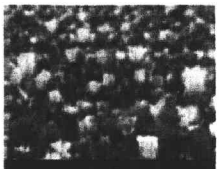

WESTERN RURAL DEVELOPMENT CENTER

Rural Connections

CONNECTING 13 WESTERN STATES AND 4 U.S. TERRITORIES

Spring 2008 Vol. 2 Issue 3

IN THIS ISSUE...

Director's Message

In the last few years, wildfires in the western U.S. have caused hundreds of millions of dollars in damage to homes, private property, and a loss of habitat as well as grazing land for ranchers living adjacent to public lands caused by wildfires.

This newsletter focuses on a very important issue in the Western United States, wildfires. The last few years have seen hundreds of millions of dollars in damage to homes, private property, and a loss of habitat as well as grazing land for ranchers living adjacent to public lands. Given the importance of this issue we asked experts from across the West to share their research and experience about the causes of increased fires and what suggestions they have for citizens and land managers when it comes to living with wildfire danger.

In the first article, Professor Mark Brunson from Utah State University shares his research on citizen's response to the increased size and destruction by wildfires. He suggests that two factors have converged to cause an increase in wildfire size and significance. These are invasions of sage-brush-dominated rangelands by non-native grasses such as cheatgrass and the expansion of woodlands dominated by junipers and pinyon pines. His research focuses on the social acceptability of different management options for Great Basin rangelands.

The next article discusses wildfire risk and home purchase decisions. Champ et al., found that 67% of home buyers purchasing homes in an area at risk of wildfires did not know they were purchasing homes in an area where they might be in the line of a wildfire. They also found that a majority of their respondents in Colorado had not owned a home in a fire-prone area before. These home buyers, through their home buying preference of living in a wildfire prone areas, are a major contributor to increasing fire suppression costs in the rural West. Their research points to new educational efforts as a way to increase the knowledge of locals in wildfire prone areas.

In addition to the original loss of grazing land and the loss of private homes, wildfires are having a detrimental impact on sagebrush rangelands. Summer Olsen writes on research that will provide land managers with improved information to make decisions about restoring sagebrush rangelands. Her report on the SageSTEP program illustrates that by working across agencies and state boundaries it may be possible to lessen the expansion of cheatgrass.

M.D.R. Evans and K. Rollins provide insight into pre-emptive vegetation management which involves the removal of accumulated fuels from the landscape. They argue that to allocate resources between restoration and preservation it is necessary to estimate the values of each of these investments.

As these researchers from universities and federal and state agencies demonstrate, it is possible through regional collaboration and local input to develop models to lessen the impact of wildfires and to also reduce the possibility of larger and more destructive wildfires in the West. Through collaboration and a regional focus these researchers are helping prepare for the future.

On another topic, this is my last column as director of the Western Rural Development Center. I am now moving on to focus on research dealing with rural development and teaching the next generation of those who will continue the long legacy of the WRDC. It has been a very sincere pleasure to interact with many of you over the years and my expectation is that our paths will continue to cross as I continue to conduct research on rural places and work with rural people on issues pertinent to their local lives.

It is with a great deal of pleasure that I introduce the new WRDC director, Dr. Don Albrecht. Don has spent over twenty years at Texas A&M University after leaving his home in Utah. He has a very real interest in working with university faculty and rural people as they strive to create a positive future for themselves and their children. I hope you will welcome Don as you have welcomed and encouraged me in the role of director.

Until our paths cross again.

John C. Allen

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Invasive Forest Pests: Problems You Can Live Without

BY DAVID R. BRIDGWATER

Western forests are experiencing attack by invaders. Insects, diseases, animals and weeds are damaging our forest ecosystems. Sudden oak death is killing tan oak, but is also capable of infecting many other species including Douglas-fir. Port Orford cedar root disease is killing Port Orford cedar in southwestern Oregon. White pine blister rust is killing five-needle pines throughout the range of the pines. Balsam woolly adelgid has been killing grand fir, silver fir and subalpine fir throughout the Northwest. The green spruce aphid periodically defoliates spruce throughout the west. Larch casebearer at times defoliates larch throughout the tree's range. There are over 100 species of invasive plants in the west, and while most have little direct effect on mature trees, they are able to invade disturbed sites and interfere with tree regeneration. Some species also pose a threat by increasing fire intensity and spread. Feral swine in some western states may kill reproduction though their feeding habits and disturb soil, allowing for more invasive weed to establish. Other articles in this issue will explore some of these invasives in greater detail.

