

Closing Remarks: A Visit to Dr. Stout's and Dr. Murphy's Forest Health Clinic

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Two years ago I attended a camp with fellow silviculturists in central North Carolina. Camp Kanuga provided all kinds of fun activities. We described ecosystems and designed silvicultural systems for a variety of objectives; and as our camp scribe (Phil Aune) noted, the central camp theme evolved into ecosystem management. I am not sure exactly how or what happened but Phil Aune, Andy Youngblood, Nelson Loftus, and I rudely woke the sleeping giant of ecosystem management. However, as often happens in these circumstances, only one individual gets blamed for the deed. After Camp Kanuga, Phil went back to Redding, Andy to Bend, and Nelson to Washington, DC. I was the unfortunate silviculturist caught with my hands in the cookie jar so-to-speak, and was sentenced to a minimum of 18 months in Walla Walla, WA with the Interior Columbia Basin Ecosystem Management Project (Graham and others 1994b).

Twelve months into my sentence as Deputy Science Team Leader the frustrations, meetings, and stress started taking their toll. My sponsor, Terrie Jain noticed that the stress was affecting my psyche and suggested when my sentence in Walla Walla is complete, I might attend a rehabilitation clinic. She said a clinic would help me readjust to society and help me reaffirm my roots in silviculture. Therefore, we decided to investigate clinics that I might attend after finishing my sentence in Walla Walla.

Since I could only be AWOL a minimum of one week the search was limited to clinics in the West. The Jimmie Heuga Clinic in Colorado was considered but it specializes in helping people with multiple sclerosis and at this point I needed something to help my mental state. Also the Betty Ford Clinic showed potential, but unfortunately celebri-

ties like Liz Taylor usually overwhelm the participants. Terrie and I were looking for a clinic staffed by general practitioners, rather than specialists, one that could integrate many issues, develop good prescriptions no matter the objectives, and be respected in the ecological and forestry communities.

Fortunately, Terrie grew up in a small community north of Santa Fe, NM, and remembered a clinic high in the mountains of south central New Mexico at Mescalero. Terrie investigated this clinic and found it good at integration and staffed by competent resource professionals who prescribed treatments for a wide range of objectives and health conditions. The forest health clinic was led by two general and well respected practitioners, Dr. Stout and Dr. Murphy. To determine if this clinic would benefit my mental and physical health, Terrie and I planned a visit during the week of May 8, 1995.

I knew little about Mescalero, NM, except that it was near Ruidoso, the site of some of the richest horse races in the world and it was located at 8,000 feet elevation in the mixed conifer and ponderosa pine forests. Since it had forests, horse racing, and a nice hotel it appeared perfect for a forest health clinic.

Terrie acquired some information about the clinic we were visiting. I tried to read while Terrie drove, but it was almost impossible because she drove very fast; seems several cars with flashing lights were wishing us a good trip. According to the information, the clinic directors are general practitioners in both the mental and physical health of forests. They are silviculturists. Since the late 1800's silviculturists have been meeting the desires of land owners, managers, and society by prescribing forest treatments to produce a wide variety of forest conditions. As silviculturists, Dr.

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Stout and Dr. Murphy are two of a long line of silviculturists mentored by individuals such as Davis, Smith, Gisborne, Wellner, Marquis, Leopold, Hawley, and Baker (Baker 1934, Hawley 1937, Smith 1962).

As silviculturists they were trained in a wide variety of related disciplines including wildlife, soils, economics, timber management, autecology, synecology, fire ecology, landscape ecology, sociology, and silvics. Not only are Dr. Stout and Dr. Murphy well trained, but they are also leaders in continuing education. Since the early 1970's they have developed and presented continuing education to a wide variety of resource professionals. These programs include continuing education in forest ecology and silviculture (CEFES), the Silviculture Institute, and continuing education in ecosystem management (CEEM). These programs have supplied education to a wide variety of resource professionals throughout the United States and are models used for other educational programs.

