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INTERVIEWEE: Richard “Lynn” Benefield
INTERVIEWER: David Todd
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Google Voice [00:00:01] This call is now being recorded.

David Todd [00:00:04] How about this!

Lynn Benefield [00:00:06] Is that you, David?

David Todd [00:00:08] It sure is. You sound great. You sound very clear. So you're on your landline. Is that right?

Lynn Benefield [00:00:16] Yes, I am.

David Todd [00:00:18] Oh, that's super. I was, I was getting, you know, half of what you were saying. And so I wanted to see if we could try a different device. And this, this sounds much better. Thank you so much for being patient with us.

Lynn Benefield [00:00:34] Okay.

David Todd [00:00:35] There are always little technical glitches in setting these things up. And so thanks for hanging in there with us. I appreciate it.

Lynn Benefield [00:00:45] Well, I just I just wish I knew more about it. See, when we first got computers down at the lab, we had some smart young biologists that had went through college on computers, and here I was, I didn't know anything about computers. And I had a good secretary that knew everything about computers. And I sat back and when I had a problem, I'd holler at them. And I didn't learn how to do all this kind of stuff. So I'm at sort of a disadvantage here.

David Todd [00:01:17] So aren't we all? I mean, it's this new generation that knows, they live in that world.

Lynn Benefield [00:01:23] Yes.

David Todd [00:01:25] They know best. But, but you know other things. So, and I look forward to hearing more about that. I'm, I'm eager to get started.

Lynn Benefield [00:01:38] Okay.

David Todd [00:01:38] But I wanted to ask if you had any questions before we dove into this?

Lynn Benefield [00:01:42] Well, yes, let me let me tell you what I've done. I've spent time in going over the questions. And what I've done: each category, like on the first category, it has upbringing? Each, each question you have, well, I'll put a one, a two, a three, four, down like that. And would it be acceptable if I read the questions and then respond, I mean, and answer it? And then if you have any follow-up questions or anything for that particular one, or what works best for you?

David Todd [00:02:22] That's great. Sure. Whatever you're comfortable with.

Lynn Benefield [00:02:25] OK.

David Todd [00:02:25] It sounds like you've done a lot of preparation. So let's, let's use what you've done.

Lynn Benefield [00:02:30] Okay, well, that'll be good then. And, and I can, I'll probably try to add a few things in, but I've got six pages of typed.. .

David Todd [00:02:42] Oh, my gosh.

Lynn Benefield [00:02:43] Typed material.

David Todd [00:02:44] That is so nice of you. I really appreciate, you know, studying this and doing homework on it. I didn't mean for you to have to do that, but I really appreciate it.

Lynn Benefield [00:02:54] Well, let me. Okay, let's, let's get started then. And the first question.

David Todd [00:03:02] Yeah. Well, Mr. Benefield, let me, let me just put a little introduction at the front of the recording so that people who might listen to this or read the transcript will know what we're all about. And then I'll, I'll give it over to you. This just takes maybe a minute or two. I'll just give a little introduction.

Lynn Benefield [00:03:22] That'll be great.

David Todd [00:03:24] Okay. Well, um, well, good morning, David Todd here, and I'm fortunate to be with Lynn Benefield. And with his permission, we plan on recording this interview for research and educational work on behalf of the Conservation History Association of Texas and for a book and a website for Texas A&M University Press. And finally, for an archive at the Briscoe Center for American History at the University of Texas at Austin. And Mr. Benefield would have all rights to use the recording as he sees fit, too. I just wanted to make sure that that was OK with him. What do you think?

Lynn Benefield [00:04:10] That, that'll be fine.

David Todd [00:04:12] OKay. Well, let me just lay out a little bit about when and where we are doing this and maybe give a very short introduction to you.

David Todd [00:04:24] It is Thursday, January 27, 2022 and a little before 10:00 Central Time, in the morning.

David Todd [00:04:36] My name is David Todd. I am representing the Conservation History Association of Texas and I am in Austin. And we are conducting a remote interview by telephone with Lynn Benefield, who is based in the Seabrook, Texas, area. Mr. Benefield is a fisheries biologist who worked at Texas Parks and Wildlife from 1966 through 2001. Among other tasks, he supervised the marine labs at Port Arthur, Seabrook, Palacios, and Port O'Connor. And after retirement from the agency, he also worked as a consultant with Benchmark Ecological Services. During his career, he often worked with the Texas oyster fishery, including monitoring mudshell mining, surveying oyster reefs, building artificial reefs, and managing the private oyster reef program in Galveston Bay.

David Todd [00:05:37] Today, we'll talk about his life and career, and especially focus on his work with the Eastern oyster. So with that introduction, I just wanted to thank you for participating in the oral history project, and maybe we can start with some of these questions that you've been studying and thinking about.

Lynn Benefield [00:05:58] That'll be great.

David Todd [00:06:00] Okay. So we were going to start with a question about your childhood. Maybe you can read what you've written there.

Lynn Benefield [00:06:07] Okay. On my childhood. It's question number one. Just a brief background: I was born in Corsicana, Texas, in July of 1940. And my dad had died when I was two and we lived with my grandmother and a couple of older uncles. And of course, my mother had to go to work in Corsicana to, you know, make things meet, as far as finances and everything. One of the things that I got started on early was that I become an expert crawdad fisherman. Now a crawdad, for those of you who don't know, is what is properly called a crayfish or a mud bug in Louisiana. And we had a ditch behind my grandmother's house that I would spend hours out there catching these little crawfish and I'd clean them, and my grandmother would graciously fry them up for me and they're, excuse me, very good eating. And I spent a lot of time catching crawdads, and I guess that was my first step into any type of fishery. Although it may be silly, it got me started.

Lynn Benefield [00:07:35] Eventually, I graduated up to a cane pole, catching bluegill and goggle eye of our farm pond, and then eventually I was able to get my uncle's casting reel and artificial plugs. He had three artificial lures, and I started to be a bass fisherman. And so my interest was there. I didn't know what a marine biologist was. Matter of fact, Corsicana is probably about 220, 25 miles from salt water.

Lynn Benefield [00:08:13] And but I did have one little connection you might say. I had an aunt and uncle that lived at Freeport and I would occasionally be able to go down, during in the summer and visit with my cousin. And we both enjoyed fishing saltwater. And I spent quite a bit of time in Christmas Bay, wadefishing for redfish and flounder and trout, and we would also fish the Freeport jetties trying to catch trout. So that's sort of what I did when I was growing up.

Lynn Benefield [00:08:55] And I graduated from Mildred High School. It was a small Class B school and, and I think I had 17 in my graduating class. And nothing was going on. And back in those days, we had to (this is 1958) we had to go into the military and serve in the service for one term. I joined the Navy and went through boot camp in San Diego, California, and spent about eight months waiting on a technical school at El Centro, California Naval Air Station.

And once that was completed, I was shipped to the East Coast to them Dam Neck, Virginia and went through introductory guided missile school six weeks, and then shipped overseas.

Lynn Benefield [00:09:52] And I spent 17 months, two months in the Mediterranean on an old World War Two Liberty ship. And it was converted to an oceanographic survey ship. Basically, what we did was map the bottom profiles in the Mediterranean for two months, and then we moved up to north to the coast of Norway and spent 15 months doing the same type of work, mapping prominent profiles on bottom structures. And I can't really say exactly what was done with the data, but it's my understanding that it was to be used in our submarines and the missile type work that it was their duty to in case war came.

Lynn Benefield [00:10:54] It was good duty: home port, Bergen, Norway. And Norway's a beautiful country, but nothing's like Texas. And so I headed back to Texas after serving in the Navy three years and didn't have anything going as far as a job's concerned in the Corsicana area, so I went down to Bryan / College Station and had a cousin that was attending Texas A&M, he was a wildlife major and he eventually was a quail biologist for the Parks Wildlife. But anyway, I spent a day in class with him going around and. looking, listening and looking and everything, and I decided it would be good for me to have a degree. So I really know a lot about fishing. No, I'm just kidding there. But he probably gave me some interest as far as what kind of career. So I entered Texas A&M to get a degree in wildlife science / fisheries option.

