



*Promoting the application of
fire ecology through science
and education*

Volume 5, Issue 3-4

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AFE BULLETIN— MARCH/APRIL

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Submit your announcements and stories to the AFE Bulletin:

- Send Submissions to Sarah Otterstrom at:

dryforest@dslextreme.com

- Please send before the 28th of each month to be included in the next bulletin. THANK YOU!
- AFE apologizes for the late publication of the March/April Edition

THE FOR PAPERS IS OPEN UNTIL MAY 19TH FOR THE 3RD INTERNATIONAL FIRE ECOLOGY AND MANAGEMENT CONGRESS, NOV. 13-17 2006

This Congress provides a week long focus on the science and technology that are the basis for wildland fire management. The theme of the opening plenary session is "Changing fire regimes: Context and consequences: featuring invited speakers who will further explore this topic that is so significant for fire management. We have accepted proposals for over 30 species sessions on specific fire ecology and management themes. We now would like to complete the program with oral presentations and posters submitted by individuals within the fire ecology and management community.

We invite abstracts for oral and poster papers in these general categories: fire history/fire regimes, fire ecology and effects, fire and climate change, smoke management, fire modeling, remote sensing, wildland fire and fuels planning and management, social political, economic and cultural aspects of fire and



The Congress will be in beautiful San Diego, California during November when the average temperature is 70° Fahrenheit.

fuels management, and post fire rehabilitation.

More specific categories for abstracts are found in the "Paper and Poster Topic List" that is linked from the following web site. Submitters are asked to identify a category with their submission.

Detailed information about the call for papers and an online submission form can be found at:

[Http://emmps.wsu.edu/firecongress/papers.html](http://emmps.wsu.edu/firecongress/papers.html)

PUBLISH YOUR RESEARCH IN THE JOURNAL FIRE ECOLOGY

Fire Ecology is an on-line publication of the Association for Fire Ecology. The journal strives to publish high quality, peer reviewed articles on topics including, but not limited to fire ecology, fire science, and fire management. Manuscripts may be in one of

the following categories:

- Original research papers
- Short communications and responses
- Book Reviews

For information:

<http://www.fireecology.net/>

SUMMER COURSE ANNOUNCEMENT: DENDROECOLOGY WORKSHOP

The University of Arizona's renowned Laboratory of Tree-Ring Research (LTRR)

<http://www.ltrr.arizona.edu>

is offering a short course in this important and growing field May 15 - June 2, 2006.

This three-week intensive course will introduce students to basic theory and techniques in dendrochronology and dendroecology. Lectures, laboratory training, and a multi-day field trip with sample and data collection are integral to the course and learning strategy.

Lectures will be presented by course instructors and other leading scientists in the field. Readings will be drawn primarily from the published literature. The class is designed for graduate or advanced undergraduate students with an interest in the field, as well as faculty and postdoctoral researchers.

Working professionals in forest ecology and management are also welcome.

Dendroecology will be convened simultaneously with courses in dendroclimatology and dendroarchaeology; some joint lectures are scheduled. See the LTRR Summer School website (<http://www.ltrr.arizona.edu/summerschool/index.html>) for details on other offerings.

Registration and logistics. Dendroecology can be taken for undergraduate or graduate credit by registering with the University of Arizona for GEOS (Geosciences) 497k/597k beginning March 8 at (<http://summer-winter.arizona.edu>). Registration will be limited to 20 students. Tuition will be payable to the University of Arizona upon acceptance into the course by the instructors and submission of application materials.

On-campus housing is available near the LTRR and must be arranged separately. The course fee includes meals and accommodations during the field trip only. International students and others requiring special arrangements to participate should contact one of the instructors as soon as possible.

For more information: Please contact one of the instructors to discuss your participation:

Donald A. Falk, phone 520-626-7201, dafalk@u.arizona.edu

Thomas W. Swetnam, phone 520-621-2112, tswetnam@ltrr.arizona.edu

Mail or fax:

Laboratory of Tree-Ring Research, 105 West Stadium, University of Arizona, Tucson, AZ 85721 USA. Fax 520-621-8229.

