Chapter II Issues/Key Questions

Introduction

Issue 1: AMA/Research

The Blue River Watershed is home to the HJ Andrews Experimental Forest, and the entire watershed is included within the Central Cascades Adaptive Management Area (CCAMA). Adaptive Management Areas were identified in the Northwest Forest Plan to encourage the development and testing of technical and social approaches to achieving desired ecological, economic, and other social objectives. The Central Cascades AMA was specifically identified due to its strong existing relationship between research and management. The vision of the CCAMA is to bring together research, communites and resource professionals to guide a future for natural resource management. Emphasis areas for the CCAMA include intensive research on ecosystem and landscape process as they apply to forest management, demonstrating projects at both the stand and landscape level , understanding implications of natural disturbance regimes, integrating forest and stream management objectives and acceleration of the development of late successional conditions. This watershed analysis will provide a base of understanding about the ongoing processes within the watershed that will facilitate the development of a landscape designed to meet ecological and economic needs. The Watershed Analysis and the landscape design will help lay a foundation for how activities will meet objectives of underlying management allocations.

Key Questions

1. What activities or projects are most likely to contribute to the goals of the AMA and involve researchers, managers and the community?

2. What areas in the watershed provide opportunities to address questions identified in the CCAMA Research and Learning Assessment?

3. What opportunities exist within the watershed for providing forest based employment and for producing a variety of forest products?.

4. What ongoing processes or conditions within the watershed are important to consider in landscape design?

Issue 2: Natural Disturbance

The land and vegetation within the watershed have been shaped over many millions of years by natural disturbance including volcanic action, glaciation, wind, fire, flood, insects and disease. Fire and a variety of erosional processes have played major roles in the formation of the stream channels and vegetation within the watershed.

Exclusion of natural fire from the ecosystem has altered natural processes and influenced the makeup of current vegetation. Fire history studies have been accomplished for several areas of the Blue River watershed. As in most areas of the Western Cascades , fire has been a significant force in development of distribution patterns of vegetation patterns across the landscape. Plant species composition, distribution and diversity are all affected by frequency and intensity of fire occurrence. Location and abundance of snags and large woody debris, amount of disturbance across riparian areas, size of meadows or other openings and their relation to the species associated with these factors are all influenced by the role of fire in the ecosystem. Fire causes have been both human and natural for the period that developed all of the current vegetation in the watershed.

Key Questions

1. What is the past pattern and intensity of fire disturbance in the watershed?

2. Fire pattern, fire behavior, and burn intensity are affected by fuel loading conditions and leave behind characteristic levels of large wood and snags. How do current conditions compare to fuel loading conditions before fire suppression?

3. What is the speculated role of human-caused fire in altering the vegetation, both now and in the past.

4. How did natural disturbance shape the vegetation in the watershed? What patterns were created both in the upslope and riparian?

5. Are there individual species or communities of plants that are decreasing or increasing due to fire suppression? Are there wildlife species associated with these communities that would also be increasing or decreasing?

6. What are the dominant erosional processes, not management related, and sediment delivery mechanisms operating within the uplands and riparian areas? What are the relative rates of delivery?

Issue 3: Mining

The Gold Hill area of the watershed contains the Blue River mining district. The mines were operated between 1890-1924. Although the effects of mining are localized they are unique in this area and will be discussed as a key issue.

Past mining activities may have affected a variety of processes including erosion, hydrology, water quality, human interactions, and vegetation patterns through direct mining activities such as dredging, piling of tailings and digging of shafts and through associated activities including road building, timber harvesting and transportation of equipment and chemicals. Water quality could have been affected by the introduction of chemicals and sediment. The original shafts may have changed hydrologic regimes by capturing subsurface flow. Instream dredging may have misparted fish habitat by decreasing substrate stability. Old roads are located across the slopes as well as in close proximity to the stream channels themselves and may have affected drainage patterns as well as stream channel characteristics.

Mining claims are still active in the area. New mining activities may have continued impacts on water quality and may also affect ongoing research studies by affecting the processes described above. There would be a concern in the future if mining activities were to occur closer to the Blue River reservoir or the confluence of Mann and Wolf Creeks.

