BITTERROOT ECOSYSTEM MANAGEMENT RESEARCH PROJECT (BEMRP)

ECO REPORT

WINTER, 2000-01

A Progress Report from a Partnership in Landscape Level Ecosystem Management

One Ranger's Experience in Summer 2000
"You couldn't train for the scale of fires we had this year."

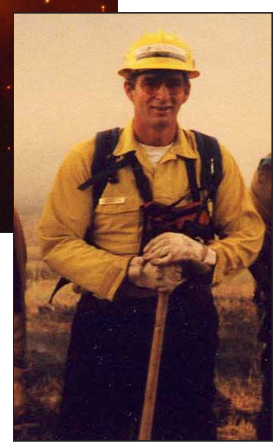
How does one capture 77 days of a ranger's life as he coped with a scale of wildfire never before seen on the Bitterroot National Forest? Prior experience as Division Supervisor and Safety Officer on Incident Management Teams gave Darby/Sula District Ranger Craig Bobzien a mere inkling of what he would face last summer. His familiarity with fire strategy, tactics, and staffing gave him an edge at a time when downsizing created a scarcity of wildfire experience.

Valley Complex Fire near Darby, Montana, August 13, 2000. Photo by Karen Wattenmaker.

Before the summer began, Bobzien knew it would be a bad fire year. All forecasts and on-the-ground conditions indicated it.

Early last spring, Bobzien and district fire staff began tracking fuel moistures and the energy release component (ERC), which measures forest fuels volatility. All indicators showed fire potential was several weeks ahead of schedule. By the end of July, ignition sources were the only remaining ingredient needed for a big fire year. Bobzien's own words set the stage:

> "About early July I talked with Forest Supervisor Rodd Richardson and indicated I'd like to get back involved with fire in some capacity but he said, 'I think this is a good year to stay close to home.' That turned out to be prophetic. This summer there were fourteen Incident Management Teams on the District. That's not counting five others with partial responsibilities for fires on the District."
>
> "July 31st! That's the day I'll always remember. Charlie Miller, District Assistant Fire Management Officer, and I went up Skalkaho-Rye Road to look at the large Cougar Fire, as it backed its way west from the Deer Lodge Forest. As we drove up Rye Creek, the serviceberry under the forest canopy was in fall colors already, kind of crumpled and brown. And we both said, 'It looks like September after the first frost.' Everything just looked crispy. We stopped in the old Sleeping Child Burn area. Charlie took the fuel moisture reading on the thousand-hour fuels. Six percent! Fifteen to twenty percent would be more normal.
>
> Then we continued on to the very highest elevation north slope, under a mature spruce-fir forest canopy about fifty feet from a stream. We took the thousand hour fuel moisture there. Eight percent! I said, 'Well, Charlie, it's not if; it's just a matter of when!' "



Ranger Craig Bobzien in smoke and fire at Sula Ranger Station on August 6, 2000.

As Miller and Bobzien wound their way back down, their conversation was peppered with "what ifs." Nearing the valley, they saw the Blodgett Fire take off on an adjoining district and heard their pickup radio become active. Bobzien recalls Miller's exclamation: " 'Oh, my God!' We looked up and it was just black to the south of us. That was the cell that started all the fires on July 31."

Bobzien's story could fill a book. For 77 days he never left the Valley. He slept with a map of the fires. Even on his day off, he fielded phone calls constantly. He rarely slept more than four hours a night and, like others, was "running on adrenalin for weeks, and appealing to an inner strength" to keep going.

August 1st was another memorable

(continued on page 2)

Inside

One Ranger's Experience . . . *(from page 1)*

Craig Bobzien facilitating community input to fire recovery process, Darby, Montana. Photo by Nan Christianson.

day. Bobzien pulled everybody off the fires, which were running wild. One hand crew was cut off from their vehicle and hiked out. Behind lay their burned vehicle.

Bobzien told how Valley residents lived for the rare clear days, which brought only anxiety to fire officials who knew "those would be the days when the fires would just rip." During days when smoke was thick enough to cut it with a knife, the fires lay low.

Then came the big fire day, August 6th. "It was Sunday. It started out real clear, and smoke had drifted out of the fire camps. Everyone said, 'This is going to be a big fire day!' I don't think they knew then just how big it was going to be." International media were in the area. The Forest business management team was doing a review at the Sula Complex Camp when the entire canyon along Highway 93 was overrun by fire. The fire swept through the Incident Command Post area, and spot fires were everywhere. Everyone lay down in a safe place to weather the firestorm. "We worked on into the night. I recall just the glow as I went along. It was so smoky. I think there were well over fifty homes lost that day." Bobzien saw firefighters stay to the bitter end to protect homes. Only when flames reached 150 feet from the homes, and "the third call" came, did they pull back. One homeowner called his saved house "a little brown house in a sea of charred sticks."

Valley Complex Fire into the trees, August 13, 2000. Photo by Karen Wattenmaker.

Trees torching in the Valley Complex Fire near Darby, Montana, August 19, 2000. Photo by Karen Wattenmaker.

Bobzien has only praise for community residents. "For all the loss and anxiety, they really pulled together. People were continually asking what they could do to help. There were many, many unsung heroes." They baked bread and cookies and made donations to firefighters. "Thank you firefighters" signs sprang up everywhere. However, some questioned why firefighters did not extinguish fires. Putting this issue into context, Bobzien noted that in mid-July the Forest had 30 hand crews available to work the 8,000-acre Little Blue Fire. By early August, only eight hand crews were here to work the 130,000-acre Valley Complex because of countless other fires burning elsewhere.

His experience with the wildfires of 2000 has given Bobzien "just a little teaser" of what people encounter in war and caused him to "honor and reflect on people dealing with chaos." Bobzien believes the calming influence exerted by Incident Management Teams, Sheriff's officials, and Rural Fire Chiefs helped people cope with the turmoil.

The fires of 2000 will reshape forest ecosystems and resource management approaches, both in the short term and long term. They have and will continue to reshape human lives as well. Fire recovery is well under way and will persist intensively for at least the next three to five years. Someday, the hallmark of a true Bitterrooter will be one who answers, "yes," to the question, "Did you live here when the Bitterroot burned?"

Symposium Proceedings Available

The Bitterroot Ecosystem Management Research Project: What We Have Learned, edited by Helen Smith, has been published. Savor this smorgasbord of papers on topics presented at the 1999 BEMRP Symposium. Gain new insights on vegetation, fauna, human dimensions, and landscape modeling. Learn about other Ecosystem Management (EM) Projects and delve into the historical/philosophical context of EM. Secure a copy by writing to Rocky Mountain Research Station, 324 25th Street, Ogden, UT 84401 or call 970-498-1392.

Smith, Helen Y., ed. 1999. *The Bitterroot Ecosystem Management Research Project: What We Have Learned.* 1999 May 18-20; Missoula, MT. Proc. RMRS-P17. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 154 p.

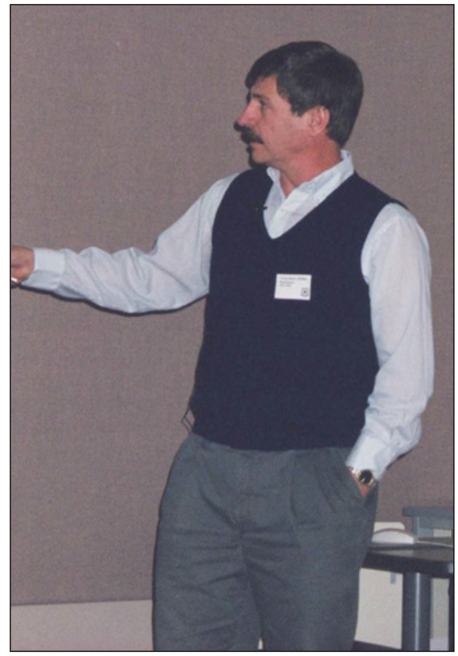
2000 Southwestern Montana Wildfires
The BEMRP Response

Greg Jones, Program Leader
RMRS, BEMRP

The Bitterroot fires of 2000 will not be soon forgotten! They will have a lasting effect on the landscape, having burned 378,000 acres across all ownerships and 307,000 acres on the Bitterroot National Forest alone. How does this effect BEMRP?

