ENVIRONMENTAL CONSIDERATIONS

Kalispell is located at the center of the Upper Flathead Valley, a broad agricultural valley surrounded by the foothills and mountains of the Flathead National Forest, Stillwater State Forest and Glacier National Park. The Swan Range to the east rises 4,500 feet above the valley floor and peaks further east along the continental divide reaching elevations above 10,000 feet. The City of Kalispell is 2,959 feet above sea level and most of the Growth Policy Area consists of nearly level alluvial lands, bottomlands and low terraces. The confluence of the Flathead, Whitefish and Stillwater Rivers is part of a large riparian complex that covers most of the eastern half of the Growth Policy Area. Important resource and environmental factors in the growth policy area include hydrology, floodplain, air quality, steep slopes, soil limitations, wildfire hazards, important wildlife habitat, important agricultural lands and historical and cultural resources.

Climate

Kalispell has a relatively mild climate for its elevation, influenced principally by topographical features. The water surfaces of Flathead Lake and the valley’s many smaller lakes and three rivers tend to moderate temperatures in both winter and summer. Temperatures in Kalispell range from a January average of 21 degrees Fahrenheit to a July average of 65 degrees. Winds are generally light in Kalispell, where the annual prevailing wind direction is from the west. Annual rainfall in Kalispell averages 16 inches and annual snowfall, 59 inches. The average length of the growing season, defined as the average annual frost-free season, is 110 days in the Kalispell area.

Water Quality

A variety of federal, state, tribal and local agencies implement regulations intended to protect water quality. The U.S. Environmental Protection Agency and U.S. Army Corps of Engineers regulate filling of lakes, streams, rivers and wetlands. The Montana Department of Environmental Quality regulates point-source water pollution, sewer and water utilities, solid waste management, storm water discharge, and sanitation in subdivisions. The Montana Department of Fish Wildlife and Parks regulate construction or alteration of facilities that affect streams and stream banks undertaken by government agencies. The Montana Department of Natural Resources and Conservation regulates timber harvesting adjacent to streams. The Flathead Conservation District regulates stream bank and streambed modification. Flathead County administers lakeshore regulations addressing lakeshore construction and other activities.

The Flathead Valley’s relatively pristine water quality is of high value. Respondents to public opinion surveys in Flathead County ranked water quality as the number one concern for the future.

The Upper Flathead Valley’s groundwater resources, as described by the Golder Associates Study prepared in 1995 for the Flathead City County Health Department, are varied and complex. A deep artesian aquifer spans a large regional area. The Evergreen
Alluvial aquifer, located generally along the Flathead River floodplain, is a highly permeable sand and gravel aquifer controlled by the flows of the river. The Flathead River drains into Flathead Lake approximately ten miles southeast of Kalispell.

The mountain streams of nearby Glacier National Park are continental headwaters, draining eventually into the Atlantic and Pacific Oceans and the Gulf of Mexico. Flathead Lake, the nation’s largest fresh water body west of the Mississippi River, is among the cleanest lakes of its size in the world.

The health of Flathead Lake is a good indicator of the health of the rivers, streams, lakes and surface water that contribute to the lake. Over 60,000 people live within the area having waters that drain into Flathead Lake, including the shoreline of the lake and upstream areas. A large share of the nutrient load that reaches the lake is likely derived within a relatively small portion of the drainage. Among some of the major contributing waters to Flathead Lake are Whitefish Lake and the Stillwater and Whitefish Rivers, the North Fork, Middle Fork, South Fork and the main stem of the Flathead River, and Swan River and Swan Lake.

Ashley Creek flows out of Ashley Lake, into Smith Lake, both located west of Kalispell and then flows easterly and southerly through the Growth Policy Area, into Flathead Lake. East Spring Creek originates northeast of Kalispell and flows into the Stillwater River. The Whitefish River flows into the Stillwater River east of Kalispell and the Stillwater River flows into the Flathead River southeast of town. The Flathead River then flows into Flathead Lake and emerges again out of the south end of Flathead Lake and eventually flows into the Clark Fork River.

More than twenty-five years of water quality monitoring show a steady decline in the water quality of Flathead Lake due to increases in nitrogen and phosphorus. The lake remains among the cleanest large lakes in temperate regions world wide, but research shows that water quality in Flathead Lake has been steadily declining since 1977.

Of great concern are British Petroleum Canada’s plans for coal bed methane extraction in the Flathead River Valley of Southern British Columbia on the headwaters of the North Fork of the Flathead River. These plans have potential to significantly degrade the water quality of the entire Flathead River Basin which includes all of the Flathead Valley. Agencies that oversee water quality in the United States and Montana have limited ability to halt these types of activities across international boundaries, and then becomes a political issue.

The Federal Clean Water Act requires states to report impaired waters. The Department of Environmental Quality maintains a list of water bodies that fail to meet water quality standards. The 303(d) list identifies impaired water bodies and probable causes of impairment as well as suspected sources of pollutants. DEQ is required to develop Total Maximum Daily Loads (TMDL) for all water bodies on the 303(d) list. The 303(d) list is defined by EPA as waters with Category 5 designations, i.e. "Waters where one or more applicable beneficial uses have been assessed as being impaired or threatened, and a TMDL is required to address the factors causing the impairment or threat."
The development of a Total Maximum Daily Load (TMDL) is a process that looks at all sources of pollution influencing water quality, including natural sources in a watershed. Assessing an entire watershed, the TMDL assures that all the pollution sources in a watershed are considered. A TMDL is established using available information. In 1997 the legislature required DEQ to use “sufficient, credible data” in making beneficial use determinations. As a result of the new definition of sufficient, credible data, 486 water bodies were removed from the 2000 303(d) list pending reassessment. However, a federal judicial order required EPA and DEQ to complete “all necessary TMDLs” for all water bodies on the 1996 303(d) list by May 5, 2007.