Lynn Benefield [00:12:07] I spent four, four and a half years in school and one of the things that at the wildlife department, they had a bulletin board that job applications, or job positions that were available in the fall of '66, '65. There was one job available that with the Texas Parks and Wildlife Department at the Seabrook marine lab, of course in Texas. And it would be working with mudshell mining or dredging in Galveston Bay.

Lynn Benefield [00:12:45] I got my roommate to bring me down, down here to Seabrook, and we went over to Baytown and met my future boss and got an interview and, and was hired to go to work on February the 1st, 1966. And I started...

Lynn Benefield [00:13:07] Let's see, one of the other questions was, "Can you point to any books or favorite TV shows?" And I didn't. I don't know if "Flipper" was on back then. That would be the only thing that had to do with marine biology that I could think of. But I don't think "Flipper", TV program, actually influenced me on anything like it.

Lynn Benefield [00:13:36] My cousin probably did, who was at A&M when I visited with him.

Lynn Benefield [00:13:40] Okay.

David Todd [00:13:42] Good.

Lynn Benefield [00:13:42] Career. I worked with Parks and Wildlife from 1966 through 2001, 19 years as a field biologist. And basically, I started out working on the mudshell mining and then transferred over to a regional, area biologist, where I was sampling for project leaders, in other words, taking shrimp, crabs and samples.

Lynn Benefield [00:14:17] I worked some with the oyster biologist, Robert Hofstetter. Bob was probably one of the most influential biologists that I worked with. He and Dr. Sammy Ray were the two oyster experts in the Galveston Bay or Texas coast. And you can learn a lot from listening to those two gentlemen. And I was blessed to be able to sit down and talk with them.

Lynn Benefield [00:14:48] And Sammy was quite quite an interesting character. And I have to say this, tell this. Probably no one, not many people, have heard it. But he was in World War Two and in the Pacific, and Sammy had an interest in bird life and he was collecting specimens for the Field Museum, I think the Field Museum in Chicago, if I'm not mistaken. But he was out one day with his little, I don't know what gauge, shotgun, but he was on this island and he was out there collecting birds. And next thing he knew a company of Marines surrounded him and of course, he was a Navy corpsman and worked with Marines. And anyway, they took him back. They thought they had a prisoner because he was a short Lebanese-type guy.

Lynn Benefield [00:15:49] And he, he went before the commanding officer of these soldiers. And the officer knew him quite well, because that officer had an alcohol problem and Sammy had the only alcohol that anybody could use by drinking it. And so from then on out, the officer told him, he said, "Look, if you want to go out collecting birds, that's fine." Said, "What you do, you come meet, come to me and I'll get some guys to go with you and they'll take care of you while you're out collecting birds."

Lynn Benefield [00:16:35] But Sammy was my idea of a consummate Ph.D. He was very easy to talk to and very eager to help you understand things about his specialty of oysters. So that's my Sammy Ray thing. And I guess he influenced me more than any academic professor that I was ever around.

Lynn Benefield [00:17:03] And then Bob Hofstetter worked with him closely. So that's my background on oysters.

Lynn Benefield [00:17:11] Do you have any questions on that, David?

David Todd [00:17:16] No, no, this is great, you're doing really well. Thank you for telling me about, you know, your childhood and your time at A&M, and then the start at Parks and Wildlife.

Lynn Benefield [00:17:26] Okay.

David Todd [00:17:27] This might be a good time to talk a bit about just the oyster itself. And maybe you can help introduce us to your work with the oyster and maybe the kind of life history of an oyster, as you understand it.

Lynn Benefield [00:17:43] Sure. Well, one of the things, when I was a kid growing up, my uncle would, in the fall, we would get these canned oysters, I don't guess you call them canner, or I guess you would. They were oysters in a glass jar, a glass jar in the grocery store. And he would always have my mother buy a pint or two of these Louisiana oysters. And that's the first thing I'd have ever run into on oysters.

Lynn Benefield [00:18:17] And then when I was in Bergen, Norway, we were eating in a hotel and someone, they had raw oysters. And this chief petty officer, he dared me to eat raw oyster. Well, I ate raw oysters. And that's, that's, that's all I knew about them, you know.

Lynn Benefield [00:18:34] And got to Seabrook and Bob Hofstetter, began to talk to me about oysters and everything. I was trying to learn anything about it, any of the species that we monitored with, there at the lab. And we'd sit down and sometimes at night he would be down there and being as I was broke and didn't have a lot of money at the time, I'd go down and

work on some data or something like that, and he'd be there, and we sit and talk about oysters.

Lynn Benefield [00:19:09] So, I guess, I guess you would say that one of my first encounters, we were having some huge rains up in the Dallas / Fort Worth area and it takes about a week to 10 days, I don't know about the 10 day, but at least a week for that, all the flooding and everything to get down to the coast and into the bays. And Bob had mentioned that he would like to just check and see what effect it was going to, the fresh water, was going to have on the oysters up in Trinity Bay, which is our northmost bay in the Galveston complex.

Lynn Benefield [00:19:54] So we set up a little project. It wasn't anything massive or anything, but we had started sampling oyster reefs in Trinity Bay. I'd get a bushel sample at several sites and every week, why, we would go up there. And this was in addition to the work that I was doing on the shell project and monitoring to see if there was. And after about two, two months, the salinity dropped almost to zero. And as the temperatures began to get warmer and the water, well then, we, we found that oysters began to die. And the salinities were, I like to say, down below five parts per thousand. And, and that's when the mortalities began to come.

Lynn Benefield [00:20:52] And we just, it gave us an indication of what was going on out in the bay. Salinity and fresh water are probably some of the most important things that you deal with whenever you deal with oysters.

Lynn Benefield [00:21:08] Now. Let's see here. On my shell dredging project, some of the things that we did, and I will get into this in more detail later on, we, we would make oyster boat counts. And what this involved, as we were running from Seabrook in the bay all the way over to the East Bay on the east side of the Galveston Bay system. And we would count the commercial oyster boats working on the Redfish Reef complex, and I'll talk about that some later on, too. And I know one year, and I don't remember what year it was this, it has been a long time, but we would count 70 and 80, 90 boats out in the Redfish complex harvesting oysters. I think Louisiana was probably having a bad year, and a lot of the boats had come to Texas to work on the oysters in Galveston Bay. And we would make counts there.

Lynn Benefield [00:22:19] And on the way over to where the dredge boats were at, one of the things we had to do, also, was monitor the, the siltation that these large dredge boats would stir up as they were digging the buried mudshell.

Lynn Benefield [00:22:43] And we, let's see here, you know, y'all pardon me, I'm looking at some notes.

Lynn Benefield [00:22:55] We'd also have to do population samples. And we could use oyster tongs alongside of a barge and hand-tong oysters over out of a measured distance in the area, and then equate that to the number of oysters that, that the reef had. And a lot of work went into it. But then we also used a dragline bucket with a 40-square foot area, and it would pick up a bite of the reef and pull the oysters up and dump them on the barge. And we'd go through the sample and determine the number of oysters in a bushel and then equate that for the reef.

Lynn Benefield [00:23:52] Another aspect of the dredging project was the siltation. These big dredges, if you've ever been around salt water and channels, you'll occasionally see what they call channel dredges. Well, this is what basically they look like. The shell dredges were modified channel-type dredges. And they could dig down to 15-20 foot, I guess. And they had

a cutter head, which is the, the device that cuts the buried shell from the mud and brings it up into the dredge, where it's washed in a hopper-type thing with, wash the silt off of it. And then the shell is routed out to barges, and then the barges go back in where the company has their docks and everything, and unloaded and utilized.

Lynn Benefield [00:24:55] One of the things on my trip down to Freeport to visit my cousin, we would go through Dow Chemical there. I think it was Plant B, or it may have been Plant A. I'm not really sure. But any way, I'd see these big, huge barges with oyster shell on them. And at the time, I had no clue what it was for, or anything like that. But Dow did use oysters to get certain chemicals, I guess, to use in their processes that they were doing, there in Freeport.