First, a significant part of BEMRP's past and ongoing research has addressed fuel treatment by applying a variety of treatments on the ground in Lick Creek, Larry Creek, and Sawmill drainages, as well as on the face between Fred Burr and Bear Creeks. In addition, landscape modeling has addressed fuel treatment strategies, effectiveness of fuel treatments relative to predicted acres burned with and without treatment, suppression costs relative to fuel treatment costs with and without treatment, and the combined effects of wildfire and fuel treatments on resource values such as sediment production and big game habitat.

The 2000 fires have created tremendous new opportunities for learning about effects of fire, human interaction with fire, and results of salvage and post-fire rehabilitation treatments. Likewise, they also provide opportunities for testing fire behavior prediction models. Numerous research units in the Rocky Mountain Research Station and the University of Montana expect to receive research funding for these purposes. A key role for BEMRP will be coordinating research efforts among the various research units and the Bitterroot National Forest. The exact form of this coordination is still being worked out, but may include a "boundary spanner" position. This position could be a conduit for sharing information, developing common-interest databases, and collaborating to design, measure, and monitor future land management treatments. We are excited about the opportunities and potential payoffs of coordinating research with land management!



BEMRP Program Leader, Greg Jones, presents at Regional Training Academy in Missoula, Montana. Photo by Janie Canton-Thompson.

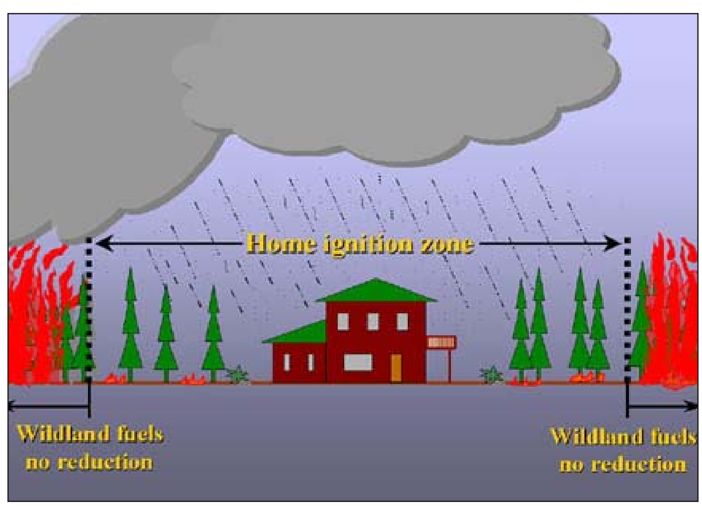
Aftermath of the Fire Storm
Insights on Structure Protection

"It's the little things" that unravel health and relationships. Research physical scientist Jack Cohen takes this truth one step further: "I would say, with few exceptions, the burned houses I investigated in the Bitterroot did not ignite from crown fires directly. They ignited from the little things." Cohen, one of the developers of the current National Fire Danger Rating System (NFDRS), has been doing fire behavior modeling since the mid 1970s, examining the dynamics of wildland fire and, more specifically, the requirements for combustion. He maintains, "Fire has a very intellectual, emotional, and physical attraction. Fire gives us the ability to make our lives a great deal easier, for better or for worse."

Since 1997 Cohen has been engaged in experiments in the Northwest Territories to better understand the nature of crown fires, in cooperation with the Northwest Territories and the Canadian Forest Service. There in low elevation boreal forests, researchers, after inventorying vegetation and fuel components, have ignited prescribed crown fires and measured their spread rates, heat emissions, flame temperatures, and wind velocities. Following the fires, vegetation and fuels have been remeasured. Cohen uses small, experimental wall sections and houses adjacent to burn plots to compare actual and predicted ignition responses to crown fires. These experiments allow him to fine-tune ignition models which assess homes' ignition potential during wildfires and what can be done to reduce it.

Cohen has discovered that burning embers, not raging crown fires, typically ignite structures. This was true in most of the cases he investigated in the Bitterroot last summer. Interestingly, most wildfires had actually passed through an area before houses

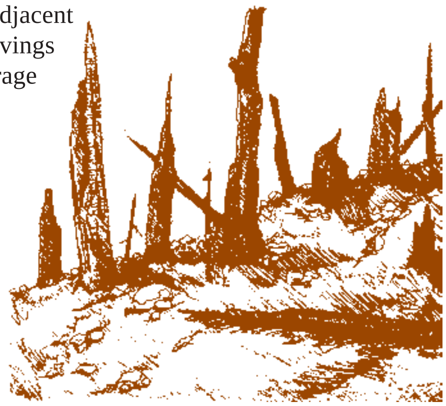
(continued on page 4)



A low ignition potential "Home Ignition Zone" reduces potential fire destruction even if no vegetation fuel reduction occurs in the surrounding wildlands.

Aftermath of Fire Storm . . . (from page 3)

burned. Ignitions started with the small things: pine needles smoldering in a roof gutter or under a deck; burning embers landing on wood piles, dried shrubs, or board walks adjacent to houses; and wood shavings trailing from under a garage door. These functioned like a long fuse where glowing combustion crept slowly, much like a hiker follows a trail to a lake, until minutes to hours later it became flaming combustion and consumed the structure.



Because of Cohen's research, we can now reasonably protect houses from burning by treating the area inside "the home ignition zone" (the area within 100 to 200 feet of a home). Potential for home ignitions from wildfire is determined by assessing ingredients within this zone. During the 2000 wildfire season, Cohen produced a video called "Protecting Structures from Wildfire." Focusing on "the little things," it shows what a homeowner can do in 24 hours to improve a home's chances of surviving an encroaching fire.

In Cohen's words, "This information affords us a lot more options than we previously believed when we address keeping our homes from burning down during wildfires. It allows the option of separating landscape management from the management of our home ignition zone." The question remains: Are we willing to take care of "the little things?" Cohen stated, "In the long term, I envision that this problem will go away, that we can have wildfires without residential fire disasters." This assumes we will modify fuels in home ignition zones to make them compatible with risk of ignition from firebrands.

Learning About Fire

Jane Kapler Smith, RMRS, Fire Effects Research

Tami Parkinson, Clearwater National Forest

Tom McWilliams (right), Fire Management Officer, Palouse District, Clearwater National Forest, discusses fire and fuels with Beta Club members. Photo by Tami Parkinson.

Tami Parkinson uses "matchstick forests" to demonstrate effects of slope and forest density on fire spread at a public workshop in St. Maries, Idaho. Photo by Tom McWilliams.

Forest fires have beneficial effects on the natural environment: Basically true? Basically false? Not sure? What would you answer? Would experiments and discussions influence your response?

Tami Parkinson, Forest Technician on the Clearwater National Forest and M.S. student at the University of Idaho, wants answers to these questions. Last spring, she hosted six public workshops in northern Idaho. At each, she used a "pre-test" to quiz participants on their understanding of wildland fire and attitudes about fire's role in forests. Then Tami and several helpers set up "activity centers" where participants investigated four topics: the nature of ecological communities, the relationship of fire spread to slope and forest density, ways to reduce fire hazards around homes, and how fuels relate to fire spread. The activities were adapted from *FireWorks*, an educational trunk used in Montana and Idaho schools.

Sixty-one members of the public attended Tami's workshops. After each workshop, participants completed a "post-test" which could be compared to their earlier answers.

"Their feedback was positive except for the amount of time required," said Parkinson. "Throughout the program participants were eager to be involved. They asked great questions, which led to a variety of discussions about fire."

A month after the workshop, Parkinson mailed a second post-test to each participant. She is currently analyzing participants' understanding and attitudes, searching for changes that took place during the workshops and following month. "I am pleased with the results and believe this is one method to reach out to adult audiences," Tami commented. Watch for her results in the next issue of *Eco-Report.*

ECO-Report

Published by the
Rocky Mountain Research Station
P. O. Box 8089, Missoula, MT 59807
(406) 542-3248

Editor/Writer: Janie Canton-Thompson

Wildfire: No Respecter of Ownership Boundaries

Comparison of fire severity between thinned (right) and unthinned forest land (left). Photo by Janie Canton-Thompson.

