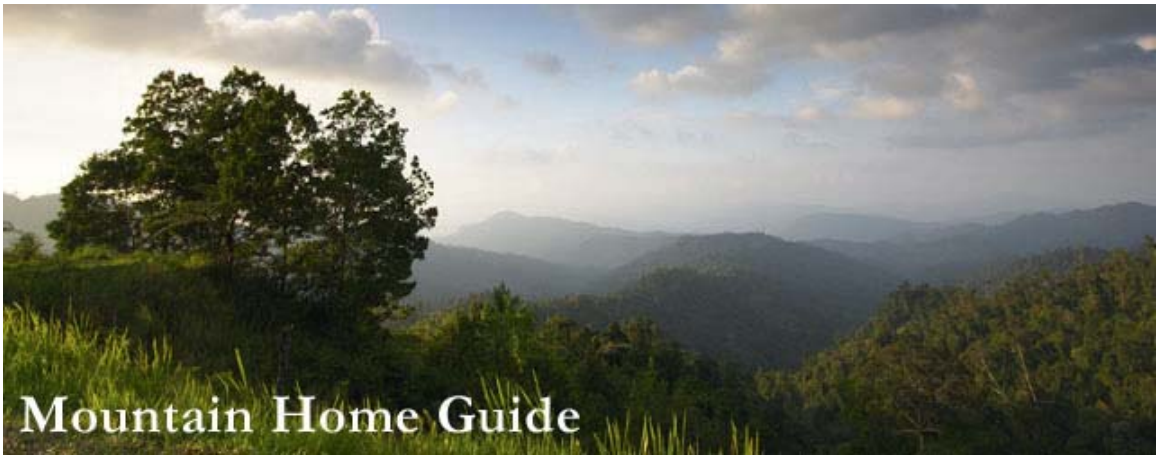


# Eleven Factors To Consider

**BEFORE YOU BUY OR BUILD**

Every year in the mountains of North Carolina, people lose money and suffer hardships due to the lack of awareness of important factors when purchasing land or a mountain home. This website will share some examples of those hardships and provide a guide to making wise investment and development decisions.

**TWO AVOIDABLE SITUATIONS**

A woman who lives in the rugged mountains of western North Carolina saved her money for many years with the intention of buying some property and building a home. She finally purchased a half-acre lot by a mountain stream.

Since the property was not serviced by a sewer line, the woman had the have the local health department check the suitability of her land for a septic system before she began building her home. When the environmental health specialist checked the property, he discovered that solid rock lay just below the shallow soil. Any septic system on the woman's small, rocky lot would be inadequate for treating and absorbing the sewage before it reached the nearby stream and, consequently, would create a potential health hazard for her and her neighbors.Since state law requires that each new house have an adequate, approved septic system, that woman could not build on her lot.

Another incident involved a man who bought a small lot in a subdivision the provided a splendid view of the mountains. His trouble began when he drilled a well 600 feet deep that did not yield a drop of water. He drilled a second well 485 feet deep that yielded a flow of only 2 gallons of water per minute. The total cost of obtaining those two gallons of water per minute exceeded the cost of the lot alone. Within a year of buying the property, the banks along the excessively steep access road to the man's lot were terribly eroded. The road ditch that was 6 inches deep when he bought the lot was now four feet

deep and was eating away at the road. The developer's promise that the state would assume maintenance of the road never materialized, and the developer refused to take the responsibility for maintaining the road. The lot owner is now considering taking his case to court.

A young couple has finally saved enough money to buy their first home. They found a nice mobile home already placed on a quarter of an acre site with an incredible view. The slope of the land was typical in the mountains (an approximate 30 degree slope.) The developer, therefore, cut a right angle into the slope to create an opening for the home thus exposing the soil around the home. No vegetation covered the cut. The first major spring rain forced the couple to address erosion around their home. Not only was their land washing down the mountain, it placed them in violation of the North Carolina Sediment law. If the property buyers in these true cases had taken some time to examine the environmental limitations on building a home in the mountains of North Carolina, they would have saved thousands of dollars and avoided a great deal of trouble.

**THE MOUNTAIN ENVIRONMENT**

The mountains of western North Carolina are a complex and varied environment. Differences in elevation, slope, precipitation, and orientation toward the sun create environmental conditions ranging from desert-like like environments on south-facing, dry-rock outcrops to temperate rain forest in areas where average annual rainfall exceeds 94 inches.

