



# McKenzie Watershed Council



## *Action Plan for* **Water Quality and Fish and Wildlife Habitat**

**January 1996**

*Prepared by*

 *Lane Council of Governments*

## **Abstract**

This document is the McKenzie Watershed Council's Action Plan. The Action Plan contains the councils goals and priority actions relating to water quality and fish and wildlife habitat issues. These actions are intended to be implemented during the next 18 to 24 months. Implementation of the Action Plan will involve various council partner organizations and other private and public stakeholders. A separate Technical Report supplements the Action Plan, providing additional technical background used in developing the plan.

## **Acknowledgments**

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Technical advice for the plan was provided by a Water Quality Task Group and Fish and Wildlife Habitat Task Group assembled by the watershed council.



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**McKenzie Watershed Council  
Action Plan for  
Water Quality and Fish and Wildlife Habitat**

***January 1996***

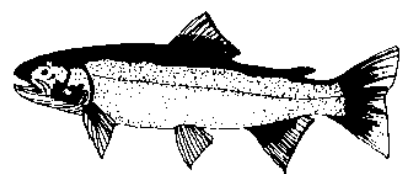
Prepared by Lane Council of Governments



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# Chapter One





# Introduction

## Purpose

This document is the McKenzie Watershed Council's Action Plan. The Action Plan contains the council's goals and priority actions relating to water quality and fish and wildlife habitat issues. These actions are intended to be implemented during the next 18 to 24 months. Implementation of the Action Plan will involve various council partner organizations and other private and public stakeholders.

The council is not a regulatory or enforcement agency, nor does it adopt plans or rules in a legal sense. Instead, it makes recommendations to decision-makers and landowners and managers on ways to protect the highly valued resources of the McKenzie watershed. In short, the Council provides a framework for collaboration among its member organizations and others.

The Action Plan takes a watershed-wide approach and strives to integrate existing plans and efforts. Whenever possible, the Action Plan includes actions that address several of the council's goals and objectives. It is also considered a "living document" that can be readily updated as new information becomes available. This initial Action Plan addresses only the water quality and fish and wildlife habitat portion of the council's work program. The council is now examining recreation and human habitat issues which will result in additional recommendations to be added later.

A separate Technical Report supplements this Action Plan, providing additional technical background used in developing the Action Plan. The Technical Report includes a characterization of the McKenzie watershed, documentation of work completed by the technical advisors, as well as a listing of all recommended actions identified to date by the council. Additional information on the creation of the McKenzie Watershed Council and development and implementation of the Integrated McKenzie Watershed Management Program can be found in the document, *How the McKenzie Watershed Council Got Started*, May 1995.

## Document Organization

This document is organized into four chapters and is supplemented by a series of appendices:

Chapter One, Introduction, describes the purpose of the Action Plan and the council's role in its implementation. In addition, this chapter outlines the Action Plan's organization and describes the process used in its development.

Chapter Two, Goals and Objectives for Water Quality and Fish and Wildlife Habitat, articulates the council's vision for water quality and fish and wildlife habitat issues in the watershed. The Chapter contains the council's five goals: water quality, water quantity, riparian areas and floodplains, stream habitat, and uplands. This chapter also summarizes current conditions and trends in the watershed for these goals.

Chapter Three, Priority Actions for Water Quality and Fish and Wildlife Habitat, describes the council's five priority actions for the next 18 to 24 months. These actions strive to bring current water quality and fish and wildlife habitat conditions in line with its vision for the watershed.

Chapter Four, Monitoring and Evaluation, explains the council's strategy for monitoring watershed health and measuring council and project effectiveness.

The Appendices include the council's charter, a list of acronyms, and a list of other available resources.

## Background

The McKenzie watershed encompasses an area of approximately 1,300 square miles. More than 80 percent of the watershed lies within Lane County with the remaining portion in Linn County. Bounded on the east by the crest of the Cascade Mountains, the McKenzie watershed generally drains westward towards the Willamette River, just north of the Eugene-Springfield metropolitan area (*Figure 1 and Map 1*).

**Figure 1**  
**McKenzie Watershed Context Map**



The McKenzie Watershed Council was established in 1993 as an advisory body with the purpose of bringing residents, organizations, and governments together to take a pro-active approach in addressing management issues in the McKenzie River watershed. The mission of the council as contained in its charter is "to foster better stewardship of the McKenzie River watershed resources, deal with issues in advance of resource degradation, and ensure sustainable watershed health, functions, and uses." The council's charter is contained in the Appendix of this document.

The council strives to provide a framework for coordination and cooperation and uses consensus as its decision-making process. The 20-partner council, as shown in *Figure 2*, represents key interests and stakeholders in the watershed, ensuring a comprehensive look at watershed issues. Council partners also regularly communicate with other groups and individuals, forming an even broader network of watershed stakeholders.

*Map 1*  
**McKenzie Watershed Vicinity Map**



To date, funding for council efforts has come primarily from the U.S. Environmental Protection Agency (EPA) and the Natural Resources Conservation Service (NRCS). Some funds from NRCS have been passed through to the East Lane County Soil and Water Conservation District to develop, promote, and implement demonstration projects in the McKenzie watershed. In-kind contributions from partner agencies and organizations compose a significant portion of the resources available to accomplish many aspects of the program. The council is currently investigating several funding opportunities to implement priority actions prescribed in the Action Plan.

## **Figure 2** **McKenzie Watershed Council Partners**

### **Local Citizens (15)**

#### **Private Interests (8)**

*Agripac Cooperative*, Plant Manager  
*McKenzie Fisheries Restoration Project*, Member  
*McKenzie Residents Association* (2), Members  
*Mohawk Community Council*, Board Member  
*Pacific Rivers Council*, Administrative Director  
*Rural Resources Development Committee*,  
Co-Chair Water Resources Subcommittee  
*Weyerhaeuser Company*, Land Use Manager

#### **Elected Officials (7)**

*City of Eugene*, Mayor  
*City of Springfield*, City Councilor  
*East Lane Soil & Water Conservation District*, Board Member  
*Eugene Water & Electric Board*, Board Member  
*Lane County*, County Commissioner  
*Springfield Utility Board*, Board Member  
*Willamalane Park & Recreation District*, Board Member

### **Agency Representatives (5)**

#### **Federal (3)**

*Army Corps of Engineers*, Project Manager  
*Bureau of Land Management, Eugene District*, Area Manager  
*USDA-USFS Willamette National Forest*, McKenzie District Ranger

#### **State (2)**

*Division of State Lands*, Asst. Director Policy & Planning  
*Water Resources Department*, NW Region Manager

## Action Plan Development

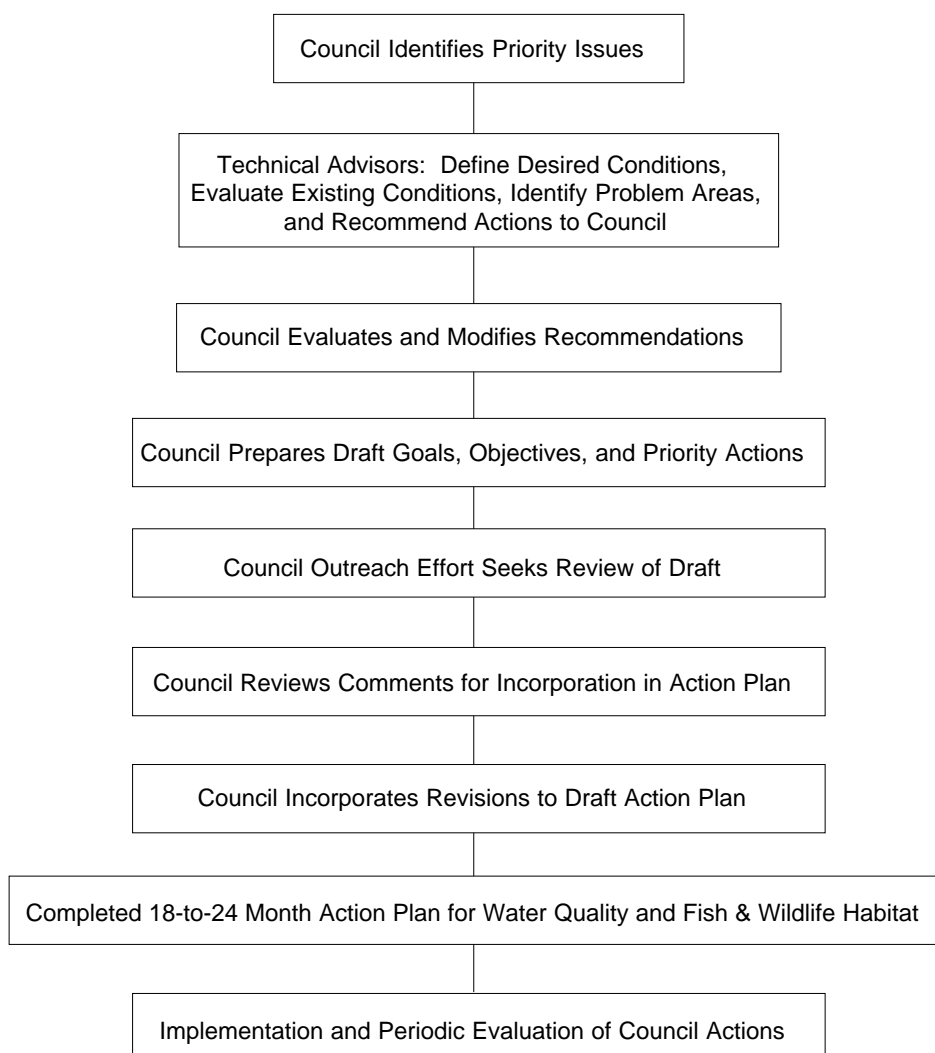
Development of this Action Plan began in April 1994 when the council identified its shared values for the McKenzie watershed and identified four priority issues to be addressed in its work plan. The priority issues are:

- Water Quality
- Fish and Wildlife Habitat
- Recreation
- Human Habitat

This Action Plan addresses the first two priority issues: water quality and fish and wildlife habitat. Development of the Action Plan for recreation and human habitat is expected to be completed by the end of 1996.

