

**Interview with Tim Schowalter, by Max Geier, November 18, 1997, Cordley Hall, Oregon State University, as transcribed by Andy Coleman and Keesje Hoechstra.**

*Before coming to OSU in 1981, entomologist Tim Schowalter had been involved with Jornada Experimental Range in New Mexico and Coweeta Hydrologic Laboratory in Georgia, two US Department of Agriculture sites with deep university affiliations, IBP, and ultimately LTER involvement, so he knew about large, long-term ecosystem research efforts. Once he joined the faculty of OSU in 1981, he pursued NSF-funded projects concerning log decomposition, herbivory of Douglas-fir seedlings, and spider communities in canopies of old and young forests. Several of these projects connected with Andrews Forest and others did not. As with many entomologists at land-grant universities, his work spread across applied and basic subject matter and from single species to ecosystem-scale questions. He expanded his interest in inter-site studies to other LTER sites as his career progressed.*

**Max Geier:** This is an interview with Tim Schowalter taking place on November 18, 1997, at 1 o'clock in the afternoon in his office at Cordley Hall. Interviewer is Max Geier.

**Geier:** You've been to the meetings and have probably seen a little bit about this project and what we are doing here, correct?

**Tim Schowalter:** I've only been to one a few months ago. It was the last one I have been to, I guess. I haven't heard any updates that you may have given in the last couple of months.

**Geier:** Okay, because I did actually a fairly lengthy discussion last time. So, let me just briefly encapsulate. What I am doing here is interviewing people here in relation to their involvement with the Andrews group and with the LTER program. I am looking for professional networks, and how people are drawn into the group as well as how they communicate outside the group as it relates to the science. I was talking to Jack Lattin, and he identified you as someone I should talk to as a key figure involved in LTER activities at the H.J. Andrews, and also, the international LTER. Maybe you could start out by talking a little bit about the origins of your collaboration with Jack and other people at the Andrews. I'm talking maybe about your personal origins and backgrounds leading up to it.

**Schowalter:** So, before I was actually at the Andrews?

**Geier:** Yes, even before. Colleges you went to, why you went there, and programs you were interested in at the time.

**Schowalter:** Well, I got my master's degree at New Mexico State, back there in the International Biological Program, what a lot of people called the IBP, which was the forerunner of the LTER program in the sense it was the first international effort to document and compare community structures and ecosystems around the world. It was during that time, I don't know

how much you've heard about the IBP program, so I don't need to repeat what you already have on that.

**Geier:** A fair amount. I've been dealing with Ted Dyrness.

**Schowalter:** My involvement goes back to the IBP days. I did a lot of the small mammals, vegetation, and pitfall studies. I did it all back in the Jornada, which is one of the current LTER sites, a desert LTER site [New Mexico]. And then, went on to the University of Georgia where I did my dissertation at Coweeta Hydrologic Laboratory, which was at the end of the IBP program. It was terminating at that point and NSF was developing at that time what were the ecology programs at NSF, what became the Ecosystem Studies program that was developing at that time at NSF. So, there were several of us. Kermit Cromack went through that program as well.

**Geier:** At Georgia?

**Schowalter:** At Georgia. Coweeta is another one of the LTER sites. So, I had experience with those two IBP sites, which subsequently became Ecosystem Study sites, and are now LTER sites. I had connections at that time with Tom Callahan, who was director of the Ecosystem Studies program [NSF], and a student of my major professor at Georgia a few years before me. So, some of those connections were developed early. My major professor was Dak Crossley, who was the Co-PI along with Wayne Swank at Coweeta back then. I guess my involvement with the LTER program was developing at that time. I had met many of the people who are now involved with the LTER program at various sites through collaborations and through meetings at that time. We were having site reviews that included people from Hubbard Brook and the Andrews. I have forgotten who all was on some of those review teams. Then I went from there to Texas A & M for a couple of years, where I worked for a post-doc on southern pine beetle research, and while I was there, the LTER program developed at that time, back in 1980. We actually submitted a proposal for an LTER site to work in the mesquite system in southern Texas, which wasn't funded. But I was, of course, applying for jobs, and I had sent resumes to a number of places, mostly other ecosystem study sites, including to Jack, here at the Andrews, to see whether there was a possibility for employment.

**Geier:** That was Jack Rothacher, you mean?

**Schowalter:** No, Jack Lattin.

**Geier:** Jack Lattin, okay.

**Schowalter:** I had applied to work with him as a post-doc, at one point, or asked him about opportunities for post doc research up here. There was no opportunity for it at that time, but then a position came open here. I, of course, would have taken a job anywhere there had been a hard-money job. And I interviewed for several, but they didn't come through. So, in a way, it's fortuitous that I did end up at a place where I could stay involved with LTER research.

**Geier:** But you were getting your fingers in here interested in working with this group before you got the position?

**Schowalter:** Right, I knew a number of the people here. I had been acquainted with Kermit Cromack for years, and I knew Art. Art McKee had been through Coweeta, as well. So, there were a number of people that I had been acquainted with for some time. I knew Jack's name, although I think I had only met him once at a meeting before I came up here in this job. So, I got the position that I have now in 1981, and rather quickly got involved with research. I got an NSF grant to look at effects of herbivory on Douglas-fir saplings, nutrient turnover, and related processes in 1983. Since then, I have had projects to look at log decomposition in canopy communities, funded through NSF. One thing I guess I should note too, that my involvement with the international LTER sort of started while I was at NSF. I was the program director for Ecosystem Studies, in 92-93. I was involved in federal development of the terrestrial ecosystem initiatives, which have been subsequently supporting some projects. I have been involved in some of the desertification negotiations, which kept me close to the two desert sites that I am familiar with, the Jornada and Sevilleta. A number of the other program officers at NSF at the time were other LTER folks in different sites, so it is a fairly integrated community.

I met people from around the world, international programs, who were coming in asking about our LTER sites, and of course, was promoting our LTER network as sort of demonstration sites for some of the issues that were coming up with respect to desertification, which was big at that time. This includes terrestrial carbon pools, the issue that led to the terrestrial ecosystem initiative. The meteorologists and oceanographers can calculate to within 1.2 gigatons how much carbon there is in various atmospheric and oceanic pools, and they are missing 1.2 gigatons, which is about 20 percent of the global carbon that they can account for, and they are assuming that it is terrestrial carbon. It led to the spin-off through the global change community to a panel I served on that developed the Terrestrial Ecosystem Initiative. Again, the existence of the LTER program was central to many of those discussions. It was sort of surprising to me how relatively few people I was working with on these various interagency committees, knew about the LTER. It is a big NSF program that a lot of people out in other agencies, I thought would know about, didn't. It was an opportunity to showcase the LTER and talk about how LTER research was contributing to those issues.

**Geier:** Outside the NSF, what are the other agencies that participated?

**Schowalter:** EPA, USDA, Department of Energy, the [U.S.] State Department was involved, NOAA, NASA; all those committees I was on included representatives from all of those agencies that had involvement or interest in environmental conditions, environmental changes. The State Department, of course, because they were the primary negotiators of the EMSAT agreement.

**Geier:** What you're saying is that as late as '92 or '93, the LTER program was a pretty well-kept a secret of the NSF?

**Schowalter:** I don't know, it was surprising. I would not have thought so, and I think there were people in other agencies who knew about it, many whose positions and roles would have benefited from knowing about the LTER, and I was surprised that they didn't. How widespread that is, I couldn't tell you, but there were people when I bring up the LTER in these committees I was serving on, it was not known to the other members of these committees. They were all the environmental offices for those agencies. So, that surprised me. Yes, that was an indication how widely known the LTER was outside NSF, and, you know, it was pretty poor at that time.

**Geier:** Maybe we could back up here just a little bit. I understand that you did your undergraduate work at Wichita State. Are you from Kansas originally?

