

## Forest Health Protection Under a Wandering Star

**Asheville, North Carolina -- May 2006**

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### Introduction

First, I want to take this opportunity to thank everyone who was involved in my selection for the Western Forest Insect Work Conference 2005 Founders Award. I know Carroll Williams is the one that nominated me for this recognition. I also know that a number of other people were involved but, unfortunately, I don't know who they are. As I said last year in Victoria, BC, this award, along with the Southern Forest Insect Work Conference's A.D. Hopkins award, are the Oscars of Forest Entomology. For me, this is truly one of the high points of my life.

I call this presentation, "Forest Health Protection Under a Wandering Star." For someone who has moved around as much as I have during my Forest Service career: Asheville, NC, Pineville, LA, Missoula, MT, Davis, CA, Fort Collins, CO and Portland, OR, plus a few years with FAO in Rome, Italy, it's an appropriate title. In addition, as most of you know, my work wasn't limited to forest entomology. It also involved some forest pathology, a lot of remote sensing and many years of program management.

I also want to say that having the opportunity to give this address in Asheville, NC is special for me. This is where I began my work: first as a seasonal with the Division of Forest Insect Research of the Southeastern Forest Experiment during the summer of 1959 and later as one of the first members of the Asheville FPM Field Office of Region 8.

### Special People

Before highlighting some of my own career, I want to take this opportunity to recognize some people that had a significant influence on how my professional life developed. Without their influence and guidance, it may have taken a very different direction.

#### Aubrey H. MacAndrews

A. H. MacAndrews was the chairman of the Department of Forest Entomology during my undergraduate years at the State University of New York at Syracuse University. Prof. Mac, as he was known around the college, was undoubtedly the best teacher I have encountered. For me, he was a bright star in a faculty filled with gifted teachers. Prof. Mac did two things for me. First, he made it clear in his required Entomology 2 class that there was a great deal about the insects that are damaging our forests that we do not know. He also brought the real world into the classroom. He often spent entire lectures describing consultations he had done for the City of Syracuse, the activities of unscrupulous tree surgeons or crazy things that happened on spruce budworm spray projects while he was working in Canada.

Prof. Mac's class tweaked my interest to the point that during the summer between my junior and senior years, I sought and found a summer job with the Southeastern Forest Experiment Station's Division of Forest Insect Research here in Asheville. I got involved in aerial surveys, development of methods to predict defoliator outbreaks and had the opportunity to work with a young entomologist by the name of Gene Amman, who is also a recipient of this coveted award. I spent a lot of that summer helping Gene rear and release predators of the balsam

woolly adelgid on Mt. Mitchell.

By the end of that summer, I was hooked. I knew what I wanted to do for the rest of my working life. When I went back to Syracuse that Fall, I had some real direction. I loaded up on elective courses in entomology and, despite the heavy course load, my grades improved significantly.

Russ Smith

After receiving my undergraduate degree, I returned to Asheville and the Southeastern Station. A few months later, the applied functions of the Divisions of Forest Insect and Disease Research: surveys, evaluations and technical assistance to suppression projects were transferred to the Regions. In response, R-8 chartered a series of zone or field offices staffed with specialists to do this work. I made the switch and became one of the charter members of the Asheville "zone" office.

At the time, the director of Forest Pest Control in R-8 was Russell K. Smith. Russ was one of the most unforgettable individuals I ever met. He grew up on a homestead in eastern Colorado and would tell fascinating stories about life on the prairie. During WW II he joined the OSS and was a spy. One of the few things Russ told me about his OSS experience was that as part of his training, he had to be able to drink a bottle of whiskey within a certain period and still carry on a coherent conversation. For some unknown reason, Russ felt it necessary to maintain this level of training long after he left the OSS.

When I joined the R-8 Forest Pest Control team in September 1960, Russ took a liking to me. He liked the way I wrote technical reports and two years into this assignment, he made it possible for me to go to graduate school under the Government Employees Training Act. Several years later, at the age of 26, Russ saw fit to select me to be the "Zone Leader" of the Asheville Zone Office. Admittedly, I was a too young for the job but with Russ's support and guidance, it worked and I had my first practical experience as a program manager.

