend my time as a ground pounder [Editor’s Note: a “ground pounder” is a derogatory slang term used in the military to refer to ground-based units] and I didn’t like that very much. Sitting in an office for the most part, in charge of maintenance of airplanes, and –

SS: So, you were serving a sentence, then, until you could get out?

AK: Yeah, then I went back to school and got masters in Fisheries and then worked with the Game and Fish Department for a couple of years as their – in charge of their fishery research group, that consisted of me, a technician, and a half-time secretary for the group. Then I had a chance going to school and [was] offered a nice assistantship at Utah State. Went up there for PhD and –

SS: Where is Utah State?

AK: Logan, Utah.

SS: Logan. I don’t know about it. Is it close to Park City, by any chance?

AK: I don’t know where Park – sounds like it, I don’t know.

SS: Park City was so beautiful. Was Logan beautiful, a beautiful place to be?

AK: Oh my gosh it was one of the prettiest areas. School, like all universities ought to be, about twelve-thousand students instead of these great, big, huge groups; you got to know your professors well. The classes were just – and I took every class I could get in statistics, and computer science, and chemistry. The professors were such – really good. It was a good time, from that standpoint. The assistantship I had was working with the city on their oxidation ponds and trying to grow some fish.

SS: What’s an oxidation pond?

AK: That's a treatment – a way of treating wastewater instead of using complicated waste reduction plants and so forth. It was where you put a series of ponds out at the end of a primary pond or use solids and so forth and come out of the sewers in the entire city and they'd drop out and they'd have a lot of anaerobic decomposition there. The secondary treatment, which is somewhat less than the tertiary treatments (where?) the fish –

SS: Oh, the tertiary is where you'd put the fish in?

AK: The tertiary, which then was in pretty good shape by then, (by the?) waste coming out. So, the water was clear and nice to work with if you don't mind sewage.

SS: Why did they want fish in that?

AK: What I was trying to do was build a statistical model of what happened – what could happen – an oxidation model – and I was trying to work out the energy flow between the plankton – the nutrients coming in then the plankton – the phytoplankton, zooplankton – and then into the fish. The fish was a neat thing (is my?) top carnivore, and measuring how – you know, nice research [inaudible] have fun doing it, I guess. I'm not sure of any real application or anything, but that was fun to do it, so – I always promised Madeleine, my wife, if we ever got out of graduate school, if I ever got out of PhD, I'd take her to Hawaii, and I was offered a job in Hawaii, so I went over there for a little over a year (in Edison?) and we did a study on – that's when things started to (get applied?) – setting up a plan, a program, for Oahu to handle all their waste and that was – at that time the entire city of Honolulu took all their waste and there was a pipe, out it went.

SS: Into the sea.

AK: Yeah, that was pretty horrible. So anyway, our job was trying to figure out ways to stop that.

SS: Would that have been in the sixties? 1960s?

AK: No, it was in – I graduated with PhD in 1970, so it took them until about – I don't know how long to start responding and putting in the plants. We were doing what they call a preliminary design – the diagnosis of a problem, the preliminary design, the kinds of things that needed to be done to clean up their flow. One of the guys I worked with, (Jimmy?) [inaudible], he was a young PhD, just like I was, just out of school – he went to Berkeley – so he was responsible for taking a lot of that stuff and turning it into something and ultimately, he became their State Secretary of Health or Environment or whatever it was. Anyway, he made sure that some of the things we were doing actually

were implemented. Then [I] came back here, worked in Washington for a while, then I started some studies in New Jersey – boy that’s not pleasant at all, I just didn’t like doing the same thing generally. I had a friend of mine that I went to school with at Utah, Utah State. He was a lab director in Pascagoula, and he convinced me I needed to come down there – a place like Pascagoula, I’d never heard of – and he wanted to add some new acoustic gear, they were trying to build some sort of a model. Figure out when you send a pulse out, what kind of fish, how many pounds of fish, and so forth, where you’re picking it up.

SS: Is that ultrasound?

AK: Yeah, it was just, well, hydroacoustic. So anyways, that sounded like a good deal and that was something I could apply some of the statistics and computer science that I had been working with. So, I came down to do that. That’s how I got involved with all the vessels and activities; I spent time going out with hydro-acoustics and working on statistical models. Washington called and I went up to Washington for a while and back. [Inaudible] the director of the engineering lab, and they say “[inaudible]” – again, they used to call it something, they call it something else now, but we did some pretty exciting things – at least I thought they were. We developed the first satellite tracking device for sea turtles, for dolphins – nobody had ever tried it, [they] said it was impossible to do; we proved to them that you could do it.

SS: How does that work?

