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Incorporating ecological principles into Montana's local land use planning: A way to contribute to the protection and management of ecological systems

Emily A. Brown

The University of Montana

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Incorporating Ecological Principles
Into Montana's Local Land Use Planning:
A Way to Contribute to the Protection and Management
Of Ecological Systems

By
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BLA. Utah State University. 2000

Presented in partial fulfillment of the requirements
for the degree of
Master of Ecosystem Management

The University of Montana
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Approved by:

Chairperson

Dean, Graduate School

Date
In Montana, rapid growth has created dramatic change throughout many parts of the state. This change is often in the form of unplanned sprawl. Most of the current planning trends throughout the state - described as being inconsistent, implemented without forethought or structured frameworks, and lacking coordination with other jurisdictions - are helping to encourage unplanned growth. This often results in a transformation of rural areas and degrades ecological systems. Many studies have looked at growth and land use planning in Montana placing emphasis on smart growth and land use planning legislation revisions. Yet, very few studies and plans have looked at ecological approaches and principles and their integration into Montana’s land use planning practices to create a holistic approach to planning and a strategic direction for ecological conservation. Some communities have acknowledged the impact of growth and development on ecological systems and are attempting to promote conservation strategies. However, local conservation efforts are often piecemeal and site specific, giving little consideration to the entire ecological system.

The objective of the following paper is to help Montana’s local governments become aware of their role concerning the protection and management of the natural systems in which they live and depend. It presents a planning direction from an ecological perspective, promoting the integration of ecological principles into local and state planning frameworks, and encourages the cooperation of public land agencies, counties, and cities. To advance these ideas, Montana’s current planning and growth trends and the associated impacts will be addressed. Ecological principles and the potential for implementing them, how they have been used in land use planning, and their planning benefits will be examined. Barriers that prevent or make incorporating such principles and approaches difficult, and the barriers found in Montana will be discussed. Finally, possible steps to implement ecological principles into Montana’s local land use planning will be presented. The hope is that by incorporating these principles into Montana’s land use policies, it will establish better land use planning and help local governments contribute to the protection and management of ecological systems.
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INTRODUCTION

Urban growth has long been known to be a major cause of landscape-scale variation and degradation in ecological systems (McDonnell and Pickett, 1990; Saunders et al, 1991; Barnes et al, 1998; Hansen et al, 2002; Palmer et al, 2004). Home-building, commercial development, road construction, and related activities are transforming these natural systems and their biological processes on a large scale (McDonnell and Pickett, 1990; Sander et al, 1991; Goudie, 2000). Here in Montana, rapid growth has created dramatic changes in land use throughout many parts of the state, often without any coordinated land use planning (MSGC, 2001). This unplanned growth could be costly to Montana in terms of its open space, vital ecological systems, its hometown quality of life, and taxpayer money (MSGC, 2001).

Many studies have examined growth and land use planning in Montana and discussed issues related to smart growth, affordable housing, transportation needs, and legislation revisions (e.g., Environmental Quality Council 1999 report, American Planning Association 2001 report, Montana Department of Transportation 2002 report, and numerous Smart Growth Coalition studies). However, while these areas are important to strategically direct and influence the patterns of land development, very few studies have looked at ecological approaches and principles and how they might be integrated into Montana’s land use planning practices to create a more holistic approach to growth and urban development and a strategic direction for ecological conservation.

Montana has millions of acres of designated wilderness, natural preserves, parks, and critical wildlife habitat, all important ecological systems that provide vital services to communities throughout the state (Palmer et al, 2004). Many residents are concerned that the growing population, lack of coordinated land use planning, and high levels of use are
degrading these natural areas. Critical ecological systems and wildlife habitat are being fragmented into small remnants, while designated public lands are beginning to take on more of the characteristics of an island surrounded by a sea of development. This fragmentation of natural areas has created great concern for public land agencies who are finding it ever more difficult to manage public lands, and for local residents who wish to protect the integrity of the natural systems in which they live. A crucial challenge facing Montana, then, is how to practice land use planning in a way that protects the ecological systems on which the state depends, while sustaining local communities and maintaining their values and beliefs.

In recent years, public land agencies have addressed this question more directly by moving away from traditional management practices in favor of approaches emphasizing ecosystem integrity (e.g., ecosystem management) (Meffe et al, 2002; Brody, 2003). These approaches focus on incorporating ecological perspectives with social, economic, and institutional perspectives. They also promote holistic integration of science with socially defined goals and objectives, and look beyond specific jurisdictions to focus on the broader spatial and temporal scales (e.g., the entire ecosystem or watershed) (Meffe et al, 2002). However, such efforts should not be solely the responsibility of federal and state agencies and environmental organizations. It requires the coordination and cooperation of many different jurisdictions, including local governments.

Local level land use planning must be considered along with other jurisdictional scales when it comes to protecting and managing entire ecological systems. The factors causing ecosystem decline, such as rapid urban development and unplanned sprawl, occur at the local level and are the product of local land use decisions (Brody, 2003). As a result, some of the most powerful tools that potentially affect these natural systems are in the hands
of local planning groups (e.g., city councils, town boards, county commissioners, and planning boards) (Brody, 2003). Thoughtful policies at the local level can often protect critical ecological processes more effectively than state and federal protection options (Duerksen et al, 1997). It is important that local governments become more involved and aware of the influence they have on the natural systems in which they live and the ecological components and processes on which they depend. It is also important to understand adjacent public land agency's focus and objectives regarding management of these ecological systems.

The objective of this paper is to help the state of Montana and its local governments become more aware of their role concerning the protection and management of the natural systems in which they live and depend on, and why it is so important for them to become involved. This paper presents a land use planning direction from an ecological point of view, promoting the integration of ecological principles into both local and state planning frameworks. It also encourages the cooperation of public land agencies, counties, and cities to create a cohesive planning unit. By incorporating these ecological principles into Montana's local land use policies, it may establish better land use planning and create a way for local governments to contribute to the protection and management of ecological systems.

In order to advance these ideas involving land use planning and the potential for integrating ecological principles into the process, four sections will be presented. The first section outlines the current land use planning patterns and growth trends in Montana, as well as the associated socioeconomic, ecological, and public lands impacts. Secondly, the potential for implementing ecological principles into land use planning and the associated benefits will be discussed. The third section, examines the challenges, constraints, and
barriers that could impede incorporation of such principles into land use planning. And finally, the fourth section discusses potential recommendations related to conducting land use planning in Montana within a more sustainable ecological framework. This would also include possible coordinated roles that public land agencies may pursue with local governments.

CURRENT LAND USE PLANNING AND GROWTH TRENDS IN MONTANA

Current Land Use Planning Patterns

To understand why there is a need to consider an ecological approach to planning in Montana, it is important to understand the type of planning that is taking place throughout the state and fueling this need for change. To begin, it is fair to say that Montana can be described somewhat as a *laissez-faire* state. This means that past development pressures have not been significant enough to necessarily concern citizens about potential land use problems (Nelson, 1999). As a consequence, Montana has been slow to create clear statewide planning mandates regarding land use, and local jurisdictions have not, or have just recently, started to plan (Meek et al., 2001; MSGC, 2001). All land use planning authority is given to local jurisdictions and in the hands of county and city officials, who interpret these state planning mandates the best they can. Local jurisdictions have three primary tools they are authorized to use in addressing land use planning issues: growth policies, subdivision laws, and zoning and permitting regulations (MDOT, 2002). However, other than subdivision laws, the use of these tools is voluntary (Montana State Legislature, 2003). These three tools will be discussed further in a subsequent section. What is important to note, however, is that this type of *laissez-faire* approach to planning, coupled with current rapid
population growth throughout many parts of the state, has helped create much of the land use planning currently taking place in Montana.

The type of planning that has resulted is described by many as being varied and inconsistent, with plans implemented with very little forethought, without a structured framework, and often lacking coordination with other jurisdictions (Meek, 2001; MDOT, 2002). Typically, plans are implemented by local governments within borders of designated areas, with little regard for the surrounding lands and other communities (Meek et al, 2001). Many local plans in Montana do not guide development in terms of actually influencing the rates or locations of land use change. Communities often choose not to manage growth, other than assure a steady supply of buildable land (Nelson, 1999).

Such planning strategies have created a type of development in Montana that has been characterized as sprawl; i.e., a relatively low-density, noncontiguous, automobile dependent, residential and nonresidential development expanding away from city centers (Meck et al, 2001; MDOT, 2002; Bengston et al, 2004). The general pattern of development in Montana over the last 10-20 years has been to move away from the cities into new low-density residential subdivisions with lots ranging up to twenty acres (Meck et al, 2001). These larger lot developments distribute people and infrastructure over a much larger land area, require a substantial expansion of infrastructure, and create more individual landowners responsible for considerable amounts of open space (MSGC, 2001; Dwyer and Childs, 2004). This pattern has not always resulted in good neighborhoods (Meck et al, 2001). In addition, these new developments have resulted in highly visible changes in land use, particularly in rural areas and along the wildland-urban interface, as new subdivisions and retail centers consume significant amounts of natural areas and agricultural land (Meck et al, 2001; MDOT, 2002). There is also great concern that many parts of Montana are now
experiencing a cycle of development and land use change similar to that in many other areas of the West (MDOT, 2002). This cycle involves new residential development adjacent to established urban areas, which then creates the market for development to accommodate retail and other services. The cycle often repeats itself expanding outwards consuming more and more land (MDOT, 2002). The Montana Smart Growth Coalition (MSGC, 2001) concluded that these types of planning patterns can have cumulative negative impacts on ecological systems, rural areas, counties, cities and towns (MSGC, 2001).

Growth Trends and Related Impacts

Current planning trends in Montana are not, however, the only reason to advocate a new ecological approach to land use planning. Growth continues to increase in the state, social and economic views continue to change, vital ecological services may be lost, ecological impacts are prevalent, and public lands are feeling the pinch as urban growth surrounds them.

Growth in the West and Growth in Montana

With a population growth rate of 25.4 percent, the Rocky Mountain West was the fastest growing region of the country in the 1990’s (Hansen et al, 2002). Nevada, Arizona, Colorado, Utah, and Idaho ranked as the top five fastest growing states, according to the 2000 U.S. census. About 67 percent of the counties in this region grew faster than the national average (Beyers and Nelson, 2000; Hansen et al, 2002). It was also found that most of this growth, occurring in the 1990’s, was in non-metropolitan western counties where much of the land was federally owned (Johnson and Beale, 1999). In fact, counties that contain federally designated wilderness areas grew twice as fast as non-wilderness counties.
(Frentz et al., 2002). Furthermore, these growth trends are expected to continue, with the Rocky Mountain West projected to have an additional 29 percent increase in population by 2020 (Cordell and Overdell, 2001).

The State of Montana has not been exempt from this growth. With a growth rate of 12.9 percent, the 2000 US Census ranked Montana twentieth in the nation in terms of fastest growing states. The state increased from a population of 799,065 in 1990, to a population of 902,195 in 2000 (US Census Bureau, 2000). These numbers, however, are only going to increase, with the US Census Bureau (2000) estimating that by the year 2025 1.1 million people will be residing in the state. Currently, out of the 56 counties in Montana, 33 of those counties have seen their populations grow between 1990 and 2000. Those counties that have had the most significant growth rates over that decade are shown in Table 1.

<table>
<thead>
<tr>
<th>County</th>
<th>1990 population</th>
<th>2000 population</th>
<th>Difference</th>
<th>Percent of Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ravalli</td>
<td>25,010</td>
<td>36,070</td>
<td>11,060</td>
<td>44.22%</td>
</tr>
<tr>
<td>Gallatin</td>
<td>50,484</td>
<td>67,831</td>
<td>17,347</td>
<td>34.36%</td>
</tr>
<tr>
<td>Broadwater</td>
<td>3,318</td>
<td>4,385</td>
<td>1,067</td>
<td>32.16%</td>
</tr>
<tr>
<td>Jefferson</td>
<td>7,939</td>
<td>10,049</td>
<td>2,110</td>
<td>26.58%</td>
</tr>
<tr>
<td>Lake</td>
<td>21,041</td>
<td>26,507</td>
<td>5,466</td>
<td>25.98%</td>
</tr>
<tr>
<td>Flathead</td>
<td>59,218</td>
<td>74,471</td>
<td>15,253</td>
<td>25.76%</td>
</tr>
<tr>
<td>Stillwater</td>
<td>6,536</td>
<td>8,195</td>
<td>1,659</td>
<td>25.38%</td>
</tr>
<tr>
<td>Missoula</td>
<td>78,687</td>
<td>95,802</td>
<td>17,115</td>
<td>21.75%</td>
</tr>
<tr>
<td>Carbon</td>
<td>8,080</td>
<td>9,552</td>
<td>1,472</td>
<td>18.22%</td>
</tr>
<tr>
<td>Sanders</td>
<td>8,669</td>
<td>10,227</td>
<td>1,558</td>
<td>17.98%</td>
</tr>
<tr>
<td>Lewis &amp; Clark</td>
<td>47,495</td>
<td>55,716</td>
<td>8,221</td>
<td>17.31%</td>
</tr>
<tr>
<td>Mineral</td>
<td>3,315</td>
<td>3,884</td>
<td>569</td>
<td>17.16%</td>
</tr>
<tr>
<td>Sweet Grass</td>
<td>3,154</td>
<td>3,609</td>
<td>455</td>
<td>14.43%</td>
</tr>
<tr>
<td>Madison</td>
<td>5,989</td>
<td>6,851</td>
<td>862</td>
<td>14.39%</td>
</tr>
<tr>
<td>Golden Valley</td>
<td>912</td>
<td>1,042</td>
<td>130</td>
<td>14.25%</td>
</tr>
<tr>
<td>Yellowstone</td>
<td>113,419</td>
<td>129,352</td>
<td>15,933</td>
<td>14.05%</td>
</tr>
<tr>
<td>Big Horn</td>
<td>11,337</td>
<td>12,671</td>
<td>1,334</td>
<td>11.77%</td>
</tr>
</tbody>
</table>
Table 1 Continued. Counties Growing in Montana 1990-2000

<table>
<thead>
<tr>
<th>County</th>
<th>1990 Population</th>
<th>2000 Population</th>
<th>Growth</th>
<th>Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Granite</td>
<td>2,548</td>
<td>2,830</td>
<td>282</td>
<td>11.07%</td>
</tr>
<tr>
<td>Musselshell</td>
<td>4,106</td>
<td>4,497</td>
<td>391</td>
<td>9.52%</td>
</tr>
<tr>
<td>Chouteau</td>
<td>5,452</td>
<td>5,970</td>
<td>518</td>
<td>9.50%</td>
</tr>
<tr>
<td>Glacier</td>
<td>12,121</td>
<td>13,247</td>
<td>1,126</td>
<td>9.29%</td>
</tr>
<tr>
<td>Beaverhead</td>
<td>8,424</td>
<td>9,202</td>
<td>778</td>
<td>9.24%</td>
</tr>
<tr>
<td>Powell</td>
<td>6,620</td>
<td>7,180</td>
<td>560</td>
<td>8.46%</td>
</tr>
<tr>
<td>Park</td>
<td>14,515</td>
<td>15,694</td>
<td>1,179</td>
<td>8.12%</td>
</tr>
<tr>
<td>Lincoln</td>
<td>17,481</td>
<td>18,837</td>
<td>1,356</td>
<td>7.76%</td>
</tr>
<tr>
<td>Cascade</td>
<td>77,691</td>
<td>80,357</td>
<td>2,666</td>
<td>3.43%</td>
</tr>
<tr>
<td>Silver Bow</td>
<td>33,941</td>
<td>34,606</td>
<td>665</td>
<td>1.96%</td>
</tr>
</tbody>
</table>

(U.S. Census Bureau, 2000)

From this table, it is apparent that the counties with significantly large populations are still growing at a very rapid rate, but also that a number of counties with very small populations are experiencing a substantial population increase. What is also evident is that population growth is not uniform throughout the state. While most counties in Eastern Montana are experiencing a population decline, counties throughout Central and Western Montana are becoming more densely populated (EQC, 1999; MDOT, 2002). These counties, experiencing growth, are also where the highest proportions of public lands – Forest Service, National Park Service, and BLM – are located. Figure 1 highlights the 16 counties with a growth rate of 14 percent or more between 1990 and 2000 in relation to public lands in Montana.

Counties such as Flathead, Missoula, Lake, Ravalli, Gallatin, and Lewis and Clark are of particular concern, because they are all located adjacent to large tracts of public lands, have large populations, and are still growing at a considerable rate. For instance, from 1990 to 2000 Flathead County grew by 15,253 people. From 2000 to 2003 it grew by another 5,014 (Real estate Center, 2003). Gallatin County grew by about 17,347 people between 1990 and 2000, and another 5,412 between 2000 and 2003 (Table 2) (Real estate Center, 2003).
Population trends, however, are not the only indicators that rapid growth is indeed taking place in Montana. The Environmental Quality Council study conducted in 1999 stated that from 1988 to 1999 more than 11,000 subdivision proposals to create 34,000 residential parcels were reviewed by the Montana Department of Environmental Quality. Between 1990 and 1997, the number of subdivisions reviewed under the Sanitation in Subdivisions Act
increased by 184 percent. The number of housing units permitted for construction in 
Montana per year, between 1990 and 1996, more than doubled, an increase of 119 percent 
(EQC, 1999). Between 1974 and 1994, lands in agriculture decreased by 3.1 million acres, 
dropping the states agricultural land area from 66.9 percent to 64.2 percent (EQC, 1999). 
Over a five-year period, from 1992 to 1997, Ravalli County saw its agricultural land decrease 
from 241,655 acres to 183,647 acres. Flathead County's agricultural land decreased from 
277,050 acres to 216,303 acres, and agricultural land in Lewis and Clark decreased from 
883,479 acres to 822,066 acres (MSGC, 2001).

So, why is growth occurring in Montana and other Rocky Mountain States? This 
question has been the topic of various studies. One study states that the majority of those 
moving to these particular areas are drawn to amenities such as mountainous scenery; access 
to outdoor recreation (e.g., skiing, hiking, and fishing), and proximity to open space and 
wilderness (Hansen et al, 2002). Another study found it was improvements in 
communications and information technologies that allowed people to move away from cities 
and work from home (Elmendorf and Luloff, 1999). Some respondents attributed their 
migration to better social environments, less people, and cheaper land (Dwyer and Childs, 
2004). While others move to these areas because of the shift from an industrial to a service 
based economy (Elmendorf and Luloff, 1999). Whatever the reason, population growth is 
booming in Montana and other Western states, and based on US Census Bureau (2000) 
projections, it doesn’t appear to be slowing down.

Social and Economic Change

The rapid population growth described above has further changed the social and 
economic characteristics of many Montana communities. For most of the 1900s, the
population of many rural areas in the West grew slowly or even decreased. Local economies were based on natural resource industries such as logging, farming, mining, and ranching (Hansen et al, 2002). Many residents of the region considered conservation strategies on private and public land detrimental to local economic development. Efforts to protect natural areas and preserve public lands from extraction activities or commercial development were seen as restricting the use of vital natural resources. (Hansen et al, 2002). However, with the rapid surge of growth hitting the western states, over the last twenty years, these economic and social perspectives that once dominated this region are dramatically changing (Hansen et al, 2002; Dwyer and Childs, 2004).

Growth is occurring in the western states because people want to live near nature. They are attracted by the natural amenities, the “wild” scenery, the lack of congestion, and the recreational opportunities (Hansen et al, 2002). The newcomers flocking to these areas also bring with them different expectations with regards to environmental protection and ecological integrity. New immigrants often embrace environmental values that emphasize living in harmony with nature (Cortner and Moote, 1999). They also typically prefer protection and preservation of natural areas to a greater degree than non-immigrants (Frentz et al, 2004). The introduction of these new values and perspectives has created a very complex sociopolitical structure throughout much of the West. A structure that gives rise to strongly held and diverse views of how land should be used, managed, and protected (Dwyer and Childs, 2004).

The new perspectives and values that have emerged from this growth have also helped to shape a new economy in the West. Once the primary components of the economy in western states, natural resource extraction, farming, and ranching (Hansen et al, 2002) are now being replaced by an economy that emphasizes tourism and recreation, service based
businesses, and technology-based companies (US Census Bureau, 2000; BEA, 2000). Here in Montana, natural resource extraction has been in dramatic decline, a relic of the “old west”, as more of the economy shifts from the rural setting and into the cities (EQC, 1999).

Ecological Impacts

An ecosystem consists of a full diversity of organisms and their associated non-living environment that function as an integrated ecological unit (Szaro et al, 1998; Meffe et al, 2002). They exist at many different scales (e.g., a forest, a watershed, or a small pond and its shoreline) because an ecosystem is a functional concept, without a particular spatial extent (Meffe et al, 2002). Ecosystems are also dynamic to the extent that their species composition, structure, and function continually change over time. Furthermore, the boundaries between them are not clearly defined. Ecosystems are interconnected and grade into one another, as well as being nested within a hierarchical matrix of larger ecosystems (Szaro et al, 1988).

Ecosystems are recognized as open complex systems made up of political, social, economic, biological, and physical components (Cortner and Moote, 1999). As such, humans and the communities in which they live are very much an integral part of these ecosystems (Pickett et al, 2004). Our local communities are not isolated and disconnected from the ecological components of that system. Energy, organisms, materials, humans and their activities flow and merge into one another, influencing and impacting each other on a regular basis (Meffe et al, 2002; Pickett et al, 2004).

Because of the fluid nature of ecosystems and the interconnectedness of all biotic – including humans – and abiotic components, Montana communities can have a major impact on their associated ecological systems and can disrupt the natural processes within
them (Pickett et al, 2004). Likewise, functioning ecosystems can provide communities with a diverse array of services that residents could not live without (e.g., clean drinking water, oxygen production, erosion control, wildlife, scenic beauty, climate control and temperature improvements, food production, crop pollination, flood mitigation, and recreation) (Meffe et al, 2002; Palmer et al, 2004). Because biologically diverse systems are better than impoverished systems at providing these services (Meffe et al, 2002) planning and management that contributes to healthy and productive ecological systems should be a very important consideration for Montana communities.

Unfortunately, Montana’s ecological systems will be increasingly impacted and their ecological services increasingly strained because Montana’s population will continue to grow. Urban and suburban centers will continue to expand outward, and there will be more people to depend on the services from these natural systems. Much of the planning that is occurring throughout the state – sprawling subdivisions and ranchettes replacing natural habitat and agricultural land – is also altering these ecological systems, their processes, and the biodiversity they contain in a myriad of ways (Goudie, 2000). These ecological impacts tend to be the most substantial, because they are, for the most part, irreversible and permanent. Major impacts on watersheds, soil, geomorphology, and air quality are a few examples. However, growth and human activities have probably had the greatest impact on plants and wildlife than on any other components of the environment (Goudie, 2000).

Urban and suburban development have altered, degraded, or destroyed natural vegetation through deforestation, fire suppression, road construction, subdivisions, parking lots, and other types of infrastructure. As the landscape is converted to homes and commercial development, native plant species communities are often severely fragmented into small, often disconnected, patches (Saunders et al, 1991). The need for fire suppression
in natural areas also increases as urban development occurs. Removing fire disturbances from these ecosystems can potentially have serious negative impacts on fire-adapted plant and animal species. These changes in fire regimes as well as fragmentation of native habitat have negative impacts on plant and wildlife diversity, as well as the overall health of all native species. These impacts are a major concern for anyone interested in healthy native plant and wildlife communities and maintaining the ecological integrity of these natural systems (Meffe et al, 2002).

With fragmentation, contiguous areas of natural habitat are converted into a series of remnant vegetation patches surrounded by a matrix of different vegetation and/or land use (Meffe et al, 2002). Fragmenting these natural areas leads to four primary landscape level consequences: 1) reduction of overall native habitat, 2) isolation of remnant patches, 3) creation of abrupt edges, and 4) alteration of within patch microclimate (Saunders et al, 1991; Smith, 1993; Barnes et al, 1998; Goudie, 2000; Meffe et al, 2002). All four consequences lead to a reduction of ecosystem diversity, integrity, and the loss of habitat heterogeneity for plants and wildlife. This increases the likelihood of extinction for many susceptible species (Saunders et al, 1991; Smith, 1993).

The reduction in the available area of natural habitat is unavoidable following fragmentation (Saunders et al, 1991; Meffe et al, 2002). Such fragmentation results in habitat patches of various sizes and shapes. Unfortunately, these sizes and shapes commonly yield an area that is too small to offer sufficient habitat heterogeneity for factors like territory size of a species, food supply, or other required features such as streams and wetlands (Barnes et al, 1998). A decrease in suitable habitat is particularly negative for area-sensitive species that require large areas to survive and reproduce. Susceptible species may have a restricted ecological niche, require minimum areas or corridors for seasonal movements, or simply
require large areas due to their large body size and resource needs (Meffe et al, 2002).

Unfortunately, the negative impacts of habitat loss and small patch size are exacerbated further if these patches are isolated from other areas of natural habitat (Saunders et al, 1991). Upon isolation, a remnant is likely to have more species than it is capable of sustaining. Over time, however, many species will be lost as changes brought about by fragmentation take effect (Saunders et al, 1991). Rapid local extinctions are most likely to occur in species that require large territories, exist at low densities, depend entirely on native vegetation, or are dispersal-sensitive because of morphological, physiological, or behavioral limitations (Saunders et al, 1991; Meffe et al, 2002). In isolated patches, the probability of extinction increases because small isolated populations are more susceptible to lose of genetic diversity and loss of within-population heterozygosity. The result is potentially decreased fitness in the species (Meffe et al, 2002). In addition, there is often an influx of other species that are capable of establishing in the fragmented area which directly compete with native species (Saunders et al, 1991).

The creation of abrupt edges can also have serious repercussions on native plants and wildlife living within a remnant patch. This is especially true for those species that have not evolved in landscapes that are naturally edgy or heterogeneous (Saunders et al, 1991). Abrupt edges create a number of potentially negative biotic effects in fragmented areas, such as the introduction of edge generalists (e.g., plant and animal species who survive and reproduce well in edge areas) (Saunders et al, 1991). There are also human effects associated with these edges, such as pets, vehicle traffic, the introduction of non-native species, pollution, and increased activity within natural areas (Barnes et al, 1998; Meffe et al, 2002). These factors place considerable stress on native species and can result in lower survival and reproduction rates.
Another edge effect related to fragmentation is an alteration of the microclimate within and surrounding the remnant. Alterations in solar radiation, temperature, wind, water, and relative humidity can all have potentially negative effects on the native flora and fauna that are adapted to interior conditions (Saunders et al, 1991; Barnes et al, 1998; Meffe et al, 2002). For example, the loss of vegetation increases the solar radiation reaching the ground. This results in greater temperature fluctuations, with higher daytime temperatures, and lower nighttime temperatures relative to naturally vegetated areas (Saunders et al, 1991). Increased exposure to wind can damage vegetation either through direct physical effects (e.g., wind pruning or wind-throw), by increasing evapotranspiration, or by increasing the transfer of material such as dust and seeds from the surrounding matrix (Lovejoy et al, 1986; Saunders et al, 1991). The water regime and the hydrological cycle in these patch remnants are also altered through changes in the rates of rainfall interception and evapotranspiration, due to removal of vegetation. These hydrological changes affect soil moisture levels, the pathways by which water penetrates the soil, and increase surface water flows leading to increased erosion and transport of particulate matter (Saunders et al, 1991).

However, loss and fragmentation of natural areas are not the only ecological impacts to biota. Fire plays many major roles in an ecological system, and has a significant influence on plant and animal life. Fire influences the physical and chemical properties of soil, nutrient loss, and hydrologic processes that plants need to survive. It also affects the genetic adaptations of plants, plant composition and diversity, mortality, regeneration, growth, and succession (Barnes et al, 1998). Our increasingly efficient fire suppression efforts, however, are greatly changing natural systems and the plant species that make up these systems (Smith et al, 1997; Barnes et al, 1998). This exclusion of fire leads to marked build-up of fuel, decline of many fire dependent plant species, and increased damage to plants from insects.
and disease. In addition, late successional species tend to increase in abundance, often leading to a decline in habitat and both plant and animal diversity (Barnes et al, 1998). Entire forest and grassland composition and structure have been altered because of fire suppression. In order to restore and maintain natural ecological processes, and to reduce the amount of fuel that may have built up, these areas could be allowed to burn. However, with increasing development comes the necessity to protect life and property, which limits the likelihood that areas will be allowed to burn.