With this excellent educational background, Dr. Stout and Dr. Murphy understand that ecosystems are communities of organisms working together with their environments as integrated units. They are places where all plants, animals, soils, water, climate, people, and processes of life interact as a whole. These ecosystems may be small, such as a rotting log, or large, such as a continent or the biosphere. The smaller ecosystems are subsets of the large ecosystems, that is, a pond is a subset of a watershed, which is a subset of a landscape, and so forth (Salwasser and others 1993).

All ecosystems have flows of things—organisms, energy, water, air, and nutrients—moving among them and all ecosystems change over time and space. Therefore, it is not possible to draw a line around an ecosystem and mandate that it stay the same or stay in place for all time. Managing ecosystems means working with the processes that cause them to vary and to change (Salwasser and others 1993).

Dr. Stout and Dr. Murphy recognize that their patients (ecosystems) are difficult to define, the doctors understand that often ecosystems are defined by the issues. Natural resource management issues such as protecting habitat for anadro-

mous fish, grizzly bear, spotted owl, or maintaining community stability can be used to define ecosystem boundaries and components. The doctors know their patients contain a variety of structures, processes, and functions all interacting among each other. In addition, the doctors are comfortable working with a variety of temporal and spatial scales, knowing that time and space are key components of their patients.

Terrie and I soon discovered that Dr. Murphy and Dr. Stout and their immediate staffs do not work in a vacuum. They confer with a network of associates and specialists from throughout the United States and Mexico. During the week in which we visited the clinic there were more than 170 specialists and associates visiting the clinic (fig. 1). Associates from New Mexico were the most supportive, but surprisingly many came from Washington, DC, and a team from Mexico was present. With this network, the patients receive the utmost professional and most advanced diagnosis, prognosis, and integrative prescriptions.

After being introduced to the staff and associates of the clinic, Terrie and I were invited into the waiting room. The waiting room was quite a sight. It was full of ecosystems all expressing different health concerns. Southeastern Alaska with its glaciers and islands occupied one of the large easy chairs. The middle of the waiting room was occupied by both the mixed conifer forests of the inland west and the forests of the Appalachians. These patients were constantly changing and moving,

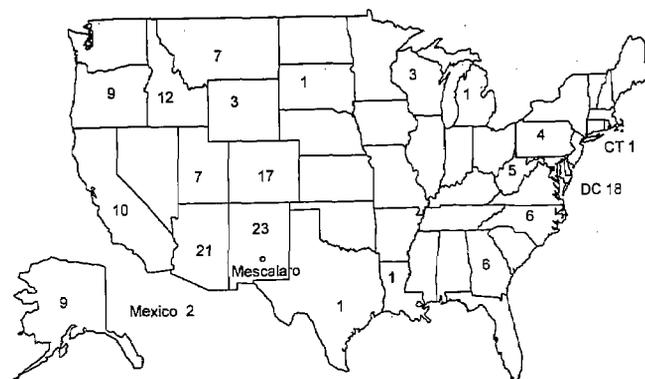


Figure 1.—The number of associates from throughout the United States and Mexico who attended the Forest Health Clinic from May 8 through May 11, 1995.

arguing over who got to sit at the kid's play table in the waiting room. One of the smaller patients (ecosystems come in all shapes and sizes) was the North Kaibab led by its top-level consumer the northern goshawk. Moreover, the line outside the waiting room was increasing as we watched. It appears there are no limits to ecosystems displaying health problems. We asked the doctors if it would be possible to visit an examining room while they examined their patients. Being open, integrating silviculturists they were more than agreeable.

The first patient we observed the doctors examining was the mixed conifer forests of the inland west. This ecosystem was led by the ponderosa pine, western white pine, and western larch patriarchs. The ponderosa pine was a majestic tree, tall and straight, with yellow bark. At its base was the evidence of many surface fires occurring early in its life, but no evidence of fire during the last 50 years.

Along side of the ponderosa pine was the state tree of Idaho, the western white pine. It also was a majestic tree but had some discolored needles. In fact, much of its top was dead due to white pine blister rust, an introduced disease. The western larch stood tall and proud, for the most part the tree was healthy, however it had a few remnants of small needle-eating insects (larch casebearer). Unfortunately, although seemingly healthy, the species has problems reproducing. Because western larch flowers early in the spring, frosts often damage the flowers making regeneration difficult.