Lynn Benefield [00:25:31] So another thing - we got real scientific on trying to monitor the sediments. These dredges, as they pulled the materials up from down below, in the mud and everything, brought up a lot of mud with it. And washing created a lot of silt. And if you get silt in the concentrations enough, it acts as what we call a turbidity flow. And silt concentration will actually follow gravity, or the currents to some degree, and move across the bay bottom. And a lot of the reefs over in East Galveston Bay were what we call flat, or maybe not have more than a foot rise up out of the bottom. And, and if this was the case, and we didn't catch it in time, the silt could actually cover a portion, especially the edges, of a reef. Sometimes the reef was so flat it would go all the way across the reef.

Lynn Benefield [00:26:44] But we had to monitor that, and what we used, it wasn't a scientific device because we had, when we surveyed the reefs, we would sound bottom with a pole, an aluminum pole with a flange on each end, and you'd hit the mud and you'd get a certain feeling. And then when you hit the shell without any mud on it, at the edge of a reef, you'd get a clanging, and it's very obvious that you'd hit the reef. And we would throw a cane pole with a weighted window weight on the bottom and a flag on it.

Lynn Benefield [00:27:23] And we would survey or go around the reef delineating the, the edge of the reef. And finally, you know, connecting the ends together. And we would have the outline of the reef. And this is, we'd would put 2x2s out there and tie what we call silt baskets to them, on the edge of the reef. These were simply oyster shell halves with the cup side laying up. And fill the, a wire basket, and we would when we surveyed and got the reef marked, we'd put those baskets down and we'd monitor them every day, sometimes twice a day, to see if there was silt showing up.

Lynn Benefield [00:28:17] Now one of the things - we would use a scale of one to five, with one being just no trace of silt. But occasionally you would get that, what we call natural sediments from the reef and everything, and it would be brown particles of shell and other, other stuff. And in that way, we knew that everything was fine.

Lynn Benefield [00:28:45] But as the silt begin to progress towards the reef, and it would get sometimes really, really bad. And even overnight, if we left it one day and then got back out the next day, there's conditions were such that damage could occur to the reef. And so we had to be very careful and sometimes even run them twice a day.

Lynn Benefield [00:29:11] But we would run each one of those and put a deal down, one through five, or whatever the siltation was. If you had a five, it was difficult to pull the basket up through the silt, so that gives you an idea from one, which is nothing, up to five. But it was it was a good, accurate measure and which we, which I had written on in my technical series on shell dredging.

Lynn Benefield [00:29:43] One of the things, other factors on the dredging aspect, the Parks and Wildlife issued permits for them to dredge buried mudshell. When, when they first began to monitor the, the dredging operations out in the bay, there was a rule that wouldn't allow a dredge to come within 1500 feet of, of a reef. Well, when I came to work in 1966, they had had a rule change, and I'm not so sure that, I can't say for sure, but I don't know if the biologists were involved with implementing this. But they allowed the dredgers to come within 300 feet, which was horrible from the standpoint of the reef and the damage the siltation would do.

Lynn Benefield [00:30:49] So we had to spend a lot of time running the silt baskets and trying to, you know, if it got too bad, we would relocate the dredges and tell them they had to relocate. And funny, funny thing, whenever I, my first few, few months, I worked with a game warden on the boat, and we were surveying and checking silt baskets and everything, and we had this dredge that the reef that it was close to began to silt up. And so the game warden told me, he said, "We've got to make a move." And now here, here's a biologist on, still on probation and going to go up and tell this multimillion dollar company's dredge that they've got to relocate. And it was quite an operation to move the dredge and everything.

Lynn Benefield [00:31:47] And so I didn't know any better. I went up and got on board and went up to the folks who are whatever it is up there, and I told the captain, I said, "Captain, this is where you're at, this is where the reef is at, and this is what's happened, and you got to move." And I showed him on the map where, where he needs to locate, so he wouldn't be damaging the reef and everything.

Lynn Benefield [00:32:15] And so on the way back in, I had about two or three phone calls from the regional office, from Austin, and I didn't really know whether I had a job whenever I got back to the lab. But fortunately, I had a warden that, he was an old hand, and Ray had instructed me how to do this, and I did what the rule said I was supposed to do and how to handle it. And I didn't get fired and I guess the rest is history.

Lynn Benefield [00:32:46] But those are some of the things. There was Parker Brothers, the construction company. They did a lot of cement work and making cement. And I think the shell, shell that they used was involved. They sold oyster shell for back roads and stuff like that and whatever else. They had three dredges at one time that were working in the bays. I think, when I went to work, there was two in Galveston Bay and one in Matagorda Bay.

Lynn Benefield [00:33:25] And Horton and Horton was a company that had one dredge and they were in Houston. And then Haden Company had a dredge. So we could have as many as four or five dredges out working that area. And with two biologists, the game warden, monitoring the whole crew, it got, it got pretty hairy at times. But I was working outside and I enjoyed it.

Lynn Benefield [00:33:54] And got to survey a lot of reefs and one of the things that we used. Well, let me back up a little. When I was in the Navy doing the work on the oceanographic ship, we had the latest Loran-C units and they had land stations that sent signals out. And they would, we could get pretty accurate readings on bottom profiles. And we would run transacts in sort of a square-like thing and, and pinpoint these particular profiles.

Lynn Benefield [00:34:38] But we didn't have anything like that in Parks and Wildlife. We had World War Two hand-held Mark something sextants, hand sextants. And that's what we used to determine the location of the reefs. And basically, we would find an area that had a

reef in it and we would use what we call shot points, or like the channel markers, the large, tall channel markers as survey shot points, and use three of them. And then we would take an angle between point one and point two and then back angle between point two and point three. And you put that on a three-arm protractor and put it on the map and you get one little dot. And some of the reefs would have as many as 100 dots by the time we got through floplotting the thing.

Lynn Benefield [00:35:39] And it took a lot, a lot of work. We would, actually we got pretty good at it. Our, all those surveys as far as sounding what the bottom was, we were very close to each other as far as determining the reef edges. And, and if we had enough people, sometimes we'd have two people with two sextants and we wouldn't have stopped the boat. Somebody would be doing the front angle, somebody would be doing the back angle.

Lynn Benefield [00:36:15] But this, this went on in Galveston Bay. I think in the, oh, probably '67, somewhere in that range. And then the, the buried mudshell begin to play out, and the pressure began to mount against the dredging up in this area and the boats moved down to San Antonio Bay in '68, and I had to go down and train a new biologist to work down there.

Lynn Benefield [00:36:51] But trying to think, there's something else that.

David Todd [00:37:00] You got anything, David, you want to ask me about that as far as sextants and everything?

Lynn Benefield [00:37:07] Oh.

David Todd [00:37:09] Well, yes.

Lynn Benefield [00:37:10] Dr. Eric Powell, who was an oceanography professor at A&M, had developed (this was after the dredging was stopped in the bays), he had access to GPS technology. This was during the Gulf War over in the Middle East, and he had it coordinated with extremely good precision depth recorders. And he, all he had to do was get his instruments running and then run transects across the bay. And any reef or anything that he crossed over, well, it would show up quite clearly on the on the maps that, he, I think the computer actually plotted the maps as he went across the bay.

Lynn Benefield [00:38:03] But there's only one problem with it is that when the military had to use their sextants, not sextants, their GPS, they didn't want anybody else using the satellites. And they would shut the satellite down to all people except the military. And if he was in the middle of a line, he just had to quit and go home.

Lynn Benefield [00:38:27] So, but the thing that I was getting towards with was the accuracy of GPS, he surveyed the reefs in Galveston Bay, and the thing that pleased me was I was talking with him one day, we were out in the bay and out on an issue. And he let me know that the work we did with hand-held sextants was very accurate, and I think anything under 50 feet was considered extremely good. So it made me feel good.

Lynn Benefield [00:39:06] Now, you say, "Well, what, what good does having the reef surveys?" Well, one of the things that was extremely good was the use that people other than Parks & Wildlife got from these reef maps that were made. Basically when we did the fieldwork, got the surveys done, we plotted it on a map and took the shot sheets and we sent it

all to Austin, and there, we had a cartographer hired at the time and that was one of the jobs that he did is put these into real nice spiffy maps.