Flathead Lake has been listed as a “water quality-limited water body” or “impaired” by the Montana Department of Environmental Quality, and therefore a TMDL is required. Swan Lake is also a high priority water body for TMDL development. Whitefish Lake and the Stillwater River are each identified as moderate priority water bodies for TMDLs. Including the low priority water bodies on the list the Flathead Basin has 35 water bodies that require development of watershed specific plans draining into Flathead Lake. A total of 346 miles of streams in the Flathead Basin above the outlet to Flathead Lake do not meet water quality standards. Over 156,000 acres of lakes do not meet water quality standards in the Basin. DEQ has assigned priorities for development of plans and TMDLs based mainly on public interest and not necessarily the degree of problems that a water body exhibits.

DEQ has adopted Total Daily Maximum Loads (TMDL) for Flathead Lake and provided targets for nutrient reduction. A Total Maximum Daily Load is the total amount of a pollutant that a water body may receive from all sources without exceeding water quality standards. A TMDL can also be defined as a reduction in pollutant loading that result in meeting water quality standards. The purpose of a Total Maximum Daily Load (TMDL) target is to establish quantifiable management measures to protect water quality and monitor how well water quality protection measures are working. This target will be used to guide decision making until better information becomes available. The goal of the TMDL is to achieve water quality standards through a 15% reduction or elimination of man-caused water quality impairments with a 10% margin of safety. The margin of safety is included to account for projected future increases in point source loads attributable to increased wastewater flows and the continuing upward trend in population growth in the unincorporated areas of the Flathead Basin.

There are basically two sources of water pollution. Point sources are discharges from an identifiable outfall such as pipes or ditches. Point source discharges are regulated by permits issued by the Department of Environmental Quality. Examples of point sources include municipal and public sewage treatment facilities, factories, some storm sewers and large livestock feedlots. Nonpoint sources are generally land extensive activities that do not require discharge permits. Nonpoint sources include agriculture and forestry activities, small construction projects, unregulated storm water discharges, and individual septic systems. Ninety percent of stream pollution and eighty percent of lake impairments in Montana come from non-point sources.

Phosphorus and nitrogen are nutrients that contribute to algae growth. Past efforts to reduce the amount of nutrients reaching Flathead Lake and its tributaries have been successful. Upgrading sewage treatment plants in the upper basin for phosphorus removal, connecting Evergreen to the Kalispell Wastewater Treatment system, and
banning domestic use of phosphorus containing detergents have reduced the amount of nutrients reaching Flathead Lake from these sources.

The level of reduction needed to protect Flathead Lake is commensurate with the levels achieved by the community waste water treatment plants through implementation of the 1986 Flathead Lake Phosphorous Strategy. Community waste water treatment plants have achieved the state mandated phosphorous limit of 1mg/L. All of the facilities in the basin meet or surpass this standard on an annual basis. The City of Kalispell routinely exceeds this standard, meeting levels closer to 0.2 mg/L for total phosphorous and has voluntarily undertaken active nitrogen removal. The waste water treatment facilities have reduced pollution loading 70 to 90 percent.

Other community wastewater treatment facilities have also played a significant role in reducing nonpoint loading. Reductions in nonpoint loading through the development of new public systems (Lakeside/Somers) and the expansion of areas served by public systems such as the Evergreen, Big Mountain/ Whitefish Lake and Bigfork have played a major role in protecting water quality.

However, water quality continues to decline primarily due to polluted runoff. Polluted runoff, also known as nonpoint source pollution, is perhaps the greatest threat to water quality in the Flathead Basin. It is caused by rainfall or snowmelt moving over and through the ground. As it moves, runoff picks up and carries natural and human-caused pollutants, depositing them into rivers, lakes and groundwater.

Croplands, livestock feedlots, golf courses, lawns, gardens, roadways, parking lots, construction sites, landfills, city storm sewers, logging operations, residential septic systems, and erosion from streams, river-banks and lake shores are all sources of polluted runoff. Even airborne chemicals and particulates carried into our waters by rain or snow contribute to the problem.

The scattered locations of these pollutants and their often unpredictable dispersal make clean up efforts complex and often costly. This is because the waterways within a watershed are interconnected. Streams flow into rivers, which flow into lakes. There can be a connection between these surfaces waters and groundwater. A pollutant introduced in one area upstream can pollute the water downstream.

Meeting TMDL targets and allocations for Flathead Lake will most likely require reductions in nutrient loading in the Flathead River Headwaters and Whitefish and Swan Lakes as well as all of the rivers and streams that flow into and out of these lakes, as well as limiting the installation of individual septic systems in areas of high groundwater.

The completed Water Quality Protection Plan and TMDLs for Flathead Lake, the Swan Lake watershed and the Flathead River Headwaters can be found at: http://deq.mt.gov/wqinfo/TMDL/finalReports.asp
Floodplain

Flooding is perhaps the most significant environmental concern in the Growth Policy Area.