The average citizen is very aware of the catastrophic fires that blackened over 300,000 acres of the Bitterroot National Forest during 2000. However, probably few comprehend private forest-land impacts where more than 50,000 acres also burned. Peter Kolb, Extension Forestry Specialist, has insights on the battle facing private forest landowners as they recover from fire losses and lay groundwork to reduce the risk or severity of future wildfires.

Consider the cost of reseeding. The average severely burned site requires 10 to 30 pounds of seed per acre, and preferred native species grass seed costs $10 per pound, plus sowing expenses. Kolb calculates reseeding 1,000 acres of severely burned forest-land could easily exceed a quarter of a million dollars. Needless to say, some landowners confront a grim situation.

Some will say, "Why not let nature reseed these lands?" Kolb explained natural reseeding requires an available seed source and receptive soils. Considering the magnitude of the fires, neither may be available in time to avoid problems. The longer a burned site lies unoccupied by preferred species, the greater the likeli-hood of noxious weed infestation. Kolb said abundance of weeds like knapweed often doubles or triples following fire. One reason for this is that wildlife will concentrate feeding activity in unburned meadows, many of which already contain weeds. Weed seeds stick to animals' fur and may also be transported in their digestive tracts. Kolb remarked, "Anything that walks through existing weed patches can vector seeds."

What can be done to assist fire-stricken landowners with recovery? Kolb thinks it is important to realize fire is a landscape level phenomenon. Weather, topography, and fuels determine where fire spreads. Kolb asserts landowners must focus on fuels manipulation, the only controllable option, considering two basic scenarios. First, in a typical fire year, fuel management can significantly impact fire behavior. Treatments include thinning, spacing of trees, and fine fuel management in the understory (grazing, brush control, and understory burning). However, in an **extreme** fire summer like 2000, under-story fuel management may be less effective, and more extensive measures are needed to protect property from rapidly moving crown fires. These include creating fuel breaks (irregular shaped clearcuts) that can impact a running crown fire and strategic control of grass fuels through grazing.

Peter Kolb examines hydrophobic soils in severe burn area. Photo by Janie Canton-Thompson.

Kolb stated there was ample warning about the potential for severe wildfires last summer. As early as March 2000, officials began advising the public of that possibility. Kolb cooperated with the Forest Service and other agencies on "Face the State," which aired on statewide T.V. in June, warning people of the wildfire danger. He also sent a proposal to Sixty Minutes, which reaches a nationwide television audience, and asserted, "…the vast forests of Montana and Idaho…are a time bomb that will make the recent fires in New Mexico look small." He received no response. "We were trying to get people's attention."

To further inform landowners about wildfire, Kolb is using three approaches. He will produce a publication called "What Every Landowner Needs to Know About Wildfire," a video covering the same materials, and also a series of workshops. To learn more, contact Kolb at (406) 243-2773 or email efpfk@forestry.umt.edu.

Sawmill Creek RNA Restoration

Peter Rice, University of Montana, Division of Biological Sciences
Mick Harrington, RMRS, Fire Effects Research

Restoration of a unique ponderosa pine/bunchgrass ecosystem has begun on the Bitterroot National Forest. The project area is in the Sawmill Creek Research Natural Area (RNA) and permissible management activities, guided by RNA policy, are limited. Both its bunchgrass and forested canyon communities have experienced dramatic conversions in biodiversity and plant community structure in recent decades.

During the 1987 RNA designation process, researchers and managers realized a number of invasive alien plants were present. A 1994 weed mapping effort showed spotted knapweed had spread throughout most of the 160 acres of montane grasslands. Other noxious weeds were scattered throughout the grassland and starting to infest the forest habitat types. An integrated weed management plan was developed to facilitate restoration of native plant communities and maintain elk winter range. Herbicides, biocontrol insects, pulling/digging, and changes in use and access

(continued on page 6)

Sawmill Creek Restoration . . . *(from pg. 5)*

patterns were implemented to eradicate or suppress weeds. Herbicide test plots, initiated during fall 1996, confirmed target weeds could be controlled and native plants would respond favorably to release from competition with weeds. Three years after spraying, knapweed production was down over 90 percent on test spray plots, while habitat type indicator species, primarily bunchgrasses, increased dramatically. These results justified treating 160 acres of the grasslands and forest ecotones (boundaries) in fall 1998. Effectiveness of spotted knapweed control was 96 percent, based on canopy cover of treated areas.

When past fires burned regularly in the grassland, they spread into the forested canyons and maintained open ponderosa pine-dominant ecosystems in dry Douglas-fir habitat types. The forest canyons have changed dramatically since the last landscape level wildfire about 1914. Old growth ponderosa pine still dominates, but the understory and midstory tree layers are mostly occupied by dense groups of Douglas-fir. Many larger firs are dead or dying from mistletoe, bark beetles, and root disease. Surface and ladder fuels exist at hazardous levels. Even under moderate conditions, a wildfire would kill many old pines. To address this problem, Bitterroot National Forest staff, together with Rocky Mountain Research Station scientists, designed forest restoration treatments. The scientists will monitor pre- and post-treatment structure and composition along with understory vegetation responses, paying particular attention to the potential spread of noxious weeds from adjacent grasslands.

Pile burning to reduce ladder fuels in old growth ponderosa pine at Sawmill RNA. Photo by Mick Harrington.

Restoration cutting and piling of understory Douglas-fir was completed and piles burned in late November, 1999. Larger firs, which were clearly competing with ponderosa pines and could not be harvested because logging is prohibited on RNA's, were girdled to relieve stress and reduce fire hazard. Trees per acre were reduced from 277 to 96. Ponderosa pine now represents 55 percent of the trees, and firs have been reduced by almost 80 percent. As the grassland responds to reduced competition from spotted knapweed, and the ladder fuel in forested canyons is lessened, fire will be periodically returned to the RNA in the form of spring prescribed burning.

Research in Progress: Disturbance Regimes in the Riparian Zones of Western Montana

Elaine Kennedy Sutherland, Project Leader
RMRS, Vegetation Research

While we consistently acknowledge the importance of riparian systems in western landscapes, we have little concrete information on how these areas functioned historically. To sustain these critical areas, managers need to understand the processes that historically operated and the frequency of their recurrence. We also lack basic understanding of historic vegetation and aquatic patterns that

Forest riparian vegetation in transition to a dense conifer stand. Photo by Mick Harrington.

resulted from those processes. Without such information, it is difficult to support active management of riparian areas, and we often fall back to the "hands off" approach. There is mounting evidence that "fire suppression only" management has sometimes led to unsustainable conditions and deterioration of habitat in these critical wildlife areas. Fish management policies have put National Forests in the position of needing strong supporting information to manage Riparian Habitat Conservation Areas.

The need for information on riparian disturbance processes and vegetation patterns extends throughout Region 1 and ultimately should be provided for various stream types and geophysical settings. We initiated a study in 2000 to address this problem. With funding from BEMRP and Region 1, we are investigating disturbance processes as well as historic vegetation and aquatic patterns in riparian areas on three National Forests (Bitterroot, Flathead, and Lolo), covering various broad biophysical settings. We are trying some practical approaches to stratifying riparian areas, gathering data, and making sense of existing information. Work in 2000 focused on pulling together existing data and assembling GIS coverages, includ-ing riparian disturbance elements (especially fire history), vegetative composition, community structure, and geomorphology. Work in 2001 will emphasize developing a first-level stratification of riparian areas. This will be used to begin analysis of riparian patterns across the landscape, and to initiate fieldwork to assess conditions of terrestrial and aquatic zones in these strata. The actual information collected may also be extrapolated to similar riparian systems throughout the Region.

Keeping in Touch with Wildlife Workshop on Monitoring Efforts

Kevin McKelvey
RMRS, Wildlife Research

Lynx wearing monitoring radio collar. Photo by John Squires.

The National Forest Management Act (NFMA) requires the Forest Service to maintain viable populations of all vertebrate species throughout their ranges on National Forest lands. This mandate is increasingly framed in terms of monitoring the status of various species over space and time. There are, however, major hurdles associated with geographically extensive monitoring of animals. For most animal species, we have not developed reliable means of counting their numbers or demonstrating their presence within a particular area. Science can currently provide little guidance concerning how to best fulfill this legal mandate.

