

The abundant forests of the Northwest characterize the region. These forests provide many benefits to humans and other organisms. Society's exploitation of the original forests has resulted in a shift to younger stands; old-growth ecosystems are becoming rare. But such ecosystems may contain unique habitats which some species may require for existence and which also may provide clues to good management of younger stands. These selected old-growth stands provide a place to study this ecosystem.

Twelve stands have been selected, totaling about 1,800 acres; all are in western Washington. They are located on lands managed by Department of Natural Resources and span a variety of conditions, species, and geographic locations (Fig. 1). All stands have dominant trees older than 160 years of age; they also have a substantial amount of standing and down dead wood, and understory trees of various ages. These stands were carefully chosen to best represent the forest types that once covered this region and for stability in the face of such environmental effects as strong winds. Stand sizes vary from 80 to 300 acres and elevations range from 500 to 3,200 feet. They are frequently adjacent to harvested old-growth, now replanted areas which would provide sites where comparative studies could be carried out. The research sites are accessible by nearby existing roads, but not all sites are adjacent to roads. They are relatively remote, but their location and ownership offer a reliable place for research in old-growth stands (see also North, Malcolm P. 1990. *Old-Growth Research Areas of the Department of Natural Resources*. Olympia, Washington: Washington State Department of Natural Resources). For information contact Division of Forest Land Management (MQ-11), Department of Natural Resources, Olympia, Washington 98504; (206) 753-0671.

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"New Forestry" and the Old-Growth Forests of Northwestern North America

A Conversation with Jerry F. Franklin

Gordon H. Orians interviewed Jerry F. Franklin on June 14, 1990, with additional comments added on August 13, 1990.



Jerry F. Franklin (Photo by Mary Levin, University of Washington Photography)

Jerry F. Franklin is a specialist on the structure and function of natural forest ecosystems, especially old-growth forests. His areas of expertise in-

clude the successional processes following catastrophic disturbances; effects of changing environmental conditions on forest processes; and silvicultural systems for forest treatment.

Franklin received his B.S. in forest management from Oregon State University in 1959; his M.S. in forest management from Oregon State University in 1961; and his Ph.D. in botany (minor in soils) from Washington State University in 1966. He has been a research scientist for the United States Department of Agriculture Forest Service, Pacific Northwest Research Station, since 1959 and currently is chief plant ecologist. From 1973 to 1975, he was director of the Ecosystem Studies Program for the National Science Foundation. Franklin also is Bloedel Professor of Ecosystem Studies in the College of Forest Resources, University of Washington, Seattle. He co-authored *Natural Vegetation of Oregon and Washington* with C. T. Dyrness in 1973, which was revised and reprinted in 1988.

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Gordon Orians: Jerry, you've been a research scientist for the Forest Service all of your career. How many such independent research scientists does the Forest Service have?

Jerry Franklin: I take it that's a question not on how many scientists we have, but how many independent ones?

GO: In this position I gather that you are a free agent?

JF: A very small percentage of Forest Service scientists have that level of independence. I would guess it doesn't amount to more than 35 or 40 in an organization that has perhaps 600 or 700.

GO: Are they all associated with a university?

JF: Essentially, all of them are associated with some university.

GO: Your entire research career really has been devoted to the coniferous forests of the Pacific Northwest. You've recently become strongly identified with the "New Forestry," if we can call it that. What were the experiences you had that made you especially interested in getting involved with altered forestry practice?

JF: My first love has been and still remains natural forest ecosystems and how they work. Especially, our temperate coniferous forests—particularly the old-growth forests because so much of my roots are associated with those. But the reason I've gotten involved in altered

New Forestry

The principle of integrating ecological and environmental values with forest commodities production

The objective of new forestry is to integrate the maintenance of ecological values with the production of some level of commodities. It is achieved by taking an ecosystem approach to the forest, how it works, and how it is managed. "New Forestry" has a technical side that emphasizes maintenance of higher levels of stand (patch of forest) structural diversity, and looks carefully at landscape-level patterns and how they work over time. It has a social side, which brings user groups—public of all kinds—into the objective-setting and decision-making process to participate in the resolutions.

forestry is because I felt so strongly that those natural forests have many lessons to teach us about how we should carry out our forest stewardship. Given all the other people working with and carrying the ball on old growth, I've become very interested in making sure that these messages—these lessons from the natural stands—begin to get into our forestry practices.