An invasive forest pest can be defined as an organism occurring in an ecosystem to which it is not native, and either causing or having the potential to cause ecosystem damage. When invasive species kill trees, timberlands are reduced in value, hazard from forest fire is increased and ecosystems are altered. Invasive species that don't directly kill trees—such as many invasive weeds—alter ecosystem processes, may form monotypic vegetation, can crowd out desirable species, degrade productivity and recreation benefits, and prevent reproduction of desirable species.

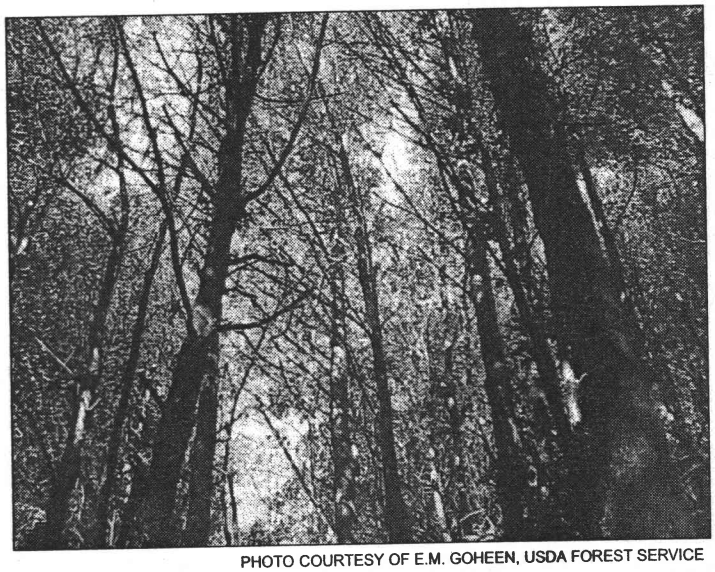

PHOTO COURTESY OF E.M. GOHEEN, USDA FOREST SERVICE

Tan oak mortality from sudden oak death.

These changes can occur at such rates that the ecosystem is unable to adapt. Because native trees did not evolve with the invaders from other continents, they often have limited genetic resistance to them. Rates of pest establishment and spread increase because when released into new environments, the invasives come without other species or conditions that would normally regulate their activities, such as the balsam woolly adelgid. In some cases, imported insects and diseases virtually eliminate American plant species from their natural habitat. Such was the case with chestnut blight, which between 1900 and 1950 all but eliminated the native chestnut tree from eastern forests, and set off a cascade of changes to not only forest composition, but also to the diversity of plants and animals throughout the east. Today, many forests in the west are at similar risk.

The current infestations and growing threat of invasive species make them a forest priority. Not only do these species threaten the sustainability of our forest ecosystems, but also potential movement of forest products regionally, nationally and globally. Damages caused by invasive species, including only those that can be expressed in monetary terms, have been estimated as high as $1.38 billion a year. Invasive species are thought to have been involved in 70 percent of this country's extinction of native aquatic species, and 42 percent of current endangered species are significantly affected by invasive species. Forests in the west are rich in biological diversity and provide vital goods and services. These non-native organisms have increased in their range and severity, while others await entry through global commerce and other human activities. Invasive species do not need to actually

(CONTINUED ON PAGE 2)

In This Issue: Invasive Species

Alaska Biological Control Program Directed at Amber-Marked Birch Leaf Miner

BY J.E. LUNDQUIST, K.P. ZOGAS, C.L. SNYDER AND B.K. SCHULZ

Non-native invasive insects are having major impacts on the economics and ecology of forests nationwide. Until recently, Alaska was fortunately mostly free of these pests. Due to the remoteness of much of Alaska's native forests, an invasive pest infestation would be extremely difficult to control. Global markets, global climate change, and the ever increasing mobility of people, goods and services are working in concert to increase the risk of invasion by exotic organisms to Alaska forests to unprecedented levels.

The amber-marked birch leaf miner (AMBLM) was introduced to northeastern U.S. from Europe in the early 1900s. Since then, it has spread across Canada and the northern United States. It was first found in Anchorage in 1997, although there is evidence that it may have been present as far back as 1982 near Haines. Subsequently, this infestation has grown to nearly 200,000 acres, including the entire Matanuska-Susitna Valley, Fairbanks, Skagway and a large part of the Kenai Peninsula.