It is clear we cannot monitor all vertebrate species. For those we can monitor, we can develop and test the necessary sampling protocol, and prototype these implementations on large areas of forested land. Currently, plans are to prototype a regional-scale vertebrate monitoring protocol in north Idaho in conjunction with testing of current vegetation monitoring methods. However, the issue remains: what to monitor?

The Committee of Scientists, a group of prestigious scientists brought together to provide guidance on this issue, suggested that *focal species* be chosen. A focal species is an organism of particular importance for the functioning of a natural ecosystem. Small changes in its density have disproportionately large effects on ecosystem properties like stability, productivity, and diversity. While these species almost certainly exist, the logic through which they would be chosen is not worked out. Additionally, important issues like how many focal species need to be monitored within an ecosystem before we can assert ecosystem stability based on their dynamics are not understood.

Because these issues are important and unresolved scientifically, BEMRP has taken an active role in furthering this inquiry. This year, BEMRP is supporting a symposium to bring together a group of leading scientists to discuss these issues and propose a way forward. This symposium is being organized by Dr. Barry Noon, a member of the Committee of Scientists who took the lead in formulating their focal species concepts. The symposium will occur this winter in Fort Collins, Colorado.

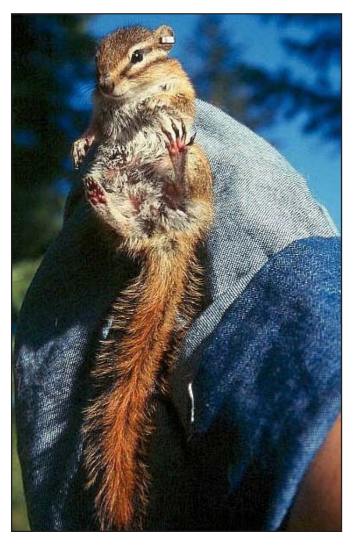
Research Highlights

Evaluating Effects of Exotic Weeds and Restoration Treatments on Plants and Animals of Forest Savannas

Yvette Ortega and Kevin McKelvey
RMRS, Wildlife Research

Exotic organisms pose a major threat to global biodiversity and have significant impacts on ecosystem function. Spotted knapweed, our region's most pervasive exotic weed, was introduced from Eurasia in 1923 and has spread to every county in Washington, Idaho, Montana, and Wyoming. Knapweed invades open areas, including savanna habitats within forest ecosystems. Forest savannas are grasslands with scatterings of trees that provide important habitat for numerous species. For example, elk use them as winter ranges, and chipping sparrows move in to breed in mid-May.

We are currently conducting a three-year study to examine effects of exotic weeds on plants and animals of forest savannas. Preliminary data analyses from eight study sites on the Lolo National Forest indicate that knapweed is impacting native plant communities by displacing native grasses such as bluebunch wheatgrass, and native forbs, such as arrowleaf balsamroot. This simplification of the native plant community may in turn impact small mammals, birds, deer, and elk — all of which depend on native plants for food and structure. Alterations in plant communities may similarly impact insects, which constitute an important food source for small mammals and birds. Because of the interdependency of plants, insects, small mammals, and birds, and their important roles in forest systems, there are numerous potential implications of weed invasion. We are currently collecting detailed data on all these components to understand how exotic weed invasion alters forest savannas.



Red-tailed Chipmunk. Photo by Dean Pearson.

In a related study, we will use this multi-level research approach to evaluate the effects of management strategies that employ herbicide and prescribed fire to restore historic conditions within forest savannas. Collectively, these studies will enable us to assess the ecological state of weed invasion and the efficacy of restoration treatments to improve the management of forest ecosystems.

Faithfulness of Songbirds
The Perspective of Yellow Warblers

Banded Yellow Warbler. Photo by Amy Cilimburg

Warblers are small North American songbirds that feed primarily on insects. All are brightly colored and known for their warbling songs. Many people are concerned about potential declining populations, based on habitat fragmentation or loss. University of Montana graduate student Amy Cilimburg has been studying Yellow Warblers in Montana to determine if this population might be declining.

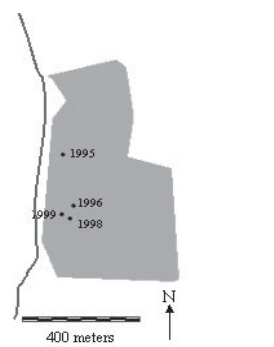
Yellow Warblers are neo-tropical (wintering in new world tropical areas) migrants that arrive in Montana during May and depart for Mexico in August or September. They nest in deciduous riparian areas. Like most songbirds, they often build multiple nests during a season when predators destroy their eggs or young. One cannot easily follow warbler migration or movement because they are too small to wear satellite trackers.

During the 1998 and 1999 Yellow Warbler breeding seasons, Cilimburg and her field assistants reached their research site at sunup to survey warblers. Throughout their morning watch, they carefully listened for these tiny birds' distinctive song to divulge their location. They played a tape of a warbler song, and male warblers, brighter and easier to see, typically responded aggressively. Once a warbler was located, the researchers used binoculars to determine if it wore colored leg bands, designed to identify each bird.

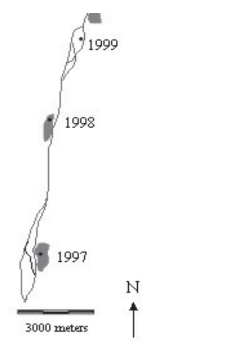
The vigil provided valuable data on how faithful Yellow Warblers are to their previous breeding sites. Scientists typically assume most songbirds are very site faithful. Remarked Cilimburg, "Generally, the assumption is if the bird doesn't come back it's probably dead. We don't know if it's dead or if it just decided to breed somewhere else." Cilimburg's research indicates some warblers that fail to return to their previous breeding site may still be alive in nearby areas. In 1999, she found 30 percent of the returning birds were located off the study site on which they were banded, dispersing from 0.1 to 24 km. She calls this phenomenon "breeding dispersal" and is entering her data into a statistical program that will provide a better estimate of warbler survival rates. To some degree, warblers appear to have a genetic tendency that steers them back to the same breeding site. They also may learn from previous experience and choose a different site next season, based on negative experiences. In view of increasing habitat fragmentation, knowledge of breeding dispersal and movement patterns will help scientists better estimate warbler population trends and enable appropriate conservation measures.

Recording Yellow Warbler data. Photo by Milo Burcham.

Example of site-faithfulness. Breeding territory for one male at Bitterroot River site #1 (Teller Wildlife Refuge). The bird was not seen in 1997.



Example of breeding dispersal. Breeding territory for one female in three consecutive years. Darkened plots are Bitterroot River study sites # 1 through 3.



ECO REPORT

Ecosystem Management Means Partnership

Furthering the goals of this project requires public participation in decision making. Would you like to become a partner? For more information, please contact

Greg Jones, Program Leader
Rocky Mountain Research Station
P.O. Box 8089, Missoula, MT 59807 (406-542-4167)
e-mail: jgjones@fs.fed.us

Sue Heald, Forest Planning Officer, Bitterroot National Forest
801 North 1st St., Hamilton, MT 59840 (406-363-7142)
e-mail: sheald@fs.fed.us

Professor Robert Pfister
The University of Montana School of Forestry
Missoula, MT 59812 (406) 243-6582
e-mail: rpfister@forestry.umt.edu

Visit the Bitterroot Ecosystem Management Research Project on the Internet!
www.fs.fed.us/rm/ecopartner

Lapplanders and Native Americans
Intriguing Contributors to Forest Biodiversity

Lars Östlund, Associate Professor of Forest Ecology at Swedish University of Agricultural Sciences in Umeä, Sweden, studies the effects of native peoples' activities on forests of Northern Scandinavia. He collaborates with archeologists, historians, and ethnologists, and has been studying the practice of peeling trees for food by native peoples in the northern hemisphere, prior to the 1900s. Having completed extensive research on peeling among the Sami (Lapplanders) in Scandinavia, summer of 2000 found Östlund in western Montana studying similar practices that occurred in the Bitterroot Valley and in the Bob Marshall Wilderness. He will return next summer to continue his data collection.