**Schowalter:** Yep.

**Geier:** What led you from Wichita State to New Mexico State?

**Schowalter:** I worked for a couple of professors at Wichita State, with two ecologists there. The program was primarily a cellular and genetics program, but there were two ecologists, Don Dissler, and Youngman, I don't remember his first name. But they took us on a field trip down to Arizona and the Chiricahuas. The American Museum of Natural History set a field station in the Chiricahuas [Mountains] there. And I got interested in the Southwest. I applied to work at New Mexico State, and I hadn't heard from them for a while, and I started graduate school, or taking graduate credits, at least, at Wichita State. Then, I got a call from New Mexico State that they had an assistantship available to work with Walt Whitford. Back then, there was a number of desert IBP sites, and the Jornada was just one of them. There was another IBP site in Utah, I don't remember the exact name of the site now, but Jim MacMahon [Utah State Univ.] was the overall program leader, and was coordinating the research at all of these desert sites. But, Walt was the PI on the Jornada site. So, I just very quickly got involved in Jornada research.

That is not what I ended up doing my thesis on. I actually ended up doing my thesis on the energetics, bioenergetics of a lepidopteran defoliator of grasslands, which was the major economic problem in northeast and northcentral parts of New Mexico. That was an ecosystem-level project, and I was becoming more interested in sort of ecosystem-level questions, and then subsequently moved on to the University of Georgia, where I had originally been interested in [Dak] Crossley's work on grasshopper energetics. One or two of his students had done some work on grasshopper energetics. But he gave me some books to read, and I was just generally reading what was going on in the area, the Coweeta in particular, since there was no money to do some research there. Interestingly enough, I walked into Dak's office and said, from having read the Coweeta proposal and a lot of other literature from the projects that it appeared that nobody had really looked at the effects of canopy arthropods on nutrient

turnover. Dak just laughed. I knew I'd stepped in it. That is exactly what he wanted me to do. So, I got my first taste of canopy research at Coweeta, and that is something that has been followed up here. Since '91, actually since before I went to NSF, I have been also working at the Luquillo LTER site, doing similar research on canopy arthropod responses to Hurricane Hugo.

**Geier:** Oh, okay. In Puerto Rico then?

**Schowalter:** Yes. And I also went back to Mexico, back in 90-91 for a year of leave. I was working in the Jornada again, looking at arthropod responses to moisture gradients.

**Geier:** So, returning to your roots.

**Schowalter:** So, my background at this point spans, I guess, six US LTER sites, because I have a log study at the Andrews here in Oregon, and also at Cedar Creek, an LTER site in Minnesota, Konza LTER in Kansas, and Coweeta, again. So, I have got Andrews, Cedar Creek, Konza, Coweeta, Jornada, and Luquillo.

**Geier:** That was all before you went to the NSF?

**Schowalter:** Right, yeah. And I guess you had asked about involvement in the international LTER? Jim Gosz, who is the current, or was the recent executive director for the LTER network, was division director of NSF while I was there, or came while I was there. I guess working with Jim was good, but I was thinking one time how many of the division directors were LTER alumni, and how many of them I knew. It was a rather impressive list.

**Geier:** You found yourself in familiar company there.

**Schowalter:** Right. So, when they were developing the international LTER network [ILTER], I had been at NSF, I was familiar with a lot of national and international policy development, and my name came up a few times. So, I was invited to join the delegation to Hungary. I was part of the ILTER delegation that went to Hungary in '94 and '95, and have also been invited to be a delegate to the East Asia and Pacific Region LTER meeting in Taiwan in '95.

**Geier:** Go back a little bit again here. You majored in biology and anthropology, and chemistry too. Can you identify the point where you moved more into the biology program in New Mexico? Was there a reason for that?

**Schowalter:** Yeah. I was interested in anthropology, and continue to be. Human effects and human interactions with the environment, continues to be a major interest of mine. Now, of course, we are looking more at the human influences on ecosystems, but there are times in our not so distant past, when we were much more dependent on the ecosystem resources that were available. As an anthropology major, I focused on Native Americans [indigenous] and Africans, and how their cultures reflected the availability of resources, the development of

their economic systems based on those resources, their agricultural or trade use of those resources, and so on. Biology, though, goes back longer. I had been interested in biology since I was a kid, and my parents encouraged me to collect insects, leaves, rocks, fossils. (Laughs) I had a collection for just about everything. I could bring snakes or frogs home, and nobody panicked. Even my mom would help me fix something up to keep them for a while, and then they usually encouraged me to let things go, too. So, my parents were good at nurturing an appreciation for biology.

**Geier:** Were they involved with science at all?

**Schowalter:** No, my dad was an aeronautical engineer, trained as an electrical engineer, but he designed the tail section for the 747, among other things. He also was instrumental in developing flight simulators for most of the Boeing planes. So, I saw the computer era develop. And when the first computer games, the first Atari's came out, I had seen those things, those same set-ups and designs in flight simulators at Boeing. So, it was interesting to see how the technology spread from there. But biology was just always a love. I actually did start out as a math major at Wichita State, but changed eventually to biology. Then I added anthropology as I went, because I got interested in it, and I almost added geology at one point. I had the good sense to not pursue it for a degree. I would have been a student forever, and at one point, probably would have been, except I got a notice from the College of Liberal Arts and Sciences, that it was time for me to graduate, that I had enough hours. (Laughs)

**Geier:** I was curious how you made the move to New Mexico on the basis of your experience in the Southwest. You mentioned your advisor at Wichita State. Were there any particular people there that you might identify as mentors or role models?

**Schowalter:** At Wichita State? Don Dissler, who clearly has been the mentor that meant a lot to me. I took four classes under him, and he was a person that was very interested in learning himself. When he found out that there were four or five of us, who had been taking his classes and who were interested in entomology, he offered an entomology class. By training, he was a fish ecologist, so this was quite a departure for him, but he stayed probably a lecture ahead of us, took some nice field trips, and learned a lot of entomology. And, just somebody to hang around. He just spent a lot of time with us, and talked about his training and background, what got him into biology. Just somebody who just really loved being outdoors and studying ecology. I had great field trips with him. We would just go and pitch our tents at a field site, and all be out there together. There was a group of probably five or six of us that just interacted very closely with Dissler. He had employed me for a year as a research assistant. So, I had some experience working in the lab, and going out in the field collecting primarily small mammal and invertebrate samples for tissue analysis as part of an impact assessment study on a new, coal-fired power plant in Topeka, Kansas. They were burning sulfur heavy coal and the primary objective of this project, it was an EPA supported study, was to see how the new scrubbers being installed at that time, would cut down on the sulfur emissions and effects on ecosystems around the power plant. We were taking samples in various cardinal directions, up wind and down wind, and collecting small mammal and arthropods. My part of it was

collecting small mammal and arthropod samples for population estimation, and also tissue analysis for heavy metals and sulfur, primarily.

**Geier:** You mentioned the field trip and the subsequent move to New Mexico. I'm not sure if I haven't been listening, maybe you already mentioned this, but did you identify anybody at New Mexico who might be on the order of possibly a guide for your future career?

**Schowalter:** Yeah, clearly Wickford. I've continued to be associated with Wickford over the years. It's just amazing how our paths continue to cross. He took a sabbatical to Georgia while I was a student there, so I got to introduce him to Crossley, and all the other folks there. And he got interested in mites at the time. So, Crossley was an oribatid mites specialist, and now Wickford is working with mites. It's gotten to be a real tight knit group again of people who have just moved around, worked in different places.

**Geier:** So, you kept in touch with people over the years?

**Schowalter:** Yeah, and I'm continuing to co-author papers with him, and also with Crossley. The association has stayed pretty close among all three of us. Plus, my post-doc supervisor, Bob Coleson, at Texas A&M, was a product of that Coweeta guild, too. And although his work at Texas A&M has focused on southern pine beetle, he has approached it from an ecosystem perspective, so my association with him sort of continued to reinforce that approach to looking at insects from the ecosystem perspective, which is a fairly rare one. There are only probably a half a dozen entomologists I know who approach their research from an ecosystem perspective.

**Geier:** How you might characterize the similarities and differences between Coweeta and the Andrews, in terms of the research you do, and the kinds of people that were working on those sites, what your impression is?

