Central Cascades
ADAPTIVE MANAGEMENT AREA

Willamette National Forest
Eugene District
Bureau of Land Management

December 1996

Strategic Guide
Acknowledgments

Completing the Strategic Guide for the Central Cascades AMA was possible because many people were involved. Each of the people listed below helped to reach closure on this first iteration. They worked as idea creators, writer-editors, graphics illustrator, map makers or data gatherers. In addition, many of the implementation ideas also came from them, and we will rely on them for implementation. I want to send my thanks and recognition out to all who helped, for without them, I could not have completed the Guide:


Thanks to each of them and anyone else I may have forgotten.

Diana Bus
Coordinator
Central Cascades AMA
Central Cascades
Adaptive Management Area
Strategic Guide

Agencies: Eugene District, Bureau of Land Management
Pacific Northwest Research Station, Forest Service
Willamette National Forest, Forest Service

For Further Information
Contact: Diana Bus
Central Cascades AMA
P. O. Box 10226
Eugene, OR 97440
Phone: (541) 683-6633
E-Mail: dbus@or.blm.gov
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Welcome to the Central Cascades Adaptive Management Area Strategic Guide!

A product of President Clinton’s Forest Conference and Northwest Forest Plan, Adaptive Management Areas are federal forest lands where the testing of new forest management techniques is encouraged and where communicating and coordinating with local communities and interested groups is emphasized.

Located in the Cascades Mountain Range of Oregon, the Central Cascades Adaptive Management Area (AMA) includes both National Forest System and Bureau of Land Management (BLM) forested watersheds. Several local communities are neighbors to the AMA (Refer to Map 1: Administrative Boundaries).

This Central Cascades AMA Strategic Guide provides a framework to coordinate activities and transform what we learn into actions. This strategy builds upon results from two previous AMA assessments, “Research and Learning Assessment for the Central Cascades AMA” and “Education Assessment for the Central Cascades AMA”.

Specifically this strategy is:

1) A guide to help interested citizens, communities and groups. It provides key information on ways to encourage learning and seek changes in federal agency natural resource practices and processes.

2) A guide for decisionmakers that outlines the Central Cascades AMA priorities so time and funding decisions can support these priorities.
3) An adaptive management framework for natural resource managers, researchers and others who wish to promote needed research, demonstration projects and management studies to help communities and forests to remain viable and productive. (Refer to Figure 1.)

Figure 1. Adaptive Management Model used by the Central Cascades AMA.
The concepts in the Strategic Guide will be applied at three geographic levels:

- **The local AMA level** - Willamette National Forest and Eugene District (BLM) personnel work with scientists and interested people at the watershed level and with individual forest stands to test ideas and new approaches. They also implement and monitor day-to-day projects. Numerous, diverse, intensive research and management studies are underway within the AMA.

- **The Willamette National Forest and Eugene District level** - We move to a larger landscape that encompasses three river basins (McKenzie, South Santiam and Calapooia). District Rangers and Area Managers produce the annual program of work and complete basic forest protection programs. They also work with the local communities and citizen interested in designing and implementing these programs. Several research and monitoring projects span the public and private lands at this scale.

- **The Willamette Province level** - At this broad scale federal and non-federal natural resource managers and scientists work to integrate activities across large-scale landscapes. This province includes much of Oregon’s population. Several communities, large and small, urban and rural, are physically and socially tied to the forested landscape and what it provides in terms of goods and services as well as outdoor experiences. Studies of vegetation age and change and historic land use concern much of the Willamette Province and the Coast Province the west.

Three different time scales will guide Central Cascades AMA work and experimentation. They are:

- **Day-to-Day** - Implementation activities are tied to a one- to three-year-time period. This time scale is where short-term program budgets and projects are proposed, implemented and monitored.

- **Short-Term** - This time scale (5 to 10 years) helps us respond to changing social and natural resource conditions. We work with communities to increase our understanding of their values and goals as reflected in the community strategic plans. This work helps set priorities for completing ecosystem management work. This is the timescale of many research and management studies.

- **Long-Term** - This time scale is generational both in terms of people and the forest. Forests and communities are long-lived and some biological and social community processes can only be measured and monitored in this time scale. Research on important themes such as silviculture, disturbance processes and long-term productivity span decades to centuries.
Many potential customers exist for adaptive management outcomes. Listed below are some of the customers and partners that may find value in this Guide. The success of the Central Cascades AMA depends on customers and partners sharing information and providing resources to further AMA goals.

- Agency natural resource managers
- Natural resource policymakers, elected officials and tribal governments
- Watershed councils, councils of governments and province committees
- Private enterprises that use public lands to provide goods and services and outdoor experiences
- Scientists and researchers
- Natural resource educators
- Natural resource professional groups
- General public
- People from other parts of the U.S. and other countries concerned with natural resource management
- Other AMAs
Chapter 2 discusses what is happening today in the Central Cascades AMA. It also provides a brief inventory to set the stage for planning for tomorrow. The chapter’s outline follows our vision:

“To bring together resource professionals, communities and research to guide the future for natural resource management.”

One way to look at the natural resources within the Central Cascades AMA is by the ownership and management of these resources. The AMA boundary encompasses 168,526 acres of land. The Forest Service has jurisdiction on 148,946 acres. The BLM has jurisdiction on 16,595 acres. The remaining 2,985 acres are in other ownerships and are not affected by this Guide.

**Land Use Designations**
Management of the federal lands in the Central Cascades AMA is determined by the principles in the Northwest Forest Plan and approved land use designations developed through agency planning processes. A brief description of these follow:

**The Northwest Forest Plan** - The Northwest Forest Plan is a multi-agency plan guiding federally managed natural resources. It responded to the need to provide for a healthy forest ecosystem that supports populations of native species (particularly those associated with late-successional and old-growth forests) and the need for a sustainable supply of timber and other valuable resources to the national economy on a predictable and long-term basis. The April 1994 interagency Record of Decision on the Northwest Forest Plan allocated federally-managed lands to Riparian Reserves, Late-Successional Reserves, Adaptive Management Areas and Matrix. The major land use allocations for the Central Cascades AMA are shown on Map 2: Northwest Forest Plan Land Use Allocations. Acreages are summarized in Table 1. A more thorough description of the land allocations can be found in the Northwest Forest Plan.
Land Use Allocations Under the Willamette National Forest and Eugene District BLM Land Management Plans - The land use plans of the Willamette National Forest and the Eugene District of the BLM also contain guidance for areas within the Central Cascades AMA. These special allocations developed through previous planning efforts have been amended through adoption of the Northwest Forest Plan. Where existing plans are more restrictive or provide greater benefits to late-successional forest-related species, the objectives of existing Standards and Guides will continue to guide implementation.

<table>
<thead>
<tr>
<th>Land Use Allocations</th>
<th>Acres</th>
<th>Management Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptive Management Area</td>
<td>165,541</td>
<td>Develop and test technical and social approaches to achieve desired ecological, economic, and social objectives.</td>
</tr>
<tr>
<td>Late-Successional Reserve (LSR)</td>
<td>9,165</td>
<td>Protect and enhance a network of late-successional and old-growth forest ecosystems.</td>
</tr>
<tr>
<td>Late-Successional Reserve (100 acres)</td>
<td>6,333</td>
<td>To preserve an intensively used portion of the breeding season home range for northern spotted owls.</td>
</tr>
<tr>
<td>H.J. Andrews Experimental Forest (HJA)</td>
<td>15,728</td>
<td>Study the effects of management activities to better understand forests and watersheds.</td>
</tr>
<tr>
<td>Key Watersheds</td>
<td>35,315</td>
<td>Key watersheds overlay portions of the AMA and place additional requirements or emphasis on activities in those areas.</td>
</tr>
</tbody>
</table>

Table 1. Central Cascades AMA Land Use Allocations under the Northwest Forest Plan.
Map 3: Special Land Use Allocations outlines these underlying allocations. Acreage figures are shown in Table 2. A more detailed description of these underlying allocations can be found in the Willamette National Forest Land Management Plan and Eugene District Resource Management Plan.

Table 2. Special Land Use Allocations inside the Central Cascades AMA.

<table>
<thead>
<tr>
<th>Land Use Allocations</th>
<th>Acres*</th>
<th>Management Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated Research Site</td>
<td>1,565</td>
<td>Support long-term forest research and demonstrate opportunities concerning site productivity.</td>
</tr>
<tr>
<td>Old-Growth/Special Wildlife Habitat</td>
<td>2,645</td>
<td>Preserve representative ecosystems of old-growth forests and provide for unique wildlife habitats and botanical sites.</td>
</tr>
<tr>
<td>Designated Wild and Scenic River</td>
<td>256</td>
<td>Preserve the river’s free-flowing condition, protect and enhance water quality and identified outstandingly remarkable values.</td>
</tr>
<tr>
<td>(Recreation designation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dispersed Recreation</td>
<td>131</td>
<td>Provide recreation experiences by managing user activities and natural resources.</td>
</tr>
<tr>
<td>Administrative Use Sites</td>
<td>42</td>
<td>Provide facilities to accomplish land and resource management and protection.</td>
</tr>
<tr>
<td>Special Interest Areas</td>
<td>3,881</td>
<td>Preserve lands that contain exceptional scenic, cultural, biological, geological or other exceptional characteristics.</td>
</tr>
<tr>
<td>Visual Resource Management</td>
<td>38,694</td>
<td>Manage landscapes for a designated level of scenic quality.</td>
</tr>
<tr>
<td>Bald Eagle Habitat</td>
<td>1,650</td>
<td>Protect, manage and conserve federally listed and propose species and their habitats to achieve their recovery.</td>
</tr>
<tr>
<td>Research Natural Area (RNA)</td>
<td>1,280</td>
<td>Preserve naturally occurring biological and physical site attributes.</td>
</tr>
</tbody>
</table>

*Acreages may overlap with each other.*
**Administrative Units**

Approximately 90 percent of the Central Cascades AMA is administered by the Forest Service and is managed by the Sweet Home, Blue River and McKenzie Ranger Districts. The other 10 percent is managed by the McKenzie Resource Area of the Eugene District of the BLM. The H.J. Andrews Experimental Forest (HJA), which is connected to the Forest Service’s Pacific Northwest Research Station and Oregon State University, lies entirely within the AMA. A brief description of the federal administrative units are shown in Table 3 and on Map 1.

Table 3. Administrative Units of the Central Cascades AMA.

<table>
<thead>
<tr>
<th>Administrative Unit</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Willamette National Forest</td>
<td>148,946</td>
</tr>
<tr>
<td>Blue River Ranger District (85,950 acres)</td>
<td></td>
</tr>
<tr>
<td>H.J. Andrews Experimental Forest (15,738 acres)</td>
<td></td>
</tr>
<tr>
<td>McKenzie Ranger District (29,867 acres)</td>
<td></td>
</tr>
<tr>
<td>Sweet Home Ranger District (33,129 acres)</td>
<td></td>
</tr>
<tr>
<td>Eugene District BLM</td>
<td>16,595</td>
</tr>
<tr>
<td>McKenzie Resource Area (16,595 acres)</td>
<td></td>
</tr>
<tr>
<td><strong>Total AMA Acres:</strong></td>
<td><strong>165,541</strong></td>
</tr>
</tbody>
</table>

**Building Relationships**

A priority for the Central Cascades AMA is integrating the values of communities with the experiences of researchers and federal land managers. The success of integrating communities with federal land managers and researchers depends upon developing long-term trusting relationships. These relationships rely on effective communication. To facilitate this communication, the following actions and activities are occurring within the Central Cascades AMA.

- **AMA Executive Group** - The Central Cascades AMA uses an executive group to steer AMA activities. This group includes the District Rangers from the Blue River, McKenzie and Sweet Home Ranger Districts, the McKenzie Resource Area Manager, the Willamette National Forest (NF) Supervisor, Eugene BLM District Manager, Pacific Northwest Research Station (PNW) - Corvallis Ecosystem
Processes Team Leader and AMA coordinator. This group meets regularly to share information, facilitate interagency program implementation and discuss and agree upon Central Cascades AMA activities and resource expenditures.

Central Cascades AMA Coordinator - This position was developed to serve as AMA Coordinator for both agencies [BLM and Forest Service (FS), including PNW Research Station]. Although funded by the FS, the individual is stationed at the Eugene BLM District Office. This arrangement encourages communication between agency personnel. Primary roles of the coordinator are to:

- Serve as a link between agencies and make the connection to the larger AMA network;
- Market AMA information and represent AMA activities to internal and external audiences;
- Serve as a link to the Willamette Province Interagency Executive and Public Advisory Committees;
- Be a connection between Willamette NF and Eugene District personnel;
- Enhance the communication between research and management, particularly the PNW/BLM link.

Quarterly Newsletter - The newsletter is a communication link between federal land managers and communities associated with the AMA. The information in the newsletter includes a list of upcoming activities in the local communities, current events, ongoing research and requests for volunteers. Members of the public can highlight their work in the newsletter. Currently, the newsletter is distributed to more than 500 people and/or groups.

Field Trips and Public Meetings - Many public meetings have been held to highlight ongoing activities in the AMA, to share information and to learn from one another. For example in May 1996, a meeting was held where individuals were asked what federal agencies could do to communicate more effectively about the AMA and to generate interest in ongoing projects in the AMA. In
addition, the individual partners have hosted numerous public meetings to share information about projects in the AMA such as watershed analysis, timber sales and riparian improvement. Local citizens and representatives from interested groups in the area were the primary audience.