Sami people, whose traditional livelihood was primarily raising reindeer, practiced bark peeling on Scots pine, which resembles ponderosa pine in the Northern Rockies. Samis peeled the outer bark during spring when removal was easy. Sheets of inner bark, or cambium, were then prepared as a staple food resource. Sami ate bark fresh, dried or roasted, obtaining carbohydrates, Vitamin C and fiber, helping to balance a diet high in protein and fat. One unique result of eating inner bark was protection against scurvy (Vitamin C deficiency). In contrast, coastal Scandinavians who ate no bark suffered serious scurvy-related illnesses. Bark peeling was also imbued with much religious significance. Linguists have traced inner bark use, and its associated culture, via Germanic and Baltic loan words, which came into the Sami-Finnic protolanguage before the second millennium B.C. Sami bark peeling ceased when land use regulation, modern agriculture, and large-scale timber cutting operations became dominant in the late 1800s.

Östlund's Bob Marshall study aims to interpret Native American use of ponderosa pine forests by examining Indian peeled and fire scarred trees. Cultural, ecological, and historical records will be used to corroborate findings. Östlund hypothesizes Native Americans used pine inner bark as a diet staple, similar to Samis. The pattern of scarred trees seems related to frequently used campsites, and Native Americans appear to have promoted the ponderosa forest by active burning.

Östlund termed his work "the archeology of living trees. It's rather important that we study this now when we still have the trees because each decade we lose some of this information. We lost trees like this in the Bitterroot fires this year." By understanding how native peoples used and shaped past forest ecosystems before the evidence disappears, we gain valuable information about the historic components and processes necessary for future ecosystem management decisions. Potential applications of Östlund's research include using fire to maintain historic ecosystem processes, protecting forests' cultural history through locating and preserving scarred trees, and establishing a guide for locating and interpreting these trees.

Lars Östlund (right) inspecting Indian peeled ponderosa pine at Fales Flat, Bitterroot National Forest. Photo by Steve Arno.

Scots pine in northern Sweden, bark peeled in the early 19th century by Sami people. Photo by Lars Östlund.

Lars Östlund with ponderosa pine in Montana's Bob Marshall wilderness, bark peeled in the late 19th century by Native Americans. Photo by Rikard Andersson.

Tending the Garden at Tenderfoot Creek Experimental Forest

Ward McCaughey
RMRS, Vegetation Research

The Tenderfoot Research Project, conceptualized in the late 1980s, was formally developed and initiated in the early 1990s. This research was designed to evaluate alternative harvesting methods in lodgepole pine, integrating fire with silviculture, and to develop demonstration areas for managers, researchers, and the public. Research will evaluate the effects of innovative harvesting methods on resources such as water quality and quantity, wildlife, forest fuels, and vegetation. Lodgepole pine forests at Tenderfoot are similar to those on the Bitterroot Front, both in composition and fire suppression history. Results from the Tenderfoot Research Project will provide new alternatives for managing lodgepole pine to improve forest health and reduce fuels.

Past research studies and monitoring efforts at Tenderfoot provide a variety of baseline information for evaluating effects of research treatments. Baseline data include climate, hydrology, wildlife, fisheries, and vegetation. Figure 1 depicts a stream monitoring flume site on Tenderfoot Creek, and Figure 2 shows scientists taking snow depth and density measurements for winter precipitation inputs.

The harvest methods being tested include two shelterwood with reserve treatments. One treatment leaves trees in an even distribution while the second treatment leaves trees in untouched groups ranging in size from one-half to over two acres. Figure 3 illustrates evenly distributed trees on the left and a dense group of leave trees on the right. After eight years of baseline data collection, research treatments were installed during the summer of 2000 with prescribed fire treatments scheduled for 2001.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 1. Stream monitoring flume.

Fig. 2. Scientists taking snow measurements.

Fig. 3. Harvest treatments at Tenderfoot Creek Experimental Forest.

Photos by Ward McCaughey.

The Learning Center

A New Direction in Conservation Education

"We share what our members know about Ecosystem Management (EM) and how they do it," says Carolyn Durgin, Program Coordinator for the Montana Ecosystem Management Learning Center Program. The Program is a partnership among the Forest Service, University of Montana, Montana State University Extension Forestry, Swan Ecosystem Center, Glacier Institute, Boone and Crockett Club, and Montana Department of Natural Resources and Conservation. Durgin continues, "We define EM as a concept and process for satisfying human concerns for the environment, economic well-being, and social harmony. However, the definition evolves as we learn, so no one can be an expert in EM."

Stressing cooperation, networking and ongoing learning, the Learning Center works with teachers, students, researchers, land managers, and public groups. Activities include classroom instruction, workshops, field trips, curriculum development, and teacher training at eleven learning sites that provide demonstrations in an accessible field setting.

Education requires communication. Communication in Learning Center programs includes a variety of traditional methods, but Durgin believes hands-on field trips are ideal. "Providing information isn't enough; there must be something in a person's experience that gives them ownership and motivation to act."

Since learning is a highly complex process, Learning Center programs address a variety of "learning styles," namely, verbal/linguistic, logical/mathematical, kinesthetic, musical, visual, intrapersonal, and interpersonal. Also, different teaching methods produce different rates of information retention. For example, average retention rates vary from 5 percent for lecture and 10 percent for reading to 75 percent for practice-by-doing, and 90 percent for teaching others (The Learning Pyramid, National Training Lab, Bethel, Maine). "Learning styles also affect what we want to learn." Some ask, " **Why** does this work?" Some focus on **what** the facts are. Others inquire **how** something works. Finally, some ask "**what if?**" Durgin notes, "It's basically putting variety into how you teach so that different types of learners pick up the main points." Combining classroom instruction with interactive field demonstrations appears to maximize the success of conservation education for a variety of groups and individuals.

Learning Center partners are learning together as they share how various EM concepts and treatments attempt to address the needs of all ecosystem components. For more information on the Learning Center Program contact Durgin at (406) 243-6655 or chd@forestry.umt.edu.

Students learn about wildlife forage at Pattee Canyon/Mount Sentinel Learning Site. Photo by Carolyn Durgin.

Climbing the Rocks
Resolving Management Issues

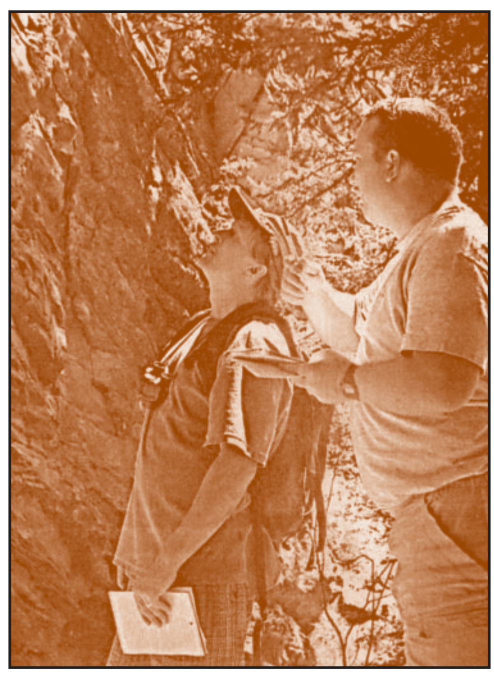
A perfect "rock climbing face" in Kootenai Canyon, Bitterroot Mountains. Photo by Jim Harding.

While many are content to visually enjoy the splendid summits of Montana's Bitterroot Range, others are born to climb them. However, like all natural resources, these majestic peaks form the context for user conflict, leading University of Montana graduate student Jim Harding and forestry professor Bill Borrie into the world of rock climbing issues research.

Rock climbing in the Bitterroots has steadily increased over the past ten years. Harding and Borrie became involved after an initial dialogue among local climbers, the Forest Service, and long-time residents raised three issues: erosion on approach trails, cultural site management, and the method and frequency of climbing bolt placement. In a BEMRP funded project, Harding collected data using participant observation in which the researcher actively joins the context of the community, participates in its affairs, and understands it from within. During summer 1999, Harding conducted informal conversations with climbers at two primary climbing areas – Blodgett Canyon, known as the "Yosemite of the Bitterroot," and Kootenai Canyon (where the climbing site is on private land adjacent to the Bitterroot National Forest). These conversations have fostered continued collaboration between the Forest Service and climbing community to resolve issues. Every climber interviewed by Harding indicated an awareness of each issue. His data also revealed other interesting facts, for example, the differing desirability of each site and the makeup of most of the climbers (predominantly University students, in addition to locals). It will be used to develop climbing guidelines and monitoring activities although its uses will be limited to publicly owned sites.

