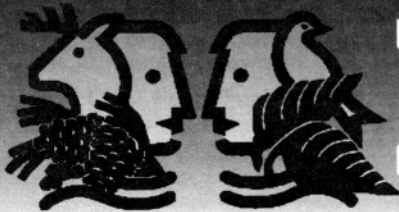


BITTERROOT ECOSYSTEM MANAGEMENT
RESEARCH PROJECT

ECO



REPORT

SUMMER, 1997

A Progress Report from a Partnership in Landscape
Level Ecosystem Management

Third Annual Project Workshop:

Collaboration at the Heart of the Job

Forest ecosystems must be managed through collaborative stewardship, Regional Forester Hal Salwasser explained to researchers, Forest Planners from the Northern Region, line officers, project planners, and resource specialists at the Bitterroot Ecosystem Management Research Project's annual workshop. The global demand for services and products from forests will continue to grow rapidly in the coming years, according to Salwasser. Scientists and managers must work together to ensure that temperate forests can continue to provide services and products for centuries to come.

Intermountain Station Director Denver Burns pointed out that researchers need to maintain objectivity in regard to management decisions even in collaboration. If objectivity is lost, he said, the reliability and credibility of management based on science will be lost, too.

The workshop, held March 11 and 12 in Missoula, alerted managers throughout the Northern Region to Project research. The first day focused on connections between research, Regional guidelines for planning, and the Columbia River Basin assessment. Forest Service personnel from the Region have worked on planning protocols during the past year, reported Doug Glevanik, Regional Director of Ecosystem Assessment and Planning. Protocols, Glevanik explained, are recommended ways to "gather and store data, analyze data, interpret and use results, and set consistent definitions and terminology." Selected protocols were presented in tandem with research projects to demonstrate ways to obtain information for planning and management. (See stories on pp. 4, 6, and 12.)



Elizabeth Bella (seated), Chris Stalling (center), and Judy Friede (right) register participants at the March workshop.

On the workshop's second day, researchers summarized individual projects, many of them described in this issue of ECO-Report. To close out the day, a panel of Bitterroot residents and planners summarized their thoughts on public involvement in planning (see article, p. 6).

Summer Field Trips – Mark Your Calendar!

The Bitterroot Ecosystem Management Research Project is hosting three field trips for the public this summer, so mark your calendar and watch for more information in future mailings.



On a field trip in July, 1996, Josh Tewksbury shows the many-layered nest of a Yellow Warbler that has been parasitized by a Brown-headed Cowbird.

As ECO-Report goes to press, plans are in place to visit "Habitat for Small Ones" on July 9. Stevensville wildlife biologist Dave Lockman will describe bird habitat in aspen and upland sites. University of Montana graduate student Josh Tewksbury will lead visitors to nest sites of neotropical migrant birds, and ecologist Dean Pearson will share his discoveries about small mammal habitat.

On July 29, learn about "Silviculture and Fire for Ponderosa Pine Forests." Visit the Bear/Fred Burr demonstration area in forest composed of second-growth ponderosa pine and Douglas-fir. To reduce

fire hazard and improve conditions for developing old-growth pine in this forest, three management strategies have been used, including prescribed fire. Research Forester Steve Arno will describe fire history. Cathy Stewart and Brooke Thompson, Stevensville silviculturist and fire management officer, will describe treatments. Bitterroot Ecosystem Management Research Project Director Clint Carlson will discuss tree pathogens and their ecological roles, and researcher L. Jack Lyon will discuss elk habitat. Call 777-5461 to sign up.

On Sept. 4, come along to "Lick Creek: Ten Years of Managing for the Ecosystem." Researchers and Darby District staff will present current findings in the Lick Creek and Lost Horse Creek drainages, home of some of the Forest Service's first projects demonstrating ecosystem management. Call 821-3913 to sign up.

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Riparian Areas: Small Sites, Big Treasures

By Jane Kapler Smith

Riparian areas comprise less than one percent of the area in the western United States, according to Stevensville wildlife biologist Dave Lockman, but their role in providing habitat is enormous. Of the bird species that breed in western Montana, 65 percent nest primarily in riparian sites, using mainly deciduous shrubs and trees. Small mammals rely on large woody debris for shelter as they travel through the forest searching for food. Native fish require streams with clear water and pools around fallen logs. Sites with these qualities are treasures within the forested landscape, scientists and managers emphasized during a field trip for the public to Larry Creek last July (see article, p. 11).

At Larry Creek, researchers are using harvesting and prescribed fire to restore shrubs, herbs, western larch, and ponderosa pine while reducing potential for severe wildfire. Two years ago, when University of Montana graduate student Matt Arno began his research, the scenery was "a wall of grand fir," mostly 10 to 20 feet tall, with older pines, larch, Douglas-fir, and cottonwood interspersed. Shrubs were hard to find. Woody debris covered the ground—mostly twigs and branches from the dense undergrowth. Arno's goal has been to create a significantly more open forest structure where shrubs, cottonwoods, and aspen can thrive, and where ponderosa pine and larch can regenerate.

The treatments are nearing completion. The timber harvest protected large pines, larches, and cottonwoods. Using his 85-horsepower farm tractor and special harvesting winch, Arno removed nearly five truck loads of Douglas-fir and grand fir logs over frozen ground. Soil was doubly protected last winter, when the ground was covered by 20

to 30 inches of snow during skidding operations. All sapling and pole grand fir were cut. Felled saplings and poles were left on half of the area, which will be burned this fall. They were removed from the other half of the area and piled near the road, where firewood collectors could gather them. Material remaining there this fall will be burned.

During harvesting, the two small streams crossing the skid trail (an old logging road) received protection from temporary log bridges. Additional attention was given to stream habitat as several large logs were placed across streams and cut so their ends would rest in the water. Fisheries biologists hope these logs will cause pools to form. Pools are essential resting and feeding habitat for native trout species.

Treatments for the birds.

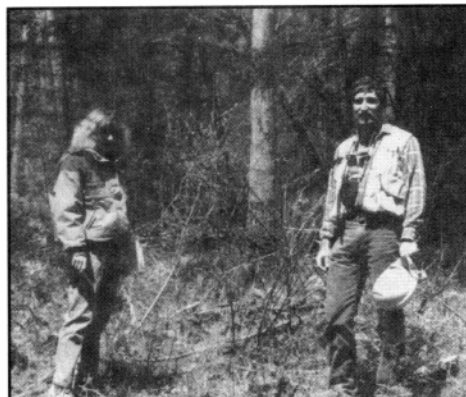
Are the treatments good for habitat? "I can't see that they would do anything but good for birds," Lockman says. A wild turkey nested on the harvested area this spring where, two years ago, it wouldn't have been able to find the ground. Remnants of shrubs were budding in small patches. If shrubs do not regenerate rapidly on the treatment sites, according to research director Mick Harrington, planting may be considered.