Key Questions

1. What ecological processes have been affected by mining operations and to what extent?

2. What mitigation could be used for future mining activities?

Issue 4 Roads

The Blue River watershed has an extensive network of roads that were built in conjunction with timber sales. The density and location of these roads are having an effect on various processes in the watershed. Many of the roads are located on steep and unstable terrain causing mass failures in some locations and increased contribution of ravel to stream channels. There are areas of sidecast on the existing road systems that are also contributing to additional sediment input to streams.

Other roads have been built within riparian areas and are constricting stream channels, decreasing large wood potential and contributing sediment through runoff to the streams. Roads located in riparian areas and adjacent to stream channels, specifically in Tidbits and North Fork Quartz Creek, have affected the vegetation composition by encouraging alder rather than conifers in openings created by rights of way. The density of the road system also contributes to a change in timing of peak flows and contributes to larger peak flows. This occurs by the roads acting as small stream channels and in effect extending the drainage network. Roads can also interrupt the drainage pattern and affect wet areas by either creating new ones or eliminating existing wet areas and meadows. Culverts within the road system in the watershed are generally undersized and would not be able to accommodate the flow from a 100 year flood event. Some of the culverts are also acting as a barrier to movement of fish and other aquatic species.

Roads can also affect the continuity of habitat by creating a non passable barrier for some wildlife species. The system also has the potential to affect wildlife that are sensitive to human noise and disturbance. Roads act as conduits for the spread of non-native plant species.

Although roads have the potential for a variety of effects to ongoing physical and biological processes in the watershed they are at the same time a source of recreational and economic opportunities for people wishing to use the resources in the watershed. The road system also provides access for fire suppression activities.

The upkeep and maintenance of the road system is becoming an issue because the decrease in timber sales has resulted in a decreased amount of funding available to maintain the roads. Without maintenance there is the possibility that damage may occur to streams and riparian areas if the roads fail. One specific problem resulting from declining maintenance dollars is a backlog of deferred ditch and ditch relief culvert maintenance. At present a significant number of ditches and ditch relief culverts are functioning at a reduced capacity. They are partially filled in or blocked from sloughing cut slopes. Some ditch relief culverts are in need of replacement because they are damaged or near the end of their design life. If ditch and drainage maintenance is deferred much longer, drainage structures may become inoperable at some point in the future. The result may be an increased likelihood of road prism failures and increased erosion rates due to water flowing on road surfaces during storm events.

Key Questions

1. Where and to what extent has the density and condition of roads influenced natural and management induced disturbance including mass movement, landslides and surface erosion? Where and to what extent does the input of sediment influence channel conditions? What effects have these changes had upon fish populations?

2. Where and to what extent has the density and configuration of roads affected surface and subsurface hydrology through expansion of the drainage network?

3. Where and to what extent have roads affected drainage patterns that have created or eliminated wet areas or meadows?

4. Where are high risk or high priority stream crossings which do not have drainage structure designed to withstand 100 year events? Where are the culverts that would prevent fish passage?

5. Where and to what extent have roads affected riparian function by encroaching on stream channels causing constriction of stream channel, conversion of conifer stands to hardwood and decreasing large wood potential and increasing sediment to streams?

6. Where and to what extent have roads affected wildlife populations ?

7. Where and how is road use contributing to the spread of non-native plants?

8. Where are the high priority areas that need maintenance based on access needs, potential resource damage and reconstruction costs?

Issue 5: Past Harvest Activities

Harvesting trees is the primary activity that has influenced vegetation patterns since 1940. Seral stage distribution may be outside historic ranges that have occurred in this area in pre management time. Prior to timber harvest the primary process that created vegetation composition and structure was fire.

Timber harvest has resulted in a patch work type pattern across the landscape. There are usually few to no older larger trees left within these harvested areas and the trees within these areas are even-aged. The edges of these units tend to be very distinct and abrupt against adjacent forest. This pattern has resulted in a fragmented landscape which contains many fewer acres of interior forest. For the most part harvesting was concentrated in late successional forests. This has resulted in changes to species composition and habitat complexity. Some animal populations have declined due in part to shrinking amounts of habitat which they require and the inability of the species to successfully disperse across the altered landscape.

Recent management has been limited due to management allocation designations. There may be many young stands that are overstocked.

Past harvest has had the potential to affect hydrologic and erosion processes in the watershed as well. Many of the effects are similar to those associated with roads including the potential for peak flows due to increases in water quantity, changes in timing or rate of soil movement, and decreases in water quality through increases in temperature and/or sediment. Harvest could also have affected stream channel conditions by removal of large in-stream wood and harvest of potential source areas adjacent to the streams.