Development of this Action Plan involved a series of work sessions, meetings, and outreach efforts as shown in *Figure 3*. The goals, objectives, specific tasks, and responsibilities outlined in the council's charter provided the framework for the Action Plan.

**Figure 3**  
**Action Plan Development Flowchart**



Two groups of technical advisors were assembled to undertake the water quality and fish and wildlife habitat topics. The charge given to the technical advisors was to define desired conditions, evaluate existing conditions, identify problem areas, and recommend actions to bring current conditions in-line with the desired conditions.

The council reviewed the technical advisory groups' recommendations and developed a draft statement of goals, objectives, and priority actions for water quality and fish and wildlife habitat. The council considered the draft a starting point for discussion; with the goal of the Action Plan to serve as broad an audience as possible.

The council then sought public review (citizens, community leaders, agencies, technical advisors, etc.) of the draft to learn whether the proposal met the objectives of groups and individuals not directly seated on the council. Feedback received during this public outreach effort proved to be valuable in identifying revisions that were incorporated into the final Action Plan.

The council aims to achieve its long-term vision for the McKenzie watershed through the implementation of this Action Plan. The McKenzie Watershed Council understands that its performance will ultimately be judged by the on-the-ground results of its efforts and is excited to be moving into the implementation phase of its work program.

## **Getting Involved in the McKenzie Watershed Program**

The McKenzie Watershed Council understands it will take active involvement of many individuals and organizations for the vision described in its Action Plan to be realized. The council invites all interested parties to become actively involved in the council's work and encourages them to:

- Get on the council's mailing list for agendas, minutes newsletters, and other materials;
- Attend monthly council meetings;
- Contact council partners about issues that are important to you;
- Participate in council-sponsored demonstration projects;
- Inform the council of activities and events which are occurring in the watershed;
- Request information on council activities;
- Invite council partners to make a presentation to your club or community group; and
- Volunteer time and expertise to a council event or program.

The council welcomes comments from the public and reserves ten minutes at the beginning of each council meeting for public comment. The council meets on the second Thursday of every month and invites the public to attend. For more information on the McKenzie Watershed Council and its program, contact Lane Council of Governments, 125 East 8th Avenue, Eugene, Oregon 97401, (541) 687-4283.







## Chapter Two



# Goals and Objectives for Water Quality and Fish and Wildlife Habitat

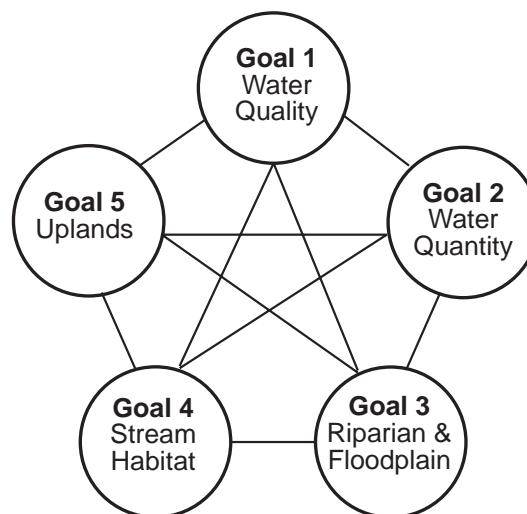
## Introduction

This chapter describes the watershed council's goals and objectives for water quality and fish and wildlife habitat. It is organized according to the five goal areas. A standard format is followed for each goal including: a goal statement, objective statements, examples of actions to implement the goal, and a discussion of existing conditions and trends.

Goals are broad vision statements describing how the council would like conditions or activities to be in the future. They provide direction for the development of priority actions and implementation. The objectives for each goal add more specificity in describing a course of action. In addition to the goal statement and objectives, each goal contains examples of actions to implement the goal. These examples are meant to help clarify how the council might implement each action. The council's specific actions are contained in Chapter Three. The discussion of existing conditions and trends is included to help clarify the goal's purpose and intent and to provide an overview of existing conditions. A more detailed discussion and analysis of existing conditions can be found in the Action Plan Technical Report.

The five goals for water quality and fish and wildlife habitat are water quality, water quantity, riparian areas and floodplains, stream habitat, and uplands. These goals were selected to address the various aspects of these two topics. In reality, the five goals are tightly interconnected and dependent upon one another (*Figure 4*). For example, aquatic life such as salmon need high quality water, adequate stream flow, and good stream habitat. These components are significantly affected by what activities occur in riparian areas and uplands.

**Figure 4**  
**Council Goals**



**Goal 1. Water Quality:** Maintain and enhance existing high water quality of the McKenzie River, tributaries, and underlying groundwater for drinking water, fish and wildlife habitat, water contact recreation, industry, and aesthetics.

## Objectives

*Promote Projects or Actions That:*

- 1A. Maintain current high water quality conditions where they meet or are better than state standards.
- 1B. Improve current poor water quality conditions where they are less than state standards.
- 1C. Maintain or enhance water quality conditions where state water quality standards do not exist.

**Examples of Actions:** *Develop and implement a coordinated water quality monitoring program. Develop strategies to address areas identified with poor water quality.*

## Discussion of Existing Conditions and Trends

The aim of this goal is to maintain and enhance the McKenzie River's high quality water. The watershed is the source of drinking water, both surface and groundwater, to over 200,000 Lane County residents. Major industries count on the water supply to be free of impurities that could harm their products. Kayaking, rafting, and drift boat fishing are among the popular water contact recreation uses of the river. Fish depend on high water quality for passage, spawning, rearing, and overall viability. Oregon has adopted standards to protect these varied and beneficial uses of water although it is widely recognized by the scientific and academic community that additional indicators of water quality exist that are not associated with established state or federal standards.

The *Willamette River Basin Water Quality Study* (August 1995) prepared for the Oregon Department of Environmental Quality (DEQ), examined the Willamette River Basin including portions of the McKenzie River. The study reported that water quality in the lower reaches of the McKenzie River as a whole had the highest water quality conditions compared to other areas in the Willamette River Basin. The upper reaches of the McKenzie River were not evaluated in this study. Although water quality in the lower McKenzie is considered good, it still occasionally violates water quality standards. Logging, urban development along the river corridor, and agricultural uses are considered the major non-point pollution sources within the watershed.

DEQ is responsible for assessing surface waters relative to state water quality standards. In 1994, DEQ identified the lower reaches of the McKenzie River as violating the dissolved oxygen (DO) standard during the fall, winter, and spring periods. This limitation affects aquatic life in the river because nearly all aquatic animals require the presence of some oxygen in the water, with cold water fishes (salmonids) requiring high levels.

However, DEQ is proposing modifications to the state's DO criteria. If the proposal is adopted, the lower reaches of McKenzie River would no longer be considered in violation of the state DO water quality standard. The proposed criteria, based on concentration rather than saturation, provide a more direct measure of the effects of DO on beneficial uses without measurably impairing the levels of protection.

In May 1994, the council assembled a team of technical advisors from academia, industry, and federal, state, and local natural resource agencies. Among its responsibilities was the charge to provide a comprehensive evaluation of current

water quality data, including identification of baseline conditions, trends, data gaps, and problem areas. Early on, the technical advisors recognized that although several agencies have collected water quality data over time, no one analyzed these data to determine baseline conditions for the entire McKenzie.

With the council's concurrence, the U.S. Geological Survey (USGS) was contracted to inventory surface-water quality data for the McKenzie watershed with the expectation that sufficient data existed to describe current water quality conditions watershed-wide. Unfortunately, the resulting inventory found that considerable data gaps prevent any meaningful baseline watershed-wide water quality assessment. In light of these findings, the USGS recommends waiting to analyze existing data, concluding that "a much better and more cost effective analysis could be made if these historic data were analyzed along with data collected in a new monitoring network."

A limited water quality assessment has been performed for the lower reaches of the McKenzie River. A 1995 DEQ analysis (*Trending Analysis for the Clackamas, North Santiam, and McKenzie Rivers*) observed several trends, but the trends appear related to releases from reservoirs, the time of day samples were collected, or changes in sampling procedure. Existing data suggest that water quality in the lower McKenzie River is sensitive to conditions that typically vary throughout the day (oxygen, pH, and temperature). This type variation could lead to decreased aquatic habitat conditions and violation of certain state water quality standards during certain times of the day.

Available DEQ fish tissue data indicate that certain toxic compounds are potentially present in the lower McKenzie River. DEQ concludes that fish tissue data are probably influenced by urban and major industrial runoff. No state fish tissue standards exist, but some toxics are occasionally observed in fish tissue that are above Environmental Protection Agency standards. No violation of the Food and Drug Administration standards were observed and the Oregon Health Division has not indicated that a fish advisory for the McKenzie is necessary. Water column toxics data indicate the presence of some toxics. However, observed values are limited and do not meet DEQ requirements for adequate number of data, or frequency of standard violation to indicate the McKenzie is not meeting state water quality toxics standards.

The USGS was only contracted to inventory surface-water quality data, reflecting the council's initial surface-water focus. Results of the study indicate that significant groundwater recharge into the lower reaches of the McKenzie River exists which could have a significant affect on water quality. The council intends to revisit groundwater quality issues once work on surface-water is well underway.

**Goal 2. Water Quantity:** Ensure adequate streamflow exists in the McKenzie River and tributaries to meet instream and out-of-stream water needs (e.g. aquatic habitat, recreation, pollution dilution, irrigation, industry, hydroelectric power, etc.).