AK: Well, they were pretty primitive. We used a satellite that was called “GOES” initially, and that was getting triangulation as the satellite would come over. Then the transmitter would transmit up and you’d get triangulation on where the animal was. It was surprising – particularly how well they worked on sea turtles – dolphin were something else because they – dolphin are so streamline that we’d have a small transmitter on it that we’d attach to the dorsal fin. It would just move through the dorsal fin because of the pressure and speed of the animal. But sea turtles –

SS: And then it would fall off?

AK: Yeah, it would fall off. It would only stay on for a month or so. That was a big problem, what was happening to the dolphin in the Pacific. Tuna fisheries, you may recall [inaudible] used to use dolphins as a means to locate the school, so if you got yellowfin tuna, then they’d put a seine around the tuna, and unfortunately, hopefully, the dolphin would get away, but they didn’t.

SS: Probably didn't know they needed to.

AK: Well, so they'd kill a whole bunch of dolphins. They didn't want them, they weren't worth anything, they'd just throw them over the side. Anyway, (there were a lot of?) questions about dolphin, and that was one of them. I don't remember what the question was that we worked on. We also put together some of the – got the gear people in Pascagoula, they went over there and worked on some of their net problems with the [inaudible] in Pacific and they had some ideas. I think their ideas, plus a lot of the industry's ideas, now they're able to seine the fishery and not have any mortality of dolphins is amazing. How they do it, I don't know, but they started out then. Well, with our involvement with that.

SS: Now you said something about a GOES satellite, just in case someone transcribes this in the future –

AK: GOES. G.O.E.S. That's an acronym for something, don't ask me what it is.

SS: Alright, it's an acronym, okay good. We can find it. [G.O.E.S. is an acronym for Geostationary Operational Environmental Satellite. The first ever GOES satellite, GOES-1, was launched on October 16, 1975.]

AK: It's, you know, way back when. So, that was some of the things we did.

SS: What year would that have been? Ballpark figure.

AK: I was director of the lab from probably about [19]74 to, I don't know. I don't know, maybe it was – and I was there almost ten years, eight years, seven years, and then the effort was to try to get – because they were really close, – there were a lot of people saying “let's close the Pascagoula lab” and so we [inaudible], and so they said “Hey, can you make them more applicable and get them out doing something that (makes sense?), which they were, they were doing quite a number of things that made a lot of sense, but just weren't telling people about it or whatever. I guess that was one thing I could do. Anyways, so they put me in charge of the Pascagoula laboratory, and I moved over there in – gosh, I don't know, [19]83, [19]87.

SS: And they're still going strong.

AK: They're doing extremely well. They've got two little great big boats over there – one time they wanted to move all the boats to Miami. Said “let's run everything out of Miami.” Pascagoula, it's a nice place to work, you've got good political support. Gene

Taylor's been a super guy down there; [he] traveled a lot when he was still active, it was quite helpful. (Cochran?) was quite helpful to the lab there. And they're doing a lot of – just some of the (dull?) stuff, some of the most important stuff in the Southeast. So now they're talking about closing some of the other labs, but never Pascagoula. They've become almost untouchable because of the quality of work that's coming out of [inaudible]. I feel good about having some involvement with that, but I didn't create the quality necessarily, it was really getting people to realize it was a high quality and there were some outstanding people and what I know there still are some very good people. Also, combining some of the engineering talent at (NSTL or Stennis?), with the biological things that were going on at Pascagoula.

SS: Yeah, that would be a good marriage.

AK: [Inaudible] a really super guy at Stennis, [inaudible], he's still there, in fact I had a phone call from him a couple days ago. He's an engineer, one of these guys that you say "Hey Walt, can you see if you can get this done? We've got a problem with this, the gear – this isn't working right on the ship or something's going on." Just turn your back because he's going to get everybody mad in the country but, by golly, it's going to be working when he finishes. Great guy. Great guy. We had oceanographers there and all of our computer science was being ran out of – they had a big computer science facility in (Slydale?). We didn't have it, NASA had it, and we utilized that.

SS: So, a lot of cooperation among agencies. You get a lot more done.