The Flathead, Stillwater and Whitefish Rivers and the adjacent lands are subject to natural flood cycles. Major floods have been recorded in 1894, 1926, 1933, 1948, 1964, 1975 and 1995. The primary yardsticks used to measure flood prone areas are the 100-year and 500-year floodplains. The term 100-year floodplain defines an area covered by a flood of such intensity that it would, on average, occur once every one hundred years; the 500-year floodplain, every 500 years. In other words, a 100-year flood event has a one percent chance of occurring in any given year. The 100 and 500-year floodplains extend across roughly a fourth of the Growth Policy Area. (Map 7.1)

100-year floodplains offer numerous benefits to the property owners and the community by:

- Providing flood storage and conveyance;
- Reducing flood velocities and potential for erosion;
- Absorbing large volumes of water gradually releasing it to adjacent streams or water bodies during low flow periods;
- Recharging wells and aquifers by holding water long enough to allow it to percolate into underlying soils;
- Supporting vegetation that acts as a flood buffer and stabilizes the shoreline;
- Enhancing water quality by absorbing sediments, toxins, and nutrients;
- Providing critical habitat for birds, mammals, reptiles, fish, and amphibians

Since 1984 Kalispell and Flathead County have administered floodplain management regulations requiring permits for new structures, fill and storage in the 100-year floodplain. Implementation of the regulations is required for participation in the National Flood Insurance Program, which offers low-cost flood insurance for buildings and their contents. Although it is discouraged, local floodplain regulations do not prohibit construction in the 100-year floodplain, but require fill so that the bottom habitable floor is elevated above the base flood elevation.

The Flathead City-County Health Department issues permits for all on-site sewage disposal systems outside of the City of Kalispell and does not allow a septic system in or within 100 feet of a designated 100-year floodplain. All development within the city is required to be on Kalispell’s Public Sewer system. However, the availability of these services does not prevent damage to structures if flooding occurs.

Allowing development in areas subject to flooding can be a threat to life and property and contributes to degradation of water quality. It can be very costly to mitigate for damages caused by flooding. The 1975 flood in Evergreen was estimated to be a 25-year flood event. Officials at the time estimated property damage in excess of two million dollars and news stories reported that over 200 mobile homes were either flooded or pulled from high water areas in the Evergreen area. The 1964 flood was much more extensive. (Map 7.2) The flows through Columbia Falls on the Flathead River were 25 percent higher than a 500-year flood event. This flood was triggered by torrential rains
which swept through the mountains and valley during a period of unseasonably high spring temperatures which were already causing a rapid thaw of an unusually high spring snowpack.

Local floodplain regulations are adopted and enforced locally, but are authorized by the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Prior to these acts, flood insurance was nearly non-existent for private property owners. When local communities participate in the National Flood Insurance Program (NFIP), private property owners are then eligible to obtain flood insurance.

Flathead County began participating in the National Flood Insurance Program (NFIP) September 5, 1984. By participating in the NFIP, the County (and the three municipalities) has adopted Floodplain Regulations to identify all areas within Special Flood Hazard Areas (SFHA). With the adoption of the regulations, they have also adopted Flood Insurance Studies (FIS), which form the basis of the Flood Insurance Rate Maps (FIRM). These documents are used primarily in determining actuarial flood insurance rates and, secondarily, to assist the local jurisdictions in their efforts to promote sound floodplain management.

FEMA is currently undergoing a comprehensive nationwide map modernization process. This process involves working with local communities and state officials, contracted consultants, and the public. The result of this process is to produce digital maps and may include some detailed study on a limited number of waterways. Flathead County has been identified as a priority community that is in need of significant map modernization. This process began in 2004 and the completed Digital Flood Insurance Rate Maps are expected to be adopted by Flathead County in September of 2007.

Flathead County currently participates in the Community Rating System (CRS) and is recognized as a Class 9 community. This recognition is based on the regulations and management that have been in place, and results in property owners throughout the county enjoying a 5% discount on their flood insurance premiums. More active management of the floodplain could result in a classification of 8, and a 10% discount in flood insurance rates.

**Groundwater and Depth to Water Table**

Groundwater is water that fills pores and cracks in rocks and soil. Groundwater sustains lake levels, provides for base flows in streams, and is a major source of domestic water. Groundwater comes from precipitation and condensation that enters the soil. It is susceptible to depletion in quantity and degradation of quality.

Groundwater flows beneath the surface of the earth, generally moving down hill following the contours of the land. It moves toward a point of discharge, which is usually a lake, stream, spring or a well.

The depth to groundwater varies with seasons and precipitation levels. Many areas experience seasonally high groundwater levels, usually in the spring, which limits land
uses. These areas are commonly near floodplains, alluvial deposits and swamps, which places limitations on septic tanks, basements and road building.

An aquifer is a water-bearing layer of permeable rock, sand or gravel. The thickness and depth of an aquifer vary with its location. The quantity of water a rock can contain depends on its porosity, or the amount of open space and cracks between grains. Water movement in rock depends on the permeability, or ability to transmit or allow water to flow. Aquifers are recharged or filled by precipitation and infiltration from streams. Recharge is greatest in late spring when snow melts and there is runoff from the mountains.

A substantial amount of groundwater feeds directly into the aquifers which then flow into Flathead Lake. High density development in areas with high water tables have the potential to degrade water quality of the Flathead River and Flathead Lake, as well as the groundwater that supplies and recharges domestic water wells.