## Objectives

*Promote Projects or Actions That:*

- 2A. Ensure adequate streamflow exists to:
  - Maintain and increase fish and wildlife habitat and populations,
  - Minimize the impacts of point and nonpoint source pollution, and
  - Support a variety of recreational uses.
- 2B. Maximize the efficiency of current out-of-stream uses.

**Examples of Actions:** Encourage voluntary water conservation by industrial,

## **Discussion of Existing Conditions and Trends**

The aim of this goal is to insure streamflows in the McKenzie watershed exist to meet both out-of-stream and instream needs. Adequate streamflow supports the health of aquatic and riparian habitats, improves water quality by lowering pollution concentration levels, and maintains recreational values. Water depth, flow patterns, and duration and frequency of flooding within riparian zones are major factors affecting plants and wildlife. Riparian areas in turn influence water quality and the health of the aquatic system. In addition, adequate streamflows can insure that sufficient water is available for hydro-electric power generation and industrial, agricultural, and municipal purposes.

Streamflows in the McKenzie River approximate seasonal rainfall and snowmelt patterns, with peaks usually in February and May and low flows from August through October. It appears that a significant volume of groundwater discharges into the lower reaches of the McKenzie, since flows are 20 percent higher near the confluence of the Willamette than would be expected solely from overland sources. Near this confluence, flows range from a high of about 10,200 cubic feet per second (cfs) to low flows of 2,020 cfs. Natural flows are generally not stable, but fluctuate seasonally according to precipitation.

Natural flow patterns in the McKenzie have been altered substantially by dams, diversions, water withdrawals, and changes in the landscape vegetation. The average annual withdrawal/return at Leaburg and Walterville Canals decreases and increases the flow in the McKenzie by about 50 percent. Releases from Cougar and Blue River Dams have also altered flows on the mainstem McKenzie. Combined effects from water released from these reservoirs represent flow increases of 30 to 50 percent during summer and corresponding decreases in late winter and spring.

Under Oregon law, all water is publicly owned and users (with some exceptions) must obtain a permit or water right to use water sources. Oregon's water laws are based on the principle that the first person to obtain a water right on a stream is the last to be "shut off" in times of low streamflows. Generally, state law does not provide a preference for one kind of use over another. If a conflict between users emerges, the date of priority determines who may use the available water. If the water rights in conflict have the same priority date, domestic use and livestock watering have preference over other uses.

All waters within the state may be appropriated for use except those which are withdrawn by legislative action or restricted by an administrative order of the Water Resources Commission, a seven-member citizen body that sets water policy. The commission cannot adopt water-use restrictions that reduce existing water rights, but may modify or add new restrictions that affect new uses. The commission also sets minimum streamflows and approves instream water rights for fish protection, to minimize the effects of pollution, or to maintain recreational uses. Water availability is a major factor in the determination of whether new water rights are granted. Currently, water appropriations are still available in the McKenzie watershed for certain uses and periods of the year. Minimum streamflows and instream water rights, like all water rights, have a priority date and cannot affect a use of water with a senior priority date.

Presently, ten stream reaches in the watershed have instream water rights or minimum flows primarily to provide fish and wildlife benefits. These rights vary between 3,131 to 3,385 cfs, depending on the time of the year. Additionally, four of these reaches have a minimum streamflow for releases from stored water in the

total amount of 1,860 cfs.

Aside from instream water rights, there are approximately 10,962 cfs of surface rights and 242,571 acre feet of reservoir rights allocated in the McKenzie watershed. Hydropower accounts for 91 percent of the surface water and about 7 percent of the stored water allocations. Hydropower does not consume water, but in several cases removes it from long reaches of the river. Conversely, water rights for irrigation account for only 2.5 percent of the appropriated surface water and 92 percent of reservoir water. Less than 85 cfs of groundwater is allocated in the McKenzie watershed, with 63 percent of this earmarked for irrigation. Most of the remaining groundwater is appropriated for municipal use. *Table 1* summarizes the non-instream water rights for the McKenzie watershed.

The watershed council recognizes the complexities associated with developing and implementing actions to achieve this goal. Additional investigation into areas such as Oregon water law, variations in precipitation patterns, and the effects of existing water allocations and uses on instream flows will provide the necessary technical background to assist the council in developing sensible actions to achieve this goal.

***Table 1***  
**Summary of Non-Instream Water Rights for  
the McKenzie Watershed**

*Source: Oregon Water Resources Department, October 1994*

**Goal 3. Riparian Areas and Floodplains:** Emphasizing the voluntary cooperation of private landowners and public land managers, maintain and/or restore the functions of healthy riparian areas and floodplains because of the importance of those areas to watersheds and stream conditions.

**Objectives:**

*Promote Projects or Actions That:*

- 3A. Maintain and enhance the percentage of functional floodplain habitat and healthy riparian areas.
- 3B. Maintain and enhance high quality riparian areas and floodplains.
- 3C. Minimize harmful disturbance of the riparian areas and floodplains.
- 3D. Increase the connectivity between streams and floodplains.

**Examples of Actions:** *Encourage the development of riparian area and floodplain education programs. Facilitate voluntary participation in riparian and floodplain restoration projects.*

## Discussion of Existing Conditions and Trends

This goal strives to maintain and improve the quality and quantity of riparian areas and floodplains in the McKenzie watershed. Riparian areas are those areas along rivers, streams, lakes, ponds, and any other waterbody including wetlands. Riparian areas can be viewed as three dimensional zones of direct interaction between land and aquatic ecosystems. These zones extend upward into the canopy of the vegetation and outward to the extent of flooding. In the McKenzie watershed, much of the riparian area and floodplain along the mainstem McKenzie River are in private ownership and these are the areas most commonly impacted by development and other human uses.

Riparian areas can vary greatly in size and types of vegetation. In general, a healthy riparian area is indicated by a diverse mix of vegetation right to the waters edge. Trees in the riparian area include saplings to mature trees of both hardwood species such as maple, alder, and cottonwood and conifers such as Douglas fir and cedar. Healthy areas may also contain a variety of native shrubs and grasses. Vegetation in the riparian area and floodplain perform many important functions. Several of these functions include water quality benefits, stream habitat and food production, wildlife movement corridors, and resting areas. Vegetation in this area helps to improve and regulate water quality by helping to moderate temperatures through shading, filtering excess nutrients before they enter the waterbody, providing bank stabilization that reduces erosion, and helping to regulate and moderate surface flows down stream.

The riparian area and floodplain provide an important link between upland and aquatic ecosystems. The link to the stream channel is so prevalent that changes in the riparian area can be translated rapidly into changes in stream biology. Bankside trees are the principle source of large wood debris in streams. Fallen trees (large woody debris) in a stream form pools which trap organic materials and provide habitat essential for fish spawning and survival. In addition to these water quality and stream benefits, most birds and animals are dependent on riparian areas for life. These areas provide important travel corridors, food and resting sites, and places to breed and nest for numerous wildlife species.

A detailed assessment of riparian and floodplain conditions has not been conducted for the entire McKenzie watershed. Based on the results of completed assessments in various areas of the watershed, in general, the quality, quantity, and connectivity of riparian vegetation along waterbodies within the McKenzie watershed has decreased over time. Logging, residential development, and agricultural clearing have all impacted riparian vegetation within the McKenzie watershed. This is most apparent along the lower and middle reaches of the mainstem McKenzie River and within the Mohawk watershed. These are the areas having the highest priority for restoration activity. High quality riparian areas and off-channel sloughs in the lower McKenzie are especially important to juvenile salmon. These areas should be identified and preserved where possible. Further assessment of riparian conditions within the Mohawk and Lower McKenzie watersheds would provide valuable information to identify opportunities for demonstration projects and serve as a baseline to evaluate watershed health.

For the mainstem McKenzie River, 92 percent of the river has experienced alteration of the streamside forest and separation from its floodplain. Increased development in riparian areas may have negative long-term impacts to fish and wildlife. Hardwood trees are gradually replacing conifers along the McKenzie River corridor and almost all of the riparian area in mature forest is in the upper river.



Increased human use of riparian areas for roads, agriculture, and residential purposes has led to an increased fragmentation of the riparian landscape. The density of residential or developed areas within the riparian area of the main stem McKenzie has increased considerably since 1945 as more and smaller areas are converted from natural vegetation to human use. Currently, privately owned commercial forest land is regulated by the Oregon Forest Practices Act. These regulations specify requirements for maintaining upland and riparian areas. Residential and commercial development within riparian areas is regulated by the Lane County Riparian Ordinance. This regulation governs vegetation removal and restoration work within the riparian area. At this time, agricultural lands are not covered by these regulations.

Riparian areas and floodplains provide numerous important functions as described above. Impacts to these areas have gradually occurred over time. Existing regulations may help to slow further degradation of these areas, but regulation alone will not mend the damage that exists. What is needed is a program of restoration projects on private lands. Some approaches to restoration should include incentives to landowners to undertake these efforts and direct government expenditure. Volunteer assistance should be part of these efforts.

**Goal 4. Stream Habitat:** Improve stream habitat to maintain/increase fish populations and other aquatic life.

### **Objectives:**

*Promote Projects or Actions That:*

- 4A. Maintain high quality stream habitat where it currently exists.
- 4B. Rehabilitate appropriate areas where high quality stream habitat does not exist:
  - Increase the amount of large woody debris,
  - Increase the number of pools,
  - Increase the amount of coarse sediments,
  - Decrease fine sediments (turbidity),
  - Reduce barriers to fish migration, and
  - Re-establish natural side channels and connectivity within the floodplain.

