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## Park, Linda ~ Oral History Interview

Maggie Allen

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Woods Hole, MA 02543

# **Interview with Linda Park by Maggie Allen**

## *Summary Sheet and Transcript*

### **Interviewee**

Park, Linda

### **Interviewer**

Allen, Maggie

### **Date**

August 11, 2016

### **Place**

Northwest Fisheries Science Center  
Seattle, Washington

### **ID Number**

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### **Biographical Note**

Linda Park is a research geneticist at the Northwest Fisheries Science Center in Seattle, Washington. She received a Bachelor of Science degree in biological sciences and genetics from Cornell University and a Ph.D. in population biology from Washington University in St. Louis. She has worked for NOAA for 26 years, and is currently the team leader of the molecular genetics laboratory.

### **Scope and Content Note**

Interview contains discussions of: Northwest Fisheries Science Center, environmental DNA, deep ocean organisms, functional genetic mapping, epigenetics genetics, molecular genetics, population biology, NOAA, NMFS, salmon genetics, technology, fieldwork, funding and government agencies.

In this interview, Linda Park discusses her path to becoming a geneticist with NOAA and gives an overview of her career. During her graduate work, she conducted research in one of the first labs to do molecular genetics for population biology. Her first post-doc position was in a Monterey lab studying rockfish. At NOAA, she has helped to establish a new molecular genetics program focused on DNA instead of proteins.

Park describes the incredible pace at which the field of genetics has progressed and how her lab has collaborated with other divisions in the agency. She also remarks on the increase in diversity that she's seen since initially being hired.

## **Indexed Names**

Park, Linda

## **Transcript**

**Maggie Allen:** This interview is being conducted as part of the Voices from the Science Centers Project funded by the Northeast Fisheries Science Center. It is also a part of the Voices from the Fisheries project that is supported by the NMFS Office of Science and Technology. I am Maggie Allen and today I'm speaking with Linda Park at the Northwest Fisheries Science Center in Seattle, Washington. It's August 11, 2016 at 2:00 pm. Research geneticist Linda Park received a Bachelor of Science in Biological Sciences and Genetics from Cornell University and a Ph.D. in Population Biology from Washington University at St. Louis. She is currently the program manager of the Genetics and Evolution program and supervisor of the Molecular Ecology team.

**Linda Park:** Actually, I'm sorry. I guess I didn't read that right because that's not true, sorry.

**MA:** Okay. That's okay. So, yeah you can start saying what you're actual current position is [laughter].

**LP:** Yeah. So, I guess I would say that I'm probably the—I don't even know what we call it—is it the team leader? I don't know what we are. Oh, in the molecular genetics laboratory. The Genetics and Evolution Program got merged last year and we changed a bunch of the structure. So then I'm the team leader of the Molecular Genetics Laboratory.

**MA:** Okay.

**LP:** And so, ecology and a bunch of things got changed. All the names changed and it's like team, program, whatever.

**MA:** So, you're currently the team leader for the molecular—

**LP:** For the Molecular genetics laboratory.

**MA:** The molecular genetics laboratory, okay.

**LP:** Sorry about that. I kind of glossed over it and said yeah, yeah [laughter].

**MA:** That's okay. Okay, so you are currently the Molecular Genetics Laboratory team lead—supervisor.

**LP:** Yeah. And is this actually what's on the web? That's funny.

**MA:** Yes. It is on our web. I've had a few mistakes, so... Okay, well then on that note, why don't you just tell me what inspired you to pursue a career in science and how you've gotten to where you are today.

**LP:** Well, I guess I've always liked science. I should say that I didn't—it was a happenstance thing. I did not try to pursue a career in science. I actually wanted to be in theater arts. I was not interested in becoming a scientist, but science is what I did easily and it was the path of least resistance, whereas theater arts was a really hard road and my parents were not excited about that, so they always said well, you can do it but why don't you do something else in case. Biology and science was easy and I liked it, it was interesting, and so I always did it. So, it was also my fallback, and then it eventually became my career because theater wasn't where I was going to happen [laughter]. But I did do dance all through graduate school up until—and actually some here when I first got here. I had a lot of injuries and a lot of surgeries and it was never going to happen. But yeah, I didn't know I wanted to be a scientist until I would say halfway through grad school. It was just something to do.