*The AFE Lifetime
Achievement
Awards Honor the
legacy of two
pioneering fire
ecologists: Harold
Biswell and Herbert
Stoddard Sr.*

Call for Nominations for the AFE LIFETIME ACHIEVEMENT AWARDS

Two awards will be made: **The Harold Biswell Award** (Western US) and the **Herbert Stoddard Sr. Award** (Eastern US)
Criteria: Life-time significant contribution to fire ecology and management in the United States. The contribution may be in research, teaching, service, or a combination of these areas. The nominator should provide rationale for the nominee to receive the award within two pages.

Nominations should be sent to Dr. Scott Stephens by email <stephens@nature.berkeley.edu>
All materials must be received by October 9, 2006. Awards will be announced at the 3rd International Fire Ecology and Management Congress. Any member of AFE can make a nomination. Selection of winners will be made by the AFE Board of Directors.

For more information on the awards visit:

<http://www.fireecology.net/pages/12>

THE LATEST SCIENCE– MARCH

BY, LOUISA EVERS

STATE/REGIONAL FIRE ECOLOGIST, OREGON BLM/REGION 6 FOREST SERVICE, PORTLAND, OR

This month I cover four papers from all over. One is a nice follow-up to last month's paper on birds in the Amazon, although it does not specifically address birds. However, it does look at the different effects of Amazonian parks and indigenous lands on fire and deforestation. Two concern deciduous forests and savannas in the eastern United States with both examining species richness in fire-prone ecosystems. The last concerns fire-related selection pressures in northern hemisphere Mediterranean ecosystems.

Nepstad, D.; Schwartzman, S.; Bamberger, B.; Santill, M.; Ray, D.; Schlesinger, P.; LeFebvre, P.; Alencar, A.; Prinz, E.; Fiske, G.; Rolla, A. 2006. Inhibition of Amazon deforestation and fire by parks and indigenous lands. Conservation Biology 20(1): 65-73.

Last month, I included a paper that examined how understory bird species richness differed in the Amazon between areas fragmented by selective logging and those fragmented by fire. A key question was whether inhabited or uninhabited lands provided better protection from deforestation and changing fire regimes. This study examined reflectance differences between the uninhabited parks, biological reserves and ecological stations and the inhabited lands set aside for indigenous peoples. The study could not examine logging specifically, but instead examined deforestation, which results from both logging and agricultural settlement. A measure of how well a given reserve type reduces deforestation and fire was the ratio of deforestation and burning in buffer zones outside the reserve versus inside the reserve. If the ratio was greater than 1, then the reserve had deflected conversion. The authors recognize that it may underestimate reserve effectiveness where boundaries are close to existing roads or existing agricultural settlement areas. They also had to correct for co-registration errors between land cover maps from different years and between land cover and reserve boundary maps.

Fire inhibition was estimated only for reserves that were at least 50,000 hectares in size and were less than 20% cerrado – a fire-adapted savanna ecosystem. The authors measured the influence of reserves on fire by comparing fire density within 20 kilometer wide strips along the inside and outside of reserve boundaries. This large size was due to their use of GOES satellite data for fire detection, which has a 4 kilometer resolution. All reserves had some inhibitory effect on deforestation and fire, but the effect was greatest for indigenous reserves even though more indigenous reserves are located closer to the agricultural frontier. When comparing parks that had similar development pressures outside as the indigenous lands, the effects were similar in inhibiting deforestation. Those indigenous lands that had high deforestation and fire rates were those that were not established until after significant exploitation by outsiders had already occurred. Those indigenous lands that most successfully resisted deforestation and fire were those with tribes very active in protecting their established rights. This effect persists in most cases for at least 400 years after contact with outside society. The study also indicated that contact with the outside world, population growth and resource degradation are not inevitably linked. Many will find this good news as indigenous lands occupy one-fifth of the closed canopy forest in the Amazon, twice the area targeted for protection in parks and five times the area currently protected in parks.