Partners use field trips to highlight and seek input on activities in the AMA that include sharing information about the AMA’s land base, evaluating different young stand management activities, learning about research in the AMA and considering riparian reserve management. Field trip participants have included international groups, researchers, land managers, citizens, educators, students and people who work in the woods.

One-on-One Communication - Each partner uses individual and small group communications to gather and exchange information. These one-on-one communications are an effective tool to learn what people want from or value in their federal forests. This happens at all levels, with all kinds of people, on nearly any subject.

Membership in and Discussion with Existing External Groups - Many presentations have been made to groups such as watershed councils, advisory committees, classrooms and economic development groups. Participation with groups will continue. This forum provides an opportunity to exchange information as envisioned in the adaptive management model.

Physical Description of AMA
The Central Cascades AMA includes land within three main river basins which flow into the Willamette River (South Santiam, Calapooia and McKenzie Rivers). Several of these watersheds are only partially located within the Adaptive Management Area; other portions either lie within other land use allocations or are in non-federal ownership. The main basins (South Santiam and McKenzie Rivers) define and divide transportation systems and human communities as well. For ease of describing the different parts of the AMA, they have been divided into blocks (see Map 4). Brief block descriptions follow. For a more thorough description, refer to the Central Cascades AMA Research and Learning Assessment and specific watershed analyses listed in the references section of this Guide.

Block Descriptions
Moose Creek - The Moose Creek block lies in the northwestern corner of the Adaptive Management Area. With the exception of the privately-owned, upper eastern slopes, the block is managed by the Willamette NF. Most of the block falls within the Moose Creek watershed, and all of the federally-managed portions of the Moose Creek watershed are in this block.
Map 4: Block Map of Central Cascades AMA

<table>
<thead>
<tr>
<th>Blocks</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moose Creek</td>
<td>9,209</td>
</tr>
<tr>
<td>Canyon Creek</td>
<td>17,864</td>
</tr>
<tr>
<td>Calapooia</td>
<td>5,803</td>
</tr>
<tr>
<td>Deer Creek</td>
<td>17,426</td>
</tr>
<tr>
<td>Blue River</td>
<td>28,557</td>
</tr>
<tr>
<td>Bear Creek</td>
<td>3,217</td>
</tr>
<tr>
<td>Marten Creek</td>
<td>3,435</td>
</tr>
<tr>
<td>Isolation Block</td>
<td>2,182</td>
</tr>
<tr>
<td>Lower South Fork</td>
<td>8,154</td>
</tr>
<tr>
<td>H.J.Andrews</td>
<td>15,738</td>
</tr>
<tr>
<td>Lower Blue River</td>
<td>9,788</td>
</tr>
<tr>
<td>McKenzie Valley</td>
<td>35,003</td>
</tr>
<tr>
<td>Hagan LSR</td>
<td>9,165</td>
</tr>
</tbody>
</table>
The majority of the watershed contains relatively uniform, even-aged stands of post-fire, mature Douglas-fir forests (approximately 90 to 110 years old). Roads have been built into the lower portion of the block to provide access for cutting and stand tending operations. Young, even-aged plantations are dispersed through portions of the lower watershed. Most of the federally-managed part of the upper watershed is still roadless. Moose Creek provides key habitat for winter steelhead and spring chinook salmon, and is closed to angling. Stream restoration projects are underway in the lower stream reaches. Cougar Rock, located at the far northern tip of the block, is of interest to Native Americans for berry-picking and other traditional cultural values. Moose Lake is in the roadless portion of the area and is the largest natural lake within the AMA.

Canyon Creek - This portion of the AMA consists of the Canyon Creek and Falls Creek watersheds, both tributary to the South Santiam River, and other minor streams also tributary to the South Santiam. Almost all of the Falls Creek basin is managed by the Willamette NF, while most of the lower and middle portion of Canyon Creek basin is privately owned. High stream gradients and barrier falls severely limit fish populations in this stream. Canyon Creek and the South Santiam River provide key habitat for winter steelhead and spring chinook salmon.

The area has been extensively roaded and harvested for timber management. Only small areas remain unroaded and remaining patches of natural forest are fragmented. There are at least 2,000 acres of plantations more than 30 years old in the upper portion of Canyon Creek. Lower portions of the block border the South Santiam Highway corridor and are managed for scenic values.

Calapooia River - The federally-managed headwaters of the Calapooia watershed lie within the AMA and are managed by the Willamette NF. The vast majority of the watershed’s lands are privately-owned and are in young plantations. The federal acres are roaded and fragmented due to the traditional practice of dispersing patch clearcuts across the landscape. This basin also has a high proportion of older, even-aged plantations due to past management.

Blue River - This block contains the lands in the Blue River watershed above Blue River Reservoir. With the exception of two small inclusions of private land, the entire block is managed by the Willamette NF. Wolf Rock is a dominant feature of the upper watershed.
Even-aged plantations and roads are dispersed throughout the block. Uncut forests are quite mixed, ranging from young, fire-regenerated Douglas-fir to mature and old forests.

Because of its proximity to the HJA, the area has long been used for research. Numerous datasets have been developed through these studies (such as stream discharge, fire history, spotted owl occurrence). Research activities in the area have increased in recent years as interest in larger landscape scales has increased and the research program has grown. The area also receives many visitors, particularly in the Mona Creek basin, through the 50-70 tours the Cascade Center for Ecosystem Management (CCEM) hosts each year.

**H.J. Andrews** - This block coincides with the HJ Andrews Experimental Forest and the Lookout Creek watershed boundaries. The HJA is administered through a three-way partnership among Oregon State University, Pacific Northwest Research Station and the Willamette NF. The HJA has been the location of hundreds of studies since its designation in 1948. It is currently a site in the National Science Foundation-sponsored Long-Term Ecological Research (LTER) program and a Biosphere Reserve. Although nearly one-quarter of the HJA has been harvested, very little cutting has occurred during the last twenty years. The remaining three-quarters of the HJA is evenly split among mature and old-growth forests. Several dozen studies are currently active, the vast majority of which are focused on ecosystem processes.

**Lower Blue River** - This block contains the Willamette NF managed lands that drain into Blue River below the head of Blue River Reservoir. This area is considered separately from the Blue River block because of the influence of the dam and reservoir. Managed by the Army Corps of Engineers, Blue River Dam and Reservoir are major features which attract recreationists and block fish passage.

Access to the area varies from the unroded portion in the northwestern corner to the heavily traveled areas near the reservoir. Uncut forests are generally 110- to 140-year-old mature Douglas-fir; plantations are scattered across the lower slopes. The Gold Hill mining district straddles the ridge on the northwestern boundary of the block.
Deer Creek - A large portion of the Deer Creek watershed and several adjacent smaller patches that lie within the AMA are included in this block. This area drains into the McKenzie River and is managed by the Willamette NF. The area has been extensively roaded and harvested for wood products using clearcut and shelterwood systems. Bunchgrass Mountain bounds the upper, northeastern portion of Deer Creek. Higher elevation meadows which are currently being invaded by conifers, cap portions of the peaks. Directly to the north and northwest of Bunchgrass Mountain, the Wildcat Mountain Research Natural Area (RNA) drapes across the Adaptive Management Area boundary. Numerous studies have occurred and are ongoing in the RNA.

McKenzie Valley - Lands in this block lie within the McKenzie Valley in close proximity to the river. The elements that link the diverse lands in this block are the McKenzie River, Highway 126 and high levels of human use. In particular, human use influences the conditions, concerns and opportunities associated with this block. It is prized for its recreational opportunities, fishery, domestic water source, power generation and homesite values. Numerous campgrounds, trails, roads, boat-launching sites and fishing-access sites are located close to the river. Features of note include the McKenzie River Trail (National Recreational Trail status), the McKenzie/Santiam Scenic Byway, the Delta Campground area (includes old-growth trail and amphitheater), Castle Rock and Eagle Rock. The McKenzie supports a prized native chinook salmon and native rainbow trout fishery. Subpopulations of bull trout are found in some of the upper reaches of the McKenzie. A partnership effort has restored the old McKenzie Fish Hatchery as a visitor center staffed by the McKenzie River Chamber of Commerce.

Privately-owned lands are intermingled throughout the block, particularly towards the western end. Most of the lands managed for wood fiber production have been clearcut once, and some areas are now being harvested a second time. The Federally-owned, upper valley lands towards the eastern end are managed by the Willamette NF and are in a range of conditions from young plantations to old growth. One replication of the Young Stand Thinning and Diversity Study is located in plantations in the Mill Creek Area. The Eugene District of the BLM manages the federally-owned lands in the westernmost portions where uncut areas are generally even-aged (90 to 120 years of age) mature Douglas-fir forests.

The communities of Vida, Blue River, Rainbow and McKenzie Bridge are found within the block. Several privately-operated resort and local commercial enterprise are located on the valley floor.
Blue River and McKenzie Bridge Ranger Stations are located near their namesake towns. Private residences are found throughout the area, frequently adjacent to the McKenzie River.

**Lower South Fork** - The southernmost portion of the AMA extends southward along the west side of Cougar Reservoir and the South Fork of the McKenzie River. The block encompasses the area of several small tributaries that drain directly into the reservoir, and is managed by the Willamette NF. Small amounts of private land occur in the upper reaches of these streams.

Heavy use of Terwilliger Hot Springs is a dominant feature of the area. At times, hundreds of people a day enjoy the hot springs and nearby reservoir. User conflicts, crime and resource degradation are problems associated with the area. There is a high level of concern about the impacts on local communities.

A stand of old-growth forest occurs in the rugged slopes of the northern portion of the block. Heavy timber cutting has occurred over the last 40 years in the remainder of the block. Commercial thinning has been initiated the last 5 years as these plantations reach commercial thinning ages. One replication of the Young Stand Thinning and Diversity Study is located in this block. Additional exploratory commercial thinning prescriptions, such as very wide spacing and variable spacing prescriptions, are also being implemented in this area.

**Isolation Block** - The Isolation Block, managed by the Willamette NF, occupies most of the East Fork of Deer Creek watershed on the south side of the McKenzie River. Portions of the East Fork watershed and most of the surrounding landscape are in private ownership. The Eugene District of the BLM manages some lands in the lower part of Deer Creek. Fire-regenerated Douglas-fir forests 70- to 85-year-old cover most of the Isolation Block. A few clearcuts were dispersed through the block in the last 5 years. The vast majority of the surrounding, privately-owned forests have been clearcut and are now in 5- to 30-year-old plantations.

The Isolation Block was designated as an Integrated Research Site for the Long-Term Ecosystem Productivity (LTEP) program. An amendment to the Willamette NF Forest Plan made this land allocation to support research objectives in 1992. The LTEP program is a five-site regional network of applied and basic science studies focused on questions related to long-term ecosystem productivity. Treatments are associated with differing successional stages, and varying levels of forest floor organic matter are being established in three replications. Planning and pretreatment data collection have been underway since 1990.
Marten Creek - This block lies within the Marten Creek watershed managed by the Eugene District of the BLM. Fire-regenerated stands (90 to 110 years old) dominate the lower, federally managed portions of the watershed. Occasional pockets of remnant older forest are scattered throughout this section. Upper portions of the basin are now in young plantation forests that are privately-owned.

The Marten Creek watershed is a low-elevation basin (1,200 to 2,800 feet) with portions relatively undisturbed and intact. It was designated a Key Watershed in the Northwest Forest Plan and has been proposed as an Area of Critical Environmental Concern by BLM. The lower portion has largely unfragmented, mature riparian vegetation with occasional older remnants, an excellent steelhead fishery in the lower three miles, and potential for bull trout and chinook salmon.

Bear Creek - This block lies within the Bear Creek watershed managed by the Eugene District of the BLM. The Bear Creek watershed is also a low-elevation basin with portions relatively undisturbed and intact. It was designated a Key Watershed in the Northwest Forest Plan and has been proposed as an Area of Critical Environmental Concern by BLM. Fire-regenerated stands (60- to 110-year-old) dominate the watershed; however, occasional pockets of remnant older forest are scattered throughout the area. The lower portion has largely unfragmented, mature riparian vegetation with occasional older remnants, and an excellent steelhead fishery below the falls.

Hagan LSR - The Hagan block is a designated Late-Successional Reserve. The area is managed by the Willamette NF and is covered by mature (100- to 140-year-old) Douglas-fir forest. Most of the area drains into the South Fork Gate Creek and on to the McKenzie River. The Hagan Block Research Natural Area (RNA) occupies most of the North Fork of Hagan Creek watershed. The entire RNA is part of the permanent vegetation measurements program and the lower part of the main creek is part of the permanent stream channel measurements program.
One of the key ways to implement adaptive management in the Central Cascades AMA is participation by communities and community members.

**Communities of Interest**
Communities of interest are defined as people and groups with common interests, rather than geographical boundaries. A number of existing local and regional communities are interested in Central Cascades AMA activities. Some of the communities of interest are local aggregations of national interest groups. In addition to participating in their specific area of interest, established groups form alliances to focus on specific issues. Examples of communities of interest interacting with the Central Cascades AMA include Pacific Rivers Council, McKenzie River Guide Association, Northwest Reforestation Contractors Association, and the Pulp and Paperworkers Resource Council.

**Communities of Place**
Communities of place are connected to a specific geographic location. They are generally united by location and often have a similar economic base. East Linn County includes the incorporated communities of Lebanon, Sweet Home, Brownsville and Scio which are situated outside the National Forest boundary. The population lives in the valleys and near the edges of the forests. The landscape is dominated by small farms, forested mountains and dispersed rural communities along state and federal highways. The timber industry has been a dominant influence in the economic life of these communities. Transition is occurring, but the timber industry is still a major focus of economic vitality.