Key Questions

I. How does the current landscape pattern compare with historic patterns and seral stage distribution? How has timber harvest contributed to the landscape?
   - A. What is the seral stage distribution ? How does it compare to the past?
   - B. Where and what kind of non-forested habitat is present within the watershed? Are there some that have limited distribution across the watershed/Forest/Region? What threatens these areas?
   - C. What vegetative species of concern as identified in the Presidents Plan exist within the watershed? What species may occur based on their range and habitat requirements?
   - D. What TE&S species are known to occur or could potentially occur within this watershed? What is the condition of their populations and habitat?

II. What is the distribution of habitat for animal species resulting from harvest patterns and how does that compare with pre-harvest conditions?
   - A. Interior habitat
   - B. Edge habitat
   - C. Early, mid and late seral habitat
   - D. Riparian habitat
   - E. Snag and log habitat

III. How has the landscape pattern created from harvest affected overall habitat for specific species of concern?
   - A. What is the historic and current landscape for marten and pileated woodpecker habitat suitability?
   - B. What is the current amount of suitable northern spotted owl habitat surrounding all known activity centers? What is the health of the large LSRs surrounding this watershed? How will this habitat change over the next few decades?
   - C. What is the current big game habitat quality in the watershed?
   - D. What wildlife species of concern as described in the President's Plan may potentially occur in the watershed based on range and habitat requirements? What species are known to occur?
   - E. What TE&S species are known to occur or potentially occur within this watershed? What is the condition of their populations and habitat?

IV. What are the most important sediment delivery mechanisms generated by harvest activities? How do the rates of delivery compare with natural processes? Where are the high risk areas?

V. Where and to what extent has timber harvest amount and distribution affected water yield and water quality? Where and to what extent have these changes affected stream channel function and habitat?

VI. Where and to what extent has the removal of in-stream large wood and harvest of source wood areas changed the routing of sediment and in-stream habitat?

VII. What opportunities exist in the watershed for aquatic and terrestrial ecosystem restoration projects?

Issue 6: People Related

The Blue River watershed has been used as a place of hunting, gathering, living and recreation for people over many years. The area around Gold Hill and along the major ridge systems surrounding the area have been used by various Native American Tribes as hunting and travel routes. Most current recreation use is centered along the reservoir and the lower end of Blue River. The only place in the watershed that is developed occurs along the river below the dam. There are parcels of private land along the reservoir and along the north and west ridge systems. These areas are forested.

A major recreational activity is fishing. Blue River and the reservoir have been stocked with hatchery rainbow trout since 1970 by ODFW to enhance the recreational fishing experience In recent years they have stocked annually with 8,000 and 18,000 hatchery rainbow trout, respectively. Blue River has a wild population of rainbow trout. The hatchery fish compete with wild fish for habitat and food. Some hatchery fish may interbreed with wild fish.

Although not nearly as popular as fishing there is a minor amount of kayakers using Blue River during spring flows. The stretch of river between Quentin Creek and the reservoir is identified in the Willamette Kayak and Canoe Club Soggy Sneakers Guide as a Class 4 and 5 river run. To date, aquatic restoration efforts have balanced and accommodated the needs of the aquatic ecosystem and kayakers. This has included working with a member of the club in the design of a restoration project.

When the reservoir is drawn down, all terrain vehicles (ATV) use the drawdown zone. These vehicles may disturb vegetation and increase erosion and this practice appears to be in conflict with the effort to revegetate the drawdown zone.

During good water years, there is a desire among users of the reservoir to hold water in the reservoir as long as possible through the summer. However, if the reservoir remains too full late into the summer, the vegetation established in the drawdown zone will not have enough time to grow before winter.

Key Questions

1. How has the stocking of hatchery rainbow trout affected the wild rainbow population in the watershed?

2. Can a balance be maintained between in-river wood and kayaker opportunities?

3. What effect does ATV use in the reservoir drawdown zone have upon the establishment of vegetation and how can impacts to vegetation be avoided?

4. How can preservation of heritage sites be enhanced?

5. How does maintaining full pool later in the summer of good water years affect established draw down zone vegetation? How does the timing and amount of drawdown of the reservoir affect recreation users?