Besides the impacts associated with habitat loss, fragmentation, and fire suppression growth and urban development have also been known to affect water quality and alter hydrologic cycles in watersheds (Dodd et al, 2003). One of the main factors behind these problems is storm-water run-off from urban areas. As land undergoes urbanization and growth, surfaces are made less pervious to water, either by compaction of established soil structure or through impervious covers such as concrete and asphalt (Dodd et al, 2003). These impervious surfaces, along with wetland drainage and the construction of dams and canals, have the effect of altering the local watershed balance by increasing storm flow volumes, decreasing base-flow mechanism, and changing ground water levels and rates of recharge (Goudie, 2000; Bradley et al, 2003). As urban development progresses water quality is also affected due to an increase in suspended sediments and pollutants (e.g., fertilizers and pesticides) in run-off from urban and agricultural lands that can taint both surface and ground water. Decreased water quality and altered hydrologic flows can reduce fish habitat quality, negatively affect native vegetation, and decrease suitability of water for human consumption (Goudie, 2000).

The soils and the geomorphology of an ecosystem are also impacted by population growth and urban development. Construction and development remove vegetation and
relocate upper soil horizons. These types of impacts increase sedimentation and erosion and accelerate mass movements (Goudie, 2000). Agriculture and urban landscaping often alter soil structure, pump fertilizers and pesticides into the soil, and create very saline soil conditions (Barnes et al., 1998; Goudie, 2000). Often urban development alters river channels to mitigate for floods, manage for drought, and make room for new roads and bridges (Saunders et al., 1991). All of these alterations have a negative impact on natural vegetation, wildlife, fish, and water quality throughout these ecological systems.

In Montana, the rapid population growth and land use change occurring in many counties have affected wildlife and their habitat, plant communities, soils, and water as millions of acres have been lost to urban growth. In Gallatin County, for instance, growth and habitat loss are of particular concern because of its designation as part of the Greater Yellowstone Ecosystem. Most of the agriculture, grazing, and residential developments in Gallatin County are located in lowlands and in habitats that are high in net primary productivity. These areas are also considered “hot spots” for many native species (Hansen et al., 2005). About 25% of the bird species found in the Greater Yellowstone Ecosystem are strongly associated with hot-spot habitats. These habitats serve as population source areas and are critical for maintaining the viability of many bird populations across the region (Hansen et al., 2005). However, studies have indicated that birds in hot spots near human activity have low reproductive rates due to nest predators that are abundant in human landscapes (e.g., raccoons). Consequently, development in Gallatin County may help reduce habitat quality and population viability for these native bird species found throughout the natural reserve (Hansen et al., 2005).

While not dependent on lowland habitats, the threatened grizzly bear also appears to face high mortality rates in these lowland areas. Around Glacier National Park and the Bob
Marshal Wilderness Complex, where urban development is increasing, federal biologists report that more than 60 percent of the conflicts between grizzly bears and humans occur on private lands (Hansen et al, 2002). Many conservationists feel that higher human population densities on these private lands and the future reduction of native habitats, could threaten the recovery of this species (Hansen et al, 2002).

Watersheds throughout Montana have also been impacted because of growth and urban development. In the Gallatin River watershed alone, the Montana Department of Environmental Quality lists 21 stream segments as “impaired”, totaling 240 river miles (NRCS, 2005). The leading contributors to stream impairment in the Gallatin Watershed are agricultural runoff and irrigation dewatering. The third most significant cause of stream impairment is the combined effect from non-agricultural land development, urban runoff and road construction (NRCS, 2005). In the Bitterroot watershed, the Bitterroot River is included in the state’s list of threatened and impaired streams and rivers, along with 21 other stream sections in the watershed (Montana Water Center, 2003). High levels of dissolved nitrogen and phosphorus are found in the Bitterroot, indicating that sewage, septic leakage, and animal waste are entering the river and negatively affecting water quality (Montana Water Center, 2003).

In the Flathead River basin, one of the primary causes of bull trout decline is residential development (US Fish & Wildlife Service, 2005). In Flathead County, an increasing human population has led to increased eutrophication due to nutrient enrichment in Flathead Lake and other large lakes within the basin. This has caused a downward trend in water quality. Residential development along tributaries in the basin is affecting water quality and stream morphology by building in the floodplain (US Fish & Wildlife Service, 2005). All of these factors are having an adverse affect on bull trout.
Impacts to Montana’s Public Lands: A Public Land Agency Survey

Because public lands are connected to their surrounding landscapes through social, economic, and ecological relationships, the impacts from population growth and urban development have a considerable influence on these designated lands (Zube, 1995). Public lands are often not large enough and inadequately buffered from surrounding land use to be totally effective in protecting all native species and natural processes within their borders (Murry, 1995). As growth and urban development spread out across adjacent landscapes, natural systems tend to be fragmented. This fragmentation slowly shrinks the natural buffers around public lands, cutting off corridors between them, isolating these designated areas, and altering the ecological systems within them (Hansen et al, 2002; Frentz et al, 2004). If growth and urban development continues unchecked, public lands become more like islands of semi-natural habitat, increasingly altered by the pressure of growth that quickly surrounds them (Zube, 1995). Indeed, many of the issues public lands are dealing with rest upon what is occurring outside their boundaries (Zube, 1995).

Federal public lands make up over 27 million acres (29 percent) of Montana (Montana DNRC, 2005). Federal agencies in Montana have been given the task of protecting the health and integrity of these designated areas by maintaining the ecological composition, structure, and function, which exist within the public lands. They must also deal with the social and economic issues of communities adjacent to these natural reserves. However, as nearby development expands, public managers are increasingly facing the very difficult challenge of maintaining native species and ecological processes in the face of the conflicting objectives of the people who live and work in Montana (Hansen et al, 2002).

In March of 2005, an online survey was conducted to gain a better understanding of the management issues that public land agency districts are dealing with in Montana related
to growth and land-use changes adjacent to their borders (See Appendix for full survey and results). Forty-Five online surveys were sent to public land district managers throughout Montana. Twenty-two managers from the Forest Service, BLM, and the National Park Service responded to the survey (Table 3). There were five main sets of questions in the survey as follows: 1) questions regarding growth and urban development; 2) the major management issues and obstacles districts are dealing with because of growth and urban development adjacent to public lands; 3) growth policies and planning; 4) information sharing and collaboration with adjacent local jurisdictions; and, 5) possible solutions. The main objective of this section is to look at those responses related to growth and urban development and its effects on public lands. Answers involving growth policies, planning, information sharing, and possible solutions will be looked at in subsequent sections.

<table>
<thead>
<tr>
<th>Beaverhead-Deerlodge National Forest</th>
<th>Lolo National Forest</th>
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<tbody>
<tr>
<td>Dillon Ranger District</td>
<td>Ninemile Ranger District</td>
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<tr>
<td>Wisdom Ranger District</td>
<td>Superior Ranger District</td>
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<tr>
<td>Butte Ranger District</td>
<td>Kootenai National Forest</td>
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<tr>
<td>Jefferson Ranger District</td>
<td>Fortine Ranger District</td>
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<tr>
<td>Pintler Ranger District</td>
<td>Three Rivers Ranger District</td>
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<td>Madison Ranger District</td>
<td>Libby Ranger District</td>
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<tr>
<td>Gallatin National Forest</td>
<td>Bureau of Land Management</td>
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<tr>
<td>Gardiner Ranger District</td>
<td>Dillon Field Office</td>
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<tr>
<td>Bozeman Ranger District</td>
<td>National Park Service</td>
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<tr>
<td>Hebgen Lake Ranger District</td>
<td>Yellowstone National Park</td>
</tr>
<tr>
<td>Lewis and Clark National Forest</td>
<td>Other</td>
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<tr>
<td>Rocky Mountain Ranger District</td>
<td>Montana</td>
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<td>Judith Ranger District</td>
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<td>Musselshell Ranger District</td>
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<td>Belt Creek Ranger District</td>
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<td>Flathead National Forest</td>
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<tr>
<td>Swan Lake Ranger District</td>
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</tbody>
</table>
1. Growth and planning patterns

According to responses, growth and urban development seem to be occurring adjacent to all public land districts that took part in this survey. Based on a fifteen-year time frame, this growth has been occurring at a moderate to rapid rate, in the form of medium to low density. Medium density refers to average lot sizes of $\frac{1}{2}$ to 1 acre, while low density refers to lot sizes greater than or equal to two acres. Development, according to participating districts, seems to be scattered with no distinct order. It is occurring outside of cities and adjacent to public lands, with much of the development occurring in natural and wildlife habitat. Respondents also commented that development patterns designed to preserve open space rarely occur (Table 4). The patterns and densities of growth, that respondents reported, reflect the same responses that other studies have identified as current planning patterns found throughout Montana (e.g., MSGC Biennial report, APA Smart Growth Survey).

<table>
<thead>
<tr>
<th>Development Pattern</th>
<th>Occurring the most often</th>
<th>Occurs often</th>
<th>Is occurring</th>
<th>Rarely occurs</th>
<th>Is not occurring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development is concentrated in one area.</td>
<td>0</td>
<td>0</td>
<td>10 (45%)</td>
<td>6 (27%)</td>
<td>2 (9%)</td>
</tr>
<tr>
<td>Scattered development with no distinct order</td>
<td>5 (23%)</td>
<td>5 (23%)</td>
<td>8 (36%)</td>
<td>1 (5%)</td>
<td>0</td>
</tr>
<tr>
<td>Development occurring primarily in natural and wildlife habitat</td>
<td>2 (9%)</td>
<td>8 (36%)</td>
<td>7 (32%)</td>
<td>2 (9%)</td>
<td>0</td>
</tr>
<tr>
<td>Development pattern consisting of natural/wildlife habitat mixed with agricultural and urban</td>
<td>1 (5%)</td>
<td>6 (27%)</td>
<td>9 (41%)</td>
<td>3 (14%)</td>
<td>0</td>
</tr>
<tr>
<td>Most of the development is occurring within the cities</td>
<td>1 (5%)</td>
<td>0</td>
<td>4 (18%)</td>
<td>11 (50%)</td>
<td>2 (9%)</td>
</tr>
<tr>
<td>Most of the development is occurring outside city limits</td>
<td>4 (18%)</td>
<td>12 (55%)</td>
<td>2 (9%)</td>
<td>0</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Most of the development is occurring directly adjacent to the borders of the public land district.</td>
<td>2 (9%)</td>
<td>8 (36%)</td>
<td>8 (36%)</td>
<td>2 (9%)</td>
<td>0</td>
</tr>
<tr>
<td>Development is structured to preserve open space (i.e. wildlife corridors natural habitat islands)</td>
<td>0</td>
<td>0</td>
<td>2 (9%)</td>
<td>12 (55%)</td>
<td>4 (18%)</td>
</tr>
</tbody>
</table>
2. Management issues and obstacles on public lands

When it came to impacts on public lands, the majority of respondents agreed that population growth and current development are negatively affecting fire management, wildlife management, wildlife biodiversity, wildlife habitat, watershed management, water quality, recreational use, and visual/scenic qualities (Table 5). These negative effects, caused by adjacent growth and urban development, are creating a number of management issues that the participating public land agency districts are currently coping with. The five most prominent, according to respondents, include: fire management, user access and recreation, impacts to wildlife and habitat, issues regarding infrastructure on public lands, and multiple landowners with diverse values. There were also a number of issues that emerged once or twice in the survey responses. These issues are found in Table 6.

<table>
<thead>
<tr>
<th><strong>Table 5. Effect of Development Patterns on Management Issues</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>Management Issues</strong></td>
</tr>
<tr>
<td>Fire management</td>
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<tr>
<td>Wildlife management</td>
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<tr>
<td>Wildlife biodiversity</td>
</tr>
<tr>
<td>Wildlife and natural habitat protection</td>
</tr>
<tr>
<td>Watershed management</td>
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<tr>
<td>Water quality</td>
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<tr>
<td>Recreational use</td>
</tr>
<tr>
<td>Air quality</td>
</tr>
<tr>
<td>Natural resource extraction</td>
</tr>
<tr>
<td>Visual and scenic qualities</td>
</tr>
</tbody>
</table>
### Table 6. Other Growth and Urban Development Issues

- Water quality issues: including increased pesticides and lawn fertilizers and septic tank leaks into watersheds
- Visual quality issues: development next to public lands visually impacts the natural scenery
- Affluent absentee land owners: large second homes adjacent to public lands
- Land exchange requests
- Lack of surveyed boundaries along National Forest boundaries: confuses landowners, public and agency in management of local areas.
- Homes built to close to dammed river: prevents periodic controlled release of high flows to clear out sediment and promote growth of riparian vegetation
- Developers are purchasing lands adjacent to public land and selling off parcels large enough to avoid subdivision requirements like the environmental assessment.

### A. Fire management

The most predominant public land agency issue related to urban growth, according to respondents, is fire management. Survey participants stated that already high fuel loads on public lands, along with increased adjacent development, has led to serious fire management issues at the urban-wildland interface. One respondent commented that, “there is a need to remove fuels within these areas, and an increased complexity when trying to treat fuels (i.e., prescribed fire).” The need to reduce and remove these fuels becomes more serious and complex when there is a lack of public acceptance to do prescribed burns near housing developments. As one respondent put it, “there is an intolerance for prescribed burning.”

However, fire issues and fuels reduction become more of a problem when private landowners, adjacent to public lands, increase fire risk on their own property by not eliminating vegetation, not reducing fuel loads, not storing flammable material away from structures, and building homes out of undesirable and flammable material – wood shingles and cedar siding. One comment stated that, “there is a lack of fuels reduction projects on private land to protect structures,” while another participant expressed that people are, “building houses out in the forest out of undesirable materials; i.e., wood shake shingles, and...
expecting the government to protect their home at any cost”.

Not only do many private landowners refuse to reduce fuels on their land and object to strategies like prescribed burns on public lands, they expect the public land agency to protect their home from wildfire at any cost. Unfortunately, many of these public land agencies do not have enough personnel or volunteers in place to be effective, and are focusing more money on fire related issues instead of on other important management responsibilities. As one participant stated, “People expect the Forest Service to protect their homes from wild fires. The Forest Service is not equipped to handle structure protection to the extent that the many new home developers may call for”.

B. Use access and recreation

The second management issue facing public land agencies because of adjacent growth and urban development is access to and recreation on public lands. Over the years, there has been a decline of access to users because of increased development and private landownership adjacent to public lands. One manager expressed that “there has been a loss of public and administrative access across private lands that have been historic access. Gates and ‘No Trespassing’ signs go up. This creates problems for the public who want to access public lands behind the private lands for recreation. The Forest Service’s ability to manage its lands is reduced if we can’t get there.” Another manager stated that because access was being cut off by development, “the public was creating routes across private land to connect to NF system trails,” causing conflicts between private landowners and public land users. Another respondent simply felt that, “access to public lands are being cut off,” because of the urban growth at the wildland-urban interface.

However, even with a loss of access, many participating managers noted that there
has been a dramatic increase in use of public lands. The increase in recreational use has placed enormous pressure on public land agencies. One manager stated that as more and more roads are closed to access, recreation use will be concentrated in remaining open areas. With an increase in motorized recreation (ATVs and snowmobiles), recreational issues will only become more difficult. “Increased ATV use creates new trails and erosion,” according to several respondents. Not only are new trails being formed, but a number of managers also stated that recreational use of public lands by adjacent neighbors (e.g., horseback riding, ATVs, and snowmobiles) is occurring illegally in areas that are not compatible for such use. Increased recreational use has also created greater user conflicts, as well as conflicts between public users and adjacent private landowners.

C. Impacts to wildlife and habitat

Impacts to wildlife and habitat are the third most common issue raised by survey respondents. Because private lands are often located in lowlands and along riparian corridors, the same areas wildlife tend to use for migration and winter range, habitat fragmentation and encroachment of development are frequent concerns of many of the respondents, particularly with regard to large game animals. The loss of hiding/thermal cover for whitetail deer on private land has created a greater demand to provide suitable habitat on adjacent public lands, which is increasingly an issue for some managers. While encroachment on winter range for big game wildlife, which creates smaller areas of usable range, are issues stated by others. Primary wildlife corridors on private lands are being chopped up, preventing wildlife from migrating to and from public lands. One manager commented that, “fragmentation of wildlife habitat along the Rocky Mtn. Front is slowly occurring along the NF boundary and east into the plains. Key corridors for travel and
foraging need to be protected to preserve open landscapes on private land, to maintain connection with foothills and montane habitat on NF lands, BLM, and state wildlife refuges.”

However, wildlife has no regard for boundaries and often cross private land, making them highly vulnerable. As one participant stated, “the increase of homes built in grizzly bear habitat pose a threat to bears due to the presence of attractants such as barbeque grills, dog food, and garbage. When bears come to these attractants they get into conflicts with humans and the bears ultimately lose (are killed).” The number of roads being built to accommodate growth is also posing numerous threats to wildlife, according to many respondents. Roads fragment the landscape creating barriers to wildlife. There is an increase in wildlife-vehicle collisions, and new roads “allow people into areas where wildlife was formerly safe and unbothered.”

Not only is wildlife habitat being affected by fragmentation, it is also heavily impacted by exotic weeds. The introduction of exotic and noxious weeds are increasingly common along the urban-wildland interface, and are becoming more common due to urban development and increased recreation use. A number of managers stated that invasive and noxious weeds were becoming a major issue. These noxious weeds spread steadily year by year because they have few native insects or diseases to control their growth, and because they can out compete native plants in many areas, often overwhelming them. Issues include: the destruction of native wildlife habitat, lowered foraging use, expensive treatments, and that weed management requires a lot of resources.

D. Infrastructure on public lands

Issues regarding infrastructure on public lands is the fourth most common response.
Many of the participants expressed that there has been a rise in the requests for permits to access private lands from public lands. One respondent stated, "there is an increase in requests for access across the National Forest to reach private lands. In many cases private land owners begin to use the National Forest without even asking and then resist removing unauthorized trespass." These requests for access to private lands create a number of problems for public land agencies. Problems that managers are facing include: Forest Service system roads built primarily for logging, are now being used for residential access, which they were not designed or built for, "the need to plow snow on forest roads," and requests to maintain access roads to a higher standard for personal use to a private residence.

The increase in development has also amplified the amount of infrastructure (e.g., fences, waterlines, power lines, and trespass development) being placed on public lands. "Requests for placement of amenities on public lands, like mailboxes, driveways, power lines," are also becoming more frequent, according to a number of respondents. So too have the requests for right-of-ways across public lands for roads and utilities. One manager mentioned that processing the requests for these types of infrastructure are very difficult because of limited resources to do the environmental analysis and permit authorization.

E. Increase of landowners and different values

The fifth issue involves an increase of landowners and values. With a greater number of landowners near public lands, comes a greater need to involve more people in decision making processes in order to achieve consensus. The more individuals, the more opinions expressed on how public lands should be managed. Many managers stated that the increase of landowners and the variety of different values regarding public lands is making management of those lands very difficult. Adjacent landowners are often intolerant of fire
management practices including prescribed burns. New residents are also often more intolerant of uses such as livestock grazing, timber harvest, and minerals development on public lands. Furthermore, new development near public lands makes it increasingly difficult for the managing agency to acquire land to consolidate its holdings spatially.

ECOLOGICAL PRINCIPLES AND THEIR POTENTIAL ROLE IN LAND USE PLANNING

Planning With an Ecological Perspective

Increasing growth, changes in socioeconomic perspectives, and negative impacts on natural ecosystem services and public lands are all good reasons to consider incorporating ecological principles into land use planning. But, what are these principles and how have they been used? There are numerous ecological based approaches to planning. The following highlights two such approaches, ecosystem management and green infrastructure, and the ecological principles and strategies that they incorporate in order to be successful.

Public Lands and Ecosystem Management

During the 1990's, natural resource and public land management in the United States went through a major change in philosophy and direction (Meffe et al, 2002). These advances in land management evolved from a series of events, legislative actions, judicial reviews, and understandings and expressed values provided over time by natural resource managers and the scientific community. Change in public land management also developed from widespread public comment, failing rural economies, and concerns over the long-term
health and viability of the environment and the ability to supply desired goods and services from public lands (Szaro et al, 1998; Cortner and Moote, 1999; Meffe et al, 2002). In other words, traditional methods of natural resource management (i.e., natural resource extraction, top down approach, government mandated, expert driven, equilibrium perspective) were failing to keep up with population growth and resource demand, while sustaining desired levels of environmental quality (Silver and DeFries, 1990; Szaro et al, 1998; Malone, 2000; Meffe et al, 2002). Not only would these traditional approaches result in further losses of biodiversity and ecosystem sustainability if continued, but they were also being met with public resistance and resentment (Grumbine, 1992; Szaro et al, 1998; Meffe et al, 2002).

What emerged were new ideas and advancements that recognized the importance of considering large natural systems, ecosystem sustainability, cross boundary management issues, and collaboration among all stakeholders. These advancements in public land management evolved into what has been termed today as Ecosystem Management (Cortner and Moote, 1999; Meffe et al 2002).

1. Ecosystem management definition

Ecosystem management can be defined in a variety of ways. At its simplest, it is an approach to management that considers the ecological, socioeconomic, and institutional perspectives in the search for solutions acceptable to all (Meffe et al, 2002). In its more complex form, ecosystem management is an approach to maintaining or restoring the composition, structure, and function of natural and modified ecosystems with the goal of long-term sustainability. It is flexible and adaptable, recognizing the fundamentally dynamic and non-equilibrium nature of ecosystems and acknowledging the natural processes essential to their resiliency. Ecosystem management is a holistic view centered on a collaboratively
developed vision of desired future conditions within a geographic framework defined primarily by natural ecological boundaries (Meffe et al, 2002). It emphasizes integration across various spatial, biological, and temporal scales, as well as the assimilation of scientific knowledge of ecological relationships within a sociopolitical and value based structure, with the goal of protecting the integrity of ecosystems over the long term (Grumbine, 1994).

2. Ecosystem management principles

As varying as the above definitions may be, however, there are several common principles that run through all of them. These include: socially defined goals and objectives, holistic integrated science, adaptable institutions, and collaborative decision-making. These principles, as well as the many others that define this approach, are found in Table 7 (Cortner and Moote, 1999; Meffe et al, 2002). They reflect the overall goal of ecosystem management – ecological and socioeconomic sustainability (Cortner and Moote, 1999).

<table>
<thead>
<tr>
<th>Table 7. Principles and Strategic Steps of Ecosystem Management</th>
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<tbody>
<tr>
<td><strong>Principles</strong></td>
</tr>
<tr>
<td>1. Sustainability both socioeconomic &amp; environmental</td>
</tr>
<tr>
<td>2. Expanded spatial &amp; temporal scales</td>
</tr>
<tr>
<td>3. Managed in the context of natural boundaries</td>
</tr>
<tr>
<td>4. Balance between commodities, amenities, &amp; ecological integrity</td>
</tr>
<tr>
<td>5. Integration of ecological, socioeconomic &amp; institutional</td>
</tr>
<tr>
<td>6. Non-equilibrium perspective; dynamics &amp; resiliency</td>
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<tr>
<td>7. Socially defined goals &amp; objectives</td>
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<tr>
<td>8. Holistic integrated science</td>
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<tr>
<td>9. Adaptive &amp; flexible institutions</td>
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<tr>
<td>10. Collaboration among stakeholders</td>
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<tr>
<td>11. Consensus building; multiple issues &amp; partnerships</td>
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<tr>
<td>12. Multi-jurisdictional cooperation</td>
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<tr>
<td>13. Focus on ecological structure, composition, &amp; function; biodiversity</td>
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(Cortner and Moote, 1999; Malone, 2000; Meffe et al, 2002)
3. Strategic steps to ecosystem management

Table 7 also identifies the strategic approaches to ecosystem management. While these steps are not set in stone and vary among agencies, they do provide a basic model on how to incorporate the principles of ecosystem management and work on an ecosystem level. The first step involves making an inventory and collecting data on the system under consideration. This involves assessing ecological, socioeconomic, and institutional conditions (Meffe et al, 2002). Developing a strategy is the second step in this process. Under this step, socially defined goals and objectives are created, plans and strategies for working multi-jurisdictionally are designed, and policies that can be used to achieve the desired goals and objectives are established. This step helps to focus priorities and sets a direction for where management should go (Meffe et al, 2002). The third step is implementation. This is where projects and plans are designed with allocations of time, funds, and other resources (Meffe et al, 2002). The last two steps involve monitoring and evaluation. Monitoring involves examining the project or plan to determine if the outcome is what was expected. The evaluation step determines if the project or plan meets the goals and objectives that were established (Meffe et al, 2002).

4. Development of a national policy

In 1993, an attempt to develop a uniform federal policy on ecosystem management arose from the White House's National Performance Review (Szaro et al, 1998; Malone, 2000). It called for all federal agencies to ensure sustainable ecosystems and encourage sustainable economic development through ecosystem management (Stein and Gelburd, 1998; Szaro et al, 1998). Following this action, the White House Office of Environmental Policy established the Interagency Ecosystem Management Task Force which issued a report

Green Infrastructure

Ecosystem management is an approach to deal mainly with public lands that have limited development, and it does not direct land use practices and policies on private lands (Szaro et al, 1998). Green infrastructure, on the other hand, is an approach that evolved to manage and protect ecological systems on private lands and in urban centers. It was developed to address the ecological, economic, and social impacts of sprawl and the accelerated consumption and fragmentation of critical wildlife habitat and open land (Benedict and Mchahon, 2002; The Conservation Fund, 2005).

The shift to this systematic green infrastructure approach came about for a number of different reasons. First, there was an increasing recognition of the problems associated with urban sprawl and landscape fragmentation including: loss of biodiversity, disruption of ecological processes, a loss of vital ecological services, increased public and private costs of providing services to sprawling development, a decreased sense of community, and the loss of a connection with nature (The Conservation Fund, 2005). The second reason for a shift to green infrastructure involved federal water quality mandates. A third reason involved endangered species protection, especially the importance of habitat conservation plans that protect multiple species and link isolated preserves (Benedict and Mchahon, 2002). An increase in the marketability and resale value of homes near protected green space is another reason, as is urban revitalization, emphasizing the value of natural areas within the city.
(Benedict and Mchahon, 2002). Smart growth policies and development practices designed to promote environmental, social, and economic sustainability also contributed to the evolution of this approach (Benedict and Mchahon, 2002). And, lastly, green infrastructure came about because conventional conservation initiatives tended to be reactive not proactive, piecemeal, single scale, haphazard, and focused on conserving individual pieces of land (The Conservation Fund, 2005).

1. Definition of green infrastructure

Green infrastructure is defined as an interconnected network of greenspace that conserves ecological values and functions and provides associated benefits to human populations (Benedict and Mchahon, 2002). It encompasses a wide range of landscape elements including: public and private conservation lands (e.g., nature preserves, wildlife corridors, parks, and greenways); natural areas (e.g., wetlands, waterways, forests, and wildlife habitat); and public and private working lands of conservation value (e.g., ranches and farms) (The Conservation Fund, 2005). All of these landscape components can potentially support native species, maintain natural ecological processes, sustain air and water resources, and contribute to the quality of life of communities and people (Benedict and Mchahon, 2002; Walmsley, 2005).

Unlike conventional conservation approaches, green infrastructure looks at ecological values and actions in unison with land development and growth management (Benedict and Mchahon, 2002). The green infrastructure framework lifts ecological systems and their components to an equal footing with built infrastructure (e.g., roads, sewer systems, schools, and hospitals), considering these natural systems and open spaces a vital part of a community (The Conservation Fund, 2005). Overall, green infrastructure is an
ecological framework for environmental, social, and economic sustainability (Walmsley, 2005).

2. Principles and strategic steps of green infrastructure

Benedict and Machahon (2002) and The Conservation Fund (2005) have detailed a number of principles and strategic steps that define green infrastructure and are presented below in Table 8.