Lynn Benefield [00:39:49] We had charts that were, I guess we'd have seven or eight sections of maps, pages in it, and they were about two foot by two and a half to three foot - large charts, an inch to 2000. And the thing that helped us, of course, is we knew where the reefs, just about all over the bay. We also, they were made available to other agencies like the federal agencies - Fish and Wildlife, National Marine Fisheries. If they had need for knowledge of where the reefs were at, what, well they got copies of the maps and everything. The oyster fishermen, some of the fishermen, got copies of the maps that needed to know where reefs were at. And there was there was one other use that I'm wanting to talk about. I'll have to look over my notes. I'm not so sure what it was. But anyway, what I'm trying to say is ...

Lynn Benefield [00:41:02] Oh. Those of you that fish and have maps of Galveston Bay that have the oyster reefs on them, that's where those maps came from. The sporting goods stores, Marburger's in Seabrook - he had came and asked for information on that. And so freedom of information, we made it available to him, and he was one of the first ones that come out with a fishing map, mylar, plastic-type fishing maps with oyster reefs.

Lynn Benefield [00:41:38] And uh, so we had a lot of people using our work that normally people wouldn't think about, you know, being able to use what the Parks & Wildlife does.

Lynn Benefield [00:41:51] Uh, let's see here.

David Todd [00:41:54] You know, while we're talking about the reefs, you know, it'd be interesting to me to hear your thoughts about where, where the reefs were in Galveston Bay and in San Antonio, Matagorda Bay. I guess those were the principal reefs were?

Lynn Benefield [00:42:15] Yeah, ... let me back up a little further than that, too.

Lynn Benefield [00:42:23] One of one of the things that some of the regulations did, it allowed the companies to apply for permits to dig buried mudshell that were underneath some of our exposed reefs, In other words, they may have a reef that was a two or three, four or five acres or more and maybe, you know, a month of dredging, if they could get to it without the reef being there. And one of the things they worked up and was taking the top portion of the exposed reef and moving it, in other words, taking it and move it to, you know, a different part of the bay, where the conditions for salinities and everything were good. And planning and building a new reef. And they'd put the material down in most all of it would be the top part of the reef. And it just relocated the reef.

Lynn Benefield [00:43:42] Maybe not exactly as much as what, you know, what we, we needed, but it was a means of letting the industry go in and dig the buried mudshell then. And that was done quite a bit. There's a number of reefs, they're still working in. And we would require at least 18 inches of shell be placed down. And if it was placed where there hadn't been any dredging, well, we wouldn't let them put it back in dredge holes because they'd sink out of sight. But we built a number of reefs, and, and I'm not sure on acres and everything, but the lab at Dickinson and probably archives up at Austin would have that information.

Lynn Benefield [00:44:33] Now, David, what was it you were, you were asking?

David Todd [00:44:37] Well, just while, while we're talking about the, the reefs that were being moved and then rebuilt, do you think that those artificial reefs took? Were they successful in recreating a reef in a new location?

Lynn Benefield [00:44:55] Yes, there, there's a number of them. The main, the main thing is if there was exposed shell and, and it had be, you know, with eighteen inches, sometimes they'd have two foot of shell there, any, any type of spawning of the oyster within about 18 to 20 months, you would have mature oysters growing.

Lynn Benefield [00:45:24] And there's one one reef in particular is called Gas Pipe over in East Bay, and that was one that I'd helped locate. And we, we monitored the placement of the shell and then I was privileged to see it several years later, see oyster boats working on it. And the main thing is, having material, and oyster shell is the best material for the oyster's spawn to set on.

Lynn Benefield [00:46:01] And, and let me just go into that, and that might help a little. The, the oysters normally will spawn, sometimes in the late spring into the maybe early fall. They can spawn throughout the summer. One of the things that - old wive's tale, I guess that you hear, is that if they have a "R" in it, you could eat the oysters. But if you don't, if they don't have an "R", you don't eat them.

Lynn Benefield [00:46:39] Well, you can eat oysters year-round. But after they spawn, they're watery and the composition of the flesh is not so good as fat oysters like you get in the wintertime. But they spawn, say, in, in, say, May or June. The oysters' eggs drift around. They, they're, they're fertilized. There's a little, little organism that develops into what they call a "veliger". And it drifts for two to three weeks and it's progressing and growing. And, and then whenever that time arrives, well, it begins to settle out to the bottom. And if it settles on, say oyster shell, that's what we'd call clean ...

Lynn Benefield [00:47:34] And one of the things that happens whenever, like I was talking about the Trinity Bay oysters dying from the freshwater, well, when they die, they, the shell pops open and you have crabs and little fish and everything eating the meat and flesh and everything. And that oyster shell is clean, what we call, "clean", and these little veligers, when they settle down, and if they find that clean material like that, they'll sit on it and glue themselves to it and begin to grow as oysters. We call them, "spat". They grow in 18 to 20 months after setting. You have a mature oyster that's large enough to be harvested and sold by, you know, by the fishery, oyster fishermen.

Lynn Benefield [00:48:36] So that's a little of the history now.

Lynn Benefield [00:48:38] Let's, let's talk a little about the salinity aspect.

David Todd [00:48:43] Yes, please.

Lynn Benefield [00:48:44] The saltiness, we always measured in parts per thousand. Sea water is 36 parts per thousand. And in Galveston Bay, it runs the gamut from zero, whenever you've got the Trinity on a flooding stage and in like Hurricane Harvey coming through, there's probably areas of the bay that were zero from all the fresh water running into the bay. Down in West Galveston Bay, which is typically a saltier bay, and mainly because it doesn't have the river flow that Galveston has, the main Galveston Bay, has. But you know, there's times I don't know if it was Alicia, or one of the storms came through and it came through

over West Galveston Bay and dumped a lot of fresh water in there, and it mixed with the saltwater and, and it got down into the range for oyster growth. I don't know if I mentioned it or not, but a lot of people, I say, a lot of people, some of the scientists, say that it varies from 10 to 24, 25 parts per thousand is a, is a good range for oyster growth and survival. And we had commercial boats. I was out one day down there and we counted almost 100 boats down in Upper West Bay, and that's almost unheard of.

Lynn Benefield [00:50:27] But the game warden that I worked with, Ray Hansen, he was raised in League City and he was he was quite a bit older than me, and, and he told me that back in World War Two, that the Redfish Bar, and what I mean by that, is there's a oyster reef basically from Eagle Point all the way across the bay, over to Smith Point. And he said that parts of that reef come up near the surface and may have even had some shoaling there.

Lynn Benefield [00:51:04] And for a long time, that brought good mixing of saltwater coming in from the Gulf and fresh water coming in from the Trinity and San Jacinto and runoff from Houston. And, and so one of the things, when the War came, they built bases and touch-and-go airstrips around, and they needed a quick material to put down. And they used a lot of oyster shell and he said, and I don't have any doubt about it, but I don't have any confirmation on, literature or anything like that, but he said that the dredges were able to go in and they dredged out a good portion of that bar where you didn't have it, the reefs, coming up near the surface. And, and they didn't realize it at the time, but what happened was that that allowed the saltwater and the freshwater to mix in such a way that within a short time after the War, Galveston Bay become the top oyster producer on the Texas coast. For up until that time, I think Matagorda Bay was producing probably as much or maybe more than what Galveston was.

Lynn Benefield [00:52:26] So, you know, the salinity is extremely important. The, the habitats of oyster reefs are important. That oil spill of that rig off Louisiana - I forget what the name, name of it was called ...

David Todd [00:52:46] Deepwater Horizon?

Lynn Benefield [00:52:47] Yes, that's it. I think they even made a movie about it. But they, the Parks & Wildlife, got mitigation money from that. And one of the things that they did, and again, let me let me back off. I apologize for being sort of out of sync here.

Lynn Benefield [00:53:14] But whenever Ike, Hurricane Ike, came through, it come through at Bolivar, across Bolivar. And it carried a tremendous amount of sediments over into East Bay, and a lot of reefs were buried. And what the department did was, with some of the money, I don't know how much, but they purchased crushed limestone. And they went out into the bay and with these companies, with the materials on barges, and they knew where the reefs were located, even though they may have been covered by the sediment. And they, they were able to put a lot of, a lot of limestone down and crushed, small, small pieces, two to three, maybe four-inch size bricks or whatever you want to call it. And being as the reef was underneath that sediment, it didn't, the material, didn't sink into the mud very much. So they were able to use, get more mileage out of the material they had, than what they would have if they had put it in the soft bottom. And this this is something that was done, of course, I was gone, but a lot of things have been done, I think innovative, that maybe we tried to do and weren't able to do. But anyhow, that's sort of the thing.