**MA:** So, what was it halfway through grad school that made you say, okay.

**LP:** Well, so actually, I was interning with a video production company. Did a lot of work with them and really enjoyed it and got that there because I was taking electronic music and my electronic music professor knew the people at the video production house and my boyfriend at the time worked for Lucasfilm and was a computer programmer and did a lot of graphic arts and so was sort of in that world and he knew people that knew people, and this was the major video production house in St. Louis. Did an internship for them and after I guess my second year there—and I was doing this while I was in graduate school—kind of came to the realization that I would come in and say something really cool happened in science like, did you hear they found this really new star? This is really cool! And everybody's like, yeah that's fine. Most of the people there had stopped taking science in high school because they weren't interested, and so there weren't any scientists and it became—I actually realized I actually liked talking to scientists and I actually liked science more than like a hobby or something like that, so I was sort of... I shouldn't say horrified, but I kind of realized oh my god, I am a scientist. And so that's when I guess I sort of came to grips with the fact that this was actually going to be my career, that I was actually going to do this. Because I did miss it when I couldn't talk about it with people who—when people weren't interested, I was clearly not with the people that understood what I was talking about.

**MA:** And that was why you were getting a Ph.D. degree in population biology?

**LP:** Yes. That was probably around my third year in graduate school. I mean, I went to graduate school and I was enjoying it because I really liked it. I do like what I do, but it just never defined me, and so I always thought I would do something else. I was doing it because it was interesting, but I always thought that I would really do something else, but no. That ended up being that I actually really liked it more than I liked the other stuff, which was a surprise to me. But, science is interesting, so.

**MA:** Yeah. And how did you secure your position here then?

**LP:** Well, that was also somewhat of a happenstance as well. The lab that I happened to be in when I was in graduate school was sort of at the forefront of things. It was one of the beginning labs that did molecular genetics for population biology. I didn't realize it at the time, but it was a fairly new field. When I was looking for post-docs, there were not that many people who knew how to do what I did, and so a lot of people were trying to hire me to teach them and I wasn't interested in that. So, there was only a few places that I felt like I could go where I was actually going to learn more things.

So, I ended up in a lab in Monterey working on rockfish. I was working on fruit flies, elephants, other things before that and so never on fish, but they were working on rockfish and so I went there and there was a person who was interested in learning how to do the molecular work, and she had been up here at the University of Washington and when this job came out I asked her about it and she said, "well, they're not looking for me because I'm just learning this stuff. They're looking for somebody like you." The laboratory I was in, I had just been there for a few months. It was quite a contentious laboratory. It turns out the scientist who ran the laboratory had Alzheimer's and nobody knew it at the time, but that probably contributed somewhat to the chaos that was in the laboratory and it was not a good place to be, and so after about six months I knew I had to get out of there. Somebody committed suicide in the laboratory after I left—I mean, it was a very unhappy place.

So, I thought okay, I've got to get out of here and this job came up and so I applied for it. At the time it was a temporary job. Only a couple of other people that I knew that were interested in this job, and most of them were looking for permanent jobs and they got permanent professorships because, again, a lot of people weren't doing this, what I was doing. So, I came up just because I needed to get out of where I was because it was not a good place to be. So, again, it wasn't particularly like I was looking to work for NOAA—I actually didn't really know anything about NOAA. They needed somebody to start the lab here, so they hired me.