Brewer, L.G.; Vankat, J.L. 2006. Richness and diversity of oak savanna in northwestern Ohio: proximity to possible sources of propagules. The American Midland Naturalist 155(1): 1-10.

I must admit, there is a special place in my heart for oak ecosystems, so I'm always interested in papers that examine the fire ecology of these types. Although this paper does not examine fire ecology directly, fire was and is an important determinant of species composition in oak ecosystems. This paper examines how wet prairies and oak barrens functioned with oak savannas in preserving species richness and biological diversity in the shifting mosaic of oak savanna, woodland and forest under historical conditions in northwestern Ohio, USA. Savannas and woodlands occurred on the ridges of old sand dunes, with the woodlands in areas partly protected from fire. Barrens and wet prairies occurred in the low interdunal areas subject to seasonal flooding. The low areas also have drier raised areas in them that once supported oak savanna. All areas burned with oak savannas burning more often than oak woodlands and wet prairies and oak barrens burning primarily in late summer and fall. As might be expected, fire exclusion has increased overall stand densities.

“Those indigenous lands that most successfully resisted deforestation and fire were those with tribes very active in protecting their established rights.”

The Latest Science Continued on Page 4...

....The Latest Science Continued

Savanna species are often found on the edges of woodlands and in association with wet prairies and oak barrens. Their research hypothesis is that wet prairies and barrens served as refugia for savanna herbs and thereby affected savanna species richness and diversity. The study found that species richness in present-day savannas is related to proximity to former wet prairies and oak barrens, thus providing support that these areas were propagule sources. However, they found little support for the theory that biological diversity in the savanna was a result of the proximity to former wet prairies and barrens. Instead, the environment within the savanna itself appeared to be more important in determining the relative abundance of savanna species.

Reilly, M.J.; Wimberly, M.C.; Newell, C.L. 2006. *Wildfire effects on plant species richness at multiple spatial scales in forest communities of the southern Appalachians*. *Journal of Ecology* 94: 118-130.

This paper is one of the still relatively rare studies that examines ecological effects at more than one scale. Many ecological effects are scale dependent, with statistical significance at one scale but not another or with cause-and-effect relationships changing rather dramatically between scales. Observations made at one scale may be dependent on processes acting on another scale or even more than one difference scale, often acting simultaneously. Trying to deal with multiple processes operating at different scales has been one of the big conundrums in land management, particularly when species conservation is a major social concern. The authors elected to use species-area curves to examine disturbance effects at multiple scales as these allow comparisons of species richness at multiple scales before and after a disturbance and assessment of rate at which species richness changes as area increases, using measures of both alpha and beta diversity.

immigration rather than germination of soil-stored seed. Given seed dispersal characteristics of the species present, tree species immigration is dependent on proximity to the burned area and on wind- and bird dispersal of seeds. Over time, the authors expect that competition effects will again result in local extirpations of shade intolerant species and species diversity will move back towards pre-fire levels, assuming no subsequent disturbances. The study failed to find evidence that increases in species richness was related to increased habitat heterogeneity at the local community level. The biggest factors appear to be disturbance severity, spatial grain of the observation and dispersal capacity of the species present in the surrounding landscape.

Pausas, J.G.; Keeley, J.E.; Verdu, M. 2006. *Inferring differential evolutionary processes of plant persistent traits in northern hemisphere Mediterranean fire-prone ecosystems*. *Journal of Ecology* 94: 31-39.

Several indicators suggest that selective pressure for resprouting capacity and propagule-persistence are greater in California than in the Mediterranean basin, this study examines how well these traits are related in species from the two regions through phylogenetic analysis. Mediterranean ecosystems occur world-wide, although in five disconnected areas, with dominance by species with similar characteristics such as resprouting and dormant seed banks. Species in Mediterranean ecosystems can be classified into functional groups – obligate resprouters, obligate seeders, facultative species and species that immigrate into the burned area. All four types occur in this ecosystem, but the relative mix differs, suggesting different selective pressures in different areas. The authors examined two Mediterranean ecosystems in the northern hemisphere with similar biogeographical histories – California and the Mediterranean basin. They believe there has been stronger selective pressure for persistence traits in California given the higher occurrence of lignotubers, serotiny, and fire-induced germination by

exposure to smoke or charred wood than in the Mediterranean basin. They find particularly striking the presence in California of fire endemic annuals that persist in the seed bank for many decades and establish for only 1-2 years after a fire; something that is completely lacking in the Mediterranean basin.

