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The Founders' Award Address / La Presentación del premio Fundador

Twenty five years of forest insect research and related events

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Buenos días, amigos míos. Es un honor inmenso recibir el Premio de "Founders" de la Conferencia de Insectos Forestales del Oeste y ser considerado con los distinguidos señores McGregor, Amman y Safranyik.

La Conferencia ha sido muy generosa en presentar a mí este premio. Generosa porque la mayor parte de mi productividad ha sido a raíz de la colaboración y la asistencia de muchas personas en el Manejo de la Sanidad Forestal y la Estación Experimental donde he trabajado en las Montañas Rocosas. En el espíritu de sus contribuciones y sus colaboraciones, acepto este premio.

Como ustedes saben, el premio no lleva ningún beneficio monetario al recipiente. Por lo tanto, quería iniciar una política nueva respecto de este premio. Cada miembro de la Conferencia debe proporcionar al recipiente del premio cien dólares como testimonio del respecto que llevan para el recipiente. ¿Están de acuerdo con la nueva política que propongo? Bueno, muchas gracias, mis amigos.

I apologize to all those fluent in Spanish for that butchered rendition of my introduction. What I tried to say in Spanish is that I am honored to receive the Founders Award and be considered with the likes of McGregor, Amman, and Safranyik. I am somewhat undeserving of the award because much of my productivity has been due to the collaboration and assistance from colleagues in Forest Pest Management and the Rocky Mountain Forest and Range Experiment Station. Further, as you know, the Founders Award carries with it no monetary compensation. Therefore, I am instigating a new policy. Each member of the conference will give the Founders Award recipient \$100. Thanks you very much!

My attendance at WFIWCs has been infrequent and sporadic since retirement. Similarly, contacts with my U.S. Forest Service (FS) colleagues have been infrequent and sporadic. Nevertheless, changes in the WFIWC conference and life in the Forest Service have been noticeable. When I have talked with my former FS colleagues in recent years, I come away with the feeling that many are disappointed and frustrated with their work. One friend used the term "upside down" to express his concept of FPM in his region. Another said "I spend most of my time working on legal matters." And while "gridlock" and "paralysis by analysis" are frequently heard, my favorite is "stand and stare management." Judging by what I see of and hear about bark beetle conditions in the west, "stand and stare management" appears to predominate. And the fun seems to be disappearing from forest entomological work. With this in mind, I would like to present a brief summary of my FS tenure, some accomplishments, and events during the course of that time that made the work enjoyable, worthwhile, and memorable.

I began work with the Rocky Mountain Forest & Range Experiment Station (RM) as a summer assistant to W.F. McCambridge in 1963. Mac, or the old duff as his close associates called him behind his back, could be a tough S.O.B. on occasion. In those days, competition for summer jobs was substantially less than it is today, and employment was often a matter of contacts. Dr. Fred Knight had worked at the RM Station from 1950 to 1960, and had continued his friendship and contacts with entomologists at RM after leaving. Whenever the insect project at RM had summer jobs available, they would contact Dr. Knight and ask if he had any good candidates for the job(s). Because Dr. Knight valued these job opportunities for his students, he cautioned me about performing well during my employment and told me not to screw up or I could lose this opportunity for future students. Little did I know that working for McCambridge might be a formidable task.

During that summer, Mac was studying the emergence and attack behavior of the mountain pine beetle (MPB) near Allen's Park, a site south of Estes Park, CO. We had placed emergence cages on infested trees and attractants on green trees. Specific zones on the boles of the trees to be attacked had been delineated with string and I was to count the number of beetles emerging in the cages and the number of attacks between the string lines at specific times each day. I understood that I was to count the attacks between string lines for each zone but didn't know that I wasn't supposed to count the attacks in the areas between zones. As luck would have it that summer, the weather conditions were not ideal for beetle emergence. Each day during the start of the emergence period, the clouds would start to build around 10:00, by 11:00 it would be overcast, and by noon it was pouring. The rain didn't last all afternoon but lasted long enough to drop temperatures and shut off emergence. Despite the rain, I counted beetles and attacks---both within the zones and between zones. I worked for about 10 days on the study and then turned in the data to Mac after being relieved. I started a special assignment thereafter so I didn't see Mac again until just before I left to return to school

At the end of the employment, Mac was required to fill out an evaluation form for the temporary employee and send a copy to the employee's school---in this case to Dr. Knight. Mac and I didn't have time to review his evaluation before I left so I didn't know what type of evaluation he had given me. After returning to school, Dr. Knight came bouncing into my office one day smiling broadly. He gave me a copy of the evaluation and congratulated me on the evaluation. Mac had written something like "employee showed good initiative. When weather conditions compromised the collection of information according to the study design and thus threatened the validity of the study, the employee showed good initiative by expanding the scope of the data collection and thus increasing the quantity of the data." Little did Mac know that it was not a matter of initiative but of not fully understanding his directions.