In addition to the patriarchs in the exam room, there were several other vegetative components ranging from grasses and shrubs like cheat grass and sagebrush to pinegrass and alder. As Terrie and I watched, the exam room filled because of the prolific regeneration of Douglas-fir, white fir, and grand fir. These species were constantly being eaten by spruce budworm, tussock moth, *Armillaria* and other killing and stressing agents. In addition, because fire had been excluded, these trees were filling in all of the open spaces between patriarchs, thus changing the ecosystem structure. Because of these conditions and recent droughts large portions of this ecosystem were blackened by large forest replacing fires.

Many other components also filled the examining room. Juniper, pion pine, grizzly bears, spotted

owls, goshawks and suites of other plant and animal species occupied various niches in the ecosystem. The social and economic components were characterized by small towns like Priest River, ID to metropolitan areas like Salt Lake City, UT.

The diverse communities and intervening areas were populated by a host of humans ranging from Native Americans, to movie stars, to loggers, to ranchers, to retirees, and a multitude of others. These people expressed a multitude of demands ranging from the production of commodities (timber and forage) to the protection of spiritual and special places.

As with all good exams, the doctors quizzed the patient as to their employment history. Initially, from 10,000 years to 500 years ago, the forest ecosystems of the inland west worked for the human inhabitants. During this time they provided food, water, sacred places, medicine, and fiber for Native Americans. From 500 years to 100 years ago human populations increased primarily from European settlers and their offspring. To keep this employer happy, the inland forests had to work harder to supply food, water, and fiber. Since then and especially the last 25 years, the inland forests have been putting in overtime, trying to supply a disparate list of goods and services for the ever-changing objectives of the employer, the public. Inland forests tried to produce abundant fiber, abundant water, abundant wildlife, and abundant scenery. Unfortunately, these objectives often conflicted, adding additional stress on the patient. As the doctors examined the patient, aggressive regeneration of Douglas-fir, white fir, grand fir, ponderosa pine, western hemlock, and western redcedar continued to increase the biomass and carbon loading of the ecosystem.

During the exam Dr. Stout, noticed some entries from a previous exam. The note highlighted some of the problems facing western forest management. It went on to state "that the picture that has been drawn thus far can hardly be called satisfactory; over cutting of pines and undercutting of other species, an unbalanced drain upon forests. Confusion is added by the fact that the public and local, state, and federal governments have not come to an agreement on the problem, the approach, and the division of responsibility."

Dr. Stout continued reading the note: "There is no shortage of solutions. The problem is to select the one which least disrupts the existing scheme of things and invites public support necessary to transform it into an action program. It is critical to recognize that the course which is best from a purely local stand point may not serve the best national interest." Surprisingly, Dr. Stout noted that this entry was not made when the patient last visited, but rather it was made by Drs. Hutchison and Winters when they were leading the clinic (Hutchison and Winters 1942). Due to excellent diagnostic work at the clinic, silviculturists 50 years ago, recognized health problems in western forests. But, like many patients, and in this case because of the patient's employer, the ecosystem did not change its work, reproducing, smoking (fire), or consumptive habits and it's health continued to deteriorate.

Because of it's employers consumptive demands, the foremost treatment being applied to forest ecosystems of the west was the attempt to exclude wildfires. In addition, large volumes of high quality fiber, primarily the ecosystem's patriarchs, were harvested. Intermediate treatments (thinnings, cleanings, and weedings) were conducted to increase or maintain fiber production. Regeneration was prescribed to establish important tree species that contributed to primarily fiber production. In general the treatment history emphasized forest protection and commodity production for the human inhabitants of the ecosystem.