**MA:** And so most of your work was in a lab in the beginning? Like most of your day to day was working in a lab?

**LP:** Yes. Started at the lab, worked at the lab, hired people to work in the lab and was all about setting up the lab and getting it running and bringing in new technique. The genetics program was here already and had been here for 15, 20 years before, but they did a different technique and this was a new thing for them and they needed somebody to come set it up and do it. So, the other lab that was here continued to run for at least maybe 10, 13 years after I got here. After we shut that part down, those people now work in my lab. So, the genetics program has sort of shifted what they do, but we have also a lab in Manchester that was there as well when I got here, and still remains there and they have also switched over to molecular techniques. They were doing something called allozymes and it was a big lab, and that's what all the molecular—I mean, that's what all the salmon genetics labs were doing on the coast. So, there are actually a lot of salmon genetics labs so it wasn't like I started salmon genetics. It's been here for a long

time, it's just a different kind of technique. So, doing DNA [deoxyribonucleic acid] instead of proteins.

**MA:** Is that what you did? Were you focused more on DNA?

**LP:** Yup.

**MA:** So, those were your main projects when you first got here?

**LP:** Mmhm.

**MA:** So, you were salmon mostly?

**LP:** Yes. I came here to work on high-seas drift net. A couple of years after that, salmon ESA [Endangered Species Act] became the big thing and then that's where everything went.

**MA:** Oh okay. And so what other trends have you noticed in your field since you've been here.

**LP:** Well, I mean everything's molecular. Everything's DNA and DNA's kind of ubiquitous now and it's what everybody does and it's very fast-moving with the Human Genome Project and where everything is going, it's changed just tremendously since I've been here. It's kind of crazy. It's just...you know, nothing we'd imagined it would be 20 years ago. It's involved with everything. Our group pretty much collaborates with *every* division. So, it might not be the main—genetics is our main interest, our main research. It is not the research of a lot of people, but the tools that we have help other people with their questions. So, we have projects with FE with FRAM with EFS, we have projects with everybody and we collaborate with a lot of people.

**MA:** What's that like, collaborating with everyone?

**LP:** It's fun. It's good. I mean, it's very—we have a lot of very different projects and it's not boring, that's for sure. We have a lot of different things and we work with different labs and we have all sorts of stuff. It's been great.

**MA:** So, what is the project you've worked on that you most enjoyed or are most proud of?

**LP:** I don't think there is...I don't think there's one. I mean, we have—and our projects go forever. We have some projects that go for ten years, so it's sort of hard to say where one project starts and another one stops and one begins. Yeah, I don't have a particular favorite project.

**MA:** Okay. What about how has technology shaped your field and how do you think it will continue to shape your field?

**LP:** Well, technology is everything for us. It's huge. Things that—what I did for my thesis that took me years to do you could probably do in a week now. Things like that. So, it's kind of daunting. It's amazing how much we can get, and so we're now in the era of big data and it's

more about analysis too, is our limitation. Everything now is more reliant on computers and a lot of stuff is about statistics and programming, and so that's different too. So we're getting people in that can, that have those skills is not as easy because biologists are not necessarily people that go into their field because they're numbers people. So, it's a little bit of a different skillset. So, that's changed quite a bit.

**MA:** Where else do you see the future of your field going?

**LP:** I think it...there's so much to be done. I mean, it's cheaper, there's all this stuff that we can do. The thing is, with the oceans there's so many organisms we know *so* little about. I think the genetic tools will be pretty essential for figuring a lot of that stuff out. Right now we're doing a lot of what's called environmental DNA, so were doing sampling out of the water and trying to look at organisms that we don't even have in our hands, and so being able to do a lot of kind of remote analyses and things. I think the deep ocean is where a lot of new stuff will be. It will be really interesting. Yeah, I think it's only going to grow, really, for genetics. You see all the things that are going on with biomedical stuff. With humans, obviously, it's way ahead of where we would be and we would not do all of that stuff with salmon, but disease, anything disease discovery and monitoring—any kind of evaluation and genome mapping. All that kind of stuff is possible now, for organisms that you wouldn't ever dreamed of doing that stuff with before.

**MA:** And do you have any concerns about the future of the natural environment and where you see your work kind of helping that adapt to changes?