Harvesting and burning on a riparian site can actually protect it from severe fire, according to Leslie Anderson, Stevensville assistant fire management officer. If a severe fire burns through an untreated riparian area, streams are filled with silt for many years, and water temperatures rise substantially until vegetative cover is restored. According to Anderson, removing the dense fir at Larry Creek will help protect the site from severe fire. Monitoring will help managers learn what techniques work for protecting these ecological treasure troves.



(Left) Larry Creek site before harvesting, May, 1995: Can you find researcher Matt Arno next to the fire-scarred tree stump? Photo by Madelyn Kempf.

(Below) After harvesting: In May of this year, Dave Lockman (right) and Lucia Solorzano look for sprouting shrubs on harvested site.



Larry Creek Logs Come Full Circle



Mike Wilson shows possible location for picnic shelter to be built using timber from Larry Creek riparian restoration project.

Trees removed in the Larry Creek restoration project will keep the rain off families at reunions, children at school outings, and employees at company picnics.

Mike Wilson, resource technician with the Stevensville District, plans to use about a third of the logs harvested in the restoration project for a picnic shelter at the Larry Creek group campground. The shelter, he says, "will enable people to weather the short rainstorms we often have" in the area.

The logs have already been milled at Findley Lumber, Florence. Fill material and a concrete pad come next. A construction company will build the 16 by 20 foot shelter, which will accommodate five picnic tables.

Wilson hopes a concrete company will donate labor and/or materials for the shelter. Plywood and shingles are also needed. Contact the Stevensville Ranger District, 406-777-5461.

ECO-Report



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Stevensville Ranger Selects Management for Ecosystem Restoration

by Lucia Solorzano

Management of the 39,400 acre Stevensville West Central analysis area on the Bitterroot National Forest will focus on returning about 7,700 acres of land west of Victor and Stevensville to "a more sustainable condition." The Stevensville West Central Decision Notice, released in November 1996 and upheld in February 1997 following two appeals, clears the way for vegetative treatments.

The selected alternative (Alternative One) includes precommercial thinning on 1,200 acres, commercial harvesting on 1,100 acres, and prescribed burning on 5,400 acres. Alternative One was modified in response to public concerns about economic efficiency, feasibility, and harvest activities within the Selway-Bitterroot Roadless Area. The modifications reduced the total amount of vegetative treatments from 8,500 acres to 7,700. Four other alternatives were studied in the Environmental Assessment.

The decision by District Ranger Thomas G. Wagner followed work by his predecessor Leslie Weldon and an interdisciplinary team headed by Dave Silvius. Planning included one of the most extensive public outreach efforts in Bitterroot National Forest history—29 public meet-

ings, three field reviews, and two meetings with an interest group.

Wagner, in the decision notice, writes that Alternative One was "designed to restore the ecosystems and resource values in the area that have been affected by past harvesting, road construction, and the exclusion of fire. The Selected Alternative will ensure the sustainability of biological diversity and integrity at the landscape, community, and species levels through ecosystem stewardship actions."

Two groups appealed the decision notice, saying that it violated the National Environmental Policy Act by not completing an environmental impact statement, failed to comply with the Forest Plan Standards for elk habitat, and failed to comply as well with the Administrative Procedure Act by following "arbitrary and capricious decision making." However, Katherine Q. Solberg, the appeal reviewing officer, found that the District Ranger evaluated all available information that was relevant in making the decision. Solberg concluded in her report: "The decision and the rationale leading to the decision are well documented and demonstrate the decision is reasoned and informed."

Implementation of the decision has begun; projects are scheduled through the year 2000.

Projects planned in Stevensville West Central area:

- Vegetation restoration through commercial harvest on 1,100 acres of the 39,400 acre analysis area. Treatments are designed to enhance conditions for old-growth ponderosa pine, reduce fuel loads, and provide wood products.
- Prescribed underburning over a 20-year cycle on approximately 4,600 acres, including several ponderosa pine old-growth areas. Prescribed underburning will be implemented for one time only on 800 acres of upper-elevation whitebark pine.
- Implementation of a comprehensive watershed and fisheries restoration program. This project will include obliteration and inactivation of some roads to reduce sediment and improve fish productivity.
- Recreation access improvement. Parking areas and vehicle turnouts will be enlarged at Glen Lake Trailhead, Bear Creek Overlook, and Gash Point Trailhead.

Planners Put Models to Work

by Lucia Solorzano

Help in selecting an alternative for the Stevensville West Central area came from a variety of human sources and two forward-thinking inanimate ones—computer models designed to show what forest areas would look like with and without various treatments, the environmental effects of timber harvesting, and what costs may make certain types of treatment unsuitable.

The SIMPPLLE computer model, which stands for SIMulating vegetative Patterns and Processes at Landscape scaLES, and MAGIS, an acronym for Multi-resource Analysis and Geographic Information System, were used to give large-scale and stand-specific views of what the Stevensville West Central area would look like with and without underburning, thinning, or other treatments.

According to Dave Silvius, interdisciplinary team leader for the project, SIMPPLLE let the planners see how current forest health problems could worsen if left untreated. Says Silvius, "It indicated that we really needed to take some action to prevent stand-replacing fires. It also showed that without active management, the subalpine fir, which is susceptible to spruce budworm and stand replacing fires, would continue to replace lodgepole pine and whitebark pine."

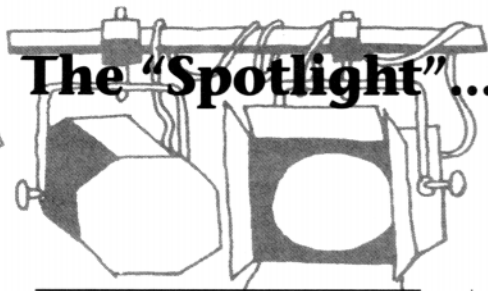
The SIMPPLLE model graphically displayed, continues Silvius, "that our 5 to 10 year program for timber sales would hardly make a dent in the spruce budworm and fuel problem. Additional harvesting and burning would be needed, over a longer period of time, to restore the landscape to a sustainable condition."

The MAGIS computer model examined each alternative, stand by stand, indicating how well the proposed treatments would meet

watershed, wildlife, and economic objectives. MAGIS is scheduled for use again to help an interdisciplinary team describe existing conditions and develop alternatives for the Daly Creek/Skalkaho analysis area on the Darby Ranger District.



Dave Silvius shows locations in the Stevensville West Central area where MAGIS recommended specific treatments. About 60 percent of the model's "suggestions" were adopted.