Extensive hardwood forests at lower elevations give way at elevations about 4,000 feet to spruce-fir forests that remind one of Canada. On a western North Carolina mountain, a thousand feet in elevation is equivalent to a horizontal latitude distance on 200 miles at sea level. By wYalking to the top of the tallest mountains, a vertical climb of 5,000 feet, you can travel ecologically 1,000 miles --- the distance from North Carolina to Montreal, Canada.

Steep slopes, shallow, rocky soils, and flood plains are a few of the many site imitations on building a house in the region of highly diverse environments. The types of limitations will vary depending on the elevation and specific location of your house or property. Every site will have some limitations. However, with proper planning, design, and construction, the environmental can often be overcome and future problems avoided.

**You may want to consider the following factors before buying property in the mountains.**

# Factor 1: Site Stability

The ease of construction and the ability of a piece of land to adequately support a building are basic concerns of the home buyer or builder. Site stability depends upon the land's slope, soil characteristics, and water drainage. It also depends upon human-made alterations to the land required to make it a more suitable building site. Certain types of soils are unsuitable for home construction. Some clay soils will expand as they absorb water and contract as they dry. This shrinking and swelling of the soil exerts great stress upon the foundation of a house. The house's foundation may crack severely unless it is specifically designed to tolerate such stress. Each county has a survey soil map which can be found by contacting your Soil and Water Conservation District county office.

**SLOPE**

Over three quarters of the land in western North Carolina has a slope in excess of 30 percent. The financial and environmental costs of building on such steep terrain are substantial and significant. Building-site preparation and access are complicated by shallow bedrock, high erosion rates, soils that are subject to sliding, and the lack of adequate sites for septic systems. Conventional septic systems are difficult to construct on slopes greater than 30 percent and often function poorly in these situations.

Most of the steeply sloping land in the region is located at the higher elevations. Since snowfall is greater and snowmelt slower at these elevations, access to the house during the winter may be difficult, at best.

Many houses in western North Carolina are built on steep mountain slopes. Building on those slopes requires careful planning and construction to minimize unacceptable or undesirable changes to your land. One solution to to choose a multi-level house that follows the contour of the mountain. This type building can be constructed to lessen the need for land leveling. Building your house on pilings can also protect the natural contour of your land and help minimize the costs of site preparation.

In many cases, some amount of leveling is necessary to prepare the house site for construction and to build an access road. On steep slopes, leveling involves a process called "cut and fill" whereby rock and soil are "cut" from higher slopes and used to "fill" in the land below. It is important to stabilize both the cut and the fill banks in order to control erosion and slippage of the site. Slopes of cuts and fills should ideally not exceed 30 percent, depending on the type of rock and soil that is present. In other words, the cut bank and the fill bank should rise or fall no more then 30 vertical feet for every 100 feet of horizontal length.

The local Soil and Water Conservation District can assist you in evaluating your land for site stability and in developing plans to protect it. With regard to graded slopes and vegetation, the North Carolina Sedimentation Pollution Control Act of 1973 states the following: "The angle for grade slopes and fills shall be no greater than the angle which

can be retained by vegetative cover or other adequate erosion-control devices or structures. In any event, slopes left exposed will, within 15 working days or 30 calendar days of completion of any phase of grading, whichever period is shorter, be planted or otherwise provided with ground cover, devices, or structures sufficient to restrain erosion." Therefore, vegetation should be established on exposed land as soon as possible.

Another important aspect of the NC Sedimentation Pollution Control Act is that the person "financially responsible" for clearing the land is the person responsible for complying with the law. This means that if you are a homeowner paying a developer to clear your land, you, the homeowner, are responsible for complying with the law. This pertains to any size development --- even less than one acre. For more information on this law, contact the NC Division of Land Resources at 828.251.6208. If possible, please use a variety of native vegetation in landscaping your property. Refer to the factor "Stewardship" below for more information on native vegetation.

# Factor 2: Sewage Treatment & Disposal

Approximately 75 percent of the homes in western North Carolina depend on individual sewage treatment and disposal systems. However, a large percentage of the land, 90 percent in some counties, has severe limitations for conventional septic systems.

Every prospective property owner should realize that an adequate septic system approved by the Environmental Health Section of the county health department is required before a new home is allowed to be occupied or connected to a source of electricity. It is important to evaluate the site for septic suitability before purchasing the property.