Another factor has been recognizing that most of the world's forests are going to be managed in some way. Given that they are going to be managed, we can do the most good for those forests by improving the quality of the stewardship. I frequently ask myself the question at times, "How can I accomplish the most for trees and forests?" And it turns out that, in my judgement, altering stewardship is the most important thing we can do—altering the way the commodity lands are managed.

GO: Do you think the overall mandate of the Forest Service is sufficiently broad to encompass all of this?

JF: I think the mandate of the Forest Service is sufficiently broad and probably always has been. There've been failures of knowledge. There've been particular emphases put on Forest Service programs over the years but the agency has always had the power to do those things, if not the will. Of course, a part of the problem has resulted from interactions with Congress and with administrations that really emphasized commodities rather than stewardship.

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GO: Among the things that you've been particularly advocating are patterns of partial harvest in which varying numbers of trees of various sizes are left standing. What has motivated that particular concern?

JF: There has been a variety of motivations, I guess. As I look around at the different practices that we could change, the most important single thing that I could see that would maintain ecological values would be to leave some big green trees behind on cutovers. And a recognition that clearcutting isn't really necessary to achieve reasonable levels of commodity production, even with the shade-intolerant Douglas-fir forests. There's so much you can do with green-tree retention to maintain ecological values! I guess this emphasis results from a broadening of my own perspectives on what we *could* do and a realization of all the things you *might* contribute to by leaving green trees behind. This doesn't mean we're going to do partial cutting everywhere because there's a lot of places that we can't, due to windthrow problems, or one thing and another. But I think if the chief of the Forest Service said to me, "You get to do one thing, Jerry. What is it?" I'd say, "Okay. I want to leave some green trees behind on all our cutovers." As you know, a large amount of diversity is associated with the big green trees and with the standing dead-and-down material that they eventually become, so that we can provide a lot of function and a lot of habitat with green-tree retention.

GO: In your view, these trees would then be left forever uncut. They would go until they eventually fell over. And then, in the next harvest—if some of them had fallen over—some new trees would be allowed to get old and not be harvested. Therefore, throughout the life of the forest, you maintain a certain number of these large trees.

JF: My preference would be to do it that way, but the general objective would simply be to maintain some large green trees in perpetuity. Whether or not harvesting of residual green trees took place

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at subsequent entries would depend on your ability to replace them and what your other objectives were.

GO: Are there any places where harvesting of that sort *has* been carried out and you have some experience with it?

JF: Well, there are some places, but most commonly it's been carried out under a selective management strategy, which involves frequent light entries and which maintains the bulk of the stand. And I'm talking about a more drastic treatment than that. Has there been a place where foresters have maintained a large green component? Nature certainly has done a lot of it, but I don't know of any significant human-created examples except for some that were done accidentally.

GO: So what you envision is that the foresters go in and take out *most* of the trees and leave a certain number standing, then it's left untouched again until the next harvest so that we're going on the same sort of cycle, but always leaving some things unharvested as opposed to going in periodically and selectively logging.

JF: Right. Whether you use a selection system or partial retention or clearcutting, for that matter, depends on where you are and what your objectives are. But, in general, I think the concept of partial retention is a more robust practice. It provides for more variable applications. More adaptability to different topographies and forest types and tree species.

GO: The system that you're advocating—fairly heavy harvesting, but leaving certain numbers of trees—is that being practiced now anywhere?

“There’s so much you can do with green-tree retention to maintain ecological values!”

JF: Yes, it is. It’s being experimented with quite extensively. Many National Forests have been leaving wildlife trees on cutovers. Several National Forests are now doing significant green retention. The Willamette and Siskiyou National Forests are among the leaders in these practices. The Washington State Department of Natural Resources has been experimenting in the west side of the Olympic Peninsula. Plum Creek Timber Company is doing a significant percentage of its cut with 10% green retention. All these owners are evolving very rapidly in their applications of the concept. I’m always stunned when I see how far they have evolved during the last 12 to 18 months.