**LP:** Sure. We can help with monitoring those changes and we can—actually, one of the things that we're trying to do is look at functional changes, so not just...in the past, genetic markers were used as passive markers, were just sort of what you used to watch things change. Now it's more possible with all the genetic mapping to look at functional changes, why things are changing, and the actual biological mechanisms and so being able to figure out why things really happen and if what we're doing is impacting something. We have some projects where we're trying to look at whether the genetic changes that are happening because of something in a hatchery or some certain hatchery practices are occurring will actually have a long-term impact on the survival of the population, whether or not this could be genetic changes or whether they're things that the animal copes with its natural plasticity. Things like that. We're looking at epigenetics, which have multigenerational effects in some cases. So yeah, there's a lot that genetics will do for that.

**MA:** Do you think your work can be translated into policy and management? Is that kind of a difficult threshold to cross?

**LP:** Yeah, I guess our work per se probably not. There are people who do things like transgenics and stuff, but that's not what we do, and I don't think NOAA has embarked on anything like that. I mean, there's some policy about whether or not it's approved or whether or not people can do things, but I think NOAA's more concerned with the natural world. So, as far as then policy for what we do, there's the ESA. There's things like that in terms of being able to determine whether populations should be protected, or whether certain species are distinct or things like

that. We look at—we do stuff for enforcement, trying to look at IUU, the International...what is it—

**MA:** Unregulated.

**LP:** Unregulated, and Illegal, Unregulated and Un-whatever [laughter] fishing.

**MA:** Undocumented.

**LP:** Undocumented, there you go. So, as far as that, the data that we provide might be used in policy, but I don't see us directly doing anything like that.

**MA:** Okay. What are some challenges working in the scientific field or in the government?

**LP:** Well, I would say that planning is always difficult. When you work with organisms that are in the natural environment that don't follow a yearly schedule and are not in sync with fiscal budget it makes things very difficult. So, yeah. We always have issues with that sort of thing. Just things that you don't think should interfere. And I think everybody has that. Universities certainly deal with it, just in a different way. We don't have a three year budget, we have a one year budget. Sometimes the money comes...you don't know you have the money until your field season has passed. There's just that kind of stuff—the timing of it is always difficult. It would be nice if we had a two year budget, for instance, instead of a one year budget.

It's just really hard to get in sync with some of the things that we have to do that we have to match up with the field collections and any field work. Anything like that is difficult to sync up with the federal budget. Trying to get labor paid for that's going to be around at the time that you're actually going to be doing the fieldwork can be really hard. So, it's sort of mundane things. It's not things having to do with the science per se, it's just the implementation of our system with trying to get the work done. And then the federal government in general is not a science organization, and so I think a lot of the mechanisms are not set up for things that are as uncertain as science. So, we don't necessarily know how many pens and things we're going to buy. It's very difficult to do predictions on supplies and where things are going to go because our questions, some of them are fairly open-ended so you can't plan. The government's not good at that, so that can be difficult.

On the other hand, we have access to samples and a wide number of colleagues so working for the government is a good and it's a bad thing. It's just different than doing it in a university, but it has its advantages.

**MA:** And since you've been here, how has the office environment changed? Some people mention there's more women in the workplace, things like that.

**LP:** Yes. I think the first division meeting that I went to, I think they were all men, I think they were all white, and I believe they were all over the age of 40. And they were talking about EEO [Equal Employment Opportunity], which I found pretty ironic because I was the only woman



there and I was the only young person there and I was the only non-white person there. So, that took a while to change, but it has changed drastically. Certainly in the last 15 years, but I've been here for 26 years now and it was very different in the beginning. It was pretty different. We got criticized—I had a technician who was a young, blonde, Texan girl and I think people complained that we laughed too much. There was too much laughing going on, we weren't serious. Things like that. It's changed quite a bit.

**MA:** Yeah [laughter]. Cool. What about—have you changed your research or work interests since you've been here?

**LP:** I don't think per se. I mean, everything's evolved with the type of work you do and things. We're certainly done, we do some things now that we didn't do in terms of organisms. We work on deep sea corals, we work on...but the questions and the general things haven't really changed very much.

