Bitterroot National Forest
Bitterroot Ecosystem Management Research Project
School of Forestry
University of Montana
Intermountain Research Station

ECO-News

Summer, 1995

A partnership in landscape level ecosystem management

BEMRP - a first of its kind within the Forest Service

The Bitterroot Ecosystem Management Research Project (BEMRP) became a reality in the spring of 1994. The five-year partnership, between the Intermountain Research Station, Bitterroot National Forest, University of Montana and the public, will help determine how altered ecosystems in the north Bitterroot Mountain Range have been affected by human activities.

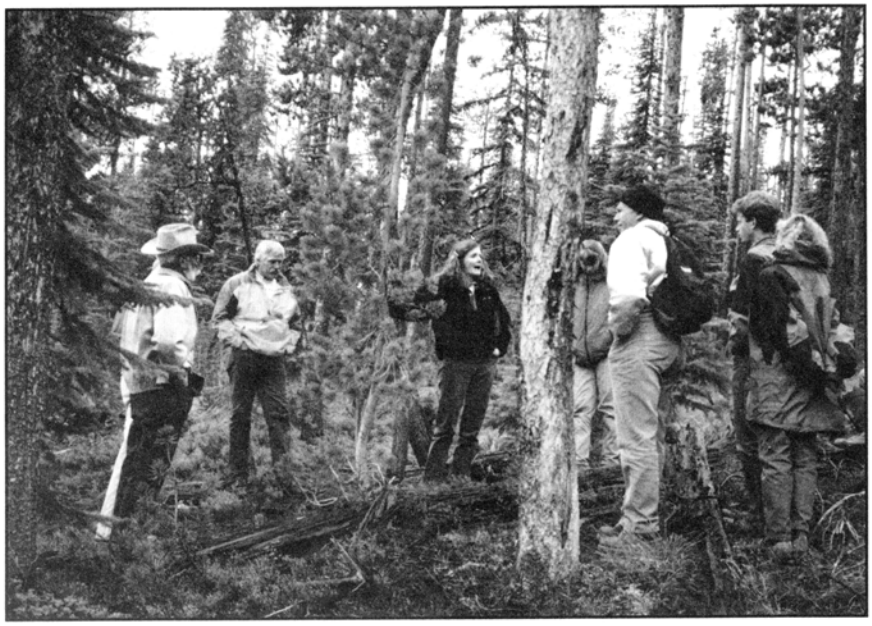
The public is a partner in the BEMRP. Public input is used to help develop desired forest conditions and concepts of land management. At the other end of the involvement scale, specialists and land managers from the Forest Service's Northern Region are being included in the BEMRP process.

BEMRP is an interdisciplinary effort, integrating vegetation, wildlife, hydrology, and soils resources through state-of-the art modeling. BEMRP blends ecosystem-based research and land management principles with the social and economic needs of people.

The knowledge gained from research studies will provide information that can be used by resource professionals not only in northwest Montana, but in other areas as well.

Since April, 1994, seventeen cooperative agreements have been negotiated with the University of Montana. Study sites for implementing EM demonstrations have been selected, and pretreatment data collected. Project demonstration sites are being developed by research scientists and land managers to show how vegetation management can be used to help restore healthy ecosystems over time. Numerous meetings have been held with the public, including on-the-ground field trips to potential demonstration areas.

Because fire has been removed as an ecological process, current forest composition and structure are far different than in the early 1900's. Former park-like ponderosa pine stands are now being overgrown by Douglas-fir and other shade-loving species. These stands are far more susceptible to insects, disease and fire. Prescribed fire will be used as a management tool to restore historic conditions in ponderosa pine, western larch, and whitebark pine ecosystems.



Center—Bitterroot Forest Zone Silviculturist Cathy Stewart give members of the public an overview of historic and existing conditions for whitebark pine in the Smith Creek area, Stevensville Ranger District. Restoration efforts will begin in 1995 to restore the whitebark pine ecosystem that is impacted by white pine blister rust. Photo Madelyn Kempf.

Limited knowledge now exists on how to manage altered Rocky Mountain ecosystems. BEMRP will help define ecosystem management not only for the Bitterroot National Forest, but for resource professionals throughout the Rocky Mountains.

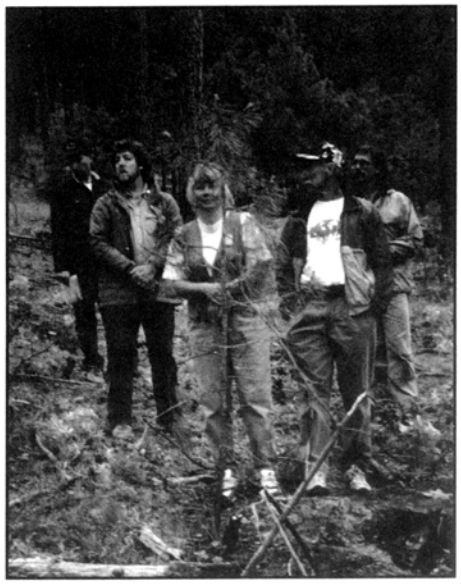
Inside

A team approach to resource planning

The Bitterroot Ecosystem Management Research Project (BEMRP) is guided by the Intermountain Research Station through a committee approach. The governing body is an interdisciplinary core team composed of Forest Service scientists and specialists. The core team is chaired by Project Leader Dr. Clinton E. Carlson, Intermountain Research Station, Missoula, MT.

Four research groups are responsible for submitting project proposals to the core team. These groups, chaired by research and forest personnel, include: Vegetation—Dr. Stephen E. Arno; Landscape Applications—Dr. J. Greg Jones; Wildlife—Dr. L. Jack Lyon; Human Dimension—Madelyn Kempf. These research groups work with the public and other land management agencies to enhance the health and diversity of Bitterroot ecosystems.

Resource professionals on a field trip to the Lick Creek Research Area, Darby Ranger District. At Lick Creek, research sites will show the effect of different harvest methods and fire cycles on the regeneration and growth of ponderosa pine, bitterbrush, and on bird use and public perceptions. All harvest practices, which are part of research efforts, retain an overstory of the most vigorous ponderosa pine available. Photo Madelyn Kempf.



BEMRP Project Leader Clint Carlson (second from right) on a public field trip to Lick Creek. Demonstration areas show current research and management activities. Information gathered here will help develop future forests that will be more in harmony with fire ecology. These activities are expected to also benefit wildlife, recreation, and other resources. Forest managers, researchers, and the public agree that an ecosystem-based approach to management is necessary rather than focusing mainly on commodity production. Photo Madelyn Kempf.