GO: You speak of it as an experimental basis. Are there really sound ecological environmental criteria that are being employed with respect to where you’re going to try it: soil, exposure, elevation, using the number of trees left as variables in the design?

JF: Yes, I think a lot of ecological consideration and thought is going into the design and conduct of these cuttings although the tendency is for foresters to be very conservative in the number of trees they leave. They often try to minimize the number of trees that they leave behind because they’re concerned about reduced wood and dollar yields. I’ve encouraged them to be more aggressive, because if they *don’t* leave enough trees they will *not* achieve their stand structure objectives. And if they don’t, they won’t be providing habitat for these organisms and these modified practices will have *failed*. It’s very important that we succeed with this period of experimentation that we’re entering. If we are so conservative that these silvicultural systems don’t work out, 10 or 15 years from now the public isn’t likely to have a chance to go back and try it over again.

GO: You’ve just indicated that if it isn’t done successfully now, that you may not have a chance to go back to try it again. Why do you think that the opportunity would pass?

“Well, I think foresters have maybe one more shot at proving that they truly can manage forests for multiple values . . .”

JF: Well, I think foresters have maybe one more shot at proving that they truly can manage forests for multiple values—that they can give as much weight to ecologies as to commodities. If, in fact, they do *not* prove that with this current opportunity, I think the forestry profession is going to be identified as technicians managing tree farms and we’ll find other professions to manage the multiple natural resources of our public lands. I see the present as a very critical point where it’s: “Prove you can do it. You get this one more chance. If you fail, we’re going to find other professions to manage our lands.” We could go the way of the New Zealanders. They told the foresters: “Okay. The artificial forests are yours to manage as a national corporation. We’ll find other people to manage the indigenous forests.” We could go that way.

GO: Would that be bad?

JF: I think so, because I think foresters as a professional group bring a great deal of knowledge to stewardship of forest resources. They have many relevant skills, much training and experience. So I think they’re better suited than any professional group, but they’ve got to prove up on it. In a sense, foresters have to go back to their roots as broad-based resource stewards.

GO: In these experiments that are now being performed, how many trees are being left behind?

JF: Oh, it varies substantially. In mature Douglas-fir stands they are in the range of 10 to 15 trees per acre. Some of the cuttings have been more on the range of four to eight trees per acre. I typically suggest 10 to 15% of the trees and 15 to 20% of the volume as a starting point for planning. Many prescriptions on the east side and in southwestern Oregon leave a lot more. Plum Creek is using 10% on many of its current cutovers.

“... foresters have to go back to their roots as broad-based resource stewards.”

GO: How do those numbers translate into the proportion of the original trees that are left?

JF: As I just mentioned, it often falls into the range of 10 to 15% of the trees and 15 to 20% of the volume because we're leaving bigger trees—not the average tree—the bigger-than-average tree. On some of the shelterwoods that are now being reconsidered as green-tree retention cutting, it can be up in the range of 30 to 35% of the volume or the basal area.

GO: What aspects of the systems are being monitored now, after the logging of these trees that are left?

JF: There is currently not a whole lot of monitoring going on. Survival and growth of the trees is one thing that is being monitored on most of them. There are some individual studies, but at this point it's quite limited. For example, bird responses to green-tree retention. Currently, the idea is to get some of these cuttings out on the ground. But the dollars to follow up with monitoring are quite limited. I think that this is going to change very rapidly, however. Forest Service and Department of Natural Resources both have serious intentions to follow up with monitoring; too much is at stake not to. Plum Creek is doing monitoring on its cutovers, too.

GO: This comes back to the comment you made earlier, that foresters have one chance to prove it. How will they prove it? What will be the criteria by which the success of this would be judged? It's a bit troubling to know that the experiments are not being monitored better than they are, if it is really a do-or-die situation for the profession.

JF: I think it's going to change. Most of these experiments were established prior to the past couple of years. I think there's going to be a much enlarged research program. And, hopefully, there are going to be some standardized experimental designs in green-tree

retention and addressing other critical concerns, such as edges. So I think we are going to get the monitoring and the other research we need; we'd better! But, obviously, the criteria of success include issues such as whether or not we are actually able to retain more of the biological diversity on these lands than we did when we clearcut. So, diversity of invertebrates—both above and below ground—and the richness and composition of bird species and other vertebrate communities that are present are going to be examples of measures used to determine whether the cuttings were successful or not.