The molecular analysis conducted indicates that in California the ability to resprout and persistent propagules evolved independently so many species are facultative for those traits. In the Mediterranean basin, species able to resprout almost never developed persistent propagules as well and species with persistence propagules rarely have the ability to resprout so many species are either obligate resprouters or obligate seeders. The authors conclude on this basis that the selective pressures differed between the two regions. In both regions, some of the fire persistence traits predate the Mediterranean climate, which is believed to have occurred at intermittent intervals only since the beginning of the Quaternary. Resprouting is a common trait in angiosperms of both fire-prone and non-fire-prone ecosystems, indicating that fire was not a major selective pressure for the development of this trait. However, propagule persistence is believed to be only of recent origin in the Mediterranean basin, coinciding with the development of the Mediterranean climate and increased frequency of fire. In California, the development of persistent propagules appears to predate the Mediterranean climate for many species, with fire a frequent occurrence also in the Tertiary. Development of the Mediterranean climate in California then may have increased the available habitat for these species and facilitated rapid evolution of persistent propagules in sprouting species as well as selecting for the fire endemic annuals. There is also some evidence that the much longer history of intensive human uses, including grazing and agriculture as well as fire, in the Mediterranean basin affected the flora currently persisting today. The authors conclude by proposing that the presence of higher selective pressures from fire explain the observed dominance of facultative species in South Africa and Australia.



Around the country, **Student Association for Fire Ecology (SAFE)** chapters are making waves...

We welcome two new chapters: Ohio State University and Northern Arizona University.

Here is a snapshot of some of SAFE chapter activity:

Northern Arizona University

The NAU chapter is just starting up again with several plans in mind. We are hoping to start an internship with Kaibab Forest where students can get credit and work experience. We are also hoping to be the hosts of a speaker series dedicated to fire ecology. In addition, we have two people from the Coconino Forest who are interested in helping our class become Red Card certified. And on top of it all, we plan to volunteer with several local districts on monitoring prescribed burns and wildland fires this upcoming season. For more info: Pamela Peterson: paamj@hotmail.com.

Colorado State University

The Colorado State University chapter of SAFE is hosting the first annual *CSU Wildland Fire Week 2006* from April 24th to the 29th. Events include visits by renowned ecologists Dr. Jerry Franklin from the University of Washington and Dr. Tom Swetnam from the University of Arizona, a movie night on campus featuring the film "Fire Wars", as well as a Paul Gleason Memorial Hike to view a prescribed fire and pay tribute to a member of the CSU fire community. In addition to the featured fire ecology seminar, which will be held on campus and advertised to the general public, CSU-SAFE members will have unique opportunities to interact with both Dr. Franklin and Dr. Swetnam during their visits. For a complete schedule with event times and locations check the CSU-SAFE website: <http://www.colostate.edu/orgs/SAFE>.

Ohio State University

A new SAFE chapter is starting at The Ohio State University. Jessica Miesel (Ph.D. student, Ecology, Dr. Ralph Boerner) spoke to Dr. Roger Williams' Fire Management class (Natural Resources) about the research & career opportunities in fire ecology, and several students responded with interest in starting a SAFE chapter at OSU. Andy Penfield, Katie McKinley, and Jessica Miesel will be serving as officers. The Ohio DNR and the USFS have active prescribed burn programs for management and research, which will provide many opportunities for activities and involvement as the new chapter becomes more established. For more information, contact Jessica Miesel: miesel.1@osu.edu.