**Schowalter:** It's been interesting working at these sites. There are some interesting differences. Coweeta and the Andrews, I would characterize as being very well-balanced. They are both a couple hours from their major institution; University of Georgia is about a two-hour drive from Coweeta, we [OSU] are about a two-hour drive from the Andrews. There are a lot of similarities in how people have approached research. There was relatively more entomological involvement at Georgia I think than there is here, quite a few people looking at various aspects of invertebrate ecology at Coweeta, while I was there. Now, there is still probably a half a dozen people looking at aquatic and terrestrial arthropods from a variety of perspectives. Here, it has primarily been Jack and me. Stan Gregory over in [OSU Dept.] Fisheries and Wildlife looks at invertebrates, but not from an entomological training standpoint. The Jornada is an interesting one in that most people who work there come from off-site, as the LTER developed. There are a lot of people who have done research on the Jornada. There are only about half a dozen people at New Mexico State that are integrated in the LTER project. The others are coming from places like Duke and San Diego, and other places. And the Luquillo is similar in that there is a fairly small core group in Puerto Rico that

administers and takes care of much of the work at the site. And there is just this huge pool of satellite investigators that come in for their specialties.

**Geier:** Would those be mostly post-docs or would they be people who have appointments?

**Schowalter:** People like me, sometimes bringing post-docs or students. But, disciplinarily, they are all reasonably well-balanced, I guess. I think that Coweeta and the Andrews sort of share this nucleus of investigators, well-balanced investigators from the institutions close to them.

**Geier:** How would you characterize the relative interaction, across disciplines, at the two sites?

**Schowalter:** It varies. The best camaraderie is actually at the Luquillo, from my perspective. People come in there, myself included. I'm very comfortable working with that group. And it's ironic, because we only get together a couple times a year, and maybe it wouldn't work if we got together more often. Who knows? The other sites tend to develop subgroups that work more or less closely together. One of the disappointments for me here has always been the relative absence of consumer-oriented projects. We have had a real scarcity of people working with birds and mammals, and that consistently has been a comment that reviewers [of LTER proposals] have made. We've had good entomological taxonomy work at the Andrews through Jack Lattin's work, but relatively little consumer-oriented entomological work. I've done pretty much what's been done, from an insect-consumer standpoint; how populations rise and fall, what affects that, what their effects are on nutrient-cycling, carbon-flux, and ecosystem processes.

**Geier:** Do you have any theories on what might account for that?

**Schowalter:** Well, I don't know how public I want to make that.

**Geier:** Several people have mentioned the same issue.

**Schowalter:** I'm not currently directly tied to the LTER. Some of it is just personalities.

**Geier:** Let me back up a little bit here again. You've been at a large number of universities compared to most people I've interviewed. It's pretty broad, spanning a career of experience, graduate level and above. If you could give a little insight into your perception of how you might compare and contrast the research climate at Oregon State University, and the potential for interdisciplinary, collaborative research at the institution, as compared to other institutions?

**Schowalter:** That's a little tougher one. Well, one of the limitations here has been a lack of institutional support for research. My salary here, for instance, is covered, but for as long as I have been here, I've had virtually no research funding from Oregon State University. The best I had for a while was from the Forest Science Department. I was getting, for most of the 80's, I was getting about \$10,000 a year for doing cone and seed insect work, which was a very-



focused application of forest entomology research. So, the only research funding I've ever had to do, the ecological research that I prefer to do, has been from outside Oregon State. It has always been that I've been on this constant treadmill, getting research grants support. The Forest Service has begun to chip in some. I've currently got funding through the Forest Service's Demo Project, but that isn't for Andrews work. The Demo sites are in Washington and southern Oregon, and sort of span and compliment the research that I have done at the Andrews. But NSF has been my sole supporter of research at the Andrews. During the last funding cycle, I had support from the LTER for canopy sampling during three of the six years, but that has been my only support from the LTER itself. All of my other research has been supported by other NSF grants.

**Geier:** When did your first grant to fund work with the Andrews come through?

**Schowalter:** 1983, when I got a grant to look at the effects of herbivores on nutrient cycling. Since then, most of my NSF support at the Andrews has been for log decomposition research.

**Geier:** At other institutions, what you are saying is that there is more institutional funding?

**Schowalter:** Well, it depends. New Mexico State has not provided a lot of institutional support for the Jornada [LTER site]. In fact, there have been a lot of impediments at the institutional level to that. While I was a student there, for instance, the College of Agriculture took out a bunch of fences and allowed grazing on parts of the range, and at that time, it was IBP. But I gather there has been sort of continuing competition between the College of Agriculture and the LTER project over grazing rights and various aspects of management. With support of the Jornada, the Agricultural Research Services, Jornada Experimental Range support down there, I understand the LTER has very close collaboration with the ARS. But the College of Agriculture, I understand, is still a bit competitive. But that is neither here nor there anyway. The University of New Mexico has put a lot of institutional support into the development of that site. A lot of folks from UNM have worked down there. I haven't even gotten the chance to visit there, but I just understand they do have a premier field station there.

**Geier:** How about in terms of faculty, campus culture, and the informal support, such as collaborative research and stuff like that?

**Schowalter:** It's always been a fight here. Finally, in the last couple of years with the new department chair here, I got some resources to upgrade my laboratory, so now I've added in a deionized, distilled and ionized water system, so I don't have to cart water back and forth between Cordley [Hall] and my lab. Got some new benches and counters, and it's a much nicer environment to work in down there. My lab is down in the greenhouse wing across from the motor pool. I don't want to be too caustic here, but, part of it is the game you play where you are. I mean, there are trade-offs. Where would you go? But, it has always been a struggle to keep projects funded. One of the continuing complaints I have is that it is very difficult to get support for graduate students. If I don't have money on my grant, it isn't there. The only

graduate students that I can support are those that I can support on grants, because there is no institutional support for graduate students.

**Geier:** Who outside the entomology program would you identify as your closest collaborator, or colleague on campus? Outside the entomology program.

**Schowalter:** I haven't really worked that closely. I guess Kermit Cromack, we've certainly tried a few times to get some close collaboration. Actually, Jeff Morrel has probably been my closest colleague in the log decomposition research that we have been doing. He is the mycologist down at the Forest Products Department. We've shared some students in the past, and more recently now, are collaborators on a current log decomposition project.

**Geier:** I am also curious. When you first came here in 1981, you mentioned you had contacted people like Jack [Lattin] and Stan Gregory. What was the primary single attraction out here?

**Schowalter:** It was a job. I was applying for everything. The academic job market had really started to decline precipitously the time I came out of my Ph.D. program, and it's been much worse since. But, yeah, I applied for just about everything there was in California. (Laughs)

**Geier:** But you had written, or were you in the process of writing a grant for NSF, to try to come and work here?

**Schowalter:** No. I had been involved in preparation of several grant proposals while I was at Texas A&M, including an attempt to get an LTER site established in south Texas. But no, when I came up here, it was because of the job offering here for a forest entomologist position.

**Geier:** Once you arrived here, it sounds to me like you were getting involved with folks at the LTER program pretty quickly. Can you recall when your first visit to the Andrews was?

**Schowalter:** Let me think. I'm trying to remember whether it was Kermit [Cromack] or Dick Waring that sent me down there. Maybe Jerry [Franklin]? You know, I don't recall now who sent me down there. I know that I had been down there various times early on with one of them. I don't remember now which was the first.

**Geier:** Can you tell me some of your first impressions of the Andrews?

**Schowalter:** One of the things that I remember being struck by is how similar it was to Coweeta. I mean, if I kind of ignored the fact that the over-story was conifers instead of oaks, the understory was very similar to Coweeta; the dogwood, rhododendron, ferns. Walking through the understory was virtually identical to walking through Coweeta. Slopes are a bit steeper, but there were some steep slopes at Coweeta, too. So yeah, I remember that was one of my first impressions, in thinking that, hey, I can work here, this isn't so different.

**Geier:** So, the potential for entomological research was promising?

**Schowalter:** Well, I was daunted by the height of the trees. The techniques that I had used at Coweeta were mostly ground-based, using a long-handled pole pruner to get samples from 30-40 feet up. Things I could reach from the ground, using the pole and any advantage, I could get from sampling uphill on a slope. Here, there was no possibility of that. The lowest branches of the old-growth trees, were at least 150 feet up. So, canopy research was pretty much out, but I did get involved initially in some of the regenerating stands. I worked on Watershed 6, and also Watershed 10 [HJA]; they were two of the sites that I focused on. Interestingly enough, my first involvement in the canopy here came through the lab [soils] fire. It was at the end of the project that I had from NSF, to look at herbivore effects on nutrient cycling. The soils lab was doing one of my tissue analysis, with some nitrogen, phosphorous, potassium, calcium, and there was a short in one of the ovens or something, and it burned up the samples. So, I had 10,000 bottles that had, you know, was how I was going to pay for nutrient analysis, and this was towards the end of the grant, so I had to decide how I was going to spend \$10,000 on these, really quickly.