The following year, I returned to RM and worked for Mel McKnight on his western spruce budworm studies. During that summer, I was able to get a commitment from Dr. Wygant, project leader for the insect research, to finance a study for a graduate degree. RM Station supplied me with a list of potential studies deemed important to project research and I was able to select one of my choosing. The study dealt with the insect predators of the MPB and the study began the study in the summer of 1965. Because a suitable site was not found in the vicinity of Fort Collins, Mac and I journeyed to the Black Hills where a MPB epidemic was underway. A suitable study site was found SW of Lead, SD just east of Terry peak. From 1965 to 1967, trees were sampled and observations were made on insect predator densities and behavior.

The study yielded good information on the within-tree densities of the clerid, *Enoclerus sphaeus* LeConte, and the dolichopid fly, *Medetera aldrichii* Wheeler, the behavior of the adults on the bark of MPB-infested trees, and the discovery of adult asilid flies, *Laphria gilva* L., capturing emerging MPB in flight.

Of all the places I have worked, the Black Hills tops my list. MPB dynamics, active stand management, historical sites, cultural amenities, scenic vistas, and friendly, interesting people make the Hills a great place to work. If you ever have the opportunity to work there, don't pass it up.

Simultaneously with my work, Mac was participating in a cooperative study in the Hills with the remote sensing project from the PSW Station. The study, headed by Bob Heller and Phil Weber, tried to determine if aerial previsual detection of MPB-infested trees was possible. After the 1965 field season, I spent my first winter in Fort Collins. During the Christmas season, I anonymously sent Mac a subscription to Playboy magazine. After receiving the first copy, Mac was storming---whether really or pretentiously I didn't know. Anyway, Mac suspected the boys from Berkeley as the culprits and vowed to get even. I went to the Hills in early May in 1966 and Mac came north sometime later to join the PSW crew for their first data collection session. On their first day out, Mac announced that he had not brought a lunch, was heading into Lead for lunch, and would bring out lunch for anyone who had also forgotten to pick up a lunch. Dick Myhre, photographer for the

project and later photographer for MAG in Fort Collins, asked Mac to bring him a sandwich. Mac's eyes lit up and his anticipation of getting even was evident as he drove off in a cloud of dust. A short time later he returned but not before he had stopped at a grocery store and picked up a loaf of bread, lettuce, dressing, and sandwich bags. On the way into the plot area, we passed through a barn yard complete with cattle and their byproducts. Mac stopped in the yard and picked up a cow pie, just the right size to fit between 2 slices of bread and some lettuce. With a straight face, he handed the "sandwich" to Myhre and said "here's your sandwich." Fortunately, Dick examined the sandwich before taking a bite but after that, a "Big Mac" had a different connotation in the Hills!

Following the 1967 field season, my work on the MPB in the Black Hills ceased. At that time, the insect project, under the direction of Noel Wygant, worked primarily on the MPB, western spruce budworm, and spruce beetle (SB). Because Mac was working on the MPB and he had seniority, Dr. Wygant was decreasing his involvement with the SB, and no one was working full time on the SB, I was assigned to work on it. Over the course of the next 10 years, I worked on SB in logging residuals and blowdown, solar heat and chemicals for increasing mortality, needle temperatures of infested vs. noninfested trees, development of stands following SB infestation, and refinement and creation of lethal trap trees. The work took me throughout Colorado, into Arizona and New Mexico, and rare trips to Utah, Montana, and Alaska. Simultaneously with the SB work in the mid-1970s, a study of seed and cone insects affecting Engelmann spruce was conducted at the Fraser Experimental Forest.

