

FIRE BULLETIN #17



California Chaparral Field Institute, P.O. Box 545, Escondido, CA 92029
www.californiachaparral.com email: naturalist@californiachaparral.com phone: 760-822-0029

What we know about wildfire and why we don't know it

Richard W. Halsey

While attending the USGS Wildland Fire Science Workshop in Tucson last week I found myself scratching my head and asking, "Why isn't this stuff getting to those who need it most so they can make the right decisions regarding wildfire risk?"

Fortunately, one of the objectives of the conference was



to help facilitate better communication between the scientific and land management communities. Some of the best fire scientists in the western United States were attendance.

What struck me after listening to the presentations and touring the 2003 Aspen fire scar in the Santa Catalina Mountains was the lack of scientific justification and support there is for many common land management decisions, public

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perceptions, and policy actions regarding wildfire. For reference, the USGS is now the sole science agency for the Dept. of the Interior and supports a multitude of natural science research efforts within the federal government. Some highlights:

Post-Fire Seeding: One of the most consistent conclusions during Tuesday's fire science session was that post-fire seeding has never been properly evaluated in terms of its effectiveness and has contributed to the degradation of many native ecosystems. Craig Allen (Jemez Mts. Field Station, USGS) observed that over 1 billion invasive alien cheatgrass seeds were inadvertently broadcast

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Soccer and Chaparral

After controlling the ball 90% of the time, shutting out the opposition three games in a row, and riding high on friendship born from struggle and cooperation, my 10-year-old son's soccer All-Star team was forced into a penalty kick show-down due to a 1:1 tie. As each player squared off, the tie continued until the last with goalie kicking against goalie. We lost. It was such lousy way to lose, especially since our team had played so well together. Such a one-on-one showdown just didn't seem right.

You may be wondering what this has to do with

chaparral; well, quite a bit actually. You see Sunday, the day we would have been playing in the final game had we won, our family of four spent the afternoon hiking up a mountain covered with magnificent, old-growth chaparral near our home. At one point the chaparral was so high and thick that our path had to weave its way through a narrow tunnel of ceanothus, the canopy of which arched more than three feet over my head.

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Jake All-Star

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during post-fire seeding after the 2000 Cerro Grande fire near Los Alamos, NM. While touring the Aspen fire scar, Allen asked one of the field presenters what data supported their use of post-fire seeding after the fire. Others asked similar questions. The basic answer that came back each time was that “in our *opinion*, the seeding really helped.”

What was generally admitted during Thursday’s panel discussions was that post-fire seeding is more of a political decision rather than one based on demonstrated effectiveness. It shows the public that “something” is being done. It also appears to be driven by the millions of dollars in federal money available for post-fire mitigation. Considering the cost and damage it can cause to native systems, it seems prudent for federal fire response teams who suggest post-fire treatments to seriously question the efficacy of post-fire seeding.

...large fires are driven by drying climatic conditions and extreme weather conditions more than anything else.

Fire Size and Severity: Although it makes for good press and opinion pieces in local papers, the notion that wildfires have been growing larger over the last century when compared to the past is just not supported by scientific evidence. Tom Swetnam (University of Arizona) and numerous other fire scientists discussed evidence that indicates large fires have been part of the American west long before the region was ever settled by Europeans. This is important because some have used the idea that fires have grown larger in order to support various policy decisions and to cast blame on firefighters for allowing fuel build up due to fire suppression efforts. Based on the data, large fires are driven by drying climatic conditions and extreme weather conditions more than anything else. The question of change in fire severity is still open to debate (Severity is a somewhat difficult variable to quantify across all ecosystems, but See USGS, page 3

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My son Jake knew the plants along the way and proudly announced their names. They were friends to him. They were friends to all of us. On the way down, we heard the bouncing whistle of the wren-tit, a chaparral voice that made our hearts sing. Jake pointed that out too. It was one of the best adventures we’ve had as a family. You see, nature has a way of refocusing energies, helping to put things back into perspective. It allows us to realize (once again) what is really important in life.

Yeah, we lost a little dream on the soccer field and still felt horrible about it, but somehow it was O.K. after our adventure Sunday. The chaparral brought us back. And it wasn’t just because we took a walk, but because we took a walk with friends from the wild. We felt at home. The characters and things around us were familiar because we knew their names and their life histories. They had meaning for us.