Four major types of aquifers have been identified in the Flathead Valley. (Flathead River Basin Steering Committee, 1983, and Konezeske, 1968)

1. The Precambrian Bedrock Aquifer is found in hilly areas. Water is trapped in fractures of Precambrian rock and provides a source for domestic water. This includes a fractured limestone area located northwest of Flathead Lake extending north from Rollins to Whitefish Lake.

2. A Pleistocene Artesian Aquifer is found under most of the valley floor and consists of unconsolidated sand and gravel over laid by thick layers of glacial till and sediments. Two zones of sand and gravel have been identified, one deep and one shallow. Many wells extend 200 to 400 feet into the deep aquifer. This aquifer is recharged along the mountain front east of the valley by precipitation and steam seepage.

3. Pleistocene Perched Aquifers are separated from the artesian aquifers by an impermeable layer of clay, till and gravel. The perched aquifers are found in dune and lacustrine sand, glacial drift and glacial outwash. They are small in area extent and water yield. Recharge is by precipitation and stream seepage.

4. A Floodplain Aquifer is located under the floodplains of the Flathead, Stillwater, and Whitefish Rivers. It is described as a 30 foot deep, 5 mile wide bed of sand and gravel. Recharge is by precipitation, infiltration from streams, percolation from irrigation water and seepage from high groundwater. Flows range from a few gallons per minute (gpm) in the sand, to as much as 2,000 gallons per minute in gravel deposits.

The major aquifer in the Flathead Valley and the Kalispell Growth Policy Area is the shallow alluvial aquifer (#4), often referred to as the Evergreen Aquifer, which is located between the Flathead River to the east and Whitefish River to the west, and between Badrock Canyon to the north and the confluence of the Flathead and Whitefish rivers to the south. The depth to the water table in the city of Kalispell and the Growth Policy Area is generally less than 50 feet and for much of the area along
the Flathead River and in the southwest portion of the Growth Policy Area and Ashley Creek, less than five feet. (Map 7.3)

**Surface Water**

Surface water can be intermittent and flow only during runoff. Virtually all surface water is naturally occurring as a result of glacial impoundments. The direction of flow is dictated by topography, geologic structure and amount of water. When development is permitted near surface water or where seasonal runoff can transport pollutants, it can result in degradation of rivers and streams as well as the groundwater and aquifers that supply domestic well water.

**Stormwater Runoff**

Management of stormwater runoff has become a major concern throughout the Kalispell Growth Policy Area as well as countywide. The area’s many lakes, rivers and streams are being rapidly developed. Outside of the municipalities, building permits are not required, making it very difficult to monitor construction activities that can seriously degrade surface and groundwater quality.

Stormwater runoff is the water flowing over the surface of the ground as a result of rainfall or snow melt. The primary goal in the management of storm water runoff is to minimize hazards to life and property by using storm sewers, ditches and swales to collect and carry surface water to a natural watercourse or body of water in such a way as to prevent flooding and the resultant damage. Municipal, County and other public sewer and water facilities are generally designed to handle storm water runoff. However, some systems lack the capacity to handle the rapid development that has been occurring.

Persons developing property have the responsibility to convey storm water from that property to an appropriate point of disposal. The quantity and rate of runoff from a developed property should not exceed that which would occur had the property remained undeveloped. In instances where developing property cannot be drained to an appropriate point of disposal, storm water must be detained and handled on site.

Traditionally, efforts to improve water quality under the National Pollutant Discharge Elimination System, (NPDES) have focused on reducing pollutants from industrial wastewater and municipal sewage treatment plant discharges. Over time, it has become evident that more diffuse sources of water pollution, such as stormwater runoff from construction sites, are also significant contributors to water quality problems. According to the Montana Department of Environmental Quality Water Protection Bureau, sediment runoff rates from construction can be as much as 10 to 20 times greater than those from agricultural lands, and 1,000 to 2,000 times greater than those from forest lands, and that over a short period of time, construction activity can contribute more sediment to streams than is naturally deposited over several decades. This accelerated deposition causes both physical and biological damage to surface waters.
In 1990, the Federal Environmental Protection Agency (EPA), promulgated rules establishing Phase I of NPDES storm water program. Phase I addressed, among other discharges, discharges from construction activities disturbing 5 acres or more of land. In Montana, since 1992, the Montana DEQ has been permitting these discharges from larger construction projects through the Montana Pollutant Discharge Elimination System (MPDES) Program.

Phase II of the NPDES storm water program covers smaller construction projects disturbing between 1 and 5 acres. Phase II became effective on December 8, 1999, with permitting for smaller construction projects to begin on March 10, 2003. Montana has incorporated these new MPDES Phase II stormwater requirements, as well as the Phase I requirements, into the Administrative Rules of Montana (ARM), Chapter 30, Subchapters 11, 12 and 13. Effective March 10, 2003, construction activity which results in the “disturbance” of equal to or greater than 1 acre of total land area, will need to obtain permit coverage under the “General Permit for Storm Water Discharges Associated with Construction Activity” (called General Permit). Construction activity includes the disturbance of less than 1 acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb 1 acre or more (such as subdivisions with phased work over years). “Disturbance” related to construction activity means areas that are subject to clearing, excavating, grading, stockpiling earth materials, and placement or removal of earth material performed during construction projects.