**MA:** What was it like working with deep sea corals? Did you go out in the field for that?

**LP:** I have gone...No. I actually have not gone out for that. We had somebody go out recently on a boat and they go out with ROVs [remotely operated vehicles] and the ROVs do the collecting, which is always interesting. It's hard to get samples for deep sea corals. It's a pretty small community because it's just so difficult to get samples. Yeah, I don't get out in the field very much anymore.

**MA:** But you used to go out in the field quite a bit?

**LP:** I used to go out in the field some. I mean, our particular field of molecular genetics is a fair amount of lab and then we would get out in the field to either do collections or to run experiments or whatever, but it was not even 50/50. I mean, most of it...it's probably 20%.

**MA:** 20% field?

**LP:** Field, if that. Mostly lab.

**MA:** Where was your—do you have a favorite place that you went out in the field? Or most memorable?

**LP:** I don't know...I can't think of anything. We used to go to, we used to do work in a hatchery. I've gone down to Monterey Canyon on a boat to do some sampling with some scientists in MBARI [Monterey Bay Aquarium Research Institute]. That's probably most memorable because I got sick [laughter] more than anything else. Yeah.

**MA:** And so most of your work now is managerial?

**LP:** Most of my work is at a computer, sitting at a desk, yes, or on a telephone.

**MA:** Supervising?

**LP:** Yup. Pretty much, pretty much.

**MA:** Yeah. And do you see a lot of new people coming into the field? Do you have students or anything that you...?

**LP:** We have a lot of people. There isn't as much money to bring new people on. We're in the process of trying to hire a new geneticist, but we've probably lost, I would say, three geneticist position since I've been here that haven't been filled, and so we're kind of down a bit and our group is on the older side. I would say most of the people that are in our group are within three to five years of retirement. So, hopefully we'll be getting some new positions to start to be bringing in and keeping the program going.

**MA:** So, what advice would you give to any of those emerging scientists who want to come into the field?

**LP:** That's hard. It's a hard—we talk about all the time how it's not a fun time to start your career because money's a big issue—but yeah. Just try to network as much as possible and take the opportunities and go where it takes you. I think that a lot of people, if they're really serious about science, have to stop worrying about where they're living right now. There's a lot of people that basically don't want to leave Seattle, and that's the biggest thing that I think is a shame. A lot of people here are undergrads here, want to stay here, want to go to grad school here, and it's like, you've got to go where the jobs are. You want to come back, you'll come back later. A post-doc is two years, three years, four years. Even if it's five, if you get to some back here later then you can settle here and live but a post-doc's still training. Grad school's training. Go. I went to school in St. Louis and St. Louis was never any place I would have chosen, but it was a great place to be. I did real well there. Yeah, it just sort of gives you opportunities so you have to look at the quality of the opportunity, you're training and not worry so much—you're a grad student, you're not going to do anything anyway. You don't have a life [laughter]. It doesn't matter where you live. But that is one thing. Seattle is a nice place to live, I'm very happy I ended up here, but nobody ever wants to leave. It's like okay, but if you have to compromise early in your career then the opportunities don't come later.

**MA:** Yeah, true. And so, I just am curious, how does your—do you feel like your experience doing theater and dance have influenced your career in science at all? Do you see any overlap with the humanities and your work as a scientist?

**LP:** Oh, I don't know. I think a lot of biologists, [a lot of scientists], are artistic people. Keeping an open mind on how you do things. It's just a good balance. I don't know how much any of the skills overlap or whatever, but I think most of the people here actually do arts in some way or another. A lot of musicians, a lot of artists, and so I think I was just a little bit more focused on thinking that's what I was going to do more hardcore. It's amazing how hardcore some people are that still do a lot of music and things like that.

**MA:** So, were you mostly in musicals with theater?

**LP:** Yeah, mostly musicals.

**MA:** What was your favorite part that you played?

**LP:** Oh, I don't know...I got to sing "Aquarius" when we did *Hair*.

**MA:** You liked that one [laughter]?

**LP:** Well, it was nice because I opened the show. So, that's more memorable, right.

**MA:** Well, that's pretty much all the question I have. I kind of went through those really fast.

**LP:** Yeah, sorry [laughter].

**MA:** No, it's good. It's fine. But if you have anything else you want to say about your work, or working here, living here, you kind of went through all of it, so.