The East Lane County area lies between Cedar Flat and McKenzie Bridge along the McKenzie River Valley corridor. It is a landscape of rural farms, forests, dispersed homes and small businesses along the river and small unincorporated communities. The included communities are Cedar Flat, Walterville, Deerhorn, Leaburg, Vida, Nimrod, Finn Rock, Blue River, Rainbow and McKenzie Bridge. These communities are characterized by their pioneer history, independence, bond with the river, the natural environment and a sense of pride. Economic well-being is tied to tourism, visitor services and small cottage businesses.

The communities of Eugene, Springfield and Corvallis are characterized by diverse economies. These growing communities are becoming more ethnically diverse and less dependent on natural resources for their economic well-being. There are some distinct differences among Eugene, Springfield and Corvallis. Specifically, the large and active natural resource research programs at Oregon State University and PNW; the active and influential environmental presence in Eugene and the research programs at the University of Oregon; and in Springfield, local government that focuses on employment opportunities to become less timber dependent.
**Tribal Interests**

The lands of the Central Cascades AMA served as an important place for indigenous peoples currently represented by three confederated tribal governments. The Warm Springs and Grand Ronde Confederations are treaty tribes and the Siletz Federation is an Executive Order Tribe. Access to sites and resources for traditional or ceremonial use within the AMA is important to members from each of these tribes. The Gold Hill and Cougar Rock Special Interest Areas recognize these important uses.

**Community Strategic Action Plans**

Strategic Action Plans are a source for linking community objectives with Central Cascades AMA opportunities. All geographic communities within or directly adjacent to the Central Cascades AMA have Strategic Action Plans (see Table 4). Each plan identifies strengths, weaknesses, opportunities and threats; goals and objectives; and an action plan for implementation. Funding to develop these plans has been provided by the Forest Service and Oregon Economic Development Department.

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**Table 4. Strategic Action Plan for Central Cascades AMA communities.**

<table>
<thead>
<tr>
<th>Strategic Action Plan</th>
<th>Goals and Objectives</th>
<th>Link to the AMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Linn County Economic Development Alliance (ELCEDA)</td>
<td>Identify, support and implement projects of economic benefit and share information about issues of concern to East Linn County.</td>
<td>One action item is, “Learn about AMA and identify appropriate ELCEDA role.”</td>
</tr>
<tr>
<td>Sweet Home Economic Development Group (SHEDG)</td>
<td>Create and promote economic growth, diversity and stability in Sweet Home while enhancing a higher quality of life.</td>
<td>Strategic Plan has an action agenda for business development, human resources, physical infrastructure and quality of life.</td>
</tr>
<tr>
<td>Linn County Tourism Coalition</td>
<td>Use a cooperative approach to enhance Linn County’s economy and quality of life by promoting year-round regional tourism and recreation.</td>
<td>Strategic Plan provides an inventory and marketing strategy for tourism resources related to outdoor recreation, special events, historic and cultural resources.</td>
</tr>
<tr>
<td>City of Brownsville</td>
<td>Move the city towards its identified goals and objectives over the next 20 years.</td>
<td>For example, use cooperative efforts with Linn County, Forest Service and private entities to develop a multiple-use trail along the Calapooia River.</td>
</tr>
<tr>
<td>McKenzie River Corridor Strategic Plan</td>
<td>Improve economic growth while protecting environmental conditions in the McKenzie River Valley.</td>
<td>FS and BLM can provide leadership and technical assistance to implement the Strategic Action Plan.</td>
</tr>
<tr>
<td>Confederated Tribes of the Siletz Indians of Oregon</td>
<td>General guidance to further the growth and development of the tribe.</td>
<td>FS and BLM assists with ensuring the survival of tribe’s cultural heritage and religious beliefs for generations to come.</td>
</tr>
</tbody>
</table>
Watershed Councils
Watershed Councils are formalized groups, sanctioned by state and local governments that focus on programs of work in particular watersheds. Primary interests include enhancing and/or restoring the watershed. In addition, they work to identify problem areas, seek funding sources and educate interested partners. Because many local individuals are involved, watershed councils are a good way to share information, collaborate and coordinate with a wide range of people. Involvement with watershed councils helps meet AMA objectives to bring grass roots community members to the table. Of particular interest to the Central Cascades AMA are the South Santiam and McKenzie Watershed Councils because portions of both watersheds fall within the AMA.

McKenzie Watershed Council - Formed in late 1993, the Council’s mission is to: “Foster better stewardship of the McKenzie River watershed resources and deal with issues in advance of resource degradation, and ensure sustainable watershed health, function and uses.” The partners represent local city and county elected officials, interest groups and individual citizens. The Willamette National Forest and Eugene District of the BLM are represented on the Council. The Council operates in a consensus mode.

South Santiam Watershed Council - Formed in 1995 the Council is a grassroots effort to influence local land management policies and as a vehicle to access potential funding sources to pay for many kinds of watershed restoration activities. Specifically, their mission is to “involve local people to enhance and protect the natural resources of the South Santiam River Watershed functions, develop common watershed goals and plans, and facilitate watershed improvement projects.”

Community Oriented Programs
Community oriented programs supported by the federal agencies are already in operation and support AMA objectives. These programs focus on linking ecosystem management and public participation with community development and economic sustainability. The programs outlined below can provide links to specific AMA objectives.

Northwest Economic Adjustment Initiative (NWEAI)- President Clinton established NWEAI to develop, stabilize and increase the capacity of individuals, families, businesses, communities and tribes to adjust to and thrive in the face of declining timber harvests. One NWEAI program is Watershed Restoration/Jobs-In-The-Woods. The program-related objectives for this program are to:

- Restore the health of watersheds by focusing on the long-term improvement of riparian and aquatic resource conditions in accordance with the Aquatic Conservation Strategy within the Northwest Forest Plan.
• Promote a watershed-based approach to restoration across owner-
ships.

• Improve the social and economic conditions of timber dependent
communities by creating longer duration, multi-skilled, family-
wage jobs; with emphasis on providing employment for displaced
timber workers.

• Improve partnerships with local communities.

Rural Community Assistance Program - A goal of the agencies is to
improve the socioeconomic conditions of natural resource dependent
communities through partnerships with local communities. One way
to accomplish this goal is by creating longer duration, multi-skilled,
family-wage jobs with emphasis on providing employment for dislo-
cated timber workers as well as help diversify community businesses.

Ecosystem Workforce Demonstration Project - The project goal is to
demonstrate that dislocated timber industry workers, ecosystem
restoration projects, family wage jobs and education and training can
be successfully linked. The long-range goal is to provide opportuni-
ties for residents of local communities to maintain a life-style of
working in the woods that was lost to many when the timber industry
experienced severe job cutbacks.

Natural Resource Education -
More than 30 groups provide
natural resource education that is
linked to the AMA (refer to
Central Cascades AMA Education
Assessment for a complete list-
ing). These existing programs
serve a wide variety of audiences
(schools, educators, interested
groups, seniors, international
groups, policy makers, resource
managers). Programs range from
providing information about basic
ecological concepts to ecosystem
management and to the natural
and cultural history of the area.
In addition to these education
providers, each AMA administrative unit has an environmental
education program in place. As we expand resource education ef-
forts, it is important to build on and incorporate ongoing natural
resource education.
Related Individual Participation Programs - Agency programs are in place to provide opportunities for people to participate in activities. These opportunities encourage mutual learning and provide ways for citizens to give input and advice about agency activities. Opportunities for youth (such as the Youth Conservation Corps) seniors and volunteers, (such as monitoring, data collection and campground host) are available.

Ad Hoc Groups - Ad hoc groups provide other options to allow individuals to be involved in agency activities. Ad hoc groups generally develop around a particular interest or issue. One example of an ad hoc group used in the AMA is the Small Log Utilization Group for Ecosystem Management. This group identified several different methods to test new approaches to managing young stands.

“If you always do what you always did, you’ll always get what you always got…”
The Central Cascades AMA designation builds on previous land use allocations established to support research on forest and stream ecosystems and their management. The HJA and several nearby RNAs have contributed to a long history of collaborative projects between researchers and managers which has led to the discovery and application of answers to forest management questions. The long-standing connection between management and science was instrumental in identifying the location of the Central Cascades AMA.

**H.J. Andrews Experimental Forest**

The Lookout Creek watershed was designated as the Blue River Experimental Forest in 1948. The name was later changed to H.J. Andrews in memory of a previous Regional Forester. The HJA is managed for research and education; however, the emphasis and scope of the research program on the HJA has changed and grown over the years. The initial emphasis of research was the efficient conversion of old forests to new forests. Attention shifted to examine the effects of forest cutting, particularly on soil and water. This ushered in a new era of ecosystem science, focused initially on old-growth forests which still continues today.

The HJA has been designated as a Long-Term Ecological Research (LTER) site by the National Science Foundation since 1980. The LTER network of eighteen sites is the nation’s primary means of obtaining basic long-term ecological information. LTER funding provides support for many research projects on the HJA and provides a mechanism for integration across the larger HJA research program. Over 50 scientists and 40 graduate students from Oregon State University, the PNW Research Station and other cooperating institutions are generally involved in the LTER program at any given time. A wide variety of agencies and organizations (such as National Science Foundation, National Aeronautics and Space Administration and EPA) provide additional project-specific support to HJA research.

**Research Natural Areas**

One RNA is located within the Adaptive Management Area (Hagan Block) and four are nearby (Three Creeks, Middle Santiam, Wildcat and Olallie Ridge RNAs). These areas represent particular ecosystems and are dedicated to long-term, nonmanipulative research. Three of the RNAs contain vegetation plots that are regularly measured as part of the HJA permanent sample plot program.

**Cascade Center for Ecosystem Management (CCEM)**

The CCEM is a research and management partnership among the PNW Research Station, Oregon State University, and the Willamette NF. The Cascade Center was formed in 1991 as an evolutionary outgrowth of the HJA program. The increasing importance of larger spatial scales, the expanded effort to rapidly incorporate research findings and concepts
into management practices and a growing communication and education program led to the recrafting of the HJA program as the CCEM. Today the CCEM manages a program of ecosystem research, development, demonstration and education throughout much of the AMA. Projects focus on improving our understanding of ecosystem function and application of that knowledge through ecosystem management.

Providing others with the information from experiments and demonstrations drives the CCEM program. The process begins with research, management or public questions. Projects are designed to answer questions or to demonstrate how new ideas will work on the ground:

- Research projects answer science questions and produce scientifically credible results;
- Management studies and monitoring projects use scientific methods to address questions about on-the-ground management;
- Demonstration projects test whether new practices work and allow people to share information and discuss issues.

The CCEM uses tours, workshops, presentations, publications and interactions with the media to share information. This information often changes practices and produces new questions. New practices are monitored and evaluated to judge their effectiveness.

Existing Studies
A large number of projects are currently underway. Many of the projects are conducted in the HJA, but others are distributed throughout much of the AMA. The following sections briefly describe major projects or collections of projects in broad thematic areas. A brief description of the major collection of projects is discussed below and more detail on the studies is found in Appendix C.

**Long-Term Environmental Measurements Program** - The long-term environment measurements program supports a wide variety of studies. Baseline data for several physical and biological components of the forest ecosystem have been collected over the past 10 to 40 years. These data show long-term trends and provide context for interpretation of other datasets.

**Meteorology** - Variation in climatic factors, such as precipitation or temperature, are important when evaluating a wide variety of ecological processes. The HJA meteorological datasets provide measurements for the last 45 years on a variety of climatic factors. Two current projects are evaluating how this data can be used.

**Watershed Process** - Several projects are looking at how human activities affect watersheds. In particular, a major area of research interest is how management activities may increase peak flows or decrease low stream flows.
Soil Processes and Productivity - Studies are underway to better understand forest soils, nutrient cycles and the factors controlling long-term forest productivity. Items being studied include nitrogen cycles, mycorrhizal mat communities, organic matter storage, and the movement of atmospheric gases to and from forest soils. The influences of forest cutting and silvicultural practices on these soil processes are being examined.

Log/Snag Decomposition Process - Decomposition of wood plays a major role in forest soil conditions, nutrient cycling, carbon storage and release, and as habitat for plants and animals. A series of studies are in place to better understand what processes affects the decomposition of fine and coarse wood.

Carbon Storage and Release - Increases of carbon in the air and its potential effect on the climate is driving research on the amount of carbon which cycles through the forest ecosystem.

Landscape Patterns - Some species (such as the northern spotted owl) and ecological processes (such as blowdown) are thought to be highly correlated with landscape vegetation patterns. A series of projects are underway to better understand what landscape patterns exist, how they have changed over time, the implications of those patterns for species and ecological processes, and the relevance of these patterns for management plans.

Disturbance - Forest and stream ecosystems undergo constant, slow changes. Rapid changes are also induced by disturbances such as fire, flood, wind, landslides, timber cutting or road-building. These disturbances play a major role in shaping ecosystems. The frequency, severity, duration and spatial extent of disturbance all affect how plants and animals develop, which in turn influences future development of the ecosystem.

Forest and Stream Interactions - Forests affect streams through nutrient input and processing, stream temperature, channel form, fish habitat and disturbance processes. A variety of studies are underway to understand these interactions at multiple scales, ranging from individual channel units up to entire watersheds.

Plants - Understanding how plant communities develop is fundamental to managing forest ecosystems. There is a long history of plant community research on the HJA. Current emphases include upland vascular plant communities, riparian communities, nonvascular plants and fungi and better understanding the implications of alternative silvicultural practices on plants.
Invertebrates - Insects, spiders, mites and other arthropods are sampled seasonally at several locations on the HJA to better understand these species. The 3,700 species identified to date are estimated to represent approximately half of the total species on the HJA. This basic information is used in many studies. A variety of ongoing studies are attempting to better understand the roles and resiliency of these species to disturbances.