"We abuse the land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect".

-Aldo Leopold

Project goals reflect ecosystem-based principles

The Bitterroot Ecosystem Management Research Project will work to accomplish the following project goals:

- predict how managing vegetation at the landscape level influences commodity outputs and public values in altered Rocky Mountain ecosystems.
- demonstrate to the public how these ecosystems can be rehabilitated at the landscape level.
- conduct research on public opinion and evaluate what resource outputs and values are important to the diverse public living in the northern Rocky Mountains.
- develop concepts and tools to better incorporate ecosystem-based principles into land management.

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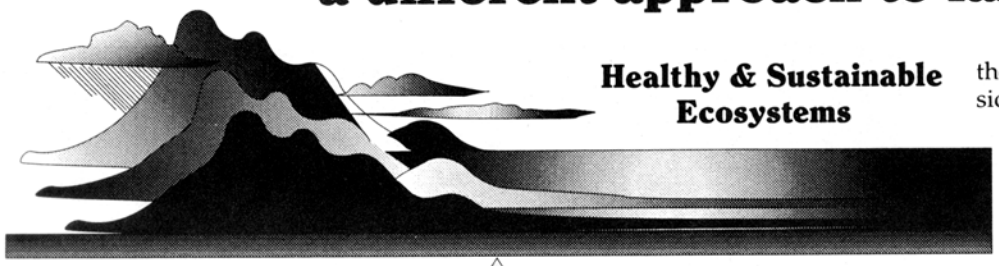
Ecosystem management—
a different approach to land management



The U.S. Forest Service, building on nearly 100 years of land management experience, is using the skills of research scientists and resource management professionals to plan for healthier, sustainable ecosystems. This approach—ecosystem management—is a different way of managing the land.

EM

Ecosystem management (EM) is not a rigidly chartered course. EM focuses on the entire landscape, or looks at the "big picture". It blends the social and economic needs of people with the capability of the resource to produce those needs. However, resource professionals are faced with the ever increasing problem of declining forest health and productivity in ecosystems altered by decades of management designed to meet the social and economic needs of past generations.

EM is still in its infancy. No one knows all of the answers. Planning must be based on partnerships with communities, public and private resource agencies, and research scientists. EM is unique in that resource professionals and the public are all learning together to put this concept to work on-the-ground.

"We have always been doing ecosystem mangement, and now it's time for us to start doing it right." - Del Skeesick

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The Bitterroot National Forest—a perfect partner

The use of innovative, progressive approaches to ecosystem management (EM) gave the Bitterroot National Forest a big advantage in the selection process which picked a suitable forest to participate in the ecosystem-based Bitterroot Ecosystem Management Research Project (BEMRP).

On-going EM efforts on the Bitterroot Forest facilitate the implementation of landscape ecology research projects. Some of these include:

- developing an integrated resource analysis for the Stevensville South West (Stevi SW) Landscape Ecology Project.
- planning the 40,000 acre Stevensville West Central (Stevi WC) Landscape Ecology Project—representative of the larger North Bitterroot Landscape Analysis Area.
- contracting a sociological study to determine public perception of the natural role of fire.
- preparing a site specific National Environmental Policy Act (NEPA) analysis for the Stevi SW project area.

A Memorandum of Understanding is in place with the Intermountain Research Station for cooperative work at Lick Creek and Coyote Meadows. These efforts by the Bitterroot National Forest can easily be amended to deal with the proposed landscape-level study.

The Stevi WC area has been selected as a prototype for the Upper Columbia River Basin project for fine scale assessments focusing on watershed, landscape and holistic resource analysis. These prototypes will serve as models to evaluate concepts and principles contained in the "Scientific Framework for Ecosystem Management in the Interior Columbia River Basin".

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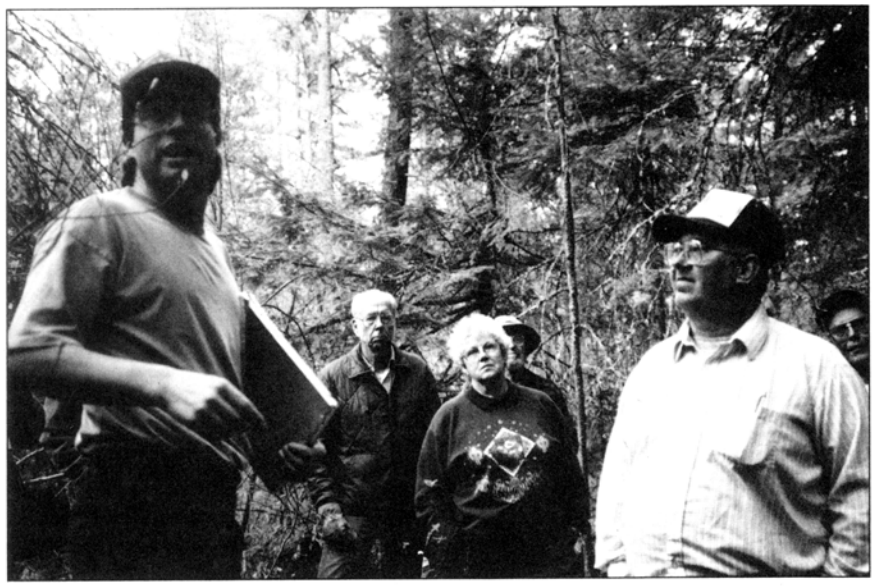


Graduate Student Matt Arno (left) explains research objectives for a riparian area restoration project in Larry Creek, Stevensville Ranger District. Vegetation removal and prescribed fire will help restore the area to more natural conditions that existed before logging, fire suppression, and other human activities affected the sustainability of ponderosa pine and western larch. Photo Madelyn Kempf.

The "human dimension"—considering peoples needs and values

by Madelyn Kempf
Human Dimension Research Group

The human—or social—aspect of ecosystem management is intertwined into all Bitterroot Ecosystem Management Research Project (BEMRP) efforts. BEMRP research scientists and resource professionals plan, implement and monitor public involvement strategy to assure that public needs, values and concerns are heard, and woven into all aspects of research and land management objectives.

Social considerations are coordinated and implemented by the Human Dimension Research Group – made up of specialists, scientists and researchers from the Bitterroot National Forest, the Forest Service's Regional Office, the University of Montana and the Intermountain Research Station. This research group is defining ways to better involve and interact with the public through all aspects of the BEMRP.