Bob Heller

I first met Bob Heller during the summer of 1959. Bob worked with the Forest Service out of Beltsville, MD and headed up an "Aerial Survey Research Project." Bob and his team would fly to Asheville in their Cessna 190 to take color aerial photos of the balsam woolly adelgid mortality on Mt. Mitchell. Bob's work tweaked my interest and caused me to take an elective course in aerial photogrammetry during my senior year. It was Bob's influence that years later led me to explore aerial photos and other remote sensing approaches on my own for assessment of forest damage and Bob was always a great supporter of the work I did.

Phil Weber

Phil is a contemporary. I first met Phil when he was on Bob Heller's project in Beltsville, MD. Later, when I was Director of the Forest Pest Management Methods Application Group, Phil directed a parallel nationwide remote sensing project. During those years, we had a great deal of contact with one another and took on a number of cooperative efforts. Whenever we worked together, a wonderful synergy developed and together we accomplished some good things.

Patrick Tesha

Patrick is a native of the East African country of Tanzania. I met Patrick when I worked with FAO

in Rome and he was in charge of the Africa Desk of the FAO Forestry Field Programme. I had a lot of occasions to work with Patrick and it was under his guidance that I learned the basics of the FAO Field Programme, which was critical to my work in FAO between 1990-1995 when I served as the Organization's Forest Protection Officer.

Sadly, all but the last two of these outstanding people, are gone. They were gone before I fully understood the positive impact they had on my life. I mention this because every one of you in this room can assemble a list of people that had a similar influence on your lives. And, very likely, by the time you get around to doing this, some of them too will be gone. The only way you can really thank them is to have a similar effect on the life and career of a friend or colleague. From that point of view, the one thing that would mean more to me even than receiving this award, would be for one or two of you to see fit to include my name on your own list of special people.

## Career Recollections

### Asheville, NC - 1959-67

I spent a significant amount of my early years in Asheville working with the elm spanworm, *Ennomos subsignarius*, a hardwood defoliator that had reached epidemic levels over portions of north Georgia, southeastern Tennessee and western North Carolina. During the early to mid 1960s, the outbreak encompassed in excess of 1 million acres of mixed broadleaf forests. In 1961, I recovered an egg parasitoid, subsequently identified as *Telenomus alsophila*, from the egg masses of this defoliator. Two years later, the eggs didn't hatch according to schedule and immediately after returning to Asheville from graduate school, I detected high levels of egg parasitism. A subsequent evaluation indicated that nearly 60% of the eggs had been parasitized. The high level of parasitism was accompanied by a significant decline in outbreak area (Ciesla 1964). A year later, I was able to determine that parasitization occurred about three weeks prior to egg hatch (Ciesla 1965).

During the mid 1960s, I was involved in assessments of seed losses caused by seed and cone insects in southern yellow pine seed production areas and successfully tested a hydraulic lift vehicle to reach into the crowns of tall pines. Several years later R-8 purchased several of these units for tree improvement work.

Another major insect pest with which I continued to be involved was the balsam woolly adelgid, *Adelges piceae*. Through a combination of aerial and ground surveys, we detected localized infestations in each of the areas of spruce-fir forest in the high elevations of the Southern Appalachian Mountains. For several years, we made annual treks into the more remote areas of the Great Smoky Mountain National Parks on horseback to ground check areas of fir mortality. These were real wilderness adventures that involved incidents with half tame black bears coming into our campsites to steal horse feed, horses returning to their stables at night, leaving us stranded, and finding caches of white lightning hidden along the Appalachian Trail.

Of course the major insect pest I dealt with, both in Asheville and later in Pineville, was the southern pine beetle, *Dendroctonus frontalis*. In 1965, I had the opportunity to explore the use of both color and color-IR aerial photos as a tool for assessment and inventory of beetle caused mortality using a multi-stage sampling technique (Ciesla et al. 1967). When I presented the

results of this work to Russ Smith, R-8 Director of Forest Pest Control, he was enthusiastic about making the technique operational and we developed project air photo capabilities in both the Asheville and Pineville Field Offices.