During the 2000 climbing season, Harding began assessing the effectiveness of three treatment messages, using printed signs placed in the climbing areas. The first focused on normative pressure, exhorting climbers to stay in good status with their fellows. The second targeted ethics, encouraging climbers to consider their behavior in the context of their personal environmental ethic. The third provided information on recreation impacts. A control message supplied general information about the climbing site. Harding evaluated the effectiveness of the messages using a questionnaire about climbers' behavior. According to Harding, climbers seemed interested and willing to participate in the survey, most hoping to continue long-term dialogue with the Forest Service and researchers to maintain and improve climbing opportunities.

Harding thinks the circular nature of his data collection process (which moved from a collaborative dialogue, to qualitative fieldwork, to quantitative assessment of treatment effectiveness, and back to collaborative dialogue) is a salient feature of this project. "It's iterative, kind of the snake eating its own tail, perpetually so." In summary he noted: "It became clear that while there may be people unhappy with certain things and there may be some resource problems, the Bitterroot Valley doesn't have near the problems of climbing areas elsewhere. Most of the people I talked to have climbed [elsewhere] and talk about how terrible things have gotten there, but we're not nearly in the dire straits that some other areas are."



Researcher Jim Harding (right) and Bill Goslin, Stevensville Ranger District, assess impacts of rock climbing in Kootenai Canyon. Photo by Jenny Johnson, Ravalli Republic.

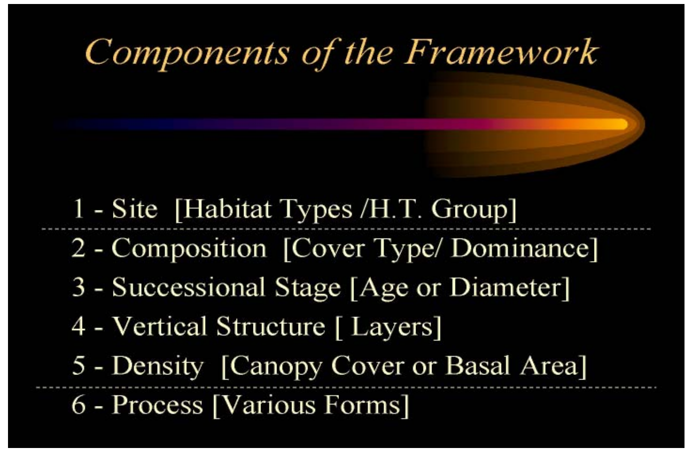
Ecosystem Diversity Framework

Robert Pfister
University of Montana, School of Forestry

Forested landscapes display a variety of vegetation patterns over time and space. These patterns reflect: 1) a wide mixture of physical environments exhibiting variation in elevation, aspect and soils, 2) the continual process of vegetation change over time, and 3) the interaction of natural and human disturbances – fire, insects, disease, wind, and management practices. Patches of uniform vegetation can be identified and mapped as stands. Similar patches can be put in groups called stand types. Landscapes can then be described as a collection of different stand types.

Classification is a formal tool used to encapsulate nature's infinite variety in categories about which we can then make generalizations to communicate knowledge. Although different vegetation classification systems have been developed for specified purposes, we need standardized, all-purpose classifications to help us study and manage landscapes at different scales. "Ecosystem management" and "sustainable forestry" require standardized classifications to provide the building blocks and tools to study and plan landscapes over long time periods. The Ecosystem Diversity Framework (EDF) attempts to bring together different classification approaches, standardize their use, and enable improved landscape analysis and communication.

The current version of EDF used in western Montana has five unique components or variables. The first is a site classification system based on natural vegetation called "habitat types." These are aggregated into general "habitat type groups" to reflect major differences in physical environments (climate, microclimate, topography, elevation, and soils). The other four components are based on attributes of current vegetation: size, composition, density, and vertical structure. Size classes range from seedlings and saplings to small, large, and very large dominant trees. Composition is based on the major dominant species such as ponderosa pine and lodgepole pine. Density classes are based on percent canopy cover and range



Ecosystem Diversity Framework components.

from very open to very dense stands (closed canopy). Vertical structure is based on the positions of tree crowns, ranging from single-story to multiple-story appearances. A sixth possible component is "process-based structure types," an alternative classification system. We need further research to integrate this classification approach with the other five components.

Each component can be used independently as a simple classification or combined into different matrices to address specific questions. These classifications can be used to label stands for inventory, for map displays with GIS (Geographic Information Systems), and for inputs and outputs to landscape models like SIMPPLLE or MAGIS. The EDF, in summary, seeks to develop a standardized ecological classification system for inventorying, studying, analyzing, and modeling landscapes and how they change through various disturbances and processes over time.

The Acceptability Question: An Enigma of Implementing Nonspatial Strategic Forest Plans in Real Time and Space

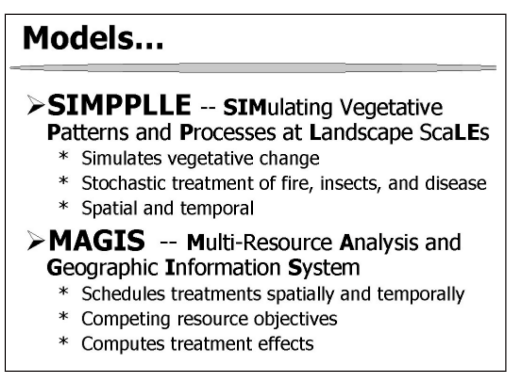
Greg Jones, Program Leader
RMRS, BEMRP

Forest plans developed in the 1980s for the Bitterroot and other National Forests are scheduled for updating in the next few years. The original analysis used FORPLAN, a nonspatial planning model. Acres allocated to each treatment type were computed into the future, by decade, along with a prediction of the resulting outputs and effects. FORPLAN did not specify **locations** for these treatments. Rather, it identified only that they occur within specific categories of ground, which may be present at various locations in the Forest.

The treatment schedules in those nonspatial plans seemed feasible at the time. However, as they were implemented on the ground, a whole new set of considerations surfaced, many of which were spatial in nature. It became difficult, if not impossible, to treat the number of scheduled acres and still satisfy the plan's standards and guidelines, which specify how effects are to be distributed across the landscape. For example, adequate wildlife habitat may be required for various species within certain third order drainages, or sediment and water yield guidelines applied to individual watersheds.

The question becomes how to handle spatial issues in the next round of forest planning. An immediate reaction might be to conduct **spatial** analysis in the next plans. Considering the sheer magnitude of acres involved, data required, and time needed to assemble and analyze data, this option is probably cost and time prohibitive.

Another idea is building spatial models for representative areas on a Forest to provide feedback into the nonspatial forest planning process. These would test whether a nonspatial plan could be implemented spatially on representative areas and accomplish the planned objectives. This would be realized by applying models to develop spatial treatment schedules, using stated objectives, analyses of the location and likelihood of various processes and disturbances (fire, insects, and diseases), and computing the combined effects of this on resource values. If analysis indicates forest plan objectives cannot be accomplished on those representative areas, the opportunity exists to re-tune the nonspatial plan and try again.



Description of spatial models SIMPPLE and MAGIS.

Carrying this idea a step farther, it may be possible to project spatial analysis results from these representative areas to "like" areas on a Forest, thereby estimating the feasibility of possible treatments on those areas too. These ideas are currently being tested in a study funded by BEMRP, using the spatial models MAGIS and SIMPPLLE.

The "Spotlight"...highlighting researchers at work:

Bob Pfister "Applied research is the fun stuff!"

Bob Pfister lecturing at the Regional Training Academy in Missoula, Montana. Photo by Janie Canton-Thompson.

Applying research to aid forest management is a familiar role for Research Scientist and Professor, Bob Pfister. Bob comes by his holistic approach to forestry honestly. He was reared on his family's diversified farm and woodlot in "the little Switzerland of Iowa," near Decorah. "That was my original exposure to forestry and conservation," remarked Bob.