After interviewing the patient Dr. Stout and Dr. Murphy addressed the general health of the patient. They both had sound suggestions, but there is no definitive definition of forest health on which they could rely. It seems that the complexity of ecosystems and diversity of issues accentuated the different views of forest health. These views range from "another reason for doing business as usual," to a utilitarian view point, to keeping all processes and components in good working order, to sustaining ecosystem complexity while providing for human needs (see Sampson and Adams 1994). In addition, it was strongly recognized that all of these viewpoints are temporally and spatially dependent. Fortunately, Dr. Stout and Dr. Murphy being adept silviculturists do not ascribe to any one single definition of forest health. Rather they ascribe to producing forest conditions that can

address a wide variety of issues and maintain forest management options for future generations. In accomplishing this task the doctors attempt to teach and communicate to their employers (society) the necessity of understanding the consequences of management actions on forest ecosystems.

Terrie and I were excited about all of the new tools available to Dr. Stout and Dr. Murphy. Visualization, GIS, and computer simulation were available to the doctors for diagnosing forest ecosystems and prescribing treatments. Although these tools offer many possibilities and are important, the doctors know that the practice of silviculture also relies on many time-tested tools. Those developed by Haig and others (1941) for managing western white pine or by Pearson (1950) for managing ponderosa pine are as valuable today as the day that they were developed. All of these tools can be used in both coarse and fine filter ecosystem analyses to address a multitude of issues and concerns. The concept of a coarse filter assumes that if habitats are conserved more than 90% of the elements of the habitat would also be conserved (Hunter and others 1988). In contrast, a fine filter would address individual elements (species) that need special treatment or protection.

As Terrie and I observed the actions in the examining room we were constantly amazed at how the doctors used the wide range of tools available. One of the most interesting was the mental health shed with it's half moon cut-out on the door behind the main clinic building. Terrie and I did not fully understand the use of this tool, however, many of the associates present at the clinic, felt the mental health shed was a vital part of their continued success (fig. 2).

Other tools available to the doctors included recommendations for managing coarse woody debris and conceptual models of addressing ecological functions (Graham and others 1994a, Kaufman and others 1994). As the exam continued the doctors summarized the information using indicator variables and reference conditions. These summary diagnostic tables enabled the doctors to address the trends that were occurring in the ecosystem.

An important instrument available to the doctors was the availability of genetic information and

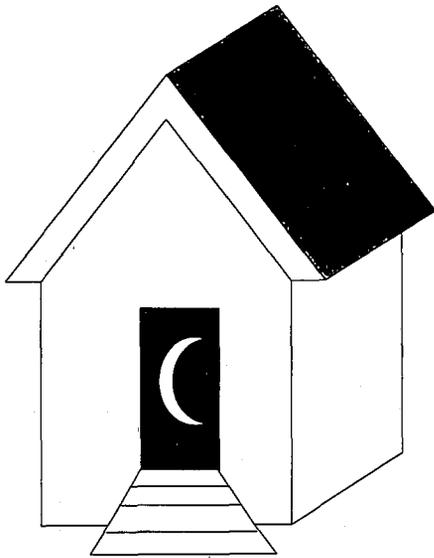


Figure 2.—The mental health shed located behind the main clinic building.

genetically improved planting stock for use in managing forest ecosystems. Safe seed transfer rules for regenerating forests were available, genetically improved rust resistant western white pine was also a valuable tool often used by the doctors. The doctors understood how important the genetic resource was in managing inland forests.

Terrie and I were very impressed with how Dr. Murphy and Dr. Stout developed silvicultural systems, a planned program of forest treatments through the life of a forest. The doctors pointed out that although many silvicultural systems were initially devised for producing timber crops they can be modified to produce forest conditions that meet a variety of management objectives. The doctors have provided prescriptions that produce desired forest structures, maintain forest processes, and maintain forest functions (i.e. maintain forest health). These prescriptions can also produce a variety of forest products and amenities (Reynolds and others 1992).

Maintaining forest health of mixed conifer forests of the inland West is a huge task for both biophysical and social reasons. One such challenge is addressing the many myths about resource conditions. There is a concern that although public opinion may not be right, it may prevail. Also, many people incorrectly assume that ancient forests covered North America, and that Native

Americans did not alter the landscape. Dr. Stout and Dr. Murphy suggested that silviculturists must educate the public, so they too will understand the complexity of ecosystems and the issues concerning future management of these forests.