**LP:** Yeah, I mean I had actually never even heard of NOAA until, I think, when I applied for a post-doc in Florida. They worked with NOAA, it was an—I didn't end up going there because I ended up going to California instead—that was the first time I even heard of NOAA and so I had no idea what I was getting into when I came up here. It's interesting, I think that it's been educational learning how different agencies work within the government. My husband works for the Department of the Interior and he works for what was Fish and Wildlife and now is USGS [United States Geological Survey]. They're very different than we are. It's really interesting. People think of "the government" as a place, but it's not. It's very different—all agencies, even all the centers, are different. So, that's been really interesting, working with people at different centers that have totally different perspectives on things. I am actually very impressed with the variety of things that NOAA does. It's really amazing. I mean, our agency does a *lot*. So, it's really impressive to see what we do and I think that's kind of—you forget it on a day to day basis, but every now and then you go wow [laughter]. Wow, that's a lot of stuff. We do some cool stuff.

**MA:** Is that how you think NOAA stands out? By the diversity of what we do?

**LP:** You know, I can't speak to that in that I don't really know all the other agencies as well. I'm sure Fish and Wildlife is pretty varied. But the oceans are very different, the coasts are really different. It's amazing how the species composition just varies so much. The fisheries and the problems, the questions that everybody has to deal with are just so different. It's amazing to me how different the regions are.

**MA:** So, you didn't know—you weren't "marine" in your Ph.D., you weren't like I want to be a marine? You were just—

**LP:** No. Had nothing to do with marine anything.

**MA:** Just science.

**LP:** Yup. Yeah. I don't have advice—I didn't even do any of the sea semester things or anything at a marine biology station or anything like that.

**MA:** What's your favorite thing about being—what do you think is special about being a geneticist?

**LP:** [Laughter] I don't know.

**MA:** What's your favorite part about doing what you do?

**LP:** You know, I don't know. I just...it's just like being a scientist. New things. When you get data, data is fun. That is the coolest thing, when you get data from a new experiment and you get to look at it. Unfortunately, I don't get to do that very much, but it's cool when you get new data because it's always fun. That never gets old.

**MA:** I guess this is my last—maybe just one more question is do you have any plans in the next five to ten years? Do you think you'll stay in your position?

**LP:** No, I think I'm going to retire soon.

**MA:** Yeah? Okay.

**LP:** My husband's retiring next year, and so it's more to do with things like that than anything else. So yeah, I think I don't have that much longer.

**MA:** And then travel and be retired and whatever.

**LP:** Yeah, yeah. We'll see. But yeah, I think that I've been here long enough [laughter].

**MA:** Yeah. 26 years you said?

**LP:** Mmhm. 26 years. I know, 17 in one office and then I moved to this office. In the era of—actually, when I first got here, I didn't think I was going to be here for that long, and I certainly told everybody there's no way I was going to make it to ten years. I think my boss at the time was irritated when he found me in the library looking at job ads in *Science*. He goes, what are you doing that of? I'm like, I'm not staying here. I had just come here because I needed to be somewhere. It wasn't intentional, so I figured I should go find a job that I had put some thought into.

**MA:** Yeah, but then you stayed.

**LP:** I did, I stayed. And the people here are good, and Seattle's not a bad place to be.

**MA:** Yeah, true. I get why people don't want to leave.

**LP:** No, I do. I do get that. I do get that, but I think people hamstringing themselves quite a bit by doing that. Because there's only so many jobs.

**MA:** Especially moving from Cornell and then St. Louis. One's a very cold place, so.

**LP:** Eh, Cornell's like here. I have several friends that I went to Cornell with that actually ended up here. One's here at the university, he's a professor at the university so when I moved here I asked him, so how bad is it with the rain? He said it's like Cornell. It's just like Cornell—you won't even notice it.

**MA:** After a while [laughter]. Right, well thank you.

**LP:** Yeah.