The "Spotlight"...highlighting researchers at work: from Switzerland to Kenya to Bitterroot streams



Sophie Osborn answers questions during presentation at the March workshop.

by Lucia Solorzano

It may seem a strange leap of science from the study of giraffes in Kenya to tracking Dippers in the Bitterroot, but that's exactly how 30-year-old Sophie Osborn of Stevensville got her start in ornithology. This summer, you'll find her slogging through streambeds and pushing through dense underbrush to follow North America's only aquatic songbird to its nest.

Until she visited Africa, the native of Switzerland and 1988 graduate of the University of Pennsylvania, with degrees in international relations and French literature, never realized that the fascinating field of wildlife biology existed. She returned to Vermont, where she had lived since age 9, and began taking biology courses—and noticing birds. "In Africa," she recalls, "wildlife was so visible all the time. In Vermont, the only really visible wildlife was birds."

Osborn became captivated with the brilliantly colored eastern songbirds and the elegant birds of prey. She began several years of field study on birds ranging from Peregrine Falcon in Wyoming to Speckled Teal in Argentina. She was attracted to Montana by the work of Sallie Hejl, research biologist with the Rocky Mountain Research Station in Missoula, and Dick Hutto, professor of ornithology at the University of Montana.

In spring 1996, Osborn started studying landscape effects on the habitat selection, distribution, and productivity of the American Dipper. The six inch Dipper, which takes its name from the dipping

motion it makes when perched, can only be found on fast-flowing streams. A solitary bird, it is just as comfortable swimming underwater to feed on aquatic insect larvae as it is flying to its nest near falling or fast-running water. Dippers feed their young in the nest for twice as long as many other songbirds. "Being aquatic birds, they have to be so much more developed," observes Osborn. "I've seen them plunge right out of the nest into whitewater."

Last spring and summer, Osborn and two assistants surveyed Dippers on 16 creeks in the Bitterroot. The team walked carrying heavy backpacks, wearing waders. Says Osborn: "We had to stay right along the stream so as not to miss the Dippers. But in doing so, we were often hit in the face by branches or had to crawl on our stomachs under downfall. Ideally, we would have liked to walk in the water along the edge of the creeks, but it was usually too dangerous with the high spring runoff."

Dippers typically build their nests in cliffs, sometimes by waterfalls, sometimes on large mid-stream boulders. In developed areas such as the Bitterroot Valley, many nest under bridges. Osborn and her crew located

a total of 24 active nests last year—12 on undeveloped sites and 12 under bridges. On six of the seven large creeks studied, Osborn found Dippers were more likely to be present in undeveloped stream portions. "Dippers are charming, funny little birds," remarks Osborn. "They share many of the same habitat needs as native fishes, which may be an additional incentive to protect their environment. The presence of Dippers may indicate a healthy riparian system."

Protection of clear, unpolluted streams will benefit not only the busy Dipper but also many of its riparian neighbors.



American Dipper. Photo by Sophie Osborn.

Diversity of Tiny Bitterroot Natives

Few scientists know the truly tedious side of field study like Andrew Sheldon, whose speciality is aquatic insects, particularly stoneflies. Dr. Sheldon, a biology professor at the University of Montana, now has two years of field work in Bitterroot streams behind him and hopes to determine the boundaries between stonefly species and what causes variation. Stoneflies begin emerging in the lower elevations of Bitterroot streams in February and continue until the last come out at the higher elevations in October. The 45 different species emerge throughout the season, which demands repetitive census-taking by Sheldon.

During the summer of 1996, Sheldon collaborated with Australian geneticists Dr. Jane Hughes and Dr. Peter Mather. The team discovered that stonefly populations from adjacent streams are virtually unique because so little interchange of genetic material occurs between watersheds. "Within streams," says Sheldon, "stoneflies are pretty homogeneous. But every stream has its own identity."

Fauna Research Rich in Links to Protocols

At the March workshop, L. Jack Lyon reported that each of the fourteen research projects on fauna supported by the Bitterroot Ecosystem Management Research Project exemplifies one or more of the Regional fauna or aquatic protocols. Fred Samson and Linda Ulmer summarized the fauna and aquatic protocols. Lyon and Ward McCaughey then described key links between protocols and fauna research. Eight Project studies link to Coarse Filter protocols, nine to Species at Risk protocols, eleven to Viability protocols, six to Connectivity protocols, and twelve to Habitat Models. Three studies contribute to Featured Species protocols. Research being conducted at Tenderfoot Creek Experimental Forest addresses all three aquatic protocols—Watershed Characterization, Aquatic Benchmarks, and Monitoring.

Many Ways to Manage Lodgepole Pine Forests

by Lucia Solorzano

Research underway at the Tenderfoot Creek Experimental Forest near White Sulphur Springs will provide insights on how to sustain lodgepole pine forests and water flow patterns over large areas. Lodgepole pine dominates a high percentage of forests in the northern Rocky Mountains, including the Bitterroot National Forest. About half the stands at Tenderfoot are two-aged, resulting from previous fires of mixed severity. However, nearly 120 years have passed since the last major fire. Many of the trees are aging and becoming increasingly susceptible to damage from strong winds, winter kill from rapid and extreme temperature fluctuations, and wildfire.

Tenderfoot Creek is "a classic lodgepole pine community," says Colin Hardy, assistant coordinator of the project, in an area "big enough to make a significant difference in water flow." The Tenderfoot Creek site is especially valuable to researchers because of data already collected on the watershed's hydrology, fire history, weather patterns, soils, fish, birds, and other wildlife.

Two sub-watersheds in the experimental forest are being used in the study. Each has a hydrologically matched sub-watershed that will be left untreated and then compared with treated sites. The headwaters of Tenderfoot Creek will be used as an additional area for comparison.

Treatments will include shelterwood harvests followed by low-severity underburns on some sites, and mixed-severity broadcast underburns on sites that are not logged. Logging will produce two stand structures: evenly spaced, and groups of unevenly spaced trees. The latter structure resembles forests that resulted from historic mixed-severity fires.

Three partners are collaborating on the Tenderfoot project: the Rocky Mountain Research Station, the Lewis and Clark National Forest, and the Bitterroot Ecosystem Management Research Project. Dr. Ward McCaughey of Bozeman is the project coordinator, heading a 12-member planning committee. The study is expected to take about 15 years to complete and already has more than two dozen research proposals related to it.

Prescribed Burn Completes Ponderosa Pine Treatments

by Steve Arno

Logging and exclusion of low-intensity fire have produced thickets of diseased fir trees (interior Douglas-fir and grand fir) in many areas formerly occupied by open ponderosa pine forest in the inland West. One such area is the Bear/Fred Burr Demonstration Site on the Stevensville Ranger District, Bitterroot National Forest. Stumps testify that the original stand, logged in the early 1900s, consisted of large ponderosa pines and Douglas-firs growing in open forest. The stumps record a long history of frequent low-intensity fires.