**Examples of Actions:** *Identify priority areas for stream restoration. Facilitate coordination of stream restoration projects among various land managers.*

## **Discussion of Existing Conditions and Trends**

The purpose of this goal is to protect and provide high quality stream habitat essential to healthy fish and wildlife populations native to the McKenzie watershed. The council recognizes the importance of maintaining and increasing the amount of healthy stream habitat and is particularly interested in focusing on habitat needs of native species.

Stream habitat includes the water area of the stream or river including side channels and backwater sloughs. Habitat requirements essential to salmon and productive native aquatic systems include: adequate pools; stable, vegetated banks; wood within the stream; proper gravel composition; and shade. Numerous human activities influence stream habitat, including road building, stream bank stabilization projects, dams, timber harvesting, and riparian vegetation clearing. These activities often result in an increase in fine sediments and water tempera-

tures, and a decrease in large woody debris, coarse gravels, and the number of pools. Some activities, such as the construction of dams and road crossings, may pose barriers to fish migration and movement.

Several watershed analyses have been completed in the watershed and several more are planned or are in progress. Many of these analyses have been completed by the U.S. Forest Service (USFS) and Bureau of Land Management (BLM). In addition, Weyerhaeuser and Guistina Lumber companies have undertaken this type of work. The largest remaining information gap for watershed analysis work is in the lower watershed on small acreage private lands in the Mohawk watershed and Camp Creek and along the main stem McKenzie River.

Improving wild fish numbers has been identified by the Oregon Department of Fish and Wildlife as a high priority related to stream habitat. Human created barriers to fish passage include culverts and dams. The majority of culvert barriers are at road crossings on tributary streams. Culverts in need of repair should be identified during watershed analysis work. Further assessment of areas not covered by these analyses should be conducted. Dams have decreased the numbers of anadromous fish including spring Chinook due to passage obstruction and increased water temperatures.

The estimated average run of spring Chinook prior to construction of Cougar and Blue River dams was about 18,000 fish. Since the completion of the dams, the average run size has been about 6,700 fish with only about 2,900 fish passing upstream of Leaburg Dam. Water temperature changes are partially responsible for reduced numbers of spring Chinook. Downstream temperatures are higher in late summer and early fall and lower during spring and early summer, than before construction of the dams. These temperature changes delay adult fish migration and limit the ability of young fish to survive. The Army Corps of Engineers is reviewing the installation of temperature control devices at Cougar and Blue River dams. The Mohawk River and Camp Creek are currently not considered suitable for spring Chinook because they lack adequate pools, the water is too warm during the summer, and flow is low during the spawning period. Historically, the Mohawk River may have contained a run of salmon.

Stream gravels are an important element for salmon egg development. Historically, gravel was trapped and held by the presence of logs and boulders. As these structures were removed, gravels have moved through the stream system faster, especially during flooding when gravels are rearranged and loosened. With the reduction of flood events due to dams, gravels are increasingly becoming compacted, especially within the main stem of the McKenzie River.

Large woody debris is a major habitat feature of healthy aquatic systems. Large woody debris in a stream creates pools for sediment and gravel deposits, improves bank stability, helps form the shape of the channel, and increases the overall complexity of the stream system. Large woody debris is also important in providing and trapping food for the aquatic food chain. Riparian areas are the primary source of large wood debris. Timber harvesting and removal of riparian vegetation for residential development and roads have reduced the number of available mature conifers for future recruitment into the McKenzie River channel. Several projects have occurred in the watershed to place large woody debris in streams from off-site. If done carefully, this kind of work can provide some short-term benefits to stream habitat. However, a long-term solution for addressing the objective to increase the amount of large wood, should focus on future recruitment of trees from adjacent riparian areas.

Side channels and backwater sloughs provide important rearing habitat for juvenile fish. Over time, the McKenzie River has become increasingly straightened, decreasing the amount of this habitat feature. Channel straightening on the main stem may be due to the interaction of several factors related to high flow events: lack of stream structures, such as large woody debris, to deflect flow; presence of roads and riprap along the channel, which channelize and direct the flow in unnatural ways; and loss of riparian vegetation reducing bank stability and increasing erosion. Dams decrease peak flows, lowering the likelihood of overbank flows onto the floodplain. Since the potential that new side channels and off channel habitat will be created naturally is minimal, the protection of those remaining areas, particularly in the lower river, is important.

High quality stream habitat is essential for healthy aquatic systems. Stream habitat has been altered by dam construction and riparian cutting. Long-term solutions to ensuring native aquatic populations are sustained should focus on maintaining existing high quality stream habitat and riparian areas and restoring degraded areas. Stream improvement projects should be conducted with care so as not to cause unanticipated negative impacts.

**Goal 5. Uplands:** Maintain healthy, sustainable uplands and special habitats throughout the watershed to protect and enhance water quality and fish and wildlife habitat.

### **Objectives:**

*Promote Projects or Actions That:*

- 5A. Maintain a diverse mix of vegetation types and ages to support a diversity of wildlife species (game and nongame) throughout the watershed.
- 5B. Provide and improve wildlife travel corridors and habitat connectivity.
- 5C. Ensure that human impacts in upland habitats are compatible with a healthy watershed.
- 5D. Maintain or enhance special habitats that are in danger of being diminished.
- 5E. Identify and implement restoration opportunities which will improve upland health.

**Examples of Actions:** *Assess the quality of upland and special habitats watershed-wide. Identify areas of critical habitat and opportunity areas for demonstration projects. Facilitate a yearly meeting of land managers within the watershed to discuss management activities.*

## **Discussion of Existing Conditions and Trends**

This goal strives to maintain a wide range of upland habitats which provide a variety of water quality and fish and wildlife benefits. By definition, uplands are those areas that are typically well drained and generally do not have standing water. Uplands are generally away from streams and outside riparian areas. Uplands in the McKenzie watershed contain several other habitat types referred to as special habitats. Special habitats include wetlands, cliffs, meadows, and talus slopes (rock slides). Agricultural lands are also considered a special habitat, providing habitat value for several wildlife species. Uplands make up the majority of land area in the McKenzie watershed.

Uplands provide habitat for over 329 wildlife species in the McKenzie watershed.

The watershed contains no species unique to the McKenzie watershed. Three species, the peregrine falcon, spotted owl, and bald eagle are federally listed wildlife species. Recovery plans are in place to address these species.

Uplands serve as important nesting habitat, roosting sites, hiding cover, and feeding sites for many wildlife species. These areas also provide travel corridors for animals moving throughout the watershed. Upland vegetation influences both the rate at which water runs off the land and the quality of that water. Densely vegetated slopes help to intercept rainfall, slow runoff, and reduce soil erosion. Slow moving water is absorbed into the ground readily and released over a long period of time.

The term vegetation seral stage corresponds closely to vegetation age with early seral stage vegetation being similar to young forests or clearcuts. In the McKenzie watershed, vegetation age usually follows land ownership boundaries. Private forest lands in the lower watershed are generally younger than forests on public lands in the upper watershed. In general, the western half of the watershed contains a higher percentage of younger forests and hardwood species than the eastern half. The greatest percent of older forests remain in the South Fork McKenzie and Horse Creek watersheds within wilderness areas. A block of older forest also remains in the South Gate Creek area on USFS land and a smaller area in the Mohawk watershed on BLM land. *Table 2* shows the percentage of seral stage vegetation by sub-watershed compared to the entire McKenzie watershed.

***Table 2***  
**Percentage of Seral Stage Vegetation by Watershed**

*Source: 1988 Landsat TM Imagery, updated to 1993*

***Definitions:***

|                     |  |
|---------------------|--|
| <i>Early Seral</i>  | <i>= 10-70% total crown closure and &lt; 75% hardwoods and shrubs</i>  |
| <i>Mid Seral</i>    | <i>= &lt; 10% tree crown closure in trees <math>\geq</math> 21 inches in diameter,<br/>&lt; 75% hardwoods and shrubs</i> |
| <i>Late Seral</i>   | <i>= &gt; 10% tree crown closure in trees <math>\geq</math> 21 inches in diameter,<br/>&lt; 75% hardwoods and shrubs</i> |
| <i>Other Forest</i> | <i>= &lt; 10% total crown closure and/or &gt; 75% in hardwoods and<br/>shrubs</i>  |

*Non-Forest* = agriculture, urban, rock outcroppings

A landscape analysis of upland habitat suitability for wildlife in the McKenzie watershed was conducted using a habitat suitability model called "Habscapecs." The model, developed by the USFS, evaluates the suitability of habitat for wildlife species guilds or groups of species with similar habitat requirements. Habitat suitability is defined as habitat which is suitable for a species to meet all of its life needs including breeding. Some of the factors influencing habitat suitability include the age, type, location, and size of the habitat patch. Some species, such as the northern spotted owl are thought to be very specific about their habitat requirements while others may use a variety of habitat types.

Management activities such as fire suppression, timber harvesting, and road construction have affected upland habitats. Past timber harvest activities have favored deer and elk, and most early seral stage associated species with increases in species population size. Future management strategies favoring habitat requirements of late seral species, may limit optimal habitat conditions for





early seral species.





# Chapter Three

## Priority Actions for Water Quality and Fish and

### Wildlife Habitat

#### Introduction

This chapter contains the McKenzie Watershed Council's five priority action clusters. These clusters provide the framework for the development of actions and tasks on which the council plans to focus its efforts during the next 18 to 24 months. These actions were developed through a review of existing conditions for water quality and fish and wildlife habitat in light of the council's goals. Recommendations from technical advisors and input received during public review of the draft action plan also helped with their development. Many of the actions are designed to address multiple goals. For example, Action #2, Demonstration Projects, may address all five goal areas and Action # 3, Education, is designed to address both the water quality and riparian area goals.