It was at the beginning of the '86 field season, so I called Callahan at NSF and explained the situation with the fire, loss of the samples, and the fact that at that time, we were having a gypsy moth scare in the Pleasant Hill area east of Eugene. And there were gypsy moths within about 14 air miles of the Andrews, so there was some concern at that time about whether or not they found a gypsy moth at the Andrews, if the climate was such that the state was committed to eradicate it, wherever it was. So, I was thinking, we have no information about who is living up in those canopies, from a population standpoint. We had had the old studies by Voegtlin, Carroll and Dennison, that had surveyed what was living up there, and they had a species list that they had developed from a variety of sampling techniques that gave a pretty good picture of who was living up there, but only their relative abundances. And it was based on four trees in one site.

So, Callahan said, "Sure, send me a proposal for what you want to do." I did, outlining the number of trees that I'd sample. I had gotten some preliminary estimates of what it would cost to climb trees. The proposal was approved, I put out a bid for climbing contracts, and ended up hiring a group out of Eugene who had been climbing trees for years for the Forest Service to collect cones. That was the Glenwood Cooperative. And Burt Recker, who has continued to climb for me over the years now, with various associates that have joined him over the years. But Burt, and John Carrol, who was an associate at the time; they climbed twelve old growth trees for me, one Douglas-fir and one hemlock in each of six stands, five of which were log decomposition sites at that time, because I had some idea we might be able to link the canopy and the forest floor in those sites, and increase the amount of information that we had for them. Then, one of the sites, I changed to Mack Creek, because there was quite a bit of interest in having a riparian site, what was going on in the canopy of a riparian site, which wasn't represented among the log sites. Anyway, that is how the canopy work here got started. It was fortuitous, if that is what you want to call it; a lab fire that saved me enough money to put into sampling twelve old-growth trees.

**Geier:** Was this just the redirecting of existing grants?

**Schowalter:** Yeah. NSF approved that use of the funds, and I was able to find a pair of climbers that understood and appreciated what I was trying to do, and have stayed interested in the project enough that they have actually volunteered in the past to climb again for free. Got the money, you might as well get paid for this work. But, you know, it's been a good association. People have been appreciative of the kinds of concerns I had in how the sampling was done, and I think they've done a good job sampling.

**Geier:** How did you run across those people in the first place?

**Schowalter:** Just an open bid. They were one of three groups that bid on the project, and came up with the low bid, and it worked out well.

**Geier:** So now, when you write a grant, you write them into it?

**Schowalter:** Yeah. We have become more consistently associated, now that I have six years of Demo support, so we'll probably be working together more continuously. During the last six years, it was every other year, and that was the first time since '86. A long time, between '86 and '92, before I was able to get LTER support to continue that canopy work. It's a funny thing, you know, everybody appreciates the fact that species diversity and a lot of things going on in the canopy can have major effects on canopy-atmosphere interactions, canopy-soil interactions, but getting money for it has been difficult over the years. It costs to climb trees. It runs about \$100 a tree. I could learn to do it myself. I've done it once down in Puerto Rico, actually, on shorter trees, but I couldn't sample efficiently myself. I'd probably kill myself, eventually. It's better from my standpoint to hire people who have experience, who know everything to look for, check every buckle, what you do in case of an emergency. I've had a couple students over the years who have been interested in doing that, but weren't trained to climb trees, and I've just said, "No. It's okay if you want to learn to climb trees in your spare time, but don't do it for your thesis where you are going to be obligated to learn it quickly, be in a rush, take chances." It's better to have these guys climbing and collecting samples for us. Now, if I had a student already trained in tree climbing or mountaineering, and wants to climb trees, I'll say great. Hasn't happened.

**Geier:** I was going to ask you, if you've ever had any accidents?

**Schowalter:** No. The only accident we had was a couple of years ago where a branch broke out above one of the climbers, and we had to run him down to the hospital in Roseburg for a couple of stitches. It could have been worse. They wear hard hats now.

**Geier:** I am curious about gaps in your [funding], how you redirected your work, or did you redirect your work?

**Schowalter:** Yeah, I mostly focused on log decomposition during that point.

**Geier:** And that's something that was easier?

**Schowalter:** Yeah, working on the ground was a lot easier. The statistical methods, the experimental designs are much more straightforward, you don't have to sell them as hard. I've been surprised and a little disappointed by that. You know, it's good for me because I had training as an autecologist while I was at Georgia, and continued to work with Mike, for instance. I've had some periodic role in decomposition studies. So, it was an area where I could sell my expertise, and also involves very clear experimental designs.

Anything you do on the forest floor is easy to replicate, easy to manipulate. When you get up in tree tops, you've got the triple whammy; difficulty of access, difficulty of repeated measurements, getting out to the same place without disturbing it, and manipulation. What can you manipulate up there? We've got some new opportunities up there now with the canopy crane at Wind River [Experimental Forest, southern Washington]. That does overcome some of those problems. With the crane, you do have fairly complete access to virtually all the tree crowns within the perimeter. You can go back to the same sample points, and there are actually some possibilities for manipulations that you could do there, if you wanted to shelter branches, impose herbivory on particular branches, or exclude predators of herbivores from some branches. There are some things you can manipulate and study, using the crane. But the climbing techniques are just too rough. They do offer the advantage of being able to move around a lot, so, for instance, the twelve trees that I sampled, maybe six of those were replicated across the whole Andrews. I mean, there were the six sites distributed around the Andrews. So, the replication was good that way, while the crane is just one site.

I can draw conclusions about canopy arthropods from my sampling at the Andrews that cover 6000 hectares. Now, more recently, since I have expanded some of the sites outside of the Andrews, I can talk about 15,000 hectares. So, the replication is absolutely essential, where traditional techniques, somebody climbing a tree or working some tower, there is no possibility of replication. People wanted to see a manipulation, so I couldn't get funding from NSF because I wasn't manipulating something. I couldn't get it from the USDA, because at that time they didn't have an ecosystem program, and they more interested in growing trees or killing insects, it seemed. I mean, that's putting it simplistically. But the review comments I was getting were on, "How is this going to benefit forestry?" Why do we want to know about insect communities?

**Geier:** Were the sites that you worked on off the Andrews in the Blue River District?

**Schowalter:** They are now. The last six years, I've been working in other parts of the Blue River District, primarily. I have several sites down around the Delta campground south of the McKenzie River towards Cougar [Reservoir].

**Geier:** What's the relative proportion of your work that goes on in the Andrews?

**Schowalter:** The last couple of years most of my research has been on the Demo sites. I've still got the log decomposition sites, though at the Andrews, so it's about half-and-half. And the Luquillo work, I like to go down to a couple of times a year. I've been up to the crane [at Wind River Experimental Forest], done some sampling for the crane one year, and I'm making some arrangements to do sampling from the canopy crane in Panama. So, I'll have a couple tropical and a couple of temperate sites, to compare canopy processes in the next year, which will be sort of unique.

**Geier:** Could you talk a little bit about your perception of the purpose of an experimental forest in the Forest Service, in your experience, how it changed in the time you've been involved here?

**Schowalter:** Yeah, you've probably heard this from others, too. When these experimental forests were started, the primary interests were timber production and water yields and quality. During the IBP days, Hubbard Brook, Coweeta, and the Andrews became sort of the three "crown jewels," as they are often called, representing the Northeast, Southeast, and Northwest primary timber areas. The focus began to change at that time toward forest communities and how various processes affected forest communities. And then, toward the end of the IBP period, people were starting to look at effects on nutrient budgets. That started with projects at Hubbard Brook in the '60's that were indicating effects of clearcutting on water quality and water yield. People started to be concerned about how nutrients leach through soils as percolation changed, as the result of canopy opening. One of the interesting things that I talked with my students about in the ecosystem classes, is the spin-off from the cold war research at about the same time work that was going on at Oak Ridge and Savannah River, and down in Puerto Rico. The Luquillo site down there was one of the sites for the Department of Energy research on radioactive tracer movements in ecosystems. Odum and their associates down there were tagging trees and seeing where the labels went, and doing similar research at Savannah River and Oak Ridge, Tennessee.