AK: Oh yeah. Yeah. NASA was extremely helpful, and the Navy's good over there. I don't know at all what's going on with the Navy. We have some good programs with some of them – ocean modeling and some of the other stuff they were doing. Still got good friends left, and retired like me, who you communicate with once in a while. I used to do some of those (America models, and [was] very good at it?) Why turtles ended up on the beach and why they were in some of the currents in that area. So, they've been helpful that way. Again, the states have been extremely helpful. Sea Grant is great. We funded a lot of groups – well, Sea Grant we funded, states we funded – helped fund. At [the] University of Zona, a number of grants were looking at various aspects of age in turtles and fish. Some of that stuff went to universities for – LSU is really a good group to work with, I always liked them. An outstanding guy that was quite good. University of Miami, of course, quite a bit. University of Florida, Southern, Jackson State – in fact one of the reasons I retired here, my kids were here too, so my two boys, their families. Now one has moved to (Birlingham?), my other son is still here, he's a deputy sheriff in this county. Interesting change. He wants to become a conservation officer of some sort, I don't think he is, but, anyway, he's a deputy sheriff now. So, I came here to work with

Jackson State to try and set up a marine science program there. Then this happened: my back quit on me, and I ended up not being able to stand up and having problems walking. I'm doing better, so obviously – that's why I've got my therapy dog, she gets me up in the morning and she is very encouraging in terms of getting out and walking, so we do her daily walks.

SS: Yeah, she's a sweetheart. I was a little confused about where the backdoor was, so I went around into her – she wouldn't come over that shock line, you know.

AK: No, no, no, no. She's pretty careful.

SS: So, I got in there and she started jumping on me, and I thought, "Oh it can't be back here because he wouldn't have the dog where she could jump on me" and I figured we'd better go back –

AK: She's not supposed to jump on you.

SS: [laughter] Yeah. Well, she knows a sucker when she sees one.

AK: She gets so excited.

SS: Oh, she's so cute. I love dogs.

AK: She's a puppy and – well, she's not a puppy, she's almost two now. But they tell me she's still got to calm down and she's growing through it, and she used to be a lot worse. I don't know, she'll get rid of being a puppy because we go out and have a training session every day, a walking and (heel?), and she's good at that. So, we walk a mile, a mile and a half, she walks – mostly in [inaudible], I don't know what time. Sometimes we'll let her go and she'll stay and come and lay down. She's got a few little tricks she likes to play. That's my dog.

SS: You know what they say about Labrador retrievers?

AK: What's that?

SS: They're emotionally arrested at three years old.

AK: Oh.

SS: Their whole lives. Just emotionally they never get older than three. But they're great dogs. So sweet.

AK: I hope she does because I'd like to be able to start taking her to some of the nursing homes. My mom was in a nursing home, and that's the only reason we had this great, big house here. My mother-in-law and I wanted the biggest house I could find – one of the things that I always learn – it's like having a public meeting, the larger it is – when you have a public meeting and people are upset with you, make sure you have a large facility. That tends to calm the crowds down, it really does. It's very good working principles. Same thing with mother in laws, if they're living with you, make sure you've got a large place to keep you and your mom in law separated.

SS: [laughter] Lessons learned.

AK: It's a good lesson. Anyway, that's my background. That's why I'm here.

SS: Well great. Thank you for sharing it – thank you for sharing it with me. Are you familiar at all with – excuse me – anaerobic respirations?

AK: Yeah. Did a lot of that. That was one of the things I had to work with.

SS: Why doesn't that prevent turtles from drowning in nets? I read that they can hold their breath for up to twelve hours.

AK: Oh, they can. But they don't. They're excited.

SS: Okay.

AK: Oh yeah, they sleep on the bottom at night. So, you're wondering “what, how come?” Sure.

SS: The stress of being in the net?

AK: That's right. And they just don't do it – if they get caught on it – on a long line, if they're caught, the same thing happens.

SS: On a long line they'd be caught with a hook?

AK: Yes.

SS: Okay.

AK: And that's one of the problems they're running into now. Turtles, in a lot of places, are being caught on long lines and traps – fish traps.

SS: Fish traps.

AK: There's another problem. The long lines [inaudible] that's one of the things I had to do initially, and I really got us going in the international world, (what kind of interesting area it is?). The Japanese were fishing out in the Gulf [Editor's Note: The Gulf of ?] for Bluefin Tuna, which is a highly desirable species. That's a great, big tuna. One of those fish, they weigh – gosh – a thousand pounds – it can be that much, a huge animal. They could be worth 10[,000], 15,000 dollars just for one fish, and they eat them for sushi. They're quite good, believe it or not [inaudible]. The Japanese were fishing over here for Bluefin Tuna. This was prior to us extending our waters to 200 miles. So, we were putting observers aboard to find out how much bycatch there was. We were worried about billfish – billfish in the sense of Swordfish and Marlin and things of that nature. So, we monitored that catch. These long lines [are] 100 miles long. Can you imagine that? That had hooks about every 100 yards, 150 yards with bait on it and it would go on for 100 miles. It's bad, you know. No wonder these – you know, the most dangerous profession in the world is fishing.

SS: Is it?