Spotted Owl - The northern spotted owl has taken center stage in the last decade in the policy debates over the fate of the Northwest’s remaining old-growth forests. Five sites (including one on the HJA) in a regional network, known informally as the Cornerstone Study Sites, have provided the bulk of the scientific information for current management approaches for conservation of the species.

Vertebrates - In addition to the northern spotted owl research project, a wide variety of studies are underway to learn about the habitat needs of other vertebrates. Research is focused on some of the least understood taxa (such as amphibians and bats), so that management direction for these species can be refined as rapidly as possible.

Social and Economic - Support for rural communities which are part of the forest ecosystem is an important aspect of adaptive management. Several projects are underway to better understand these socioeconomic issues and to develop jobs in the local communities.

Stand Management - Changing knowledge and public values have led to major changes in forest stand management practices. Many alternatives to traditional practices have been proposed and mandated in an attempt to maintain habitats and ecological process while harvesting timber. Several projects are underway to develop and evaluate alternative thinning and structural retention practices.

Stream Restoration - Decades of intensive human use of forested watersheds have degraded some stream ecosystems and in turn decreased fish populations. Various large-scale stream restoration programs are ongoing and being evaluated.

Monitoring

Three kinds of monitoring contribute to adaptive management:

Implementation Monitoring - Implementation monitoring answers questions like “Did we do what we said we were going to do?” Are activities being implement as planned? This tends to be the most straightforward and easiest kind of monitoring to implement. It is usually accomplished on a project-by-project basis.
Effectiveness Monitoring - Effectiveness monitoring evaluates whether desired results are being achieved. For example, is watershed restoration resulting in better water quality and improved fish habitat? Effectiveness monitoring frequently requires more rigorous sampling and may include comparisons of alternative treatments with untreated controls.

Validation Monitoring - Validation monitoring helps evaluate the underlying assumptions of the Northwest Forest Plan. This kind of monitoring tends to be the most intensive and is often addressed using careful research designs, especially for actions where impacts are not known.

A variety of agency, interested group and citizen monitoring is underway in the Central Cascades AMA. Monitoring work by partners such as the McKenzie Watershed Council, various school groups, and local citizens can help to gather information and learn more about the lands and communities in and around the Adaptive Management Area. Standard agency implementation monitoring of restoration projects, timber sales and other projects can provide information on how well the agencies are implementing their planned activities.

There is also a wide variety of effectiveness, validation and broader scale implementation monitoring underway in the Central Cascades AMA. Long-term validation monitoring is in place (as part of the larger regional/statewide system) on a variety of themes such as young stand management and stream habitat restoration. A number of the existing remote sensing studies are completing longer-term implementation monitoring. These studies can then provide a basis for validation monitoring concerning effects of landscape pattern on key ecosystem features such as stream flow and population of northern spotted owls. Much of this work is conducted through research projects. However, the AMA provides a way to use the results promptly, efficiently and publicly to improve management practices. Many effectiveness and validation monitoring projects are already underway in the AMA primarily in and around the HJA. See Appendix C.
Chapter 3 describes the future work of the Central Cascades AMA. This chapter reviews our adaptive management philosophy and the guiding principles of our practice of adaptive management. These guiding principles will also be used to evaluate our progress. Finally, Chapter 3 describes a set of themes and implementation opportunities which will help focus efforts in the Central Cascades AMA.

The Central Cascades AMA provides a unique opportunity to develop an understanding of the concepts and application of adaptive management. These adaptive management approaches can guide future innovations in resource and ecosystem management by capitalizing on and integrating the knowledge of communities, land managers and scientists.

Figure 2. Adaptive Management Model used by the Central Cascades AMA.

The adaptive management model used in the Central Cascades AMA has five major steps. The steps are described on the next page.
Step 1

**Study/Research** - Ask questions, develop theories and gather information to answer research, management or public questions.

Step 2

**Application** - Implement projects or studies that answer the questions, monitor the projects and use the answers to develop information that can be exchanged with others.

Step 3

**Sharing and Learning Opportunities** - Draw upon local knowledge and share what has been learned from the new information by exchanging it with others. (Technology transfer)

Step 4

**Evaluate the Effects of Change and Adapt Practices** - Use what has been learned to adjust and adapt practices. Answer questions like: did we get the expected results, were there any surprises and what new information is needed.

Step 5

**Connecting the Loop** - Evaluate the results and feed the information into new question development. This is a critical step in this adaptive management model. It is a major component of ongoing and planned actions in the AMA. In addition to this evaluation, other programs are underway in the Central Cascades AMA that can help to connect the loop. These include standard agency implementation monitoring, a variety of validation monitoring and broad-scale implementation monitoring programs.

**Guiding Principles**

The AMA Executive Group supports a set of guiding principles for employees to use when completing work in and around the AMA. It is their hope that people outside the agencies associated with the AMA will also use these guiding principles. The three principles are:

- **Work Differently** - Create opportunities for working differently, across jurisdictions, interests and disciplines. Try new things. Learn from one another.

- **Interact with Communities** - Interact effectively with all communities to develop innovative management approaches and make the most of available resources.

- **Use Adaptive Management Processes to Adapt Practices** - Identify learning objectives, implement projects, exchange information, evaluate the effects of change and adjust or adapt practices, policies and actions accordingly.

**Themes**

Three themes will help set the focus of Central Cascades AMA activities during the next five years. The themes were developed out of discussions with individuals and groups. In addition, the themes were developed to meet the expectations outlined for the Central Cascades AMA in the Northwest Forest Plan.
Ecosystem Management Learning through Research Studies, Management Demonstrations and Monitoring

Theme 1 focuses on gathering and generating new information from a variety of ongoing and new activities. It addresses the specific emphases identified for the Central Cascades AMA in the Northwest Forest Plan (ROD page D-12-13). These emphases are:

- Intensive research on ecosystem and landscape processes and its application to forest management through experiments and demonstrations at the stand and watershed level
- Approaches for integrating forest and stream management objectives and the implications of natural disturbance regimes
- Management of young and mature stands to accelerate development of late successional conditions (a specific management objective for the forest within the Moose Creek block as well as in other portions of the AMA to be selected)

Based on these emphases, projects in the following categories will receive particular attention:

Landscape Management - Characterize disturbance regimes of fire, flood and management practices. Use field and modeling studies to assess how landscape conditions affect streamflow, biodiversity and other important ecosystem characteristics.

Stream Restoration - Characterize different stream restoration techniques and the corresponding results. Ongoing projects include the Quartz Creek Stream Restoration Study, Moose Creek monitoring and the Pool Complexity Project.

Young Stand Management - Characterize the effects of different stand management techniques on vegetation, wildlife habitat and economic considerations. Projects currently underway include the Young Stand Thinning and Diversity Project, Very Young Stand Management Project and Small Log Utilization Group projects.

The activities associated with Theme 1 are the primary way new information will be generated for the Central Cascades AMA. The Research and Learning Assessment provides a list of high priority questions that can help identify topics for AMA projects. This information will provide a basis for applied studies and management demonstrations of how ecosystems work. Projects that test different ways to meet the underlying intent of Standards and Guides in the Northwest Forest Plan are of particular interest. The CCEM will play a major role in coordinating the activities for this theme.
Theme 2: Communicating for Shared Learning and Adapting Practices

Theme 2 focuses on compiling, evaluating and sharing what has been learned with interested individuals. It is integral to the Central Cascades AMA vision “to bring together research, communities and resource professionals to guide a future for natural resources management”. Theme 2 also helps implement some of the social and technical objectives of the AMA network, particularly those related to learning and communication. As described in the adaptive management model, exchanging information is an important step for successful adaptive management. Objectives of particular interest include:

- **Personalize the Implications** - Many times, individuals interested in the AMA have said that it is important to personalize the implications of activities for communities and individuals, particularly at the local level. A clear understanding of the impacts helps people understand how or if they want to be involved. The primary opportunity to personalize the implications of activities is at the local level. It involves developing long-term relationships between agency personnel and community members, working with community strategic plans and understanding community goals.

- **Wise Decision-Making** - In order to make wise decisions, resource managers need access to the latest technical information from research and management studies. Through the use of scientifically credible information, decisionmakers make better decisions and adapt management practices as new information becomes available. Researchers and managers play important roles in meeting this objective.

- **Policy Development** - Sharing information can improve the policy decisions that guide ecosystem management. Agency personnel and community members can help meet this objective.

- **Outreach** - Sharing information with people who can communicate the message to a wider audience allows more people to access the latest information. Education providers, as outlined in the Central Cascades AMA Education Assessment, can help implement this objective.

- **Use Local Knowledge** - Using local knowledge can improve actions that are taken as a result of agency decisions. Community members as well as members and representatives of tribal governments are instrumental in implementing this objective.

A variety of mechanisms are available to share learning. By implementing the activities associated with Theme 2, changes can be made to practices, policies and actions. We must take full advantage of each mechanism to adapt practices appropriately.
Linking People and Communities with Ecosystem Management

The purpose of Theme 3 is to provide a connection between communities of place and communities of interest with the AMA. Theme 3 can help to fulfill the AMA network-wide technical, economic and social objectives from the Northwest Forest Plan. Objectives of particular interest for this theme include:

Collaboration and Cooperation - Collaboration and cooperation with communities, tribes and interested groups can help agency personnel develop innovative management approaches that link community development and economics with ecosystem management.

Economic Opportunities - Agency actions that support implementation of community strategic plans can create economic opportunities for community members and businesses. By supporting these economic opportunities, agencies can improve community capacity and hopefully, assist with community sustainability.

Technical Assistance - Each community (or collection of communities) is moving along a path of development. Depending on where each community is on that spectrum, agency personnel can provide technical assistance to aid in completion of certain community actions. Technical assistance can range from assisting with development of a community strategic plan, to writing grants, to supporting efforts to help build a workforce skilled in ecosystem restoration activities. Agencies can benefit from having skilled ecosystem workers available as they help fill missing skill levels that may have been eliminated with recent agency reorganizations.

Different individuals and groups have responsibility for the activities associated with Theme 3 depending upon the scale and scope of the actions. For example, Forest and District personnel can link across agency boundaries to implement work at a broad scale; researchers can work at a long-term time scale; and the AMA Coordinator can work with other AMAs to make large adjustments, when needed, at the policy level.
The implementation section of Chapter 3 outlines the specific actions that will be a focus of the Central Cascades AMA during the next 3 to 5 years, with specific attention to the work planned in 1997-98. Where possible we have identified who would be responsible for the activity and when the activity might take place. Please recognize that this section does not identify every action or opportunity as many of the ongoing activities identified in Chapter 2, as well as programs of work at each administrative unit will continue. In the spirit of adaptive management, as new opportunities arise, we will take advantage of them. In addition, scheduled dates are tentative depending upon money, priorities and staffing.

The specific implementation opportunities were identified to ensure a mix of short- and long-term projects; a mix of new starts as well as enhancements of ongoing work, and are results oriented. Where possible, the actions have been sorted by the major steps in the adaptive management model.

Note: The following abbreviations will be used in the activity tables.

BLM  =  Bureau of Land Management
BRRD  =  Blue River Ranger District
CCEM  =  Cascade Center for Ecosystem Management
FS  =  Forest Service
MCRA  =  McKenzie Resource Area
MCRD  =  McKenzie Ranger District
ORD  =  Oakridge Ranger District
PNW  =  Pacific Northwest Research Station
SHRD  =  Sweet Home Ranger District

My interest is in the future because I am going to spend the rest of my life there.

Charles F. Kettering
A variety of landscape design processes will be used by each unit and will involve mutual information sharing across boundaries. (Theme 1)

Understand long-term, historic patterns of landscape change created by natural disturbance processes, land management practices and vegetation succession. Examine ecosystem responses to past and future landscape patterns, and effects on important species, streamflow and carbon storage in forests and soil.

### Landscape Design Activities

#### Study/Research

- Blue River Landscape Project* 1997 + BRRD
- Robinson-Scott Landscape Design projects 1997 + MCRD
- Bear-Marten Landscape Design projects 1997 MCRA
- Deer Creek Landscape Design 1997/1998 MCRD
- Deer Creek Landscape Design projects 1999/2001 MCRD
- McKenzie Tribs/Quartz Creek Watershed Analysis 1997 MCRD & BRRD
- Horse Creek Watershed Analysis 1997 MCRD
- Moose Creek Landscape Design 1997 SHRD
- Calapooia Watershed Analysis 1997 SHRD & WeyCo

*The Blue River Landscape Project will test the intent of various Northwest Forest Plan Standards and Guides. A description of the Landscape Project is in Appendix E.