A number of people that I've been associated with over the years have been involved in those radioactive tracer studies at one of those three sites. In fact, I had some training under Crossley in radio tracer techniques and have some early papers on that. But, most of that research at that time was what would be the fate of these radioactive elements, if there were a nuclear war? How quickly would the fallout be attenuated in tree tissues or what would eat those tree tissues, how would things get deposited in vegetation or sediment, and what processes in the ecosystem, such as herbivory, would tend to move those things around? So, I think a lot of the ecosystem research that developed during the late '60's was sort of a spin-off of that. Radio tracers were an easy way to look at how these radioactive elements moved from pool-to-pool, because you could measure the time it took for it to get from the tree trunk to the leaves, and how quickly it accumulated there, so it was easy to develop equations for turnover time. Without tracers it's much more difficult to do that. You now actually have to measure the processes such as herbivory to actually try to get an estimate of how quickly those materials are being moved. With the tracers all you have to do was evaluate the leaves and see how quickly it started to accumulate, and then just develop the equation for transport rate.

**Geier:** So, it's kind of a short cut?

**Schowalter:** Uh-huh. (affirmative)

**Geier:** To something that research might have led to otherwise, but in a more direct route because of Cold War concerns?

**Schowalter:** Yes. A lot of people at Georgia while I was there, had worked at Oak Ridge. I got to visit Oak Ridge several times while I was there, and got acquainted with a number of the people doing these kinds of studies at Oak Ridge. More recently, since I've been working at Luquillo, I've gotten acquainted with a lot of the folks that did that work during that period down at Luquillo. There're still some tagged trees down there that are fenced off. (Chuckle)

**Geier:** Were there concerns about the legacy of that study?

**Schowalter:** When you've worked in those areas, you tend to be a little cavalier about it maybe, but they've got it fenced off. As long as there isn't any active movement of materials out of there, it's probably not going to go anywhere. But the radioactive tracers that end up in leaves, ended up on the forest floor. The leaves decomposed, those radioactive tracers could enter the groundwater pool. There was interest in following where those radioactive traces went in ecosystems. I think that led to the interest in nutrient cycling generally, at many of these ecosystem sites.

**Geier:** How would you compare the research culture at Oak Ridge with the Andrews crew?

**Schowalter:** I don't know that I was that familiar with it [research culture] at Oak Ridge. If I were going to compare, I'd probably say that it was much more regimented at Oak Ridge. It was government research, much of it classified, so it was very different than the more open, academic research. One of the things I've appreciated here at the Andrews that I did not see so much at Coweeta at the time, it's been better since, but one of the things that struck me when I started working at the Andrews, was the close corroboration between the Forest Service, the Blue River District folks, and the academics. While I was at Coweeta, that atmosphere was a bit testy. And like I say, when I was working down at the Jornada, the relationship between the USDA and the academics was a bit testy down there then. Again, those environments have changed. But that's one of the things I think remains a strength of the Andrews, that we've had a succession of very cooperative district rangers and their staff, who not only have been very interested, and in some cases helped guide some of the ideas that we were developing for research, but also been very quick and eager to implement them elsewhere on the Blue River, sometimes, and say, "Okay, let's take this out and try it operationally and see what we get." So, some of the first new forestry cuts, for instance, were in the Blue River District off the Andrews.

**Geier:** Who in the district or forest [Willamette] or in the regional office [Region 6] would you characterize as being the most closely involved with the work you're doing?

**Schowalter:** I really worked directly with folks at Blue River. John Cissel, of course, has been very helpful in identifying appropriate sites. When I was changing the direction for the study a bit in '92, the LTER project was providing sufficient money that I could add in a mature age-class and a partially-harvested one of the "new forestry" kind of stands, where in '86 I had started out just sampling old growth and sampling regenerating plantations. In that first study, I had 10-to-15 year-old, versus 450-year-old stands. They were so different that an obvious question is, "Well, when does the community become more like old growth?" So, there were enough 150-year age class forests in the area of the Andrews that I could include that, and some of the new forestry kinds of cuts and old shelterwood cuts. I did a lot of work with John back then, going through aerial photographs and to John about suitable sites to try and identify which ones, because I wanted to make sure they were geographically intermixed so that they would be independent replicas. This has been a traditional problem in forestry, and in the early years of ecosystem research, how to deal with what we call the paired-watershed approach, which was pseudo-replicated. We thought all the samples we were taking on each of two watersheds, a treated and untreated one, were independent, when in fact they weren't. And they couldn't be appropriately compared. And probably everybody who did projects back prior to '84 was guilty of pseudo-replication, because that was how we did research back then. We treated one watershed, and we had a control, and we compared them. And you don't know whether across that gradient there are other confounding variables besides the treatment that could cause differences. Were they different to start with for some reasons, that weren't measured?

In my work since '84, I've tried to be very concerned, especially because my research would be vulnerable to that, because it's hard to climb trees. You might just want to climb a few, and your replication would be minimal. And again, when you are trying to select sites for to represent these different types of forest classes, I did in fact have a concern because it was so hard to find old growth outside the Andrews. But it was also hard to find enough shelterwood and mature age planted forests inside the Andrews, in order to include those other two stand types. And in doing so, I was forced to try and look for old growth outside the Andrews, and I had to be very careful that I kept the sites, the different treatment plots, geographically-intermixed, so I didn't end up with all the old-growth sites inside the Andrews, and all the mature age plant sites outside the Andrews. There might be various environmental gradients from the Andrews besides that site that would have nothing to do with the way the stands have been treated.

**End of Side A, Tape 1 (of 1)**

**Beginning of Side B, Tape 1 (of 1)**

**Geier:** So, you worked with John Cissel to identify these? Is that what you did?



**Schowalter:** Yeah.

**Geier:** Would you say that was more difficult at other places you've been, like Coweeta?

**Schowalter:** Well, Coweeta was a different place when I was working there. We had two watersheds we were working on when I was there. I've had good working relations with Wayne Swank [leading scientist at Coweeta] since then. He helped me set up the log decomposition project that I have at Coweeta. So yeah, I don't know that that's too different, but again, I think it's just sort of the overall collaboration between the Andrews, the academics here at OSU and the Forest Service at Blue River, I think, which has just been a real good association.

**Geier:** Yeah, Fred talked about that.

**Schowalter:** Good chemistry there.

**Geier:** The kind of two-way chemistry where it's not just them refining what you're doing, but a real collaboration.

**Schowalter:** Yes, and it's been a whole succession of folks. I can't remember now who the district ranger was when I came, but I know Steve Eubanks followed that person, and Lynn Burditt sort of carried on that same tradition. I remember that, and they've all carried on that same tradition. It's sort of remarkable to me that all the people who've come through here sort of have the same cooperative, collaborative spirit. I don't think that works everywhere, and I've been glad to see that it's worked here.

**Geier:** How would you characterize the degree of your interaction with other people at the site on the Andrews? Here I'm talking about the scientists and technicians and folks like that? How important was that kind of interaction to your research as you recall?

**Schowalter:** In terms of close interaction, I haven't had a lot. There was more back when I was part of the big log decomposition project. There were Jim Trappe, Mark Harmon, and Jack [Lattin], and others that were involved in that project. We were working pretty closely together at that time. Bob Griffiths and Bruce Caldwell were involved in that one as well. Yeah, it was good. We had weekly meetings, monthly meetings, excuse me, and pretty close collaborations. A lot of ideas generated when you're working closely with people with different perspectives working on different organisms, and sort of tuned into the different concepts and approaches that that brings. I still get that working with Jeff Morell. But, I guess, I haven't had real close working relations with others at the Andrews. I still get to meetings periodically, but my involvement has sort of gone elsewhere. I enjoy multi-disciplinary research as much as I can be involved in it. I still get it at Luquillo and other places where I work as well. The Demo project is a multi-disciplinary project. So, there is an excitement and a synergism that you get, working with people who have different backgrounds that bring different concepts and approaches.

**Geier:** You're in a little different situation than a lot of people I've talked to in that you've started this kind of work as a junior faculty at Oregon State University. Did you ever encounter any problems with that, where this kind of work, in other words, cooperative work, might be a drag in some areas of your career development?