AK: It is a dangerous profession with the heavy gear that they use and the sea conditions they have to worry about. I don't know if you've ever seen that program on T.V. that shows the boats that are going out after Dungeness Crab in the arctic and they'll be on a trawler at times when they're hauling their gear and that's awfully dangerous. They do the same thing with long lines, they're dangerous.

SS: Did you see *The Perfect Storm*?

AK: Yeah.

SS: Yeah, the long lines going out – it catches – the hook catches the guy in the hand and pulls him overboard. I didn't know how realistic that was.

AK: Very realistic.

SS: Ooh. Bad way to go.

AK: Very realistic. They're putting these – what they call a “Gangion” – and they put those things – they hook them on to the line as they go out. Yeah, you could get a hook in your hand or could be pulled overboard by a lot of things. When you're fishing out there, the sea is never nice and calm, it never is when you're fishing, and the rest of the time it's nice and calm. But when you're fishing, it can get rough. And those guys, they don't come in. They keep going.

SS: Yeah. They're out there for a long time.

AK: Well, they've got to make a buck, and it's hard to do.

SS: Do you think that bottom trawling harms the ecosystem of the Gulf of Mexico?

AK: Sure it does. It has to.

SS: Shrimpers don't think so [laughter].

AK: It changes the ecosystem.

SS: Okay. Changes it.

AK: There was a time – and I'm not – please understand that I'm not – I mean right now it wouldn't do it any good anyway because ecosystem is what we have right now, but there was a time, they don't do it anymore, but where the coral is growing off Florida, they'd take a chain between two boats, drag that chain through an area. Provide some trawling grounds for them.

SS: So, they clear the coral so they could trawl?

AK: Yes. That was a problem, and you'd know it was happening and it was pretty unsettling. They don't do that anymore. That stopped.

SS: Is that illegal now?

AK: Oh that's – yeah, they can't do that. They cannot destroy the bottom habitat. They can't do any of that stuff. Anything that goes on the bottom, they've got to be very careful about it, so it's not the same thing at all. The trawls, they're dragging and they're kicking up the bottom, so it has to be changing the ecosystem. The ecosystem, and the bycatch, and all the things that they're catching – the ecosystem is adjusted to that – I

don't know. What I say is doing a lot of harm to it— I like that trawl fishery out there, I think it's a positive thing, I think it's part of our culture. I would sure like to see it continue, but there are areas they shouldn't trawl, sure. And there are closed areas where they can't trawl now, and there are very large areas where they can't trawl now.

SS: Can you think of examples?

AK: No, I can't think of some of the areas. They were primarily off Florida, but those are protected areas where they can't operate trawls.

SS: The Pennekamp Reef is off the east coast of Florida, but I don't know if that would be a shrimping area anyway.

AK: I don't know. All areas used to be shrimping areas. A shrimper doesn't want to catch coral. He doesn't want to tear up his net. There are some areas now where they can't trawl, and they are marked on charts and so forth, and they are patrolled by the Coast Guard, and I just don't recall where they are right now, what the names are. But there are some fairly substantial areas, and that's the only way that you can protect that. So, by limiting those areas, they limit the damage that's done.

SS: Well, I think we've touched on all these other questions. Number thirty-two, "what lessons have been learned from using TEDs?" you've talked about some of those; is there anything else you'd like to put on the record?

AK: I think by working with the industry – a lot of cooperation very closely with them – again, I hope we've learned a lesson of – the industry is important as a part of our culture, and I think it's important that we try to maintain an industry but have to maintain it in an environmentally productive way. I think an industry can work with us, and they did. There are certainly some lessons that can be learned from the things we did, some of the mistakes we made. I'm sure there were mistakes, and I can't think of any, but I'm sure there were, and I'd have to go back through it, I'm sure I can find out something. I think that there could be the immediate response of closing an area, but there's also the possibility of working up some sort of a gear, or fishing technique modification, as we did with TEDs, that's highly unusual, I think it started people thinking that there was another way of doing things such as – I know in the North East they've got some gear modifications for their trawls, or getting rid of certain types of fish that seem to be working quite well, so they don't just have to close areas. I think we can work around it with some gear modifications. And if you get some really quality people and put them together, they can come up with some solutions, and it takes a lot of different kinds of folks, not just guys like me sitting behind a desk with a great, big computer in front of

them. You really have to have the engineers, the oceanographers, the gear people that have grown up working with sewing webbing and know how to do it to the divers, to the folks that can pick up any squirming thing that comes aboard the deck and identify it, count it, measure it, love to do it. Done.

SS: Okay, great. Is there anything you'd like to put on the record that we have not talked about?

AK: No.

SS: Well, thank you so much for giving me the interview.

AK: You're welcome I hope you got what you were looking for.

SS: I did.

-----END OF INTERVIEW-----