#### Application

- Support efforts and create opportunities that allow for one-on-one and small group information sharing from landscape design development 1997 to 2000 BLM, FS & PNW & CCEM
- Incorporate what has been learned during landscape design analysis into sessions hosted by partner agencies 1997 + BLM, FS & PNW
- Host a regional landscape design workshop 1998 CCEM
- Assess findings from studies, experiences from applications and results from monitoring in public discussions and analyses 1997 to 2000 BLM, FS & PNW

#### Sharing and Learning Opportunities

- Monitor implementation of the landscape designs 1998 to 2000 + CCEM
- Monitor ecosystem responses to different landscape designs 1998 to 2000 + CCEM
- Evaluate findings associated with costs, barriers and challenges 1998 to 2000 + BLM, FS & PNW

### Evaluate Effects of Change

- Blue River Landscape Project* 1997 + BRRD
- Robinson-Scott Landscape Design projects 1997 + MCRD
- Bear-Marten Landscape Design projects 1997 MCRA
- Deer Creek Landscape Design 1997/1998 MCRD
- Deer Creek Landscape Design projects 1999/2001 MCRD
- McKenzie Tribs/Quartz Creek Watershed Analysis 1997 MCRD & BRRD
- Horse Creek Watershed Analysis 1997 MCRD
- Moose Creek Landscape Design 1997 SHRD
- Calapooia Watershed Analysis 1997 SHRD & WeyCo

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- Host a regional landscape design workshop 1998 CCEM
- Assess findings from studies, experiences from applications and results from monitoring in public discussions and analyses 1997 to 2000 BLM, FS & PNW

- Monitor implementation of the landscape designs 1998 to 2000 + CCEM
- Monitor ecosystem responses to different landscape designs 1998 to 2000 + CCEM
- Evaluate findings associated with costs, barriers and challenges 1998 to 2000 + BLM, FS & PNW
Stream Restoration and Riparian Habitat Activities

Study/Research

Each management unit will implement a variety of stream restoration and riparian habitat management activities. (Theme 1)

Understand how management activities, including restoration, affect stream habitat quality, water quality, riparian habitat and the species that use these habitats. Compare passive and active management with each other. For example, how does no further vegetation cutting and road building compare with watershed restoration activities such as building in-stream structures and modifying roads.

Application

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pool Complexity Project</td>
<td>1997+</td>
<td>BRRD &amp; CCEM</td>
</tr>
<tr>
<td>Quartz Creek Restoration Study</td>
<td>1997+</td>
<td>BRRD &amp; CCEM</td>
</tr>
<tr>
<td>Gate Creek restoration and monitoring</td>
<td>1997+</td>
<td>BLM, FS &amp; partners</td>
</tr>
<tr>
<td>Support work by the McKenzie Watershed Council</td>
<td>1997+</td>
<td>BRRD, MCRD &amp; MCRA</td>
</tr>
<tr>
<td>Support work by the South Santiam Watershed Council</td>
<td>1997+</td>
<td>SHRD</td>
</tr>
<tr>
<td>Restoration and habitat management projects associated with EWEB hydroelectric project</td>
<td>1998+</td>
<td>MCRD</td>
</tr>
<tr>
<td>Deer Creek Restoration and Monitoring</td>
<td>1997+</td>
<td>MCRD &amp; partners</td>
</tr>
<tr>
<td>Develop cooperative agreements with private landowners for anadromous fish habitat along Canyon Creek</td>
<td>1997+</td>
<td>SHRD</td>
</tr>
<tr>
<td>Finn Creek riparian habitat restoration (with private landowners)</td>
<td>1997</td>
<td>MCRA</td>
</tr>
<tr>
<td>Indian Creek habitat restoration</td>
<td>1998+</td>
<td>MCRA</td>
</tr>
</tbody>
</table>

Sharing and Learning Opportunities

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete a “Stream Restoration Communique”</td>
<td>1997</td>
<td>CCEM</td>
</tr>
<tr>
<td>Host a Bull Trout Symposium</td>
<td>1997</td>
<td>BRRD &amp; MCRD</td>
</tr>
</tbody>
</table>
The floods of 1996 have provided an excellent opportunity to learn about the impacts of management activities. (Theme 1)

Conduct/continue studies of the hydrology, road drainage, geomorphology and other ecological responses to the 1996 floods. Compare results with other floods of similar magnitude (such as 1964) to assess flood response effects to management practices and watershed condition.

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluate different stream restoration techniques (Pool Complexity and Quartz Creek studies)</td>
<td>1998-99</td>
<td>CCEM</td>
</tr>
<tr>
<td>Gather information about in-stream structures from Moose Creek monitoring</td>
<td>1997 +</td>
<td>SHRD</td>
</tr>
<tr>
<td>Continue water quality and riparian habitat monitoring Gate Creek</td>
<td>1997 to 2000 +</td>
<td>BLM, FS &amp; partners</td>
</tr>
<tr>
<td>Buck Side Channel restoration and Monitoring</td>
<td>1997 +</td>
<td>MCRD</td>
</tr>
</tbody>
</table>

The floods of 1996 have provided an excellent opportunity to learn about the impacts of management activities. (Theme 1)

Conduct/continue studies of the hydrology, road drainage, geomorphology and other ecological responses to the 1996 floods. Compare results with other floods of similar magnitude (such as 1964) to assess flood response effects to management practices and watershed condition.

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host public forum to learn about potential implications of management practices</td>
<td>1997</td>
<td>CCEM</td>
</tr>
<tr>
<td>Host a workshop to share findings from the active research underway on “Peak flow response to clear cutting and roads in small and large basins, Western Cascades, Oregon”</td>
<td>1997</td>
<td>CCEM</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use ERFO (Emergency Relief for Federally Owned Roads) surveys to understand how roads were affected by the floods</td>
<td>1997 +</td>
<td>BRRD, MCRD &amp; SHRD</td>
</tr>
<tr>
<td>Conduct Phase 2 flood monitoring as part of a regional analysis to evaluate the effects of different management activities</td>
<td>1997</td>
<td>PNW &amp; CCEM</td>
</tr>
</tbody>
</table>
A wide variety of young stand management activities are underway. (Theme 1)

Understand how various management approaches affect young stand development. Identify information needed to evaluate effects to wildlife, biodiversity and other ecological impacts. Understand how approaches to young stand management are connected to economic effects and community conditions/capacity.

### Study/Research

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop a young stand adaptive management strategy and identify information needs</td>
<td>1997 to 2000 +</td>
<td>CCEM</td>
</tr>
<tr>
<td>Implement site-specific young stand management prescriptions*</td>
<td>1997 to 2000 +</td>
<td>BRRD, MCRD &amp; SHRD</td>
</tr>
<tr>
<td>Very Young Stand Study demonstration project</td>
<td>1997</td>
<td>BRRD</td>
</tr>
<tr>
<td>Young Stand Thinning and Diversity Project</td>
<td>1997 +</td>
<td>CCEM</td>
</tr>
</tbody>
</table>

*Thinning projects are listed in Appendix B. These projects can provide opportunities to develop, demonstrate or test new approaches.

### Application

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop a video about the Young Stand Thinning and Diversity Project</td>
<td>1997</td>
<td>CCEM</td>
</tr>
<tr>
<td>Host field trips to share results from the Young Stand Thinning and Diversity Project</td>
<td>1997 to 2000 +</td>
<td>CCEM</td>
</tr>
<tr>
<td>Support efforts to share what has been learned about forest-based employment</td>
<td>1997 +</td>
<td>BLM &amp; FS</td>
</tr>
</tbody>
</table>

### Sharing and Learning Opportunities

### Evaluate Effects of Change

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluate results from effectiveness and validation monitoring to recommend needed changes in young stand management</td>
<td>1999 +</td>
<td>CCEM</td>
</tr>
<tr>
<td>Evaluate young stands logging practices, timber sale contract and appraisals</td>
<td>1997</td>
<td>FS</td>
</tr>
</tbody>
</table>
In addition to the site specific examples previously listed, complete the following activities to share what has been learned. (Theme 2)

### Activities to Exchange Information

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use small groups, one-on-one discussions and informal get togethers to share what has been learned</td>
<td>1997 to 2000 +</td>
<td>BLM, FS &amp; PNW</td>
</tr>
<tr>
<td>Exchange information with professional natural resource associations such as the Society of American Foresters or Wildlife Society</td>
<td>1997 to 2000 +</td>
<td>BLM, FS &amp; PNW</td>
</tr>
<tr>
<td>Disseminate information through HJA www site, Central Cascades AMA newsletter and CCEM News</td>
<td>1997 +</td>
<td>BLM, FS &amp; PNW</td>
</tr>
</tbody>
</table>

Support implementation of activities developed in community and watershed council action plans. (Theme 3)

### Activities to Support Community Plans

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluate activities in community strategic plans to determine which actions most closely align with FS/BLM program of work</td>
<td>1997</td>
<td>BLM &amp; FS</td>
</tr>
<tr>
<td>Support implementation of appropriate community actions and economic plans</td>
<td>1998 to 2000 +</td>
<td>BLM &amp; FS</td>
</tr>
<tr>
<td>Support work by McKenzie and South Santiam Watershed Councils that complement community strategic plans</td>
<td>1997 to 2000 +</td>
<td>BLM &amp; FS</td>
</tr>
<tr>
<td>Work with McKenzie School District to develop management plan for school forest and look for additional opportunities to collaborate</td>
<td>1997 +</td>
<td>BRRD</td>
</tr>
<tr>
<td>Support environmental education program at McKenzie School</td>
<td>1997 +</td>
<td>BRRD &amp; MCRD</td>
</tr>
</tbody>
</table>

Support tribal efforts to emphasize cultural heritage and reintroduce traditional uses. (Theme 3)

### Activities to Support Tribal Efforts

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use adaptive management to implement strategies for the Cougar Rock Area</td>
<td>1997 +</td>
<td>SHRD</td>
</tr>
<tr>
<td>Use adaptive management to implement activities outlined in the Gold Hill SIA Implementation Guide</td>
<td>1997 +</td>
<td>BRRD &amp; SHRD</td>
</tr>
<tr>
<td>Complete Camas Prairie restoration</td>
<td>1997 +</td>
<td>SHRD</td>
</tr>
</tbody>
</table>
Support efforts to examine internal administrative processes and develop changes to meet the different social objectives. (Theme 3)

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop agency business approaches that better serve local communities</td>
<td>1997 to 2000 +</td>
<td>BLM &amp; FS</td>
</tr>
<tr>
<td>Pursue a change in authorities that allow agencies to reinvest money from the sale of products to restoring the ecosystem</td>
<td>1997</td>
<td>BLM &amp; FS</td>
</tr>
<tr>
<td>Complete Small Log Utilization Projects</td>
<td>1997 +</td>
<td>MCRA, MCRD, SHRD &amp; ORD</td>
</tr>
<tr>
<td>Survey boaters on McKenzie River from Olallie to Ike’s Landing</td>
<td>1997</td>
<td>BLM &amp; FS</td>
</tr>
<tr>
<td>Pursue designation of the Blue River Landscape Project as an Administrative Study</td>
<td>1997</td>
<td>CCEM</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share what has been learned by implementing the small log utilization projects</td>
<td>1997 +</td>
<td>BLM &amp; FS</td>
</tr>
<tr>
<td>Use the AMA network to encourage changes to regulations and practices resulting from evaluation of AMA research, monitoring and demonstration projects</td>
<td>1998 to 2000 +</td>
<td>BLM, FS policies, &amp; PNW</td>
</tr>
<tr>
<td>Share what has been learned from the Sweet Home Ecosystem Management Demonstration Project</td>
<td>1997</td>
<td>BLM &amp; FS</td>
</tr>
<tr>
<td>Share river user survey information with county and state agencies, interest groups, individual river users and residents</td>
<td>1997 +</td>
<td>BLM &amp; FS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use information from river study to evaluate BLM and FS management practices on the McKenzie River corridor</td>
<td>1998 to 2000 +</td>
<td>BLM &amp; FS</td>
</tr>
</tbody>
</table>

The AMA executive group will complete an annual evaluation of what has been implemented in the Central Cascades AMA. This evaluation will determine whether actions in AMA Guide are on schedule. Depending on the results, the Guide will be adjusted accordingly.
**Adaptive Management** - A continuing process of action-based planning, monitoring, researching, evaluating and adjusting to improve implementation and achieve the goals of ecosystem management.

**AMA** - Adaptive Management Area

**Biodiversity** - The variety of life forms and processes, including a complexity of species communities, gene pools and ecological functions.

**BLM** - Bureau of Land Management

**Blowdown** - Trees or a grouping of trees blown down as a result of a wind/weather storm.

**CCEM** - Cascade Center for Ecosystem Management

**Community Capacity** - the ability of a community to maintain itself in a sustainable way.

**Community Strategic Action Plans** - A plan that helps a community determine what actions are in its best interest and help to attain community goals and objectives. They also identify a community’s strengths and weaknesses.

**Disturbance** - A process that causes significant, rapid change in structure and/or composition of an ecosystem through natural events such as fire, flood, wind or earthquake or by human-caused events such as the harvest of forest products.

**Ecosystem Management** - The use of ecological approaches in land management to sustain diverse and productive ecosystems while meeting human objectives.

**ELCEDA** - East Linn County Economic Development Alliance

**EPA** - Environmental Protection Agency

**Executive Order Tribe** - A Native American Indian Tribe recognized by an executive order from the President of the United States.

**Fire-Regenerated Stands** - A stand or grouping of trees that initiated following a forest fire.

**FS** - Forest Service

**HJA** - H. J. Andrews Experimental Forest
**Glossary**

(Cont.)

**Hypothesis** - An unproved theory or supposition tentatively accepted to explain certain facts and provide a basis for further investigation.

**Key Watersheds** - A watershed containing either habitat for potentially threatened species or stocks of anadromous salmonids or other potentially threatened fish, or a watershed greater than six square miles with high-quality water and fish habitat.

**Landscape Design** - A systematic analysis of a heterogeneous section of land, often a watershed, that results in a strategy to schedule management (particularly vegetation treatments) activities for the area.

**Land Use Allocation** - The commitment of a given area of land or a resource to one or more specific uses; for example, for recreational use or timber production.

**Late-Successional Reserves** - A forest in mature and or old-growth states that have been reserved or set aside from most manipulative activities.