<table>
<thead>
<tr>
<th>Principles</th>
<th>Strategic Steps</th>
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<tbody>
<tr>
<td>1. Proactive</td>
<td>1. Design Holistically</td>
</tr>
<tr>
<td>2. Environmental &amp; socioeconomic sustainability</td>
<td>2. Plan comprehensively</td>
</tr>
<tr>
<td>3. Systematic</td>
<td>3. Lay out strategically</td>
</tr>
<tr>
<td>4. Holistic approach to planning</td>
<td>4. Plan and implement publicly</td>
</tr>
<tr>
<td>5. Multi-jurisdictional cooperation</td>
<td>5. Ground in the principles and practices of diverse professions</td>
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<tr>
<td>6. Planning done at multiple scales</td>
<td>6. Fund up-front</td>
</tr>
<tr>
<td>8. Linkage between natural areas</td>
<td></td>
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<tr>
<td>9. Ground in sound science &amp; land-use planning theories</td>
<td></td>
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<tr>
<td>10. Focus on ecological structure, composition, and function; biodiversity</td>
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<tr>
<td>11. Integration of ecological, socioeconomic, and institutional</td>
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<tr>
<td>12. Green space as a community infrastructure</td>
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</table>

(Benedict and Machahon, 2002; The Conservation Fund, 2005)

Unlike the steps in ecosystem management, green infrastructure does not have to be accomplished in any particular order. One step is to plan holistically. This means working to link diverse green space and ecological areas along with their elements into a system that function as a whole, rather than separate, unrelated parts. Another phase involves planning comprehensively, meaning green space systems need to be planned broadly to provide
ecological functions, social values, and economic benefits (The Conservation Fund, 2005). Making sure green space and natural systems are strategically laid out to cross multiple jurisdictions and incorporated at each level of government serves as one more strategy, as does planning and implementing with involvement of the public, stakeholders, organizations and agencies (Benedict and McAhon, 2002). Another step involves planning and design based around sound science and building on the knowledge of disciplines like landscape ecology, urban planning, and landscape architecture (The Conservation Fund, 2005). The last two steps require that green infrastructure be funded up front along with all other essential services, and that green infrastructure be the basis for a conservation framework to be used in considering the type and location of different land uses and the conservation of particular green space and natural areas (Walmsley, 2005; The Conservation Fund, 2005).

**Summary of Ecological Principles**

These two approaches differ in that ecosystem management focuses on public lands, while green infrastructure is geared more towards private land and urban centers. However, while each present potential ways that ecological principles can be implemented into planning, both ecosystem management and green infrastructure share a number of common principles and themes. It is these principles that will be promoted as the basis for a better alternative approach to local land use planning in Montana, and a way for local jurisdictions to contribute to the protection and management of important ecological systems found throughout the state.

For instance, *collaboration with diverse people and empowerment of people* should be a key principle in land use planning. For plans to be successful, approaches must be designed and implemented involving public input. Plans must incorporate the needs and issues of citizens,
private landowners, and community organizations (The Conservation Fund, 2005). Through empowerment, people feel they have a say in land use planning decisions and are a participant in the development of their community and the protection of associated ecological systems (Elmendorf and Luloff, 1999).

*Expanded spatial and temporal scales and multi-jurisdictional cooperation* are also important principles that should be implemented into land use planning. Taking a more holistic view that incorporates the larger spatial context and focusing on ecological rather than jurisdictional boundaries to address multiple species and entire natural systems are fundamental elements of ecological protection (Meffe et al., 2002). Administrative lines drawn on a map do not capture true ecological complexity, and decisions made in one jurisdiction affect other jurisdictions in a number of ways (Meffe et al., 2002). Coordination and alliances should be formed with adjacent agencies, cities, and counties, which may include data sharing, planning, implementation, and monitoring.

Ecological integrity focusing on ecological structure, composition, and function should also be part of an alternative approach to land use planning. In order to sustain ecological systems for the long term, planning needs to maintain or restore the biodiversity of natural and modified ecosystems. Composition is “what is there”, structure is “how it is distributed in space and time”, and function is “what it does” (Meffe et al., 2002). This concept along with *holistic, integrated science*, which promotes research performed at all levels of organization from ecological sciences, planning theories, to cross sections of physical and social sciences, can be very valuable for local governments in the protection and management of ecological systems. These are a few examples of principles that should serve as the basis for a planning framework centered on ecological protection. Other important principles that should be incorporated are found in Table 9.
<table>
<thead>
<tr>
<th><strong>Table 9. Important Ecological Principles to Consider</strong></th>
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<tr>
<td><strong>Environmental and economic sustainability:</strong> Commitment to protect, restore, and manage environmental and economic perspectives to remain viable and productive indefinitely (Elmendorf and Luloff, 1999)</td>
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<tr>
<td><strong>Expanded spatial and temporal scales. Ecological rather than jurisdictional boundaries:</strong> Taking a more holistic view that incorporates the larger spatial context and much larger time frames. Addressing multiple species and entire ecological systems. Looking beyond political boundaries to consider entire natural landscapes (Meffe et al, 2002).</td>
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<tr>
<td><strong>Integration of ecological, social, economic, and institutional:</strong> Considering all four perspectives and blending them in the search of solutions acceptable to all (Meffe et al, 2002).</td>
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<tr>
<td><strong>Data collection and monitoring:</strong> In order to understand where a community is and where it should go. It involves assessing ecological, socioeconomic, and institutional conditions to acknowledge the complete community picture. Monitoring involves examining the plan to determine if the outcome is what was expected. The evaluation step determines if the plan meets the goals and objectives that were established.</td>
</tr>
<tr>
<td><strong>Ecological integrity. A focus on ecological structure, composition, and function:</strong> In order to sustain ecological systems for the long term, planning needs to maintain or restore the composition, structure, and function (biodiversity) of natural and modified ecosystems. Composition is &quot;what is there&quot;, structure is &quot;how it is distributed in space and time&quot;, and function is &quot;what it does&quot; (Meffe et al, 2002).</td>
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<tr>
<td><strong>Diversity and connectivity:</strong> A variety of living organisms considered at all levels of organization and increased inclusiveness. Connectivity refers to networks of viable natural systems and interconnecting habitats as well as cooperating partnerships (Elmendorf and Luloff, 1999).</td>
</tr>
<tr>
<td><strong>Collaboration with diverse people and empowerment of people:</strong> To be successful, approaches must be planned and implemented involving public input and incorporating the wants, needs, and issues of citizens, private landowners, and community organizations (The Conservation Fund, 2005).</td>
</tr>
<tr>
<td><strong>Multi-jurisdictional cooperation:</strong> Administrative lines drawn on a map do not capture true ecological complexity, and decisions made in one jurisdiction affect other jurisdictions in many ways (Meffe et al, 2002). Coordination and alliances should be formed with adjacent agencies, cities, and counties. This may include data sharing, planning, implementation, and monitoring.</td>
</tr>
<tr>
<td><strong>Holistic, integrated science:</strong> Science takes a broad perspective, recognizing the interconnectedness of ecosystem variables across large spatial and temporal ranges. Promotes research performed at all levels of organization from ecological sciences, planning theories, to cross sections of physical and social sciences. Scientists, managers, and planners from several different disciplines need to coordinate and work together to understand all of the factors influencing, and influenced by, component parts and functions of an ecosystem (Cortner and Moote, 1999)</td>
</tr>
<tr>
<td><strong>Socially defined goals and objectives:</strong> Simply put, society defines the goals and objectives. Planning will depend on what society wants from a specific ecological system (Cortner and Moote, 1999)</td>
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**Land Use Planning That Incorporates Ecological Principles: Case Studies**

In order to examine how feasible it is to implement many of these ecological principles into land use planning, three case studies are presented below. The first study will look at the State of Florida and its incorporation of a statewide growth and ecosystem based management plan that all local governments must adhere to. The next two studies will look at county-level planning. The first of these two will examine Riverside County in Southern
California and how they have integrated habitat and wildlife conservation into their county comprehensive plan. The second study will report on Pima County in Arizona and their conservation approaches to planning. It should be noted, however, that these case studies are not meant to necessarily dictate what guidelines Montana and its local governments should implement. All land use planning situations are different. In these three case studies, the loss of critical habitat and the Endangered Species Act drove much of the planning that took place. The point of this section is merely to represent the myriad of approaches local governments have incorporated when attempting to manage growth, protect ecological systems, and maintain their social and economic structure.

The State of Florida

Florida contains some of the most biologically diverse and valued ecosystems in the United States. Critical, unique, and fragile environments, like the Everglades and the Big Cypress Swamp, are found in the state. In addition, Florida is home to some of the last remaining plant species, panther populations, and coastal habitats in the Eastern United States (Brody, 2004). However, rapid growth in the state and the dramatic decline of these ecosystems, due to urban development and the agricultural industry, led to the Environmental Land and Water Management Act in 1972 (Cullingworth and Caves, 2003).

The Environmental Land and Water Management Act provided for the designation of areas of critical state concern, as well as special measures for dealing with developments of regional impact (Cullingworth and Caves, 2003). Areas of critical state concern are recommended by the Florida state-planning agency. Four areas have been designated, including the Big Cypress Swamp Area, the Green Swamp, the City of Key West – Florida Keys, and the City of Apalachicola (Cullingworth and Caves, 2003). However, while the
Florida Land and Water Management Act made an attempt at linking environmental protection with land use planning, it was often ineffective. This was mainly because few local governments had a strong environmental protection component in their plan – that is if they had a comprehensive plan (Arline, 1999).

The State of Florida recognized that state level ecosystem approaches to management were important to the sustainability and integrity of these ecological systems. So, in 1985, the state overhauled its planning system at the state, regional, and local levels (Cullingworth and Caves, 2003). This transformation took a top down approach to planning. A hierarchy of plans first featured a comprehensive state plan. Under this comprehensive plan, the state adopted twenty-five goals and policies ranging from education to economy, health to natural resources, and a variety of other topics. The Florida land use goal states: "In recognition of the importance of preserving the natural resources and enhancing the quality of life of the state, development shall be directed to those areas which have in place, or have agreements to provide, the land and water resources, fiscal abilities, and the service capacity to accommodate growth in an environmentally acceptable manner" (Cullingworth and Caves, 2003). Plans of state agencies, regions, and local jurisdictions are then required to be consistent with the goals and policies of the state comprehensive plan.

Under the 1985 Local Government Comprehensive Planning and Land Development Act, the State of Florida also mandated all municipalities and counties prepare, adopt, implement, and follow a comprehensive plan. It also required that local plans be consistent with the goals of the state plan (Arline, 1999; Brody, 2004). An administrative rule, applied by the Department of Community Affairs, establishes minimum criteria for the content of the comprehensive plan and prescribes methods local governments must use in preparing and submitting plans. To ensure that local governments actually adopt a plan that
meets these minimum criteria, the Department reviews plans and plan amendments, which cannot become legally effective until the plan is found to be “in compliance” with state law (Arline, 1999).

A stated purpose of the Local Government Comprehensive Planning and Land Development Act is to “protect environmental resources.” Therefore, all local comprehensive plans are required to look beyond jurisdictional boundaries, drive collaboration efforts with other jurisdictions or organizations, and contain policies that seek to protect critical habitats encompassed in broader ecosystems (Brody, 2004). Comprehensive plans are mandated to have a conservation section. This section is required to contain goals, objectives, and policies for the conservation, use, and protection of natural resources in the area and their natural functions. Natural resources include: air quality, water, and water recharge areas, wetlands, water wells, estuarine marshes, rivers, bays, lakes, harbors, shores, floodplains, fisheries, beaches, marine habitat, forests, wildlife, soils, minerals, and other natural and environmental resources (Arline, 1999). The Department of Community Affairs furthered the requirement that local comprehensive plans protect environmental resources by challenging local governments that fail to comply with the minimum criteria (Arline, 1999).

In 1993 the state went even further by establishing a framework for ecosystem management to ensure a level of consistency in the way the concept is understood and carried out (Brody, 2003). Florida’s Department of Environmental Protection (DEP) recognized that traditional methods to management could not sufficiently protect biodiversity. This led to the reorganization of the state's environmental programs around an ecosystem approach to management, which is now termed regional watershed management (Malone, 2000). Under this approach, management moved toward an integrated
understanding of problems and solutions based on natural boundaries rather than defined jurisdictional borders. Local Florida communities seeking to protect broader ecological systems now have a model on which to base their specific programs (Brody, 2003).

Overall, Florida has one of the nation’s most comprehensive land use and environmental regulatory programs. Some 467 counties and municipalities have adopted plans determined to be in compliance with state law (Cullingworth and Caves, 2003). It has obligated local governments to inventory their own local environmental resources and forced them to plan for the future based on projected population growth (Arline, 1999). County and city concurrency with state legislation has also made implementation of these plans more feasible and helped deal with many of the costs of urban sprawl (Cullingworth and Caves, 2003).

**Riverside County**

Riverside County is one of five counties planning under the Natural Community Conservation Planning (NCCP) program in Southern California. The NCCP is a pilot project, which attempts to create a conservation program for the entire range of an endangered ecosystem – the coastal sage scrub – and all of the species that inhabit it. This is done by emphasizing protection, restoration, and management of large blocks of contiguous habitat, often in trade for developing highly fragmented areas. These main reserves are then connected together through a system of secondary habitat reserves and less dense land uses (O’Connell, 2002). The NCCP planning area covers 6,000 square miles, and is expected to result in more than 300,000 acres of large habitat blocks preserved under permanent conservation management (O’Connell and Johnson, 2005).
In collaboration with NCCP, Riverside County is designing a multi-topic comprehensive plan. This Plan will delineate how to set aside wildlife habitat for conservation, while accommodating a doubling of the county's population from 1.5 million to 3 million people, and addressing the county's infrastructure needs. The comprehensive plan is called the Riverside County Integrated Project (RCIP). The goal of the comprehensive plan is to shape growth patterns around habitat conservation and "to create a high-quality, balanced and sustainable environment for the citizens of Riverside County and make Riverside County's communities great places to live, work and play" (Cohn and Lerner, 2003).

One part of this Riverside County comprehensive plan includes a multi-species habitat conservation plan for western Riverside County (MSHCP). The MSHCP is a comprehensive, multi-jurisdictional effort that covers a 1.26 million-acre area in western Riverside County, from west of the San Jacinto Mountains to the Orange County border. The plan's goals and objectives are to protect high profile species like the Stephen's Kangaroo Rat and the Quino Checkerspot butterfly, as well as over 146 other species (Cohn and Lerner, 2003). Goals also include conserving 510,000 acres, which consists of 15 habitat types, including chaparral, coastal sage scrub, vernal pools, playas, forest, woodlands, and native and non-native grasslands (Cohn and Lerner, 2003). The tools and strategies of the plan include working with public land agencies, such as U.S fish and Wildlife, the BLM, and California Department of Fish and Game, to create the 510,000 acre reserve system using 376,000 acres of existing public lands, and working with private land owners to secure the other 153,000 acres of private land for protection. Tools used to acquire and secure private land will include funds from impact fees, mitigation for roads and other buildings, with state, federal, and local appropriations, or through areas set aside as part of development projects.
(Cohn and Lerner, 2003). Land for the reserve system will be acquired over the next 25 years and purchased only from owners willing to sell their property (Smith, 2004).

The multi-species habitat conservation plan works with all 14 cities in western Riverside County, helping them to adopt conservation goals and objectives that can be integrated into the county’s conservation plan. Collaboration with environmental groups, business leaders, cities, and property owners, as well as regulatory agencies such as the U.S. Fish and Wildlife Service, the BLM, California Department of Transportation, California Department of Parks and Recreation, Riverside County Flood Control and Water Conservation District, and many other groups and agencies was done throughout the entire comprehensive planning process and is still being done as implementation takes place (Smith, 2004). This type of collaboration, and the plan that has been created, is beneficial to agencies like the U.S. Fish and Wildlife Service who are often stretched to the brink reviewing every project potentially affecting listed species, working to protect wildlife habitat, and trying to enforce Endangered Species Act prohibitions (O’Connell and Johnson, 2005).

Besides the multi-species habitat conservation section, the Riverside Integrated Project comprehensive plan also includes updates for the unincorporated portion of the county, which includes land use, circulation, housing and open space. The comprehensive plan also contains incentive programs to improve transit alternatives and promote mixed-use center development. Future transportation corridors in the western part of the county, along with the environmental documentation needed to determine where advance reservation of development rights for those corridors should be, are identified in the comprehensive plan, as well as regional watershed management and water quality issues (Cohn and Lerner, 2003).

Overall, Riverside County has attempted to conserve natural habitat and important ecological areas in perpetuity. By integrating ecological principles, like collaboration among
stakeholders and multi-jurisdictional cooperation, Riverside County is forging the way for a new type of planning. Planning, that promotes natural systems and integrates the ecological into the socioeconomic and institutional perspectives of that County. True there are some downfalls. In all planning there will be strategies that do not work and people who do not agree. One of Riverside County’s strengths, however, is their attempt to be adaptive and flexible in light of changing situations and development trends. The trick for them is trying to maintain the course of conservation in the presence of so much population growth pressure (O’Connell and Johnson, 2005).

Pima County

Pima County, Arizona has also been implementing ecological principles into land use planning throughout their county. For several decades, Pima County has undergone rapid population expansion. Fearful that the natural resources found in the county would be lost, the county created the Sonoran Desert Conservation Plan. The plan was initiated in 1998 in order to conserve a number of rare species, like the endangered Cactus Ferruginous Pygmy Owl. Since that time, the county has expanded the plan significantly (Cohn and Lerner, 2003). The current Sonoran Desert Conservation Plan covers a 5.9 million-acre portion of the Sonoran desert ecosystem in Pima County, with the purpose of “ensuring the long-term survival of plants, animals, and biological communities that are indigenous to this county” (Pima County, 2005). The plan integrates natural resource protection and land-use planning activities into one plan.

There are six main elements that are focused on in the plan. They include: critical habitat, biological corridors, riparian protection and restoration, historical and cultural preservation, mountain parks, and ranch land conservation (Pima County, 2005). Mindful of
the correlation between growth and the destruction/degradation of ecological systems, the plan gives high priority to protecting these natural systems and their ecological processes. The plan attempts to direct growth to areas with the least natural, historic, and cultural values (Pima County, 2005).

The planning process has included broad participation by many agencies, organizations, and interested citizens. Public participation has involved over 400 public meetings, various comment periods, a series of educational sessions and workshops, meetings of multiple advisory and technical teams, and a citizens' steering committee of over 80 members that have met since March of 1999. More than 150 scientists have also contributed their expertise (Pima County, 2005). Local municipalities and state and federal agencies have participated in meetings, on various committees, and as members of the Government Working Group. The Government Working Group functions as a collaborative interagency partnership with Pima County to support and make suggestions regarding successful implementation of the Sonoran Desert Conservation Plan (Pima County, 2005).

In December 2001, Pima County updated its comprehensive land use plan to incorporate the Sonoran Desert Conservation Plan, which had been recognized as a successful strategy for identifying and protecting key natural systems throughout the county (Cohn and Lerner, 2003). The Conservation plan strategy for natural and cultural resource protection was used to guide the environmental protection section of the county comprehensive plan (Cohn and Lerner, 2003). The section now consists of a Conservation Land Use System that categorizes future land use in all of the county's unincorporated lands. Land categories include: biological core management areas, scientific research management areas, important riparian areas, multiple use management areas, recovery management areas,
agriculture within recovery management areas, and critical landscape connections (Cohn and Lerner, 2003).

There have also been a number of policies, stemming from the Sonoran Plan, which have been adopted and incorporated into the county’s urban environment regarding growth areas and urban design. They include: buffer overlay zones around biological preserves, riparian habitat mitigation, native plant protection, hillside development policies, conservation subdivisions, big box store limitations, home design standards, mixed use development, transit oriented development to promote the neighborhood unit, infrastructure service area boundaries, and water conservation (Cohn and Lerner, 2005). The Sonoran plan has helped the county acquire and protect substantial ranch, parklands, and riparian areas, and the research and inventory work of the Sonoran Conservation Plan generated the scientific and historical justification for two new Bureau of Land Management areas: The Ironwood National Monument and Las Cienegas National Conservation Area.

As in the case of Riverside County and the State of Florida reviewed above, Pima County is working to consider ecological systems in its land use planning and community development strategies. These three case studies have shown that taking an ecological approach to planning can promote the sustainability of important ecosystems and local communities through the integration of science, effective collaboration, and public approval.

Benefits of Incorporating Ecological Principles Into Land Use Planning

The previous sections have addressed ecological approaches to planning and how important principles can be implemented into the planning framework. This section will look at the numerous benefits that can come from incorporating ecological principles into
local land use planning. These include ecological benefits, planning benefits, economic benefits, and social benefits.

Ecological Benefits

Implementing ecological principles into local land use planning provides a strategy to help protect the ecological systems in which a community exists and depends on, by working to maintain ecological integrity in human dominated landscapes (Smith, 1993). The identification and preservation of important ecological areas, along with the corridors that connect and make these critical areas more functional, helps to conserve wildlife habitat and decreases the impacts of habitat fragmentation. This in turn helps protect plant and wildlife species, biodiversity, and species health and fitness (Mazzotti and Morgenstern, 1997; Elmendorf and Luloff, 1999; Cohn and Lerner, 2003). Implementing ecological approaches and principles to planning protects vital ecological services which provide clean air, improved water quality, sustained water storage and aquifer recharge, flood attenuation, and better fish habitat and wild life habitat (Mazzotti and Morgenstern, 1997; The Conservation Fund, 2005). It also identifies opportunities for the restoration and enhancement of naturally functioning systems in urban areas (Benedict and Mcahon, 2002).

Planning Benefits

The adoption of ecological principles in planning provides a framework for integrating diverse natural resource and growth management activities in a holistic way (Benedict and Mcahon, 2002). It incorporates the ecological with the socioeconomic and institutional elements that already exist in the land use planning framework. It provides
communities with a unifying vision for present and future growth and can help direct growth and control urban sprawl (Benedict and Mchahon, 2002). It creates continuity and logical structure that enables communities to establish a system that is greater than the sum of its parts, and affords communities and developers with some predictability and certainty in planning (Benedict and Mchahon, 2002; Cohn and Lerner, 2003). Planners are provided with a structure for natural systems associated with human settlements, which helps organize, streamline and inform the process through which local governments evaluate and set priorities for sites under consideration for conservation, restoration, and residential or commercial development (Cohn and Lerner, 2003). This ensures that both green space and development are placed where they are most appropriate, are planned cooperatively, and allows for vital ecological areas to be identified prior to development (Elmendorf and Luloff, 1999; Benedict and Mchahon, 2002).

Benefits to planning also include monetary savings. By identifying areas such as floodplains and steep slopes and restricting development in such areas, the public incurs fewer costs from natural disasters (Berke et al, 1996). Implementing ecological approaches and principles decreases the cost of public infrastructure and public services and is often more cost effective than conventional public works projects. For instance, purchasing and protecting watershed land can be far less expensive than building a new water filtration and treatment plant (The Conservation Fund, 2005). Also, because of increasing land values and competition for land purchase, planning for critical wildlife habitat protection, implementation of riparian buffers, or designated open space early on in community development prevents many of the complexities and costs of later efforts (Elmendorf and Luloff, 1999; EQC, 1999).

Because this type of planning approach works across jurisdictional boundaries, it can
help relieve tensions between local governments or with public land agencies, promote planning at a landscape scale, and help make acquisition of land for conservation strategic rather than haphazard. Implementing ecological approaches and principles into local land use planning is also useful for public land agencies. According to the Montana public lands agency survey (2005), when ecological principles are integrated into local planning, environmental protection, ecological planning, multi-jurisdictional coordination, and public collaboration become commonly implemented, potentially making public land management more successful and easier to accomplish. Communities that plan at a landscape scale can also provide the context for a broad range of information about the area of concern (Cohn and Lerner, 2003). This is helpful to government agencies, public officials, land managers, and conservationists as they seek to improve the effectiveness of conservation projects, evaluate proposed developments, or work to comply with existing environmental regulations (Cohn and Lerner, 2003). It can also reduce the likelihood of conflict over how to protect endangered species and the need for costly remediation programs (Cohn and Lerner, 2003).

**Community Benefits**

Ecological approaches to planning can help make communities safer and healthier by protecting air and water quality, and limiting development in unsuitable areas such as wetlands, fault zones, unstable slopes, critical wildlife habitat, and floodplains (EQC, 1999). Preventing development in these areas can lead to safer living conditions in hazardous environments by reducing the impacts from natural hazards such as floods, landslides, and fires (Nelson, 1999).

Maintaining natural areas can serve as a buffer among different land uses, and can be used to break up development. These natural boundaries can also enhance neighborhoods
and community identity (Elmendorf and Luloff, 1999). By enhancing the community, property values and marketability of homes and other real estate increase and possibly attract new people and new and progressive businesses to the area, helping to improve conditions for economic development throughout the community (Elmendorf and Luloff, 1999; Nelson, 1999; EQC, 1999). Ecological approaches to planning can help provide mechanisms to balance environmental and economic factors and help to diversify the economic base (Benedict and McHahon, 2002). For instance protecting ecological systems and the integrity of their processes may increase recreational use, fishing, hunting, wildlife viewing, and allow for more sustainable natural resource extraction (Mazzotti and Morgenstern, 1997; Elmendorf and Luloff, 1999).

Besides economic benefits, implementing ecological principles into planning also has a number of social benefits. A growing number of citizens now identify wildlife and natural habitats as essential to a high quality of life. Thus, preservation of a community's natural landscape makes it a more desirable place to live, work, and recreate, and enhances community pride (Cohn and Lerner, 2003). Protection of natural areas provides for tranquility, exploration, richness, beauty, solace, and peace, all-important social and psychological values (Elmendorf and Luloff, 1999). Public involvement in this process can also help enhance a sense of community by providing an opportunity for citizens to express their hopes, values, and visions for their community's future, and participation in the planning process also provides community members with some sense of security regarding decisions about which areas can or cannot be developed and under what conditions (Cohn and Lerner, 2003).
CHALLENGES AND CONSTRAINTS

General Constraints to Incorporating Ecological Principles Into Land Use Planning

Trying to implement ecological principles and executing creative ideas that foster ecological approaches to planning, while sustaining social and economic values, can be a very arduous and complicated affair. There are numerous reasons for these difficulties. This section discusses the many challenges, constraints, and barriers that can emerge when planners try to integrate ecological principles into local planning. By identifying and understanding these issues, local governments may be able to come up with creative solutions to overcome these barriers.

The Eight Main Barriers

According to Elmodorf and Luloff (1999) there are eight main barriers that keep local governments from incorporating ecological approaches and principles into land use planning. The first barrier they address is the difficulty in (and sometimes opposition to) establishing multi-jurisdictional cooperation and partnerships. Often planning is orientated to individual municipalities or counties. Ramifications of such planning can create possible serious impacts on adjacent jurisdictions. The second barrier is municipalities often have a limited interest in obtaining natural resource inventories that supply essential information for comprehensive plans. Comprehensive plans are the framework for planning. It provides the vision and direction for all land use planning decisions in a given jurisdiction. Any type of regulatory or incentive based planning that will be implemented by a county or city is based and influenced by the objectives, goals, and general structure of the comprehensive plan.
Without adequate data (e.g., critical habitat and river corridors) the design of the comprehensive plan, the overall framework, and the planning that is guided by this framework are seriously hindered. The third barrier is related to legislation that enables, but does not require, municipalities or counties to develop comprehensive plans. When local governments do not develop comprehensive plans, “negative planning” often occurs. This means planning or proposal reviews take place with no comprehensive plan to provide vision and direction for development. The fourth barrier to integrating ecological principles into land use planning is a lack of professional planning staff and local expertise, especially in regards to the sciences of forestry, ecology, or wildlife biology. The fifth is a shortage of municipal funds for capital projects such as watershed restoration, natural habitat acquisition or comprehensive planning. The sixth barrier involves a lack of education and information on the benefits of multi-jurisdictional cooperation, a quality natural environment, and the downfalls of poor land-use planning. The seventh barrier addressed is that there is not enough awareness and involvement of residents in community decision making. Finally, the eighth barrier is that there tends to be ignorance of ecological concepts within the planning process (Elmendorf and Luloff, 1999).