Researchers and managers are testing six silvicultural treatments, including underburning an uncut stand, in the 60-acre study area. Harvesting took place primarily in 1995; burning was completed in May. One of the main goals of cutting was to commercially remove as much small or diseased fir as possible while leaving an open stand of pine and the healthiest firs. Areas of heavy fuels, such as mistletoe brooms, were burned just as the snow melted (left). A low-intensity burn over the entire area was conducted a week later (below).

These treatments are the first in a sequence to restore the stand. Eventually it should be relatively open, resistant to insect and disease epidemics and severe wildfire. It will have value for aesthetics, wildlife habitat, and watershed protection. It will also produce timber that can finance maintenance costs.

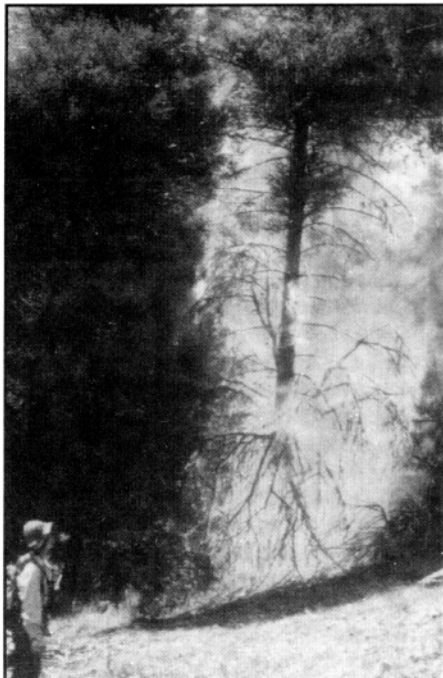
The public is invited to join a field trip to this Demonstration Site on July 29 (see p. 1).

Economics of Restoration Treatments

Can timber products underwrite the cost of ecosystem restoration treatments in ponderosa pine forests? Yes, say silviculturist Carl Fiedler of the University of Montana School of Forestry and Charles Keegan of the Bureau of Business and Economic Research at the University of Montana, if the treatments are designed properly. Fiedler and Keegan designed a prescription for restoring a ponderosa pine/Douglas-fir stand in the Bitterroot National Forest. Their prescription developed a park-like stand of large ponderosa pine by reducing stand density and the proportion of Douglas-fir. This treatment yielded an average of 3.4 thousand board feet per acre, primarily of Douglas-fir, with a net value exceeding \$700 per acre on tractor ground and exceeding \$400 per acre on steep ground requiring cable systems.

An alternative thin-from-below prescription removed nearly all small trees from 5 to 9 inches in diameter. Timber products from this treatment had a negative net value of nearly \$300 per acre. On cable ground, losses exceeded \$500 per acre.

Ecological and economic contrasts between the two prescriptions are dramatic. The first prescription directly addresses fire hazard, declining tree vigor, and species conversion problems, returning substantial revenue. The second is costly and fails to address long-term problems in the stand.



Photos by Steve Arno.



Public Advises Managers, Scientists, Citizens

by Lucia Solorzano

Encourage greater public involvement in forest management decisions. Keep the process short. Keep it nonconfrontational, and let participants feel their voices are heard—that's what a panel of Bitterroot residents advised during the annual Project workshop in March.

The four panel members, representing government, business, and private citizens, agreed that the loudest voices on either side of an issue should not be allowed to discourage other members of the community from feeling their participation is wanted and needed.

"You need to create a process in which people feel comfortable," observed Tim Schwecke, who has served as Ravalli County planning director for the past five years. Otherwise, he explained, 60 percent of the people are afraid to stand up and say, "This is what we think."

Schwecke was joined on the panel by Doris Milner, a private citizen long active in forest issues; Harvey Hackett, a private rancher; and Dale Berry, a business owner currently involved in forming an Economic Development Authority for the Bitterroot. The panel was moderated by Kerry McMenus, planner for the Bitterroot National Forest.

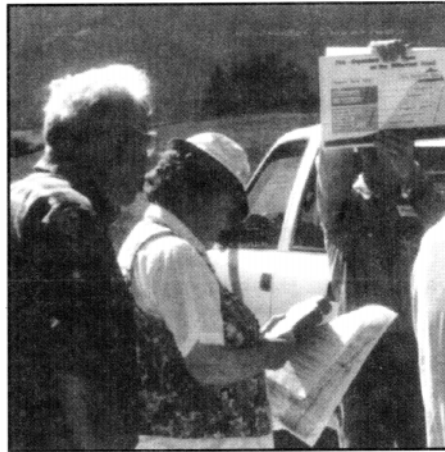
Panelists addressed three questions in their 10-minute talks: How do people get involved? What successes and challenges have they experienced? How would they improve the process?

Schwecke found that breaking meetings into small discussion groups, instead of

allowing individuals to address an entire group, increases chances for serious dialogue. That helps make meetings less confrontational and more inviting to citizens who are interested in the process but have not already decided on a particular point of view.

Panelists also acknowledged that lengthy processes discourage many citizens from taking part. Says Schwecke: "If they can see a clear end to the process, they are more likely to participate."

Doris Milner cites the start of her own deep involvement in forest issues as stemming from seeing that "something that I



On a field trip, Bitterroot residents Stewart Brandborg (left) and Doris Milner view posters describing the forest ecosystem, using the ecosystem itself as a backdrop. Photo by Clint Carlson.

cherished a great deal was being threatened." Because, she noted, the Bitterroot National Forest exists like a pair of arms embracing residents of the valley, all people who live there have some concern for how the forest is managed.

Members of the public need to become educated in order to be effective participants. "Education has to come first," Milner stressed. "Try to communicate and look at the other person's point of view." Entering with preconceived notions, she noted, detracts from the overall success of the process.

Hackett concurred on the need for citizens to learn about the issues being discussed—to grab their old science textbooks, or buy or borrow new ones, and find out what the facts are. Says Hackett: "We have a great black hole of public ignorance about (the) connections" between soil, trees, and habitat. "My own challenge was to get the information."

Business leader Dale Berry urged that the planning process not be viewed as a win-lose situation. Citizens, he advised, need to know that their views have been heard. Then, even if the final decision is not what they would have chosen, they still know they contributed to its development.

Finally, Berry noted, the acceptability of the final decision depends on having someone at the top who is not swayed by the most verbal participants or the most letters to the editor. "Somebody's got to step up to the plate and do what's right for the Bitterroot Valley, the National Forest, and the community as a whole," he concluded.

Bitterroot Projects Link with Human Dimensions Protocols

At the Project workshop in March, Regional social scientist Cynthia Manning explained links between Human Dimensions research in the Bitterroot Ecosystem Management



Cynthia Manning describes links between human dimensions research and protocols.