**Schowalter:** It didn't for me, I don't think. I was cautioned by the department head when I came here, to be careful. He didn't tell me not to, but he said to be careful about being sucked into projects where I wouldn't be able to show my own personal contribution. With that in mind, I did get started on some other projects. I had Forest Service funding to look at cone and seed insects and nursery insects. My first projects at the Andrews, were myself with one collaborator, working on herbivore effects on nutrient cycling. And again, it wasn't so much that I wouldn't have been willing to collaborate as the fact there weren't other people to collaborate with, really, with those interests. And to some extent that's continued to be the case. Like I said, I've been so disappointed that we haven't been able to get more bird and mammal people associated with the Andrews. Because I, as an entomologist concerned with population community and ecosystem processes of insects, would feel more akin to small mammal and bird people coming in with maybe some of those approaches, than I necessarily do with geomorphologists and plant ecologists. I interact easily with those disciplines and need to, but they don't facilitate close working relationships as much as I might have with other people working with other consumers.

**Geier:** Did you try to recruit some people that might be able to fill those niches? Were you involved in the effort to try and bring people in?

**Schowalter:** I wasn't, particularly. I know there've been people on campus that we've all talked to over the years. Some of that's just the personality climate, and the other thing is the fact that everybody at OSU is busy. I don't get as much time to go to Andrews meetings anymore. The incentive isn't there as much, and without the incentive, I tend to do other things because we're all just pedaling as fast as we can.

**Geier:** Welcome to Oregon higher education.

**Schowalter:** Yeah. Again, I have a commitment. If I've gotta support graduate students, I've gotta have a proposal into NSF, through every channel. (Chuckle)

**Geier:** That's a point I wanted to raise here, actually. Who do you consider to be your audience, and what is the balance between teaching and research, the use of graduate students versus post-docs? Things like that.

**Schowalter:** Well these are, you know, there are tradeoffs. I just finally managed to reallocate enough money for a half-time post-doc a couple years ago, and I've been really pleased that I did. I had somebody that I can help supervise. I had done that with research assistants in the past, and actually had some of my research assistants publish papers, and do some of the

analyses on that support. But getting a post-doc brings more new skills and familiarity with data analysis and reporting. Somebody that I don't have to train quite as much to bring up to speed. Graduate students, though, are our market. There's continuing pressure in the department to bring in more graduate students. I've started going more and more in recent years to undergraduate assistants. We're being encouraged to improve student retention at the undergraduate level, and part of that, is providing jobs for undergraduates. And I've found that undergraduates come cheaper, and I have had a good rapport with undergraduates. There's somewhat less commitment there. I mean, they're not doing theses that'll make me famous, they're not writing papers that'll make me famous. (Laughter) But they're people that are going to go out into whatever fields they end up in, whether it's ecological or not, with an awareness of what it takes to do ecological research, and some of the concepts and problems that we're facing there. I've also been participating in the Saturday Academy program for high school students during the summer. And I've been very pleased with the high school students that I've employed, two each year for the last four years now, and found those students to be very capable. We go through an interview process with that. There's a fairly detailed application process that Saturday Academy administers, and then they send interested applicants my way. I choose those I want to interview, and I've ended up with good students. So, I guess as far as the balance, you could do it a lot of different ways. If I wanted to maximize my publications, I'd probably be trying to get post-docs, and I probably should be in some ways, but I've just found it very enjoyable working with the high school and undergraduate students.

**Geier:** You started with using mostly graduate students and then switched.

**Schowalter:** Yes. Research assistants.

**Geier:** Then made the switch.

**Schowalter:** Yeah. I just tried some different things over the years when I had opportunities. A lot of it's just a matter of money. I usually don't have as much as I'd like to. I have a lot of students who are interested in the research and apply, but, if I don't have support to bring them, they don't come.

**Geier:** So, essentially, it's just a matter of what funding is available and what graduate students?

**Schowalter:** Right, graduate students and research assistants were relatively common. I try to maintain a balance anyway. My first grant had only a research assistant on it. And you get different things with different people. With a research assistant you've got the continuity, you've got the commitment. Graduate students have to take classes, and they may or may not want to do your work for their thesis project, so they may be doing other things a lot of time. So, if you really need assistance on a project you need somebody who's committed to it and is going to put all that time into it. So, research assistant is a better way to go there. If you want somebody who's going to help with publications, then a post-doc is better. Graduate students,

eventually, if they get their thesis published, but you can push that up to a point, but actually getting a final manuscript is kind of tough.

**Geier:** I'm curious about two things: how large a work group you might ordinarily take with you on a site visit, and secondly, when you're working at the Andrews, where that group might stay?

**Schowalter:** It has varied over the years. Probably some of the largest groups I've had have been the last couple years, where I may have ten people. The last few summers I've had two undergraduates, REU students [Research Experience for Undergraduates], two high school Saturday Academy students, plus a couple graduate students, and a post-doc, depending on if some other folks tag along or not.

**Geier:** Have those numbers been increasing over the years?

**Schowalter:** It's been variable. Back during the log decomposition project, '85-'86, that era, or '86-'87 actually, I had a primarily undergraduate work crew of 8-10 students, I guess, in summer. And a few of them who continued to work during the school year.

**Geier:** And they mostly lived on the Andrews during the summer?

**Schowalter:** No. We just usually made trips down there for the time that we were collecting samples. Usually we'd spend a night or two, maybe three days.

**Geier:** Stayed in the trailers down there?

**Schowalter:** Early on, yeah. I'm not sensitive to skunks, so there was a time when the, let's see, was it the White Salmon trailer? I can't remember which one, had gotten a skunk under it one time. Nobody else would stay in it, so I always had a trailer I could stay in. (Laughter) [HJA campus in 1980s was collection of old trailers, and was tagged "Ghetto in the Meadow."}]

**Geier:** You just can't smell it?

**Schowalter:** Yeah. If it's really strong I can smell it, but I don't find it unpleasant.

**Geier:** Yeah. Students didn't complain either?

**Schowalter:** Well, I don't remember ever taking any students in there. I was working alone a lot in those earlier years, something I try to tell my students not to do.

**Geier:** Not to work alone?

**Schowalter:** Yeah.

**Geier:** Did you ever have any problems with that?

**Schwalter:** I never did, but it's a precaution I've always tried to take, just tell my students not to go out alone. There are enough potential problems in the forest without not being alone while you're there.

**Geier:** I was also curious, if there were any particular sites on the Andrews that you visited recreationally?

**Schwalter:** Yeah, I guess the Old-Growth Trail [HJA] down there by the 350 road, is one that I've taken a few times, but I don't usually go down there for fun. I have taken my daughters, my family down there a couple of times, to camp along Blue River and fish, but, it's been only a few times over the years.

**Geier:** And what would you estimate would be a kind of an average stay when you go down there with these work crew studies? How long are you there for?

**Schwalter:** A couple days.

**Geier:** Two, three days?

**Schwalter:** Yeah, two or three days, max.

**Geier:** How do you characterize your interactions with local residents in Blue River. To what degree were you involved with those communities at all, or were they aware of your presence?

**Schwalter:** I haven't been much. I can't think of any particular involvement, other than shopping in Blue River. Early on, before the Black Forest restaurant burned down, we used to eat there a fair bit.

**Geier:** Where's was the Black Forest restaurant?

**Schwalter:** There at the intersection of McKenzie highway and the eastern entrance of the old highway into Blue River, the main entrance into Blue River. It was right there and was a nice restaurant with seafood and steaks. It was a pretty varied restaurant. As I recall, you could get hamburgers and things like that there too, and they had a salad bar. It burned about six or eight years ago. I can't remember. But, there isn't even a foundation there anymore. So, everybody cooks at the Andrews now, I guess, mostly, although there's still a restaurant up towards McKenzie Bridge, but I just don't usually go up that way.

**Geier:** It was mostly on the way, or on the way out, when you'd stop off there?

**Schwalter:** No, we'd come down, while we were staying up there, to eat. It's just that it was easier, I don't know. You know, there're habits you develop, and I've just never driven up further east from there to the other restaurant.