In the late 1970s, the CANUSA program began. Because our project was scrambling for funds, we submitted studies. CANUSA funded a study on the distribution of egg masses and larvae in the crowns of Douglas-fir and white fir---this work was conducted in northern New Mexico and southern Colorado. Simultaneously, a study of the incidence of WSBW parasitism in sprayed vs. unsprayed areas was conducted in northern New Mexico in cooperation with Region 3. As this work was in progress, a pandora moth epidemic erupted on the Kaibab National Forest in northern Arizona. In cooperation with entomologists in Region 3 and the Kaibab staff, work commenced on prescribed burning to kill pandora moth pupae in the duff and top soil layer. A study was also started on the distribution of egg masses and larvae in the crowns of the ponderosa pine.

In 1981, the insect project in Fort Collins was terminated. Bob Stevens and Steve Mata remained in Fort Collins as part of a multi-functional project; the rest of the staff was offered positions in other locations. I was offered a position in Flagstaff, Arizona and began work there in 1982. The primary work at Flagstaff was to be seed and cone insects in ponderosa pine. While seed and cone insects can cause substantial destruction of ponderosa pine seed and cones, I thought the work secondary in importance compared to bark beetles and the WSBW. Nevertheless, we began a study of the important seed and cone insects and the amount of seed and cone loss they were causing. Fortunately for me, the pandora moth epidemic was continuing on the North Rim. I scheduled my technician to collect most of the information on the seed and cone insects while I spent as much time as possible working on the pandora moth on the North Rim.

During the field seasons of 1982 and 1983, entomologists from Region 3 and I conducted studies on the distribution of egg masses and larvae, life history, emergence and behavior of adults, impact of the defoliation, and the effects of several aerially-applied insecticides on pandora moth larvae.

The pandora moth epidemic was somewhat centered around Jacob Lake, Arizona. Although Jacob Lake is not really a lake but just a pond, not really a town but just a crossroads, it is important because it is the last commercial establishment before one enters the northern part of Grand Canyon National Park and nearly all of the visitors to the North Rim funnel through the Jacob Lake area. The Jacob Lake complex contains cabins, motel rooms, a restaurant, a gift shop, groceries, and fuel. Region 3 entomologists and I usually stayed there during our work and usually returned for lunch at the restaurant. On one occasion, Dayle Bennett, Mike Andrews (Dayle's summer assistant), and I sat down at the lunch counter. Across from us at another part of the counter sat an older couple who, judging by their accent, were from Germany or a country where German was the primary language. Their lunches were served shortly after we sat down. The man

had apparently ordered a bacon, lettuce, and tomato (BLT) sandwich. By chance, he lifted off the top slice of bread and found no bacon present. He voiced his surprise to his wife, not in loud terms but loud enough so that his words were heard at our location. Mike Andrews, being quick-witted, leaned forward and addressed the man across from us--- "Excuse me sir." As the man looked at us, Mike continued "BLT doesn't mean bacon, lettuce, and tomato in this country; it means bread, lettuce, and tomato." Such was life on the North Rim.

In 1984, Bob Stevens retired and I was able to transfer back to Fort Collins to fill his position. At that time, the primary study for the entomology position in the multifunctional project was to determine the relationship between various levels of stand density and mountain pine beetle-caused tree mortality. During the next 6 years, Steve Mata and I established sets of growing stock level (GSL) plots in lodgepole (LP) and ponderosa pine (PP) stands in Colorado, southern Wyoming, and the Black Hills of South Dakota. Elaborating on a plot design by Russ Mitchell, we usually installed a partially cut GSL 40, GSL 80, and GSL 120 in conjunction with a control at each of the LP sites and a GSL 60, GSL 80, and GSL 100 in conjunction with a control at each of the PP sites. Occasionally, we added a fifth plot or cut to different densities at some locations. After a number of plots were established, we used the plots at several locations to study: water stress in partial cut vs. uncut stands; bark temperatures and wind conditions in cut and uncut plots in order to elaborate on Bartos and Amman's microclimate concept; and evaporation of verbenone from capsules in cut vs. uncut stands. Simultaneously with this work in the late 1980s, we worked with Ken Lister and Gene Amman to test several densities of verbenone capsules for preventing MPB attacks.

Work on the plots continued after I retired from the Forest Service. At least 10 years has past since each of the various sets of plots were cut so plots were remeasured and the information published. Some of the plots are approaching the 20-year mark since cutting. Hopefully, we can revisit them and produce additional information on partial cutting and MPB-caused mortality.