Values and Risks of an Ecological Approach to Planning

Working to implement ecological principles into planning can be very problematic because there are so many different values and risks associated with each planning avenue taken (Cullingworth and Caves, 2003). Which areas should be protected and which should be developed? What wildlife species should be focused on? What are the economic costs and benefits of protecting an area or a certain species? What are the benefits and costs of working with other jurisdictions? What are the risks to businesses, the community, and to
individual property rights? These are all questions that must be weighed and are very difficult to assess. This is mainly because local governments do not have the luxury of being flexible and adaptable like public agencies can. If a development is placed in winter range for wildlife or on a ridgeline within a view shed, the decision is permanent, irreversible, and the impacts to the community and the ecological system extend far into the future (MDOT, 2002). Local governments may lack the desire to weigh these values and risks or come to a standstill because of lack of consensus on which value and risk should take precedent (Cullingworth and Caves, 2003). These types of decisions can create yet another barrier in regards to ecological approaches to planning.

**Private Property**

Local governments also must deal with multiple landowners and the issue of property rights, which can be an enormous impediment to ecological planning. U.S. society places a high cultural and legal value on private property rights. It is perhaps one of the most stubbornly protected American liberties (Cortner and Moote, 1999). There is a strong belief in the sanctity of rights of property, and an intense conviction that those affected by any government policy should be able to influence the plans. There is also the belief that a property owner should be relieved from hardship, either by exception or compensation, if the outcome of the plan should impose an unreasonable burden on the individual (Cullingworth and Caves, 2003). Unfortunately, these conflicts will always surface when governments attempt to regulate the use of private property.

**Inability to Change**

Besides the issue of property rights, a local government’s inability to be flexible or
innovative can also be seen as a barrier to ecological planning. Often times, jurisdictions stick to the idea that what has worked in the past will always work. Zoning is a good example of this (Cullingworth and Caves, 2003). Jurisdictions will often stay on a specific course with guidelines set in stone, rather than veer off onto new avenues with new approaches. The risks may be too great, the outcomes too uncertain for planners to truly make the jump to innovative change. Planning lags behind, becoming another issue that must be overcome if protecting and managing ecological systems is truly a concern.

**Lack of Trust**

The last constraint to implementing ecological concepts is a lack of trust. Trust is at the foundation of the planning process and is an integral component that allows relationships to be built and plans to be implemented. This includes both organizational and interpersonal trust (Lachapelle et al, 2003). Organizational trust involves fairness of the process used to develop the plan, while interpersonal trust includes benevolence, honesty, and reciprocity. In other words, interpersonal trust entails a government or stakeholders' pledge to fulfill their side of the plan (contract)’ (Lachapelle et al, 2003). Unfortunately trust is not always present in the planning process.

In land use planning, there is often a widespread distrust of governments, experts, and business – basically everyone in power (Cullingworth and Caves, 2003). Studies have shown that most people distrust government because they consider it inaccessible and unresponsive to local concerns and believe it is ruled by organized interest groups and power players (Cortner and Moote, 1999). Much of this distrust between parties comes from a lack of shared understanding about the views that each party has on the issue at hand (Cullingworth and Caves, 2003). This lack of trust diminishes the ability of diverse groups of
stakeholders to share in learning, to build relationships, and to associate in other dimensions of successful planning (Lachapelle et al, 2003).

Montana’s Challenges and Constraints

A number of these constraints and challenges are relevant to Montana’s local Land Use Planning. If ecological principles are to be incorporated, it is essential to understand the barriers that may be keeping Montana and its local governments from planning effectively, and that would prevent ecological approaches from being implemented into land use planning. But, before the constraints and challenges can be identified, it is first important to understand the land use legislation that is driving planning in Montana.

Montana State Code: Land Use Planning

To begin, it is important to note that in the State of Montana all land use planning authority resides at the local level (MDOT, 2002). The Local Planning Enabling Act – Title 76 of the Montana State Code – enables local governments – counties and cities – to engage in land use planning through four means: 1) creation of a planning board, 2) a growth policy, 3) subdivision laws, and 4) zoning and development permits (MDOT, 2002; Montana State Legislature, 2003). However, with the exception of subdivision regulations, these planning authorities are strictly voluntary. The following is a brief description of each in order to gain a better understanding of how planning is manifesting itself at the local level.

1. Planning boards

According to section 76-1-102 of the Montana State Code, the purpose of the
planning board is to improve the present health, safety, welfare, and convenience of their citizens (Montana State Legislature, 2003). They are to plan for the future development of their communities so that highway systems are carefully planned, and that new community centers grow only with adequate highway, utility, health, educational, and recreational facilities. The planning board is also required to recognize the needs of industry, business, and agriculture in future growth; that residential areas provide healthy surroundings for family life; and that the growth of the community be proportionate with and promotive of the efficient and economic use of public funds (Montana State Legislature, 2003). Section 76-1-106 then goes on to state that, “planning boards can propose policies for subdivision plats; the development of public ways, public places, public structures, and public and private utilities; the issuance of improvement location permits on platted and unplatted lands; or the layout and development of public ways and services to platted and unplatted lands” (Montana State Legislature, 2003). Planning boards are also permitted to develop a growth policy if the governing body requests one (Montana State Legislature, 2003).

However, planning boards are not mandated, and local governments may choose not to establish a planning board if they so wish. As stated in section 76-1-101 of the Montana State Code, “the governing body of any city or town, the governing bodies of more than one city or town, or the governing body of any county or combination thereof may create a planning board if they choose to do so in order to promote orderly development” (Montana State Legislature, 2003). If a planning board is established, however, their purpose and role, stated above in section 76-1-102 and 76-1-106, must be followed.

2. Growth policy

A “growth policy” is the term used for a comprehensive plan in Montana (Meck et
al, 2001). It is considered the framework for land use planning. Any type of planning that is to be implemented by a county or city is based and influenced by the objectives, goals, and general structure of the growth policy. The Local Planning Enabling Act enables local governments to prepare a growth policy and sets out required procedures (MDOT, 2002). According to section 76-1-106 of the Montana Code, a planning board shall prepare a growth policy if requested by the governing body. However, this is a voluntary decision by the local jurisdiction, making the preparation and adoption of a growth policy optional (Montana State Legislature, 2003; Mcgee, 2003). If a growth policy is enacted by a local jurisdiction, it does have to address the criteria found in section 76-1-601 of the Montana Code, but the extent to which the growth policy addresses these elements contained in section 76-1-601 is at the full discretion of the governing body (Montana State Legislature, 2003). Elements that must be included are found in Table 10.

<table>
<thead>
<tr>
<th>Table 10. Section 76-1-601 A Growth Policy Must Include:</th>
</tr>
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<tbody>
<tr>
<td>1. Community goals and Objectives</td>
</tr>
<tr>
<td>2. Maps and text describing an inventory of existing characteristics and features of the jurisdictional area, including: land uses; population; housing needs; economic conditions; local services; public facilities; natural resources; other characteristics and features proposed by the planning board and adopted by the governing body.</td>
</tr>
<tr>
<td>3. Projected trends for the life of the growth policy for each of the following as listed in number 2 above.</td>
</tr>
<tr>
<td>4. A description of policies, regulations, and other measures to be implemented in order to achieve the goals and objectives.</td>
</tr>
<tr>
<td>5. Strategy for development, maintenance, and replacement of public infrastructures, including drinking water systems, wastewater treatment facilities, sewer systems, solid waste facilities, fire protection facilities, roads, and bridges.</td>
</tr>
<tr>
<td>6. An implementation strategy that includes: a timetable for implementation of growth policy; a list of conditions that will lead to a revision of the growth policy; and a timetable for reviewing the growth policy at least once every 5 years and revising the policy if necessary.</td>
</tr>
<tr>
<td>7. A statement of how the governing bodies will coordinate and cooperate with other jurisdictions that explains: how the governing body will coordinate and cooperate with the county, if they are a city or town; how the governing body will coordinate and cooperate with cities and towns, if they are a county.</td>
</tr>
</tbody>
</table>
Table 10 Continued. Section 76-1-601 A Growth Policy Must Include:

8. A statement explaining how the governing bodies will define the criteria for subdivision regulations, and how they will evaluate and make decisions regarding proposed subdivisions. Criteria include: the effect on agriculture, agricultural water user facilities, user services, the natural environment, wildlife and wildlife habitat, and public health and safety.

9. A growth policy may also include: one or more neighborhood plans; establish minimum criteria defining the jurisdictional area for a neighborhood plan; address the criteria in subdivision regulations describe zoning regulations that will be implemented to address the criteria in subdivision regulations; identify geographic areas where the governing body intends to authorize an exemption from review of criteria.

10. A planning board may propose and the governing bodies may adopt additional elements of a growth policy in order to fulfill the purpose of this chapter.

(Montana State Legislature, 2003)

Once the growth policy is adopted, the governing body, according to section 76-1-605, must "be guided by and give consideration to the general policy and pattern of development set out in the growth policy in the authorization, construction, alteration, and abandonment of public ways, public places, and public structures, or public utilities; the authorization, acceptance, or construction of water mains, sewers, connections, utilities, or facilities; and adoption of zoning ordinances or resolutions" (Montana State Legislature, 2003).

3. Subdivision regulations

Subdivision regulations are a mandatory requirement under state law (EQC, 1999). There are two statues that govern land subdivisions in Montana: the Montana Subdivision and Platting Act and the Montana Sanitation in Subdivisions Act. In general, the Subdivision and Platting Act is for local review, and the Sanitation in Subdivision Act provides for state reviewing of mainly minor subdivisions (EQC, 1999).

Under the Montana Subdivision and Platting Act (76-3-101 through 76-3-614 of the
Montana code) all counties, cities, and towns are required to adopt and enforce local subdivision regulations. According to section 76-3-501 the governing body of every county and city must adopt and provide for the administration and enforcement of subdivision regulations. Also, as stated in 76-1-606, if a growth policy has been adopted, the subdivision regulations for that local jurisdiction must be in accordance with that growth policy (Montana State Legislature, 2003).

The purpose of subdivision laws, are to regulate the process of platting land into lots and supplying public facilities (e.g., roads, sewer, water) to the lots (Meck et al, 2001; MDOT, 2002). These regulations must, according to section 76-3-501, provide for the orderly development of the jurisdictional areas. They must provide for the coordination of roads within subdivided land with other roads, both existing and planned, for the improvement of roads, and for the dedication of land for roadways and for public utility easements. Regulations must provide for the provision of adequate open spaces for travel, light, air, and recreation; for the provision of adequate water, drainage, and transportation; the regulation of sanitary facilities; for the avoidance or minimization of congestion; and for the avoidance of subdivision which would involve unnecessary environmental degradation. Regulations must also avoid subdivisions which would create a danger to health, safety, or welfare by reason of natural hazard or the lack of water, drainage, access, transportation, or other public services, or that would necessitate an excessive expenditure of public funds for the supply of such services (Montana State Legislature, 2003). Before granting approval, local governments must consider the anticipated needs of a proposed subdivision for local services such as roads and maintenance, and overall public health and safety related to the development (MDOT, 2002). This is done by requiring the subdivder to submit an environmental assessment to the governing body (Montana State Legislature, 2003).
The environmental assessment (EA) is used to assess the impact of a proposed subdivision on ecological systems and the community. According to section 76-3-603, the EA must include a description of every body or stream of surface water that may be affected by the proposed subdivision, together with available ground water information, and a description of the vegetation, wildlife use, and topography within the area of the proposed subdivision. It must contain a summary of probable impacts of the proposed subdivision on agriculture, agricultural water user facilities, user services, the natural environment, wildlife and wildlife habitat, and public health and safety. A community impact report containing a statement of the anticipated needs of the proposed subdivision for local services must also be included (Montana State Legislature, 2003). Minor subdivisions are exempt from environmental assessments.

4. Zoning and development permits

Zoning is a legal tool local governments can voluntarily use in order to protect public health, safety, and welfare. This is done by dividing jurisdictions into use districts or zones, restrict various uses to certain zones, and impose requirements that permitted uses must meet (MDOT, 2002). Zoning can take place in unincorporated areas as well as in incorporated municipalities (Meck et al, 2001).

A. Part one zoning

Zoning in unincorporated areas can occur by two methods. The first is citizen-petition "part one zoning". When petitioned by 60 percent of the freeholders in an area of 40 acres or more, a county may create a planning and zoning district and adopt land use regulations for the district (Meck et al, 2001). This zoning district designation can occur
whether or not there is a growth policy in place. The establishment of a zoning district is prohibited if freeholders representing 50 percent of the titled property ownership in the district protest within 30 days (EQC, 1999). Once a district is established, the county must appoint a planning and zoning commission. The commission prepares a development pattern document that identifies restrictions that will be applied (Meek et al, 2001). Citizenpetition part one zoning may not regulate lands used for grazing, agriculture, horticulture, or for growing timber (EQC, 1999).

B. Part two zoning

The second method of zoning in unincorporated areas is “part two zoning”, which authorizes counties to adopt traditional zoning that can apply to all or part of the unincorporated area, but requires the adoption of a growth policy. According to section 76-2-203 of the Montana code, zoning regulations must be made in accordance with the growth policy and designed to: lessen congestion in the streets; secure safety from fire, panic, and other dangers; promote public health and general welfare; provide adequate light and air; prevent the overcrowding of land; avoid undue concentration of population; and facilitate the adequate provision of water, sewerage, transportation, schools, parks, and other public requirements (Montana State Legislature, 2003). Zoning must be made with reasonable consideration to the character of the district and its peculiar suitability of particular uses, conserving the value of buildings, and encouraging the most appropriate use of land throughout the jurisdictional area (Montana State Legislature, 2003). County zoning regulations must also, as nearly as possible, be compatible with the zoning ordinances of the municipalities within the jurisdictional area (Montana State Legislature, 2003).
C. Municipality zoning

The Municipal Zoning Enabling Act authorizes cities and towns to adopt zoning or development permit regulations to regulate the size, height, and location of buildings and other structures; to regulate densities; and to divide the municipality into zoning districts (EQC, 1999). Municipality zoning is similar to that for counties. Meaning, municipalities are only authorized to adopt zoning regulations only if a growth policy has been adopted. Zoning must be made in accordance with the growth policy and follow the criteria and found in section 76-2-203 stated above (Meck et al, 2001; Montana State Legislature, 2003).

D. Development permits

Local governments can also use development permit regulations to influence land use, under Montana law. Development permit regulations usually address the quality or character rather than the location of new development (EQC, 1999). For instance, a development permit may address buffering or screening, or a type of architecture or facade.

Montana's Challenges and Constraints

The growth that is occurring throughout Montana has created a myriad of planning challenges and constraints that the state and local governments are only just beginning to address. This section will attempt to focus in on some of the main barriers and stumbling blocks that are keeping local governments from managing growth and protecting the ecological systems in which they live.

The following criticisms are based on a number of different surveys and reports. The first is the American Planning Association’s Smart Growth Survey (Meck et al, 2001) conducted in January 2000. The purpose was to assess the Montana Code in order to
improve planning and land-use control in Montana (Meek et al, 2001). In order to do this, six focus groups were conducted in the Bitterroot Valley, Missoula, Kalispell, Three Forks, Bozeman, and Billings as well as with representatives of the planning staff for the Flathead Indian Reservation. Participants included: local planners, planning board members, elected officials, land-use attorneys, developers, homebuilders, and interested land owners (Meek et al, 2001). The second survey used in this assessment was the public lands survey conducted in March of 2005. As mentioned in an earlier section, twenty-two public land agency managers answered questions regarding growth and urban development, the major management issues and obstacles districts are dealing with because of growth and urban development adjacent to public lands, growth policies and planning, and information sharing and collaboration with adjacent local jurisdictions. Other surveys and reports used in this section were the EQC 1999 Planning for Growth report, The Montana Department of Transportation’s 2002 TranPlan 21, The EQC 2000 Funding for Growth report, and the Montana Smart Growth Coalition 2001 State of Growth report.

1. Local land use planning constraints

In regard to land use planning, there are a number of criticisms about how local governments are tackling the subject. With the voluntary stance the state of Montana has taken to planning, growth policies, and zoning, current legislation allows local governments to do as much or as little as possible when it comes to growth management and land use planning (Meek et al, 2001). Because there is not a strong constituency for good planning in the state, this inconsistency creates a patchwork of local planning schemes that are often incompatible with one another, lack quality, may not manage growth, and establish a variety of local plans with some calling for rigorous ecological protection and others that only skim
the surface (Meck et al, 2001). Local governments may lack the political will to do proactive planning, and if they do create land use plans, many local jurisdictions do not support or implement them (Meck et al, 2001).

With an absence of proactive planning by many local governments, it is subdivision regulations and state infrastructure spending that have the most influence on settlement patterns in most communities, not growth policies or plans (Meck et al, 2001). Local governments often report that subdivisions are defining growth management in their jurisdictions (Meck et al, 2001). They claim they are so busy with subdivision review that they do not have time for planning or make progress on a comprehensive plan (EQC, 1999). Planning is taking place one proposal at a time, influenced by the whim of subdivision developers (EQC, 1999; Meck et al, 2001). Unfortunately, many communities are finding their land use policies written after the fact as a consequence of subdivision review, rather than in advance through the thoughtful process of community planning (EQC, 1999).

Current planning patterns are also occurring because of a lack of money and incentives. Cities have very little money for economic development, which means they have trouble saying “no” to development proposals, even if they may create other problems (Meck et al, 2001). Disincentives exist for urban development, making it much easier to develop in unincorporated areas of the county than in in-town locations (Meck et al, 2001). Many respondents are concerned about this type of planning, claiming Montana has not learned from mistakes made in other states where subdivisions have popped up everywhere (Meck et al, 2001).

Many participants voiced a concern for water quality and supply stating both are negatively affected by land subdivision in many areas. Loss of open space, agricultural land, and wildlife habitat, as well as an exacerbation of weed problems are all caused in part by
subdivision development and are a very common concern (Meek et al, 2001). Unfortunately, local governments are doing very little to safeguard wildlife (MSGC, 2005). Respondents in the public lands survey stated that there was an ignorance of structures and development in wildlife habitat. Lands are being developed with limited discussion of access, wildlife, or watershed issues. This lack of planning is a huge hindrance to management on public lands. There is a need to start thinking more about the effects of development on the environment (Meek et al, 2001).

However, while counties need to plan better and provide more predictability for development and non-development of land, some political realities in the state could make acceptance of land-use policy change difficult. These political realities involve both the planning culture that exists currently in the state, and the political climate in the state with regard to growth and development (Meek et al, 2001). For instance, Montana is essentially two states, east and west. The west is growing and has a very different political culture then the eastern half of the state, which has seen a decline in population. Any approach to improving planning would have to acknowledge the different circumstances and political cultures of each region (Meek et al, 2001).

Also, while subdivision review and state infrastructure are defining land use planning, many believe that a lack of education is also a huge contributor to land use patterns seen throughout numerous communities. They stated that the problem is with untrained lay people on boards who don’t understand the rules they are applying (Meek et al, 2001). Cities are unaware of the fiscal impacts of development, and there needs to be some effort to instill the benefits of planning and to make the case that good planning is good fiscal policy (Meek et al, 2001). Others felt that Montana residents lack education regarding proactive planning (Meek et al, 2001). The respondents in the public lands survey emphasized a lack of
ecological concepts in planning, and an ignorance of the impacts of development on ecological systems.

2. Growth policies

As of 1999, 44 of Montana’s 56 counties had adopted some type of master plan (EQC, 1999). However, since that time the master plan statute has been changed to a growth policy and new requirements were introduced, including the voluntary implementation of the policy legislation (EQC, 2000). Since the change, only 15 counties and 12 cities have attempted to develop a new growth policy (EQC, 2000). That is 15 out of 56 counties, and 12 out of hundreds of cities. Very few counties in the Eastern half of the state have even begun to develop long range planning goals (EQC, 2000).

In terms of the growth policy legislation, many participants found that the growth policy statute was purposefully vague and does not provide adequate guidance (Meek et al, 2001). Development and application of growth policies has, therefore, been inconsistent, with growth policies being assembled on a piecemeal basis, with one part not relating to other parts (Meek et al, 2001). The majority of survey participants also felt that the type of growth policies that were being produced were having little effect on settlement patterns in Montana. In order ensure more quality and consistency in growth policies, specific details would have to be established (Meek et al, 2001). But, even with more detailed legislation, the voluntary stance to implement growth policies allows local governments to do as much or as little as possible (Meek et al, 2001). Meaning, many regions in Montana lack current growth policies that can serve as a reference to planning (Meek et al, 2001).

It was also noted that the current growth policy statute does not represent state policy, though state policy itself has not been truly defined (Meek et al, 2001). Currently
there is not a state agency that oversees or regulates the creation of growth policies (MDOT, 2002), leading in part to the inconsistency noted above. Furthermore, the state does not require that local jurisdictions conduct periodic review of growth policies (Meek et al, 2001). Without an evaluation of the growth policy, it is very hard for a local jurisdiction to determine how they are doing, and what needs to change (Meffe et al, 2002).

In the public lands survey, one manager stated that, growth policies are not restrictive enough, and development still occurs in areas that limit Forest Service management options. Another manager felt that counties don't have a real clear growth policy other than a fairly hands off approach. These comments came from public lands managers in response to questions about adjacent local growth policies, and how they may be affecting public land management.

Most public lands managers, however, had only a very vague knowledge of any adjacent growth policies and the goals and objectives they contain. For the 12 counties and 10 cities that managers believed had growth policies, 5 counties were believed to have goals and objectives related to wildlife and habitat protection, while 7 counties and 2 cities had goals and objectives of watershed protection. Wildfire goals and objectives were contained in 7 counties and 1 city’s growth policy, and 3 counties had goals and objectives for natural resource protection. This suggests that some local governments are attempting to implement ecological goals and objectives into their growth policies. However, the extent that they were helping management on public lands was unclear.

In regards to growth policies and whether they hinder or help management on public lands, most respondents really could not say if they did or not. Some believed that they helped while others believed that some helped and some hindered. From the responses that were received on this subject, it appeared that most public land agency managers really did
not know this answer. And, for those that did, two main issues that were perceived to hinder management on public lands were 1) growth policies that were too flexible and did not define and set criteria, and 2) a hands off approach to planning by many counties and cities. Overall, public agencies felt that the vast majority of counties and cities were doing only slightly well or not doing well when it came to wildlife and habitat protection, watershed protection, wildfire management, and natural resource conservation.

3. Subdivision regulation constraints

Survey participants also felt that the relationship between the growth policy and zoning and subdivision regulations is very vague and not strong, and that new consistent criteria are needed to clarify the relationship (Meek et al, 2001). However, most of the criticisms involving subdivision regulations were focused on the environmental assessment.

The majority of environmental assessments are required to be done by developers before their subdivision can be proposed. This basically means that a highly technical, somewhat subjective process is put in the hands of a subdivider or developer who is often uninformed and has their own self-interests in mind (Meek et al, 2001). The developer will often provide data that lacks quality or accuracy, and supports approval of the development. This often creates EAs that are useless to decision makers, and provides very minimal if any ecological protection (Meek et al, 2001). Respondents expressed that because of how the process is conducted, the intent of the environmental assessment is often lost. Currently there is no control over the quality or accuracy of the assessment, and good science is not being applied to the review of these subdivision proposals (Meek et al, 2001). Some criticisms stated that this type of subdivision review has not been an effective tool for
addressing wildlife issues (EQC, 1999). Moreover, minor subdivisions are not even required to have an environmental assessment (Meek et al, 2001).

4. The role of the state

A number of the surveys and reports came up with various barriers relating to the State of Montana and its role in land use planning. These include the absence of a statewide growth policy, limited funding, a lack of "enabled" incentive tools for local governments to use, and little state support to help local jurisdictions establish effective planning.

A. Statewide growth policy

Montana does not have a statewide growth policy, and the consensus of many respondents is that an initiative to set such state goals and objectives for growth and development, in the state, is long overdue (Meek et al, 2001). Such a framework could provide some consistency in land use planning policy and practice (Meek et al, 2001). However, while many desire such a growth policy, there is a lot of skepticism as to whether the state has the ability and credibility to formulate such a policy. Also, would a statewide growth policy truly be effective in local land use planning (Meek et al, 2001)?

B. Lack of funding

More-funding options are needed to encourage local governments to invest in the development of planning and growth policies so that communities can encourage smart growth (EQC, 2000). Many survey respondents felt that a lack of money is a huge stumbling block to preparing growth policies and achieving smart growth. They emphasized that growth policies should not even be required if the state cannot provide money for them or
create more options for cities and counties to raise money (Meck et al, 2001). Developing or updating a growth policy costs in the range of $30,000 to $500,000. Updating subdivision and zoning regulations is another cost (EQC, 2000). The city of Helena spent around $50,000 to update their subdivision and zoning regulations, while Gallatin County spent an estimated $150,000 on their new growth policy (EQC, 2000; MGC, 2001). Respondents stated that there needs to be funding to inventory local resources, as well as money for the tools and staff that are needed to develop effective growth policies. Because of the lack of resources and staff that many counties and cities have, local governments cannot even begin to think about effective growth management and planning (Meck et al, 2001).

Currently there are few funding options in the state of Montana. They include the CDBG Planning grants, County land planning funds, and local property tax (EQC, 2000). The CDBG is administered by the Department of Commerce and provides grants to be used for a variety of planning activities in addition to preparing or updating a growth policy. Grants are awarded on a competitive basis and awards reach up to $15,000 (EQC, 2000). County land planning funds come from a special state revenue account that pays for five types of programs, which includes county land planning. Funds for the revenue account come from 8.36% of the coal severance tax. The amount distributed to each county ranges from approximately $3,000 to almost $6,000 each year (EQC, 2000). Local governments may fund planning from the general fund. Revenue for the fund comes from property taxes. Under current law, local governments that have not allocated adequate funds to pay for planning have three options. They can reduce the general fund for another program and allocate money to planning, ask voters to approve an increase in taxes, or use revenue from any newly taxable property (EQC, 2000). Local governments that have established a planning board are authorized to assess a special levy for planning board purposes. The
maximum planning levy varies according to the class of the county or municipality and is specified by law (EQC, 2000). However, revenue for the general fund is limited because of a property tax freeze initiative approved by voters in 1986, and the amount of money raised with the mill levy alone may not be adequate for all of the planning expenses a local jurisdiction may need (EQC, 2000). These three forms of funds, while helpful, do not provide adequate funding for growth policies and other planning activities. More funding options are needed to encourage local governments to develop and implement good planning (EQC, 2000).

C. Lack of planning tools and support from the state

There are currently very few planning tools available to local jurisdictions. Many survey respondents expressed that there is a strong need for the state to enable new regulatory and incentive-based tools that local governments can use to manage and direct growth and open space preservation (Meek et al, 2001). However, many felt these tools should move away from regulation and towards a system that encourages good urban form and urban design (Meek et al, 2001). More incentives, such as tools that promote cluster development and infill should be considered (Meek et al, 2001).

There is also a limited capacity at the local level to undertake land use planning (MDOT, 2002). Other than funding, local governments have limited resources available to them as well as technical knowledge (MDOT, 2001). Many comments suggested that the state should be more helpful in providing data on ground water, transportation, and housing, as well as the many other aspects related to growth management and planning (Meek et al, 2001). Consultation on planning between the state and local government does not occur on a regular basis, if at all, and would be desirable (Meek et al, 2001). Also, there is currently no
state oversight when it comes to growth policies or subdivision regulations (Meek et al, 2001). A State Planning Department does not exist to make sure local governments are conforming to established growth policy, zoning, and subdivision legislation (MDOT, 2000).

5. Multi-jurisdictional coordination barriers

The surveys and reports also had a number of responses regarding multi-jurisdictional coordination. According to statements, there is a lot of distrust between city and county governments (Meek et al, 2001). Decisions made by a city can affect growth in the county and vice versa. In some areas of Montana there is little or no coordination between the city and the county (EQC, 1999). For example, even though Sweet Grass County wants to encourage growth around Big Timber, the two planning boards do not work together (EQC, 1999).