Obviously, the moment of truth is going to come much sooner than maturity of most of the experimental cuttings. For example, to grow spotted-owl habitat you might be talking about 60 to 80 years of development following cutting before the cutover stand is suitable habitat. We do not have that amount of time. So some of our proof is going to have to come through retrospective studies of stands where accidents of man and nature have already created similar conditions—in seeing how well these green-retention areas work. The proof will be in the diversity—the richness of these stands, in their continued functioning in terms of watershed regulation, and in terms of productivity.

GO: How much opposition has there been to these experiments where there is a rather significant fraction that we will notice in the bottom line of economics of the harvest?

JF: Well, it's a mixed reaction, from both the conservation point of view and the industry point of view. With the conservationists, the attitude seems to be that, "We like these ideas and we want you to use them on the commodity lands, but we really don't want any more of the natural forests cut." On the other hand, industry has been reluctant to accept them, with the idea of, "Well, we really don't need to do those on our current cutover lands, although they may be okay to use on the additional old growth we cut down."

Well, there's been a major change in the attitude of the industry in the last twelve months. Their attitude now is that they seem very interested in these ideas because (obviously) they offer an alternative to total preservation. And they are willing to think about doing them on their own lands as well as on the public lands. One very active participant has been Plum Creek Timber Company who, after a long history of intense clearcutting, has begun green-retention cutting on both sides of the Cascades. In any case, we see an in-

creasing acceptance of these concepts by wood-oriented foresters, private and federal.

GO: Many of the remaining old-growth forests in the Pacific Northwest are now mid-elevation and on fairly steep slopes because the easy-to-cut things were cut first. How do you view the potential of this green-tree retention plan on those slopes? Do you see it fundamentally as one that has a major role in the lowland forests and in their future management?

JF: My attitude is that if you've made a decision to cut timber on those slopes, then you should be using this "kinder and gentler" forestry. Whether new forestry can be sufficiently sensitive to ecological values that you can cut where you might otherwise consider forest preservation is another question. But if you have made the decision that you are going to log specific areas, I think essentially all should be logged with ecological sensitivities—mid elevation as well as low elevation. In some ways, the mid-elevation lands, because they are less productive and because they are more vulnerable to abuse, probably need greater attention. Unfortunately, from the standpoint of biological diversity, we need greater consideration of ecological values at low elevations, too. Indeed, some of those simplified low-elevation forests ought to be rehabilitated into more structurally complex stands.

GO: What are the methods by which you would propose to create the forests that already have been cut? Now we have lots of forests in the lowlands of western Oregon and Washington that were cut around the turn of the century. So they're coming on toward 100-years old, many of them. How do you see dealing with those? Much of the marketable timber in the next 30 years will come from that sort of land.

JF: My objective on many of those lands would be to create mixed-structure stands. I would do that by using green-tree retention in a very aggressive way whenever I harvested. That's the sort of thing we're hoping to do in the Siouxson drainage down in southwestern Washington which is an area of 80-year-old timber. In those kinds of forests you have the potential to either drastically simplify or sterilize them because you can remove almost all of the material. Or, you have the ability to accelerate the development of a mixed-structure stand by leaving behind a significant green component and regenerating a new stand of mixed composition underneath the green trees. Hence, you can accelerate the development of a mixed-structure/mixed-composition stand.

GO: One problem that I can see with doing this aggressively is that it does result in a lower harvest on these areas that are cut. It may put more pressure on cutting some of the remaining old-growth stands because we're not getting as much out of the other things. What do you see as the trade-off there?

JF: There's no question that the allowable cut would have to come down significantly, and this is happening. So I don't see trading off green-tree retention for acres. However, it is important enough that I personally would be willing to give up some additional acres of natural forest in order to see this extensively implemented. That gets back to the question of what will be the best thing that we could do for the forest resource in general. Altered forestry practices are probably more important than total preservation. It's very important that we invest some of our conservation resource in these modified forest practices, even if it means giving up some acres of totally preserved forest. We should be reducing the cut consistent with good forest stewardship, which includes significant old-growth preservation and altered forestry practices.