University of Idaho

The University of Idaho chapter has been helping Dr. Penny Morgan to redesign the prescribed burning lab from 2 to 3 credits, which will include a more rigorous fuels sampling program and better use of existing fire modeling software. We are also raffling off a Stihl 310 chainsaw as a fundraiser during the annual College of Natural Resources student awards banquet. Finally, we invited Rocky Barker, author of *Scorched Earth: How the Fires in Yellowstone Changed America*, to speak with our club and other interested groups on March 27, 2006. For more info, contact Chris Powell: powe1016@uidaho.edu.

University of California Berkeley

The UC Berkeley SAFE chapter is currently planning a special Fire Science Seminar Series for Fall 2006. The seminar will be named after the late Dr. Harold Biswell, former UC Berkeley professor and prescribed fire pioneer. Fire specialists, scientists and policy-makers will be invited from around the world to speak to students, faculty and staff about a wide range of fresh fire topics. In addition, UCB SAFE members are gearing up for the upcoming 3rd International Fire Ecology and Management Congress, to be held November 13-19, 2006 in San Diego, CA. For more information, contact Jennifer Potts: jpotts@nature.berkeley.edu.

FIRE MANAGEMENT OFFICER JOB—SEQUOIA & KINGS CANYON NP

The vacancy announcement for the Fire Management Officer job at Sequoia and Kings Canyon National Parks is posted on USAJOBS.

The announcement number is SEKI-06-42-EQ. The job is advertised as a GS-401-12/13.

The FMO provides leadership to the wildland fire, aviation and structural fire programs. The park is the birthplace of the wildland fire use program in the National Park Service. Typically the park manages a number of complex wildland fire use incidents each year, as well as prescribed burns and a range of fire suppression and fu-

els management activities. The FMO works closely with the rest of the ranger division to cooperate on a variety of all hazard incidents. The park has an excellent fire management plan in place.

There are USGS fire scientists located at the park headquarters at Ash Mountain, who provide a sound scientific basis to the program. The Southern Sierra fire managers group has sponsored a number of cross jurisdictional data efforts. The park is part of one of the FPUs chosen as a prototype for the Fire Program Analysis system.

Please give this outreach wide circulation. This is a wonderful opportunity for a person dedicated to seeing fire play its natural role in the ecosystems of the Sierra Nevada, working with great people in a very special park.

Please feel free to call me, William Kaage (who recently moved from this position to the regional office 510-817-1370) or the Chief Ranger at the park. JD Swed, who will be supervising the position.

The 20th Anniversary of the Yosemite Fires in 2008 will mark an important time for fire ecologists to reflect on the ecological impacts of wildfires "

FIRE CONFERENCES AND MEETINGS

The Ecological Restoration Institute at Northern Arizona University is currently preparing for the 2006 National Conference. The conference will be held October 24-26, 2006 in Flagstaff, Arizona. The title of the conference is **"Conserving and Restoring Frequent Fire Landscapes of the West: Linking Science, Collaboration and Practice."**

Information is available at the conference website:

<http://www.eri.nau.edu/cms/content/view/740/952>

Take Note!

The Association for Fire Ecology is already planning conferences for the coming years!

October 2007—
Traverse City, Michigan, National Congress with emphasis on fire ecology in the Great Lakes Region

Fall 2008—near Yellowstone National Park, 20—year Anniversary of the Yellowstone fires, National Conference to be organized in partnership with the International Association of Wildland Fire

Australian Bushfire Congress

www.bushfire2006.com

June 6-9, 2006
Brisbane, Australia

Conference Theme:

The Bushfire 2006 theme "Life in a Fire-prone Environment" aims to provide a forum to share new ideas on the complex issues of bushfire management.

THE LATEST SCIENCE – APRIL

BY, LOUISA EVERS

STATE/REGIONAL FIRE ECOLOGIST, OREGON BLM/REGION 6 FOREST SERVICE, PORTLAND, OR

If this month's column could be said to have a theme, it would be prescribed fire and fuels treatments. I found four papers that examine the effects of prescribed fire on different aspects of the environment in different ecosystems. So we'll look briefly at the lichen element of biological soil crusts, carbon and nitrogen cycling in mixed pine and hardwood forest, interactions with grazing and birds in grasslands, and impacts on wildfire effects in dry forest pine.