#### The five priority actions clusters are:

- Action # 1:** Assess water quality conditions watershed-wide
- Action # 2:** Develop and encourage restoration, enhancement and conservation demonstration projects for priority sites on private lands in cooperation with willing landowners.
- Action # 3:** Develop and implement a broad-based information and education program focusing on water quality practices and riparian areas.
- Action # 4:** Develop and implement a broad-based incentive program that promotes stewardship in the McKenzie watershed.
- Action # 5:** Assess fish and wildlife habitat conditions watershed-wide.

Each action cluster follows a similar format including a goal statement, a background discussion describing the purpose of the action, and a list of tasks to accomplish the action. The actions also include a discussion of possible lead/sponsor, necessary resources, and an estimate of the time frame required to implement the action. The council will work to identify resources to accomplish each task and refine the scope of the action clusters as it moves into implementation of the Action Plan.

#### **Action #1: Assess water quality conditions watershed-wide.**

#### **Background**

An aim outlined in the council's charter is to "promote ongoing monitoring of the health of the McKenzie River watershed." Assessing water quality is one of the mechanisms by which watershed health will be measured and council performance evaluated.

In May 1994, the council assembled a *Water Quality Task Group* made up of technical advisors from academia, industry and federal, state, and local natural resource agencies. Among its responsibilities was the charge to provide a comprehensive evaluation of current water quality data, including identification of baseline conditions, trends, data gaps, and problem areas. Early on, this task group recognized that although several agencies have collected data over time, no

one had analyzed the data to determine baseline conditions for the McKenzie. The sole exception was the Department of Environmental Quality, which performed a trends analysis of the limited data collected at its Armitage Park site.

With the council's concurrence, the U.S. Geological Survey (USGS) was contracted to inventory surface-water quality data for the McKenzie watershed with the expectation that sufficient data existed to describe current water quality conditions in the watershed. Unfortunately, the 1995 inventory found that only a few water quality constituents of interest have been measured with some consistency; consequently, any watershed-wide characterization of current conditions would result in considerable gaps. In light of its findings, the USGS recommends waiting to analyze existing data and concludes that "a much better and more cost effective analysis could be made if these historic data were analyzed along with data collected in a new monitoring network."

### **Tasks**

1. Develop and implement a water quality monitoring program, involving citizens where appropriate.
  - Review *Water Quality Monitoring Subcommittee's* (a subgroup of the *Water Quality Task Group*) recommendations for monitoring objectives, approach, site priorities, and sampling parameters.
  - Develop a common monitoring protocol, quality control and assurance program, and data storage and analysis system.
  - Identify personnel and capital requirements along with budgetary constraints.
  - Recruit citizens, school groups, organizations, private industries, and public agencies to provide resources and volunteers.
  - Implement fixed-station surface-water monitoring.
  - Begin developing benchmarks and a monitoring program for ground-water.
  - Coordinate with *OSU Extension-Lane County Groundwater Committee* to expand the volunteer well sampling program in the watershed.
2. Evaluate data to determine water quality conditions.
  - Add monitoring data to geographic database to facilitate tracking and analysis.
  - Use historic data (when practicable) and monitoring network data to analyze spatial and temporal water quality conditions in the watershed.
    - Identify any gaps between existing and desired conditions (as articulated in the *Water Quality Benchmarks*). Investigate possible causes if water quality trends are deviating from desired conditions.
    - Summarize water quality conditions in a *State of the Watershed* report every five years.

### **Lead/Sponsor**

Eugene Water & Electric Board (EWEB) serves as lead for the council's water quality work program. With EWEB's lead, a subgroup of the Water Quality Task

Group has designed a water quality monitoring program for the McKenzie watershed. EWEB is committed in this endeavor and is leading efforts to secure resources for on-going implementation.

### ***Necessary Resources***

- Personnel to:
  - collect and analyze samples;
  - store, retrieve and analyze data; and
  - prepare reports.
- Computerized data storage system.
- Equipment and materials for data collection and analyses.

### ***Estimated Time Frame***

- Fixed-station surface-water quality monitoring began November 1995.
- Begin assessing baseline conditions, November 1996.
- Begin trends analyses, November 1998.

**Action #2: Develop and encourage restoration, enhancement and conservation demonstration projects for priority sites on private lands in cooperation with willing landowners.**

### ***Background***

The council's mission advocates "deal[ing] with issues in advance of resource degradation" and "foster[ing] better stewardship of the McKenzie River watershed resources." Initiating demonstration projects on private lands is a means of promoting and highlighting good stewardship among private landowners. Demonstration projects provide opportunities to build strong cooperative relationships between the council and private land owners. Engaging private landowners in these projects allows these stakeholders to develop a greater awareness of the role they play in maintaining watershed health.

In December 1994, the council assembled a Fish and Wildlife Habitat Task Group, made up of technical advisors from academia, hunting and fishing organizations, environmental groups, industry, and federal and state natural resource agencies. Among its responsibilities was the charge to identify baseline habitat conditions, trends, and problem areas. The task group recommends targeting the council's restoration, enhancement, and conservation efforts on private lands since significant efforts are planned or currently underway on publicly owned lands in the watershed. The advisors also point out that much of the riparian zones and floodplains in the watershed are in private ownership and that these are the areas most commonly affected by development.

In March 1994, the Natural Resources Conservation Service (NRCS) allocated \$90,000 to the East Lane County Soil and Water Conservation District (SWCD), to initiate water quality protection and enhancement projects on private lands in the McKenzie watershed. In the Spring of 1995, the council, East Lane SWCD and the NRCS sponsored two demonstration projects in the McKenzie watershed. These projects were successful in generating interest from other private landown-

ers in the watershed wishing to participate in similar projects. Momentum generated from these projects should be instrumental in implementing other demonstration projects in the watershed.

### ***Tasks***

- Request that the Fish and Wildlife Habitat Task Group identify and prioritize candidate sites on private lands for restoration, enhancement, and conservation projects.
- Assist NRCS/SWCD in identifying and recruiting private landowners in the McKenzie watershed to participate in demonstration projects for priority sites.
- Develop resource management plans for demonstration projects in collaboration with participating landowners.
- Recruit citizens, school groups, organizations, private industries, and public agencies to provide resources and volunteers for demonstration projects.
- Assist landowners in project implementation and provide ongoing technical support.
- Monitor effectiveness of demonstration projects, involving citizens where appropriate. Summarize completed projects and progress in a State of the Watershed report every five years.
- Develop incentive programs that encourage private landowner and community participation in demonstration projects.
- Identify and reduce administrative and regulatory barriers that discourage rehabilitation projects.

### ***Lead/Sponsor***

NRCS, in partnership with SWCD and the council, is working with private landowners to implement demonstration projects in the McKenzie watershed. Their most publicized project to date occurred along a quarter-mile stretch of private riverside pasture on the Mohawk River, a major tributary of the McKenzie River. Over 60 volunteers participated in the project, along with a Lane County Metro Youth Corps and crews from the Jobs-In-The-Woods program. NRCS will continue to take the lead in working with private landowners to implement restoration, enhancement, and conservation projects on private lands in the watershed.

### ***Necessary Resources***

- Personnel to:
  - Develop resource management plans,
  - Provide ongoing technical support,
  - Assist in project implementation and monitoring, and
  - Develop incentive programs.
- Equipment and materials to carry out demonstration projects.

### ***Estimated Time Frame***

- Two to five months to identify priority sites for demonstration projects.
- Nine months to develop incentive programs.

- Demonstration project implementation will be ongoing.
- Three months to reduce administrative and regulatory barriers that discourage rehabilitation projects.

### **Action # 3: Develop and implement a broad-based information and education program focusing on water quality practices and riparian areas.**

#### ***Background***

The council recognizes the importance of a well informed and educated public as contained in part of its charter mission statement: "To foster better stewardship of the McKenzie River watershed resources...." A lack of public awareness about water quality and riparian area issues contributes to an inadvertent degradation of water quality and riparian areas. Informing businesses and residents along the river about activities that cause water quality and riparian area degradation, and identifying alternatives to these behaviors, may play a role in reducing adverse impacts.

Riparian areas provide numerous water quality benefits, such as filtering runoff, reducing erosion, and providing shade to waterbodies, in addition to providing habitat for fish and wildlife species. "Housekeeping" practices such as the improper use and disposal of pesticides, herbicides, fertilizers, and other wastes can all contribute to degraded water quality.

To date, the council has focused its public outreach efforts on developing the Action Plan. Several informational materials have already been developed including a newspaper insert, newsletters, and numerous fact sheets about the council. With council support and coordination, two council partners were successful in obtaining grant monies from the Governor's Watershed Enhancement Board. The Eugene Water & Electric Board received funds to conduct a teacher training program on the McKenzie watershed and the Pacific Rivers Council received funds to develop a pilot citizen monitoring program.

Tasks in the following action item target residents and businesses located along or using the river corridor in an effort to provide information and education about these practices. It also strives to support and provide coordination among existing efforts.

#### ***Tasks***

##### **1. Information and Education**

- Discover what educational materials are now available to help landowners understand about environmentally friendly management of riparian areas and disposal of household and yard waste.
- Help customize and distribute educational brochures, videos, and newsletters to supplement currently available materials.
- Conduct workshops/demonstration projects for realtors, local businesses, tree trimmers, community groups, and residents on environmentally friendly riparian management practices and disposal of household and yard wastes.
- Involve Landscape Architecture and Urban and Regional Planning students from the University of Oregon in customizing educational materials

and demonstration projects.

- Assist local schools and community educational projects (such as the old Leaburg Fish Hatchery) that educate young people and adults about riparian areas and proper waste management.
- Present an annual award for residents, schools, and businesses who best work to improve riparian areas and water quality.
- Work with appropriate agencies and businesses to make available a catalog of local suppliers of native plant materials and a guide for their selection.
- Educate volunteers on water quality and riparian condition monitoring as well as restoration project techniques.
- Assist Lane County in its efforts to expand household hazardous waste disposal programs.