**LSR** - Late-Successional Reserve

**LTER** - Long-Term Ecological Research Program

**LTEP** - Long-Term Ecosystem Productivity Program

**Matrix** - FS and BLM lands not included in reserves, withdrawn areas, adaptive management areas or late-successional reserve areas as designated in the Northwest Forest Plan.

**Monitoring** - The FS and BLM complete three types of monitoring - implementation, validation and effectiveness monitoring. Implementation monitoring answers the question: “Did we do what we said we would do?” Effectiveness monitoring answers the question: “Did we create the expected effect with the implemented activities?” And validation monitoring determines if the assumptions that underlie the plan are accurate.

**NF** - National Forest

**NWEAI** - Northwest Economic Adjustment Initiative

**PIEC** - Province Interagency Executive Committee

**PNW** - Pacific Northwest Research Station of the Forest Service
Province Committees - Groups of agency and non-agency persons that meet on a regular basis to provide advice to agency decisionmakers for a particular piece of land. For example, the Willamette Province Public Advisory Committee makes recommendations on activities in the Willamette Province.

Record of Decision - A document that outlines management decisions, identified alternatives and states whether all practicable means to avoid environmental harm from the selected alternative have been adopted, and if not, why not.

Research Natural Areas - A designated area set aside by the Forest Service specifically to preserve a representative sample of an ecological community, primarily for scientific and educational purposes.

Riparian Reserves - A designated area containing an aquatic ecosystem and the adjacent uplands that directly affect it, that have been set aside from most manipulative activities by the Northwest Forest Plan.

RNA - Research Natural Area

SHEDG - Sweet Home Economic Development Group

SIA - Special Interest Area

USDA - United States Department of Agriculture

USDI - United States Department of Interior

Watershed Analysis - A systematic procedure for characterizing watershed and ecological processes to meet specific management and social objectives.

Watershed Council - A group of people interested in the improvement or restoration of a particular watershed. Generally they operate in a cooperative way to complete monitoring and education activities and use a consensus mode to reach agreement.

Even if you’re on the right track, you’ll still get run over if you don’t move.

Will Rogers
References


Linn County Strategic Tourism Plan, 1990.

McKenzie River Corridor Strategic Action Plan, January 1996.


USDA FS/USDI BLM. April 1994. Final Environmental Impact Statement and Record of Decision on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (also known as the Northwest Forest Plan).


The Record of Decision for the Northwest Forest Plan indicates that all AMA’s will have a plan. The plan will rely largely on existing information from available assessments. The Northwest Forest Plan also identifies a list of specific things to be addressed by each Adaptive Management Area’s plan. The information in this appendix describes how each of these items are addressed for the Central Cascades AMA.

**Vision**
The vision for the Central Cascades AMA is to bring together resource professionals, communities and researchers to guide a future for natural resource management. This vision was developed in an interagency fashion and validated with publics. It is one of the driving forces for all that happens in the AMA, as is reflected throughout the Guide.

**Learning that Includes Social and Political Knowledge**
The Guide incorporates knowledge gained through the community action plans, the watershed council programs of work and social research activities. It is also focuses attention on anticipated learning activities during the next few years as outlined specifically in Chapter 3 of the Guide.

**Strategy to Guide Implementation, Restoration, Monitoring and Experimental Activities**
The framework for these efforts are best described in the themes, actions and implementation strategies described in Chapter 3 of the Guide.

**Three-to Five-Year Timber Sale Program**
A three- to five-year sale program is included in Appendix B. This will include a list of the sales within the AMA that occurred during 1994-96 and planned sales for ‘97 and ‘98. A review of this summary shows the variable nature of the yields from the AMA. The long-term yields will be developed based on results of watershed analyses once they are all completed and the landscape review as outlined in the implementation activities for Theme 1. Each agency has developed an estimate of long-term yield using standard matrix projections. This provides a sense of maximum possible yield. It is expected that actual yield will be lower than maximum possible yield.

**Education of Participants**
The Education Assessment for the Central Cascades AMA outlines the many ongoing education opportunities and efforts.

**List of Communities**
Described in Chapter 2 of the Guide.

**Inventory of Community Strategies, Resources and Partners**
Summarized in Chapter 2 of the Guide. More detail is available in the Community Action Plans.
Coordination with Overall Activities in the Province
This was provided through the participation of the Province Interagency Executive Committee (PIEC) chairs in the AMA Executive Group. Information exchange occurs with the PIEC and its public advisory committee. The AMA network also allows for communication with other provinces.

Funding Strategy
The current strategy for funding is to determine the amounts of money available from each of the partner agencies to commit to AMA activities each year. This results in priorities following the available funding and limits the ability to think strategically about future activities. Looking for new mechanisms and expanding the use of existing (but seldom used) mechanisms may help to alleviate this problem somewhat. However, as national efforts continue to reduce the size and cost of government, AMA’s may not be successful without a steady funding source for at least baseline programs.

Integration of the Community Strategies and Technical Objectives
AMA links to community action plans, watershed councils and planned actions in Chapter 3 of the Guide are ways to accomplish these objectives.

Biophysical Data
Biophysical data is provided in watershed analyses and the Central Cascades AMA Research and Learning Assessment.

Social and Economic Data
Social and economic assessment work has come primarily from the Initial Social Assessment, the Research and Learning Assessment, the Education Assessment and the related Community Action Plans.

Research and Monitoring
Research and monitoring opportunities are assessed, prioritized and linked to specific portions of the AMA as outlined in the Research and Learning Assessment.

The Central Cascades AMA does not have a formal Technical Advisory Panel. Instead we use a variety of techniques to gather ideas and steer the management of the AMA including:

- Research peer reviews of projects, publications and LTER program
- Watershed Councils and other interested groups
- The Willamette Province Advisory Committee
- Ad hoc groups created to deal with citizen-driven issues
- National Environmental Policy Act (NEPA) public involvement process for projects
- Public meetings and field trips

This provides for a broader range of involvement and ideas.
<table>
<thead>
<tr>
<th>FY</th>
<th>Unit</th>
<th>Project Name</th>
<th>Acres</th>
<th>MMBF</th>
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</thead>
<tbody>
<tr>
<td>94</td>
<td>BRRD</td>
<td>Tap Thin</td>
<td>209</td>
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<tr>
<td></td>
<td>MCRD</td>
<td>Mill Thin I and II</td>
<td>501</td>
<td>4.40</td>
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<tr>
<td></td>
<td>SHRD</td>
<td>Flam 13C</td>
<td>13</td>
<td>0.17</td>
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<td></td>
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<td><strong>723</strong></td>
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<tr>
<td>95</td>
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<tr>
<td></td>
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<td>Blue River Thin</td>
<td>114</td>
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<tr>
<td></td>
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<td>LTEP</td>
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<tr>
<td></td>
<td>MCRD</td>
<td>Misc Salvage</td>
<td>10</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>SHRD</td>
<td>Flam Santiam</td>
<td>15</td>
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<tr>
<td></td>
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<td><strong>FY95 Subtotal</strong></td>
<td><strong>420</strong></td>
<td><strong>17.187</strong></td>
</tr>
<tr>
<td>96</td>
<td>BRRD</td>
<td>Wolf Rock Salvage</td>
<td>10</td>
<td>0.20</td>
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<tr>
<td></td>
<td>BRRD</td>
<td>WS 3 Salvage</td>
<td>6</td>
<td>0.12</td>
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<tr>
<td></td>
<td>BRRD</td>
<td>Delta Thin</td>
<td>192</td>
<td>1.82</td>
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<td></td>
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<td>Think Thin</td>
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<td>1.26</td>
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<td></td>
<td>BRRD</td>
<td>Road 15 Salvage</td>
<td>1</td>
<td>0.004</td>
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<tr>
<td></td>
<td>BRRD</td>
<td>Southside Elk (Unit 1)</td>
<td>15</td>
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<tr>
<td></td>
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<td>Olallie Thin</td>
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<td></td>
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<td>Hwy 126 Salvage</td>
<td>20</td>
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<td></td>
<td>MCRD</td>
<td>Misc Salvage</td>
<td>10</td>
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<tr>
<td></td>
<td>SHRD</td>
<td>Flam Thin</td>
<td>75</td>
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<tr>
<td></td>
<td>SHRD</td>
<td>Canyon Access Salvage</td>
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<td></td>
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<td><strong>FY96 Subtotal</strong></td>
<td><strong>870</strong></td>
<td><strong>7.474</strong></td>
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<td>97</td>
<td>BRRD</td>
<td>Commercial Thinning</td>
<td>200</td>
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<tr>
<td></td>
<td>BRRD</td>
<td>Northend Timber Sale</td>
<td>400</td>
<td>8.0 to 15.0</td>
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<tr>
<td></td>
<td>MCRA</td>
<td>Top Hatch</td>
<td>30</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td>MCRD</td>
<td>SLUG Thin</td>
<td>200</td>
<td>0.40</td>
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<tr>
<td></td>
<td>MCRD</td>
<td>Misc Salvage</td>
<td>10</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>SHRD</td>
<td>Powder Regen III</td>
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<td>Flam Helo</td>
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<td>O Thin</td>
<td>265</td>
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<tr>
<td></td>
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<td>F Thin</td>
<td>240</td>
<td>1.20</td>
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<tr>
<td></td>
<td></td>
<td><strong>FY97 Subtotal</strong></td>
<td><strong>1401</strong></td>
<td><strong>15.55 to 22.55</strong></td>
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<tr>
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<td>BRRD</td>
<td>Commercial Thinning</td>
<td>200</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>BRRD</td>
<td>Northend Timber Sale</td>
<td>200</td>
<td>6.0 to 8.0</td>
</tr>
<tr>
<td></td>
<td>MCRA</td>
<td>Indian Creek</td>
<td>30</td>
<td>1.50</td>
</tr>
<tr>
<td></td>
<td>SHRD</td>
<td>Hen Moose</td>
<td>100</td>
<td>4.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>FY98 Subtotal</strong></td>
<td><strong>530</strong></td>
<td><strong>13.5 to 15.5</strong></td>
</tr>
</tbody>
</table>

*Estimated yearly average for first 5 years under Northwest Forest Plan direction*  

<table>
<thead>
<tr>
<th>FY</th>
<th>Unit</th>
<th>Project Name</th>
<th>Acres</th>
<th>MMBF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Estimated yearly average for first 5 years under Northwest Forest Plan direction</strong></td>
<td><strong>790</strong></td>
<td><strong>12.1 to 13.9</strong></td>
</tr>
</tbody>
</table>

**BRRD** = Blue River Ranger District  
**MCRA** = McKenzie Resource Area  
**MCRD** = McKenzie Ranger District  
**SHRD** = Sweet Home Ranger District
The information in Appendix C describes some of the ongoing research in the AMA. A more complete listing that identifies researchers, timelines and study details can be found in the Research and Learning Assessment. Or you can contact Diana Bus at (541) 683-6633.

Vegetation
A network of over 100 permanent vegetation study areas are periodically measured to better understand natural processes of succession, tree mortality, biomass accumulation, timber growth and herb and shrub dynamics.

Meteorology
A permanent network of meteorological stations spanning different environmental zones record precipitation, temperature, humidity, snow depth and duration, wind speed and direction, acidic precipitation and atmospheric wet fall/dry fall.

Hydrology
Stream discharge, water chemistry, water temperature are continuously measured in four sets of paired-watersheds across a range of watershed sizes and elevations to compare undisturbed, moderately disturbed and heavily disturbed watersheds.

Erosion
Networks of sites monitor sediment export from paired-watersheds, long-term movement rates of deep-seated earthflows and the occurrence of landslides and debris-flows to estimate erosion rates and to correlate these rates with landscape characteristics and human uses.

Stream Channels
Changes in stream channel morphology are measured through permanent channel cross-sections, time lapse photographs and field surveys of large woody material input rates, residence time, transport distance and physical characteristics.

Temporal Variability
The HJA meteorological dataset has been extended back in time through statistical relationships with regional meteorological data, so that correlation’s with El Nino events, ocean salmon catch and other meteorological stations throughout the LTER network can be made.

Spatial Variability
Meteorological datasets are being analyzed to determine patterns in the spatial variability of climatic variables and to develop relationships with local topography.

Road Effects on Hydrology
A field project is underway to evaluate the significance of road networks in terms of altered hydrologic processes, such as potential increased peak stream flows.

Hyporheic Zone
The movement of groundwater, nutrients and organisms in wetted areas beneath the surface in riparian areas (the hyporheic zone) is being analyzed.
Mycorrhizal Mat Communities
Studies of are underway to better understand the dynamics of mat development, the mechanisms that allow these mats to facilitate growth of conifers on stressed sites, and the role of these mats on nutrient cycles and in reducing root pathogen development.

Ceanothus Ecology
The limits on establishment, growth rates and nitrogen fixation rates of Ceanothus are being studied on the Andrews forest.

Douglas-fir and Alder Interactions
Varying proportions and densities of nitrogen-fixing red alder and Douglas-fir have been established as part of a two-site study (second site is in the Coast Range) to evaluate the effect of red alder on Douglas-fir growth.

Long-term Log Decomposition
A 200-year study is evaluating decomposition rates and processes for four conifer species in both upslopes and stream environments.

Leaf and Fine Litter Decomposition
Decomposition rates and processes of fine litter and leaves are being analyzed as part of an international, 28-site study extending from the north slope of Alaska to Costa Rica.

Root Decomposition
The factors controlling root decomposition are being evaluated as part of a regional study involving coastal, western Cascade and eastside forests.