#### Pineville, LA - 1967-70

I transferred to Pineville, LA to manage the Pineville FPC Field Office in 1967. Two years into my Pineville assignment, in August 1969, two things happened simultaneously. My second daughter, Cathy was born and Hurricane Camille struck the coast of Mississippi. Hurricane Camille was a Category 5 storm that caused major damage to property and infrastructure on the Mississippi coast and caused blowdown over a large area of the State. The Mississippi Forestry Commission requested a survey to map blowdown and identify priority areas for salvage. For several days I commuted between the hospital and the office, attempting to coordinate the survey. The survey was successfully completed and the Forest Service aerial survey team mapped over 1.8 million acres of blowdown (Terry et al. 1969). The Mississippi Forestry Commission was so anxious to receive the survey maps that I had to charter a small airplane to deliver the maps from Alexandria/Pineville to the Commission's Headquarters in Jackson.

The forest tent caterpillar, *Malacosoma disstria*, is a recurring defoliator of low-lying water tupelo forests of Alabama's Mobile River Basin and the Achafalaya River Basin of southern Louisiana. In 1969, scientists at the Southern Forest Experiment Station conducted field tests of several chemical and biological insecticides for control of this defoliator in the Mobile River Basin. Since the areas were inundated with 6-10 feet of spring runoff at the time of spraying, classic pre and post spray larval sampling to determine efficacy of the various materials was virtually impossible. The Pineville F.O. flew aerial photos over the spray plots and successfully evaluated the degree of foliage protection achieved by the various treatments (Ciesla et al. 1971a).

#### Missoula, MT - 1970-75

During the latter part of 1970, I was selected to fill a vacancy for an entomologist in R-1, Missoula, MT. The move to Missoula fulfilled a childhood dream, the opportunity to live and work in the West. I served as Entomology Section Head for the R-1 Forest Insect and Disease Branch from 1970-72 and as the Region's Director of Forest Insect and Disease Management from 1972-1975.

In the summer of 1971, I was involved in what was to become the last of a series of pilot control projects of the insecticide Zectran for control of western spruce budworm, *Choristoneura occidentalis* (Dewey et al. 1972). We established the test on the Nezperce National Forest, set up a field laboratory in Grangeville, ID, and hired a number of local residents to work both in the field and laboratory. Of the 30 locals we hired for the field crews, 26 were female. In 1971, forestry and forest entomology were still very male dominated professions and I had some concerns about whether or not female field crews could do the job that was needed. I soon learned that they were quite capable of handling the job and moreover, that these ladies enjoyed being out in the hills as much as I did. The only real problem we had was that since they were clipping branches out of trees with pole pruners, I insisted they wear hardhats. At the time, heavily teased hairstyles, such as the beehive, were in fashion, something not conducive

to the wearing of hard hats. There were many times during that project when I saw ladies from the field crews running back to their pickups for their hard hats as I turned a corner on a back road.

Later that summer, a major outbreak of Douglas-fir beetle, *Dendroctonus pseudotsugae*, erupted in the North Fork Clearwater river basin in northern ID. In order to assess the magnitude of the outbreak, I designed and conducted a multistage inventory using aerial photos and ground surveys, based on the work I had done with southern pine beetle in R-8 (Ciesla et al. 1971b). The resultant survey produced the needed data and was repeated for several years (McGregor et al. 1972, 1974). In addition, since the outbreak involved largely state and private lands, I used it as an example of why the Idaho Department of Lands should become involved in the Cooperative Forest Pest Action Program and add a forest pest management specialist to their staff. As a result, the Idaho Department of Lands joined the program and hired Ladd Livingston. Ladd did an outstanding job of providing leadership to Idaho's forest health program for many years and just recently retired.