Lynn Benefield [00:54:46] One of the, in '68, the dredges moved down to San Antonio Bay. And I think I've mentioned that the, probably the, the buried mudshell was getting scarce up here in Galveston Bay. Now they had one dredge with Parker Brothers, I think, J.P. Deersaugh, it was named I believe. It had worked in Matagorda Bay for a while. I don't know how long. Sabine Lake had dredging that went on over there, but it was on the Louisiana side. The warden that I worked with and I had to take a boat over there. And the reef, there was a reef right out in the middle of the lake. And we had to determine where the state line was. And we found that the dredges that were working, I think it was one or two dredges working around over there, were permitted for Louisiana waters, and I think they were probably Louisiana dredges. And so you had dredging up and down the coast, probably as far as Aransas Bay, maybe even into Corpus, I don't know.

Lynn Benefield [00:56:06] Speaking of the bays, the bays in, on the upper and middle coast have always at least since World War Two, have been more productive on oysters than lower coast bays. Aransas and Corpus, they have reefs. They also have high salinities quite often. And Laguna Madre has very little as far as any type of reefs are concerned. I know down at Brownsville, where they get some fresh water from the, or used to, from the Rio Grande, well, South Bay and another area down there, they, they have had some production down there.

Lynn Benefield [00:56:58] But for the most part, Matagorda and Galveston, and to a lesser degree, Aransas Bay have produced most of the oysters that have been produced. But, uh, Galveston is the number one bay. And again, it depends so much on the amount of fresh water.

Lynn Benefield [00:57:22] One of the other things that I think, David, that you had addressed was, or asked, was about the blue crabs and oh, sand trout, and shrimp and these organisms in their relationship with oyster reefs.

David Todd [00:57:42] Yes, I'd like to know that.

Lynn Benefield [00:57:45] Blue crabs, they will get on reefs or anything, you know, out in the bay. They're an organism that's similar in salinity requirements, in a way, that the oyster is. If you have a good oyster bay, you're going to have a good crab bay, because of the fresh water. And, and I'm not saying that the crabs wouldn't feed on the small juvenile oysters, you know, an inch or so, where maybe they could break the shell with their claws, pinchers. I'm not saying that doesn't happen, but I don't, I don't remember ever seeing any, any major damage from blue crab.

Lynn Benefield [00:58:32] You have stone crabs that do inhabit some of the reefs. And, but they're, I think, mostly found in saltier water like West Bay and on down the coast, than what you have, say, in Galveston Bay north.

Lynn Benefield [00:58:48] Uh, let's see here - another aspect of salinity - you have certain labyrinthulomyecete parasites, is a... I don't know. I probably should have tried to look all these names up. But anyway, you have parasites and that their salinity, they need high salinities to operate. In other words, if the salinities are high, they will prey on oysters. And they, the oysters, like I say, this is one of the reasons you don't have oysters in the high-salinity bays, is because of the diseases that, or, you know, they, they need the salinities to survive, that goes on in West Bay, and on down towards Corpus Bay. And Laguna Madre will have salinities, sometimes 40, 45 parts per thousand and that's just way, way high.

Lynn Benefield [01:00:02] Shrimp - I don't, I don't know if there's been many studies that show that there's a problem of shrimp or if it benefits shrimp. I would assume that shrimp probably maybe use, use the, are around the reefs and everything. I just don't know on that.

Lynn Benefield [01:00:23] Sand trout - I would think, you know, comparing them to the reef structures to say, tire reefs, I worked with the tire reefs and I think from a structure aspect that, you know, if you're a bass fisherman, when you find a structure, and fish for it, and you know, saltwater species is not much different, they, they will, you know, reefs attract them because of structure. And you know, there's, there will be food there for the fish to feed on. And that would probably be the thing that draws sand trout in there.

Lynn Benefield [01:01:03] I think there was a question on the striped bass and probably, I know when I was in school, we had, at A&M, we had to collect information on various species, and striped bass come up, and, and there was, I think, some reference long time ago of maybe being reproducing populations of stripers in the Galveston Bay system. And, and but it was very, very little, as far as my memory serves me.

Lynn Benefield [01:01:41] What you find in the bays now are basically striped bass that probably are stocked by Inland Fisheries in the lakes and that come through the spillways of the dams and maybe find their way down into the bays. I mean, we, HL&P in Baytown, they have a pond over there, and we'd go over there and collect redfish for the hatcheries, and occasionally you'd catch stripers fishing below the dam there. And, I know I caught one that was 13 pounds. And so, you know, they could possibly reproduce, I guess, but I'm not a freshwater expert anyway.

David Todd [01:02:39] Well, that's interesting. It tells me a little bit about how these reefs were useful to other fauna.

Lynn Benefield [01:02:46] Yes.

David Todd [01:02:49] Well, I have I have lots of questions that I think you'd be really uniquely placed to answer, if you have a moment.

Lynn Benefield [01:03:00] Yes.

David Todd [01:03:02] One of the things I'm really interested in, I think you may be one of the people who was there to witness it, and that's the end of this oyster shell dredging industry. And I was wondering if you can talk about that. You mentioned earlier about the mudshell monitoring that you were doing.

Lynn Benefield [01:03:25] Yes.

David Todd [01:03:26] But, but I'd be curious about those days in the, it's sort of the twilight of that shell dredging business along the Texas coast. Do you remember much about that?

Lynn Benefield [01:03:38] Well, a little. I think the last dredging occurred in the late '70s. I know that when I left, went off this mudshell dredging in '68. I'd been down in San Antonio Bay. We had two, three, three other biologists come in and work for a year or two years or whatever, however many years. And they, they were beginning to receive pressure - and that's probably something I need to mention too - from sporting groups, sport fishermen's groups, regular oyster fishermen, the commercial fishing industry.

Lynn Benefield [01:04:26] But when I was working up here in Galveston Bay, there was dredges over at Smith Point and they were cutting in to the islands there that were shell islands, basically. And one day we went over there and there were commercial oyster boats surrounding the dredges. And they were protesting, and they had them shut down for a day or so. I don't think it was more than a day.

Lynn Benefield [01:04:55] But the interesting thing to me was that there's a family over at Smith Point named the Nelsons, and they they've been there ever since there has been Smith Point, I guess. And they are commercial fishermen. And the patriarch, old Cornelius, he, he came aboard our boat and sat down, and, and we made him coffee, and he sat there and he talked about how things were back in the good old days. And, you know, we laugh about that. But that's a, that was an interesting time for me to understand, you know, somebody that actually lived in it.

Lynn Benefield [01:05:38] But anyways, the oyster fishermen, they would put pressure on legislators up in Austin, and of course, the GCCA become an advocate, I'm sure for the, you know, removal of shell dredging.

Lynn Benefield [01:05:58] And one of the things that probably helped along way too, was I remember going up to Austin and we went through La Grange, I think, on the way up there on 71. And of all things, we had to stop and wait for a train to go by. And it was loaded with boxcars full of limestone. And they were headed down to the coast. And I assume that much of the use for oyster shell was replaced by limestone. And they had a cheap, cheap source of it. I think Parker Brothers had their own source. And some of the companies just dropped out of business whatever the pressure got so that, you know, it just wasn't worthwhile for them to fool with it.

Lynn Benefield [01:06:54] But when it started? David, I don't I don't really know. I don't have anything in it writing on when the dredging started. The Ship Channel was made probably back in the early 1900s, probably dug by drag lines and then hydraulic dredges.

Lynn Benefield [01:07:18] But I suspect, you know, I mentioned about World War Two and the shell being removed from Redfish Bar. That was probably in the early '40s. Well, I'm sure it's probably in the early '40s. So I would say that probably the hydraulic dredges may have started sometimes in the, in the '30s. I don't know. That'd just be a speculation on my part, though.

Lynn Benefield [01:07:45] And, but it ended in the late '70s, and I think everybody, especially the conservation folks, let a big sigh of relief out that they didn't have fool with it anymore and the damage that it did., It did damage in most cases.