**Geier:** There is another one?

**Schowalter:** Pardon?

**Geier:** There is another restaurant?

**Schowalter:** I think there's another restaurant, or there used to be, and like I said, I just haven't been up east from the Andrews to check that out. Should do that sometime, I guess, somebody told me there was one up there.

**Geier:** I don't want to drag you into too long of a discussion here, but if you could talk briefly about your appointment as NSF program director, which came in '92-'93, and you touched on earlier. I wonder if you could identify for me, first, how that came about, and then, what were your priorities and goals, and to what extent did you accomplish those as program director?

**Schowalter:** Yeah, that was an interesting situation. I was in China during June and July of '92 when we got a call, my wife got a call, from Jim Edwards, acting division director [NSF], asking if I'd come for an interview. I was only around a phone where I could call home about once a week. I'd only managed to call home about three times while I was in China, and managed to run up a \$450 phone bill! (Laughter) But anyway, the last time I called was just a few days before I was going to be coming back. Cathy said Jim had called and wanted me to come interview at NSF, and I just thought, "No." That was the kicker, that they wanted me there September 1, because they had a vacancy. I just thought, "No." (Laughter) No way, because we had moved to New Mexico State under sort of similar circumstances, with about five weeks notice between approval of my request for a leave, and when the school year started down there.

That had been frantic, and I thought, "I don't want to do that again, upset the whole family, and make a major move." Cathy said, "Well, it might be good timing, and you ought to think about this." So, I had a few days still before I flew home, and when I got home, we talked about it. I figured it would have been a good experience, our daughters at that time were going into second and seventh grade. We figured that was a good time for them to get some of the cultural and political opportunities around Washington. So we decided that would probably be okay to do it, and I went ahead and called Edwards. This would be the day after I got back from China that I called Edwards. I was on a plane to NSF two days later. (Laughter) So, this was a whirlwind thing. I had, in the meantime, talked with some people we knew who had a realtor friend in the Washington area, because we figured we're not going to have time to make a lot of trips back-and-forth to look for housing. So, I managed to take an extra day while I was there to look around with this real estate agent at available housing, and we narrowed it down, based on talking with friends who'd been to NSF, where some of the better areas were for families with kids. I sort of focused on those, and we were there September 1. (Laughter) We made it.

I guess, as far as my goals, I was interested in finding out how NSF worked. I'd been familiar with a lot of programs. I guess all the ecosystems studies directors for the last ten years had all been close acquaintances of mine, or friends, and in some cases, colleagues. So, I was fairly familiar with it, but it's funny how much you learn when you're actually there. The whole grant process from the time a proposal comes in to the mail room, what happens to it and how is it evaluated. I used to really worry about these proposal reviews that I'd get that just said, "This proposal stinks!" And that's all it would say. Or, "What's this guy doing, thinking he can call himself an ecologist?" And you're thinking, "Good grief!" One of the fortunate things you find out, is that nobody really cares about those reviews. They don't count against you, and neither do the ones that say, "This is great," and don't say anything more about it. From the panel and director point-of-view, the only reviews that count are the ones that are really thoughtful reviews that illustrate and highlight what's good about the proposal, what's bad about the proposal, or what could be fixed. Those are the ones you really look for. And one of the things I discovered there, was how much NSF depends on people from the community to come in as rotating program directors. They depend on the rotators, like I was, to bring in the most current ideas. What kind of problems researchers are facing in the field, what the techniques are that are in current use and the concepts, and the reasons for or against them. Because the permanent people at NSF may go out for a review now-and-again, but they don't get those kinds of details. They don't have the hands-on experience of doing research that allows them to be maybe the best judges, in some cases, of a good proposal versus an excellent proposal.

**Geier:** And that's something that you hadn't been fully aware of before you came here?

**Schowalter:** Well, they were things I sort of knew about, but didn't realize. I still learned a lot about the actual workings of that. I didn't realize how dependent NSF was on rotators, to be honest. NSF was having trouble getting rotators at that point. Well, not really trouble, I guess I should say, but it's been worse since. I understand that there've been a number of positions that have been vacant since, that they've had a hard time filling. And reviewers, it's even harder to get people to review proposals. And some programs there, some proposals don't get reviewed. The only people who review them are the panelists. And the panelists complain because they're not specialists in the field of the proposal in most cases. They want somebody who's a technical expert in that area with the insights necessary to say, "Yeah, this is going to advance science in this area. This technique is the only way to do this." Those kinds of things. If you're a panelist, and I've served in these capacities too, you're thinking, "Boy, I know the general ecological principles involved here, but I don't know if this is the best microbial project that we could support." If it's outside your immediate field, you just don't have the hands-on expertise unless the proposal has been reviewed by outside technical experts.

So, Richard Bains, who was my co-program director at the time, and I, for the ecosystem studies program, tried to call enough outside people to get two to commit to review each proposal, in addition to the panelists who'd be reviewing it, with variable success. But we did, in most cases, at least get one outside review. The ecology program just can't even touch it. I mean, they have a hundred proposals each panel, and there's no way they could do that much calling, to get a few people to commit. And so, a lot of these programs just are not getting

adequately reviewed. And it isn't a problem with NSF, it's a problem with people in the community not being willing to review proposals. I know people are busy. I'm busy, but I still try to review all the proposals that get sent to me. It's a responsibility. I'm getting money, it's something I do in return. And a lot of people obviously don't see it that way, or don't take the trouble to return the investment.

**Geier:** So, you think that's kind of an increasing problem?

**Schowalter:** Yeah. I was talking with Scott Collins about it when he was here for the Andrews site review this summer, and he said it's getting worse.

**Geier:** Going in, did you have any particular goals or priorities as program director?

**Schowalter:** I didn't. I was on a steep learning curve. I don't think it helps to go in with goals and priorities. NSF has its established procedures and the way things work. There is a lot of influence that you can have on various aspects of national policy though, and that was something that I really learned while I was there. I don't think I would have even guessed it to have as a priority when I went. But one of the things that we discovered, is that a lot of agency funding is based on how much research in an area you're supporting. So, when the freshwater initiative was coming through, most of the work for that had been done prior to Richard's and my going to NSF in the summer of '92. The research that had been done by NSF at that point, indicated that there'd only been like a couple projects and a hundred thousand dollars-worth of support for freshwater projects in the past, I don't remember how many years it was. So, NSF was only going to get out of it a pittance in new support under this freshwater initiative under the way funding would have been distributed. Richard and I scratched our heads and thought, "Hey, between the two of us we can think of at least a dozen projects and half a million dollars." So, we did a pretty thorough search of NSF's data-bases, and by the time we were done, in the draft of this freshwater initiative that we received for approval that had NSF at the bottom of the list, and would have probably only gotten a percent of the money, we moved from the bottom of the list to second in terms of the amount of research that NSF was supporting in freshwater ecology.

**Geier:** And that was just a matter of going out and finding what was already existing?

**Schowalter:** Right. And whoever had done it before us, hadn't done it thoroughly. So again, you had those opportunities to help show what the agency is doing, and tell Congress, "Hey, we're not just sort of an 'also ran,' we're a major player."

**Geier:** How would you relate your experience there to your own research agenda before and after you got back?

**Schowalter:** A lot of it is just knowing better how to orient a proposal to the audience. I had some idea beforehand, but what you hear from friends is always different from what you've experienced yourself. So, I think I just got a much clearer idea about how a proposal is



processed by NSF. Who's likely to see it. One of the things I discovered at NSF was how much power is in the hands of the program directors. The panelists make a recommendation, but the program directors make the final decision. We discussed at length what kind of a portfolio of projects we wanted NSF to be responsible for. If all the most meritorious proposals were for research in one particular area, we didn't necessarily have to support only those projects in that particular area, we could also pick some other proposals that may not have been as highly recommended, but filled out a range of areas; forest, grassland, desert, aquatic, microbiology, birds. We tried to support a diversity of projects instead of six proposals that were all for virtually the same kind of research that were most highly recommended. And we thought, "Boy, if we'd fund all six of these, what are people going to say?" Plus, NSF has incentives for funding certain kinds of proposals, like research from undergraduate institutions to encourage, research for undergraduate students that will benefit undergraduate students who will participate in this project.