It was extremely refreshing to witness the many significant examples of implementing projects for improving forest health. An example from the Idaho Panhandle National Forests included projects that successfully minimized root disease and introduced rust-resistant western white pine. Likewise, the Bitterroot National Forest successfully introduced fire into ponderosa pine / Douglas-fir forests. The Kaibab Forest implemented projects for sustaining northern goshawk habitat. Likewise, the production of and the continual development of blister rust resistant western white pine and its millions of seedlings planted were a major success.

So as the patient (ecosystem) exited the examination room Terrie and I were impressed by the prescriptions the doctors had prepared and successfully implemented. Even with these successes it appeared that the forest health questions facing the inland forests will continue. Drs. Stout and Murphy will likely see the patient again and again.

The doctors were extremely efficient and multifaceted. They not only worked with forest ecosystems of the West but were at home examining, diagnosing, and prescribing treatments for other forest ecosystems. Terrie and I watched as the doctors patiently and carefully lead the Appalachian ecosystem into the examining room. This ecosystem was led by the sugar maple, loblolly pine, and eastern white pine patriarchs. In addition, to these leading tree species, there were several oaks attempting to take leadership roles. Since no single oak species could assume this commanding position they all demanded to be heard.

This disparate group of tree species was leading a highly complex and diverse ecosystem. The suite of tree species present was large but we recognized the long leaf pine, eastern hemlock, beech, cherry, and balsam fir. In addition, there was an extremely rich populations of dogwood, red maple, poison ivy, silver bell, sourwood, and many others. This diverse and often dense vegetation provided habitat for black bears, ticks, chiggers, raccoons,

opossums, deer, mosquitoes, black flies, and a host of other organisms. The introduced gypsy moth and blister rust were thriving while acid rain fell in many areas. The human inhabitants of this ecosystem lived in diverse communities ranging from Washington, DC, to Rosman, NC.

As in the West, the native Americans were the first employers of this ecosystem. For centuries the demands they made were simple and well within the limits of what the system could produce. Beginning in the 1600's European immigrants started asking the system to produce more and more goods and services for an expanding population. These business moguls, politicians, farmers, miners, loggers, and industry workers frequently changed their minds on how this ecosystem should be managed. During the last 25 years dominant management objectives included producing fiber, scenery, woodpeckers, turkeys, water, sacred places, and stable communities.

Even with this wide variety of management objectives the doctors enthusiastically started examining their patient. They used their full complement of diagnostic tools. Dr. Stout even dusted off a 1922 copy of Frothingham's works for managing hardwood mixtures. They are still as applicable today as the day they were prepared. When the doctors prepared their lab sheets they looked similar to those prepared for the western ecosystems. *Armillaria*, blister rust, budworm, pine beetle and introduced species were prominent on the list. In addition, those pesky deer, along with acid rain and gypsy moth, were causing many changes in the ecosystem.

The doctors and their network of specialists and associates located throughout the United States set about developing silvicultural systems and prescribing treatments to meet the wide variety of management objectives this ecosystem has. What Terrie and I did not see in the western ecosystems that was so obvious in the East, was the tremendous human populations making demands on the system. There were millions of people living in this ecosystem making the task of maintaining the system in a healthy state extremely difficult.

Even with these difficulties the doctors developed excellent silvicultural systems and prescriptions. Prescriptions have been developed and

successfully implemented for mediating the effects of the southern pine beetle. Likewise, prescriptions have been prepared and implemented reducing the vulnerability of many parts of the ecosystem to attack by gypsy moth. Even though the oaks are, such an important species in much of the ecosystem establishment is sometimes difficult. But, the doctors successfully developed shelterwood systems producing excellent regeneration. Also, the doctors have successfully linked silvicultural systems to the specific habitat for sensitive wildlife species.