The years 1973 and 74 were the years of the Douglas-fir tussock moth, *Orgyia pseudotsugata*, both in R-1 and R-6. In 1973, work in R-6 established that the insecticide Zectran was ineffective against this insect. This caused the Forest Service to petition EPA for the use of DDT, which was banned in 1972, against this outbreak. Having to use DDT against this massive outbreak was not my proudest moment as a forest entomologist. However, we applied the material with as much precision as possible and conducted a parallel effort of testing other chemical and biological insecticides that met with some success (Ciesla 1975, Ciesla et al. 1976).

MAG (Davis CA - 1975-81, Fort Collins, CO 1981-88)

In 1975, Russ Smith, who had now become Director of Forest Pest Management with USDA Forest Service in Washington DC, chartered the Forest Pest Management/ Methods Application Group (MAG, known today as the Forest Health Technology Enterprise Team {FHTET}) and selected me to direct this new initiative. This group, whose function was to evaluate and implement new technologies, especially for assessment of pest impacts, was originally established in Davis, CA and later relocated to Fort Collins, CO.

During the first years of MAG's existence, we also had a role in aerial application of pesticides and Jack Barry, formerly of the U.S. Army Dugway Proving Grounds, joined the staff. One of the first projects we took on was to characterize a DC-7 spray aircraft based in Burbank, CA for possible use on a spruce budworm project in Maine. We established a characterization grid in a large salt flat in southern CA. While en route to the grid, loaded with a tank mix dyed with a vivid red dye, the engineer running the spray system decided to test it over the community of Valencia, CA. The system worked well. Several local residents witnessed a large aircraft releasing a deep red spray cloud over a rather upscale residential area. Within minutes, the homes turned pink, as did a number of swimming pools, cats and white poodles. One of the witnesses managed to get the tail number of the aircraft and called the FAA. Later that evening, the owners of this aircraft had to do quite a bit of explaining to the authorities while Jack and I maintained a very low profile.

One of the technologies we began to evaluate early on at MAG was geographic information systems (GIS). The ability to integrate spatial information on insect and disease damage with land ownership, vegetation types and other thematic map layers and generate data tables using a computer was, to us in MAG, a fascinating concept. Soon terms such as "polygons, arcs,

points, digitizing" and "overlay processing" became an integral part of our vocabulary. Unfortunately, there were people in the Forest Service that didn't share our enthusiasm and had some real concerns about committing to this technology. For a time, a moratorium was placed on GIS development and implementation in the Forest Service until some basic issues could be addressed. However, after we moved to Fort Collins, we developed a partnership with the Western Energy Land Use Team (WELUT) of the U.S. Fish and Wildlife Service, which had an office in the same complex we were housed. This group had developed one of the first working and user friendly GIS, a system known as the Map Overlay Statistical System (MOSS). Together we conducted a number of tests and demonstrations with this system (Pence et al. 1983), organized GIS training sessions and eventually made a copy of the MOSS software available to R-6.

Another of the activities we took on at MAG was the production of traps for the Douglas-fir tussock moth Early Warning System. This system was based on use of pheromone-baited traps developed by Gary Daterman, the 2004 recipient of the WFIWC Founders Award. Through the efforts of Eleanor Franz, MAG Administrative Technician, we established partnerships with facilities that provided work opportunities for the mentally and physically challenged both in Davis and Fort Collins to coat the milk carton traps with Tanglefoot and package traps and pheromone baits for delivery to the field.

Perhaps the most exciting technology we worked with during my years at MAG was the use of high altitude panoramic aerial photography for mapping and assessment of forest damage. This technology was made available by NASA during the mid 1970s and was introduced to the Forest Service by Phil Weber, who had just taken on the leadership of the Nationwide Forestry Applications Program (known today as the Remote Sensing Applications Center). The ER-2 aircraft, a civilian version of the U-2, and the large area covered by a single frame of photography, allowed us to cover large areas in a short time and acquire complete air photo coverage of outbreak areas (Ciesla et al. 1982).