It's got particular targets for new investigators, so it's these kinds of proposals for new investigators or investigators at undergraduate institutions or women and minorities are within the meritorious pool, then you can go to separate pockets of funding outside the program, and support those. So, it was to our advantage in going through the list of proposals that we were considering, we could say, okay, here's one we can support from here. It doesn't come from ecosystem studies money, we can support it at the division level from women and minorities money, or from undergraduate institution money. There are those other special pockets of money that you could get into if you had a meritorious proposal that would fit them. It was interesting learning how that worked and I've spent a lot of time since, encouraging people I know at undergraduate institutions, for instance, who are interested in researching: "This is there. Make a proposal. Here's how you do it." So, I'm kind of carrying the NSF message around now, and trying to encourage people to submit proposals; how to do it, how to present themselves to NSF, so that they might have a shot at some of that money.

**Geier:** I should have you do a seminar to the Western [Oregon University] faculty.

**Schowalter:** It was interesting, when I came back here, I offered to give workshops on how to write proposals for NSF. And the research office scheduled me, and two people came. I was just appalled that there was no more interest in that.

**Geier:** Well, I gathered from what you've been saying here, that your network that you had through the LTER drew you into NSF. Would it be accurate to say that was more the case than building new networks once you got there? In other words, what did you bring back?

**Schowalter:** A lot more familiarity with NSF, how it interacts with other agencies, the whole structure of the federal research development network. How work funnels down from these interagency committees, the fix-it committees that are coordinating committees for various aspects of research and development, how their recommendations filter down to various agencies and help develop their initiatives, and research or funding priorities. That was something I learned, being directly involved in a couple of those, such as the desertification

negotiations and the terrestrial ecosystem initiative. I got a lot of insights into how federal policy is developed, and I saw a change, because I was there for six months under President Bush and six months under President Clinton, and I got to see how that transition occurred, too. That was really enlightening. Things that were off the table during the first six months, all the sudden were back on the next six months, and some of them were things that I had brought up. I said, "You know we need to consider, for instance, if we're going to tell these Third World countries that they've got to reverse desertification, most of them don't have economies to allow them to do that. We're going to have to provide some way that they can do that through financial support or otherwise." During the Bush administration, that was just absolutely off the table. We weren't even going to consider that. When I brought it up again after Clinton was elected, that was back on the table for consideration. And I left before the final outcome, so I don't really know how it came out finally, but at least there was a different atmosphere for consideration of some of those issues. After Clinton was elected, some of the agency people that would come to meetings were changed, and instead of the three-piece suits, you'd get people who'd slip their shoes off and sit cross-legged in their chairs, had flowers in their hair. (Laughter) It was sort of funny, you know?

**Geier:** Culture shift.

**Schowalter:** A real culture shift, yeah.

**Geier:** You were talking earlier about the relative importance of the rotating people as opposed to the permanent staff. How influential was that level in making those decisions, I mean with permanent staff members?

**Schowalter:** It's all collaborative. NSF relies on both, and they've got to have that in every program, or at least in every cluster, a permanent person, one permanent person for however many rotators. In the past it was one permanent and one rotator, but they've sort of reorganized that now into clusters and at least now one of the cluster members should be permanent. That's the continuity in the program. They're the ones who can tell you, "Well, here's the tradition, here's how things usually work. If you do this, here's what's going to happen." You need that. When you're coming in as the short-termmer you have to know. I would have been a fish out of water if I'd been trying to develop all that myself. So, having permanent people there to tell you how things usually work and what happens if you do this, is absolutely essential. As are the rotators who, like I said, are bringing in the newest ideas and the hands-on experience with techniques and approaches.

**Geier:** When you returned back to OSU, it was kind of another culture shift all on its own, I bet?

**Schowalter:** Oh yeah. (Laughter) While I was at NSF, I was getting e-mail across my desk, whoever was thinking anything in the government, I'd see. When I got back here, not only was I cut off from all that, but the GT [*Corvallis Gazette Times* newspaper] was publishing things

we'd seen two weeks earlier in the *Washington Post*! (Laughter) I was thinking, "Boy, is this a backwater!"

**Geier:** How would you characterize your move back into the LTER group here, and are there different priorities now that you didn't have when you went to NSF?

**Schowalter:** Oh, I don't know. I don't know that it changed that that much. Yeah, I don't know that I've noticed anything there.

**Geier:** Does your level of involvement with the group feel pretty much the same as it was before?

**Schowalter:** Probably not. I've probably branched off into other things, like I said, I've gotten some of these international involvements, plus the fact that this last round of the LTER, I'm not funded on it. So, it's just been a little different. I'll try to get over as often as I can, but this term especially, there've just been too many other commitments.

**Geier:** Last question here, and then I'll let you go. Maybe you could characterize for me how you would rate the effectiveness of the Andrews group in communicating to various audiences what goes on at the Andrews. And I'm thinking here in comparison to some of the other LTER sites that you've been involved with?

**Schowalter:** My feeling is generally that they've been pretty good, from the level of technical journal publications to workshops. I'm involved in some extension work, and the examples and concepts I generally present to people, are from the Andrews. So, when I'm talking about forest health, a lot of the research that I can bring to that is from the Andrews. Because I can also bring data from eastern Oregon and Coweeta, to the extent it's appropriate, to say, "Yeah, these are common forest processes across all these different kinds of forests. So, it isn't unique to western Oregon, for instance. What we find here we seem to find everywhere else, and that makes us more confident that what we predict from seeing these things happen elsewhere, probably will happen here." But, the experience at the Andrews clearly provided a framework for a lot of what I present to various groups that are interested in pest management or forest health.

**Geier:** So, there's good recognition now of work that they've done at the Andrews?

**Schowalter:** Uh-huh (affirmative).

**Geier:** People are aware of it.

**Schowalter:** I think so. Yeah, the people who've worked at the Andrews have also generally been influential in, for instance, the FEMAT Program. [Forest Ecosystem Management Assessment Team which set framework for the Northwest Forest Plan] A lot of Andrews' people were involved in that. The governor has a task force on forest health restoration in

eastern Oregon. Stan Gregory, Dave Perry and I have been on that. I'm on a National Research Council committee on forest health management in the Pacific Northwest. Stan and Dave have been on that as well. So yeah, the Andrews has been fairly well-recognized from the standpoint of scientific support agenda on whatever concepts or recommendations we might be making.

**Geier:** Well, you mentioned early in the interview that there was a relative lack of knowledge about the LTER in the other agencies. Would you say that the Andrews group is in that same category when it gets outside the LTER group? How aware are people?

**Schowalter:** I think the Andrews is better known here. Like I said, I was sort of surprised by the lack of awareness of the LTER among people that I would have thought would be familiar with it. Especially since USDA, EPA, NASA and other agencies have been involved in research at various LTER sites, that some of those folks weren't familiar with it. I don't know what the reasons for that were. Well, here's an article in *The Oregonian* about the entomological work at the Andrews. If you look behind you there's another one that a lot of these have made it to the AP [Associated Press] too. That's Andrews' work that's acknowledged in that one on forest health. So, the word gets out. I think most foresters in this region would know about research at the Andrews, because most of the ecological research that's supporting any of these New Forestry ideas came out of the Andrews.

**Geier:** In your field of research is the Andrews, would you characterize it as a model of the kind of research that can be done?

**Schowalter:** Yeah. Again, the Andrews, Hubbard Brook and Coweeta, have been referred to as the crown jewels of the Forest Service for a long time. Since back in the '70's, at least, I've heard that reference. So, yeah, they're held up within the forestry community, at least, as exemplars. The Andrews is certainly one of those.

**Geier:** I probably shouldn't keep you here any longer, but I do want to give you the opportunity if you had anything more to raise, either to contact me or drop me a note.

**Schowalter:** Okay.

**Geier:** I'm over in the Forest Science Department, and you can reach me over there or I'm on the campus e-mail.

**Schowalter:** You teach at Western Oregon?

**Geier:** Yeah.

**Schowalter:** I thought I remembered something like that, but wasn't sure until you mentioned it.

**Geier:** Yeah. Yeah. The reason I mentioned that earlier is that we've got an environmental studies program we just started up there a few years ago and we've been scrambling around trying to figure out some of these solutions and things like that on funding.

**Schwalter:** Well, good luck. Yeah.

**Geier:** Anyway, I shouldn't keep you longer.

**End of Side B, Tape 1 (of 1)**