Public participation helps design, execute, and evaluate all phases of the project. Since people are part of ecosystems, the public must become partners in planning the desired future condition for the ecosystems and developing proposed management actions.

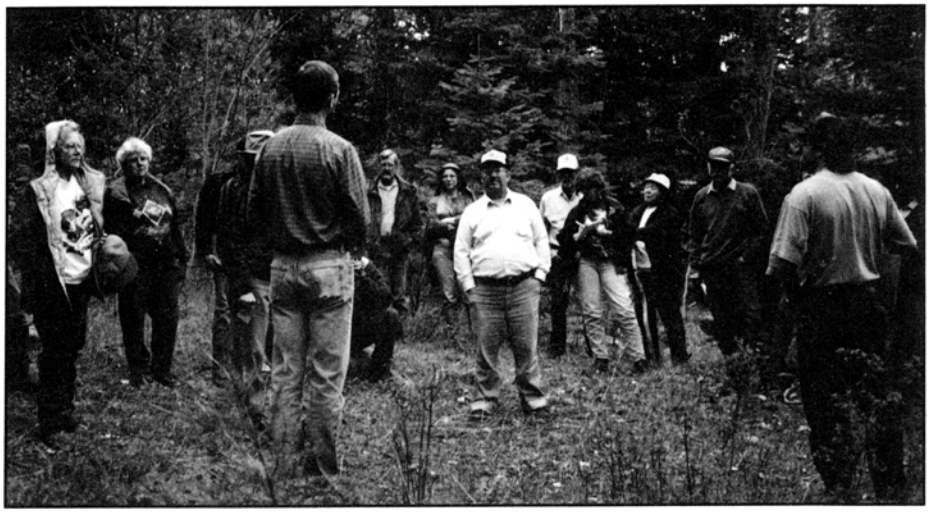
Over 25 public meetings and field trips have been planned and implemented by the Human Dimension Research Group in conjunction with the Stevi WC Landscape Ecology project. Resource managers, scientists, and educators use these meetings as a forum to explain the concepts of ecosystem management to the public, and gather the public's input on their needs, wants and concerns about forest management on the Bitterroot National Forest.

Public input is solicited early on in the process to assure that public involvement strategy is timely, adequate and meets the needs of the public, resource professionals and the resource. Social scientists at the University of Montana are monitoring ongoing public involvement strategy, developed and implemented by the Human Dimension group, to assure that these needs are being met. Videography has been used to record all public meetings and field trips, and an analysis of the video imagery is underway.

Several cooperative studies on public involvement have been completed. The Bitterroot Valley Social Assessment, prepared by the Bitterroot Social Research Institute, is an overview of social structure, social process, and social changes in the Bitterroot Valley.

Several papers on public involvement process have also been completed. These include: (1) "Public Participation in Natural Resource Policy Making: A Review of the Literature", by University of Montana Graduate Student Christian F. Gebhardt; and (2) "Institutional and Legal Barriers to Involving People in Ecosystem Management", by Daniel B. Schlager, J.D., and Wayne A. Friemund, Ph.D.

The Human Dimension group is working toward the development of more effective and economic ways to involve the public in the future.



Larry Creek Riparian Restoration Area Field Trip
Intermountain Research Station Research Forester Mick Harrington (back to camera) explains how major changes are taking place in forest ecosystems on the Bitterroot National Forest. There is a growing need for land managers to take a proactive approach, and address forest health concerns before the conditions get too bad. Harrington explained that not a lot of work has been done on riparian areas because of their importance and delicate situation. Photo Madelyn Kempf

Historic changes on the Bitterroot face

by Madelyn Kempf
Human Dimension Research Group

The spectacular beauty of the Bitterroot Mountain Range attracts many people with its scenic beauty, which includes heavily wooded forests, craggy rock outcrops, alpine lakes, grasslands, and wildlife in their "natural" environment. But, is what we see out there natural for ecosystems of the northern Rocky Mountains?

Harvey Hackett, native Bitterrooter, fourth generation rancher, and member of the Stevensville West Central Public Working Group, has seen many changes in the complexion of the Bitterroot mountains.

Hackett's roots go deep. His great-grandfather arrived in the Bitterroot Valley in the 1870's, purchasing the family ranch on Sweathouse Creek, west of Stevensville, in 1892.

Hackett notes that fire suppression efforts started full force in the Bitterroot during the 1920's. Up to then, good grazing was available on both sides of the Bitterroot Valley because fires regularly burned in the area—both natural and human caused. Some of Hackett's earliest memories are of the mature ponderosa pine on the westside slopes, and the abundance of grassy hillsides on both the west and east sides of the valley.

During WWII, Hackett remembers collecting honey from old growth ponderosa pine "bee trees" on the west face of the Bitterroots. The honey bees favored the old

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The "not so candid" camera — update on wildlife research

by Kerry Foresman
Professor of Biological Sciences

For the past seven months, Research Technician Dean Pearson and I have been working in the Bitterroot Mountains testing Forest Service methods for detecting forest carnivores. We set remote cameras along several miles of trails—reaching into the heart of the Selway-Bitterroot Wilderness—in search of lynx, wolverine, fisher, and pine marten.

We have had resounding successes, if not comical failures! On the plus side, we collected photographic proof of one or more wolverines, and several fisher and pine marten—two of Montana's rarest species. The marten and fisher are rarely, if ever, documented in these areas.

Over 400 photographs of pine marten have been taken, and we are still counting! Though the pine marten is one of our targeted species, we have started to dream up strategies to discourage its appearance—truly worthy of Rube Goldberg.

Fisher—a rare species in the north Bitterroot Mountain Range. Remote cameras have recorded the presence of this elusive species in the research area. Photo J. Jones .

Though lynx have alluded us, our photographs display a "who's who" of the mountains. Mountain lion, bobcat, red fox, coyote, moose, white-tailed deer, pine squirrels, northern flying squirrels, snowshoe hares, and deer mice are all primping for the camera. Lion hunters, families on cross country ski outings, and hikers have all stopped to smile for our not-so-candid cameras.

On the negative side, like most field research, the experimental design looks best while sitting at home next to the fire. Here all contingencies are easily handled with the stroke of a pen, or these days a computer keystroke.

The legions of volunteers who readily jumped at the opportunity to help—with visions of seeing a wolverine up close and personal—disappeared as the reality of cold, rainy, icy conditions set in.