GO: The current rate of cutting is simply not consistent with maintenance that we've had from the National Forest or the other ecological values. It's probably perfectly okay if you want to manage these areas as tree farms. But if you're really thinking about the other values, it's obvious we cannot sustain the level of cut we've had other than in ownership situations. An example would be the Department of Natural Resources [DNR] lands in Washington where there is some responsibility to the beneficiaries of a certain level of harvest. There seem to be additional problems in managing the forest that way. What the Department of Natural Resources has agreed to do is to defer some cutting. But to maintain the cuts they feel that are mandated, it appears that they must clearcut most of the remainder.

JF: Well, this gets into the whole question of maximizing return to the beneficiaries. And if maximizing the return to the beneficiaries—regardless of damage to the resource—is what that's about, then I think we need to make some changes. I think Brian Boyle [Commissioner of Public Lands; see interview in volume 5, #2] himself has talked about that issue. In any case, it's obvious that it's not in the best interest of the public to provide maximum return to the beneficiaries if it degrades the resource. If, in fact, we cannot accommodate good stewardship on our Washington DNR lands because of the Trust responsibilities, then we either have to change the laws or some way compensate the Trust so that we can practice

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responsible stewardship. I personally think return to the Trust should include costs associated with responsible stewardship. There are some states—not Washington—where the trusts take an absolutely hard line. Short-term financial return to the trust takes precedence over even the survival of the resource. Thank goodness we don't have whale trusts, huh?

GO: One of the puzzling aspects of the controversy surrounding the harvesting of old-growth forests in this region is the fact that there's been massive loss of jobs in the industry, yet this has not been due to any environmentally imposed constraints or anything to do with spotted owls. It's been due to a combination of automation in the industry and the fraction of the logs that are shipped abroad unprocessed. Why is it, in your opinion, that the logging profession has not been more concerned about the loss of jobs from these factors and has, instead, become so emotional over the *potential* loss of jobs from environmental concerns? Do you have any insights into that? It puzzles me.

JF: I think it's logical, but not rational. It's simply that the environment and spotted owls are a lot easier to target than your buddy that's down working on the dock loading up logs on ships. Or easier than dealing with some of these other tough issues. It's also easier than fighting with the corporation about the export that they're doing of the logs or the modernization of the mill that's taking place. These environmental constraints are easy targets and emotional targets.

GO: Among the very emotional ones now, too, is the logging of the Tongass which, unlike the other forests of the Northwest, is an enormous money loser. At least whatever else one thinks about the forest practices on Forest Service lands in Washington and Oregon, they do, as I understand it now, make money. The Tongass massively loses money. Do you think it is likely that we'll be able to bring

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that into closer alignment with how other coniferous forests are being used?

JF: I think there are many actions currently bringing it more into line. It's hard to figure out quite how things got so out of whack, but obviously there was a lot of pressure to build an indigenous forest products industry, since the beginning of this century. Out of that came the long-term contracts and commitments to the two pulp mills. I don't think a lot of people realized how limited the commercially valuable stands really were and the degree of conflict that existed with other ecological values. There probably were not careful analyses of the amounts of money that were involved to manage these areas and how that played off against benefits; as a society we often don't look carefully at cost: benefit ratios. Very clearly, with the legislation that's in Congress, there are going to be readjustments of the Tongass cutting plans to one degree; the specifics of these adjustments will be determined by a House and Senate Conference Committee.

GO: Among the issues that you've been concerned with is the possible influence of changing climate—particularly as a result of increase of greenhouse gases—on the consequences of forest practices, and particularly on forest regeneration. What sort of role do you see that green-tree retention is playing in attempting to increase resilience of the management plans in the face of climate change?