Bob earned a Bachelors Degree in Forest Management at Iowa State University. Following graduation, he migrated to the Pacific Northwest, spent a summer as a lookout near Mount Rainer, and then a summer working for the State of Oregon. After receiving his masters degree in silviculture at Oregon State University, Bob launched a career that took him to the heart of forest management and a pioneering role in ecosystem management (EM) research.

Beginning in 1961, Bob accepted a position in applied silviculture research and forest management at the Intermountain Forest and Range Experiment Station in Moscow, Idaho. Here, he managed the Deception Creek and Priest River Experimental Forests and received his PhD in botany from Washington State University.

In 1967, Bob became the Silviculture Unit Project Leader at Missoula's Forestry Sciences Laboratory. By 1970, he was Project Leader of the Forest Ecosystem Research Work Unit, heavily involved in EM research when it was an obscure specialty. During the 1970s, Bob's team developed a forest habitat type classification system for most of the Intermountain Station area. This system and an evolving Ecosystem Diversity Framework (see article on page 8), provide two rigorous classification systems underlying EM in the Northern Rockies.

In 1981, Bob left the Forest Service to become Director of the Mission Oriented Research Program at the University of Montana's School of Forestry. Here, he augmented research duties with teaching, leading numerous continuing education courses, and developing cooperative research programs. No stranger to academia, he had been teaching weekend classes at the University since 1971. In 1985, Bob added the position of Associate Director of the Montana Forest and Conservation Experiment Station to his duties.

Among the landmarks in his career, Bob lists Society of American Forester participation, membership in the ECOCLASS Task Force, publication of *Forest Habitat Types of Montana* in 1977, leadership of the Inland Northwest Growth and Yield Cooperative, initiation of the Montana Riparian Association, and active involvement in New Perspectives Forestry and EM in the 1990s. Another highlight came in 1993 when former BEMRP Program Leader Clint Carlson asked him to collaborate with the Program as a Forestry School representative, thus closing a loop in his career circle.

"This gave me a way to reunite with the Forest Service family and be part of it. I'm thankful for a career that has provided me the opportunity to work half of my career with the Forest Service and half of my career with the University, integrating applied research with forest management in both contexts."

Bob is currently going through another career metamorphosis. He is retiring "at the end of the millennium." In 2001, Bob will rejoin the Forestry School under a one-third time post-retirement contract where he will pursue his research priorities and remain active in the Mission Oriented Research Program, the EM Learning Center Program, and BEMRP, leaving more time for family and personal interests.

Bob's family includes his wife Marietta (a former school music teacher), three grown sons, their wives, and six grandchildren. Outside of work, he and Marietta enjoy traveling, and Bob sings with his church choir and the Rocky Mountainaires, a barbershop chorus. He also enjoys golf, sports, outdoor activities, and reading in his spare time.

Book Corner

A Review of Some Study Guides on Fire in the Forest

Stephen F. Arno
RMRS, Retired

The record-setting 2000 fire season emphasized that western Montana residents are living in fire-dependent ecosystems. There are reasons why everyone interested in forests should study fire. The emergence of tens of thousands of new homes in and near our wildland forests since 1970 makes it difficult to manage fire and fuels in adjacent public lands. Many resources allocated to fire suppression in 2000 were diverted to protecting vulnerable forest homes. Personal responsibility is an admired and expected trait of residents of the rural West. Since many of us have chosen to live in or near forests, we share the responsibility for learning about fire so we can appropriately manage our own property and help with recommendations for public forests. We can also provide knowledge-based input to county commissioners as they consider improving fire-safe standards for new and existing forest homes.

The following are some educational resources on the ecological role of fire, fire behavior, and ways to manage fire and fuels:

***Fire Ecology of Pacific Northwest Forests* by James K. Agee, 1993. Island Press. 493 p. $38 paperback** (phone orders: 1-800-828-1302).

Although intended as a college text and reference book, I recommend it for anyone with a moderate knowledge of and deep interest in wildland forests. While focusing on forest types found in Washington, Oregon, and northern California, it also covers most Northern Rockies types. Chapter 1 explains natural fire regimes, and how fire has shaped forests since the last ice age. Subsequent chapters describe how and why fires burn; human relationships and the use of forest burning from ancient times to the present; methods for determining fire history; fire effects on vegetation, soils, water, and air; and approaches for rehabilitating burned areas. Six chapters describe the role of fire in major regional forest types, half of which make up most Northern Rocky Mountain Forests. General audiences should note that these types are based on potential climax tree species, not the most common tree. The last chapter deals with fire management issues, including forest health in the inland mountains and fire's relationship to global climate change.

Dr. Agee, a recognized authority on fire ecology, is good at delivering a synopsis of voluminous scientific knowledge. The book has a simple, effective style of referencing other literature; it has useful illustrations, an index, and a small glossary of technical terms.

Another book provides an excellent guide to forest fires for general audiences, but unfortunately is no longer in print. Nevertheless, it should be available in some libraries and might be found through book search services. ***Forest Fires* by Margaret Fuller, 1991. John Wiley & Sons, New York. 238 p. paperback**. The book is a layperson's guide to wildland fire ecology, behavior, management, firefighting, and prevention. Its author focuses on forests of central Idaho, which are comparable in many ways to those of western Montana.

The Bitterroot Ecosystem Management Research Project: What We have Learned is a valuable resource. A synopsis of findings from five years of studies, it consists of more than 50 short articles on subjects like comparing historic and modern forests on the Bitterroot Front, ecosystem-based management in the ponderosa pine zone, silvicultural treatments, prescribed fire applications, soils and nutrient considerations, wildlife habitat considerations, restoration of native plant communities infested by invasive weeds, and ecosystem-based management in several forest zones. See this Eco-Report, page 6, to find out how to receive a free copy.

"What Do You Mean By That?"

Last year we previewed a glossary of unfamiliar terms planned for BEMRP's web site, which is still under construction. This year we offer you additional and perhaps unfamiliar terms used by fire scientists (definitions adapted from Temperate Forest Foundation Fire Ecology Glossary at web site http://forestinfo.org/fire.htm). Again, we invite you to suggest new terms for inclusion in our developing glossary.

Crown fire - A fire burning into the crowns of vegetation, generally associated with an intense understory fire.

Fire regime - The combination of fire frequency, extent, predictability, intensity, and seasonality in an ecosystem.

Lethal underburn - A fire that, although it consumes only surface and understory fuels, kills the overstory through crown scorch, cambium damage, or both.

Prescribed fire - A fire ignited under predetermined, known conditions of fuel, weather, and topography to achieve specific management objectives.

Prescribed natural fire - A fire ignited by natural processes (usually lightning) which is allowed to burn within specified, predetermined parameters of fuels, weather, and topography to achieve specific objectives.

Surface Fire - A fire burning in ground surface fuels without significant involvement of the understory or overstory, with flame lengths usually below 1 meter.

Understory - The layer formed by the crowns of smaller vegetation in a forest.

Understory fire - A fire burning in a layer formed by the crowns of smaller vegetation in a forest, which is typically more intense than a surface fire and has flame lengths of 1 to 3 meters.

Wildfire - A fire of either natural or human ignition, not meeting land management objectives, and requiring suppression.

Profiling Economies Near Forest Service Lands

Larry Swanson
University of Montana, O'Connor
Center for the Rocky Mountain West

Preparing area economic profiles, in other words, collection and analysis of data characterizing the structure, makeup and important changes of local economies, has traditionally been an important part of Forest Service planning. However, over time these profiles become outdated.