Dean's twice weekly trek up the canyons with a 70 pound pack, my unique ability to fall into the ice-covered creek while crossing (not once but twice), and our all too frequent tumbles on the icy trails left both of us battered and bruised. Dean even had a dislocated shoulder!

However, we learned a great deal about animal, as well as human behavior. Our cameras successfully recorded not only who appeared, but when.

Overview of wildlife studies

by Jack Lyon
Wildlife Research Group

The concept behind these wildlife studies is to look at several classes of animals from small to large, from birds to mammals, and look for landscape-level effects on their populations.

At public meetings, solid support has been voiced for this approach. Following is a list of project that are currently being done in conjunction with the Bitterroot Ecosystem Management Research Project:

(1) Bitterroot Ecosystem Management Small Mammal Study—Dave Spildie

This study examined small mammal populations in 4 different treatments: clearcut, old burn, control, and wilderness. 489 animals of 7 species

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Research specialists are studying the effects of ecosystem management on elk winter range and hiding cover. Research specialist Bill Koncerak will evaluate changes in hiding cover and forage production when fire is restored to the ecosystem. Photo Milo Burcham.

Who's tracking who?

by Kerry Foresman
Professor of Biological Sciences

Dean and I were approached by an inquisitive female mountain lion and her two yearlings while we examined their fresh deer kill. We also had the opportunity to observe recent tracks of a lone wolf that was working its way up one of the canyons.

With dates and times imprinted on our photographs, we could see that at seven minutes past noon a mountain lion crossed one of the main trails, about 1/2 mile from the trailhead . Just a short time before, a family of cross-country skiers stopped to wave at our camera. Had these skiers only known!

Vegetation studies support ecosystem management

by Steve Arno
Vegetation Research Group

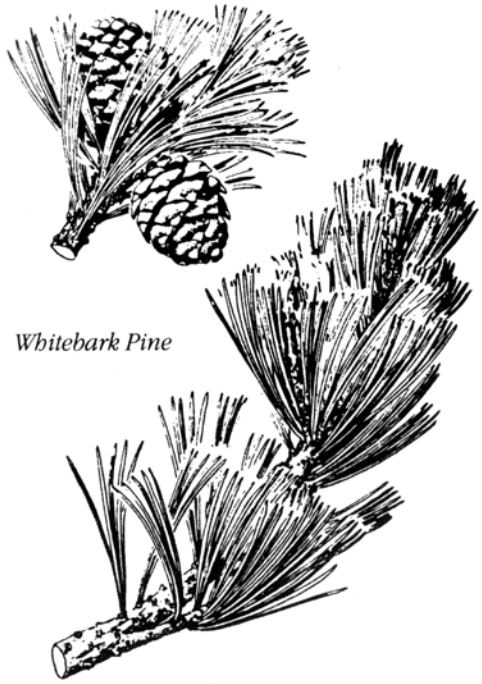
The Vegetation Research Group is made up of two dozen researchers and natural resource specialists from the Intermountain Research Station, University of Montana, and the Bitterroot and Lolo National Forests.

Its principal accomplishment in fiscal year 1994 was to identify a broad range of studies that could be undertaken to provide information necessary for development of ecosystem management strategies. The vegetation group has been busy developing initial plans for these studies.

Three studies will describe historic vegetation patterns and compare them with present and projected vegetation under current management and "no action" preservation and attempted fire exclusion strategies. Eight studies deal with restoring natural processes and vegetation patterns in lower elevational forests. These include studies of returning fire in fire-dependent old growth and riparian communities.

Four studies investigate disturbance strategies for maintaining upper elevational forests of lodgepole pine and whitebark pine. One of these measure hydrological implications of landscape scale manipulations.

Other studies will provide information needed to support ecosystem management through the use of classification, ecological simulation, and modeling the landscape effects of alternative management schemes. The studies will also determine the costs of different silvicultural approaches for restoring altered forest ecosystems.



Whitebark Pine

Looking to the past to understand the present

by Steve Arno
Vegetation Research Group

University of Montana Graduate Student Ann Karsian has collaborated with Dr. Peter Mehringer, Washington State University, to describe "secrets of the past" as revealed by research on sediments in a pond near Lolo Peak.

Painstaking analysis of fossil pollen, and microscopic charcoal in sediment cores taken from the pond, reveal that four different kinds of forest environments existed here in the past several thousand years. This study began with sediments deposited immediately above the several inches of ash resulting from the explosion of Mount Mazama—present site of Crater Lake, Oregon—about 6,800 years ago.

From then, until about 5,600 years ago, the site was surrounded by a much warmer, drier forest than exists today. In this forest, spruce was absent and Douglas-fir and/or larch were abundant.

From about 5,600 to 3,500 years ago, cool, moist conditions prevailed as indicated by a major increase in spruce and subalpine fir. For the last 2,000 years, cool, dry conditions were indicated by an abundance of subalpine fir pollen, along with the Douglas-fir, larch and lodgepole pine pollen type, but showing a major decline in spruce. During the entire 6,800 year record, there is abundant evidence of fires interacting with these forests.

As soon as her thesis is completed, Karsian plans to produce a publication that interprets the fossil record. This will help us understand the long-term ecological changes that are part of the wildland forests of the Bitterroot Mountain Range.

Steve Arno (right) explains thinning and burning research units at the Lick Creek Research Area to KECI-TV news reporter Larry Frost (behind camera). Holding media field trips is an effective "tool" to help increase public awareness of the work that research specialists and land managers are accomplishing. Photo Madelyn Kempf.

Desired future condition on multi-aged ponderosa pine and Douglas-fir on the Bitterroot National Forest. Photo Steve Arno.

On Mary's Pond.
A coring tower gathers pond sediment for Ann Karsian's study of long-range ecological changes. Photo Steve Arno.

Vegetation Studies in Place

by Steve Arno
Vegetation Research Group

As in the Wildlife Research Group, a diverse group of studies are in place to determine site-specific to landscape level relationships of vegetation to individual sites, and the interaction of natural processes. Following is a comprehensive list of current vegetation research studies.

Vegetation History Studies

(1) Measure vegetation changes on the Bitterroot front. Characterize pre-1900 and present forest composition, structure and fire regimes based on field sampling a grid covering all forest zones.

(2) Characterize forest vegetation and fire history for the last 7,000 years in a lodgepole pine/larch forest site.