While there were memorable moments during the MPB work in the late 1980s, the outstanding moment came after I left the FS. In 1995, the WFIWC was held in Rapid City, SD. During the planning of the program, it was decided to have a field trip to visit one set of GSL plots and to offer a hot lunch near the plot location. Once it was decided to have steak and baked potatoes, how to bake the potatoes on site presented a problem. That quiet, seldom vocal, entomologist from Rapid City, Bill Schaupp, suggested contacting the RM Station field lab in Rapid City to see if they had any facilities suitable for the task. They did; a large oven used for drying plant material. We cooked the potatoes in the oven, transferred them to an insulated cooler for transport to the site, and then placed them on the grill for warming just before they were served. A number of attendees were complimentary with regard to the steaks and potatoes. It was only later that afternoon when we were returning some of the equipment that we learned why the potatoes may have had a distinctive taste. Some years prior, the SD State Police had contacted the lab and requested permission to dry the remains of a murder victim. As Paul Harvey says, "Now you know the rest of the story." And please express your thanks to Mr. Schaupp.

Recently, Steve Mata and I analyzed data from the LP GSL plots. While most of the plots have not been subjected to MPB infestations since installation, the stand data was used in several hazard rating methods to evaluate how applicable those methods are with regard to predicting current and future susceptibility of partially cut LP stands. Six slides are presented.

Slide 1. To give a general idea of our partial cutting design, slide 1 depicts the number of trees per acre in the various 1-inch diameter classes when we installed the Brush Creek plots and after the plots were cut. Differences in the numbers per diameter class illustrates how we discriminated against the lower diameter classes---not exclusively but proportionately more.

Slide 2. Mean diameter, age of site index trees, and elevation/latitude from the Brush creek and Colorado State Forest GSL plots were used in the Amman et al hazard rating system to derive a hazard rating for each of the plots at installation, after cutting, and at remeasurement.

Basically, the hazard ratings for unmanaged stands does not change after cutting or in the future.

Slide 3. Percentage of susceptible pine basal area, trees per acre converted to trees per hectare, age of site index trees as substituted for age of the stand, and elevation/latitude from the Brush Creek and Colorado State Forest GSL plots were used in the Shore and Safranyik rating system to determine susceptibility ratings for each of the plots at installation, after cutting, and at remeasurement. Hazard ratings for the partially cut stands decrease after cutting but do not change thereafter.

Slide 4. Stand density indexes for the Brush Creek and Colorado State Forest plots were compared to the low and high susceptibility categories in the Anhold et al. rating method. Most of the uncut stands rate low in susceptibility because either the number of trees per acre was above the upper limit of high susceptibility or the average diameter was <8 inches. After cutting and at remeasurement, most of the higher density partially cut stands rated high in susceptibility because the number of trees per acre was in the zone of high susceptibility.

Slide 5. Basal area values after cutting and at remeasurement for each partial cut GSL at the Brush Creek location were plotted and straight lines were drawn through the 2 points for each plot. Each line was projected until it intercepted the BA 120 and BA 150 levels or until years since cutting (x-axis) equaled 100.

Slide 6. Basal area values after cutting and at remeasurement for each partial cut GSL at the Colorado State Forest location were plotted and straight lines were drawn through the 2 points for each plot. Each line was projected until it intercepted the BA 120 and BA 150 levels or until year since cutting (x-axis) equaled 100.

Landing the job in Fort Collins provided multiple benefits. Besides being able to travel and work on the forests of the central and southern Rockies, the Fort Collins location enhanced my pursuit of knowledge regarding early western history, particularly the area encompassed by the Platte and Missouri rivers, and the Rockies. I have visited points along the Oregon Trail, forts, museums, battlefields, and cemeteries. I came to know the paintings of the early artists, Russell and Remington, and the photos of Illingworth and Huffman. I especially like the paintings of Russell who painted wildlife, historic events, and scenes from the every day life of the cowboy as well as his own Christmas cards. I was fortunate to know someone who owned an original, had it duplicated into a Christmas card, and sent a copy to me. In addition to the painting, Russell also wrote his own Christmas greetings on the scene. His verse may not be familiar to many of you because it is from another era. An era in which travel was primarily by horseback, motels were nonexistent, and one camped wherever you were when the day ended, hopefully beside a source of water. The scene is of two cowboys who meet on the prairie. One pulls a bottle from his saddlebags and toasts his friend with the following words. The words, which echo my sentiments to each of you, go something like this:

Here's hoping your trail is a long one,
plain and easy to ride,
May your dry camps be few,
and health ride with you,
To the Pass on the Big Divide.

Thank you very much! Amigos.