The implementation of the Phase II stormwater requirements means that every construction project involving “disturbance” on 1 or more acres, including construction projects in the City of Kalispell, must obtain a “General Permit for Storm Water Discharges Associated with Construction Activity” (called General Permit) from the Montana Department of Environmental Quality.

The City of Kalispell Public Works Department monitors stormwater management practices in all development within Kalispell beginning at the time of approval of a project to the time of completion.

Additional information on stormwater discharge regulations and permitting can be obtained by contacting the Montana Department of Environmental Quality, Water Protection Bureau, Storm Water Program, P.O. Box 200901, 1520 East Sixth Ave., Helena, MT. 59620-0901 or by phone at (406) 444-3080. The following website contains additional information, permit fees and application forms.

**Wetlands**

Wetlands play a critical role in protecting water quality, as well as providing flood management, habitat and natural scenic values. The natural functions of a water body and adjacent riparian lands are inherently interconnected. The Montana Department of Environmental Quality has estimated that 95 percent of all water pollution in Montana comes from non-point sources, generally carried by storm water runoff and crossing riparian lands before reaching water bodies. Of particular concern, established native plant communities in riparian areas serve a variety of important functions: They hold stream banks in place, reduce flood velocities, absorb nutrients, filter sedimentation,
provide diverse habitat, improve fisheries by shading and contribute to scenic values. Activities which can degrade the integrity of riparian areas include channel alteration, excavation and fill, removal of native vegetation, application of fertilizers and pesticides, road building, utilities installation, excessive impervious surface, farming or development up to the water’s edge, concentrated livestock use, concentrated human activity, burning, and the operation of heavy equipment and stockpiling of debris.

The confluence of the Flathead, Whitefish and Stillwater Rivers is part of a larger riparian complex of swales, streams, wetlands and alluvial terraces that span much of the eastern portion of the Growth Policy Area. Most wetlands are confined to the areas along the rivers and streams. (Map 7.4) The USDA Natural Resources and Conservation Service have mapped much of the area extending out from the rivers as having hydric soils or soils with a percentage of hydric characteristics. (Map 7.5) Hydric soils, one of the primary indicators of wetlands, are those that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth of hydrophytic vegetation (i.e., plants adapted to saturated soils, such as cattails). Hydric soils may also be classified as floodplain and riparian habitat.

**Topography**

Slope is one of the primary design considerations for streets, storm drainage facilities, sewer and water lines, septic systems and building sites. Typically, however, only steep slopes or very flat slopes pose significant development limitations. Subdivision regulations limit grades to eight percent on residential roads with a provision for allowing minor deviations for short distances. Slope limits are intended to facilitate traffic movement during icy conditions and access by large emergency vehicles. County sanitation regulations do not allow the placement of septic drainfields on slopes steeper than 25 percent and require steep slope analysis on lands between 15 percent and 25 percent slope. In addition, the Montana Department of Natural Resources and Conservation and the Flathead Rural Fire Council have adopted guidelines for wildland interface areas that recommend against development on slopes exceeding 30 percent due to diminished ability to control wildfire. Other potential problems of development on steep slopes include soil instability, erosion of topsoil, downslope water degradation and hillside scarring.

Most of the Kalispell Growth Policy area has gentle topography, well suited for development. The plan boundary follows the base of the foothills southwest of Kalispell generally excluding the steep terrain of the foothills around Lone Pine State Park and Foy’s Lake. Within the Growth Policy area, steep slopes are generally limited to occasional sections of riverbank and bluffs. (Map 7.6)

**Soils**

The suitability of soil types for building construction, road construction, on-site sewage disposal or agricultural production help determine where development should occur, what costs may be incurred to alleviate limitations presented by poor soils and what trade-offs exist to developing agricultural lands. The most reliable soils information available on a broad scale is found in the Soil Survey for the Upper Flathead Valley Area
Certain types of soils render some areas unsuitable or less suitable for urban development because of one or more of the following properties:

- flooding or ponding
- high water table
- alkalinity or acidity
- salinity, shrink/swell behavior
- unfavorable load-bearing capacity
- stoniness
- depth to bedrock
- corrosive characteristics
- slow or rapid permeability

In most situations, unfavorable soil conditions for development can be overcome through engineering techniques at a cost that may or may not justify the development in relation to the opportunity of developing elsewhere. Most of the severe soil limitations for development in the Growth Policy Area are related to water, such as flooding, ponding and high water table. Soils with these limitations generally correspond closely to the location of floodplains and hydric soils.

**Agricultural Soils**

Over the years, three farmland rating systems have been developed for use in Flathead County. First, the Soil Survey (1960), prepared by the USDA Soil Conservation Service (SCS), rated soils by “agricultural capability classifications” on a scale of I-VIII, primarily addressing physical limitations to cultivation. Conventionally, class I-IV soils were considered well suited for cultivation. Secondly, SCS developed in 1980 the Important Farmlands Classification System, which uses a broader range of factors to rate the “farmability” of the soils. The SCS, now the Natural Resources and Conservation Services currently uses a rating system which designates categories of prime, prime if irrigated, and lands of statewide importance. Using the soils data and farmlands classifications, Map 7.7 identifies the lands in the Growth Policy Area rated as prime, prime if irrigated and lands of statewide importance.