Beyond its value as a natural resource and watershed, chaparral is valuable as a place of connection, beauty, and peace in a very busy and sometimes confusing world. This is why it is so important to help others learn to appreciate the chaparral or whatever natural environment is near their home. It helps make life so much more enjoyable and helps people smile, something we need a lot more of these days, especially after a not-so-good day on the soccer field.



Nicholas (Jake's brother) age 5 with a horned lizard friend found in a stand of chamise chaparral, 1995.

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for forests it can be measured by tree mortality). Swetnam feels that the size of high severity burn patches in ponderosa pine forests have increased over the past few decades. This is based primarily on the observation that there are many more trees per acre in such forests than has been recorded historically, leading to more fuel and possibly, in turn, to more severe fires.

We do know there were more frequent fires in ponderosa pine forests (due to lightening ignitions) before fire suppression. Allen provided evidence from charcoal deposits that showed such fires have been consistently burning throughout the drier climate of the Holocene Epoch with the exception of the last few decades. The problem relating to land management policies comes when these findings are applied to other unrelated systems.

One-size-fits-all solutions: From my own personal observation, there appears to be a behavioral predisposition for us *Homo sapiens* to over simplify things and create global opinions and solutions based on a single perspective. Such a trait leads to quick decision making, but can trap otherwise nimble minds into very tight boxes. As Don Despain (Ecologist, USGS) so eloquently explained on Thursday, many people still see fire as always destructive and not part of the ecosystem. It doesn't matter what the science says, we need to do something quickly to fix the blackened landscape. This encourages the use of one-size-fits-all solutions that rely on comfortable, familiar paradigms regardless of scientific support.

Baja-Southern California Fire Model: The impact one-size-fits-all solutions can have on land management policy and debate is clearly illustrated in Southern California. One of the most pervasive misconceptions about the region's chaparral ecosystem is that it has the same problem as do ponderosa pine forests, unnatural fuel build up due to past fire suppression efforts. It has also been suggested that fire suppression in chaparral has led to larger fires in contrast to what happens in Baja California where fire is allowed to burn more



Ponderosa pine forest without recent fires in the Jemez National Forest.

“naturally.” This model has been hotly debated in Southern California during land management conferences and within newspaper editorials. The interesting observation I made in Tucson, however, was that the Baja-Southern California fire model was never even a topic for discussion. During informal conversations with numerous fire scientists, the model was seen as not particularly relevant, especially in light of more current research; large fires have always been part of chaparral ecosystems and will likely continue to be into the foreseeable future.

Ecosystem and Climate Change: I think it is natural for most of us to measure the world within our short life spans. Forest now is where forest has always been and climate is what it has always been in our collective memories. It is difficult to imagine the potential for dramatic shifts in the distribution of deserts and forests. However, I came away from this

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Ponderosa pine forest with frequent fires Powell Plateau, Grand Canyon National Park (courtesy of Taylor McKinnon and the Grand Canyon Trust).

News and Links

Summit: Living with Fire in Chaparral Ecosystems: Providing Tools for Decision Makers.

**January 10-12, 2006 at the
Riverside, California Convention Center.**

For details and reservations:

<http://www.fs.fed.us/psw/chaparral>

Ione Chaparral: Part II

APOLOGIES! In our previous newsletter, you may have noticed that our last "Ione Chaparral" article ended rather abruptly. Gnomes from the elfin forest apparently removed the "To be continued..." notation.

Continued from FB #16...

Both Chris and I scanned the patches of dead manzanita. I stared and shook my head, "What's happening here?" Chris didn't know and it was difficult to discern any obvious signs as to cause by examining the plants in the field. It was hard to determine how long the plants had been dead, but probably no more than 5 years as nearly all the stems were still intact.



Dead Ione manzanita. Notice the area under and around the dead plants has been filled in with invasive, alien grasses.

A study of the community in 1964 didn't mention any unusual rates of mortality. However, we do know the die back was present at least since 1988 due to more recent investigations. According to George Hartwell, a talented naturalist who once lived in the area, the fungus responsible for madrone canker (*Fusicoccum aesculi*) was found in Ione manzanita tissue by plant pathologist Tim Tidwell at the Department of Food and Agriculture. Another fungus that causes root and crown rot



A healthy Ione Manzanita (*Arctostaphylos myrtifolia*)

(*Phytophthora cinnamomi*) was found to be infecting the plants in 2001 as reported by California Dept. of Fish and Game. The full document can be downloaded from here:

<http://phytosphere.com/publications/ionemanzdis.htm>

Drought stress may be the primary cause of the problem followed by secondary fungal infections. Whatever the cause for the die off, the future for the remaining stands of manzanita is unclear. Continued mining activities and possible development pose additional risks to the isolated plant community.