Johansson, P.; Riech, P.B. 2005. Population size and fire intensity determine post-fire abundance in grassland lichens. Applied Vegetation Science 8: 193-198.

The common wisdom is that fire is bad for lichens, particularly biological soil crusts. Many, many studies have shown local extirpation or dramatic decreases in lichens following fire. One the basis of a single study conducted in northeastern Oregon that found no post-fire decreases in lichen cover, the authors of this study in Minnesota decided to examine how variability in fire intensity and population size may affect lichen mortality. The study consisted of measuring preburn lichen abundance, burning two fields and then measuring post-burn abundance with an attempt to capture the variability in fire intensity common to any type of burn. One fire burned rapidly and consumed most of the litter layer while the other burned slowly and left most of the litter layer.

April's "The Latest Science" considers four papers that examine the effects of prescribed fire on different aspects of the environment.

The upshot is that lichen mortality was dependent on pre-fire cover in the field where most of the litter layer remained and independent in the field where most of the litter layer was consumed. They also found that mosses apparently provide some protection for lichen thalli. A key element in this study is that the authors waited a year before measuring the post-fire effects and noted that immediately post-burn the visual appearance was of high mortality in both fields. This outcome suggests that measures taken immediately post-fire may not be representative of plant response. On a preliminary basis, they identified the presence of a threshold in disturbance intensity where population size is irrelevant to plant response. Lastly, and possibly most importantly, they identified fire frequency as a critical factor in determining the ultimate fate of biological soil crusts based in recovery rates of lichens. Too frequent, and lichens not only do not recover, but populations continue to decrease until eliminated. This study could only focus the statistical analysis on a single genus rather than on multiple species, due to identification difficulties post-fire. Given that biological soil crusts are comprised of many different species, likely with different recovery rates, the authors point out the need to vary fire return intervals as well as insure multiple fires do not occur in too short an interval. It also suggests that prior to the era of fire exclusion in the United States, biological soil crusts may not have been as severely affected as present given greater variability in fire size and fire intensity.

LaJeunesse, S.D.; Dilustro, J.J.; Sharitz, R.R.; Collins, B.S. 2006. Ground layer carbon and nitrogen cycling and legume nitrogen inputs following fire in mixed pine forests. American Journal of Botany 93(1): 84-93.

This study took place in the mixed pine hardwood ecosystems of coastal Georgia, an ecosystem known for very frequent fires that promote an herbaceous understory with many legumes. The authors wanted to know if carbon and nitrogen cycling differed between sandy and clayey soils and what role legumes had on nitrogen cycling in something other than a pine plantation. A third factor was time since burn, with half the sites recently converted to a 2-year burning interval and half converted to a 4-year interval, both from a 3-year cycle that had been used for 20 years. These sites are managed for red-cockaded woodpecker habitat.

For the most part, the responses observed were similar to other studies with a few exceptions. Contrary to expectations, total above-ground biomass did not differ between sites burned on different frequencies or between soil types, although above-ground herbaceous biomass increased more on clayey soils than sandy soils. Although legumes increased as expected, they still only comprised about 4% of the total ground layer biomass so were not a significant contributor to stand-level nitrogen inputs from litter. However, the authors recognize that their results can only be considered preliminary due to the short-term nature of the study and only one estimate of nitrogen fixation rates. They believe the low values estimated are due in large part to the relative paucity of legumes on their study sites compared to other study sites in southern pines. They conclude that preserving and enhancing legumes on sites with low numbers of this plant type can be very important in avoiding further declines in site nitrogen.

...The Latest Science Continued

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Promoting the application of fire ecology through science and education

The Association for Fire Ecology (AFE)

AFE's new website is almost ready! Watch for it at:
www.fireecology.net



The AFE Bulletin is a service of the Association for Fire Ecology to its membership. To receive the bulletin, please renew your AFE membership annually by visiting the website:

www.fireecology.net

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