(3) Compare pre-1900 and recent growth in old growth ponderosa pine/Douglas-fir stands

Vegetation Treatment Studies

Lower Elevation Forests

(1) Lick Creek Demonstration Studies: Replicate treatment units conducted in 1992 - 1990 in a ponderosa pine forest near lake Como. Commercial thin, retention shelterwood, and single tree selection system combined with dry, moist, spring and fall underburns, and no burn. Studies compare a variety of vegetation responses and aesthetic evaluation among treatments and untreated units.

(2) Use silviculture practices and prescribed fire to convert stagnant fir stands to large diameter pine/larch/fir forest.

(3) Restore stands of old-growth ponderosa pine/larch at Snowbowl, Lolo National Forest, using prescribed fire.

(4) Use prescribed fire and understory removal to restore seral vegetation and pre-1900 stand structure in riparian conifer forests.

(5) Monitor water quality and channel response to above fire treatment in riparian forest.

(6) Restore natural vegetation at Sawmill Research Natural Area using prescribed fire, understory removal, and weed control.

(7) Compare silvicultural treatments for reducing fire hazard and improving forest health in ponderosa pine forests in residential and scenic areas.

(8) Demonstrate fire hazard reduction and ecological enhancement on adjacent small private and public lands.

High Elevation Forests

(1) Lodgepole pine landscape mosaics and watershed effects: define historic patterns and testing alternative treatments on paired watershed.

(2) Apply prescribed fire and release cutting to perpetuate whitebark pine—Smith Creek Study.

(3) Apply prescribed fire and silviculture treatments to restore whitebark pine in a previously logged site—Coyote Meadows Study.

(4) Snowbowl Whitebark Pine Demonstration Study: use silviculture treatments and prescribed fire to enhance natural rust resistance and vigor of whitebark pine.

(1)

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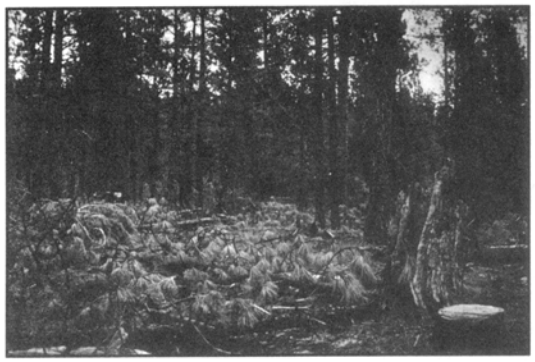


(3)

(4)

(5)

The Lick Creek Research Area, Darby Ranger District, Bitterroot National Forest

(1) Selection unit before treatment

(2) Selection unit after harvest

(3) Spring burn

(4) After the burn

(5) One-year later, post burn

Photos Clint Carlson

Models will conduct analysis at the landscape level

Modeling approaches for conducting analyses at the landscape level are being tested on the Stevensville West Central Integrated Resource Analysis Area—wilderness and non-wilderness— which includes both National Forest and private ownership. For the past year, resource specialists on the Bitterroot National Forest have worked closely with landscape analysis researchers to address important ecological planning and implementation issues. The following computer modeling will be used in the analysis process:

* **GIS**—**G**eographic **I**nformation **S**ystems

* **SIMPPLLE**—**SIM**ulating vegetative **P**atterns and **P**rocesses at Landscape Sca**LE**s—a vegetative simulation model

* **MAGIS**—**M**ulti-resource **A**nalysis and **G**eographic **I**nformation **S**ystem—a model for scheduling activities on both a spatial and temporal basis

Bridging the gap between plans and lands

by Cindy Chojnacky
Public Affairs Officer
Intermountain Regional Office

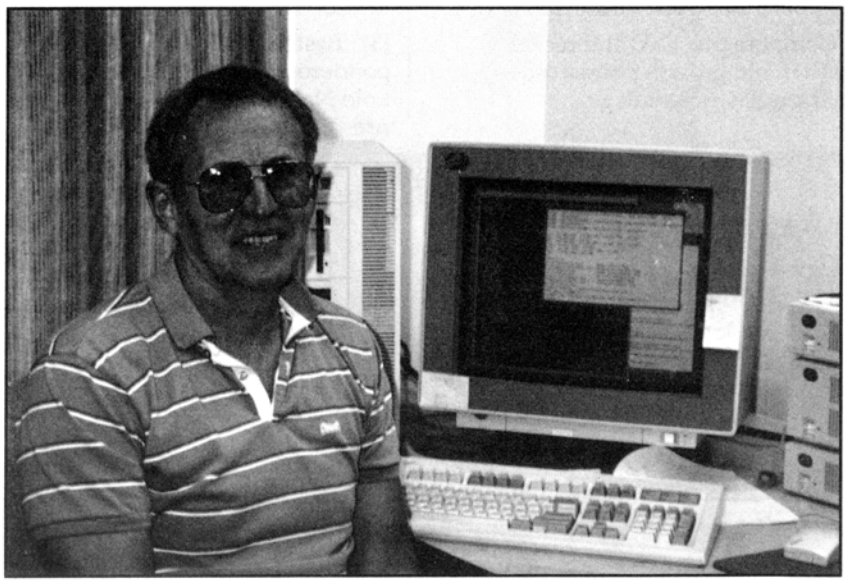
To gain a better understanding of ecological relationships, a team of State, University of Montana and Intermountain Research Station scientists are developing innovative computer modeling programs to project how land management proposals will affect the landscape.

But, how do you bridge the gap between Forest Plans and specific project plans? One such bridge—MAGIS, a multi-resource analysis and geographic information system—is being developed by Greg Jones, with Intermountain Station's Multiple-Use Economics Project; Hans Zuuring, University of Montana; and W. L. Wood, Montana Department of State Lands.

In the 1970's and 80's, forest planning efforts demonstrated a certain problem—the human mind isn't capable of calculating all the interactions of human activities and natural processes on a given area of land over time.

"Forest Plans stratify the forest in terms of how many areas are going to be managed in a certain way", said Jones . "You don't have very good control of spatial aspects, how things are arrayed. There is a real problem with trying to integrate plans."

MAGIS, a microcomputer-based spatial decision support system, includes a database management system, analytical models, graphical display and report generators. MAGIS integrates economic and biological information. MAGIS, however, does not make decisions. "Based on your objectives, you can use it to come up with scenarios on things you can do over time," Jones stressed.