Our first work with this technology was to evaluate its use for inventory of tree mortality caused by mountain pine beetle, *Dendroctonus ponderosae*. In order to determine if we could resolve mountain pine beetle faders on the 1:30,000 scale aerial photos, Phil Weber ordered a test flight over a portion of the Ochoco National Forest in Oregon during October 1976 using color-IR film. When Phil received the photos, he was ecstatic. "You can hold the photos at arms length and see the faders," he told me excitedly over the phone. A week later, I had a chance to view the photos and sure enough, you could hold the photos out at arm's length and see discolored tree crowns.

"Phil, how much larch is on the Ochoco National Forest?" I asked. For a moment there was silence in the room. The photo mission had captured the larch at its peak of fall coloring. For several years, this photo mission was known among the forestry remote sensing community as "Weber's folly." However, subsequent tests established that we could resolve mountain pine beetle faders and we successfully used the ER-2/panoramic photo system as part of a multistage sampling system to inventory mountain pine beetle losses in portions of Colorado, Idaho and Montana (Dillman and White 1982, Klein 1982, Klein et al. 1980). Moreover, several years later, we received a request from the Maine Forest Service to help them map the location of larch forests on the coast of Maine to reassess the distribution of larch canker disease. Based on the Ochoco experience, we flew aerial photography at the peak period of fall coloring of larch and obtained a virtually perfect distribution map of larch along portions of the Maine

coast.

The big payoff with the ER2/panoramic aerial camera system was with the gypsy moth, *Lymantria dispar*, in the eastern U.S. During the early to mid 1980s, massive defoliation by this introduced defoliator of broadleaf forests was occurring over portions of the Mid-Atlantic States. In 1981, Phil Weber and I requested a flight over a test site in Mifflin CO, PA. The site was photographed with color-IR film and the resulting product was of outstanding quality. I developed a photo interpretation technique, known as "office sketchmapping" that involved monoscopic examination of each photo and transfer of polygons of defoliation onto 1:24,000 scale USGS topographic maps (Ciesla and Acciavatti 1982). In 1983, in cooperation with the Morgantown, WV Field Office of NA, we organized a pilot test of this technique and acquired photo coverage of portions of the eastern 2/3 of PA, all of NJ, DE and MD, portions of southern NY, eastern WV and northern VA. Denny Ward (R-8) trained teams of photo interpreters in each of the states. When the photography was acquired and processed, Denny and I annotated and divided the film among the participating states for interpretation and map transfer (Ciesla 1984, Ciesla et al. 1984). The project was a great success and was continued for several years under the overall leadership of Bob Acciavatti, entomologist with the Morgantown FO (Acciavatti 1990). During one of those years, I was in Harrisburg, PA working with the photo interpretation team from the PA Division of Forestry. I happened to notice that one of the photo interpreters was examining portions of a large lake with a hand lens. When I looked a little closer, I noticed that the lake was filled with boats and water skiers. When I asked him what was so interesting about the lake, he replied, "I'm trying to determine the sex of the water skiers." The resolution of the photos was so clear that it could easily be done.

Chile - FAO Consultation, 1987

During October-November 1987, I had my first opportunity to do a project for the Food and Agriculture Organization of the United Nations (FAO). During the previous year, three species of bark beetles, *Hylastes ater*, *Hylurgus ligniperda* and *Orthotomicus erosus*, all native to Europe, had appeared in Chile's extensive plantations of Monterrey pine, *Pinus radiata*. Two of these beetles, *H. ater* and *H. ligniperda* were killing young pine seedlings during maturation feeding. By the time the insects were detected, they had spread throughout the country's area of *P. radiata* plantations. However, I was able to recommend silvicultural techniques, such as proper treatment of insect breeding sites and avoiding the "J" rooting of seedlings during planting, to mitigate the damage (Ciesla 1988 a, b).

The opportunity to work in Chile was a life changing experience for both Pat and I. We loved the country and the people. And, despite the fact that we spent long hours in the field each day and had to communicate almost exclusively in Spanish, we both had a great time and agreed that we wanted to become more involved in international forest health protection.