Currently BLM manages two reserves of 86 and 20 acres each with CalTrans managing populations along its rights-of-way. Large portions of Ione chaparral are on the private Arroyo Seco Ranch. According to Chris, the ranch owners are interested in protecting the endangered system. However, the local political climate does not appear conducive to preservation as evidenced by the words of a former Amador County planning commissioner.

To be continued...

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conference with a greater understanding of how naive such a view is, especially when considering the impact humans can have on the natural environment. Although global climate change was not the focus in Tucson, it was slinking around in the background. Climate change is happening. What we don't know is exactly where and what the impacts will be.

We caused it, therefore we can fix it. I'm not so sure.

The outcome of such changes will have dramatic effects on restoration ecology and our views of endangered habitats. As recently as 15,000 years ago, chaparral reached all the way into the Vizcaino Desert in Baja California, about 200 miles further south than it does today. All the hand wringing over the loss of pine trees in Southern California mountains after the 2003 firestorm (and attempts to replace them) may be pointless if the climate continues warming. The impact of climate change is often left out in the debate over how to deal with wildfire risk. Instead, attention is focused on the effects of fire suppression, suggesting that the recent pine tree die-off in many western forests is really a land management problem. We caused it, therefore we can fix it. I'm not so sure. Allen offered that the forest die back may just be the system returning to historical distributions after some very moist periods in the past. Although some suggest only mechanical thinning and logging will solve the problem, I'm wondering how we will respond if the possibility of increased aridity continues to grow. If pine forests are slowly converting to chaparral, chaparral to alien grasslands, and saguaro cactus plant communities to barren desert, we need to carefully and objectively consider the actions we take. The negative impact of management mistakes today can increase exponentially as time goes on.

Fire Behavior, Hazards, and Suppression: Two characteristics about wildfires have become clear to

me during my time as a fire researcher. 1) Catastrophic fires are always driven by strong winds and 2) We focus on things we can see and manage, tending to discount the rest. Here are a few related points from the conference:

Allen showed an interesting slide of Los Alamos after the 2000 Cerro Grande fire; burned houses with lots of burned trees around them. Clearly a defensible space issue where the forest fuel ignited the structures? No. Embers blown by winds ignited surface fires around the homes which took out the structures which in turn ignited the trees, burning outward into the forest.

Jon Taylor (Fort Collins Science Center, USGS) brought up an interesting observation about the perception of fire risk. The reason the San Bernardino, California mountain community was so far ahead of many others in terms of fire planning before the 2003 firestorm was because they could *see* the dying trees. The ironic twist to this was that the fire danger may have been greater when the trees were still alive but stressed by drought due to the volatile chemicals still present in their living tissues.

A question was raised in conversations I had with two researchers about the fire risk of burned, dead trees and fallen logs. Based on their observations, such material is not particularly hazardous for the simple reason that it is just too thick. It's the fine fuels that pose the problem. Excluding dead trees that pose a falling risk, spending time removing such material is not particularly effective in reducing fire risk. This conclusion is similar to what I have been told by experienced firefighters.

Jon Keeley (Research Ecologist, USGS) showed convincing data indicating fuel age is not a barrier to fire spread in Southern California chaparral ecosystems. The use of fire breaks in the backcountry has not proven to be effective during severe fire weather conditions when the most damaging fires occur. In addition, firebreaks act as avenues by which invasive, weedy species can

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expand into native landscapes, compromising the integrity of such systems and increasing fire risk through the introduction of fine fuels. Modifying fuels does, however, reduce fire intensity allowing for the creation of defensible space around structures and communities. Therefore, placing such fuel modification in a strategic manner makes the most sense in terms of cost and effectiveness in protecting communities.

We must take care that our efforts in reducing wildfire risk and performing post-fire treatments is based on scientific data and not driven by bureaucratic inertia and the millions of dollars available for fuels reduction work and seeding. Unfortunately, the actual effectiveness of pre and post-fire treatments does not seem to be an

important factor in their continued application. In fact “monitoring” post-fire treatments is discouraged because it is not considered *research* in BAER (Burned Area Emergency Response) team document guidelines.

Hopefully efforts will continue, such as those sponsored by the USGS in Tucson last week, to connect land management practices with science so that we can address not only wildfire risk in an effective manner, but climatic change risk as well.



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- _____ California Chaparral T-Shirt. Please circle size: S M L XL

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