Research Project and Regional protocols for addressing Social Context and Communications Strategy. Research by Kathleen Guthrie and Steve McCool, School of Forestry, The University of Montana, addressed success of collaborative public involvement (see story, p. 7). Research by Rebecca Richards and Krista McClusky, Department of Sociology at the University, is assessing the potential for use of several public participation methods for Forest planning. Lolo National Forest economist Fred Stewart described the Economic Context for ecosystem-based management. Manning described the Scenery Management protocol. Her summary set the stage for landscape architect Bob Benson, who summarized visual preferences regarding restoration treatments.

Resources and Materials for Teachers

FireWorks is a collection of hands-on materials and curricula being developed at the Intermountain Fire Sciences Laboratory to help teach children about fire ecology. Next school year will be a "pilot year" for the project. Ecologist Jane Kapler Smith and technician Nancy McMurray, Intermountain Fire Sciences Laboratory, will introduce *FireWorks* to teachers at workshops in Missoula, October 16 and 17. If you're interested in attending, contact them at 406-329-4809. Development of *FireWorks* is supported by the Rocky Mountain Research Station, the Bitterroot Ecosystem Management/Research Project, and the Northern Region.

Thoughts from Stevensville

by Thomas G. Wagner, Stevensville District Ranger



Tom Wagner, Stevensville District Ranger

Tom Wagner was selected "Citizen of the Year" in June by the Darby Civic Group and was honored at Darby Fun Day, June 28.

It is a sunny day in the Bitterroot Valley, as I sit down at my computer with some thoughts on the planning effort for the Stevensville West Central area. My involvement in this project began when Leslie Weldon transferred to a new assignment and I was asked to fill in behind her as District Ranger in Stevensville. My new assignment included making a final decision on management actions analyzed within the Stevensville West Central Environmental Assessment. This decision was unique in its use of partnership. The partners included the Rocky Mountain Research Station, University of Montana, Bitterroot National Forest, and many shareholders with interest in National Forest lands.

The partnership brought together many ideas, the latest resource modeling technology, and important research on the

ecosystems of western Montana. Just as important, the effort included a deep commitment to respond to resource and human issues in a way allowing for sustainability of these treasured lands. The first order of business for me, then, is to thank all partners for their personal and professional efforts and their willingness to stay with the process over the past three years.

The decision on management of this landscape is really only the beginning. What is now important is that all that planning be transferred to the landscape in carefully implemented projects that will address vegetative, watershed and other resource concerns. Our future meetings will be able to look at on-the-ground results from the three years of planning, so we can learn from them and make adjustments for future actions.

Many Ways to View Success

by Lucia Solorzano

A dictionary may define success as simply a "satisfactory outcome or result," but Kathleen Guthrie, a graduate in resource conservation at the University of Montana School of Forestry, found measuring success to be much more complicated.

Guthrie completed her master's thesis this spring on the topic "Measures of Success in Public Involvement Processes: An investigation of how managers, researchers and members of the public define success." Guthrie studied the Stevensville

Southwest and West Central planning processes because of their level of public involvement.

Observes Guthrie: "Understanding how different people define success is critical to achieving success in the public involvement process." Guthrie interviewed 12 managers, 12 researchers, and 18 members of the public in over 60 hours of taped conversation from August to November 1996.

Guthrie recognizes three factors that have influenced public involvement in recent years: (1) greater levels of involvement initiated by members of the public and public officials; (2) scientific uncertainty about complex topics such as ecosystem management; and (3) lack of agreement on the objectives of a process.

The traditional approach to decision making—what Guthrie calls "top-down"

planning—fails to address these three influences. Guthrie calls for a "transactive" type of planning that is based on public involvement, uses dialogue and mutual learning to address scientific uncertainty, and helps to reach agreement on goals.

Guthrie used four working propositions to help define success: (1) managers are most likely to view success in terms of product; (2) researchers are most likely to

define success in terms of learning; (3) managers are most likely to define success

in terms of political acceptance; and (4) members of the public are most likely to have broader measures of success than product, learning, or political acceptance.

In interviews with people involved in Stevensville planning efforts, Guthrie discovered only partial support for her first three working propositions. Regarding the fourth, Guthrie found that private citizens did use product, learning, and political acceptance to measure success. Her research and that of previous studies indicate that at least five other measures of success are embraced by the public: education, a sense of ownership, opportunities to voice and hear diverse concerns, building relationships, and implementation.

To achieve success in planning, Guthrie suggests that members of the public be encouraged to get involved early in the

process and that they be made to feel they have the power to veto a project. Formal and informal meetings, potluck dinners, and field trips all can enhance participants' sense of responsibility, personal relationships, and education.

Guthrie concedes that transactive planning is costly in terms of time. She notes that any big project "requires a lot of planning processes. Transactive planning should be a piece of the process—not only a piece, but a good and big piece."

Video Describes Public Involvement

The collaborative planning effort for the Stevensville West Central area occurred over 2 1/2 years and took 29 meetings. The process is documented in a 25-minute videotape produced and directed by University of Montana graduate Rick Pukis. The video, "Bridges to the Future: Natural Resource Management and Public Involvement in the Bitterroot Ecosystem," includes interviews with participants to assess the process and summarize recommendations. The video is in draft form and is available for loan from Jane Kapler Smith, 406-329-4805.

Seeking Ways to Protect Native Grasslands

by Lucia Solorzano

The Sawmill Creek Research Natural Area in the Stevensville Ranger District is known for its fescue grassland, a valuable resource for elk in winter and spring. But the area also hosts numerous exotic weeds that reduce the diversity of native plants and



Spraying weeds at Sawmill Creek Research Natural Area. Photo by Peter M. Rice.

forage for elk. Chris Toney and Peter Rice, researchers at the University of Montana, are investigating various biological, chemical, and mechanical methods of weed management that may restore Sawmill's rich grassland.

Treatments began in 1995 with hand digging and chemical application of the herbicide picloram (Tordon 22K) on small colonies of leafy spurge, dalmation toadflax, and St. John's-wort ("goatweed"). According to Toney, "The level of control... has been very good so far, nearly 100 percent. Within the area treated, the (weed) species did not come back, although we continue to find new spots popping up in other areas."

Two species of biological control insects, a moth and a weevil, were released on test plots containing spotted knapweed in 1996. About 2,000 adult knapweed root moths were freed in multiple releases, with future releases planned. The feeding

moth overwinters as a larva in the knapweed root and can kill small plants and prevent larger ones from flowering. About 360 root weevils were also released last year. Mass rearing and distribution of the root weevil are underway at the Montana Agricultural Experiment Station in Corvallis.

Spotted knapweed along old logging roads was treated last summer with the herbicide clopyralid (Transline); picloram was applied to knapweed in grasslands. Because knapweed responds to low rates of picloram, treatment selectively removes the knapweed until insect populations take hold, minimizing the need for long-term herbicide use.