## 2. Evaluation

- By using data already generated or, if sufficient data are not available, designing and administering a survey, discover the current awareness level of proper riparian management and water quality protection among residents of the watershed.
- Reevaluate the level of awareness after two years.
- Document the current condition of residential riparian areas in the watershed.
- Redocument the condition of residential riparian areas after two years.

### ***Lead/Sponsor***

A comprehensive information and education program on water quality practices and riparian area issues will involve many different organizations and agencies. The watershed council is in a position to provide coordination among many of these efforts. The council, with assistance from a university student involved in the RARE program, will accomplish many of the above tasks and provide coordination for others. A broad level of involvement will be key to an effective program.

Some of the groups that may be involved in this action include local residence associations; schools; universities; service organizations; business groups; environmental groups such as the Native Plant Society and Pacific Rivers Council; recreational organizations such as the Northwest Steelheaders and McKenzie Flyfishers; and several government agencies including East Lane Soil and Water Conservation District, Lane County, OSU Extension Service, Oregon Department of Fish and Wildlife, Natural Resource Conservation Service, Bureau of Land Management, U.S. Forest Service, and Army Corps of Engineers.

### ***Necessary Resources***

- Personnel to:
  - Develop program materials,
  - Coordinate with other local sponsors, and
  - Organize and conduct workshops/seminars.

- Funds for printing and production

### ***Estimated Time Frame***

- This task will be ongoing with progress reviewed annually.

## **Action # 4: Develop and implement a broad-based incentive program that promotes stewardship in the McKenzie watershed.**

### ***Background***

By design, the council is not a regulatory or enforcement body, nor does it control or adopt plans or rules in a legal sense. Instead, the council makes recommendations to decision-makers and landowners or managers on ways to protect the watershed's resources. The council considers incentives as the mechanism by which to implement many of its recommended actions.

Stewardship of McKenzie resources is promoted through actions taken by property owners that include conservation practices and restoration or enhancement projects. Conservation refers to maintaining an area in its natural state. Restoration activities are those that re-establish an area to as close to pre-disturbance (human induced) conditions as possible. Another approach is resource enhancement. Enhancement projects might not return an area to its pre-disturbance condition, but usually improve the functional value of an area.

Currently, restoration and enhancement activities are confronted by barriers, such as permit requirements, project cost, and lack of technical knowledge. Depending on the project, permit requirements can include a: fill or removal permit from the Army Corps of Engineers or the Oregon Division of State Lands, water storage permit from the Oregon Water Resources Department, and Lane County riparian restoration permit. Requirements may include that project design be produced by a certified engineer. For a five acre enhancement or restoration project, private land owners can spend between \$3,000 to \$5,000 before they even break ground.

Incentives encourage rather than demand landowners to initiate conservation practices and restoration or enhancement projects on their property. Effective incentive programs can provide assistance to property owners with project coordination, technical expertise, and funding. Ideally, permit requirements should be expedited or waived for restoration/enhancement activities.

### ***Tasks***

1. Present and publicize annual awards to residents, schools, and businesses who have voluntarily implemented actions that significantly contributed to improving water quality and key fish and wildlife habitat in the McKenzie watershed.
2. Develop incentive programs that encourage private landowners to take the initiative in implementing conservation practices on their land.
  - Provide technical, cost-sharing, and grant writing assistance.
  - Recruit volunteers to aid in project implementation.
  - Work with land conservancy organizations (e.g., McKenzie River Trust) and private landowners to promote conservation easements to safeguard

critical habitat.

3. Develop a volunteer recognition and publicity program for those who donate time to help the council implement its actions.
4. Research existing incentive programs and determine whether they could be used as part of the council's incentive program (e.g., Oregon Register of Natural Heritage Resources, Oregon Revenue Department's Open Space Deferral, Land Trusts, ODFW's Fish Restoration and Enhancement Program, etc.).
5. Endorse actions proposed by other agencies and organizations that advance council stewardship goals.
6. Reduce administrative and regulatory barriers that discourage restoration and enhancement projects.
  - Work with Lane County to develop criteria whereby landowners would be exempt from the County's riparian permit fees for riparian restoration and enhancement projects.
  - Provide assistance to landowners in acquiring necessary permits for projects.
  - Promote Oregon Department of Fish and Wildlife's Private Lands Habitat Initiative Program as an example of how private property owners can be encouraged to engage in restoration activities through incentives.

Through this program, Army Corps of Engineers and Oregon Division of State Lands permit fees are waived, encouraging private property owners to engage in restoration and enhancement activities on their land.
7. Encourage Lane County and the Cities of Springfield and Eugene to provide incentive options for restoration projects and conservation strategies.
8. Promote endeavors that maximize efficiency of out-of-stream water uses for domestic, industrial, and agricultural purposes.
  - Provide assistance to the agricultural community on implementing efficient crop irrigation practices.
  - Assist water utility companies in promoting municipal water conservation programs.

### ***Lead/Sponsor***

The council will assist in coordinating the various tasks contained in this cluster. For example, the Natural Resources Conservation Service (NRCS), in partnership with East Lane County Soil and Water Conservation District (SWCD), could take the lead in providing incentives to private landowners to participate in council sponsored demonstration projects and initiate conservation practices (both land and irrigation) on private lands. The NRCS and SWCD can also play an important role in working with Lane County to find ways to reduce administrative and regulatory barriers that discourage these projects.

Eugene Water & Electric Board and Springfield Utility Board could take the lead in providing incentives to residents, businesses, and industries to protect the water quality and consumptive uses of the potable water supply.



The City of Eugene's Volunteer Coordinator and students involved in the RARE program, can team up to assist the council in the recruitment of volunteers for project implementation as well as assisting in developing and implementing a volunteer recognition program.

### ***Necessary Resources***

- Personnel to:
  - Provide technical and grant writing assistance,
  - Research existing incentive programs,
  - Develop and implement incentive program, and
  - Develop and implement volunteer and volunteer recognition program.
- Funds for printing and production

### ***Estimated Time Frame***

- Program development for this action cluster will occur by October 1996.
- Implementation will be ongoing with progress reviewed annually.

## **Action # 5: Assess fish and wildlife habitat conditions watershed-wide.**

### ***Background***

The council is interested in maintaining and where appropriate, improving fish and wildlife habitat conditions throughout the McKenzie watershed. As described in the council's goals, fish and wildlife habitat is composed of riparian areas and floodplains, stream habitats and uplands. The council is primarily interested in completing assessments of these habitats to fill critical data gaps or assessments that lead to specific actions. The council is also interested in facilitating the compilation of watershed data where practical.

In December 1994, the council assembled a Fish and Wildlife Habitat Task Group made up of technical advisors from academia, industry, federal and state agencies and local non-profit organizations. The charge of the task group was to identify issues affecting fish and wildlife habitat, assess existing conditions, describe desired conditions, and develop recommended actions.

The task group assisted the council in completing an initial assessment of upland habitat suitability using the Habscares model. Maps were produced indicating habitat suitability for various species guilds and the task group began a general interpretation of these maps. This assessment will need to be refined to reach its potential usefulness. The task group also assisted with a cursory review of riparian and stream habitat conditions. The results of this review will assist in focusing future assessments to specific geographic areas such as the lower McKenzie River and Mohawk watershed.

### ***Tasks***

1. Assess fish and wildlife habitat conditions using satellite imagery and other available tools and information.
  - Compile in digital and graphical form available data, maps, and informa-

tion from completed watershed analyses and identify data gaps.

- Where data are lacking, assess riparian area and stream habitat conditions using satellite imagery, aerial photos, or field assessments. Focus efforts along the main stem McKenzie River, Mohawk watershed, and major tributaries.
  - Conduct a watershed-wide habitat suitability assessment using the "Guiding Process" (Habscales model) for upland habitat conditions and distribution for those species suspected to occur in the watershed. Expand this assessment to special habitats and riparian areas where possible.
  - Update the upland habitat assessment every two years and review the results with local land managers and other technical advisors.
  - Facilitate an annual meeting of land managers within the watershed to discuss management activities.
  - Summarize fish and wildlife habitat conditions in a State of the Watershed report every five years.
2. Coordinate with the Willamette Province Interagency Executive Team with regard to the Willamette Province Aquatic Conservation Strategy.

### ***Lead/Sponsor***

The successful completion of this action will require cooperation and coordination among many different organizations and agencies. The council will strive to assist in coordinating these activities and identify leads for each of these tasks.

### ***Necessary Resources***

- Personnel to:
  - Compile existing data,
  - Coordinate with other local sponsors,
  - Evaluate data and identify gaps,
  - Assess identified data gaps, and
  - Organize and facilitate meetings with local land managers.
- Funds for printing and production

### ***Estimated Time Frame***

- Some aspects of this action, such as annual meetings or updates will be ongoing.
- Other aspects will occur as resources allow.
- Progress will be reviewed annually.



## Chapter Four



# Monitoring and Evaluation

## Introduction

This chapter explores various monitoring types and approaches and describes the council's monitoring and evaluation strategy. The council is interested in monitoring the existing conditions and trends of the McKenzie watershed to determine whether the watershed's health is improving or deteriorating, and to evaluate the effectiveness of its actions. Tracking indicators are one of the mechanisms by which watershed health will be measured and council performance evaluated.

Monitoring provides opportunities to increase the understanding of relationships between watershed health and the impacts of various land and river uses. Involving citizens directly in monitoring efforts builds new partnerships, raises awareness of watershed issues, promotes stewardship, and engages citizens in active management of local natural resources.