Damage by this leaf-mining sawfly is caused by the larvae, which "mine" or eat the inside of a leaf during summer months, causing leaves to die and entire urban landscapes to turn brown. Impacts to trees have thus far been limited to decreased aesthetic values with foliage prematurely turning brown in the middle of the summer. Consequently, the use of pesticides to control the leaf miner in urban areas has increased dramatically. Although long-term impacts to individual trees have yet to be determined, in comparable infestations of both native and exotic defoliators and leaf miners, long-term effects of repeated defoliation have been found to reduce tree growth, reduce vigor, cause branch die-back, top-kill, and in some cases, outright tree mortality.

The pattern of adult dispersal suggests that this pest "hitchhikes" on vehicles as they travel from infested areas. The USDA Forest Service, Forest Health Protection unit in Anchorage is currently monitoring the spread of this insect, its impacts on the native forests, and the processes involved with this type of invasion.

Canadians had a similar problem with this leaf miner in the 1970-1980s in Edmonton, Alberta. The Municipality of Edmonton attempted to control this pest with a widespread and longstanding insecticide program. Eventually, this program became contentious, with many citizens sensitive and/or adverse to pesticide use. This nearly 20-year infestation ended with the appearance of a native parasitoid, *Lathrolestes luteolator*, which switched hosts, becoming parasitic on the amber-marked birch leaf miner. Within a year, this wasp had a significant impact on this infestation, and is credited with the collapse of the amber-marked birch leaf miner population to endemic levels in Edmonton and eliminating the need for further chemical control.

Since its introduction to Alaska, amber-marked birch leaf miner populations have steadily increased in and around Anchorage and have expanded to birch forests along the road corridors stretching from the Kenai Peninsula to Fairbanks. In the absence of an efficient biological control agent, the birch leaf miner populations are likely to continue to spread unchecked throughout Alaska's southcentral and interior birch forests.

Current technology to manage or control AMBLM relies on the use of chemical insecticides that are either injected into or sprayed onto the soil. However, several non-chemical control methods are being tested in Alaska. In cooperation with various partners, USDA Forest Service, Forest Health Protection is currently exploring the use of insect parasitoids, fungal pathogens and beneficial nematodes.

In 2003, a cooperative biological control program aimed at this pest began in Anchorage. Since that time, approximately 2,700 adult *L. luteolator* adults, imported from Canada, have been released in the Anchorage area. Thus far, two female parasitoids have been recovered, indicating the possibility that they may yet become established. There is also some indication of parasitism by native parasitoids as happened in Edmonton with *L. luteolator*. The possible impact of native parasitoids is being explored by Forest Health Protection personnel. Participating agencies include: USDA Forest Service, Canadian Forestry Service, USDA APHIS, State of Alaska Division of Forestry, University of Massachusetts

and the Municipality of Anchorage.

In 2007, a cooperative biological management study was initiated with the Pacific Northwest Research Station. The short-term objective of this project is to determine the efficacy of the entomopathogenic fungi, *Beauveria bassiana* and *Metarhizium anisophliae*, and the nematode *Steinernema carpocapsae* as biological control agents in Alaska. The use of alternative biological control methods, such as entomopathogenic fungi and nematodes, has previously not been explored. If these methods are effective, a dramatic reduction of the use of chemical insecticides may be achieved by providing additional elements of an integrated pest management program.

A parallel study, in cooperation with Colorado State University, on the spatial distribution of adults and the damage they cause showed that the leaf miner populations varied tremendously across Anchorage. This study is aimed at developing a tool for determining where and when different control and management methods should be applied. Spatial management is becoming more widely appreciated and more accessible as georeferencing tools like GIS and spatial modeling capabilities increase.

The availability of alternative tools for the control of AMBLM would provide landowners with several options to form an integrated pest management program. These tools are being developed using strategic planning processes involving the USDA Forest Service Forest Health Protection and its various partners, including: Cooperative Extension Service of the University of Alaska, State of Alaska Division of Forestry, Municipality of Anchorage, Alaska Botanical Garden, USDA APHIS, Kenai Borough, University of Massachusetts, University of Alberta, Canadian Forest Service and others.

The recent introduction of the amber-marked birch leaf miner demonstrates the increasing threat to Alaska's forest ecosystems posed by invasive insects. The Alaska Region has an excellent opportunity to work cooperatively to successfully control the birch leaf miner using pest-specific biological control agents, reducing damage to acceptable levels in Alaska's urban and native birch forests. ◆

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