Rice and Toney's study also looks at the value of various sites as elk winter range. If reducing exotic weeds invigorates native grasses, what effect will heavy grazing by elk have on the grasses' recovery? The study compares vegetation on open plots with that on fenced plots. Elk pellets in open plots will be counted to measure elk utilization and its effect on native grass recovery.

Research Down in the Dirt

by Lucia Solorzano

University of Montana soil scientists Tom DeLuca and Urszula Choromanska are studying how fire exclusion, underburning, and selective cutting affect the health of ponderosa pine forests. They are starting at the root of the problem—literally. The scientists are examining how different management practices influence nutrients in the soil. They hope to determine whether under-burning in ponderosa pine forests is better for the soil than fire exclusion, which can make forests more susceptible to severe wildfires.

The researchers compared sites that had been managed (thinned or burned) prior to wildfire with adjacent stands not burned by wildfire. One site in the Bitterroot National Forest (Willow Creek—see story, p. 11) includes a plot where a 1996 wildfire killed most of the ponderosa pine and Douglas-fir; a second plot that was prescribed burned prior to the wildfire; a third plot prescribed burned but not burned by wildfire; and a fourth, unburned, plot.

Study sites on the Flathead Indian Reservation near Hot Springs enable DeLuca and Choromanska to study

influences of commercial thinning. One of the three plots was thinned in 1978 and then burned by wildfire in 1994; a second plot had thinning but no burn; a third had neither thinning nor burning.

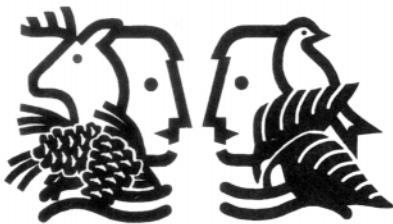
A third study site, also in the Bitterroot, will show how biomass removal affects nutrient availability. Treatments include selection cutting with different levels of slash removed, with and without underburning; conditions on treated sites will be compared with those on an untreated site.

DeLuca and Choromanska report interesting differences between plots. Consistent with existing literature, the amount of mineral nitrogen available for plant uptake and potentially mineralizable nitrogen was highest immediately after the wildfire at Willow Creek.

Two years after wildfire at the Flathead site, however, the amount of potentially mineralizable nitrogen on burned plots was significantly lower than that on unburned plots. Ammonium and amino-nitrogen remained high right after fire, but their concentrations were low on older burns, probably due to uptake by plants, leaching, and volatilization.

Further study will help determine whether underburning, with or without thinning, enhances the amount of available nitrogen in the soil, from which healthy stands of ponderosa pines draw their strength.

T-SHIRTS AVAILABLE



This spring, Missoula graphics artist Wendy Smith designed a new banner for ECO-Report. Its graphic design depicts dialogue, Wendy says. "That's the driving force in your project." The design has been used in slide shows, on reports, and on the Internet. T-shirts have just been produced—white, with the design printed as a decal on the left side. T-shirts are available in M, L, and XL sizes for \$10.00. Call Chris Stalling at (406) 542-4153.

Prescribed Burn in Whitebark Pine

by Lucia Solorzano

The first successful prescribed burn in mature whitebark pine forest in the U.S. gives fresh hope to managers hoping to reverse a 60-year decline in the health of this tree species, a major source of food for many mammals and birds in high elevation areas.

Bob Keane, research forester at the Intermountain Fire Sciences Lab, hailed the October 2, 1996 fire at Smith Creek on the east slope of the Bitterroot Range as "an absolute success, the best example of what we can do with prescribed burns" to restore whitebark pine. In the absence of wildland fires, subalpine fir and spruce have supplanted whitebark pine in many stands. Epidemics of mountain pine beetle and the exotic white pine blister rust have reduced whitebark pine numbers. Prescribed burns, according to Keane, reduce competition from fir and spruce but lack the severity of wildfires, so they allow the fire-tolerant whitebark pine to survive.

The 10-acre Smith Creek site, located at an elevation of about 7,300 feet, contained an

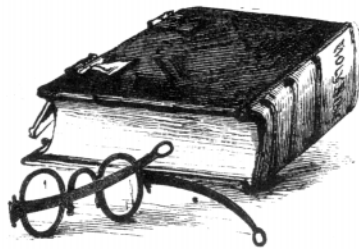
unlogged whitebark pine stand that was underburned. This stand is adjacent to a stand that was logged in 1995 to create small openings that would encourage Clark's Nutcrackers to cache whitebark pine seeds, a step critical for regenerating the species. The prescribed fire burned more than 50 percent of the unlogged stand in two days; burn coverage of the logged stand was estimated at about 90 percent. Effects of the treatment on whitebark pine growth, understory species, and fuel loadings will be monitored over the next ten years. Preliminary results are encouraging. Keane recalls that, two weeks prior to the burn, "seven nutcrackers were actually harvesting cones and caching them on the site that had been cut, right in front of our faces."

Smith Creek was the first of three sites to be treated with prescribed fire; the remaining two are at Coyote Meadows in the Sapphire Mountains and Bear Creek Overlook area in the Bitterroots.



Prescribed fire torches a subalpine fir at Smith Creek. Photo by Steve Arno.

BOOK CORNER



A review of *Made for Each Other – a Symbiosis of Birds and Pines.* by Dr. Ronald M. Lanner

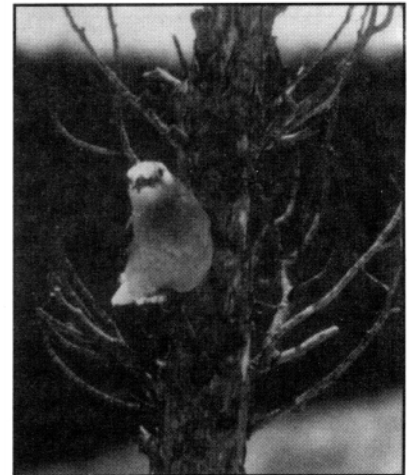
Review by Bob Keane,
Intermountain Fire Sciences Laboratory

To many, the wonder of nature is the intricate net of how living things relate to each other and to their environment. No relationship is more fascinating than that between birds and pines. Dr. Ron Lanner, recently retired from Utah State University, tells an amazingly complex tale of how the Clark's Nutcracker, a bird species in the jay family, has evolved with several species of pine to have a rich symbiotic relationship that benefits both. The pines have evolved characteristics that facilitate the harvesting of their seeds by nutcrackers. These characteristics include cones that do not open readily. Instead, they are displayed above the branch (rather than hanging from it), and they contain large nutritious seeds. What does the pine get in return? The nutcracker has a specialized pouch and feeding habits that enable it to efficiently eat and store the seeds. Lanner tells how nutcrackers cache many pine seeds in the ground for consumption later. Those seeds that remain unclaimed by the nutcracker will eventually grow into trees.