A significant component of the regional economy, agriculture in the Flathead Valley is in transition. Although, there is a rapidly increasing trend of conversion of agricultural land to high density residential and commercial use, especially in the Kalispell area, a significant percentage of the Growth Policy Area is still being used for agriculture. There are no soil types that are classified as prime in the Growth Policy Area. However, the north and western portions are very suitable for agricultural use if irrigated.

Soils suitable for agricultural use are also generally suitable for land application of septic tank waste. The Flathead Valley’s rapidly increasing population of the last few years is accompanied by an increasing number of individual septic tanks being installed. When these tanks need to be pumped, the waste has to be taken off site and is traditionally treated by applying it to suitable agricultural lands. There are three such permitted sites
located on private lands in the Growth Policy Area. These sites are located in the northwest corner of the Growth Policy Area which is also the area that is now experiencing the greatest development pressure. As growth spreads to the north and west, these sites will likely become unavailable and septic tank pumping operators throughout the valley will pay to take the waste to a municipal or public wastewater treatment facility, passing on the cost to the consumer. Municipal and public facilities will need to increase their capacity. Public wastewater treatment facilities should consider this situation when planning facility expansion.

**Air Quality**

Kalispell, like Columbia Falls and Whitefish, has been designated as a non-attainment area for small particulate matter (PM-10), in violation of the U.S. Clean Air Act. The Act requires that local communities not meeting ambient air standards adopt an implementation plan (SIP), of remedial measures. As part of the required SIP, the Kalispell Air Pollution Control District was established in 1989. The rules adopted within this area focus on reduction of road dust. Requirements include paving of new streets and large parking lots, limitations on sanding of streets and large parking lots, prioritized street sweeping and dust control for major construction and land clearing projects. In 2001, the Flathead County Environmental Health Department indicated that the SIP had been effective. Since 2001, the Kalispell area has grown and vehicle traffic has increased significantly as well as traffic congestion. High levels of both small particulate and carbon monoxide pollution in this area are now mainly related to vehicle emissions.

**WILDLIFE**

**Riparian Habitat**

The mainstem of the Flathead River, Stillwater River, Whitefish River, Ashley Creek and Foy's Lake(s) and their associated backwater channels, spring creeks, wetlands and tributaries provide important wildlife habitats in and adjacent to the Growth Policy Area. (Map 7.8) Although these habitats may be intermixed with homes and agriculture they are still important to the various wildlife species which depend on them. Intact natural forest and shrubby vegetation or marshes are particularly important to retain.

Typical riparian/wetland species associated primarily with the Flathead-Stillwater complex include: large mammals such as Whitetail Deer, Mountain Lion, an occasional Black Bear or Moose; small mammals such as Beaver, River Otter, Mink, Muskrat, Raccoons; resident or migrant water birds such as Great Blue Herons, Tundra Swans, Killdeer, Spotted Sandpipers; nesting and migratory waterfowl such as Wood Ducks, Mallards, Mergansers, Golden eyes, Canadian Geese; woodland bird species such as Pileated Woodpeckers, Great-Horned Owls, Saw Whet Owls, Osprey, Eagles, a variety of migratory and resident songbirds, Rubber Boas, Garter Snakes, Painted Turtles, Long-toed Salamanders, Spotted Frogs, and Western Toads. In late spring, a diverse population of bird species has been observed at the Owen Sowerwine Natural Area located just outside of southeast boundary of the Growth Policy Area, representative of these forested riparian/wetland habitats.
The Growth Policy Area also contains a few open unforested wetland areas such as sedge and cattail marshes located in old river channels, around ponds and at the base of the foothills southwest of Kalispell. These areas can be important for muskrats; migratory and breeding shorebirds such as snipe; many species of dabbling ducks such as mallards, widgeon, shovellers; resident reptiles and amphibians such as western toads, spotted frogs, and western terrestrial garter snakes; and predators such as red-tailed hawks, great horned owls, red-fox, coyote, and mink.

Human development in intact riparian/wetland habitats reduces wildlife habitat values. Removal of riparian/wetland vegetation to create views, graze domestic animals and build homes reduces the amount or quality of habitat (e.g. space for wildlife). Human pets such as cats and dogs tend to harass or consume wildlife. Wildlife-human conflicts increase with urbanization. For example, whitetail deer will browse extensively on expensive ornamentals, in gardens, or in haystacks. Beaver will continue to utilize remaining riparian vegetation (trees and shrubs), which may have been already reduced due to development. Dogs will chase and kill deer in the wintertime. In time, once productive wildlife habitats can become wildlife sinks due to prevalence of small predators such as skunks, fox and domestic pets.

The Stillwater Game Preserve covers much of Evergreen and is generally bounded by the Flathead River on the east, Reserve Drive on the north, the Whitefish River and Highway 93 on the west, and Conrad Drive on the south. Lone Pine Game Preserve is situated southwest of Kalispell and is bounded by Foy's Lake Road and 18th Street on the north, Airport Road on the east, and Foy's Canyon Road on the south and west. These preserves are partially in the Growth Policy area and were created by the Fish, Wildlife, & Parks Commission in the 1960’s for the purpose of protecting wildlife and preserving some of the habitat values. Rules generally prohibit the carrying or discharging of firearms, creating disturbances tending to frighten or drive away game animals or birds, or chasing wildlife by dogs. Trapping of furbearing animals during permitted seasons is allowed. Should game populations increase in these preserves beyond human tolerance, management options using hunting or other control techniques may not be a viable option with preserve status.