David Todd [01:08:04] I see. Well, you know, something else I would be really curious to hear your thoughts about it, is this period that you spent, I think, from '85 to 2001, managing the private oyster leases, these certificates of location, that I guess were in operation in Galveston Bay.

Lynn Benefield [01:08:27] Yeah.

David Todd [01:08:28] Maybe you can tell us how those leases worked and how they compare with the open-access reefs that I think are found elsewhere.

Lynn Benefield [01:08:36] I, I did learn something about that. I was hoping you wouldn't go and ask me a question about it.

David Todd [01:08:46] Aw.

Lynn Benefield [01:08:46] I was stationed at Seabrook and the regional director job come open in '85, and, and I went ahead and applied for it and was selected to be the Upper Coast regional director. And along with it came 43 private oyster leases. And basically, the private leases, and I think I'm correct, but I don't have the dates down good. I recall going to Austin one time and looking through some of the archives that Coastal Fisheries has. And there were private leases, I want to say in the very earliest 1900s. And many of them were speculators. They, they'd probably got the word that all you have to do is give the state some money, and then, and you know, they'll give you so many acres of bottom out there and you can grow oysters on them. It's a good way to make money.

Lynn Benefield [01:10:01] And it didn't last all that long. And I don't know that I ever saw any, any landing figures for that type of speculation. And I call it speculation because I didn't see anything that indicated to me that there was very much expertise going on in growing oysters on those leases.

Lynn Benefield [01:10:23] But probably, somewhere in the, I want to say maybe '50s, the leases become, you know, a factor. And again, some of this is speculation on my part and, and one of the things is the population in the Houston area grew. Well, the, the strain on the sewage treatment and that kind of thing also grew. And you begin to have areas that the state health department would check for coliform bacteria. And unfortunately, a lot of the areas were, you know, around the shorelines, and they had oyster reefs growing. Of course, the oysters, they, they probably enjoyed all that polluted water because they would grow faster with all that stuff.

Lynn Benefield [01:11:24] And, and one of the things that it become a factor was that you would have a minimum number of people that would go out at night sometimes and, and, you know, go on the shallow water reefs and, and harvest them during the, you know, public reef, reef season. And they would come in. And, you know, if you look at the reef, the oysters that came off, say, Red Fish, as opposed to oysters, say, up in Dickinson Bay or some bay that is highly polluted, well, the ones up in Dickinson Bay would have all kind of organisms growing all over them, you know.

Lynn Benefield [01:12:10] And, and if the public ate, you know, if they were, they sold the oysters to a dealer that would buy them and they had to know, I think they had to know where they came from. But you know, you don't send a full loaded boat in at nine o'clock in the morning and sell them.

Lynn Benefield [01:12:32] And but anyway, they, they had to do something about the polluted reef problems, and we worked closely with the State Health Department on this and the State Health Department developed criteria for determining what areas were polluted...

Lynn Benefield [01:12:52] [Excuse me, I'm, I'm having trouble. Let me get a drink of water, just a minute.].

David Todd [01:12:57] Of course. Yeah.

Lynn Benefield [01:13:07] But the State Health Department developed criteria that if the coliform bacteria count was at a certain level, that that area would be classified as polluted. And each year, they put out maps showing what areas were considered as polluted, and what areas were open for harvest.

Lynn Benefield [01:13:36] Now, one of the things that I can't really address it, but they've advanced now that they have certain more areas that are divided in the bay and they, even in open areas, and they look at the populations and there's a certain level of oyster population that they can shut it down, shut the season down if it drops below that level.

Lynn Benefield [01:14:04] But the main thing that the health department was looking for was the bacteria which, you know, the Vibrio vulnificus, I think is the name of it. It was a bacteria that was common, very common in polluted waters, and to a certain degree, in approved waters. But it's not something that just introduced, it's there. And if it is in the high enough concentration, well, that's what it becomes a problem.

Lynn Benefield [01:14:41] But anyway, they, the health department would monitor the, all around the bay and see what levels of bacteria that were present. And then they would draw their maps and say, "This is where you can harvest. This is where you can't harvest."

Lynn Benefield [01:15:02] And one of the things that they, on the private leases, is basically, I don't believe, I don't remember issuing any new leases. We had 43 whenever I took over. And we felt like that the use of those leases probably was adequate for removing polluted oysters, you know, and put them on private leases. And I'll get into more about that in a minute.

Lynn Benefield [01:15:35] But, it, it was difficult for the wardens, you know, to be out there at night and then they had to be out there in daytime and, you know, monitor those, those areas. So one of the things that they decided to do is have transplanting of oysters from polluted waters. And they would not allow transplanting during the public season, but during the non-public fishing season, they would allow oyster fishermen, or leaseholders, to send boats into polluted waters and work those leased, those reefs, down to a level that it wasn't as economically feasible to go, go violate the law there.

Lynn Benefield [01:16:28] And, and if they did a good job of working them down, well, then there was less likelihood that the, the outlaw fishermen would go in there at night and work, you know, work the leases, reefs.

Lynn Benefield [01:16:46] And we found that certain, certain leaseholders did better than others did. They had boats and they, they were, you know, they were, they followed the laws. They would go in under permits. They'd work, you know, these certain boats in a certain area and they would move them. It had to be done during daylight and they would move on from the reefs in polluted waters, over to the leases in approved waters.

Lynn Benefield [01:17:21] And it takes about two weeks, well, less than two weeks for an oyster to purge the concentrated bacteria. They're a filter-feeder. But it takes probably, well, somewhat less than eight or 10 days, I think, but they, there's a safety factor. They make them wait two weeks before they can harvest. They can't harvest unless they do it under permit and any harvest then can't be going on whenever the transplanting is going on.

Lynn Benefield [01:17:57] In other words, you had a public season, then you have a transplant season that might last a month, or two weeks, or whatever. And during that time, there's no oysters that could come off those leases. And that's again, a safety factor.

Lynn Benefield [01:18:15] It did several things, I guess you, you'd say. First of all, it helped as a safety factor for the public, you know, about getting bad oysters and everything. And, and basically the Vibrio - I hate to even say this - the Vibrio is killed by, you know, very, very good cooking, it's my understanding. But probably, that probably shouldn't even be used because somebody said, "Well, I'll go out there, you know, get some oysters in polluted water and cook them, and don't have to worry about them. But that's probably not a good thing for me to say.

Lynn Benefield [01:18:58] But basically, the, the, the Vibrio is, is the main culprit. And you might have four or five cases of people eating raw oysters a year that they get sick. I know of one, one sport fisherman that actually he was fishing up in Trinity Bay and then he got finned by, I don't know, some type of fish. I don't know if it was a hardhead or what. And he caught Vibrio from just from the water content and he lost a arm. And it's bad stuff.

Lynn Benefield [01:19:43] But anyway, that that gave the state agencies a tool to use, and I don't know how much the transplanting is used today. Like I say, things have, have changed somewhat. And, and I think most, a lot of it, is good changes that they've come up with.

Lynn Benefield [01:20:05] But the leases - they, they pay the states so much money, you know, per acre, per year, and they have to mark them with buoys or pilings. I think most of them use buoys. And it's just, you know, they, it's pretty tightly controlled, at least when I was working, that was the case, working with the health department and, and our game wardens.

David Todd [01:20:36] So I've got a question about these leases and how they, in your view, compare with those open-access reefs that are more common as you move further south along the coast. You know, I've heard some people say that there's a lot of competition and pressure, extra dredging, on those open-access reefs that make them difficult to sustain. But that the private oyster leases are somewhat better protected. Is that, is that true?

Lynn Benefield [01:21:10] Well, I think from a standpoint of the lease owner controlling what happens on his lease, there may be some truth to it. If a man, say, in the summer, say, this this coming summer, if a guy goes out and, and he fills up, say, he's got two or three private leases and he finds great oysters on the polluted reefs, and he takes them out and transplants them to his leases, and then just lets them set there. And they cleanse. And everything is good. He is the only one that can harvest off those leases. No one else can touch them.

Lynn Benefield [01:21:57] And, and if the, the public leases, reefs, or, say, the population is down somewhat and then they get hit hard first part of the season, work the population down, well, certainly there, there have been situations where boats would try to slip in on these private leases and steal oysters from them. And I think maybe that's where it may come from.