Portland, OR - 1988-90

Within days after our return from Chile, I learned that I had been selected to fill the vacancy of Director of Pest Management in R-6, a position that had been vacant for nearly two years. A major outbreak of western spruce budworm was underway in the Region, with several million acres of forests suffering defoliation. Plans were already underway for a large suppression project and I arrived just in time for Regional Forester Jim Torrence to announce that, based on

the Environmental Analysis that had been completed, he would authorize treatment of up to 1 million acres providing they met the pre-spray insect population densities that had been established.

That project took up virtually all of my time for my first six months in R-6. We successfully treated 600,000 acres, all with undiluted formulations of *Bacillus thuringiensis*. For the first time, we adapted the Incident Command System (ICS), an organizational structure for managing large wildfire suppression projects, to insect suppression. We established five Incident Command units and an Area Command in Portland. The project involved deployment of over 70 helicopters, a fleet of turbine powered fixed-wing aircraft and over 700 people. I believe it still stands as the largest single western spruce budworm suppression project that involved exclusive use of a biological insecticide. The project was a great success and all of the units treated met the post treatment criteria of < 1 budworm larva/15 inch branch. We conducted smaller western spruce budworm suppression projects in 1989 and 1990.

Another initiative in which I was involved was the decentralization of the Forest Pest Management function. Up to that time, all of the Forest Pest Management specialists had been located in the Regional Office in Portland. We established a zone office attached to the Wallowa-Whitman NF in LaGrande, OR and another attached to the Deschutes NF in Bend OR. Several years later, we chartered a third zone office on the Wenatchee NF in Wenatchee, WA to serve all of Washington east of the Cascades. This initiative was a success because it put specialists closer to the field and reduced the number of days they had to spend away from home. Today, five Forest Health Service Centers or Zone Offices are operating in the Region. By the time I arrived in R-6, some the FPM staff was already involved in the use of the MOSS GIS, which my former unit, MAG, had made available several years earlier. With a little encouragement, in 1989, Tommy Gregg, Kathy Sheehan, Tim McConnell and several others on the FPM staff produced the first R-6 regional insect conditions map generated by a GIS. One of my proudest moments was to display this map at a meeting of the R-6 Leadership Team.

#### Rome, Italy - 1990-95

During the early part of 1990, I saw a vacancy announcement for the post of Forest Protection Officer in the FAO Forestry Department in Rome, Italy. The job description included work in forest insect and disease management, forest fire management, air pollution effects on forests and climate change. Recalling the fascinating experience Pat and I had in Chile, I applied for the post and six months later received word that I had been selected. In June 1990, Pat and I packed our belongings and headed for the Eternal City. The initial contract was for two years. We ended up staying for five. The job turned out to be perfect for a person born with an incurable case of wanderlust. During those five years I made 45 official trips to 29 different countries. Pat was able to accompany me on many of these trips.

One of the projects in which I was involved was management of the cypress aphid, initially identified as *Cinara cupressi*, in eastern and southern Africa. This insect appeared in Malawi in 1986 and quickly spread across the region, causing severe damage to plantations and natural forests of trees of the family Cupressaceae. The insect appeared in Kenya in 1990 and caused severe damage to the country's extensive plantations of *Cupressus lusitanica* (Ciesla 1991). I was able to obtain funding from FAO for an emergency Technical Cooperation Project (TCP) to conduct surveys, initiate emergency control operations in high value areas in Kenya and begin a search for natural enemies for a classic biological control program. Additional funds were later



made available from UNDP, the World Bank and the Canadian International Development Agency. The project funded by UNDP was executed by FAO and Denny Ward from R-8 was selected to be the Project's Chief Technical Advisor. This Project resulted in the establishment of the Kenya Forest Health Centre of the Kenya Forest Department, the first of its kind in Africa (Ciesla et al. 1995). Attempts at classic biological control, under the leadership of the CABI International Institute of Biological Control met with somewhat mixed results. In 1995, it was determined that the aphid involved was a species new to science and was subsequently described as *Cinara cupressivora*, native to the eastern Mediterranean Region (Watson et al. 1998).