This lack of coordination is also evident between local jurisdictions and public land agencies. According to the public lands survey, the majority of respondents stated that their agency shares information most of the time or sometimes. When it came to city and county awareness of public land agency management issues, respondents claim that cities and counties are somewhat aware of adjacent public land agency management goals and objectives. Many respondents also stated that counties are approving development with no regard to public land agency issues and concerns. For instance, counties will close county roads reducing public access to public lands, approve subdivisions without considering public land agency management issues and concerns, and approve subdivisions without finding out if the Forest Service has approved access to those private land holdings. The extent that public land agencies knew about adjacent local government plans was also very minimal. While some public land agency managers may know which counties and cities have
growth policies, they have very little information regarding what is in the county and city
growth policies and planning agendas. Most respondents remarked with "I don't know" or
skipped the question when it came to discussing information about growth policies and their
content.

6. Distrust in government

Distrust in local government, and distrust in other residents and stakeholders can be
an enormous constraint on planning and ecological protection (Cullingworth and Caves,
2003). There are numerous issues involving distrust throughout the state of Montana. Take
Ravalli County for instance. Ravalli County is the fastest growing county in Montana,
according to the 2000 US Census. Concerned about the lack of planning and the amount of
sprawl occurring in the county, the planning staff has for years tried to create a
comprehensive growth policy (Grandstaff, 2001). However, they are finding such a task to
be a very arduous and pointless attempt. It isn’t from a lack of trying. It stems more from a
lack of cohesiveness in the community when it comes to growth planning (Grandstaff,
2001). According to the Ravalli County land services director, planning for growth in Ravalli
County has become a fractionalized affair. One group will form to work on the design of
Highway 93 through Florence, another for Stevensville, and still another for Victor. One
group concentrates on a bike path for Corvallis. One group wants to improve the Hamilton
airport; while at the same time another works to keep it the way it is. Still others, concerned
about the loss of farmland, form the Bitterroot Land Trust to establish conservation
easements (Grandstaff, 2001).

What these fractionalized groups all have in common is mutual distrust. There’s no
trust factor (Grandstaff, 2001). In particular, no one – not even groups that are traditionally
at odds with one another — trusts government. Even the government isn’t happy with the government, and the planning board and county commissioners are suspicious of each other (Grandstaff, 2001). According to comments made by the Ravalli County Land Service Director, the distrust runs so deep, that no one is willing to do the simple job of reviewing successful growth policies written by other Montana communities or elsewhere. There is the feeling that another county’s growth plan is suspect just because it was developed somewhere else (Grandstaff, 2001). Effective planning in Ravalli, therefore, may not be accomplished because of this lack of trust, personal politics, and the stubborn unwillingness to sacrifice anything for the sake of community (Grandstaff, 2001).

Progress Made So Far

These challenges and constraints, however, have not entirely kept ecological principles and approaches out of land use planning. Montana has made some headway when it comes to planning and the conservation of its natural systems. For instance, many of the faster growing counties with higher population densities have created growth policies and are attempting to manage for growth and ecological protection. As of 1996, more than 500,000 acres of private land in Montana have been protected through conservation easements acquired by land trusts as well as government agencies (EQC, 1999). These numbers are sure to have increased since that time. In Gallatin County 10 million dollars in bonds were approved to preserve farms, ranch land, and open space. The county plans to purchase the development rights on 12,000 to 18,000 acres of land (Hollis and Fulton, 2002). Also cities like Helena and Missoula have each passed open space bonds in excess of five million dollars (Hollis and Fulton, 2002).

A number of counties have also been working to protect their wetlands, waterways,
and riparian areas. Big Horn County is writing a permanent regulation that will provide the most comprehensive protection for waterways and riparian areas in Montana. It would require a 300-foot construction setback along 9 watercourses within the county. In areas where the floodplain extends beyond 300 feet, the setback will be extended another 100 feet (MSGC, 2005). Chouteau and Powell Counties have also created development regulations. In Chouteau County, 70 miles of river frontage are protected with construction setbacks ranging from 3 miles to 400 feet, with residential densities not exceeding one unit per 8 acres (MSGC, 2005). Powell County has a floodplain overlay district in which construction is prohibited within 75 feet of the Blackfoot River and its floodplain. All residential, commercial, and industrial structures are prohibited within the floodplains of the Clark Fork and Little Blackfoot Rivers (MSGC, 2005). Floodplain regulations in both Missoula and Ravalli Counties prohibit new construction of residential, commercial, or industrial structures within the floodplain. Any alterations or improvements to existing structures within the floodway or floodway fringe require a permit, and other land uses within the floodway and floodway fringe are regulated via a permit system (MSGC, 2005). However, floodplain regulations in Missoula and Ravalli are mainly designed more for natural hazard mitigation rather than watershed preservation.

While the protection of wetlands, waterways, and riparian areas is becoming more of a concern for many counties, wildlife and wildlife habitat protection has not come as far. There are, however, a few counties in Montana that are trying to make a difference in this regard. In Powell County, development regulations designate an “Important Wildlife Area Overlay District”. The district is defined by mapped areas, based primarily off of elk winter ranges, and restricts residential densities for new development to one unit per 80 acres (MSGC, 2005). Infill development in existing residential areas is excluded from the
regulation. Maps of the winter ranges of several other species for the county are also on file. The Middle Cottonwood and Hebgen Lake Zoning Districts in Gallatin County are also working to protect wildlife by using incentives (e.g., transfer of development rights and density bonuses) to create better development patterns and protect wildlife habitat and migration corridors (MSGC, 2005).

The state of Montana has also made some progress when it comes to planning and ecological principles. Besides tools like the environmental assessment, which attempts to consider the natural ecosystem, there are also programs dealing with floodplain and floodway management. These programs are administered by the Department of Natural Resource and Conservation. Under section 76-5-301, local governments must adopt land-use regulations that meet or exceed minimum standards of DNRC in regards to controlling development in the designated floodplain or floodway. If the local government fails to adopt such land-use regulations, DNRC must enforce its own minimum standards through a state permit system (Meck et al, 2001; Montana State Legislature, 2003).

The State of Montana also requires that the Department of Commerce be involved with land use planning in the state. Section 90-1-102 of the Montana code states that the Department of Commerce will make economic and social studies needed to accomplish planning throughout the state, and to coordinate and assist regional development groups in the comprehensive development of the resources of the region (Montana State Legislature, 2003). The department is required to assemble and correlate information for the purpose of creating long-range plans for economic and resource development of the state and its subdivisions. It is also mandated to apply for, accept, and administer grants from the federal government and other public or private sources to accomplish the objectives of planning. The department is also required to serve as the consultative, coordinating, and advisory
agency for state departments, officials, and agencies in state planning, and for encouraging and aiding local planning bodies. This is done either directly or by securing planning assistance, consulting services, and technical aid that may include demographic, economic, and land use studies and surveys and comprehensive plans (Meek et al, 2001; Montana State Legislature, 2003).

Regarding community development, the Department of Commerce, under 90-1-103, is to cooperate with and provide technical assistance to county, municipal, state, and regional planning commissions, zoning commissions, community development groups, recreation boards, community action agencies, and similar agencies (Montana State Legislature, 2003). The Department of Commerce is also to serve as a clearinghouse for information, data, and other materials that may be helpful or necessary to local governments in order to fulfill their responsibilities. The Department is to provide information on available federal and state financial and technical assistance, as well as carry out continuing studies and analyses of the problems faced by communities within the state. It is then required to develop recommendations for administrative or legislative action as appear necessary. It must also administer the federal community block grant program and adopt rules to implement the program (Meek et al, 2001; Montana State Legislature, 2003).

Besides land-use statutes, there are a few conservation-orientated programs that have been implemented by the state. Montana does not have any open space conservation programs. It does, however, have an agricultural conservation easement program, called the Agricultural Heritage program, which was initiated in 1999. In its first two years around $0.9 million in state funds were used to purchase easements on 9,923 acres of farmland (Hollis and Fulton, 2002). This type of program could prove very useful in future land-use planning, especially with the growing concern that has emerged in recent years about conserving open
space. Besides the agricultural conservation easement program, the Montana Department of Natural Resources and Conservation provides renewable resources grants and loans to local governments throughout the state. Funding is around $400,000 per year (Hollis and Fulton, 2002; Montana DNRC, 2005). In November of 2000, Montana approved one state bond for open space funding.

POTENTIAL STRATEGIES AND RECOMMENDATIONS FOR LAND USE PLANNING WITHIN AN ECOLOGICAL FRAMEWORK

It is apparent that Montana and many of its local communities are making some progress when it comes to planning and the protection of natural systems. However, current planning barriers and constraints continue to encourage urban sprawl and a depletion of agricultural land and wildlife habitat (Meek et al, 2001). Many communities have acknowledged these planning constraints and are attempting to do something about them. But the protection of Montana’s ecological systems, as well as effective planning throughout the state, cannot be done through a patchwork of inconsistent plans. There needs to be a new direction for land use planning in Montana.

So what is possible? How can many of these constraints and barriers be lifted? And, how can important ecological principles be incorporated to create a better planning framework to manage growth, take into consideration important socioeconomic and institutional perspectives, and contribute to the protection and management of the ecological systems Montana depends on? This section will present possible recommendations and steps that the State of Montana and its local jurisdictions should consider in regards to the direction land use planning should go. These suggested steps are based on an extensive literature review and recommendations from both the American Planning Association and
public land agency surveys. They emphasize an ecological point of view, promoting the participation and dedication of the state, local jurisdictions, as well as the public land agencies to create a planning framework in which local communities and ecological systems combine into a joint interactive network.

This section will first focus on the role of the State of Montana, and steps the state may consider in order to eliminate many of the challenges and constraints affecting land use planning, as well as how it may incorporate ecological principles to facilitate better planning and ecological protection. Secondly, this section will look at possible steps local governments can make in their land use planning practices, as well as ways to accommodate public land agencies. And third, the possible roles that public land agencies can play to facilitate better planning in adjacent cities and counties will be discussed.

The Role of the State of Montana

Incorporating an ecological approach to land use planning involves taking a broad landscape-scale perspective. It requires looking at the entire ecological system in order to manage and protect it more effectively (Meffe et al, 2002). With such a broad approach comes a greater variety of parties and interests. Local governments may lack the inherent ability to address these larger environmental perspectives and the wider range of interests, needs, and abilities that a larger governmental body, such as the state, may be able to undertake. (Cullingworth and Caves, 2003). Incorporating ecological principles and removing many of the constraints to effective planning and ecological protection, therefore, should begin at the state level.
A State Growth Policy

The first possible step entails creating a land use planning growth policy for the state of Montana. Given the often-narrow view of local governments, there exists a need for a larger framework of responsibilities within which local governments should operate (Cullingworth and Caves, 2003). Significant progress in land use planning, as well as protection and management of ecological systems at the local level, may be possible if a clear, well structured, state land use planning growth policy is established to guide the state of Montana and its local governments. It provides goals and objectives that have to be followed, and it also helps to ensure that a level of consistency is established among all local governments (Cullingworth and Caves, 2003). For instance, states like Oregon and Florida have both recognized the need for growth management and land conservation. Each has established legislation that define state land use planning goals and objectives that would be achieved through required comprehensive planning at the city and county levels (Cullingworth and Caves, 2003).

Montana’s land use growth policy could contain detailed statewide goals and objectives that focus on topics ranging from housing, transportation, conserving agriculture land, citizen involvement, as well as other land use planning related subjects. Several of these land use planning goals and objectives could focus on maintaining, protecting, and improving the state’s natural and managed ecological systems to remain viable and healthy indefinitely. These goals and objectives could promote the non-degradation of natural systems, and involve people in environmental stewardship. Goals that emphasize biodiversity, maintaining the integrity of ecological processes, and preserving Montana’s rural culture could also be considered.

Once the goals and objectives portion of the state growth policy is established, then
tools, policies, and strategies that incorporate these ecological goals and objectives can be identified. For instance, growth policy and subdivision regulation requirements, land acquisition strategies, state environmental education strategies, pollution prevention, multi-jurisdictional participation, public collaboration, and monitoring and evaluating strategies can be established (Berke et al, 1996; Malone, 2000).

*Mandatory Local Growth Policies*

One of the main barriers, according to Elmendorf and Luloff (1999), that keep local governments from incorporating ecological approaches into land use planning is state legislation that enables but does not require local governments to develop comprehensive plans. Therefore, under an established state growth policy, the next possible step Montana can take is to develop and implement a state mandate that requires all local jurisdictions — cities and counties — to establish planning boards and prepare, adopt, implement, and follow a high quality legally binding growth policy that is consistent with the goals and objectives of the state growth policy. Local jurisdictions could also be required to plan and manage for growth, and create an official map that designates ecological areas that could be protected as well as areas for later public improvement and use (Meek et al, 2001). The state could require that all growth policies be reviewed for consistency with state goals, and local governments could be directed to evaluate their growth policy and land-use planning regulations on a periodic basis and revise them if necessary.

Studies have clearly indicated that local governments are more likely to prepare comprehensive plans and implement planning when mandates are present, than when states leave plan preparation and adoption to the discretion of local jurisdictions (Berke et al, 1996). It was also found that local plans prepared under state planning mandates are of
higher quality than plans produced under no mandate, and tend to have stronger fact basis, goals and objectives, and stronger planning policies (Berke et al, 1996). Ecological issues stemming from growth pressures, developers, economic expansion, and political opposition can also be more significantly overcome by the presence of a mandate (Degrove, 1992; Berke et al, 1996). Appropriately designed and implemented state mandates can implant local planning where it would otherwise not take place and change the structure and content of local plans for the better.

Part of the mandate could include a growth policy section on protection and management of ecological systems. The state could set minimum requirements and local governments could then opt to enact more stringent standards in their growth policy. Specific elements that could be required in this growth policy section include: multi-jurisdictional coordination, coordination and collaboration with the public and other stakeholders, and planning approaches based on ecological boundaries (Brody, 2004). The section may also contain policies that address protection of critical habitat such as wetlands, riparian areas, forests, grasslands, watersheds, as well as any other critical habitat comprising broader ecological systems (Arline, 1999).

A second option to this suggested step would be to mandate that urbanized or rapidly growing counties and cities create and implement planning boards, official maps, and growth policies with a section on protecting ecological systems. In rural or slow growing counties only certain elements of the mandate would be required (Meck et al, 2001). Montana's population growth is not balanced between the east and west. Many counties and cities, particularly in Central and Western Montana, are growing at a rapid rate, while others are growing very slowly or have declining population rates. So, while land-use planning mandates are important for all local governments, it may be difficult for poorer rural
jurisdictions to participate if more standards or mandates are applied (Meck et al, 2001). The following is an example of how this approach could work.

A growth policy mandate could require that all local governments — cities and counties — establish a planning board. A planning board can be an essential tool to govern growth, implement subdivision regulations, promote the protection and restoration of natural systems, and help guide the development patterns within that jurisdiction. Counties and cities will also still be mandated to create and implement subdivision regulations. However, this is where the similarities end.

Inspired by the Washington Growth Management Act (Washington State Legislature, 2005), counties that have a certain minimum population, or counties that have had their population increase by more than the Montana state growth rate over a ten year period, with the growth rate resulting in an absolute change of so many people, would be required to implement all elements of the mandate. Cities within those counties would also have to implement all requirements. These decisive numbers that would designate a county would be determined by the state.

Counties and cities that do not fall under the above criteria would be required to establish a planning board and subdivision regulations, as well as do an inventory of existing characteristics and features of the jurisdictional area. Areas to inventory could include: land uses, population, housing needs, economic conditions, local services, public facilities, natural resources, important ecological areas such as riparian areas and wildlife habitat, and other characteristics and features proposed by the planning board. Requirements like these are put in place in order to help guide any development that may occur in the county or city, and to help avoid any ecological losses. The State, however, could encourage and assist rural and slow growing counties and cities to create growth policies and official maps. Providing
incentives such as funding, education, and technical support could be a great way to encourage such planning practices (Meek, et al, 2001). Slow growth that is poorly planned can have the same effect on an area in twenty years that ten years of poorly planned rapid growth can have. It is better that even slow growing and rural counties take a proactive stance instead of having to take a “damage control” approach in the future (Brody et al, 2004).

Help Build Local Capacity To Achieve State Goals

In order for local governments to follow, or be encouraged to follow these mandates, and in order to make the implementation of ecological principles into local land use planning simpler, the State of Montana needs to help build local capacity to achieve state goals like growth management and ecological protection. Most local governments in Montana lack a planning board or have very small boards with limited expertise and resources (Meek et al, 2001). Building local capacity to plan can be done through well developed state financial, technical, and educational assistance, and well as new enabling incentive and regulatory tools for growth management and conservation (Berke et al, 1996).

1. Funding

One main suggestion that survey participants had in the American Planning Association survey, was that the state of Montana needed to provide funding and grants for planning or give local jurisdictions the authority to generate funding in order to prepare growth policies and to be effective in land use planning (Meck et al, 2004). Funding would also be critical in order for local governments to protect and manage natural systems found
within and adjacent to their jurisdiction, now and in perpetuity. Other than the CDGB grant, bonds and local property taxes, there are a number of different ways to generate funds. The first could be to authorize local governments to generate funding through local option development excise taxes. Development excise taxes are similar to impact fees, but the public must approve them, and the level of the tax does not have to bear any relationship to the cost of providing services to the development (Snyder and Bird, 1998). Other options might include clearly authorized impact fees, local option sales tax, or a pollution tax. State level or local option real estate transfer taxes could also be authorized to generate funds (Meek et al, 2001). A real estate transfer tax is assessed on real property when ownership of the property is transferred between parties. These types of taxes are used in many areas to fund programs designed to preserve rapidly depleting open spaces in commercial or residential areas (Cordero, 2005).

2. Technical support and education

In regards to technical assistance, the state has already authorized the Department of Commerce to cooperate with and provided technical assistance to counties and cities. However, the Department of Commerce deals mostly with economic and social issues. There is little technical support provided to cities and counties regarding ecological components and natural systems. There are also very few education programs established to teach planners about growth management, ecological systems and their processes, and how these systems are impacted by growth (Meck et al, 2001).

Better legislation and programs could therefore be established by the state to educate local governments and their planning boards on ecological concepts and planning theories (e.g. smart growth and green infrastructure), help educate citizens on such perspectives, and
provide a broader range of technical assistance (Meck et al, 2001). This assistance could involve encouraging the use of Geographic Information Systems (GIS). GIS helps planners not only understand where critical ecological areas are, but also the degree to which they are in need of protection. As an analytical tool, GIS helps project the future and enables planners to make proactive choices about the management and protection of existing natural systems. GIS can serve as an educational tool by explaining complicated problems to planning participants who are not technically orientated (Brody, 2003). Making data layers in several formats easily available for local governments to download should be an important step in technical assistance.

3. Incentive and regulatory tools

Local governments cannot manage for growth or protect and manage ecological systems without the tools to do so. Therefore, The state could create and approve legislation that authorizes a myriad of innovative tools that would allow cities and counties to expand their growth management and ecological protection tool box, and promote strategies and tactics that are designed to overcome resistance to change within legal limits and peaceful practice (Friedmann, 1993). Every community is different, with varying circumstances and planning cultures. A number of different tools are therefore needed to accommodate different local jurisdictions and their strategies for planning and ecological conservation.

These innovative policies and tools can be authorized by the state in specific statutes and then either, one, require that the Department of Commerce develop model ordinances that local governments in Montana could adapt for their own use, or, two, just sufficiently describe and detail the tool or approach in the statute so it would not be necessary to develop a model ordinance (Meck et al, 2001). Table 11 gives a number of possible growth
management and open space/conservation tools that could be authorized. They include land acquisition, regulatory, and incentive based tools, all of which have a specific purpose and can be very effective in the management of growth and protection of Montana's natural systems.

<table>
<thead>
<tr>
<th>Tools for managing urban growth</th>
<th>Tools for protecting open space and the natural systems</th>
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<tr>
<td><strong>1. Public acquisition</strong></td>
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<tr>
<td>• Fee simple purchase to create public ownership of parks, recreation areas, forests, wildlife refuges, wilderness areas, greenways, or environmentally sensitive areas.</td>
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<td><strong>2. Regulation</strong></td>
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<td>• Rate of growth controls, growth-phasing regulations</td>
<td>• Subdivision exactions</td>
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<td>• Development moratoria, interim development regulations</td>
<td>• Cluster zoning</td>
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<td>• Adequate public facility ordinances</td>
<td>• Conservation zones/overlay districts</td>
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<td>• Up-zoning or small-lot zoning, minimum density zoning</td>
<td>• Buffer requirements</td>
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<td>• Greenbelts</td>
<td>• Buffer overlay zones</td>
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<td>• Urban growth boundaries</td>
<td>• Subdivision standards</td>
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<td>• Urban service boundaries</td>
<td>• Building and set back standards</td>
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<td><strong>3. Incentives</strong></td>
<td><strong>3. Incentives</strong></td>
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<td>• Development impact fees</td>
<td>• Restrictions on exotic plants and removal of native vegetation</td>
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<td>• Development impact taxes, real estate transfer taxes</td>
<td>• Down-zoning or large lot zoning</td>
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<td>• Infill and redevelopment incentives</td>
<td>• Exclusive agricultural or forestry zoning</td>
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<td>• Split-rate property tax</td>
<td>• Mitigation ordinances and banking</td>
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<td>• Location efficient mortgages</td>
<td>• Concentrating rural development</td>
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<td>• Historic rehabilitation tax credits</td>
<td>• Non-transitional zoning</td>
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<td>• Brownfield redevelopment</td>
<td><strong>3. Incentives</strong></td>
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<td>• Incentives for cluster developments</td>
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<td>• Density bonuses</td>
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<td>• Mitigation banking</td>
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<td>• Right-to-farm laws</td>
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<td>• Impact fee waivers</td>
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<td>• Agricultural districts</td>
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<td></td>
<td>• Transfer of development rights</td>
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<td>• Purchase of development rights, conservation easements</td>
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<td>• Property tax relief for conservation easements</td>
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<td>• Use-value tax assessment</td>
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Public acquisition of land to manage growth and protect open space and natural systems requires that the city or county purchase the land and place it in public ownership. This can be done with excess funds the city or county may have, or through the use of bonds specifically established to preserve open space or critical ecological areas. It also helps to shape growth patterns and growth management by protecting certain areas from being developed and pushing growth into areas that are less critical ecologically (Bengston et al, 2004).

Regulatory approaches most often restrict a certain activity in a specified area. There are a plethora of different tools that can be used in order to manage growth and protect ecological systems. A development moratorium is a growth management policy, which places a prohibition on the issuance of building permits. It is often used in rapidly growing areas to buy time needed for planning long-term solutions. Growth-phasing programs only allow a certain amount of building permits in a given year, while greenbelts, urban growth boundaries, and urban service boundaries are all types of urban containment policies (Bengston et al, 2004). Zoning tends to be the core technique used most often for growth management and ecological protection, it includes regulations on the increase or decrease of development density, cluster developments, conservation zoning districts and overlays, or forest and agricultural zoning (Bengston et al, 2004).

Incentive-based approaches involve distribution or withholding of monetary or non-monetary material resources in order to alter behavior (Bengston et al, 2004). The distinctive characteristic of incentive-based approaches is that no one is obligated to take a particular course of action. It is voluntary. There are a number of incentive based approaches for managing growth and protecting open space and natural systems, as shown in table 11. Development impact fees are used to help finance off-site impacts and infrastructure costs of
development, but they can be used to encourage more efficient development patterns by discouraging development through higher impact fees or lower impact fees depending on the area. Infill and redevelopment incentives help direct development into areas that have already been developed by using subsidized land costs, tax exemptions or reductions, improvements to infrastructure, reduction of development fees, and low interest loans (Bengston et al, 2004). Transfer of development rights and purchase of development rights are based on the idea that ownership of land involves a bundle of rights. The transfer of development rights allows the sale or transfer of development rights from one land parcel in order to increase development on other properties. Future use of the original parcel is then protected from development by means of a deed restriction or a permanent conservation easement. In the purchase of development rights, the landowner voluntarily sells the development rights but retains title to the land. A conservation easement is than used to protect the land (Bengston et al, 2004). Use-value tax assessment, on the other hand, provides landowners with an incentive to maintain their land in its current use rather than sell it for development. In this incentive, land is taxed at a lower forestry or agricultural value rather than the higher values associated with developed uses (Bengston et al, 2004).

A State Planning Department

The final step regarding the state of Montana’s role could be to create a state level Land Use Planning Department for the state. This planning department could be an independent body in charge of maintaining the state growth policy. The department may develop state goals, create plans, and establish broad based support for planning, growth management, and conservation of Montana’s ecological systems (Meck et al, 2001). It could serve as a consultant on planning matters between the state and local governments, offer
educational seminars for planning boards, and provide technical assistance. The department could review growth policies for consistency with state goals, and enforce any state mandates and guidelines, possibly withholding state funds from local governments that fail to abide by mandate requirements (Nelson, 1999). The Land Use Planning Department could also be responsible for periodically reviewing the state growth policy, as well as requiring and making sure that local governments evaluate their growth policy, land-use regulations, and ecological conservation strategies on a periodic basis (Meck et al, 2001).

Creating a state land-use planning framework, requiring mandatory land-use planning policies, providing funding and technical assistance, and establishing a state planning department are just a few of the suggestions that may help improve planning, growth management, and protection of the natural systems here in Montana. When local governments are provided guidelines from a state planning framework, provided support by state enabling legislation, grants and funding options, environmental and land-use education, technical assistance, and a planning department to give direction, improved planning and ecological protection will become more realizable (Elmendorf and Luloff, 1999).

The Role of Counties and Cities

An ecological approach to planning and the implementation of ecological principles is especially critical at the local jurisdictional level, because the vast majority of factors affecting natural systems, such as rapid urban development and habitat fragmentation, or wildlife protection and habitat restoration, occur at the local level and are created by local land use decisions (Brody, 2003). That is why it is important that thoughtful policies and actions, that incorporate ecological principals, be implemented into local level planning. So, while protecting and managing ecological systems may require a state planning framework,
focusing on broad spatial scales and multiple jurisdictions, it is better planning policies at the local level that will be the most essential. To think big, planning must start small (Brody, 2003).

There are a number of steps local jurisdictions can take to incorporate ecological approaches and principles into land use planning. Most of these suggestions will revolve around growth policies. This is because growth policies are the framework that provides the vision and direction for all land use planning decisions in a given jurisdiction, and are an important tool for accomplishing the goals of ecological protection and management. Growth policies mark the starting point for specific ordinances, land development codes, and environmental policies (Brody, 2003). The structure and guidelines established in a growth policy can have a significant effect on zoning, subdivision regulations, and other land use planning policies. However, before suggested steps for growth policies can be discussed, recommendations for planning boards and collaboration with the public and stakeholders must be addressed.

Planning boards, local residents, and stakeholders can all have a significant influence on growth policies as well as other planning ordinances. A planning board can be an essential tool to govern growth. They develop and implement the growth policy, establish and enforce subdivision regulations, review subdivision proposals, promote the protection and restoration of natural systems, and help guide the development patterns within that jurisdiction. Collaboration among local residents and stakeholders is also important to alleviate distrust, instill knowledge in residents and stakeholders, and create plans that everyone can agree on. Growth policies along with other planning strategies should not be established without the consensus of the community and involved stakeholders.
Planning Boards

A planning board's role is to improve the present health, safety, welfare, and convenience of their citizens, and to plan for the future development of their communities (Montana State Legislature, 2003). In order to fulfill this role, they need to have knowledge and expertise in a variety of different subjects (e.g. planning, collaboration, land use planning law). However, in order for ecological principles to be implemented into land use planning, an understanding of natural systems and the processes that sustain them should also be required of planning boards (Palmer et al, 2004). Having an awareness of how a given plan or strategy protects or impacts an ecological system can help planners and decision-makers be more precise and effective in their efforts to promote ecologically sustainable approaches to development.

Encouraging the state of Montana to establish education programs is one way to achieve this requirement. However, local governments can also do their part by filling planning board positions with professionals who have the knowledge and expertise, or by establishing training and continuing education requirements for members of the planning board. Education subjects could include: growth management, conservation easements, citizen participation and citizen driven planning, incentive strategies to preserve open space, ecology, biology, forestry, the integration of scientific information into growth policies and management plans, the fiscal impacts of various forms of development and land-use, as well as any other ecological approaches to planning (Hansen et al, 2002).