In order to monitor watershed health and provide fiscal accountability, a coordinated basin-wide program which monitors trends and program effectiveness as well as engages citizens in monitoring efforts needs to be implemented. Unfortunately, there has been little or no coordination of data collection, interpretation, and data storage. Cutbacks in existing data collection efforts create additional challenges.

## Monitoring Approaches

Developing monitoring programs to track watershed health, council performance, and the effectiveness of implemented actions are essential for tracking benchmark progress. In developing a monitoring program, the approach taken must be matched to the monitoring objective. There are several distinct monitoring approaches relevant to a watershed monitoring program, each with its specific purpose. A watershed monitoring program needs to answer the following questions:

1. What is the trend of watershed health in the McKenzie watershed?
2. How effective are council sponsored actions in improving watershed conditions in the McKenzie watershed?
3. How effective are individual projects in meeting their objectives?

Ambient monitoring (sometimes referred to as baseline or trend monitoring) provides information on past and existing conditions and trends over a broad area. At this level, indicators of watershed health are measured over space and time. Ambient monitoring involves collecting samples from a specific location on a defined schedule usually for a period of many years. The collected samples are analyzed for many parameters. Because of the need for an ongoing commitment of resources, this kind of monitoring is generally done at a limited number of sites (watershed-wide monitoring network). Ambient monitoring is capable of monitoring overall program effectiveness by providing information on changes in conditions that result from carrying out a plan of action designed to improve conditions (cumulative effects), but usually cannot provide detailed information on subtle changes caused by an individual land use activity, program, or project.

Although ambient monitoring will detect general trends and give a general idea as to the location of activities that may be influencing these trends, this diffuse monitoring approach generally cannot be used to pinpoint or quantify the sources of the trends. If the aim is to determine the pollutant source or the effects of a particular management strategy, site-specific monitoring should be employed.

Project effectiveness monitoring utilizes the site-specific monitoring approach to provide information on whether a specific project achieved the objectives it was intended to produce. This involves tailoring monitoring strategies to each project. This can be a very large task when there are many projects involved in a program. It is also important to recognize that it is often very difficult, or impossible, to measure the effect of an individual project for parameters that may be influenced by many sources unrelated to the project. Combined with the fact that many efforts require years or decades to fully achieve their goals, it may be more fitting to monitor cumulative project effects using a program effectiveness (cumulative effects) monitoring approach.

This is certainly the case with education and outreach efforts where the effectiveness of such efforts would not be realized on the ground immediately. In these instances it may be more practical to measure council effectiveness indirectly. For example, the number of grammar school children participating in an "adopt-a-stream" program within the watershed or the number of riparian river-miles protected from grazing.

Monitoring project effectiveness also provides a means by which individual land owners and organizations can prove to themselves and others that they have indeed made a difference in the watershed and can also be valuable in evaluating experimental and pilot projects.

In order to be able to identify "issues in advance of resource degradation," as prescribed in the council's charter, it is also necessary to track indicators which identify trends that pose a threat to achieving/maintaining desired conditions in the watershed. This monitoring approach seeks to track underlying causes that threaten watershed health rather than the actual health of the watershed itself with the objective of providing a window of opportunity to institute corrective actions before serious watershed health problems develop.

## **Monitoring Strategy**

### **A. Benchmark System**

With the help of a team of technical advisors, the council is working to develop a system of *benchmarks*, which will assist the council in evaluating the effectiveness of its actions. Simply put, the benchmark system is a mechanism to help quantitatively measure and track progress towards achieving the desired conditions expressed in the council's water quality and fish and wildlife habitat goals and objectives. Benchmarks provide a means of expressing council desired conditions for the McKenzie watershed in specific, sustainable terms and allow the council to measure its progress toward achieving its goals.

The benchmark system consists of the following components:

1. Goal: statement of desired conditions.
2. Indicator: units of measurement which tell the council what to measure, and where and when to measure it.
3. Measurement: the actual data collected for a indicator.
4. Benchmark: a specific value for a indicator set at a particular future point in time that shows progress towards reaching the desired condition (i.e. target). Benchmarks can be considered as mileposts along the way toward achieving the desired condition.
5. Target: a benchmark (i.e., quantifiable goal) set at the end of a specified planning period.

Monitoring progress towards these benchmarks will help the council learn more about the health of the McKenzie River and tributaries. This knowledge in turn will help council partners make informed decisions and set rational priorities for action implementation. It will also aid the council in determining how the watershed is responding to actions or if it is not responding at all.

The council considers these benchmarks as:

- Reference points for goal setting,
- Tools for setting priorities and allocating resources for partners' budgets and volunteers,
- Yardsticks for measuring watershed health and council performance,
- Tools for seeking partner cooperation on broad issues,
- Tools for assessing the gap between existing and desired conditions, and
- Learning and educational tools.

Since a system of benchmarks can serve a variety of purposes, the form they take will vary. However, emphasis is placed on measuring results rather than effort (e.g. x acres of low quality riparian areas rehabilitated, as opposed to x dollars spent on rehabilitating low quality riparian habitat).

Targets and benchmarks will be developed for water quality and fish and wildlife habitat. For example, the targets for water quality may be that by the year 2010, 100 percent of the water quality data at specific monitoring points in the watershed surpass state standards or baseline conditions for parameters where state standards do not exist. In some instances it is very difficult to set benchmarks and realistic targets until more is learned about the existing conditions in the watershed. Consequently, targets and benchmarks may need refinement over time as the council learns more about the watershed.

## **B. Water Quality Monitoring**

In March 1995, at direction from the council, a technical advisory committee made up of scientists and engineers began developing a water quality monitoring program for the McKenzie watershed. The monitoring program is intended to assist the council in evaluating progress towards meeting their water quality targets (one measure of watershed health).

The objectives of the water quality monitoring program are to:

1. Monitor the overall health of the McKenzie River.
2. Determine if and how the water quality of the McKenzie River is changing over time, accounting for natural and seasonal variation.
  - a. Determine spatial distribution of water quality conditions throughout the basin.
  - b. Determine temporal variability, both short- and long-term, of water quality conditions.
3. Provide credible data upon which management decisions can be made.
4. Provide an affordable and sustainable measurement tool to evaluate the effectiveness of action steps taken to protect/enhance the water quality of the McKenzie River.
5. Provide an early warning system to signal if any adverse trends are developing.
6. Utilize historical data, as much as practicable, to develop longer trends.

The water quality monitoring program incorporates three separate approaches, referred to as tiers.

### ***Tier I***

This is the ambient monitoring component of the water quality program requiring long-term sampling at fixed intervals at fixed locations. This approach is suited for monitoring the overall condition of the river system, determining long-term water quality trends and detecting the general areas of the watershed that may be the sources of water quality problems.

### ***Tier II***

The focus of this component is monitoring high flow storm events at all Tier I monitoring sites. Monitoring high flow events are considered important since storms can flush large volumes of pollutants into streams.

### ***Tier III***

This element of the monitoring program (synoptic sampling) will serve various functions. It will be used to pinpoint or quantify the sources of any adverse trends which are uncovered through the Tier I trends monitoring. Synoptic sampling can also serve other information needs such as monitoring during periods of special concerns (e.g., low flow, pesticides during spring runoff, etc.) and evaluating the effectiveness of a particular project. Synoptic sampling can be an ideal means of collecting a "snapshot" of baseline water quality conditions throughout the watershed and is ideal for some constituents which require data from many sites, but only a few samples per site.

*The council is working with Oregon Department of Environmental Quality (DEQ) to implement Tier I of the water quality monitoring program. Tier I establishes a watershed-wide monitoring network composed of seven fixed monitoring stations along the mainstem McKenzie River and key tributaries (Map 2). DEQ is collecting data at three sites (Coburg Road, Hendricks Bridge, and McKenzie Bridge) at no charge to the council. The council is contracting with DEQ to monitor the other four sites. Data will be collected eight times a year (January, February, April, May, July, August, October, and November) beginning November 1995. Water samples will be analyzed for the same physical, chemical, and biological parameters that are routinely collected and analyzed by DEQ for streams in the Willamette Basin, allowing for comparison of the McKenzie's water quality with other streams in the basin. DEQ will provide an annual evaluation and summary of the data to the council. Council partners from the Eugene Water & Electric Board, Springfield Utility Board, and the Army Corps of Engineers have already indicated a willingness to contribute funding for this long-term monitoring effort.*



*Map 2*  
**McKenzie Watershed Water Quality Monitoring Map**

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## **C. Watershed-wide Habitat Assessment**

A landscape analysis for upland wildlife habitat suitability was conducted for the McKenzie watershed using a habitat suitability model called "Habscapecs." The model, developed by the U.S. Forest Service, tries to predict wildlife occurrence relative to landscape patterns. Instead of studying a single species, in essence, the model evaluates the suitability of habitat for all wildlife species suspected to occur in the watershed. This approach is meant to be a screen to determine if adequate habitat exists in the watershed. Habitats are divided into categories from suitable to unsuitable for each group of species. Some of the factors influencing habitat suitability include the age, type, and location of the habitat and the size of the habitat patch. Some species, such as the northern spotted owl, are thought to be very specific about their habitat requirements while others may use a variety of habitat types. In general, habitat suitability is defined as that habitat which is suitable for a species to meet all of its life needs, including breeding.

The 329 species known to occur in the watershed were grouped into guilds or groups of species with similar habitat requirements. The base layer for the analysis is an updated 1988 satellite image divided into vegetation seral stages. Habitat maps for each of the 12 species guilds were produced. Following that, a group of technical experts evaluated the maps and developed conclusions.

The usefulness of this model will be refined over time. The model will provide assistance in quantifying habitat suitability throughout the watershed and assist in resolving wildlife management issues. A bi-annual meeting of land managers in the watershed to discuss the results of the model should prove beneficial in itself. Over time, the results of the analysis can be compared and trends may be established.