My new job with FAO caused me to end 30+ years as an employee of USDA Forest Service. Fortunately, thanks to the support of people like Jim Space, who was then Director of FPM in Washington DC and Sam Kunkel in International Forestry, my close ties with the Forest Service continued and a partnership on forest health concerns developed between FAO and the Forest Service. On several occasions, I was able to obtain grants from the Forest Service to conduct regional workshops on specific pest issues. In 1991, I organized a workshop on conifer aphids in Kenya and representatives from about 10 eastern and southern African countries participated. It was the first time ever that forest entomologists from the region were able to meet. I called it the "First African Forest Insect Work Conference." A year later, again with a Forest Service grant, I organized a workshop on the European wood wasp, *Sirex noctilio*, in Brazil. Representatives from eight South American countries participated and it too was the first opportunity for forest entomologists from the region to meet (First South American Forest Insect Work Conference). In 1994, thanks to another Forest Service grant, I organized a regional workshop on leucaena psyllid, *Heteropsylla cubana*, in Dar-es Salaam, Tanzania (Second African Forest Insect Work Conference). In each case, a delegation of Forest Service representatives participated in the workshop and proceedings were published that provided a record of the information presented (Ciesla et al. 1991, Iede and Ciesla 1993, Ciesla and Nshubemuki 1995). The FAO/Forest Service partnership also provided opportunities for a number of Forest Service personnel to participate in international assignments on projects in China, India, Kenya and Tanzania.

Another project in which I became involved was a UNDP forestry development project in the People's Republic of China. I formulated and later provided technical backstopping to a project component that involved implementation of improved detection and monitoring of forests pests in Anhui Province. The project introduced to the Chinese technologies such as stand hazard rating, population monitoring with semiochemicals, aerial surveys, airborne video and GIS. One of the things Pat and I immediately learned about the Chinese is that they are among the World's most gracious hosts. During a numerous visits to China we attended many "informal" banquets, which always included copious quantities of beer and a type of clear, white liquor made from rice. The second Chinese work we learned was "*gambay!*" the toast said before hurling down a shot of the strong white liquor or a tall glass of beer.

Fort Collins, CO - 1995-present

In June 1995, Pat and I returned to Fort Collins. After more than 35 years, I decided that I no longer wanted to work full time. Even though I was looking forward to returning to the Rocky Mountains, leaving Rome and FAO was difficult for both of us. During those five years, we had made friends with people from all over the World. And, we had developed good relations with

our neighbors and the merchants with whom we did business in Acilia, the community we called home for five years.

When we returned to Fort Collins, I chartered Forest Health Management International, a one-person forest health consulting company. This enterprise has been reasonably successful and consulting projects have taken me, and in some cases Pat, to places like Brazil, Chile, China, Cyprus, Kyrgyzstan, Nicaragua, Pakistan, Trinidad and Tobago and Saudi Arabia. In addition, I have taken on a number of domestic consultancies.

In 1998, in collaboration with Attilio Disperati, a professor of remote sensing at the Universidade Federal de Parana in Curitiba, Brazil, and two foresters from Cellucut S.A., a large pulp and paper company, I conducted a demonstration of aerial sketchmapping to classify tree mortality caused by the European wood wasp in Santa Catarina State. The only available aircraft for the survey was an Aero Boero, a high wing, two place aircraft designed for flight training. After we completed the survey, my pilot pointed to the starboard fuel gauge and yelled "*combustible, combustible!*" One of the fuel tanks apparently was blocked and the other was nearly empty. The pilot managed to get a message off to the control tower in Lages, the community from which we had taken off and requested fuel and a mechanic. We made an emergency landing at an abandoned airstrip near the community of Curitibaanos. Even with our dangerously low fuel supply, the pilot insisted on buzzing the runway to make sure it was free of horses and cows. Several hours later, Attilio and Pat arrived with fuel, and a mechanic. They failed, however, to bring along the most critical of survival rations - several bottles of cold cerveja. Despite this mishap, the demonstration was a success. There was good agreement between the aerial classification and existing ground data and we published a paper on the results, which was the basis for further investigations (Ciesla et al. 1999).