Effective Collaboration

Under an ecological approach to land use planning, one vital component is the involvement of people at all levels. Ecological systems are dynamic and diverse, as are the
social and economic components that exist in these systems (Meffe et al, 2002). Therefore, a
diversity of solutions and inputs, as well as a sufficiently sound basis of agreement, are
necessary for better more effective planning to be possible (Cullingworth and Caves, 2003).
This can be done by going well beyond the narrow interests that typically dominate land-use
planning and bringing in a broad range of potentially affected populations into the process
from the very beginning, making this involvement a cornerstone of planning (Friedman,
1993; Murry, 1995; Cortner and Moote, 1999; Meffe et al, 2002; Bengston et al, 2004).
Citizen and stakeholder involvement can generate a plethora of information, as well as promote understanding and agreement on issues and the various ways of solving them (Meffe et al, 2002). Collaboration can reduce the potential for latent groups who oppose proposed policies to unexpectedly emerge at the last moment. It can ease the formation of coalitions and social networks that can expedite community action and make plans a reality (Cortner and Moote, 1999). Collaboration can empower the public by transferring a good portion of the power to citizens and giving them a sense of ownership of planning proposals (Cortner and Moote, 1999; Burby, 2003). It can also help to educate. Planners, citizens, stakeholders, involved agencies, project scientists, and organizations can all learn from one another. Many citizens are poorly informed about land use planning, ecological processes, and the impacts of growth and urban development. Professionals in planning and science can make information available to citizens and teach them about why approaches that manage and protect ecological systems are so important for communities (Meffe et al, 2002). Citizens can also educate planners, agencies, and scientists on current local situations, concerns, and any other relevant local knowledge (Slocombe, 1998; Hansen et al, 2002). Through education, people learn to overcome conflict and their fear of those different from themselves. They also learn that their self interests are often similar to others and that all are
trying to reach a common good (Cortner and Moote, 1999; Meffe et al, 2002).

Therefore, local governments could create a strategy for collaboration that defines the role of citizens and stakeholders in the planning process, details collaboration guidelines, as well as different types of collaboration methods. Collaboration with local citizens and stakeholders could be required throughout the entire creation of the growth policy, the design and implementation of any strategies and policies, subdivision regulations, zoning, and any other projects that will be implemented based off of the growth policy. By completing this task, cities and counties indicate that they have made the commitment to public involvement in the land-use planning process.

The following are a number of collaborative methods that can be used by local jurisdictions to implement public participation. Planners can promote greater participation by ensuring that citizens' and stakeholders' contributions are meaningful. This can be done by providing information about problems and alternative ways of solving them, and by providing opportunities for dialogue among citizens and between citizens and planners (Burby, 2003). Methods that allow for education and public dialogue include: focus groups, workshops, charrettes, displays and exhibits at local events, planning teams, town meetings, and public meetings (Elmendorf and Luloff, 1999; Meffe et al, 2002). Local jurisdictions can also use empowerment techniques including: committee work, participatory research, education, and volunteerism to increase the quality and effectiveness of the planning process (Elmendorf and Luloff, 1999). These methods, while all very useful, may not necessarily work for all communities. Local governments should employ a variety of specific methods based on their community and its planning issues and needs.
Because growth policies are the framework that provides the vision and direction for all land use planning decisions in a given jurisdiction, in order for land use plans and strategies to actually work well, a local government’s growth policy needs to be effective. To make growth policies successful, they need to be proactive, helping communities lay out their vision of development patterns, growth, and ecological conservation initiatives well into the future (Brody et al, 2004). They need to be more than a casual document. Growth policies need to be specific and precise, having a lasting and positive relationship to land-use decisions. Berke et al. (1996) agree, finding that clearly defined goals and objectives, strategies and tools, implementation, and monitoring processes were a strong predictor of local success in planning for growth and in managing and protecting ecological systems. Because of Montana’s current vague guidelines for growth policies (Meck et al, 2001), local governments have the opportunity and are encouraged to create a more stringent highly detailed policy framework from which all planning decisions and strategies can take place. Local governments could also consider adding additional elements to their growth policy beyond what is expected. The final criterion found in the growth policy legislation states that a planning board may propose, and the governing bodies may adopt, additional elements of a growth policy in order to fulfill the purpose of the growth policy chapter (Montana State Legislature, 2003). Such elements might include, if not already mandated by the state of Montana as one of their suggested steps, a section on the protection and management of the ecological systems found within and adjacent to jurisdictional boundaries.

This conservation section could recognize ecological systems and their value by emphasizing the protection and management of open space and natural systems. It could promote and implement principles like: ecological integrity, holistic integration of science,
data collection and education, ecological boundaries rather than jurisdictional, diversity and connectivity, socially defined goals and objectives, multi-jurisdictional cooperation, nature in humanity, empowerment and inclusiveness of people, the integration of socioeconomic and institutional perspectives into the ecological, and monitoring and evaluation (Cortner and Moote; 1999; Elmdorf and Luloff, 1999; Meffe et al, 2002). Using collaboration throughout the entire process with residents, stakeholders, and public agencies, a framework could be created that would include: factual basis and inventory, community defined goals and objectives, inter-jurisdictional coordination and capabilities, strategies and tools, implementation, and monitoring and evaluation (Meffe et al, 2002; Brody, 2003). This suggested framework can also be used when developing the social, economic, and institutional components of the growth policy and carrying out the many requirements found in the Montana's growth policy legislation.

1. Inventory and factual basis

The inventory and factual basis step of the conservation section reveals the ecological components and processes that exist within the jurisdiction as well as outside its boundaries. It also helps to recognize what the possible future trends and impacts may be. This step helps identify potential places in the landscape that could be best suited to either ecological or socioeconomic objectives, and provides an informational base upon which goals and policies rely (Hansen et al, 2002; Meffe et al, 2002, Brody, 2003). This step must consider the many socioeconomic and institutional impacts on natural systems and ecological services, as well as the human needs and expectations of ecological systems (Szaro et al, 1998).

A possible way to complete this step is to first, do a data collection and inventory for
all ecological components both within and surrounding jurisdictional borders. This includes inventorying existing data sets and then collecting necessary data that is missing. Data can be placed in one of three categories: ecological resources, ownership patterns, or human impacts and influence (Mazzotti and Morgenstern, 1997; Brody, 2003). Second, the projected impacts, where applicable, should be assessed. Third, data and inventory should be expressed in both written and visual forms (Brody, 2003).

When doing the data collection and inventory, information can be placed in one of three categories. The ecological resource category may include: gathering data of watershed boundaries, habitat boundaries, classifications of wildlife and vegetation, threatened and endangered species, invasive and exotic species, identification of critical habitat, description of ecological functions and important ecological services, areas of high biodiversity, critical corridors that facilitate the movements and migration of key species, hazardous fire areas, scenic areas, river and riparian corridors, recreational resources, productive forest resources, special and unique landscapes, wetlands, groundwater resources, floodways and floodplains, vulnerable landscapes and soils, moderate and steep slopes, and viewsheds (Elmendorf and Luloff, 1999; Brody, 2003; Brody et al, 2004; Palmer et al, 2004).

The human ownership category characterizes the existing management and ownership of all lands within the jurisdiction as well as lands extending beyond the jurisdictional border. In order to identify new lands for protection and where to direct growth, knowledge about current ownership and management agencies should be obtained (Brody et al, 2004). This could include: mapping ownership of all private land, adjacent jurisdictions, mapping areas in conservation easements and permanent ecological protection, public lands, as well as the network of public and conservation lands. Management status identification for conservation areas and public lands should also be obtained (Brody, 2004).
The third category is human impacts and influence. This category identifies natural resource problems generated from human development, and identifies community values regarding ecological protection and management (Brody, 2003). Data collected under this category may include: the development of wetlands, water pollution, loss of fisheries and marine habitat, road density, alteration of waterways, habitat fragmentation, existing environmental regulations, and what factors are contributing to the impoverishment of natural systems. Community, corporate, and institutional values regarding ecological systems, and expectations of the public concerning conservation and development of natural systems should also be identified (Mazzotti and Morgenstern, 1997; Brody, 2003; Palmer et al, 2004). By identifying the human caused ecological impacts and any environmental values the community has, local governments demonstrate the degree in which they are aware of ecological problems and community needs, and their desire to improve existing conditions and implement community values into the planning process (Brody, 2003).

The next two stages in the factual basis and inventory step involve projecting impacts and trends and displaying data and inventory in written and visual forms. Future trends should be determined for the life of the growth policy and can include: future land uses, natural resources use, future ecological impacts, wildlife population trends, or recreation and tourism trends. Tools such as field studies, remote sensing, global positioning and geographic information systems, and computer simulation models can be powerful tools for ecological and land-use assessment (Mazzotti and Morgenstern, 1997; Hansen et al, 2002; Brody, 2003). By using these types of tools, maps and reports can be produced that identify critical wildlife habitat, corridors, linkages, wetlands, and other important ecological areas.
2. Community defined goals and objectives

After the factual basis and inventory has been completed, the next step of the conservation section is establishing community defined goals and objectives. This section will help guide the direction of management and protection of ecological systems by setting a future condition in which the local community aspires (Meffe et al, 2002). It reflects the values of the city or county, contains the statements that become catalysts for action, and helps to prioritize issues and problems that the community is faced with (Meffe et al, 2002; Brody, 2003, Brody et al, 2004). A goal is a general description of what the county or city seeks to accomplish and wants to emphasize (Meffe et al, 2002). They are visionary, general, and qualitative. Goals, however, are not designed to be achieved. Instead they express intention and point the direction. They do not define the route (Meffe et al, 2002). They are also important in providing a standard for measuring success, and as a scale for balancing competing demands on a particular resource (Mazzotti and Morgenstern, 1997). Objectives, on the other hand, are created from goals and are measurable, quantitative, specific, and designed to be achieved (Meffe et al, 2002; Brody, 2003). Through community and stakeholder input, ecological goals and objectives should be created for the jurisdiction as well as the extended area around the jurisdictional boundary. The integration of social, economic, and institutional perspectives into ecological goals and objectives should be a priority.

When defining the goals and objectives, goals should be clear, concise, and well-defined. Goals for ecological protection should be spatially specific and prescriptive and provide more detail than vague commitments to preserving and sustaining natural systems. Well defined goals are more likely to protect the functionality of these systems, as well as their unique landscapes and rare species (Brody et al, 2004). Goals under an ecological
perspective should also imply and reflect specific values and limits. They should reflect the wide range of values that exist, accept and recognize the inevitability of change, synthesize a wide range of information and knowledge, and be tentative and evolving as conditions and knowledge change (Slocombe, 1998). For example, goals might include: “to manage and enhance viable native ecological communities to protect the functions of natural systems and the diversity of native plants, animals, and fisheries, particularly those endangered or threatened” (Brody, 2003), or “to maintain or restore the composition, structure, and function of the natural ecosystem for long term sustainability, while integrating and accommodating the social, economic, and institutional components” (Meffe et al, 2002).

Objectives should be specific and contain explicit measures and targets in order to actualize broad statements and strengthen the ability of local plans to protect and sustain ecological systems. Objectives should be SMART, meaning they are *specific* and thoroughly define a positive change that can be made. They are *measurable* and quantitative, providing a way to measure if an objective has been achieved. It also means objectives are *accountable*, stating that the local government and the planning board have accepted responsibility for addressing objectives and doing the work. They are *realistic*, having a reasonable possibility of happening and are within the planning board and local governments sphere of responsibility or influence, and they are *time fixed*, stating when it will be done as well as intermediate deadlines or milestones (Meffe et al, 2002). Examples of ecological objectives, based off of the above stated goals, would be: “maintain 70 percent of wildlife habitat within the local jurisdiction,” or “a 30 percent reduction in nutrient run-off to reduce impacts on aquatic systems.”

It is important in the development process to ask a number of questions about what the community values and where they want the future direction of their city or county to go
What ecological services (e.g. clean water, clean air, recreation) does the community value? What ecological components (e.g. wildlife, forests, wetlands, riparian areas) does the community want to maintain? How should the community grow economically while sustaining ecological systems? Is ecological sustainability important? These are all questions that should be considered. This type of data gathering can be done in the factual basis and inventory step of the conservation section and then further examined in the goals and objectives stage.

3. Multi-jurisdictional coordination

When the goals and objectives have been established, the next step in the conservation section involves multi-jurisdictional coordination. Natural systems cannot be conserved across jurisdictional lines without cooperation from multiple jurisdictions and planning agencies (Elmendorf and Luloff, 1999). Counties and cities are already required to create a statement of how they will coordinate and cooperate with other jurisdictions. They must explain how the governing body will coordinate and cooperate with the county, if they are a city or town; how the governing body will coordinate and cooperate with cities and towns, if they are a county (Montana State Legislature, 2003). However, specific details on how local jurisdictions will cooperate with other agencies (e.g. federal and state land agencies) are needed.

Ecological systems do not adhere to local jurisdictions and land ownership, and the policies of a jurisdiction affect and are affected by the policies of other communities, counties, and agencies. Therefore, ecological protection, and management of natural systems should be considered a boundary spanning issue and not isolated to individual jurisdictions (Benedict and Mchahon, 2002). Planning and coordination should be considered on a larger
landscape scale, based on ecological systems or watershed boundaries and not on human
defined boundaries (Slocombe, 1998; Benedict and Mchahon, 2002; Brody et al, 2004). In
order to take this approach, cooperation and coordination needs to take place across
jurisdictions, agencies, organizations, and land-ownerships. This is done in order to
understand and work with the differing objectives of jurisdictions and the variety of and
differences in values, goals, and management strategies (Zube, 1995). Cooperation should
occur in order to build alliances and partnerships and to integrate the values and knowledge
of a broad array of jurisdictions and organizations into one cohesive unit with mutually
agreed upon goals (Friedman, 1993; Zube, 1995; Elmendorf and Luloff, 1999; Hansen et al,
2002).

In this stage of conservation section, local governments could create a statement
with two components to it. The first component is a declaration that captures the ability of
the local jurisdiction to coordinate and cooperate with neighboring jurisdictions. Cities
should explain how they will coordinate and cooperate with cities that are adjacent to their
borders as well as the county in which they are located. If the jurisdiction is a county, they
should explain how they will coordinate with cities within their borders as well as counties
adjacent to their borders (Brody et al, 2004, Brody, 2003). The second component addresses
how a local jurisdiction will coordinate with local and regional organizations, landowners, as
well as any public land agencies. Specifics of each component should address which cities,
counties, agencies, organizations and landowners will be involved as well as the critical
factors and techniques necessary to foster cooperation and coordination (Brody et al, 2004,
Brody, 2003).

Techniques and building blocks to improve multi-jurisdictional coordination include:
joint fact finding, information sharing, inter-governmental agreements, joint comprehensive
plans, joint power agreements, commitment of financial resources, conflict management processes, and integration of other city's, county's, or agency's ecological plans (Elmendorf and Luloff, 1999; Brody et al, 2004). Most respondents in the public land agency survey stated they would be very willing to help local governments develop growth policies and planning strategies. Therefore, establishing ongoing dialog within multidisciplinary teams comprised of planners, public land agency staff, and other organizations can be a very important building block (Picket et al, 2004).

4. Strategies and tools

The next step should set forth specific principles for the management and protection of ecological systems. It requires identifying and defining the strategies and tools that will be used to in order to achieve the city or counties ecological goals and objectives as well as any coordinated inter-jurisdictional goals and objectives (Brody et al, 2004). In order to achieve this step, possible land use and ecological strategies could be stated and then defined using regulatory, incentive, land acquisition, or other types of tools that the county or city may want to implement.

The creation of an official conservation map could be first. Once the maps and text containing all of the required data are complete, the ecological goals and objectives stated, and multi-jurisdictional coordination established, an official conservation map could be created. This map can be a device local governments can use to designate land areas for public improvement and appoint areas for conservation. It helps direct growth and protect natural systems by indicating what areas future growth can occur in and where development should be avoided (Meck et al, 2001). It also helps the public visualize future growth and gives notice of what the local government intends to develop and conserve in the future.
(Meck et al., 2001). The map may designate land into several categories including: agriculture and ranch land, important wetland and riparian areas, critical wildlife habitat, linkage corridors, multiple use areas, and developable land (Cohn and Lerner, 2003). Strategies could then be created for each of these designated areas. Strategies that can also be helpful in setting criteria for subdivision review and zoning.

In order to define these strategies and make them as successful as possible, the land acquisition, regulatory, or incentive based tools could be defined. Many of these tools were presented in the "role of the state" section of this chapter. It should be emphasized that using multiple, reinforcing tools is far more effective than relying on a single technique. Local jurisdictions could promote interlinking and coordinating individual techniques in a synergistic manner rather than applied incrementally and individually in order to achieve effective land-use planning and ecological protection (Bengston et al., 2004). However, relying strictly on prohibition regulations to protect the natural systems, like Montana's local jurisdictions often do, is not the approach that should always be taken. What could be considered is the application of better voluntary incentive based tools to complement regulatory tools (Meck et al., 2001). For example, to conserve natural habitat, a regulatory conservation zone or overlay district could be put in place in a designated wildlife habitat area and then incentives-based tools such as cluster development incentives, conservation easements, purchase or transfer or development rights, or tax incentives could be used to maintain the conservation area (EQC, 1999). Every community is different, with varying circumstances and planning cultures. Therefore, a variety of tools could be used to reflect the different circumstances found in each community.
5. Implementation

Once the city or county has established strategies, policies, and tools they can move on to the next step regarding implementation. This step could articulate the mechanisms and procedures needed to implement the conservation section of the growth policy after it is adopted, and could conceptualize a commitment to implementing this section in the future (Brody, 2003). An implementation strategy should be fully developed and defined to increase the quality and effectiveness of this step. Clearly defined elements may include: a timetable for implementation, designate who is responsible for actions taken, how adopted standards will be enforced, and how those who fail to comply with this section will be penalized. The implementation strategy may also include a provision for technical assistance, description of the basic principles for administration efficiency including possible permits and how they will be approved, any guidelines that must be followed in order to implement a project, the role and involvement of the public in the implementation process, and identification of costs and funding for implementation and monitoring (Brody, 2003). These elements will help to ensure that policies and strategies required in the conservation section are actually executed and adhered to by the community (Meffe et al, 2002; Brody, 2003). Cities and counties should be aware that planning is a long-term commitment, and that, in the case of ecological protection and management, they should plan on being involved forever.

6. Monitoring and evaluation

Because cities and counties will be involved in planning for the long run, monitoring and evaluation guidelines and criteria could be established as the final step. This is done in order to make sure that the conservation section of the growth policy is directing management and protection of open space and ecological systems and their composition,
structure, and function, in the right way. It also serves as a method to determine if any changes need to be made (Meffe et al, 2002). Because ecological systems are dynamic and the socioeconomic and institutional components found within and outside a jurisdiction are ever changing, the monitoring and evaluation stage is meant to express a city’s or county’s commitment and ability to be flexible and adaptive where possible. It is a continuous process of action-based planning, monitoring, researching, learning from mistakes, and adjusting with the objective of improving future plans (Meffe et al, 2002; Brody, 2003).

Monitoring asks the question “did we change what we intended to change, or did we direct what needed to be directed” (Meffe et al, 2002)? On the other hand, evaluation asks the questions “did we achieve our objectives; is this the right way; was this done in a reasonable way; and why did it work?” Evaluation is the examination of how a city or county’s plans and actions turned out and then determining what may need to be adjusted in the future (Meffe et al, 2002). For both monitoring and evaluation in the conservation section, ecological indicators can be used to measure if change, improvement, or achievement of an objective has truly been accomplished. These indicators should be measurable, must be responsive to change, durable, and provide multiple opportunities for measurement. Through indicators, a community can adapt to changing conditions and employ what they are learning by setting updated standards to obtain stated goals and objectives most effectively (Meffe et al, 2002).

This stage of the conservation section may include: who will be responsible for the monitoring and evaluation, how partnerships should be formed with planners, land owners, other jurisdictions, agencies, and organizations in order to monitor and evaluate the biophysical effects and impacts, the time frame for monitoring and evaluation, how often monitoring and evaluation will be done, funding for monitoring and evaluation, and where
The Role of Counties and Cities in Improving Public Land Management

The recommended steps made thus far have all focused on improving local and state land use planning and promoting management and protection of ecological systems in Montana by alleviating planning constraints and barriers and implementing ecological principles and approaches. However, better growth management and increased concern of ecological impacts, as well as protection and conservation of these natural systems, may also help management on public lands become more successful and easier to implement. Most of the respondents in the public lands agency survey stated that alleviating many of the problems public land agencies are dealing with and being able to more successfully implement public management goals and objectives could likely be accomplished if well designed, thought-out, more consistent planning that implemented ecological principles took place on adjacent local jurisdictions. The following are other possible steps, from the public lands agency survey, that could be considered by counties and cities to improve their planning and environmental strategies, and possibly management on public lands. Table 12 expresses many of the comments made by public land agencies managers regarding improvements to local jurisdictions’ planning and ecological plans.

For instance, access was a primary issue expressed by public land agency respondents in the public lands survey. Cities and counties could alleviate this management issue by planning for access before development occurs. Possible subdivision regulations could require that developers had to provide and show approved public land access for all developments occurring adjacent to public lands. Cities and counties could also be more proactive in managing access roads to public lands. Maintaining large tracts of natural habitat
and important wildlife corridors that connect with public lands, and then incorporating recreational trails into those areas, may be a suggestion to increase access into public lands and protect habitat at the same time.

<table>
<thead>
<tr>
<th>Table 12. Planning Recommendations for Local Jurisdictions</th>
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<tbody>
<tr>
<td>• Avoid development on inholdings that require off site development to provide minimum services</td>
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<tr>
<td>• Requiring state certified boundary surveys</td>
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<tr>
<td>• River setbacks</td>
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<td>• Plan proactively</td>
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<tr>
<td>• Working with agencies when planning and developing land-use strategies</td>
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<tr>
<td>• Look at things from a large-scale landscape perspective</td>
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<tr>
<td>• Recognize ecological processes and understand that ecosystems are dynamic</td>
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<td>• Consider viewsheds and better visual standards</td>
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<tr>
<td>• Growth plans need to be more detailed and specific, right now they are too flexible</td>
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<tr>
<td>• Incorporate natural resource values into policy to ensure they are not lost to poor development</td>
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<tr>
<td>• Information and education on natural systems and processes, and to help citizens understand public land issues and objectives</td>
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<tr>
<td>• Provide constructive feedback for proposals. Do not approve every development proposal that is submitted</td>
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<tr>
<td>• Consider the resources of the forest when looking at economic growth opportunities</td>
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<tr>
<td>• Keep agencies involved and become involved with agency policy and information</td>
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<tr>
<td>• Identify trail needs for outdoor recreation opportunities</td>
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<td>• Develop mutually desirable building codes for appropriate land use allocations, i.e. scenic areas may require burial of utility services if the private land is developed</td>
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<tr>
<td>• Develop a collaborative approach to mapping the wildland-urban interface and agreeing on future treatments</td>
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<tr>
<td>• Develop brochures that explain responsibilities of land owners to their neighbors, consisting of both private and public lands. Counties and cities could require realty agents to distribute this information to potential purchasers</td>
</tr>
<tr>
<td>• County planners and commissioners need training in growth policies that preserve and protect natural resources</td>
</tr>
<tr>
<td>• Proactive planning is a lot easier to implement than to overlay on existing development.</td>
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</table>

Working with public land agencies is a major priority especially around the urban-wildland interface. Therefore Counties and cities near public lands could create a fire management plan. Strategies at the urban-wildland interface could include: mapping hazardous wildfire areas, strategies for fuels reduction, defensible space requirements around development, educational programs for residents and developers, and response and
emergency action strategies when fire occurs. Another step local jurisdictions can consider is altering subdivision regulations to require that a fire and hazardous fuels assessment be done in order for a subdivision to be approved. Regulatory approaches such as special zoning in interface areas that require certain building materials to be used, vegetation setbacks around houses, and possible buffer zones around development, could be considered. Coordinated fire planning with public agencies in order to obtain information on fuel loads, vegetation, and issues regarding forest health are also important. Creating a fire management plan not only helps to protect residents in the community, but it helps fire management on public lands as well.

Cities and Counties can also provide better guidelines for construction in sensitive areas and mutually desirable building codes for appropriate land use allocations. For instance, codes could be established for developments near critical wildlife habitat and watershed areas. Codes could include certain setbacks and buffers, landscape restrictions, and septic tank requirements. Counties and cities should also consider visual impacts by implementing codes on developments, which are placed in scenic areas that may be visually impacted, especially near public lands. Required exterior colors, burial of utility lines, and landscape buffers are all possible codes that could be used.

And finally, working with public land agencies is key. If counties and cities are unaware of management goals and objectives on public lands, planning will be implemented with not regard to the issues that agencies are dealing with and the natural resources they are trying to protect. If counties and cities are willing to work with public land agencies and coordinate their land-use planning strategies, there will be less conflicts and a more holistic approach to planning will be developed.
The Role of Public Land Agencies

However, local counties and cities are not the only jurisdictions that could benefit from suggestions. Public land agencies need to do their part as well. As mentioned at the beginning of this paper, public lands and private lands are all part of the same ecological system, sharing the same services. Public land agencies, like the Forest Service, BLM, and National Park Service, need to increase their roles in ecological protection by thinking beyond the boundaries for which they are responsible and not just focusing on their jurisdictions (Wallace, 2002). This means working to integrate public land agency planning with that of county and city planning. One of the main themes that came out of the public land agency survey was that counties and cities were unaware of public land agency goals and objectives, and that public land agencies had very little information regarding county and city growth policies and planning agendas. Public land agencies can help inform local jurisdictions and at the same time increase management and protection of ecological systems by helping to integrate ecological principles into land use planning (Wallace, 2002). This can be done in a number of ways.

The first suggestion would be knowledge. Public land agencies need to understand the planning issues that are taking place on adjacent private land. In particular, agencies need to better understand adjacent local government policies and planning tools that relate to growth management and ecological protection. By understanding what is occurring adjacent to the public lands, agencies can work with and cooperate with local governments in order to influence local planning policies for the better, and improve agency management plans at the same time.

This leads to the second suggestion, helping to influence local government land-use policies for the better. This can be done in a number of different ways. However, one of the
most important roles that public land agencies can play in affecting land-use policy change is through education about natural systems, their ecological processes, and the value of natural resources (Edward and Hermansen, 2002). Agencies can encourage communities adjacent to public lands to become aware of their connection to ecological systems, conduct educational programs to increase the legitimacy of natural systems and their ecological components, and help communities to understand their responsibility to assist with their stewardship (Wallace, 2002). By educating the public and adjacent communities on the value of these natural systems, local governments can make their planning and development decisions in a more informed manner (Wallace, 2002).

Public land agencies can also influence local government land-use policies by becoming involved in the planning process. Attend public meetings, become part of the collaborative process, and initiate communication with planners and developers by responding to requests for comments (Wallace, 2002; Edward and Hermansen, 2002). Public land agencies can participate in the development or revision of growth policies, land use codes, and subdivision review (Wallace, 2002). They can also help local jurisdictions develop a consensus about what the community should look like in the future, and how they should protect the natural systems that they are a part of. All of these approaches can influence land-use planning and affect ecological management and protection for the better.

Agencies could not only help to influence the direction of land-use planning in adjacent communities, but they could also help in the data collection, strategy, and implementation phases of the planning process (Wallace, 2002). Agencies can provide research and data on surrounding natural resources, critical ecological areas, wildlife, wildlife habitat, as well as concerns that may affect the natural system and its ecological processes. Agencies can provide technical assistance to planning boards by helping with environmental
assessments, in monitoring and evaluation, and helping communities incorporate GIS and other information software into the planning process. Public land agencies can also manage public lands in a sound positive way that works with adjacent communities and does not negatively affect them.

The fourth suggestion that public land agencies should take on, is integrating communities and stakeholders into public land management decision-making. In order for planning to take a more holistic ecosystem approach communities need to understand what is occurring on public lands and help make decisions for management. If both private and public entities understand what each is trying to accomplish and plan for, local planning and public land planning may become that much easier and successful. Participation of citizens, planning boards, and the local government should be encouraged from the beginning and maintained throughout the planning process.