Jim Chew, Intermountain Research Station
Chew's computer modeling program predicts how vegetation may change on a landscape over time for a given set of management activities. Photo Madelyn Kempf.

The BEMRP team is using MAGIS with another model, SIMPPLLE, developed by Intermountain Station's Jim Chew. Chew's model predicts how vegetation may change on a landscape over time for a given set of mangement activities. It also provides analysis or the risk of various disturbances such as insect, disease and fire.

By summer 1995, MAGIS should be ready to share with interested forests and other land managers. However, there are some barriers to broad use of MAGIS, at least within the National Forest system—technology, policy, and people. The use of MAGIS requires personal computers and Geographic Information Systems (GIS). Many forests in the interior west do not have these tools. MAGIS can run on any IBM-based personal computer, but it has to be a PC.

The biggest barrier, however, is policy—either stated or believed. The Forest Service has not gotten into tactical planning, only strategic planning—policy or forest plans. There's the project planning level but nothing in between.

"The environment for something like MAGIS is getting better," said Economics Research Project Leader Ervin Schuster. "The old ways of doing things are bankrupt."

MAGIS and SIMPPLLE—predicting vegetation changes over time

by Greg Jones
Landscape Analysis Application Group

MAGIS and SIMPPLLE are being used in a repetitive fashion to take advantage of the different strengths they have to offer in addressing management issues. To illustrate, let's consider the process being used to develop the proposed action.

After the data have been assembled, the first step is to use GIS to display the existing conditions. Next both SIMPPLLE and MAGIS are used to predict vegetation changes over time—if no mangement activities are conducted except fire suppression.

SIMPPLLE predicts the amount and location of natural processes. MAGIS predicts mangement relationships, e.g., how wildlife habitat indexes will change over time. These predictions will be compared to the desired future conditions to identify needed changes.

Next, a management alternative will be developed with MAGIS. This will target stands identified by SIMPPLLE as having a high probability of undesirable natural processes. It will also specify desired amounts for key management relationships.

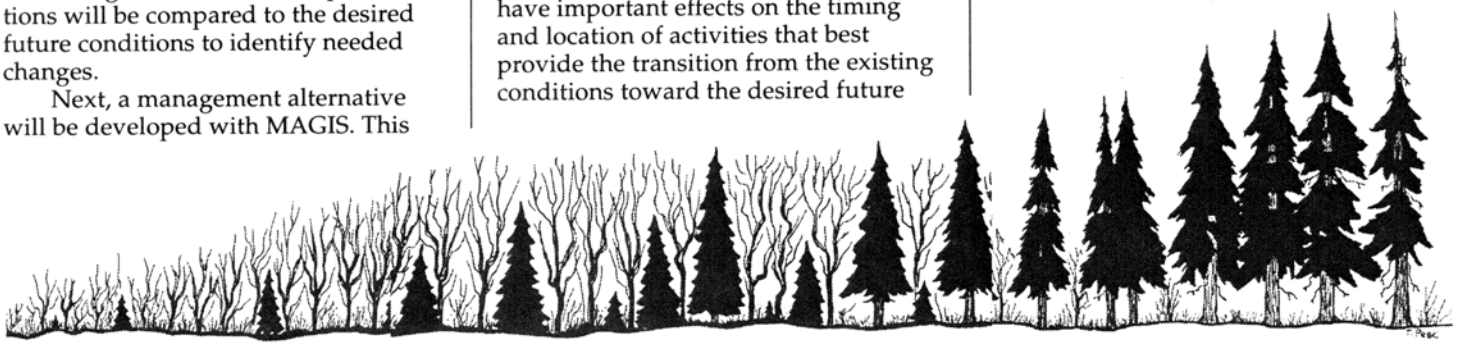
Tradeoffs, associated with changing amounts for management relationships and the location of activities, will be evaluated both with MAGIS and SIMPPLLE. The final step is for the managers to evaluate the trade-offs and decide on a proposed action.

Based on experience so far, it is important to have the actual mosaic of vegetation as input into landscape analyses. The spatial arrangement of the vegetation has important effects on the natural processes that occur on that landscape.

Likewise, spatial arrangement can have important effects on the timing and location of activities that best provide the transition from the existing conditions toward the desired future conditions. We suggest extreme caution in extrapolating the results of analyses from one landscape to another—even if they are ecologically similar.

The next phase of the Bitterroot Ecosystem Research Project's landscape research will address geographic areas, the hierarchial level immediately above the integrated resource analysis level. We envision modeling with the same or similar systems, but with a more coarse resolution of data.

The issues to be addressed must be consistent with less data resolution and the broader geographic perspective. This phase will test procedures and modeling approaches, as well as links between the hierarchial levels.



Wildlife Overview – *(continued from page 5)*

were traced over 3,840 trap nights. Initial analysis reveals significant differences in species diversity and species richness.

(2) Test of a Proposed Survey Method for Forest Carnivores—Kerry Foresman

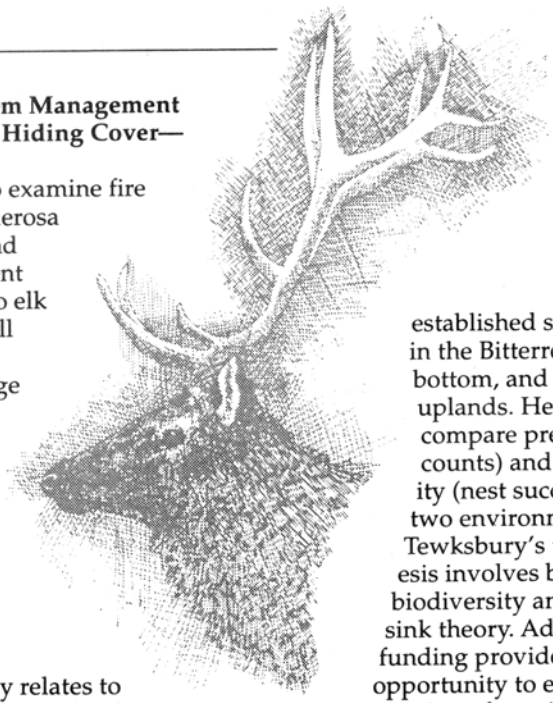
Dave Pearson will be responsible for the hard physical slogging required by this study. The study involves 8 cameras, 4 drainages, 30-day sampling frames, snow tracking in winter and sooted tracking plates in the spring and summer.