## **D. Photo Documentation**

Photo documentation can be an effective strategy in tracking visible changes in the watershed. While photographs cannot tell the entire story about a project, they can often reveal changes that other measurements miss.

Much can be learned from photographs taken at the same point over a number of years. Photo documentation can be particularly valuable in evaluating on-the-ground project effectiveness and can be an effective tool in educating others of the benefits of good resource management practices. The Natural Resources Conservation Service (NRCS) has been photo and video documenting in the Mohawk subwatershed. The documentation is being used to monitor the effectiveness of council sponsored riparian demonstration projects on private lands. Documentation from these efforts will also be extremely valuable in recruiting other private landowners to participate in similar projects.

## **E. Citizen Monitoring**

Citizen monitoring programs provide vehicles by which citizens, school groups, organizations, industries, and agencies can become directly involved in the council's work program and develop a greater awareness of the role they and others play in maintaining watershed health. While volunteer monitoring may not be appropriate for all monitoring objectives (e.g., trends monitoring, where quality assurance, and control are critical), data collected by volunteers can be very useful in augmenting watershed health monitoring efforts. The Water Quality Monitoring Technical Advisory Committee felt volunteers could be particularly effective for Tier III water

quality sampling. Types of citizen monitoring will include: water quality, surveys of riparian and instream conditions, biological monitoring, weather, and photo documentation.

The council has successfully obtained a \$21,000 Governor's Watershed Enhancement Board (GWEB) grant to implement a pilot citizen monitoring program in the McKenzie watershed. The project will provide water quality data and promote education and stewardship among local school children and residents. The program is staffed and coordinated by a person from the Resource Assistance for Rural Environments (RARE) program, an organization partially funded through the Americorps Program.

The pilot program is focusing on a limited number of sites with the objective of developing a strong, successful program which can be replicated throughout the watershed. The primary target audience for this project is middle school students and teachers throughout the watershed; however, other interested citizens, whether they live in the watershed or benefit from it, are also encouraged to participate.

In schools, the program is designed to support existing science curriculums by allowing students hands-on participation in monitoring while applying classroom learning in research and field projects. Assistance provided to schools includes staff support, water quality monitoring and safety training, site selection, and data management and interpretation.

Residential monitoring is essentially identical to the school projects, except once residents are trained they will be conducting field tests independent of RARE staff, either in small groups or individually near their homes. In addition to training, assistance will be provided for site selection, quality assurance checks and equipment calibration, as well as for data management and interpretation.

The GWEB grant has provided start-up funding, but partnerships with local agencies, organizations, businesses and industries are being sought to foster long-term continuation of citizen monitoring program in the watershed. Already, East Lane Soil and Water Conservation District is contributing funding for a school based monitoring effort on Cedar Creek, a urbanizing portion of the McKenzie watershed. This funding allows for the purchase of monitoring kits and equipment as well as some laboratory testing. Springfield Utility Board is also interested in the Cedar Creek effort and is considering providing additional assistance to the project.

## **Data Storage, Analysis, and Reporting**

A successful monitoring strategy requires a common monitoring protocol, quality control and assurance program, and data storage and analysis system. The council is in a strong position to establish an agreed upon data collection and storage protocol that will help facilitate the comprehensive watershed-wide approach to resource management that the council seeks.

A geographic information system (GIS) database for the McKenzie watershed program has been developed. Developing and maintaining this comprehensive database and GIS for the entire watershed ties together federal, state and local databases into a common system allowing for a comprehensive ecosystem approach to watershed planning. Adding monitoring data to this GIS database will facilitate analysis and provide a tool for tracking the gap between existing and desired conditions throughout the watershed.

Of course monitoring, data collection, and analysis are useless unless the results of these efforts get out to those who can use this information to implement change. The council intends to summarize the health of the McKenzie watershed in a *State of the Watershed* report every five years. The report would summarize watershed health and track the council's progress in bringing existing conditions in line with desired conditions. Dispensing this information will allow the watershed's stakeholders, land managers, and decision-makers to make better informed decisions in managing the watershed's resources.





## Appendix





# **McKenzie Watershed Council Charter**

## **Purpose**

The McKenzie Watershed Council was formed to help address watershed management issues in the McKenzie River watershed and provide a framework for coordination and cooperation among key interests in the development and implementation of a watershed action program.

## **Mission**

To foster better stewardship of the McKenzie River watershed resources, deal with issues in advance of resource degradation, and ensure sustainable watershed health, functions and uses.

## **Relationship to Decision-making Bodies and Communities of Interest**

The McKenzie Watershed Council is an advisory body to established decision-making bodies and communities of interest. As such the council makes recommendations concerning the protection, restoration and enhancement of the quality of the McKenzie River Watershed.

The agencies, organizations and interests represented on the council are not obligated to adopt or carry out the recommendations of the council, but will give due consideration to the recommendations and take actions they consider appropriate. These agencies, organizations and interests will report back to the council on any actions taken in response to council recommendations.

The council welcomes and will respond to requests for advice on actions affecting the watershed that are proposed by local, state and federal agencies; organizations; or interests.

Council partners will keep their respective agencies, organizations and interests informed about the work of the council and will bring their concerns to the council.

## **Goals and Objectives**

- Improve communication among affected private individuals, interested citizens and representatives of local, state and federal agencies;
- Establish a framework for coordination, cooperation, and citizen involvement;
- Provide a forum for resolving problems and conflicts related to the council's mission when all parties to the problem or conflict agree to refer the matter to the council;
- Develop an integrated, comprehensive watershed management program which includes an action plan, to achieve and maintain watershed health;
- Provide ongoing program evaluation during implementation; and
- Promote ongoing monitoring of the health of the McKenzie River Watershed.

## Specific Tasks/Responsibilities

- Approve a public involvement program to ensure an appropriate level of citizen participation in the council's work;
- Determine the current condition and uses of the watershed;
- Identify the desired condition and uses of the watershed;
- Prepare a proposed watershed action program, including recommended policies and actions, to achieve and maintain the desired condition;
- Monitor implementation of the watershed action program;
- Help resolve issues among diverse interests in the watershed;
- Seek funding to support program development and implementation, including funding from agencies represented on the council;
- Address the needs and concerns of the respective agencies, organizations and interests represented on the council; and
- Adopt and implement a work program, monitor work program progress and budget, and give direction to project staff.

## Cooperative Partners

The McKenzie Watershed Council shall at all times include representatives from the following interests: local government, water utility, McKenzie Valley residents, resource users (e.g., agriculture, private timber) industrial forest land manager, major water consumers, environmental, state government, and federal government. A majority of partners shall be local citizens, including local officials. The charter council partners include:

| Interest               | Agency/Organization                 | Position            |
|------------------------|-------------------------------------|---------------------|
| Local government       | Lane County                         | Commissioner        |
| Local government       | City of Eugene                      | City Councilor      |
| Local government       | City of Springfield                 | City Councilor      |
| Water utility          | Eugene Water & Electric Board       | Commissioner        |
| Water utility          | Springfield Utility Board           | Board member        |
| Recreation provider    | Willamalane Park & Recreation Dist. | Board member        |
| McKenzie Vly residents | McKenzie Residents Assn.            | Assn. member        |
| McKenzie Vly residents | McKenzie Residents Assn.            | Assn. member        |
| McKenzie Vly residents | Mohawk Community Council            | Council member      |
| Ind. Forest Land Mgr.  | Weyerhaeuser Company                | Land Use Manager    |
| Resource users         | E. Lane Soil & Water Conserv. Dist. | Board member        |
| Resource users         | Rural Resources Develop. Comm.      | Committee Co-Chair  |
| Major water consumers  | Agripac Cooperative                 | Plant manager       |
| Environmental          | McKenzie Fisheries Restoration Fund | Board member        |
| Environmental          | Pacific Rivers Council              | Admin. Director     |
| State government       | Water Resources Department          | Div. Administrator  |
| State government       | Division of State Lands             | Asst. Director      |
| Federal government     | USDOI-Bureau of Land Management     | Area Manager        |
| Federal government     | USDA-USFS, Willamette Nat. Forest   | District Ranger     |
| Federal government     | U.S. Army Corps of Engineers        | Region Project Mgr. |

The partners shall serve at the pleasure of their respective agencies and organizations. Partners may designate an alternate that will participate on the council in the partner's absence.

The council will act to replace partners who resign or are unable to continue serving on the council. The council will strive to maintain continuity and the balance of interests by giving preference to representation from the same agencies and organizations at a similar or higher level position. The council will request the agency or organization to nominate a replacement representative. If the agency or organization is unable or unwilling to do so, the council will seek representation from another agency or organization of the same community of interest.

The council may add agencies, organizations or interests as council partners upon nomination by an existing partner and approval by the council.

## **Organization and Procedures**

The council will use a consensus decision-making process.

The council will select a chair or co-chairs to serve as spokesperson(s), advise project manager on council agendas, call and manage council meetings, enforce ground rules, and perform other tasks assigned by the council. The council may select other officers as needed.

The council may form subcommittees of its own partners and task groups that include individuals not on the council to perform certain functions or focus on specific issues. The council also will identify technical advisors who can provide technical data and assistance and call on these experts as needed.

Lane Council of Governments will provide staffing and project management and coordination. In addition, partner agencies, organizations and interests may provide staff assistance when requested by LCOG or the council.

A Coordination Team will assist the project manager in obtaining information and technical assistance and carrying out tasks assigned by the watershed council. Coordination Team permanent members will be subject to ratification by the watershed council.

Funding for the first phase of the project is provided through a grant from the Environmental Protection Agency.

## **Amendments**

The council may propose amendments to this charter at any time as needed. The council will refer proposed amendments to the represented agencies, organizations and interests for approval. Amendments will become effective after all represented groups indicate their approval.