CONCLUSION

In closing, it should again be noted that Montana is making some headway when it comes to protecting its ecological systems and improving environmental quality. Smart growth approaches have helped many of the state’s local jurisdictions direct the patterns of land development, manage growth, and preserve open space. However, current planning trends throughout much of the state still continue to encourage urban sprawl and a loss of rural areas and wildlife habitat. Many communities have acknowledged this loss as well as the continued impact of growth and urban development on the natural systems and their ecological services. In spite of this, local conservation efforts, while well intentioned, are often piecemeal and site specific, giving little consideration to the entire ecological system. Unfortunately, this patchwork of well-intentioned plans is not sufficient to stop the decline
of these ecological systems. There needs to be a new direction for land use planning in Montana.

The state of Montana, its cities, and counties, need to be more proactive, not reactive, when it comes to the ecosystems in which they live. To lose these precious natural systems, their services, and the species that depend on them, would be losing a part of what makes Montana so special, and, in a lot of ways, what defines and characterizes this state. Therefore, the responsibility of protecting and managing these ecological systems should not solely be in the hands of the federal agencies, conservation organizations, and small groups who work to protect these natural areas. This role should also be in the hands of the many counties and cities throughout the state. A planning direction from a ecological point of view, promoting the integration of ecological principles into both local and state planning frameworks and encouraging the cooperation of multiple jurisdictions and public land agencies to create a cohesive planning unit may be the solution.

This paper has attempted to emphasize this direction by looking at the planning and ecological issues that currently exist in the state of Montana, and by providing examples and suggested steps that the state, cities, and counties can incorporate to achieve this path. Through more detailed planning by local governments, the creation of a state land-use planning growth policy and planning mandates, state support (e.g. funding, education, technical assistance, and a larger toolbox), the incorporation of ecological principles into both state and local planning frameworks, and by requiring jurisdictions to work across borders and at a larger landscape scale, cities and counties can fulfill their role. They can establish better land use planning, help make public land management more successful, the integration of public and private land management more feasible, and the protection and management of ecological systems more attainable.
REFERENCES


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APPENDIX

Public Land Agency Survey
Survey Consent

The intent of this survey is to gain a better understanding of the management issues and obstacles that public land agencies are encountering and dealing with because of rapid growth occurring adjacent to their borders. This survey will address the topics of urban growth, its effect on public land management, sharing information, and local government planning issues.

The survey contains thirty-two questions and will take about twenty-five minutes to complete. You do have the option to skip any question. However answering all of the questions, will provide very useful information on what is currently going on in your district.

If you need to exit the survey before you are finished, you may return to the survey at a later time. Directions will be given on the website on how to return to an unfinished survey. Once you return, you will be taken to the point that you left off, and will also be able to edit existing answers.

This survey is voluntary, and strict confidentiality of information will be maintained. Survey Monkey does not provide the names of individuals participating in the survey, only the raw data. No names will be requested or identified in the survey or at any point in the research write up or report. Only the name of the district will be identified.

1. Would you be willing to take this survey

☐ YES
☐ NO

Definition of Terms

City: refers to any city or town and its incorporated area adjacent to the public land district's borders.

District: refers to the public land area that you and your team manage

Ecosystem Management: In this survey, this term is meant to describe the principles of ecosystem management such as: maintaining natural integrity of ecosystem processes; working across multi-jurisdictional lines; incorporating adaptability, flexibility; an emphasis on the social/economic/ecological elements into land management; and a fostering of public/government/agency participation, etc.

Growth: refers to any development occurring adjacent to the public land district (i.e. urban or rural development, residential or commercial development, built structures and roads, subdivision of land for commercial/residential/or agricultural purposes, etc.)

Growth Policy: refers to Montana's term for a comprehensive plan, which is a framework for planning. Any type of regulatory or incentive based planning that will be implemented by a county or city is based and influenced by the objectives, goals, and general framework of the comprehensive plan (Growth Policy).

2. Please enter the district you manage/supervise

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Growth and Urban Development

3. Over the last fifteen years, how would you describe growth occurring adjacent to your district’s border?

- Growth is occurring at a very rapid rate
- Growth is occurring at a rapid rate
- Growth is occurring at a moderate rate
- Growth is occurring very slowly
- Growth is not occurring

4. Over the last fifteen years, what kind of residential growth, in terms of density, do you see occurring most often near your district?

- High Density: homes are on very small lots (1/4 to ½ acres) or apartment/condo complexes
- Medium density: homes on ½ acre to acre lots
- Low density: homes on lots larger than two acres
- A combination of high and medium density
- A combination of high and low density
- A combination of all three
- Do not know

5. What are the patterns of development occurring adjacent to your district border? Check all that apply.

- Development is concentrated in one area.
- Scattered development with no distinct order
- Development occurring primarily within natural and wildlife habitat
- Development pattern consisting of natural/wildlife habitat mixed with agricultural and urban
- Most of the development is occurring within the cities
- Most of the development is occurring outside city limits
- Most of the development is occurring directly adjacent to the borders of the public land district.
- Development is structured to preserve open space (i.e. wildlife corridors, natural habitat islands)
- Other (please specify)

- Other (please specify)
6. Please rank the patterns of development adjacent to the district border based on how often they occur.

<table>
<thead>
<tr>
<th>Development</th>
<th>Occurring the most often</th>
<th>Occurs often</th>
<th>Is occurring</th>
<th>Rarely occurs</th>
<th>Is not occurring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development is concentrated in one area.</td>
<td><img src="image1" alt="Rating" /></td>
<td><img src="image2" alt="Rating" /></td>
<td><img src="image3" alt="Rating" /></td>
<td><img src="image4" alt="Rating" /></td>
<td><img src="image5" alt="Rating" /></td>
</tr>
<tr>
<td>Scattered development with no distinct order</td>
<td><img src="image6" alt="Rating" /></td>
<td><img src="image7" alt="Rating" /></td>
<td><img src="image8" alt="Rating" /></td>
<td><img src="image9" alt="Rating" /></td>
<td><img src="image10" alt="Rating" /></td>
</tr>
<tr>
<td>Development occurring primarily in natural and wildlife habitat</td>
<td><img src="image11" alt="Rating" /></td>
<td><img src="image12" alt="Rating" /></td>
<td><img src="image13" alt="Rating" /></td>
<td><img src="image14" alt="Rating" /></td>
<td><img src="image15" alt="Rating" /></td>
</tr>
<tr>
<td>Development pattern consisting of natural/wildlife habitat mixed with agricultural and urban</td>
<td><img src="image16" alt="Rating" /></td>
<td><img src="image17" alt="Rating" /></td>
<td><img src="image18" alt="Rating" /></td>
<td><img src="image19" alt="Rating" /></td>
<td><img src="image20" alt="Rating" /></td>
</tr>
<tr>
<td>Most of the development is occurring within the cities</td>
<td><img src="image21" alt="Rating" /></td>
<td><img src="image22" alt="Rating" /></td>
<td><img src="image23" alt="Rating" /></td>
<td><img src="image24" alt="Rating" /></td>
<td><img src="image25" alt="Rating" /></td>
</tr>
<tr>
<td>Most of the development is occurring outside city limits</td>
<td><img src="image26" alt="Rating" /></td>
<td><img src="image27" alt="Rating" /></td>
<td><img src="image28" alt="Rating" /></td>
<td><img src="image29" alt="Rating" /></td>
<td><img src="image30" alt="Rating" /></td>
</tr>
<tr>
<td>Most of the development is occurring directly adjacent to the borders of the public land district</td>
<td><img src="image31" alt="Rating" /></td>
<td><img src="image32" alt="Rating" /></td>
<td><img src="image33" alt="Rating" /></td>
<td><img src="image34" alt="Rating" /></td>
<td><img src="image35" alt="Rating" /></td>
</tr>
<tr>
<td>Development is structured to preserve open space (i.e. wildlife corridors, natural habitat islands)</td>
<td><img src="image36" alt="Rating" /></td>
<td><img src="image37" alt="Rating" /></td>
<td><img src="image38" alt="Rating" /></td>
<td><img src="image39" alt="Rating" /></td>
<td><img src="image40" alt="Rating" /></td>
</tr>
</tbody>
</table>
7. In terms of residential development, what types of housing have been the most common adjacent to the public lands you supervise over the last fifteen years? Check all that apply.

- Very large homes
- Seasonal homes
- Duplexes
- Apartment complexes
- Manufactured homes
- Standard single family
- Other (please specify)

8. Please list and explain the main four issues the district is dealing with, at the urban-wildland interface, as a result of growth adjacent to its borders.

9. Over the last 15 years in your district, how negatively or positively have the PATTERNS OF DEVELOPMENT affected the following management issues and activities? Please rank using the following scale:

<table>
<thead>
<tr>
<th>Management Issue</th>
<th>Highly Positive</th>
<th>Positive</th>
<th>No effect</th>
<th>Negative</th>
<th>Highly negative</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire management</td>
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<tr>
<td>Wildlife management</td>
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<tr>
<td>Wildlife biodiversity</td>
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<tr>
<td>Wildlife and natural habitat management</td>
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<tr>
<td>Wildlife habitat protection</td>
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<tr>
<td>Watershed management</td>
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<tr>
<td>Water quality</td>
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<tr>
<td>Recreational use</td>
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</tbody>
</table>

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10. Over the last 15 years in your district, how negatively or positively has the DENSITY OF GROWTH affected the following management issues and activities? Please rank using the following scale:

<table>
<thead>
<tr>
<th>Issue</th>
<th>Highly Positive</th>
<th>Positive</th>
<th>No effect</th>
<th>Negative</th>
<th>Highly negative</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air quality</td>
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<tr>
<td>Natural resource extraction</td>
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<tr>
<td>Visual and scenic qualities</td>
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<tr>
<td>Fire management</td>
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<tr>
<td>Wildlife management</td>
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<tr>
<td>Wildlife biodiversity</td>
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<tr>
<td>Wildlife and natural habitat management</td>
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<tr>
<td>Wildlife habitat protection</td>
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<td>Watershed management</td>
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<td>Water quality</td>
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<tr>
<td>Recreational use</td>
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<tr>
<td>Air quality</td>
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<tr>
<td>Natural resource extraction</td>
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<tr>
<td>Visual and scenic qualities</td>
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</tbody>
</table>
11. Do you, as a manager, feel that the effect that growth has had on many of these issues is due to the lack of growth management on lands adjacent to the district's border?

- Very likely
- Likely
- Somewhat Likely
- Not likely
- Do not know

Sharing Information

12. Does your district currently share information (technical, social, recreational, economic, ecological data) with adjacent counties and cities?

- All of the time
- Most of the time
- Sometimes
- Rarely occurs
- It does not occur

13. When you have cooperated with these counties and cities in the past, what collaborative processes, organizational tools, or types of projects have worked? Please be brief.

14. Which processes, tools or projects have not worked? Please be brief.

15. If data and information sharing does not occur, would the district be willing to share information with adjacent counties and cities?

- Yes, all of the time
- Yes, some of the time
- Yes, but only specific information
- Not likely
- Do not know
16. Do you believe that adjacent counties and cities are aware of the management goals and objectives the
district is working to implement?

- Very aware
- Somewhat aware
- Slightly aware
- Not aware
- Do not know

Growth Policies and Planning

17. Growth policies are becoming more common throughout Montana. How many counties and cities
adjacent to your district borders have growth policies that you are aware of? Check all that apply.

- All of the counties adjacent to the district border have growth policies.
- All of the cities adjacent to the district border have growth policies.
- Some of the counties have growth policies
- Some of the cities have growth policies
- One county has a growth policy
- One or two cities have growth policies
- No growth policies are in place at this time
- Do not know

18. Please name the counties and cities, that you are aware of, that have growth policies.

County 1: 
County 2: 
County 3: 
City 1: 
City 2: 
City 3: 

19. Based on the list of counties and cities you came up with in question 17, which of those counties and cities have growth policy goals and objectives regarding the following:

<table>
<thead>
<tr>
<th>Goals and objectives regarding wildlife and habitat protection?</th>
<th>County1</th>
<th>County2</th>
<th>County3</th>
<th>City1</th>
<th>City2</th>
<th>City3</th>
<th>Do not Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goals and objectives regarding watershed protection?</td>
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<tr>
<td>Goals and objectives regarding wildfire management?</td>
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<tr>
<td>Goals and objectives regarding natural resource conservation?</td>
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</tbody>
</table>

20. Based on the planning that you, as a manager, have seen implemented in those counties and cities designated in question 17, which counties and cities ARE DOING WELL in terms of the following categories?

<table>
<thead>
<tr>
<th>Wildlife and habitat protection?</th>
<th>County1</th>
<th>County2</th>
<th>County3</th>
<th>City1</th>
<th>City2</th>
<th>City3</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>In terms of watershed protection?</td>
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<tr>
<td>In terms of wildfire management?</td>
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<tr>
<td>In terms of natural resource conservation?</td>
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</tbody>
</table>
21. For those counties and cities adjacent to the district border that have growth policies that you are aware of, how many of those counties and cities have goals and objectives very similar to the goals and objectives your district is trying to manage for?

- All of the growth policies
- More than half of the growth policies
- Half of the growth policies
- Less than half of the growth policies
- None of the growth policies
- Do not know

22. Overall, do you believe the growth policies currently in place, in adjacent counties and cities, hinder or help your office’s ability to successfully manage in your district?

- Greatly help
- Help
- Some help and some hinder
- Neither help or hinder
- Hinder
- Greatly Hinder
- Do not know

23. If the growth policies hinder management, what do you believe the causal factors are?

24. How has the management in your district changed or been affected by this hindrance?

25. Overall, how would you say ALL of the counties and cities adjacent to your district are doing in terms of the following:

<table>
<thead>
<tr>
<th>Wildlife and habitat protection?</th>
<th>Doing very well</th>
<th>Doing well</th>
<th>Doing somewhat well</th>
<th>Doing slightly well</th>
<th>Not doing well</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>In terms of watershed protection?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In terms of wildfire management?</td>
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<td></td>
</tr>
<tr>
<td>In terms of natural resource conservation?</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
26. How would you describe the majority of planning that occurs adjacent to your district?

- Regulatory (such as zoning)
- Incentive based (such as conservation easements, transfer of development rights)
- Both Regulatory and Incentive based
- Do not know
- Other (please specify)

27. Do you, as a manager, feel that many of the issues/problems the district is dealing with because of growth could be alleviated if well designed, thought-out, more consistent planning took place adjacent to the district borders?

- Very likely
- Likely
- Somewhat likely
- Not likely
- Do not know

28. If counties and cities were to implement growth policies that incorporated the principles found in ecosystem management (flexibility, adaptability, monitoring, environmental integrity and protection, etc.) do you, as a manager, believe that the district's management goals and objectives could be more successfully accomplished?

- Very likely
- Likely
- Somewhat likely
- Not Likely
- Do not Know

29. For counties and cities working to design a growth policy, what elements, goals, and implementation strategies would you, as a public land manager, recommend be incorporated into these plans that would help alleviate management problems in your district?

30. Would your district be willing to work with adjacent counties and cities to improve their growth policies or help them to design their new growth policies?

- Very willing
- Somewhat willing
- Slightly willing
- Not willing
- Do not know
31. Have you worked with a city or county, as a private citizen, on any growth policy or planning issues?

- Yes, very frequently
- Yes, Frequently
- Yes, occasionally
- Yes, once or twice
- No I have not
- No comment

32. Besides growth policies, what other suggestions would you make regarding strategies counties and cities can implement in order to help improve management goals and objectives on adjacent public lands?

33. Please feel free to add any additional comments:

**Survey Responses**

1. Would you be willing to take this survey?

   - YES: 24
   - NO: 0

   Total Respondents 24

2. Please enter the district you manage/supervise.

<table>
<thead>
<tr>
<th>District Name</th>
<th>Ranger District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaverhead-Deerlodge National Forest</td>
<td>Superior RD</td>
</tr>
<tr>
<td>Fortine Ranger District, Kootenai Forest</td>
<td>Gardiner RD</td>
</tr>
<tr>
<td>Judith Ranger District</td>
<td>Three Rivers Ranger District</td>
</tr>
<tr>
<td>Hebgen Lake</td>
<td>Butter Ranger District</td>
</tr>
<tr>
<td>Spotted Bear</td>
<td>Madison Ranger District</td>
</tr>
<tr>
<td>Pintler Ranger District</td>
<td>Rocky Mountain Ranger District</td>
</tr>
<tr>
<td>Swan Lake RD</td>
<td>Montana</td>
</tr>
<tr>
<td>Musselshell Ranger District</td>
<td>Libby Ranger District</td>
</tr>
<tr>
<td>Bozeman RD, Gallatin NF</td>
<td>Yellowstone National Park</td>
</tr>
<tr>
<td>Jefferson RD, Beaverhead-Deerlodge NF</td>
<td>Dillion Field office- BLM</td>
</tr>
<tr>
<td>Lewis and Clark NF-Belt Creek Ranger District</td>
<td>Wisdom Ranger District</td>
</tr>
<tr>
<td>Ninemile Ranger District-Lolo Forest</td>
<td></td>
</tr>
</tbody>
</table>

Total Respondents 23
3. Over the last fifteen years, how would you describe growth occurring adjacent to your district's border?

- Growth is occurring at a very rapid rate: 3 (14%)
- Growth is occurring at a rapid rate: 7 (32%)
- Growth is occurring at a moderate rate: 10 (45%)
- Growth is occurring very slowly: 2 (9%)
- Growth is not occurring: 0 (0%)

Total Respondents: 22

4. Over the last fifteen years, what kind of residential growth, in terms of density, do you see occurring most often near your district?

- High Density: homes on very small lots (1/4 to 1/2 acres) or apartment/condo: 2 (9%)
- Medium density: homes on 1/2 acre to acre lots: 5 (23%)
- Low density: homes on lots larger than two acres: 14 (64%)
- A combination of high and medium density: 0 (0%)
- A combination of high and low density: 0 (0%)
- A combination of all three: 1 (5%)
- Do not know: 0 (0%)

Total Respondents: 22
5. What are the patterns of development occurring adjacent to your districts border? Check all that apply.

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Total</th>
<th>Response %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development is concentrated in one area.</td>
<td>3</td>
<td>14%</td>
</tr>
<tr>
<td>Scattered development with no distinct order</td>
<td>12</td>
<td>55%</td>
</tr>
<tr>
<td>Development occurring primarily within natural and wildlife habitat</td>
<td>6</td>
<td>27%</td>
</tr>
<tr>
<td>Pattern consisting of natural habitat mixed with agricultural and urban</td>
<td>11</td>
<td>50%</td>
</tr>
<tr>
<td>Most of the development is occurring within the cities</td>
<td>2</td>
<td>9%</td>
</tr>
<tr>
<td>Most of the development is occurring outside city limits</td>
<td>12</td>
<td>55%</td>
</tr>
<tr>
<td>Development occurring adjacent to borders of the public land district.</td>
<td>11</td>
<td>50%</td>
</tr>
<tr>
<td>Development structured to preserve open space (i.e. wildlife corridors)</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>4</td>
<td>18%</td>
</tr>
<tr>
<td>Total Respondents 22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Please rank the patterns of development adjacent to the district border based on how often they occur.

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Occurring the most often</th>
<th>Occurs often</th>
<th>Is occurring</th>
<th>Rarely occurs</th>
<th>Is not occurring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development is concentrated in one area.</td>
<td>0</td>
<td>0</td>
<td>10 (45%)</td>
<td>6 (27%)</td>
<td>2 (9%)</td>
</tr>
<tr>
<td>Scattered development with no distinct order</td>
<td>5 (23%)</td>
<td>5 (23%)</td>
<td>8 (36%)</td>
<td>1 (5%)</td>
<td>0</td>
</tr>
<tr>
<td>Development occurring primarily within natural and wildlife habitat</td>
<td>2 (9%)</td>
<td>8 (36%)</td>
<td>7 (32%)</td>
<td>2 (9%)</td>
<td>0</td>
</tr>
<tr>
<td>Development pattern consisting of natural/wildlife habitat mixed with agricultural and urban</td>
<td>1 (5%)</td>
<td>6 (27%)</td>
<td>9 (41%)</td>
<td>3 (14%)</td>
<td>0</td>
</tr>
<tr>
<td>Most of the development is occurring within the cities</td>
<td>1 (5%)</td>
<td>0</td>
<td>4 (18%)</td>
<td>11 (50%)</td>
<td>2 (9%)</td>
</tr>
<tr>
<td>Most of the development is occurring outside city limits</td>
<td>4 (18%)</td>
<td>12 (55%)</td>
<td>2 (9%)</td>
<td>0</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Most of the development is occurring directly adjacent to the borders of the public land district.</td>
<td>2 (9%)</td>
<td>8 (36%)</td>
<td>8 (36%)</td>
<td>2 (9%)</td>
<td>0</td>
</tr>
<tr>
<td>Development is structured to preserve open space (i.e. wildlife corridors, natural habitat islands)</td>
<td>0</td>
<td>0</td>
<td>2 (9%)</td>
<td>12 (55%)</td>
<td>4 (18%)</td>
</tr>
<tr>
<td>Total Respondents 22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skipped this question</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

137
7. In terms of residential development, what types of housing have been the most common adjacent to the public lands you supervise over the last fifteen years? Check all that apply.

- Very large homes  
- Seasonal homes  
- Duplexes  
- Apartment complexes  
- Manufactured homes  
- Standard single family  
- Other (please specify)  

<table>
<thead>
<tr>
<th>Housing Type</th>
<th>Response %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very large homes</td>
<td>73%</td>
</tr>
<tr>
<td>Seasonal homes</td>
<td>77%</td>
</tr>
<tr>
<td>Duplexes</td>
<td>0%</td>
</tr>
<tr>
<td>Apartment complexes</td>
<td>0%</td>
</tr>
<tr>
<td>Manufactured homes</td>
<td>32%</td>
</tr>
<tr>
<td>Standard single family</td>
<td>55%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>5%</td>
</tr>
</tbody>
</table>

Total Respondents 21
Skipped this question 1

8. Please list and explain the main four issues the district is dealing with, at the urban-wildland interface, as a result of growth adjacent to its borders.

- Hazardous fuels encroachment onto the National Forest wildlife migration and use access (loss in some cases, of traditional public access; and requests for new access by adjacent or included land owners)

- Processing requests for access and utilities across National Forest Land with limited resources to do that environmental analysis and permit authorization work. Loss of hiding/thermal cover for whitetail deer on private land and the need to provide that habitat element more on National Forest land at the same time we are trying to reduce fuels issues near private land. Forest Service system roads that were designed and built primarily for logging and are now being used for residential access which they were not designed or built for. Seeing higher speeds, need for longer sight distance, all season use, etc. The impact of residential access roads to large game winter range where we try to keep open road densities low.

- Access - need to plow snow on Forest Roads, etc. 2) Fire/Fuels - need to remove fuels within these areas. Increased complexity when trying to treat fuels (prescribed fire). 3) Reduction in Access to the Forest. Closing of access routes and adjacent land.

- Increased recreation pressures - as more and more roads get closed for access - use is concentrated on the remaining area. spread of noxious weeds


- Increased ATV (4-wheeler) use - creation of new trails, erosion 2. Invasive weeds - due to recreation use and range use. 3. Access issues - lack of public access. Not necessarily due to growth adjacent to
borders, but more to existing land pattern - checkerboard ownership (relict of railroads) and private ranches adjacent to National Forest.

- Rapid growth adjacent NF is creating problems with multiple landowners with different values, fire protection, affluent absentee land owners, water quantity and quality issues in the arid west.

- Encroachment on winter range for big game wildlife. Most of primary winter range occurs in transition lands between valley bottoms and forested lands. Wildlife is being squeezed into smaller usable winter range, which could result in overuse.

2. Wildland fire protection expectations. People expect the Forest Service to protect their homes from wildland fires. The Forest Service is not equipped to handle structure protection to the extent that the many new home developments may call for.

3. Loss of public & administrative access across private lands that have historic access. (Gates & "No Trespassing" sign go up.) This creates problem for the public who want to access public lands behind the private lands for recreation. The Forest Service's ability to manage its lands is reduced if we can't get there.

4. Loss of open spaces. The whole issue of loss of open space deals with wildlife habitat loss, visual quality, recreation opportunities, etc.

- Growth within the rural/urban interface Lack of fuels reduction projects on private land to protect structures Increased use of public lands...recreation user conflicts. Conflicts of users between private and public lands

- Trespass onto public lands, such as fence lines, waterlines, improvements... Increase request for the placement of amenities onto public lands...mailboxes, driveways, power lines. Requests to maintain FS access roads to a higher standard for their personal use because it provides access to a private residence. Recreational use of the adjacent public lands by neighbors...horseback riding, OHV use...some not compatible to the land or legal. Fuels...there are many aspects to fire danger and fuels but here is one...building houses out in the forest out of undesirable materials, i.e. wood shake shingles, and expecting the government to protect their home at any cost.

- forest fuel management 2) illegal motorized use 3) road access disputes/complaints

- Infringement within wildlife migration and wintering areas. Concerns about wildfire within urban interface areas. Encroachments on National Forest System lands.

- Land Use issues--requests for permits to access private lands from Nat'l Forest lands, land exchange requests, road use permits for commercial use of FS roads, and fuels treatments proposed by FS.

- Access across public lands to the developed lands Adjacent owners using public lands Wildland-Urban Interface fuels Big game displacement

- Fire and Fuels prescribed fire management in the Wildland Urban Interface Trespass by motorized users from subdivision into closed areas. Intolerance for other uses such as livestock grazing, timber harvest and minerals development. Increased costs of fire suppression. Smoke management and intolerance for prescribed burning.

- Lack of surveyed boundaries along NF boundary & in-holdings. Confuses landowners, public and agency in management of local areas. Need funds to address trespass & prevent future trespass. 2) Improper location of existing access system trails to NF due to unsurveyed, in-holdings. Public created routes across private land connect to NF system trails. No authority to spend federal dollars on private land to correct the problems. Would require surveying to correct. 3) The public and special use permit holders do not have legal access to NF lands adjacent to the Blackfoot Reservation. Not likely to be readily resolved due to disputes regarding 1895 Agreement for Ceded Strip in Badger-Two Medicine area. 4) Fragmentation of wildlife habitat along Rocky Mtn. Front slowly occurring along NF boundary and east onto the plains. Key corridors for travel and foraging need protected to preserve open landscape on private land to maintain connection with foothill and montane habitat on NF lands, BLM and State Wildlife Refuges. Pace of interest in development has picked up in last five years and will likely increase similar to other places in Montana.
• Homes built too close to rivers because of a Dam upstream that controls flooding. It prevents periodic controlled release of high flows which clear out sediment, and promotes growth of riparian vegetation. 2. Homes built in grizzly bear habitat pose a threat to bears due the presence of attractants such as barbecue grills, dog food sacks on the back porch, etc. When bears come to these attractants they get into conflicts with humans...and the bears ultimately lose (are killed). 3. Too many houses near streams result in septic tank leaching into streams which adversely affects water quality. 4. The number of roads themselves are becoming a problem as people move into wildlife habitat. It fragments habitat, creates unnatural runoff and drainage, traffic is bothersome to wildlife, vehicular wildlife kills and they allow access of people into areas where wildlife was formerly safe and unbothered.

• Requests for access, that is easements to private lands, loss of open space cumulative effects of private development fire & fuels issues in the WUI

• Urban Wildland Fire Interface Issues Disruption of Wildlife Habitat Social issues associated with living in wildlife habitat Introduction of exotic species (plants and domestic animals)

• Access to Public Land is being cut off. 2) Homeowners are requesting R-O-W across public lands for roads and utilities. 3) Developers are purchasing lands adjacent to public land and selling off parcels large enough to avoid subdivision requirements. 4) Landowners are purchasing lands adjacent to rivers and eliminating public access.