Many pine species have evolved with

the Clark's Nutcracker, but Lanner uses the whitebark pine as the primary example of bird-pine symbiosis. Perhaps the most interesting aspect of the book is its worldwide scope. Dr. Lanner also describes relationships between nutcrackers and pines in Europe, Siberia, and Japan. Incredibly, different species of nutcrackers and pines seem to have the same symbiosis in every continent in the northern hemisphere.

Made for Each Other is written for general audiences with some background in natural history and tree ecology. It does not contain complex scientific terminology, although it contains interesting references to the scientific literature. Lanner includes the importance of pines in human cultures, including those of Native American and Siberian peoples. Readers interested in taxonomy will be especially thrilled with Lanner's treatment of pine genealogy. Lastly, the author tells the sad story of the decline of whitebark pine in the northern Rocky Mountains. I think this book will be interesting and informative to all those who enjoy learning more about the complex web



Clark's Nutcracker. Photo by Clint Carlson.

that we call nature, especially if they enjoy tramping through high elevation ecosystems and watching birds.

Lanner, Ronald M. 1996. *Made for Each Other – a Symbiosis of Birds and Pines*. New York: Oxford University Press. 160 pages. \$15.95 (paper) ISBN 0-19-508903-0; \$35.00 (cloth) ISBN 019-508902-2.

Forest Health and Elk Populations

by L. Jack Lyon

How do you balance hiding cover with forage for elk? A recent study completed by William Koncerak set out to answer this question.

Koncerak's study was conducted between July and November 1995 at 400 plots in the Bitterroot Valley. Study sites included 25 stands where underburns had been conducted periodically since 1976 and 15 adjacent unburned sites. Koncerak measured the number and size of trees and shrubs on each site, and the cover and height of selected forage species. Where underburning had occurred, stands were classified according to the number of years since the last prescribed burn.

Koncerak found that, over time after fire, both canopy closure and hiding cover return to near preburn levels—canopy closure within 10 years and hiding cover within 20 years. However, burned areas always had less cover than unburned areas. The mean hiding cover value for unburned stands was 52 percent. The mean for burned stands was 8 percent in the first two years, 16 percent at five years, and 23 percent after eight to 19 years.

Winter range forage increased after underburning and remained above preburn levels for approximately 15 years. There was no significant difference in shrub cover between burned and unburned plots.

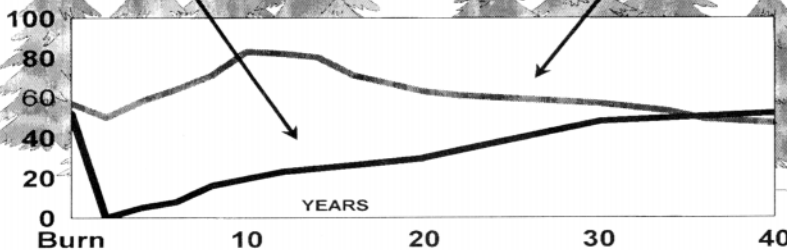
Koncerak summarized his re-search by presenting two alternative management scenarios for a 10,000 acre landscape. The initial landscape contained 4,000 acres of thermal and hiding cover, 1,000 acres of meadow, and 5,000 acres of forest that did not qualify as either hiding or thermal cover. The elk habitat potential (an indicator of habitat quality) for this landscape was judged to be 85 percent.

Under one management scenario, underburning was confined to forest stands already providing hiding or thermal cover. Elk habitat potential initially increased to 100 percent but declined rapidly after 60 percent of the stands had been burned. In the other scenario, existing cover areas were protected and underburning treatments were confined to noncover forest stands. Elk habitat potential reached 100 percent when all such stands had been treated. Koncerak's conclusion was that underburning would benefit elk until 25 to 50 percent of the total landscape had been burned. This is probably a higher level of treatment than is possible for land managers to realize.

FOREST HEALTH MANAGEMENT: ELK WINTER RANGE AND HIDING COVER

WILLIAM KONCERAK, UNIVERSITY OF MONTANA

HIDING COVER VS. FORAGE



Mountain Lions: Part of the Neighborhood

by Lucia Solorzano

Mountain lion in the Bitterroot Valley and elsewhere are not reacting to human expansion into their territory as wildlife biologists might expect. Shawn Riley, a doctoral candidate at Cornell University in

Ithaca, NY, wants to know why.

Over the past 40 years, mountain lion numbers have rebounded throughout the western states and provinces, becoming "more abundant in more places than we could have predicted," says Riley. The mountain lion, known for being a shy and reclusive predator, may be the only species of big cat on earth to increase at the same time that human development has intensified.

As their numbers have grown, so have incidents of lion-human encounters. Says Riley: "Mountain lions are here, and it is not a large wilderness issue; it has become a suburban issue confronting most communities that interface with the wildlands."

Riley's research, which will be completed this summer, examines ecological factors that make the Bitterroot Valley attractive habitat for mountain lion. The Bitterroot has rugged terrain, dense cover,

and abundant large animals for food, making ideal habitat for a predator that relies on stealth to stalk and ambush its prey.

Central to Riley's work is the human response to lions, which he has recorded through personal interviews, written questionnaires, and an analysis of media coverage in Montana newspapers. Riley plans to integrate his ecological findings with people's

responses to help design appropriate policies for managing lions. "Depending on whether people want to increase or decrease the mountain lion population, there are several things they can do," says Riley. "But that direction needs to be set by society," not government officials alone. "How wild can wildlife get before they're too wild?" asks Riley. "Where those lines are drawn depends on how society perceives the risks."



Mountain lion in Swan Valley. Photo by Shawn Riley.

Field Trips of the Past Year

Visit to Larry Creek & Bass Creek

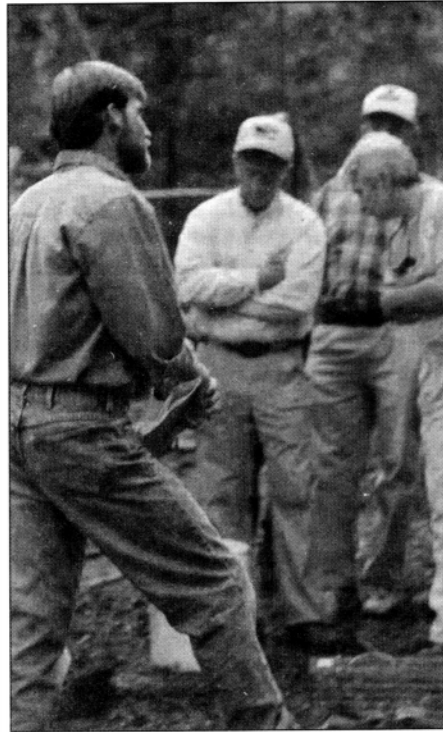
by Jane Kapler Smith

Last July 10, researchers, managers, and members of the public visited the slopes north of Bass Creek; after a picnic, they moved on to riparian habitat along Larry Creek. Sixteen members of the public participated. The group first stopped in the midst of the Bitterroot Valley to view changes in forests and fire potential along the Bitterroot Face. Then participants toured aspen and ponderosa pine forest underburned in 1994; Stevensville assistant fire management officer Leslie Anderson and silviculturist Cathy Stewart showed sprouting aspen and the patchwork of open forest alternating with thickets, which was formed by variations in fire severity.