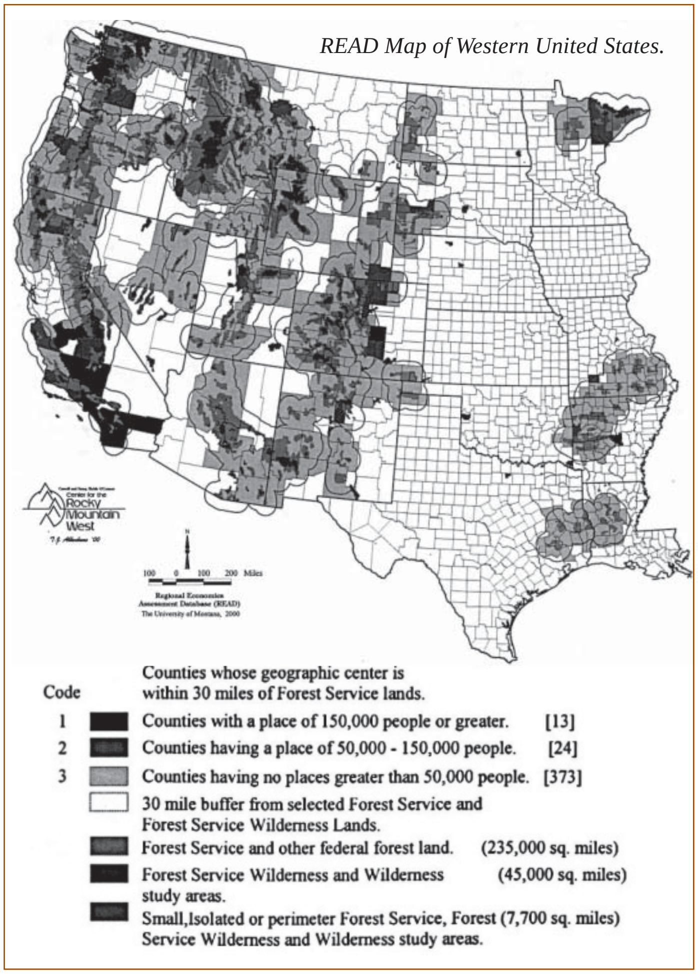
Economist Larry Swanson developed a framework for assessing and profiling such economies. In a BEMRP-funded study, Swanson has helped design a new framework for assessing and profiling economies of areas near National Forests, such as the Bitterroot Valley. Swanson is Associate Director of the O'Conner Center for the Rocky Mountain West and head of its Regional Economy program. Recently, he designed Regional Economies Assessment Database (READ), a web-based evaluation system for the comprehensive, systematic assessment of regional economies.

In READ, economic data are organized at different regional levels since changing economic patterns can be best viewed and interpreted at the sub-state level. In the BEMRP study, economic data are also being organized for areas adjacent to National Forest lands. In southwestern Montana, the Bitterroot Valley economy is being evaluated relative to economic changes in non-metro areas near intermediate population centers and near National Forests. Knowing how the Bitterroot economy (essentially Ravalli County, Montana) compares to similarly positioned western U.S. areas will provide context for analyzing and interpreting changes.

During the 1980s, Ravalli County experienced a net population gain of 1,530 people. Then, in the 1990s, the population, spurred primarily by in-migration, increased by 43 percent – from around 25,000 in 1990 to 35,800 in 1999 – making it one of the 50 fastest growing counties in the U.S. While many locals wondered what caused this dramatic shift, a similar pattern occurred in other non-metro areas near National Forests.

In this study, Swanson isolated counties sharing these features: 1) near National Forests, 2) no area larger than 50,000 people, 3) near intermediate-size population centers (30,000 to 160,000 people), and 4) wood products industry dependent in 1977 (wood products manufacturing accounted for over 10 percent of area labor income). There are 23 such counties in the West, including Ravalli, that meet these standards. During the 1980s, these combined counties lost over 4,000 people through out-migration, but added more than 51,000 people during the 1990s. Their combined dependence on wood products manufacturing declined from 27 to 16 percent from 1977 to 1992. During this time, Ravalli County's dependency on wood products manufacturing fell from 11.3 percent to 9.6 percent, a decline which might have been greater had it not been for expansion of log home manufacturing.

READ Map of Western United States.



Personal income compositions are also shifting dramatically. In 1977, 67 percent of income received by residents of the 23 counties was labor earnings. By 1997, this share had fallen to 52 percent. In Ravalli County, it declined from 58 to 51 percent. Almost half now comes from transfer payments, including social security and investment.

These are but a few of the interesting facts comprising the economic profile being prepared for this project. This, together with an assessment of the Bitterroot Valley economy and instructions for using READ in the ongoing assessment of area economies, will be included in the final report.

Improving the Link between Research and Management

Vita Wright
Aldo Leopold Wilderness Institute

BEMRP has fostered collaboration between scientists and managers to conduct a variety of research projects. Whether scientists and managers collaborate, or scientists conduct research independently, there must be a process for transferring research results to managers and for incorporating them into manage-ment decisions. Scientists and managers work in vastly different cultures with different pressures and reward systems. Consequently, communicating results in a timely, effective manner can be challenging. The questions posed during this past year's fires provide an excellent example of the urgent information needs of managers. For instance, what will happen if we try to restore burned areas? How will we prevent weeds from infiltrating the Wilderness? What will the effects of fires be on ecosystems that burned, and are management actions needed to mitigate these? Relevant research is often buried within scientific journals stored in university libraries, making it difficult for those who need information to find it. Technology transfer and research application specialists are scattered throughout the Forest Service to cross these cultural boundaries and focus on making research results more accessible to managers. They do this through a variety of tools, including non-technical research summaries, presentations, workshops, and the Internet. Perhaps the most effective method is one-on-one communication and working directly with management teams. The agency is investigating the potential roles additional "boundary spanners" could play in improving communication between researchers and managers.

BEMRP Sponsors Bitterroot Fire Tour

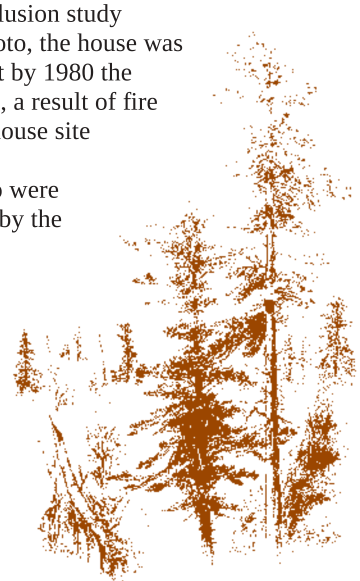
On October 16, 2000, the Bitterroot National Forest and BEMRP sponsored a tour of last summer's burned area. Retired Bitterroot Forest Fire Management Officers Bob McKee and Brooke Thompson led the all-day event attended by BEMRP and other RMRS researchers.

Starting at Hamilton, participants drove through the Blodgett Fire area, a person-caused fire of about 12,000 acres. Here they viewed results of a stand replacement crown fire and lethal underburn where one home was lost. They also saw a recently implemented Burned Area Emergency Rehab (BAER) Project, where volunteers from the local community had spread straw to intercept precipitation, slow overland water flow, and protect emerging plants. Interestingly, new growth was already evident on willow and other shrubs.

The group then drove south on U.S. Highway 93 through portions of the Skalkaho and Valley Complexes and witnessed parts of more than 300,000 acres of burned federal, state, and private lands. A side trip included Robbins Gulch with lunch at the head of Moonshine Gulch. There, the group discussed fire implications and research possibilities. Heading out Rye Creek, they drove south through East Fork Canyon where fire burned on both sides of Highway 93. While several houses were lost here, many remained unscathed, in large part due to suppression efforts by fire fighters.

The next part of the tour included a 15-mile loop through the Sula Complex, driving by destroyed homes in the Laird Creek area. Several BAER projects were also evident, including placement of straw "waddles" and contour felling for erosion control. As the tour continued over Bear Creek saddle, the burn became more of a mosaic of varying severity instead of the stand replacing burns seen elsewhere.

The tour proceeded south to Ross' Hole where the Sula Complex fire camp was burned over on August 6, 2000. The final stop was at the site of a log house featured in paired photos published in an earlier fire exclusion study (Gruell, 1983). In the 1895 photo, the house was flanked by a grassy hillside but by 1980 the hillside was covered with trees, a result of fire exclusion. Both the trees and house site burned in 2000.



All members of the group were both humbled and invigorated by the results of a natural disturbance not seen in the Bitterroot for at least 300 years. The fieldtrip became the first in a subsequent series of Bitterroot Forest sponsored trips. Luring participants from as far away as Switzerland, the trips continued twice weekly until mid-November. In Spring 2001, the Bitterroot Forest hopes to reinitiate these tours, which are open to the public.

ECO-Report

Bitterroot Ecosystem Management Research Project
USDA Forest Service
Rocky Mountain Research Station
P.O. Box 8089
Missoula, MT 59807

BEMRP Fire Tour 2000 lunch break. Photo by Kurt Krueger.