• Increase complexity of fire suppression and structure protection. Increase costs 2- Increase use in wildlife habitats especially use in winter ranges by people on foot or skiing 3- Increase interest in permits and authorizations to occupy the national Forest lands for special uses and increase requests for access across the national forest to reach private lands. In many cases private land owners begin to use the national Forest without even asking and then resist removing unauthorized trespass. 4- Increased motorized use out of private lands in the form of ATVs, snowmobile, in some cases creating new access or travel routes.

9. Over the last fifteen years in your district, how negatively or positively have the patterns of development affected the following management issues and activities? Please rank using the following scale:

<table>
<thead>
<tr>
<th></th>
<th>Highly Positive</th>
<th>Positive</th>
<th>No effect</th>
<th>Negative</th>
<th>Highly negative</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire management</td>
<td>0</td>
<td>2 (9%)</td>
<td>1 (5%)</td>
<td>13 (59%)</td>
<td>5 (23%)</td>
<td>0</td>
</tr>
<tr>
<td>Wildlife management</td>
<td>0</td>
<td>0</td>
<td>3 (14%)</td>
<td>16 (73%)</td>
<td>2 (9%)</td>
<td>0</td>
</tr>
<tr>
<td>Wildlife biodiversity</td>
<td>0</td>
<td>0</td>
<td>7 (32%)</td>
<td>11 (50%)</td>
<td>3 (14%)</td>
<td>0</td>
</tr>
<tr>
<td>Wildlife and natural habitat management</td>
<td>0</td>
<td>0</td>
<td>1 (5%)</td>
<td>18 (82%)</td>
<td>2 (9%)</td>
<td>0</td>
</tr>
<tr>
<td>Wildlife habitat protection</td>
<td>0</td>
<td>0</td>
<td>4 (18%)</td>
<td>14 (64%)</td>
<td>2 (9%)</td>
<td>0</td>
</tr>
<tr>
<td>Watershed management</td>
<td>0</td>
<td>1 (5%)</td>
<td>5 (23%)</td>
<td>9 (41%)</td>
<td>4 (18%)</td>
<td>2 (9%)</td>
</tr>
<tr>
<td>Water quality</td>
<td>0</td>
<td>0</td>
<td>6 (27%)</td>
<td>13 (59%)</td>
<td>1 (5%)</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Recreational use</td>
<td>0</td>
<td>1 (5%)</td>
<td>3 (14%)</td>
<td>13 (59%)</td>
<td>4 (18%)</td>
<td>0</td>
</tr>
<tr>
<td>Air quality</td>
<td>0</td>
<td>0</td>
<td>14 (64%)</td>
<td>5 (23%)</td>
<td>0</td>
<td>2 (9%)</td>
</tr>
<tr>
<td>Natural resource extraction</td>
<td>0</td>
<td>1 (5%)</td>
<td>13 (59%)</td>
<td>4 (18%)</td>
<td>1 (5%)</td>
<td>2 (9%)</td>
</tr>
<tr>
<td>Visual and scenic qualities</td>
<td>0</td>
<td>0</td>
<td>5 (23%)</td>
<td>11 (50%)</td>
<td>5 (23%)</td>
<td>0</td>
</tr>
</tbody>
</table>

Total Respondents 21
Skipped this question 1
10. Over the last fifteen years in your district, how negatively or positively has the density of growth affected the following management issues and activities? Please rank using the following scale:

<table>
<thead>
<tr>
<th>Management Area</th>
<th>Highly Positive</th>
<th>Positive</th>
<th>No effect</th>
<th>Negative</th>
<th>Highly negative</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire management</td>
<td>0</td>
<td>1 (5%)</td>
<td>1 (5%)</td>
<td>13 (59%)</td>
<td>5 (23%)</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Wildlife management</td>
<td>0</td>
<td>0</td>
<td>4 (18%)</td>
<td>14 (64%)</td>
<td>2 (9%)</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Wildlife biodiversity</td>
<td>0</td>
<td>0</td>
<td>8 (36%)</td>
<td>10 (45%)</td>
<td>2 (9%)</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Wildlife and natural habitat management</td>
<td>0</td>
<td>0</td>
<td>3 (14%)</td>
<td>15 (68%)</td>
<td>2 (9%)</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Wildlife habitat protection</td>
<td>0</td>
<td>0</td>
<td>4 (18%)</td>
<td>14 (64%)</td>
<td>2 (9%)</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Watershed management</td>
<td>0</td>
<td>1 (5%)</td>
<td>6 (27%)</td>
<td>10 (45%)</td>
<td>2 (9%)</td>
<td>2 (9%)</td>
</tr>
<tr>
<td>Water quality</td>
<td>0</td>
<td>0</td>
<td>6 (27%)</td>
<td>11 (50%)</td>
<td>2 (9%)</td>
<td>2 (9%)</td>
</tr>
<tr>
<td>Recreational use</td>
<td>0</td>
<td>0</td>
<td>5 (23%)</td>
<td>13 (59%)</td>
<td>1 (5%)</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Air quality</td>
<td>0</td>
<td>0</td>
<td>13 (59%)</td>
<td>6 (27%)</td>
<td>0</td>
<td>2 (9%)</td>
</tr>
<tr>
<td>Natural resource extraction</td>
<td>0</td>
<td>1</td>
<td>13 (59%)</td>
<td>4 (18%)</td>
<td>1 (5%)</td>
<td>2 (9%)</td>
</tr>
<tr>
<td>Visual and scenic qualities</td>
<td>0</td>
<td>0</td>
<td>6 (27%)</td>
<td>11 (50%)</td>
<td>3 (14%)</td>
<td>1 (5%)</td>
</tr>
</tbody>
</table>

Total Respondents 21
Skipped this question 1

11. Do you, as a manager, feel that the effect that growth has had on many of these issues is due to the lack of growth management on lands adjacent to the district's border?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very likely</td>
<td>32%</td>
</tr>
<tr>
<td>Likely</td>
<td>32%</td>
</tr>
<tr>
<td>Somewhat Likely</td>
<td>23%</td>
</tr>
<tr>
<td>Not likely</td>
<td>5%</td>
</tr>
<tr>
<td>Do not know</td>
<td>5%</td>
</tr>
</tbody>
</table>

Total Respondents 21
Skipped this question 1
12. Does your district currently share information (technical, social, recreational, economic, ecological data) with adjacent counties and cities?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Response %</th>
</tr>
</thead>
<tbody>
<tr>
<td>All of the time</td>
<td>14%</td>
</tr>
<tr>
<td>Most of the time</td>
<td>36%</td>
</tr>
<tr>
<td>Sometimes</td>
<td>41%</td>
</tr>
<tr>
<td>Rarely occurs</td>
<td>5%</td>
</tr>
<tr>
<td>It does not occur</td>
<td>0%</td>
</tr>
</tbody>
</table>

Total Respondents 21
Skipped this question 1

13. When you have cooperated with these counties and cities in the past, what collaborative processes, organizational tools, or types of projects have worked? Please be brief.

- Open exchange of information, often by District Rangers or subject matter specialists
- I work well with local County Commissioner and let her know what private access issues we are dealing with and why we make the decisions we do. As a result she has been supportive of my decisions. Recently the County agreed that prior to any subdivision approval the landowner had to show approved access if FS access was necessary. The County Fire Plan was a collaborative effort to define Wildland Urban Interface (WUI) and priorities in WUI. We are working with the local Conservation District to access fuels and watershed issues on private land in the analysis area we are working with on Forest Service system lands. This will give us a better picture of all the issues in that entire area. We adopted the County standards for residential access and require subdivisions to upgrade access road, even if they are Forest Service, to that standard. County is including fuels assessment in their subdivision approval process. County requested an assessment and funding from the state to fix a safety issue on a Forest Service system road that was used to access private land. The state did the access and is providing the funding to fix the problem.
- Coordinated fire planning. Info shared on fuels, veg types, etc.
- Recreation opportunities, access issues, timber salvage collaboration, limits of acceptable change stands - wilderness
- Joint Fuel management projects and collaborative planning of projects.
- We are trying to work with counties on economic development. Looking at "visioning" with the counties - where they want to go. Currently looking at potential / desirability of increasing tourism in Wheatland County.
- MOU’s and other cooperative agreements
• Wildland fire protection plan - working w/counties and affected communities in developing a fire protection plan.

• Public scoping on proposed projects Public meetings to involve the communities in projects i.e. Fuels reduction projects

• Providing the best information and data on the resources and their condition on the public lands.

• Resource Advisory Committee (RAC). Yaak Community Stewardship Project. Forest Plan Revision workgroups.

• Wildland Urban Interface fuels projects Municipal Watershed management projects Both through the combined City-County Government agencies and the elected officials

• We share technical information and I have personally served on the City and County Planning Boards. We routinely comment on developments that have the potential to affect the Forest. We cooperate with fire and fuels reviews of developments.

• Emergency type operations have worked best and on a much lesser scale, efforts regarding mitigation of hazardous fuels.

• They generally want us to use the Endangered Species Act to enforce zoning limitations on projects that would have adverse effects upon natural resources of high value. This is because they either can’t (politically) stop such development, or they don’t have adequate laws to prevent unwise development.

• Fuels reduction and fire protection access issues through road users’ agreements

• Public Meetings, news releases, special programs, specific outreach efforts

• Beaverhead and Madison Counties were Cooperating Agencies on the Dillon Resource Management Plan. Briefings, Public Meetings.

• Cross section citizen groups - watershed groups

14. Which processes, tools or projects have not worked? Please be brief.

• Asking them to read/comment on our land use and project Plans

• We had trouble with County approving subdivisions without finding out that the Forest Service has approved access.

• Limits of acceptable change, collaboration, just working side by side

• Have not had success with Golden Valley County in the past on access issues. The county has, in fact, closed public access (county roads) that provided access to the Forest. (This type of problem is usually due to the county commissioners who are in office at the time)

• Volunteer agreements

• Not enough scoping...not getting buy in from the communities. Most of public do not support typical timber sale projects
• Too early to tell. We just got Categorical Exclusion authorities for fuels reduction projects. It remains to be seen if this will allow us to move forward or it also will get tied up in litigation.

• Public Meetings

• Regardless of our issues developments tend to be approved. Growth plan needs to be more specific and perhaps restrictive

• What hasn't worked is not having a proper land management plan for counties....just letting anyone do his/her thing wherever they want to.

• generally they work with time

• Public meetings are sparsely attended.

15. If data and information sharing does not occur, would the district be willing to share information with adjacent counties and cities?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes all of the time</td>
<td>64%</td>
</tr>
<tr>
<td>Yes some of the time</td>
<td>9%</td>
</tr>
<tr>
<td>Yes but only specific information</td>
<td>9%</td>
</tr>
<tr>
<td>Not likely</td>
<td>0%</td>
</tr>
<tr>
<td>Do not know</td>
<td>0%</td>
</tr>
</tbody>
</table>

Total Respondents 18
Skipped this question 4
16. Do you believe that adjacent counties and cities are aware of the management goals and objectives the district is working to implement?

<table>
<thead>
<tr>
<th>Awareness Level</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very aware</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Somewhat aware</td>
<td>16 (73%)</td>
</tr>
<tr>
<td>Slightly aware</td>
<td>4 (18%)</td>
</tr>
<tr>
<td>Not aware</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Do not know</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

Total Respondents: 21
Skipped this question: 1

17. Growth policies are becoming more common throughout Montana. How many counties and cities adjacent to your district borders have growth policies that you are aware of? Check all that apply.

<table>
<thead>
<tr>
<th>Growth Policy Description</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>All of the counties adjacent to the district border have growth policies</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>All of the cities adjacent to the district border have growth policies</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Some of the counties have growth policies</td>
<td>8 (36%)</td>
</tr>
<tr>
<td>Some of the cities have growth policies</td>
<td>5 (23%)</td>
</tr>
<tr>
<td>One county has a growth policy</td>
<td>2 (9%)</td>
</tr>
<tr>
<td>One or two cities have growth policies</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>No growth policies are in place at this time</td>
<td>4 (18%)</td>
</tr>
<tr>
<td>Do not know</td>
<td>6 (27%)</td>
</tr>
</tbody>
</table>

Total Respondents: 20
Skipped this question: 2
18. Please name the counties and cities, that you are aware of, that have growth policies.

<table>
<thead>
<tr>
<th>Counties</th>
<th>Cities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gallatin</td>
<td>Bozeman</td>
</tr>
<tr>
<td>Park</td>
<td>West Yellowstone</td>
</tr>
<tr>
<td>Lincoln</td>
<td>Libby</td>
</tr>
<tr>
<td>Missoula</td>
<td>Missoula</td>
</tr>
<tr>
<td>Lewis and Clark</td>
<td>Helena</td>
</tr>
<tr>
<td>Teton</td>
<td>Choteau</td>
</tr>
<tr>
<td>Madison</td>
<td>Ennis</td>
</tr>
<tr>
<td>Powell</td>
<td>Troy</td>
</tr>
<tr>
<td>Granite</td>
<td>Yaak</td>
</tr>
<tr>
<td>Deer Lodge</td>
<td>Philipsburg</td>
</tr>
<tr>
<td>Silver Bow</td>
<td>Anaconda</td>
</tr>
<tr>
<td>Jefferson</td>
<td>Butte</td>
</tr>
<tr>
<td></td>
<td>Deer Lodge</td>
</tr>
</tbody>
</table>

19. Based on the list of counties and cities you came up with in question 17, which of those counties and cities have growth policy goals and objectives regarding the following:

<table>
<thead>
<tr>
<th>Goals and objectives regarding wildlife and habitat protection?</th>
<th>County1</th>
<th>County2</th>
<th>County3</th>
<th>City1</th>
<th>City2</th>
<th>City3</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4 (18%)</td>
<td>2 (9%)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>9 (41%)</td>
</tr>
<tr>
<td>Goals and objectives regarding watershed protection?</td>
<td>6 (27%)</td>
<td>3 (14%)</td>
<td>1 (5%)</td>
<td>2 (9%)</td>
<td>0</td>
<td>0</td>
<td>7 (32%)</td>
</tr>
<tr>
<td>Goals and objectives regarding wildfire management?</td>
<td>6 (27%)</td>
<td>3 (14%)</td>
<td>1 (5%)</td>
<td>1 (5%)</td>
<td>0</td>
<td>0</td>
<td>7 (32%)</td>
</tr>
<tr>
<td>Goals and objectives regarding natural resource conservation?</td>
<td>3 (14%)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10 (45%)</td>
</tr>
</tbody>
</table>

20. Based on the planning that you, as a manager, have seen implemented in those counties and cities found in question 17, which counties and cities are doing well in terms of the following categories?

<table>
<thead>
<tr>
<th>Wildlife and habitat protection?</th>
<th>County1</th>
<th>County2</th>
<th>County3</th>
<th>City1</th>
<th>City2</th>
<th>City3</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>In terms of watershed protection?</td>
<td>3 (14%)</td>
<td>1 (5%)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8 (36%)</td>
</tr>
<tr>
<td>In terms of wildfire management?</td>
<td>6 (27%)</td>
<td>3 (14%)</td>
<td>1 (5%)</td>
<td>1 (5%)</td>
<td>0</td>
<td>0</td>
<td>6 (27%)</td>
</tr>
<tr>
<td>In terms of natural resource conservation?</td>
<td>2 (9%)</td>
<td>1 (5%)</td>
<td>0</td>
<td>1 (5%)</td>
<td>0</td>
<td>0</td>
<td>8 (36%)</td>
</tr>
</tbody>
</table>
21. For those counties and cities adjacent to the district border that have growth policies that you are aware of, how many of those counties and cities have goals and objectives very similar to the goals and objectives your district is trying to manage for?

Response %

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>All of the growth policies</td>
<td>0%</td>
</tr>
<tr>
<td>More than half of the growth policies</td>
<td>0%</td>
</tr>
<tr>
<td>Half of the growth policies</td>
<td>5%</td>
</tr>
<tr>
<td>Less than half of the growth policies</td>
<td>9%</td>
</tr>
<tr>
<td>None of the growth policies</td>
<td>5%</td>
</tr>
<tr>
<td>Do not know</td>
<td>45%</td>
</tr>
</tbody>
</table>

Total Respondents: 14
Skipped this question: 8

22. Overall, do you believe the growth policies currently in place, in adjacent counties and cities, hinder or help your office's ability to successfully manage in your district?

Response %

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greatly help</td>
<td>0%</td>
</tr>
<tr>
<td>Help</td>
<td>14%</td>
</tr>
<tr>
<td>Some help and some hinder</td>
<td>23%</td>
</tr>
<tr>
<td>Neither help or hinder</td>
<td>5%</td>
</tr>
<tr>
<td>Hinder</td>
<td>0%</td>
</tr>
<tr>
<td>Greatly Hinder</td>
<td>0%</td>
</tr>
<tr>
<td>Do not know</td>
<td>27%</td>
</tr>
</tbody>
</table>

Total Respondents: 15
Skipped this question: 7
23. If the growth policies hinder management, what do you believe the causal factors are?

- Lack of defensible space (hazardous fuels)
- Growth policies are not restrictive enough, development still occurs in areas that limit FS management options.
- Counties need to provide guidelines for construction in rural areas that are friendly to wildlife, viewsheds and watersheds.
- Ignorance of structures and development on wildlife habitat and weeds
- Access, wildlife habitat
- I don't think our counties have a real clear growth policy other than a fairly hands off approach. As such, lands are being developed with limited discussion of access, wildlife or watershed input. I think the lack of planning is the biggest hindrance.

24. How has the management in your district changed or been affected by this hindrance?

- Requests for fuels work adjacent to developments
- Management has become more complex and expensive due to unrestricted development. We have more demand for road use permits, more conflict with new home owners, illegal use of the National Forest has increased.
- Counties and citizens often try to bring us in as the "heavy" after a project has been approved by a county (or is about to be approved), where some unwise (from a natural resources protection perspective) project is about to be implemented. People think the Endangered Species Act can stop anything.
- Apparent lack of green-space or green belts
- Public access to public lands continues to me eliminated.
- We have more neighbors with more demands from the national forest in a time of declining budgets.

25. Overall, how would you say all of the counties and cities adjacent to your district are doing in terms of the following:

<table>
<thead>
<tr>
<th></th>
<th>Doing very well</th>
<th>Doing well</th>
<th>Doing somewhat well</th>
<th>Doing slightly well</th>
<th>Not doing well</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wildlife and habitat protection?</td>
<td>0</td>
<td>1 (5%)</td>
<td>3 (14%)</td>
<td>6 (27%)</td>
<td>7 (32%)</td>
<td>2 (9%)</td>
</tr>
<tr>
<td>In terms of watershed protection?</td>
<td>0</td>
<td>2 (9%)</td>
<td>3 (14%)</td>
<td>6 (27%)</td>
<td>6 (27%)</td>
<td>2 (9%)</td>
</tr>
<tr>
<td>In terms of wildfire management?</td>
<td>0</td>
<td>4 (18%)</td>
<td>6 (27%)</td>
<td>5 (23%)</td>
<td>3 (14%)</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>In terms of natural resource conservation?</td>
<td>0</td>
<td>2 (9%)</td>
<td>3 (14%)</td>
<td>5 (23%)</td>
<td>6 (27%)</td>
<td>3 (14%)</td>
</tr>
</tbody>
</table>
26. How would you describe the majority of planning that occurs adjacent to your district?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory (such as zoning)</td>
<td>23%</td>
</tr>
<tr>
<td>Incentive based</td>
<td>5%</td>
</tr>
<tr>
<td>Both Regulatory and Incentive based</td>
<td>27%</td>
</tr>
<tr>
<td>Do not know</td>
<td>18%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>9%</td>
</tr>
</tbody>
</table>

Total Respondents 18  
Skipped this question 4

27. Do you, as a manager, feel that many of the issues/problems the district is dealing with because of growth could be alleviated if well designed, thought-out, more consistent planning took place adjacent to the districts borders?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very likely</td>
<td>14%</td>
</tr>
<tr>
<td>Likely</td>
<td>36%</td>
</tr>
<tr>
<td>Somewhat likely</td>
<td>36%</td>
</tr>
<tr>
<td>Not likely</td>
<td>0%</td>
</tr>
<tr>
<td>Do not know</td>
<td>0%</td>
</tr>
</tbody>
</table>

Total Respondents 19  
Skipped this Question 3
28. If counties and cities were to implement growth policies that incorporated the principles found in ecosystem management (flexibility, adaptability, monitoring, environmental integrity and protection, etc.) do you, as a manager, believe that the district's management goals and objectives could be more successfully accomplished?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very likely</td>
<td>23%</td>
</tr>
<tr>
<td>Likely</td>
<td>36%</td>
</tr>
<tr>
<td>Somewhat likely</td>
<td>23%</td>
</tr>
<tr>
<td>Not Likely</td>
<td>0%</td>
</tr>
<tr>
<td>Do not Know</td>
<td>5%</td>
</tr>
</tbody>
</table>

Total Respondents 19
Skipped this question 3

29. For counties and cities working to design a growth policy, what elements, goals, and implementation strategies would you, as a public land manager, recommend be incorporated into these plans that would help alleviate management problems in your district?

- Water quality protection
- Hazardous fuels reduction
- Wildlife habitat protection
- Boundary surveys
- Need to alleviate fuels issues. Need to provide watershed protection. Need to provide for some "undeveloped space". Need to plan well for access.
- Consider: Wildlife Habitat Fuels types
- All season access
- Historic uses
- Better planning in wildlife winter habitat and riparian areas. Recognition of hazardous fire areas.
- Improve Travel management planning.
- Open space concepts
- Access to public lands
- Fire safe concepts
- Recognition of wildland fire risks. Need for counties (or developer) to assume road management responsibilities. Recognition of primary winter range habitats.
- Planning of developments in appropriate land use allocations, i.e. don't put a subdivision in critical winter wildlife range. Controlling density. Place more homes in one location vs. dispersing them across a landscape. Codes for appropriate building materials in a forested environment (fire resident) Codes on sizes of structures...trophy homes should be required to pay an elevated taxed rate for excessive resource consumption. NOW is the time to address growth, look at the areas with the greatest control/best plans, they will say they were developed re-actively rather than proactively...and
unfortunately the opportunity for preventative control is loss. Codes for set backs to stop incidental trespass

• Working with us and looking at the large-scale picture—landscape level to see how their development approvals affect the landscape, etc.

• Public Access to public lands Water management Wildland Urban interface fuels management

• More regulatory attention must be paid to critical habitat and watershed needs. Developers and purchasers must recognize and accept that ecological process and management is dynamic. View sheds do change; active management is needed to address forest health and fire. Some areas must not be developed for these reasons, growth plans are too flexible.

• Require mandatory State Certified boundary surveys, by existing owners or realty agents, prior to sale of lands adjacent to all public lands.

• Counties need guidelines for fish and wildlife conservation worked into a growth policy. People are moving to Montana for the natural resources values we have here, and development should incorporate guidelines to ensure that those values are not lost because of the kinds of development taking place. That is a self-defeating policy.

• fuels and fire control roads management density requirements visual standards

• Cluster development, river setbacks, retain public access to public lands.

• Cluster development around existing services to keep the need for new infrastructure and services to a minimum. Require defensible space for fire and access for fire fighting equipment. Identify and protect key wildlife winter ranges, migration corridors etc free from development. Avoid development on inholdings that require off site development to provide minimum services. IE electrical lines, roads, water, and sewer.

30. Would your district be willing to work with adjacent counties and cities to improve their growth policies or help them to design their new growth policies?

<table>
<thead>
<tr>
<th>Response</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very willing</td>
<td>10</td>
</tr>
<tr>
<td>Somewhat willing</td>
<td>9</td>
</tr>
<tr>
<td>Slightly willing</td>
<td>0</td>
</tr>
<tr>
<td>Not willing</td>
<td>0</td>
</tr>
<tr>
<td>Do not know</td>
<td>0</td>
</tr>
</tbody>
</table>

Total Respondents: 19
Skipped this question 3
31. Have you worked with a city or county, as a private citizen, on any growth policy or planning issues?

<table>
<thead>
<tr>
<th>Yes very frequently</th>
<th>Yes frequently</th>
<th>Yes occasionally</th>
<th>Yes once or twice</th>
<th>No I have not</th>
<th>No comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
<td>8</td>
<td>2</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

Response %
- Yes very frequently: 9%
- Yes frequently: 9%
- Yes occasionally: 36%
- Yes once or twice: 9%
- No I have not: 23%
- No comment: 0%

Total Respondents: 19
Skipped this question: 3

32. Besides growth policies, what other suggestions would you make regarding strategies counties and cities can implement in order to help improve management goals and objectives on adjacent public lands?

- Information and education on natural systems and processes
- Do not approve every proposal that is submitted! Provide constructive feedback for proposals.
- Protection of Elk winter habitat. Restrictions of improvements in high fire danger areas.
- Consider the resources on the Forest when looking at economic growth opportunities
- Keep agencies involved and become involved with agency policy and information.
- Identify conservation and open space areas and look at their connectivity to public lands. Look at wildlife habitats and avoid developing, or do so wisely. Identify trail needs for outdoor recreation use opportunities. Protect riparian zones and habitats. Develop mutually desirable building codes for appropriate land use allocations...scenic areas may require burial of utility services if the private land is developed.
- Develop a collaborative approach to mapping the wildland urban interface and agreeing on future treatments.
- Information and education campaigns to help citizens understand the FS issues and objectives.
- Develop brochures that explain responsibilities of land owners to their neighbors, consisting of both private and public lands. The State should require training of realty agents to disseminate this type of
information to potential purchasers to help alleviate future problems or disputes. This could also be tied back to the Counties growth policy, requiring realty agents to provide this info to potential purchasers, so they can consider it as a part of their decision to purchase lands.

- County planners and Commissioners need training in growth policies that preserve and protect natural resources. These plans are a lot easier to implement up front, than to overlay on existing development.

- Enforced zoning and fuels reduction for new subdivisions

- Retain access to public lands across private lands

33. Please feel free to add any additional comments

- There is little growth currently occurring in Wheatland, Golden Valley and Meagher Counties. As such, most of the questions you've asked don't really apply to the Musselshell District. Our management concerns are 1. Forest health - lack of natural fire in the ecosystem and what that has done to habitat, etc. 2. Access - as mentioned previously, the land ownership pattern limits public access to the National Forest. Some private landowners allow public access, many do not. 3. Unrestricted ATV (4-wheeler) use. Most users are conscientious and try to do what's right. However, there are those who ride cross country, purposely cut and create new trails and are causing a lot of resource damage. 4. Invasive species is a growing concern. We have weed programs, but the problem keeps growing. Some spread is due to recreation use, some due to range use (and past over-use) and some due to lack of natural fire.

- Unfortunately there is a large segment of the American population that view zoning and growth policies as "un-American" or unconstitutional. It is their right to develop their private land any way they may wish (except for public health and safety restrictions). This overall attitude needs to change. Urban sprawl is one of the greatest threats to the west. We should look at other models, such as some of the European models. Growth is restricted to this boundary. The countryside remains countryside and does not become a subdivision because the landowner could make the most money from that land use. This opens the subject of "takings"... Our constitution and land use laws were develop for a vast country with an estimated population of 13 million people, not the 250 plus million now....land use policies need to be progressive and proactive, rather than reactive. Heavy users of natural resources should be taxed/penalized for consuming resources, i.e. trophy home owners, and it should not be a one time tax. Why should two people live in a 7,000 sq ft home and use limited energy resources to heat it without penalty....there should be incentives for conservation and wise use, and disincentives for consumerisms, unwise use of natural resources.

- I've been involved in Teton Counties recent efforts regarding development and approval of a Growth Management Policy. However, my familiarity with the details is currently quite vague. This survey has prompted me to reacquaint myself with the Teton County policy. Also, I believe Lewis and Clark County has a Growth Policy, but that it is more central to the metropolitan area of Helena, rather than the outskirts of the county, such as Augusta.

- Some of the best planning in my area is coming out of a watershed group that has taken a proposal to the county commissioners in the area. Our county government is not funded or able to initiate these plans. We are also getting help from some regional non profits who are discussing the issues of planning development, conservation easements, and developing an understanding. Politics in this area would not prompt favor limiting or planning growth. Unfortunately after the area has developed and people see that the values they moved to the area for, are being lost, and get mad enough to precipitate change, the damage if often done. At that point there is a desire for the feds to provide the open space opportunities that have been forgone on private land.