The Stillwater/Flathead River riparian/wetland complex, which extends along both the Flathead and Stillwater Rivers and associated tributaries and wetlands is clearly the most important riparian/wetland wildlife habitat in and adjacent to the growth policy area. A significant part of this area falls within the Owen Sowerwine Natural Area and the Stillwater Game Preserve.

Because of its flooding potential, relative inaccessibility of the river areas, its rural character on the east side and presence of the Owen Sowerwine Natural Area much of the habitat within this region is still intact and relatively wild. The Flathead/Stillwater complex supports some of the highest densities of whitetail deer in the Flathead Valley. The large spruce trees provide critical thermal (winter), cover for whitetail deer and other species during severe winters such as the winter of 1996-1997. The proximity of this natural ecosystem to the Kalispell area provides great opportunities for recreation and wildlife/habitat education.
High density development within or adjacent to this area would greatly reduce its high quality wildlife values. Maintaining the existing habitat along the Stillwater River and adjoining wetlands and tributaries (e.g. along Brenneman’s Slough, Ashley Creek, the wetland areas east of the river, East Spring Creek etc.) that connect to the Flathead mainstem, is desirable to maintain the intact nature, quality and size of the Flathead/Stillwater complex. Continued human development within this large habitat area will only increase human-wildlife conflicts, degrade habitat and water quality, increase predation on wildlife by pets and pests, and reduce overall wildlife habitat values.

Although outside of the Growth Policy Area, the wetlands associated with Foy’s Lake, Middle Foy’s Lake and other smaller lakes in that vicinity are important habitat for a variety of waterfowl and aquatic wildlife species. Although development is prevalent near or around these lakes it is important to leave inlets, outlets, marshy areas and some portion of the adjacent upland areas undeveloped to allow for waterfowl nesting, undisturbed perch or nest sites for osprey and great blue herons, and breeding habitat for reptiles and amphibians.

The Montana Department of Fish Wildlife and Parks (FWP), has recommended the following policies to conserve fisheries and important riparian habitat.

- Designate all waters as critical fish habitat.
- Maintain a 100-foot setback of development and septic systems from the edge of all rivers, streams, and lakes.
- Prohibit off-channel excavation to correct watercourses.
- Maintain streamside vegetation.
- Riparian areas should be zoned for single-family residential use, limiting density to one dwelling per five acres.
- All areas between river channels should be maintained as open space.

**Fisheries**

The Kalispell area encompasses important waters for various fish species of the Flathead Lake and River system including the Flathead, Whitefish and Stillwater Rivers and a number of smaller springs and creeks. These waters provide valuable fisheries and habitat for native fish species, some of which are being considered for listing under the Endangered Species Act. The Bull Trout, listed as a threatened species, and the Westslope Cutthroat Trout use these waters. Adult ad fluvial fish migrating from Flathead Lake up into the North and Middle Fork tributaries to spawn pass through the growth policy area on their migration upstream and on their return trip downstream. In addition, juvenile fish of both species use this river section as a migratory corridor and, for some individuals, long-term residence and rearing habitat.

There are other fish species found within the Growth Policy Area. Rainbow Trout, Lake and Mountain Whitefish, and Lake Trout provide popular and productive fisheries. These river reaches are popular with both boat and shore anglers. The small springs, creeks, and portions of the Stillwater and Whitefish Rivers provide important spawning and rearing habitat for Rainbow and Eastern Brook Trout. In
addition to sport fish there are native suckers and minnows found in all Kalispell waters.

The Flathead Lake and River System is a complex set of habitats. Many fish species found in these waters use varieties of habitats during specific seasons or life stages. Maintaining the integrity and quality of all habitats in the Flathead system is essential to conserving native fish species and popular sport fishes.

**Native Grasslands/Scrublands**

On south and west drier aspects not already disturbed by homes and pastures, one can find remnants of native palouse prairie habitats (bluebunch wheat grass, Idaho fescue, balsam root, bitterroot etc.). These native grasslands are particularly prominent just outside of the Growth Policy Area within and adjacent to Lone Pine State Park and on the south and west aspects of the foothills to the south. These grasslands provide important fall, winter, and spring foraging areas for elk, a few mule deer and many white-tailed deer. They also support a group of less common grassland bird species such as western meadowlarks, mountain and western bluebirds, vesper sparrows, savanna sparrows and short-eared owls. These grasslands often include shrubby species such as woods rose and snowberry in wetter sites and along rocky outcrops. These shrubs provide additional forage for grazing animals, cover and forage for nesting birds and habitats for a variety of small mammals.

The open grassland/shrubland and timbered habitats tend to be highly vulnerable to development because of their warmer characteristics. Development within and around these sites will reduce the wildlife values of these habitats because of increased predation by pets, alterations to native vegetation, and increased human disturbances. Homes or other developments may also attract whitetail deer to their ornamental plantings, gardens and domestic animal feeds. The presence of deer may attract mountain lions. Development within native grasslands or shrublands should seek to keep as much of this habitat type intact as possible.