(3) Multi-scale Analysis of Habitat Use by Flammulated Owls—Vita Wright

The current status of this study is that very few owls have been found in the Bitterroot North study area. As a result, Wright expanded the search area to the Sula Ranger District, and other parts of the Bitterroot where owls were present.

(4) Effects of Ecosystem Management on Winter Range and Hiding Cover—Bill Koncerak

Koncerak plans to examine fire groups 4 and 6—ponderosa pine, wet and dry—and vegetation development over time in relation to elk habitat models. He will evaluate changes in hiding cover and forage production that result when fire is restored to the ecosystem.



(5) Importance of Riparian Habitat in Sustaining Biodiversity—Josh Tewksbury

Tewksbury's study relates to riparian area bird nesting to landscapes on at least 3 different scales. He has established study areas in the Bitterroot Valley bottom, and the forested uplands. He will compare presence (point counts) and productivity (nest success) in the two environments. Tewksbury's test hypothesis involves both biodiversity and source/sink theory. Additional funding provides an opportunity to examine the question of survival—mist netting and banding.

The "Spotlight"...highlighting researchers at work

The "Spotlight" is on Graduate Students Vita Wright and Mike Hartwell.

Biologist seeks the elusive flammulated owl

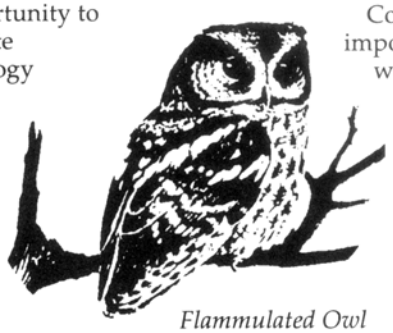
by Vita Wright
Graduate Student
Wildlife Research Group

I first became interested in working as a biologist when I volunteered in Glacier National Park collecting piles of grizzly bear scat as part of a fall feeding study. Since then, I've counted hundreds of bald eagles in Glacier Park, waited patiently for pileated woodpeckers to fly the nest on the Olympic Peninsula, and observed and banded spotted owls in California.

One of my favorite jobs was surveying spotted owls. Imagine spending all night outside, night after night, listening for owls. You stop every half mile and listen for 10 minutes. Eventually from deep in the canyon below, you hear an owl hooting. It's the time you've been waiting for! It hoots continuously while you try to figure out exactly where it is. Sometimes you follow it into the moonlit woods to flag its exact location.

"It's a great feeling to be the only one outside, watching the sky change and listening to the sounds of night..."
-Vita Wright

I enjoyed my spotted owl survey experience so much that I jumped at the opportunity to conduct my graduate research on the biology of the flammulated owls. These small owls nest predominantly in ponderosa pine forests. They use cavities created by woodpeckers in old, dead trees. They differ from other owls that winter in northwestern Montana.



Flammulated Owl

The flammulated owls are neotropical, migratory birds that winter in South America. Because they are migratory, and breed later than resident owls, their existence wasn't known in Montana until about 15 years ago.

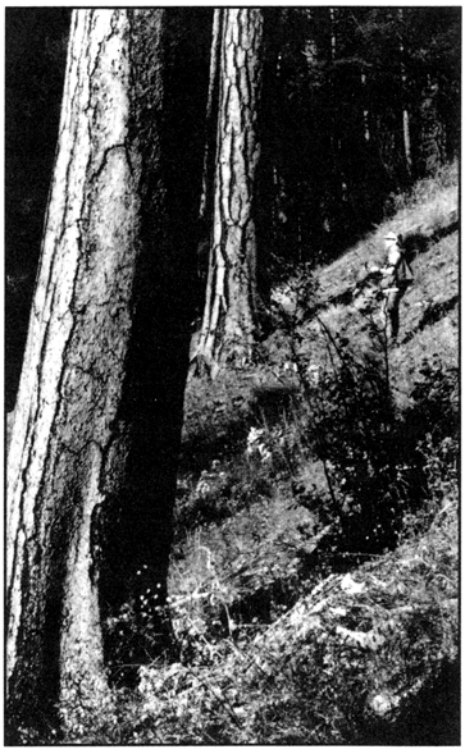
If these birds are dependent on ponderosa pine forests, do they need fire to persist? Are they dependent on old or young forests? Can they survive in stands that have been logged?

To answer these questions, in the spring of 1994 my research assistant Laurie Cleary and I camped in our truck, six nights a week, listening for owls along the eastern front of the Bitterroot Mountains. To describe the distribution of flammulated owls and their nesting habitat, we surveyed 593 points, along 108 miles of transect in the Bitterroot Mountains. We found owls at about 50 of these points—along 5 of 35 transects. The rest of the summer and fall was spent collecting vegetation data.

I am currently trying to describe the differences in habitat between transects and points that contained owls and those that did not.

Cover type is the single most important variable that explained where flammulated owls were found. These owls used old, mature ponderosa pine, and Douglas-fir cover types more than young harvested ponderosa pine, Douglas-fir, and other forest types. Older forests contain large snags with cavities these owls use for nesting.

I hope the results of this study will help land managers to understand and protect this unique species, while implementing ecosystem mangement in the Bitterroot Mountains.



Vita Wright's research assistant, Laurie Cleary, measures canopy cover in a remnant stand of large old ponderosa pine. Photo Vita Wright

Perfect partner – *(continued from page 3)*

The Bitterroot National Forest's leadership in applying the principles of landscape ecology, and ecosystem management on-the-ground, has led to the receipt of three national awards from Forest Service Chief Jack Ward Thomas.

- 1994 - the $50,000 Chief's Stewardship Award for fisheries/watershed projects, and accomplishments on the Stevi SW project.
- 1994 - the Chief's Ecosystem Management Award, Honorable Mention for ecosystem management efforts on Stevi SW.
- 1993 - the Chief's Ecosystem Management Award, First Runner-Up, for the Stevi SW project.

Researcher compares forests of the past and present

by Steve Arno
Vegetation Research Group

University of Montana Graduate Student Mike Hartwell, whose Master's Degree study is directed by Dr. Paul Alaback, has embarked on a study to collect detailed information on forests of the past—circa 1900—and the present. Hartwell's study will provide detailed inventory information on structure, composition and disturbance history for past and present forests, at more than a hundred points on the landscape.

Graduate Forestry Student Mike Hartwell measures fuels. Photo Steve Arno

Hartwell earned his bachelor's degree in natural resource science at Washington State University. He then served as a research technician for the Fire Effects Research Project for 2 1/2 years. During that time, he helped carry out studies on ponderosa pine old- growth stand structure, and studies of prescribed fire at the Lick Creek Experimental Area.