Several years later, the Forest Service, in collaboration with the EMBRAPA forest research laboratory in Colombo, Brazil, conducted a study to determine the feasibility of introducing aerial sketchmapping to Brazil. The Forest Service invited me to join with Erik Johnson (R-2) to participate in the study. We looked at aircraft availability and cost, who might provide leadership to an aerial survey program and overall interest. The study established that an aerial sketchmap program was indeed feasible for Brazil and the following year, Erik and I trained a team of aerial observers and conducted a series of operational flights. As part of the operational flights, we defined the aerial signatures of several damaging agents in pine and *Araucaria angustifolia* plantations (Ciesla et al. 2002).

In 2000, I was part of a team to conduct an environmental assessment of a proposed technical assistance project under consideration by the United Nations Office of Project Services (UNOPS) for management of the pine processionary caterpillar, *Thaumetopoea pityocampa* in Turkish Cyprus. This insect is a major defoliator of pine forests throughout the Mediterranean Basin. Two years later, when the project was finally approved, I was recruited by UNOPS as its technical specialist. Cyprus has been a divided country since the Turkish invasion of 1974 and attempts by the UN to resolve the conflict have been unsuccessful. While working in Cyprus, Pat and I lived in the Greek side of the divided city of Nicosia and each day walked across a 500 meter neutral zone lined with razor wire to the Turkish side of the city.

My work involved establishing criteria under which plantations would be treated. This involved the development of a defoliation prediction system based on egg-mass counts. I also conducted an analysis of opportunities for long-term preventative tactics to reduce damage caused by this insect, provided training in forest pest management and evaluated bark beetle

damage in pine and cypress forests (Ciesla 2004). A planned pilot project of the biological insecticide *Bacillus thuringiensis* was aborted because funding for the project was terminated after one year.

This project was one of several UN/USAID funded activities designed to increase communication and collaboration between the Turkish and Greek Cypriot Communities. Therefore, an integral part of the project was to organize a work conference on the pine processionary caterpillar that involved the Forest Departments and other stakeholders from both sides of the island (First Cypriot Forest Insect Work Conference). The conference was held in April 2003 in the Ledra Palace Hotel in Nicosia's neutral zone. This old hotel now serves as headquarters for the United Nations Peace Keeping Force in Cyprus and still contains bullet scars from the 1974 invasion. The conference consisted of two days of presentations and workshops followed by one-day field trips on both the Turkish and Greek sides of the island. The conference was a great success and, again, a proceedings was published (Ciesla and Gulensoy 2003). It was the first time professional foresters from Greek and Turkish Cyprus had been able to get together since the events of 1974. Colleagues, who had not had any contact in nearly 30 years, exchanged e-mail addresses and are now communicating on a regular basis. Having had the opportunity to organize this workshop and witness the animated communication between people who had been separated for so many years was one of the most satisfying things I have ever done.

#### Some Final Thoughts

This presentation has summarized a long journey: sometimes smooth, sometimes rocky, always interesting. There were always opportunities to take on a new challenge, discover something new or travel to a place I had never been before. Confucius said "find a job that you like and you'll never have to work a day in your life." That certainly applies to me. As I look back, I can honestly say that I looked forward to going to work about 80% of the time. This is not to say that I haven't had some tense moments with supervisors, subordinates and a few colleagues. Anyone who knows me knows that. However, I've had the good fortune to be associated with dedicated, motivated people and a good working environment. Have I reached the end of my career? I certainly hope not. As long as my and Pat's health stay reasonably good, I hope to be involved in some capacity in forest health protection. Many thanks for your attention. I hope it's been entertaining and that I've provided you with some food for thought.

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