**Forested Uplands**

Just outside of the Growth Policy Area to the southwest, there is a variety of forested uplands, which are also found in and adjacent to Lone Pine State Park, near Foy's Lake, above the valley bottom and up Birch Creek. Depending on the elevation and aspect these forested lands may support warm dry conifer species such as Ponderosa pine and Douglas firs with an understory of snowberry or they may support cooler species such as Douglas Fir and Western Larch. Typical wildlife species in this area include; whitetail deer, black bear, occasional elk or moose, mountain lion, bobcat; a variety of small mammals including ermine, snowshoe hare, and pine squirrels; many species of cavity-nesting birds; and a variety of neotropical migrants. A wildlife species list (primarily birds), derived from Ray Kuhns Wildlife Management Area located northwest of Kalispell, indicates forested sites can provide for a diverse population of bird species.
Critical wildlife values of forested sites include thermal and winter cover for big game; spring, summer, and fall habitat for black bears; winter habitat for mountain lions; and a variety of habitat for migratory and resident birds. People who seek to live at the interface of timbered/grassland areas should realize that these habitats are important to wintering many species of wildlife. Deer and human pets often attract mountain lions. Additionally, black bears can be attracted to pet or livestock food, garbage, beehives, bone yards and other human attractants.

**Whitetail Deer**

Whitetail deer can be found throughout the Flathead Valley and even within the city limits. The entire Growth Policy Area has a relatively high whitetail deer density with the exception of the downtown area. Since whitetail deer populations fluctuate with weather and harvest, the numbers may not be as important as the relative densities. The greatest densities are those areas with the highest whitetail deer habitat qualities, located mainly along the Flathead, Stillwater and Whitefish rivers where forest and vegetation provide cover and food. These areas also support the greatest density of Whitetail Deer during the winter months.

Winter range areas have the greatest thermal cover and/or receive the least snowfall in most winters. Within the growth policy area the highest quality thermal cover for whitetail deer have been the low elevation conifers stands along the Flathead and Stillwater Rivers and along the foothills to the southwest. In many areas deer have access to hay stacks, suburban vegetation and artificial food sources. In these areas they have been found in relatively large concentrations all winter. (Map 7.9)

**Mule Deer**

Mule deer may be seen occasionally throughout the Growth Policy Area. They are very adaptable to steep slopes and tend to stay in higher elevation habitats most of the year. The majority of mule deer are seen in small groups in the spring in lower elevations as the grass is becoming green. Park personnel routinely observe during spring green-up and in the fall a few mule deer in the Lone Pine State Park area just outside of the southwest boundary of the Growth Policy Area. The grasslands and steep topography of this area provide both good forage and cover during winter and early green-up areas suitable for mule deer. Mule Deer have also used the Lone Pine Preserve in the fall to avoid hunting pressure. Development on open slopes and in mule deer travel corridors may reduce their use of an area. Increased development may also lead to conflicts between deer and domestic dogs.

**Elk**

Like Mule Deer, Elk are rarely seen in the Growth Policy Area. They can be seen seasonally in a small portion of the plan area south of Foy’s Lake Road and outside of the southwest boundary of the growth policy area. The grassy and open timbered warm aspects provide winter and spring foraging areas. The timbered north slopes may provide thermal and hiding cover during fall, winter and spring. Elk are also
routinely observed from the Lone Pine Visitors Center during spring and fall. There is a significant area approximately 1½ miles west of the Growth Policy Area that is considered to be elk summer range. If the Growth Policy Area continues to expand to the west, it may encroach into Elk summer range. (Map 7.10)

**Moose**

Moose are wide ranging animals which are also tied to upland forest and riparian habitats. Moose have been seen seasonally in neighborhoods along the Flathead and Stillwater Rivers. Populations are prevalent outside of the growth policy area to the southwest, and a significant area just west of the growth policy area is considered to be winter range. This species is not as adaptable to human inhabitation as the whitetail deer and some other ungulate species. If the city of Kalispell continues to expand to the west and north, the area classified as winter range for the moose will be greatly impaired. (Map 7.11)

**Black Bear**

Although this species is known to be present throughout the Growth Policy Area, Black Bear activity is primarily tied to the coniferous or riparian forests along the Flathead and Stillwater Rivers. Black Bears will be attracted to home sites, fruit trees, domestic animal food, or garbage. There have been several human bear conflict incident reports over the past few years, mainly on the east side of Kalispell between the Flathead River and the densely developed downtown area.

**Grizzly Bear**

Grizzly Bear populations are almost non-existent in the Growth Policy Area. An occasional Grizzly Bear will use the coniferous and/or riparian areas along the Flathead River as travel corridors. These bears will also be attracted by fruit trees, domestic animal food, or garbage.

**Mountain Lion**

Mountain Lion distribution can be associated with high densities of deer, especially in the winter. Lions prefer areas with dense cover (e.g. riparian areas), and/or steep topography as is present southwest of Kalispell. Lions will also often stay in low elevation habitat and are known to prey on small mammals and domestic pets.
Wildlife Human Conflict

Human-wildlife conflict increases as development occurs in areas with wildlife populations or areas that are used as travel corridors or winter range. The Montana Department of Fish, Wildlife and Parks (FWP), maintains data regarding wildlife distribution and human-wildlife contact/conflict. FWP uses the habitat base map, FWP staff’s general knowledge and incident or game damage reports to develop data regarding human-wildlife conflict for a few species. FWP is in the process of compiling and displaying a more complete wildlife-human conflict database (which includes domestic animals, Black Bears, Mountain Lions and Grizzly Bears), for the entire region. The specifics of the reports were not available but it is notable that there is a presence of both Black Bear and Mountain Lion in the Growth Policy Area. (Map 7.12).