Seedling Growth and Litter Decomposition
A field study is being conducted to compare results with detailed tree growth and decomposition studies in growth chambers where alternative climate change scenarios are being simulated.

Regional Carbon Stores
The role of timber harvesting and forest regrowth on the Pacific Northwest regional carbon budget is being evaluated with a time-series of satellite images across the region.

Linked Multi-Scaled Models
Changes in terrestrial carbon stores and carbon exchange with the atmosphere are being assessed with a linked series of stand-, landscape- and regional-scale models.

Blue River Landscape Project
The purpose of the project is to develop and monitor an integrated landscape management approach, based upon interpretations of historic disturbance regimes, to guide future management activities in the Blue River watershed.
Landscape Pattern Dynamics
Existing landscape structure is being compared to historic and potential future conditions in the Lookout Creek basin based upon fire history studies, reconstructed landscape conditions and a simple simulated timber cutting model.

Landscape Pattern Inertia
Alternative future landscapes in the Cook-Quinten study area were evaluated to determine how long it takes to achieve landscape pattern objectives under various timber cutting rules given current landscape conditions.

Forest Distribution and Change
Satellite imagery from 1972 and 1992 was used to analyze landscape change for various ownership and land-use categories within a large western central Cascades study area.

Landscape Pattern and Vertebrate Diversity
Statistical models are being developed to map changes in habitat for selected vertebrates from 20 years of satellite imagery.

Pre-logging Landscape Patterns
A 1933 forest cover type map is being analyzed to determine the relationship of various environmental factors to a pre-logging landscape pattern in three western Oregon study areas, including one that covers most of the Adaptive Management Area.

South Fork Pilot Watershed Analysis
The pilot team tested watershed analysis procedures under the Northwest Forest Plan and analyzed watershed conditions, trends, and key processes.

Road Networks
Road density and placement as a function of topography are being compared across ownership and broad land-use categories in central western Oregon. Interactions among social and ecological processes that affected land-use and vegetative patterns between two contrasting large basins (McKenzie River and the Middle Fork of the Willamette River) are being analyzed.

Fire Regimes
Central Cascades fire regimes are being described based upon earlier fire history studies and relationships among topographic, climatic, and vegetative types and fire patterns.

Fire Regimes and Stand Structure
Stand structure data, such as down wood and snags, and environmental variables are being compared to fire regime information to determine if projections of coarse woody debris amounts can be made from fire regimes.

Paleoecological Transects
Pollen, plant material and charcoal from sediment cores taken from several lakes bogs and ancient alluvial fans in the western central Oregon Cascades are being analyzed to determine changes in plant composition and relative abundance over the last 10,000 to 50,000 years.
Exotic Plants
Patterns of exotic plant invasion are being examined in relation to plant dispersal mechanisms and forest road, trail and timber cutting patterns.

Debris Flows
A 90 meter-long experimental debris-flow flume allows geologists to measure all phases of the debris-flow process, from initiation to deposition.

Landslides
Landslides triggered by the Flood of 96 are being inventoried to determine the effects of changes in management practices over time on landslide occurrence.

Long-Term Trout Populations
Population structure in clearcuts and old-growth stream reaches of Mack Creek have been measured since 1973.

Flood Recovery
Responses of stream channels, aquatic communities and riparian vegetation to the Flood of 96 are being assessed.

Debris-Flow Recovery
Recovery of fish populations, macroinvertebrates, water chemistry and channel structure following a debris-flow are being measured.

Nutrient Addition
Stream trophic level responses to changes in primary productivity are being evaluated.

McKenzie River Dynamics
Changes in channel form and riparian vegetation from the late 1940s to 1986 were analyzed and documented on the upper 70 kilometers of the McKenzie River.

Landscape Pattern of Riparian Forests
The composition, structure and dynamics of riparian forests are being compared among several large watersheds.

Vegetation Succession
A wide variety of studies are examining changes in plant communities over time utilizing the permanent vegetation study areas network. The following projects are currently active:
• Successional processes in natural forests, and following logging.
• Development of old-growth structure and volume in maturing Douglas-fir stands.
• Structure, productivity and mortality rates of riparian forests.
• Plant demographic patterns.
• Comparison of factors controlling growth, yield and biomass accumulation rates.
• Growth and yield of noble fir forests.
**Plants**

**Forest Canopy Gaps**
Small gaps in the forest canopy were created on the Andrews as part of a two-site experiment (second site is in western Washington) to better understand the effects of gap size and position on tree, shrub, and herb regeneration; seed rain; microclimate; and soil characteristics.

**Forest Stand Dynamics Modeling**
A computer simulation model, called ZELIG-PNW, is being used to assess the consequences of a wide variety of alternative timber cutting regimes on future stand composition, growth, mortality and structure.

**Early-Successional Plant Populations**
Changes in plant populations in the Pacific silver fir zone during early succession following logging are being investigated in a study on the Andrews.

**Tall Bugbane Monitoring**
Monitoring of tall bugbane (Cimicifuga elata), a sensitive plant species, is ongoing to determine population size and reproductive status.

**Fungi Temporal Dynamics**
A retrospective study compared old growth, mature stands, and thinned stands to better understand the habitat preferences and association of certain fungi with forest succession following disturbance.

**Forest Canopy Epiphytes**
Using ropes and an upper canopy platform, changes in epiphytic plant species composition across forest age classes, within the crowns of individual trees, from forest edge to forest interior and from streamside to upper slopes are being assessed.

**Riparian Moss Communities**
Moss species composition and abundance were surveyed in riparian areas to determine relationships with elevation and stream size.

**Invertebrates**

**Riparian Zone Arthropods**
Transects spanning upslope and riparian environments have been established to compare arthropod composition in riparian areas to upslope areas.

**Canopy Arthropod Ecology**
This study is looking at the influence of canopy architecture and spider species behavior on the composition of forest canopy arthropods.

**Role of Arthropods in Wood Decomposition**
Logs have been inoculated with various arthropod species at different depths under different moisture conditions to determine the role and interactions of arthropods in wood decomposition.

**Moths and Butterfly Ecology**
Moth and butterfly sampling, trapping and rearing studies are underway to determine host plants, parasites and identity of larvae and adults.
Canopy Invertebrate Temporal Dynamics
Canopy invertebrate response to forest development and disturbance intensity is being assessed through comparison of old growth and mature natural forest, old-growth shelterwoods and 10-to 15-year-old plantations.

Soil Arthropods
Extensive samples of litter and soil organisms have been taken in forested habitats to characterize these diverse invertebrates.

Hemiptera
The habitats, distribution and identity of true bugs are being assessed in this study.

Arthropods of Pacific Yew
A review of the insects and other arthropods found on Pacific yew and other species of yew was just completed.

Prey Species
A series of studies have focused on the population dynamics, community ecology and habitat affiliations of small mammals, especially northern flying squirrels, Townsend’s chipmunks and deer mice, that make up the prey base for the spotted owl.

Demography
Spotted owl birth, survival and death rates are being analyzed in this large-scale study.

Density
A comprehensive sample attempts to accurately determine the total numbers of spotted owls in the study area.

Habitat Preferences
Spotted owl home range composition and habitat use is being analyzed in both highly fragmented habitat and in relatively contiguous mature- and old-forest habitat.

Predators
Relative use of both fragmented and unfragmented landscapes by the primary predator of the northern spotted owl, the great horned owl and the spotted owl was recently analyzed.

Reproduction and Landscape Pattern
Spotted owl site usage is being analyzed to determine the relationship between spotted owl net-site selection, reproductive success and forest fragmentation.

Bats
Two projects are underway analyzing bat roost characteristics and locations and bat foraging habitat.
Vertebrates
(Cont.)

Riparian Bird and Mammal Communities
The species composition, abundance and structure of songbird and small mammal communities has been assessed in riparian areas of young, mature and old-growth forests.

Neotropical Songbirds
As part of the national Monitoring Avian Productivity and Survivorship (MAPS) program, neotropical migratory songbirds are monitored to assess population trends, survivorship and breeding success.

Harlequin Ducks
Investigators are locating nesting and brooding harlequin ducks using radio telemetry, and describing habitat features at site and landscape scales.

Fish Parasite Interactions
The parasite-host interactions of a parasite infecting cutthroat trout is being studied.

Amphibian Distribution
A large-scale project aims to determine general distribution patterns and habitat associations of amphibians in the Blue River watershed.

Public Attitudes on Forestry Issues
Surveys were administered to a large number of Lane and Linn County residents in 1994 to determine people’s attitudes on a wide range of forestry issues.

Upper McKenzie Economic Development
A study of economic trends and strengths of the upper McKenzie River Valley is being used as a basis for development of a strategic plan and economic development projects.

Ecosystem Workforce Pilot Project
Organized as an interagency partnership under the State Community Economic Revitalization Team the pilot project demonstrated that a targeted program of employing dislocated workers to perform ecosystem restoration projects can be successful.

Delta Showcase Public Participation
The Delta Showcase project tested and evaluated a collaborative public decision-building process organized according to a Delphi model and run by the University of Oregon’s Planning and Policymaking program.

Social Acceptability of Forestry Practices
People’s reactions to alternative forestry practices on a series of tours on the HJA and nearby lands were recorded and analyzed.

Special Forest Products Assessment
The study includes an inventory of targeted species, product market evaluations, recommended harvest methods to conserve the species and protect the environment, an evaluation of administrative policies and an economic analysis of potential processing plant sites in Sweet Home.
**Young Stand Thinning and Diversity Study**
This study is evaluating the effectiveness of alternative thinning and underplanting treatments in 30- to 40-year-old plantations in terms of biological diversity, nutrient cycling, special forest products, conifer production and economics.

**Monitoring of Green Tree Retention Cutting**
A variety of studies are evaluating blowdown rates, overstory and understory growth and mortality, diversity and abundance of mycorrhizal fungi, diversity and abundance of soil microarthropods, economics and birds in recent timber harvest units.

**Retrospective Studies of Overstory Retention**
A set of retrospective studies assessed diversity of vascular plants, biomass and diversity of epiphytes, abundance and diversity of mycorrhizal fungi, and conifer growth and mortality in fire-created, two-storied stands as a surrogate for 40- to 80-year-old green tree retention units.

**Retrospective Study of Young-Growth Douglas-fir**
Commercially thinned and unthinned young-growth Douglas-fir stands are being evaluated to determine how past treatments have affected stand and habitat characteristics such as large tree and understory development, vegetative diversity, stand growth and wildlife populations.

**Slim Scout Structural Retention**
Over one hundred tours have visited the Slim Scout Demonstration Area where green tree and snag retention, down wood retention, and landscape approaches to unit location and fuels treatments are demonstrated and monitored.

**Very Young Stand Management Project**
A variety of thinning densities and gap sizes in 10- to 15-year-old plantations will be demonstrated and monitored.

**Wildlife Use of Created Snags**
Monitoring efforts are underway to compare cavity development and snag use for various snag-creation methods.

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**Quartz Creek Stream Restoration**
Large-wood structures were installed in 1988 to evaluate the effectiveness of instream structures for stream channel and fish population recovery, and to evaluate alternative methods of structure attachment.

**Pool Complexity Study**
Vertebrate populations, wood dynamics and leaf retention are being assessed in an experimental manipulation of varied woody debris loadings in three streams.

**Effects of Barrier Removal on Cutthroat Trout**
Monitoring of the genetic makeup of cutthroat trout populations following barrier removal is designed to assess rates of population intermixing and genetic drift.
Gate Creek Restoration
This project is intended to demonstrate stream restoration strategies in a mixed-ownership watershed.

Rehabilitation Monitoring
This project is evaluating the effectiveness of anchored versus unanchored stream restoration structures in terms of winter refugia of wild steelhead, dissipation of high flow energy, summer hiding cover and nutrient retention.

Blue River Reservoir Revegetation
Various species of grasses, sedges, shrubs and trees have been planted and monitored for survival and growth in this harsh zone of alternating periods of inundation and exposure.

Ecosystems are not only more complex than we think, they are more complex than we CAN think.

Frank Egler
A wide variety of funding mechanisms are available and in use to complete work in and around the adaptive management area. A partial list includes:

These FS agreements are authorized under the Interior and Related Agencies Appropriations Act of 1992. The Act authorizes FS to cooperate with other parties to develop, plan and implement projects that are beneficial to the parties and that enhance FS activities. Projects can be financed with matching funds from cooperators. Cooperators may be public and private agencies, organizations, institutions and individuals.

This BLM program is authorized in Public Law 101-512 1990. Current interpretation of this authority extends to wildlife, fisheries, recreation and cultural projects.

Participating Agreements were authorized under the “Uhlman Act” PL-148 enabling the FS to enter into agreements with other non-federal participants with shared interest. This act does not apply to BLM.

Collection agreements are instruments to accept money, equipment, property or products from non-federal parties to carry out a purpose authorized by law. These agreements may involve both trust fund collections (advances) and reimbursements. Federal laws that authorize the FS to enter into these agreements include the Cooperative Funds Act of June 30, 1914, Granger-Thye Act of April 24, 1950, Acceptance of Gifts Act of October 10, 1978, Forest and Rangeland Renewable Resources Research Act of 1978, Intergovernmental Cooperation Act of 1968, United State Information and Exchange Act, Federal Employees International Organization Service Act.

Cooperative agreements and grants are used to transfer money, property, services or things of value to a recipient to support or stimulate activities for the public good.