After dinner, participants refocused on riparian habitat. This topic brought together researchers from three disciplines—all viewing the forest in a slightly different way. In a small area upstream from the campground, Matt Arno explained his project to restore deciduous shrubs and trees in riparian habitat (see article, p. 2).

Biologist Dean Pearson displayed a red-backed vole captured on Sweeney Ridge and a deer mouse that was live-trapped the night before on Arno's research site. Colored flags indicated the routes that small mammals had used to crisscross the site the night before; nearly every trail lay alongside a fallen log—a pattern that, Pearson said, is typical of small mammals in forest habitats. "They use the logs and other woody debris for hiding and escape cover," he explained. "These are important habitat components when everyone in the forest is out to eat you."

University of Montana graduate student Josh Tewksbury and Stevensville wildlife



Dean Pearson (left) shows a vole and a deer mouse on Larry Creek field trip.

biologist Dave Lockman presented a third viewpoint about riparian habitat—that of small migratory birds. The birds were invited to speak for themselves, as the two biologists displayed, then released, a male and female American Redstart captured a few minutes earlier in delicate "mist nets." Deciduous trees and shrubs are essential nesting habitat for these tiny forest residents, Tewksbury said, and this kind of

cover has become less plentiful over the past century. Without fire, deciduous cover has declined on riparian sites. Birds find fewer nest sites when they return from wintering in Central and South America.

Willow Creek

by Jane Kapler Smith

Planned and unplanned fire interweave at the edge of the Willow Creek burn northeast of Hamilton. Last October, Stevensville District staff accompanied about 65 members of the public to the area to look at the boundary of the wildfire, an arson fire that crowned in Douglas-fir and ponderosa pine on steep slopes last August 11. Wind-blown firebrands landed in areas that had been prescribed burned with low-intensity fire in the spring of 1995 and 1996, and they didn't spread. At the ridge that forms the boundary between the untreated area and the prescribed burns to the east, the fire dropped to the ground and was contained there by firefighters.

Discussion from visitors on the field trip focused on plans to salvage dead and dying trees from the wildfire area. Since the field trip, the analysis of the proposal to helicopter log the fire killed trees has been completed, and District Ranger Tom Wagner has signed a decision to implement the proposal. According to Rick Floch, timber resource coordinator at the Darby District, the planned harvest would cover only part of the area burned by wildfire. Some dead trees would be left to meet wildlife needs and to sustain the soil. The appeal period for the salvage sale ended June 23.

Managers, Planners Visit Sixmile

by Lucia Solorzano

The song of Audubon warblers and evening grosbeaks trilling through newly opened green spaces were early signs of renewed forest life that greeted nearly 50 participants in a May 20 field trip to the Sixmile Demonstration Site near Huson.

Researcher Joe Scott led participants on a half-day look at three sites treated in 1993 with thinning, fuel removal, and burning to reduce the risk of wildfire. The treatments all differed slightly, however, to meet a separate purpose: on one site to maintain aesthetic value; on the second to obtain substantial revenue; and on the third to promote forest restoration.

Thirty people attended the morning session, 16 the afternoon session. Participants came from the Lolo, Bitterroot,

Flathead, Kootenai, Gallatin, Panhandle and Helena National Forests. They included University of Montana faculty and students, employees from Stone Container, an owner of a small logging firm, officials from the state Department of Fish, Wildlife, and Parks, and interested citizens.

Participants walked through each treatment site, examining the effects of low-impact and conventional thinning; harvesting done by hand or with commercial logging equipment; and various slash treatments, including a broadcast burn. Participants in the morning session were struck by the sounds of birds and abundant wildflowers present in the site treated for forest restoration, although blackened ponderosa pine trunks remain.

A technical report discussing final findings from the study sites is available. Contact Steve Arno, 406-329-4813.



Steve Slaughter describes treatments during Sixmile field trip.

Landscape Analysis Links with Protocols

by J. Greg Jones

At the third annual Bitterroot Ecosystem Management Research Project workshop, Regional Planner Tom Rhode provided an overview of landscape assessments for planning at various scales, and discussed National Forest Management Act requirements. Jimmie Chew and Greg Jones discussed the regional protocols that provide input for SIMPPLLE (SIMulating vegetative Patterns and Processes at Landscape scaLEs), and the planning needs

addressed by SIMPPLLE. Greg Jones discussed the regional protocols that provide input for MAGIS (Multi-resource Analysis and Geographic Information System), and the planning needs addressed by MAGIS. Kootenai National Forest operations research analyst Dan Thompson discussed modeling larger geographic areas with Spectrum programs and Geographic Information System tools. Mike Sweet, University of Montana, described relationships of satellite imagery data to vegetation protocols.



Ecosystem Management means partnership

Furthering the goals of this project requires public participation in decision-making processes. Would you like to become a partner?

For more information, please call or write to:

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P. O. Box 8089, Missoula, MT 59807, (406) 542-4151

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Missoula, MT 59812, (406) 243-6582

Visit BEMRP on the Internet!

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<http://www.forestry.umd.edu/bemrp>

Thinking Ahead: Forest Plan Revision

by Sue Heald

The Bitterroot National Forest staff is beginning to revise the Forest Plan, a task the Forest is charged with completing every 15 years. Team members include Kerry McMenus, planning staff officer; Jeff Amoss, resource staff officer; Rich Torquemada, wildlife and fisheries program officer; Jack Kirkendall, fire management officer; Gary Decker, hydrologist; Dan Ritter, recreation program officer; and Herb Spradlin, wilderness manager. Sue Heald, ecologist and assistant planner, will lead the team. The assessment will provide District Ranger Tom Wagner and Forest Supervisor Steve Kelly with a foundation for changing the Forest Plan and identifying future projects. Team members will complete assessments on large portions of the Forest, one area at a time. Much of the information about the Bitterroots will come from previous projects such as Stevensville West Central. The effort will identify long term direction for the Forest.

The planning team is currently in the process of deciding how to provide opportunities for the public to be meaningfully involved in updating the Forest Plan. Please contact Sue Heald at 406-363-7142 for more information.

ECO-Report

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