JF: New forestry practices in general make a positive contribution. One of the things they do is keep more carbon on site. Since you don't remove as much carbon, carbon storage levels are always much higher than they would be, for example in the form of green trees and snags and down logs. I also tend to feel that stands that are

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structurally and compositionally more diverse are likely to have greater resilience in the face of global change—able to tolerate it more without disintegrating. And even more than that, I think the more diverse stands will be more capable of recovering following a catastrophic event than plantations will be. Our studies of the Klamath fires, for example, show that structurally more diverse stands retain larger levels of legacies—more green trees, more habitat diversity—following a catastrophic event like wildfire.

GO: Turning to Canada: As we all know, the rate of clearcutting of British Columbia forests, particularly coastal forests, is extremely high. The situation in Canada is somewhat different than in the U.S. One, there aren’t federal lands; they’re all provincial. And, two, the legal avenues that citizens have in the United States for challenging governmental actions don’t have any standing in Canada. How is it that one can move to “kinder, gentler” forestry in British Columbia under these more difficult conditions?

JF: I don’t know how the society is doing it, but they seem to be bringing some significant changes up there. Apparently, it is primarily through social pressures—the overwhelming weight of public opinion. Some things like potential embargoes or market losses for British Columbia lumber products by some European nations could also have an impact. It’s the Greens, I guess. Basically, it is society that is bringing about the change, however, and it has to be very difficult.

I see significant change occurring in Canada and I hear about it from both the conservationists and the timber industry. They have so far to go. Their forestry has been so ecologically irresponsible that the gap between what should be from society’s standpoint—

“Some things like potential embargoes or market losses for British Columbia lumber products by some European nations could also have an impact.”

and what is—is very large. Change is occurring, and it seems that a lot of this change takes place very rapidly these days. At times it seems to me that, for some reason, a lot of the world is becoming sane for a period. A lot of sanity is going around.

GO: Jerry, you had to walk a very interesting path through this. On the one hand as a Forest Service employee and the constraints, whatever they are, that introduces; then, as a half-time employee of the University. You also interface the timber industry which, at least in part, has been rather hostile to many of the things you’ve been proposing. How difficult a juggling act has this been for you?

JF: Actually, I don’t think it’s been too difficult, really. At times in the Forest Service, I’ve been attacked by some of the national forest managers. But the Pacific Northwest Experiment Station has always protected me, based on the soundness of my science. The insulation of researchers from the unwarranted pressures by managers has worked. Over the last decade, industry did not initially want to hear these things about old-growth forests. They did not want to hear what was wrong with existing forest practices. Now, they’re in a situation where they cannot ignore the trends in society, and they have to take account of these kinds of values. So, now I find them quite aggressively seeking my counsel on these things: How can we, in some way, maintain these values, yet still have some level of wood production?

Society has created a context in the last few years which has made the industry very receptive to ecosystem concepts. It’s been an interesting change, from one of anger and derision and then ignoring, to one of: “Okay. What can you tell us?”

“... it seems to me that, for some reason, a lot of the world is becoming sane for a period.”

GO: Were there efforts to try to get you fired?

JF: No industry managers have ever tried to get me fired, so far as I know. I have antagonized three or four forest supervisors and one regional forester to the degree that they wanted me fired. However, the Experiment Station has a history that, as long as what the scientists are saying about their science and their results are sound, basically we're protected from such management pressures—much as a tenured professor is protected. I've pretty much stayed within those bounds. There are many people who would rather that I hadn't studied some of the things I've studied, but that's another issue.

GO: Are there things you want to say about this whole issue [laughter]?

JF: Sure. I think for me that the most marvelous thing of the last twenty years has been the increasing recognition of the value of old-growth forests and how remarkable they are in terms of structure and function, as well as composition. That has been incredibly rewarding for me.

GO: It also has made your life very complicated.

JF: That's all right. That's my life mission. No one, neither the forestry nor the academic community, appreciated these forests thirty years ago. A lot of the scientific work had gone on in tropical forest regions or eastern deciduous forests. Foresters were totally fixated on young, managed stands and had nothing good to say about old-growth forests at all ...

GO: They were all 'over-mature' ...

“... stands which are structurally and compositionally more diverse are more likely to be resilient in the face of global change ...”

JF: ... and decadent. The marvelous thing for me has been that, by God, these are incredibly interesting and diverse forests and they do a lot of things very well. And you better pay attention to them.

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