To prevent staring at the land and serving the DG, the clinic hosts extensive field excursions. Terrie and I participated in two excursions while we visited the clinic. Excursions were designed to allow the doctors and associates the ability to view, touch, and experience ecosystems. A short-coming of the excursions was that the vegetation, geology, soils, climate, and other basic ecosystem attributes were not described. This type of information would have been very useful for viewing the good, bad, and indifferent. For the field excursions the clinic could only afford school buses compared to the comfortable motor coaches we had at Camp Kanuga. This is probably a sign-of-the-times indicating that declining budgets will make it difficult to keep the forest health clinic fully operational.

It was refreshing to experience the ecosystems of central New Mexico. We were able to witness small trees crowding out the dominant patriarchs and view how the human component of the ecosystem continued to place heavy demands on the system through domestic grazing, timber harvest, and recreation sites. We saw places where potential house replacing fires were likely in the future. We viewed sites where active management produced forest conditions less susceptible to stand replacing fires yet provided habitat for many wildlife species. These treatment prescriptions were designed to meet the management objectives of the Mescalero Tribe. We discussed how aspen could be maintained as a forest component enhancing forest health.

These field excursions emphasized portions of the ecosystem that need intensive care by the doctors and their staff. The portion of the ecosystem containing the Mexican spotted owl was being over-run by small trees. The fuel loadings were

high and the tree component appeared to be very susceptible to epidemics of disease and insects. The participants on the excursion recognized that fires will eventually alter this portion of the ecosystem threatening more than the Mexican spotted owl. These sites were in stark contrast to the ones actively managed by the Mescalero Tribe to minimize the effects of these ecosystem components. Moreover, we were told that only a very small portion (approximately 3%) of the tree component of the area could be treated to reduce the fire potential. These management constraints demonstratively disturbed Dr. Murphy. He concluded that this approach to managing forest ecosystems definitely would not produce healthy ecosystems. The only thing that restrained Dr. Murphy was the appearance of some exotic black, triangular shaped planes overhead. These took his mind off of the sad situation that he witnessed.

The clinic had characteristics similar to those of Camp Kanuga. An important part of the therapy applied at the clinic was the communal dining of the staff and associates. This allowed for the interaction of silviculturists and associates from all over the United States and parts of Mexico even though some of the food lacked freshness and warmth (pancakes). As part of the therapy, the entire group boarded the school busses and went to a gun fight and barbecue. This evening excursion included a fisherman, a yodeler, and a fiddler. The highlight of the evening was the presentation of awards to associates of the doctors for their outstanding contributions to timber management. Dick Bassett, Bobby Kitchens, Milo Larson, Wayne Shepperd, Dennis Murphy, Bill Oliver, Ralph Johnson, and John Fiske were presented with plaques. In addition to this evening excursion there was an opportunity every evening for the staff to intermingle and have some refreshments. These group therapy sessions seemed invaluable.

Since I only had a week furlough from Walla Walla and we began planning our departure and reflecting on the work of the clinic. The doctors' work will never be complete. There will always be a forest ecosystem in the waiting room and a line waiting admittance. But Dr. Stout's and Dr. Murphy's Forest Health clinic is well equipped to address the continuing issue of forest health because they are silviculturists. The clinic is proficient

in the art and science of managing forest ecosystems to meet management objectives over a variety of spatial and temporal scales. The doctors stressed the need for public acceptance of active management to achieve healthy ecosystems. The practice of silviculture is the foundation for timber production, new forestry, new perspectives, ecosystem management, forest health, or what-ever the future may bring.

Therefore, after my sentence in Walla Walla is complete I plan on spending a long time at Forest Health Clinics with my fellow silviculturists.

ACKNOWLEDGMENTS

We would like to thank all of the excellent speakers who made presentations at this workshop. There was a tremendous amount of information presented and we did our best to capture the essence and theme of every speaker to use in our summary. We apologize if we missed some salient points but we know that they will be captured in the individual papers. In addition, please consider all of the papers in this proceedings as part of the literature cited for this summary paper. Thanks for the opportunity to share in this workshop: Russ and Terrie.

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