Lynn Benefield [01:22:24] But the private leases only affect, as far as the harvest of oysters, you know, up here in Galveston Bay. But as far as, I don't know the economics of, of the oysters produced on private leases, as opposed to public reefs down the coast. You know you have, you have a harvest of oysters in Matagorda and San Antonio and Aransas Bays. And I don't know that there's much going on in Corpus, but I haven't kept up with it. But I would, I would think the only thing that they would be complaining about is, these people that have

the private leases and they have a lot of oysters on them, they feel like it, they're hurting their, their fishery. But I'm not sure that's the case. It may be.

David Todd [01:23:23] Okay. Well, now speaking of these oystermen, these operators, as well as other parts of the oyster industry, the marinas and dealers, you've been watching the industry for a long time. And I'm curious what kind of trends you see. I mean, it seems for an outsider and an amateur like me that they've had a hard time, especially with recent hurricanes, you know, bringing in silt and a lot of fresh water. What's been your observation about it?

Lynn Benefield [01:24:05] Well, let me, let me look. I tried to... Okay. Getting my cheat notes out. You know, I got it down as number 23. OK, so let's see here. A 24. David, I will, I will send you a copy of these notes if you'd like to have them too.

David Todd [01:24:37] Oh, absolutely, I'd love to see that. And yeah, sure, please.

Lynn Benefield [01:24:42] Okay. Let me read more about it here. Let's see. 23? I just I just wrote the oyster fishermen generally know the bay quite well. I made a practice of listening to what they have to say and when appropriate, use it in our management program. Most reef locations in the bay were known to many of the fishermen and this helped the Texas Parks & Wildlife in setting, especially reinforcing, polluted reef regulations. Dealers offered input regarding marketing the products and generally dealt with the Texas Department of Health frequently. I didn't deal with marinas very much regarding this program, and certainly there's changes that have been made since I retired that I'm not familiar with.

Lynn Benefield [01:25:32] I didn't, I think a lot of the, you had Hillman's down at Dickinson. You had the Nelsons over at Smith Point and you have dealers on San Leon, in that area. They sold, they, normally the oyster dealers, so to speak, they would sell shrimp during the regular season. They would sell other products if they could. I just don't know how much the, the dealers affected the leases and the production on the leases or anything. Probably a bunch of them had private leases, and, and they were, it was all altogether there. I just don't know off hand. I don't know. Most of them that were working whenever I took over: they were still working whenever I left.

David Todd [01:26:44] I see. So they continued on.

Lynn Benefield [01:26:47] Yeah, they, they, they, they did all right, I think.

David Todd [01:26:52] Okay. Well, so one other sort of historical question. I'm, I'm curious if you have some insights about how the reefs, in Galveston Bay and some of the other important oystering areas, fared over the years. When I've heard these folks say that the reefs used to have a lot of profile to them. You know, they might be six, eight feet tall, you know, one hundred years ago, and that now that's very rare. Is that true?

Lynn Benefield [01:27:28] Well, it probably is to a degree. You know, I had mentioned the, the Redfish Bar area there, here in Galveston Bay, that I was told that, and I saw maps of a shoaling area, and the water in that area is probably 10 to 12 foot. And, and I don't, I don't know that I saw a reef. I know when we surveyed it, surveyed it, I saw reef profiles of at least 4 foot. But I never saw any shoaling of the water on Redfish Bar, now. And I suspect 4 foot wouldn't be all that common. I don't know.

Lynn Benefield [01:28:21] Over in East Bay, Hannah's Reef, is a huge reef. It's got flat, flat area where there's very little rise of the shell, but it also has shoaling areas on extreme low tides. You know, it'll expose the, you know, parts of the reef. So you're probably looked at three, three foot or so on some of the parts of Hannah's Reef.

Lynn Benefield [01:28:48] And it gets a little squirrely there. There's were reefs over at East Bay that the shell was below the bottom line. In other words, it was sort of like a saucer. You had shell inside the saucer and then you had mud around it. And I don't know if was the currents in that particular area or what, you know, kept it washed out or anything like that. I don't know why it was built like that. But I would, I would not know. You know, somebody said 10 or 12 foot on the reefs, that may be the case.

Lynn Benefield [01:29:37] I saw, there's a publication out, and I'm trying to think, who, who wrote it. He was talking about the way these deltas, not deltas, but bays were filled up. You know, you had a lot of material coming down, even a long time ago, when they were, there weren't a lot of farming practices, you know, that moved the soil, you know, and it washed away or whatever, but...

Lynn Benefield [01:30:12] [Excuse me.].

Lynn Benefield [01:30:14] The mudshell that was buried: they might have one or two or three buried reefs that were all in the same, same location. And you'd, what you'd have apparently in old, old days was that a reef would form. Then you may get into a climate situation where you had a lot of rain and washing materials into the bay, and it might actually kill the reef off and then put enough mud and stuff on top of it. And, you know, then it cover up, and then maybe later on, things would get right again, salinities be good and everything, and you'd have another reef form there. That's the only thing I could say.

Lynn Benefield [01:31:11] I had a guy come into my office there at Seabrook one day. He was talking about going to either Central America or South America to look at some of the bays they had and see if there was mudshell in those areas. And we got to talking about oyster shell here in Texas, and he had a ranch out west of San Antonio and he, next visit, he brought me about, I guess, about two dozen half shells of oysters that came from West of San Antone.

Lynn Benefield [01:31:47] I know that there's oysters and all types of fossils that you find up near the Austin area. So at one time, the oceans, the Gulf of Mexico, was inland quite a ways.

Lynn Benefield [01:32:04] And I think, you know, I tell people, they ask me about climate change. I say, "Well, ever since we've had climate, we've had climate change and we just hadn't figured out everything on how it was done."

Lynn Benefield [01:32:18] And, you know, the oysters may have been prolific back then. They had thicker shells. And I'm not sure exactly why, unless they had more predation, you know, that cause them to grow thicker shells. But there, there were changes back then.

Lynn Benefield [01:32:40] And I can remember in the '50s the, there at Corsicana, we had to haul water from a well over in the middle of the property, back to the house for the, the animals and everything, because we didn't get any rain, you know. And it went on for four or five years. And of course, if that happened this year, I mean, recently, it would be a big issue. But people just said, "Well, this is the way it is, you know?".

Lynn Benefield [01:33:11] But yeah.

David Todd [01:33:14] Yes. Thank you.

Lynn Benefield [01:33:14] I don't have a good answer for you on that.

David Todd [01:33:18] No, no, that's very helpful. It's always good to keep the, the big historical trends in mind. I mean, I was just originally thinking about the last 100 years, but you're absolutely right. You know, you go back thousands and millions of years and the sea level has moved and oyster reefs have moved and it's interesting to recall.

David Todd [01:33:42] Well, I have just one last question. I noticed that after you left Texas Parks and Wildlife, you went to work as a consultant to Benchmark Ecological Services, and, and you helped survey a pipeline route from Dollar Point to Smith Point.

Lynn Benefield [01:34:00] Right.

David Todd [01:34:01] It made me think, you know, the Texas coast is, is a rich oil and gas area.

Lynn Benefield [01:34:08] Yes.

David Todd [01:34:08] And there are pipelines and and you know, used to be drilling platforms, I'm sure there's still wells that are, that are operating. How do you think that oil and gas industry, you know, meshed with the oyster fishery?

Lynn Benefield [01:34:28] Well, I think, well, let me, let me say this. The pipelines, there was two pipelines that I dealt with. And one of them, left, oh, somewhere over around San Leon, and went across the Ship Channel over to East Bay, there near Smith Point. And one of the things that we tried to do is, of course, the Corps of Engineers requires permits for anything like that, and we had, we'd get to comment on those deals. And if they had a line, say, going right straight through the middle of an oyster reef, well, we could, we could get with the company and say, "Look, say, can you inch it over a little or move it the direction over just a little. And if you got in on the early planning, well, you could you, could work with them and, and try to avoid any sensitive areas like oyster reefs.

Lynn Benefield [01:35:41] But you also go ashore and there's a lot of spartina grass and that type of habitat that's extremely important, and you can either avoid it, but if you can't, you can also set down, and say, "Look, we'll guide you. Y'all need to replant where, where the pipeline comes ashore." I know in, down in Matagorda Bay, Transco, I think it was, had a 18- or 20-inch natural gas line came in from some of the, a field out there. And that's, that's I believe that's what happened, that they were asked to replant and reestablish the habitat where it went in.