These agreements are authorized under the Federal Technology Transfer Act. This Act authorizes FS to transfer federally owned or originated technology to state and local governments and to private sector. The Act authorizes an agreement between one or more federal laboratories and one or more non-federal parties under which the FS provides personnel, services, facilities, equipment or other resources with or without reimbursement. This act does not authorize transfer of funding by the FS to non-federal parties. Non-federal parties may provide funds, personnel, services, facilities, equipment and other resources toward the conduct of specific research and development projects that are consistent with the mission of the FS. Cooperative Research and Development Agreements for the Department of Interior are managed by the National Biological Service.
<table>
<thead>
<tr>
<th>Interagency and Intra-agency Agreements</th>
<th>These kind of agreements are used when different federal agencies (interagency) or when units within an agency (intra-agency) can provide materials, supplies, equipment, work or services to another agency to accomplish its mission.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memorandum of Understanding (MOU)</td>
<td>Memorandum of Understanding (MOU) is an instrument used for a written plan between the federal government and other parties for carrying out their separate activities in a coordinated and beneficial manner and for documenting a framework for cooperation. MOU’s are not “fund obligating” documents and cannot be used when the intent is to exchange funds, property or services. Under an MOU each party directs its own activities and uses its own resources.</td>
</tr>
<tr>
<td>Knudsen-Vandenberg Act (KV)</td>
<td>This act is used to fund activities on National Forest System lands following timber sales authorized under the KV Act of 1930, amended by the National Forest Management Act in 1976. This act is the authority for requiring purchasers of National Forest timber to make deposits to finance sale area improvement activities to protect and improve the future productivity of the renewable resources of forest lands within timber sale areas. Activities include sale area improvement operations, maintenance and construction for restoration, timber stand improvement, range wildlife and fish habitat, soil and watershed enhancement and recreation development. BLM does not have a similar authority.</td>
</tr>
<tr>
<td>Brush Disposal Funds</td>
<td>Brush Disposal Funds (BD) permit the FS to use collected funds from a timber sale contract to treat slash created by the sale. These types of funds are not authorized for use by BLM.</td>
</tr>
<tr>
<td>Appropriated Funds</td>
<td>Appropriated funds are allocated to the FS and BLM on an annual basis by Congress through budget legislation. These funds are used to accomplish the ongoing program of work.</td>
</tr>
<tr>
<td>Volunteers</td>
<td>Both the FS (National Forests Act of 1972) and BLM are authorized and encouraged to recruit, train and use the services of volunteers to complete ecosystem management work such as conservation measures or data collection.</td>
</tr>
<tr>
<td>User Fee Collection</td>
<td>The pilot recreation fee collection program focuses on using the fees collected at recreation sites to maintain and improve that site. The program is being tested on several NFs and may serve as a model for user fee collection on a broader context.</td>
</tr>
<tr>
<td>Grants</td>
<td>A wide variety of grants are available to complete ecosystem management work. Many have limitations for their use on federally-managed lands. However, grants can be especially useful for partner organizations, groups and landowners to complete ecosystem management work on non-federal lands.</td>
</tr>
<tr>
<td>Administrative Study</td>
<td>Administrative studies are cooperative or contracted work that extends research study results and the application of existing knowledge to resolve local problems. They can be funded by protection and management funds as well as trust funds.</td>
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</table>
An Adaptive Management Approach: Background

Turmoil over forest management in the Pacific Northwest remains deeply rooted. Highly prized wild ecosystems remain across a significant portion of federally-managed forest lands, where people seek to maximize human uses of these bountiful ecosystems. Traditional forest management methods when applied on a large scale do not maintain the full array of native habitats and ecological processes that characterize wild ecosystems. The recently adopted Northwest Forest Plan prescribes a network of Late-Successional Reserves, Riparian Reserves along every stream and standards and guidelines for Matrix lands managed for timber production. This approach relies on reserves to meet objectives for late-successional forest habitat and aquatic ecosystems, while maintaining traditional timber harvest rates on Matrix lands. This new approach is untested and poses many difficult challenges to forest managers. While implementation of this approach proceeds on most federally-managed forest lands in western Oregon and Washington, there is also a great need to develop and test alternative approaches to achieving the same basic objectives underlying the Northwest Forest Plan.

Landscapes and watersheds 10,000 to 100,000 acres in size offer a useful scale to develop and manage for integrated ecological and social objectives. Landscapes of this size are large enough to maintain a balance of habitat types, disturbance processes and human uses over space and time, yet small enough to use detailed, site-specific data and maintain high spatial resolution in planning processes. Landscapes and watersheds of this size offer an opportunity to use the information developed through watershed analysis to develop a landscape management strategy crafted to fit the specific conditions and processes of a particular landscape.

The purpose of the Blue River Landscape Project is to develop and test an alternative landscape management approach designed to achieve the objectives of the Northwest Forest Plan based upon natural disturbance regimes within the Blue River watershed (approximately 57,000 acres). The primary goal is to sustain native habitats, species and ecological processes while providing a sustained flow of wood fiber for conversion to wood products. The Blue River watershed and surrounding lands are in the Central Cascades AMA, an allocation in the Northwest Forest Plan that encourages development and evaluation of new approaches. Specific objectives for the Central Cascades AMA listed in the Northwest Forest Plan include: “intensive research on ecosystem and landscape processes and its application to forest management in experiments and demonstrations at the stand and watershed level; approaches for integrating forest and stream management objectives and on implications of natural disturbance regimes” (ROD p. D-12). In addition, the HJA, established in 1948, is located entirely within the Blue River watershed. Long-term datasets and ongoing research and monitoring projects associated with the HJA offer unique opportunities to monitor the effectiveness of this approach.

The central concept of this project is that approximating aspects of historical fire regimes through forest management practices can sustain native habitats and species, maintain ecological processes within historic ranges, and provide a sustained flow of timber. Timber harvest regimes will be set to approximate key parameters of historical fire regimes (for example, disturbance frequency, intensity and spatial pattern) to the degree feasible while still meeting the underlying objectives of the Northwest Forest Plan. While this concept is largely untested,
various projects are exploring this approach in a variety of settings across North America. Landscape patterns resulting from application of this landscape management strategy will be compared to neighboring watersheds managed under Matrix and Riparian Reserve allocations, Late-Successional Reserves, Wilderness and to private industrial lands. Monitoring systems currently in place on and nearby the HJA provide some opportunities to compare these various landscape management strategies in terms of implementation and ecological function.

Results from a prior case study (the Augusta Creek Landscape Project) demonstrated that it is feasible to use historic fire regimes as a general template for future vegetation management (Cissel et al., in review). Additionally, results from the Augusta Creek Project indicated that this form of landscape management may provide advantages over the long-term for a wide variety of species, particularly those associated with late-successional forests, such as the northern spotted owl. The general analysis, planning process, and prescriptions developed in the Augusta Creek Project were refined to fit the conditions in the Blue River watershed and applied to this project. Two important qualifications to this approach should be understood. First, existing conditions are far different from historic conditions in many cases (for example, the presence of roads, clearcuts and a reservoir) requiring modification of this approach. In addition, the combination of timber harvest and prescribed fire is different from the historic occurrence of fire in ways that can not be replicated in a timber harvest regime (for example, much lower levels of dead wood).

The basic information used to develop the landscape management strategy is contained in the report documenting the Blue River watershed analysis conducted during the winter of 1996. Past and present conditions and trends are documented for a wide range of resources, ecological processes and human uses. In addition to the watershed analysis report, a fire history was compiled providing critical data and descriptions of general fire regimes in the Blue River watershed. Similarly, an inventory of amphibians and reptiles in the Blue River watershed was completed. And finally, data on the reproductive rates and habitat quality for each pair of spotted owls in the watershed was provided to the Blue River Ranger District from the long-term research program on the northern spotted owl centered out of the HJA Experimental Forest.

We followed four general steps to develop the landscape management strategy:

**Special Area Reserves**
“Special area reserves” allocated in the Willamette National Forest Plan, as amended by the Northwest Forest Plan, were delineated. The reserve boundaries and general management prescriptions described in the Forest Plan were adopted for these areas.

**Landscape Areas**
The remainder of the planning area was subdivided into zones of similar ecological conditions and disturbance regimes. Vegetation management prescriptions were developed for each zone based upon an interpreted range of historic conditions. These zones were termed “landscape areas”. For each landscape area, timber harvest and fire prescriptions were developed based upon the underlying fire regime, as interpreted from tree-ring records. Timber harvest frequency and
rotation age (100 to 260 years) were based upon historic fire frequency. Timber harvest intensity (15% to 50% overstory retention) was based upon historical fire intensity. The spatial patterns of timber harvest were based upon the spatial patterns of historical fires. Timber harvest patterns were mapped and scheduled 200 years into the future so that resulting landscape patterns could be evaluated.

Aquatic Reserves
“Aquatic reserves” were then established to ensure that the full range of objectives in the Northwest Forest Plan would be met. Achievement of the Aquatic Conservation Strategy Objectives was given particular attention. These reserves were based, in part, on the type and intensity of upslope management in the local landscape area. They were designed to reflect general patterns of disturbance processes. These reserves generally take the form of entire small subdrainages scattered throughout the watershed. They are strategically located to encompass areas of high aquatic habitat diversity, source areas for organic and inorganic material to streams and to include habitat around the most productive pairs of spotted owls. In addition, corridor reserves were established on all fish-bearing streams. This network of reserves is considerably different from the network provided on Matrix lands in the Northwest Forest Plan.

Watershed Restoration Projects
The watershed restoration component of the Blue River Landscape Project is intended to supplement the landscape management strategy by re-establishing native aquatic species throughout their historic ranges wherever feasible. Similarly, restoration activities are designed to ensure that hillslope to stream processes operate within a historic range of variability. The intent is to reestablish a resilient, interconnected aquatic network that is able to maintain aquatic habitats and processes with landscape disturbance processes operating at historic frequencies and intensities. Potential restoration activities include addition of large wood to stream channels, encouraging growth of large conifers near streams, decommissioning roads, removal of human-placed migration barriers, encouraging release of adult Chinook salmon above Blue River Dam and discouraging stocking of hatchery rainbow trout.

This landscape management approach was evaluated to ascertain whether the approach would meet each of the nine Aquatic Conservation Strategy Objectives in the Northwest Forest Plan. Results of the evaluation concluded that these objectives would be met. In addition, an evaluation of northern spotted owl habitat concluded that the owls would find a greater amount and less fragmented habitat under this management strategy than would be found managing under the interim guidelines for Matrix lands and Riparian Reserves in the Northwest Forest Plan.

The landscape management strategy briefly summarized in Appendix E should be viewed as an untested approach to meeting the objectives of the Northwest Forest Plan. The strategy rests upon the assumption that, if habitat patterns and ecological processes function within the range of variation historically expressed in the landscape, the probability of maintaining productive ecosystems and native species is high. In particular, this approach embodies an ecosystem dynamics view recognizing that disturbance processes have continually shaped historic landscape patterns. Future management practices are designed to approximate key aspects of those disturbance regimes (for example, frequency,
intensity and spatial pattern of their occurrence) as closely as feasible. The degree to which management activities can simulate historic disturbance regimes is not yet clear.

The Blue River watershed is uniquely positioned for an evaluation of this approach to ecosystem management because of the presence of the HJA. Long-term monitoring programs have been underway for decades in the HJA, and for some ecosystem components within the larger Blue River watershed. The HJA itself has had relatively little timber harvesting since the early 1970s, and very little manipulation is expected in the HJA for the foreseeable future. In some ways, the HJA represents a late-successional reserve 25 years after cessation of active timber harvest. It also provides a reference point for comparison with the disturbance-based approach to ecosystem management envisioned within the remainder of the watershed.

Beyond the boundaries of the watershed lie several other land use categories that could provide instructive comparison points for future monitoring. The Three Sisters Wilderness located nearby is a designated Biosphere Reserve as is the HJA. Federally-managed watersheds allocated largely as Matrix and Riparian Reserves in the Northwest Forest Plan are also located nearby. Large blocks of industrial forest lands occur a short distance to the west of Blue River watershed. Each of these land use categories will produce alternative landscape patterns through different vegetation management regimes at a watershed scale. Large-scale monitoring (for example, through the use of remote sensing) of these varied treatments can help evaluate the effectiveness of a disturbance-based approach to ecosystem management at meeting the objectives of the Northwest Forest Plan.

Several ecosystem components offer good prospects for evaluating these alternative management approaches. These components either rely on monitoring projects already underway or are of particular importance to evaluating the success of this approach. Other aspects of monitoring this approach could also be developed. The primary monitoring components include landscape pattern, management simulation of disturbance regimes, northern spotted owls, amphibian and fish populations, stream discharge, erosion and aquatic ecosystems.

In addition to these components, the research and monitoring program centered on the HJA provides a broad context to help interpret results and changed conditions. Projects are underway to further knowledge of many species and ecological processes (for example, forest canopy epiphytes, fungi, bats, invertebrates, wood decomposition, nutrient cycling and stream channel response to floods). Long-term monitoring of climate, vegetation succession and mortality soil-atmosphere gas exchanges and other topics on the HJA will help detect changes occurring in the watershed and identify changes occurring due to management activities.
AMA Contacts

DIANA BUS, Coordinator
Central Cascades Adaptive Management Area
(541) 683-6633

JOHN ALLEN, District Ranger
McKenzie Ranger District
(541) 822-3381

ROLF ANDERSON, District Ranger
Sweet Home Ranger District
(541) 367-5168

LYNN BURDITT, District Ranger
Blue River Ranger District
(541) 822-3317

EMILY RICE, Area Manager
BLM McKenzie Resource Area
(541) 683-6776

FRED SWANSON, Ecosystem Processes Team Lead
USFS Pacific Northwest Research Station
(541) 750-7355