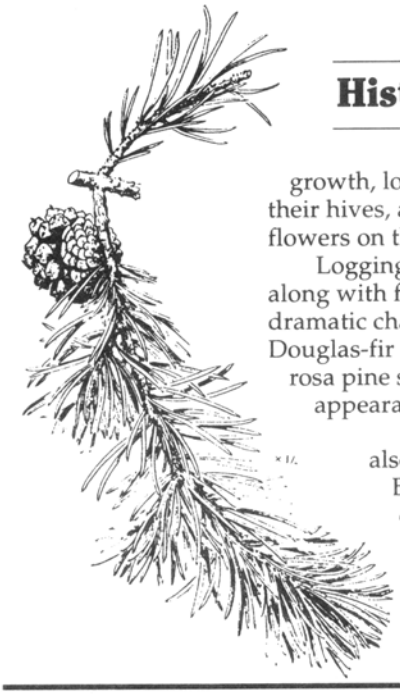
Some of Hartwell's colleagues developed a technique for describing forest structure and landscape patterns in the lodgepole pine type (Intermountain Station General Technical Report 294, 1993). Hartwell, however, determined that these techniques could be expanded for inventorying and comparing broader forest landscapes (mosaics) in the past and the present. Hartwell, and his field assistants, will conduct these inventories using a sampling grid covering extensive areas of three mountain ridges along the front of the Bitterroot Range.

Most of the field work will be conducted in the spring and summer of 1995. The final report will be completed next year. This information will provide an inventory of historic stand structures, tree species composition, and disturbance events responsible for this.

This study will also compare past stand structures and landscape patterns with current forest conditions. This will provide a uniquely detailed view of ecological processes and their effects that are of interest for the development of management strategies.

Mike Hartwell attaches the drill to the motorized increment borer.
Forest managers need basic information about the age of old-growth forests in which fire or other disturbances were important. This information is necessary for determining appropriate strategies for perpetuating desired conditions. The motorized increment borer allows a two-person crew to obtain an average of 120 cores per day. Photo Steve Arno

"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community." - Aldo Leopold



Historic Changes – *(continued from page 4)*

growth, low-elevation ponderosa pine for their hives, and probably collected pollen from flowers on the grassy hillsides.

Logging of the ponderosa pine and larch, along with fire suppression, led to some dramatic changes on the north Bitterroots. Douglas-fir began taking over historic ponderosa pine sites, changing the appearance of the landscape.

Hackett remembers that there were also a lot more mule deer in the Bitterroots. Because of vegetation changes, whitetail moved into what was once mule deer summer range gradually replacing them.

Hackett notes that there has also been a dramatic loss in blue grouse habitat. "In my opinion, the decline of the blue grouse is an indication of habitat changes," said Hackett. "Like domestic fowl, grouse require a high level of calcium and phosphorous in their diets. I believe frequent fires return these minerals to the soil".

Hackett is deeply concerned about fire exclusion in Bitterroot ecosystems. "Excessive vegetation growth uses water that would ordinarily be released to downstream flows," stresses Hackett, " and heavy forest vegetation leads to cataclysmic fire situations. I feel we need to reintroduce periodic, historic fire cycles that create the grass cover needed to enhance favored wildlife species."

Building good relationships

Part of the challenge faced by the partners in the Bitterroot Ecosystem Management Research Project is to reach across administrative and ownership boundaries to build trust, cooperation and better working relationships.

Would you like to become a partner in the Bitterroot Ecosystem Management Research Project?

For more information, please call or write to:

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Field tours—protecting forest homes without sacrificing scenery

With yet another dry winter behind us, future fire seasons could be a nightmare for vulnerable forest homeowners. Protecting life and property, especially in and near forested homesites, has become a major concern and a large expense for fire fighters.

The Forest Service's Intermountain Research Station, the Ninemile Ranger District, and the University of Montana (U of M) are co-sponsoring field tours, which take approximately four hours, to a typical low-elevation ponderosa pine/Douglas-fir forest. Here researchers demonstrate three different kinds of scenery-sensitive thinning treatments that greatly reduce the risk of wildfire damage.

Demonstrations are being conducted by Joe Scott and Dr. Ron Wakimoto, University of Montana, School of Forestry. For a schedule of tours, or more information, call Steve Arno, (406) 329-4813.

ECO News

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Research Project
USDA Forest Service
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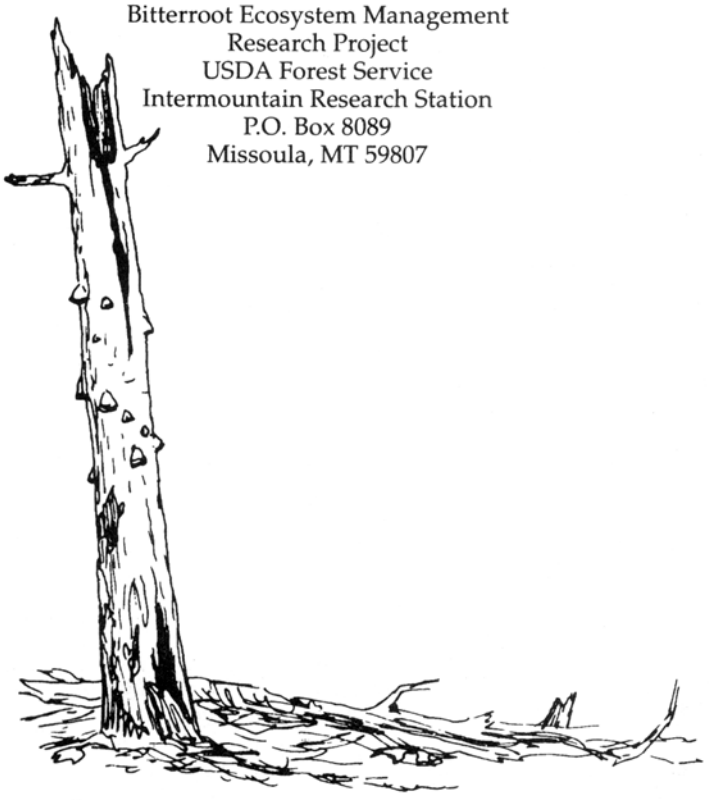

Intermountain Research Station—1995

"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community." - Aldo Leopold