Lynn Benefield [01:36:30] And one of the things, I don't know exactly when the heavy drilling started in Galveston Bay, I would say, probably in the 40s or maybe a little earlier, but well, I do know it was earlier because on one of the characteristics, they would apply for a permit to put a well down and, and you know, the, the agencies would look at it, say, well, there's no reefs there. And but they'd have come in and build a what would be shell pads. And early on, they, they had to have one pad for the drilling the well that was drilled, and another pad for, they had some type of structure that they used for generating power or something.

Anyway, they had to have two power pads down. And they would put down two acres, of guess what? Shell! And what they were doing, they were building artificial reefs out there, but the problem being is they, say, they drilled a reef, I mean, a well, and it did become a producing well for the gas oil, they'd put a structure down.

Lynn Benefield [01:37:58] And then they'd have Brown and Root, or one of the other companies, come in and lay the line to the distribution platform and then on in to the shoreline, you know, with a larger line with other, other products, from, you know, the other wells. But there was wells all over the bay. And then when they got to self-contained drilling rigs, they'd just have a one, about an acre, of shell to put down. So the single little reefs like that were the newer ones, and the old ones were the two-acre reefs. But if things on the public reef were, were, you know, overworked and everything, these oyster boats would come in and then they'd start harvesting oysters off these little reefs that surrounded, that the well structure was setting on.

Lynn Benefield [01:39:00] And if the well, the line, had not been buried, going right up to the structure and the inside of it, well quite often those dredges would hang the, the pipe. And, and, and people say, well, they didn't break the pipes. Well, they could. They did it. And if it was oil, well, you had the spill out in the bay. And if it was gas, you had the bubbling and, and some, some, you know, oil traces do.

Lynn Benefield [01:39:31] But Brown and Root, I know, aboard the barge, they developed a little barge that would cut a trench about a foot and a half wide, it had a little cutter head, and they'd cut right up through the shell pad, down to about three or four foot.

Lynn Benefield [01:39:50] And then they put the, connect the line up, and in, you know, buried like that. And there was no way on Earth that the dredges, the oyster dredges would hook it then.

Lynn Benefield [01:40:03] So that, and, and I think it was Exxon that was complaining. I was on a barge and talking to the guy out there one day. And he said, "We have trouble with them keeping a straight line, going from, from the well pad over to the, you know, collecting station. And I guess that, I don't know if they got paid by the foot on the line that they put out or what.

Lynn Benefield [01:40:39] But anyway, the whole, whole thing come down to, they had the technology to do it correctly, and not have many problems with it. And the guy in charge of Exxon pipeline division told me, he said, "The main thing we found is make sure that our, our supervisor on those boats, whenever they lay the line, then the line is done correctly." And that, that got, you know, gets rid of a lot of the problems that might have, might have come.

David Todd [01:41:12] I see.

Lynn Benefield [01:41:17] It was interesting, you know, to sit and talk to those people, because I was getting an education just like Exxon was getting an education from Brown and Root. But if they know they have to do something right, they can do a good job out there. And...

David Todd [01:41:35] Well, I like your point about getting an education, I certainly have gotten one today. I really want to thank you for all the, the good information you've shared, and I just had one more question, and that is, is there anything you might like to add that we maybe haven't covered as far as oysters and your understanding of them along the Texas coast?

Lynn Benefield [01:42:04] Well, let me let me make a deal with you. If I think of something, can I just type up an email and shoot it up to you? Or do I need to call you, or...?

David Todd [01:42:17] No, that'd be great. If you'd like to write something up, that's fine. That's fine. But I sure appreciate your, your spoken record today as well.

Lynn Benefield [01:42:27] What, what I want to do, David, is I've got a, a pamphlet by Bob Hofstetter. It's "Oysters in Texas" and, and I'm going to send a copy of it up. As, you can read most of it. I've got a bad place on the back, but then also I'm going to send a deal up again.

David Todd [01:42:55] [Excuse me?]

Lynn Benefield [01:43:01] I couldn't, I didn't really come up with the dates and everything on the estuary probe, so I thought it'd be probably best to just try to find a resume for them and send it up. And if y'all want to use it, well, it's there.

Lynn Benefield [01:43:20] Okay, well, that's great. But please know that you've told us a lot already. Don't feel obliged to do more than you'd care to. But I just again wanted to thank you for filling us in on some really interesting stories about oysters and of course, your life and career. So thank you.

Lynn Benefield [01:43:39] Well, I've enjoyed dealing with you. You've been a good guy to talk to.

Lynn Benefield [01:43:44] And are y'all doing it for other species too?

David Todd [01:43:48] We are. Yes, we're doing, we finished a chapter about Kemp's Ridley sea turtle, and we're working on some others. I think we may talk to folks about red snapper. Yeah. I'll send you a link to a website that shows some of the other species we've been working on.

Lynn Benefield [01:44:07] Okay. Reason I was asking that, you know, the, the shrimp fishery is most valuable commercial fishery that we have on the coast. And it's, you know, blue crabs are harvested and there's other things out there other than oysters, you know?

David Todd [01:44:29] Yeah. Well, I should learn more about that, too. Maybe I can get back to you later and see if you have some advice about those creatures, too.

Lynn Benefield [01:44:40] Well, and another thing - you know, we've got some bright young biologists that, that I haven't got to know. You know, they're, they're a lot smarter than I am. I just have a few years on them, you know. Each lab has, should have a seasoned biologist in charge of it. And if you want to, you know, contact them, I'm sure that they'd be more than welcome to talk to you about it. I don't know. I don't know how things are done anymore.

Lynn Benefield [01:45:18] So this, it was good career and met a lot of good people and got chewed out a lot of times, and I had, one story and I'll let you go.

Lynn Benefield [01:45:36] One of the things that you have to do it is, well, actually, there's two things. I had to, as a junior biologist at the lab, I'd have to go to public hearings to be the Coastal Fisheries witness at the regulatory hearings we'd have every year. And I was over at

Angleton one year and, and, Jimmy Evans, he runs Beach, Bait and Tackle, I don't know if that's still called that, but is was a fishing camp and he came up there, and something to do with white shrimp. And I hadn't been out of school very long. And he got up there and he said, "Now, Mr. Benefield, you're the expert." Said, "How do you tell the difference from a male and a female shrimp?" And I didn't know. And I said, "Well, Mr. Evans, I don't know, but I will find out, and I'll call you and let you know, how you tell them apart," which I did.

Lynn Benefield [01:46:44] And we had another hearing that Nolan Ryan was our one of our Parks & Wildlife commissioners. And my boss called me and said that, "You know, y'all be on your toes", said, "Commissioner Ryan may be coming down to the hearing." And, you know, he did, and we finally got the room open to have the hearing and nobody showed up. And he said, "I'd like to take the time just to sit down and talk with each one of you, and let y'all tell me what you're doing, and what's going on out there."

Lynn Benefield [01:47:20] And that was one of the neatest times to be able to sit down with somebody, especially of his notoriety, just wanted to know what we were doing, you know? And there was not one question about baseball!

David Todd [01:47:33] And did he tell you how to throw a ball 100 miles an hour.

Lynn Benefield [01:47:38] No, he sure didn't. Maybe an oyster.

David Todd [01:47:43] There you go. But these are great stories. Thank you so much. And...

Lynn Benefield [01:47:47] Okay.

David Todd [01:47:47] Thank you for your time and your interest, and all the homework you did. That was very kind of you.

Lynn Benefield [01:47:54] Well, I'll, I'll put a, print off a good copy and send this material up to you in a week or so and, and let you look it over. If, you know, if you can use it, well, I think it's good material to use. And if you don't want to, if it doesn't fit your need where you can, you can put it in File 13 or whatever.

David Todd [01:48:17] Well, it's all of value and thank you very much for sharing the material and then your time today. Really enjoyed it.

Lynn Benefield [01:48:25] All right. I enjoyed it. David, thank you.

David Todd [01:48:26] Okay, you have a good day.

Lynn Benefield [01:48:28] All right. Bye bye.