Sewage treatment and disposal on an individual lot is done with a combination of a septic tank and a drainfield. The effectiveness of a sewage disposal system depends largely on the soil characteristics of the drainfield. The soils at a particular site may be inadequate for absorbing and properly treating the septic tank effluent if the bedrock is at a shallow depth, the slope is excessive, the water table is high, the area is subject to flooding, or the soils are too dense. A failing septic system is a direct health hazard to you and your neighbors. It can contaminate surrounding drinking water supplies, pollute creeks and rivers, and cause an unpleasant odor in your home. There have been cases of people drinking water contaminated with E. coli (a bacteria from both human and animal feces.)

If you are considering buying a house or lot, obtain as much information as you can about the soil conditions and the existing septic system (if applicable). Locate the house's septic tank and drainfield. The owner or real estate agent should be able to tell you where they are.

The septic tank and drainfield should be at least 100 feet from the drinking water supply, preferably down-slope and NEVER upslope of your water supply. Since all septic tanks must be pumped periodically, the septic system should be accessible by truck. No trees or

shrubs should be planted near the septic system because their roots could clog the drainlines or break into the septic system.

Sites identified for septic systems and site where repairs are needed on existing septic systems must be designated through an evaluation by your county health department prior to any excavation AND must remain unaltered through any site modifications such as cutting and filling. Septic systems MAY NOT be sited in cut and filled areas.

**What is the capacity and type of septic system for the house?**

Soil characteristics, combined with other site constraints, give the environmental health specialist needed information to determine the Long Term Acceptance Rate (LTAR). The LTAR can differ from site to site. The septic tank, however, should have a minimum capacity of 900 gallons for residential most are typically 1,000 gallons or more. An existing septic tank system of an older home may require expansion under today's rules or if an addition to the house is desired.

**What is the age of the system and how frequently has the tank been pumped?**

A pumping/cleaning record of every three to six years is considered a normal preventative maintenance schedule. A properly maintained septic system should last a minimum of 15 years. This, however, may vary more or less due to unforeseen problems over those 15 years.

**Does the lot have a suitable site for changing (repairing or adding) the system?**

This can be a significant problem on lots that are smaller than an acre. Regardless, expansion or repair of the drainfield must maintain a minimum setback of as much as 100 feet from surface waters or streams, depending upon the water quality classification assigned by the North Carolina Department of Environment and Natural Resources.

**Is the drainfield site adequately protected from surface and subsurface (groundwater flow)?**

Surface run-off from upslope areas, roof drains, roads, and spring outlets can rapidly cause a septic system to fail. Septic systems are designed to handle only the wastewater from the home. The county health department can help you answer these questions. You can also do some simple checks yourself. Run the water in the house and watch the lowest plumbing fixture (a drain or toilet in the basement), for sewage backup. Outside, unusually lush, dark, green grass or vegetation, as well as moist areas over the drainfield, indicate that the sewage may not be absorbed properly and that system rehabilitation may be needed. Check water drainage on the property during or right after a heavy rain. Raw sewage from a failing septic system may rise to the surface and stink during rainy periods.

# Factor 3: Drinking Water

Residential drinking water supplies in the mountains may generally be divided into four categories as follows:

**Municipal supplies :** which are classified as community public water systems, and are regulated by the state and serve cities, towns, and some rural areas.

**Small water supplies :** which serve 15 or more homes (connections), or 25 or more people, and are regulated by the state and classified as community public water systems.

**Private individual** water supplies using wells or springs serving individual residences and not regulated by the state.

**Privately owned, shared** water supplies using wells or springs which serve more than one home but are not large enough to be classified as community public water supplies and are not regulated by the state.

Municipal systems typically use a surface water source such as a lake or river and have a treatment plant where the water is processed to make it safe for human consumption. A few municipal systems and almost all small community public water systems use drilled wells as a water source. Most of these systems disinfect the water with chlorine and no other treatment is necessary. Private individual and privately owned, shared water supplies may use wells (drilled, dug, or bored) or springs as drinking water sources.

Community public water supplies are required to test water supplies for various types of contamination on a regular basis. Tests for coliform bacteria are used as an indication or microbiological purity, and other tests are run to gauge the chemical purity of the water.

**Owners of private water supplies** are not required to test their drinking water for purity, but should do so periodically to make sure the water supply is safe. Testing for coliform bacteria and some of the inorganic chemicals is available through any local county health departments for a reasonable cost.

There are also private labs that can run tests for microbiological or chemical contamination.

Inorganic chemical tests are run to determine if chemicals such as lead, iron, manganese, or nitrates are present. The pH, which gives an indication of the corrosion potential, is usually determined as part of the inorganic chemical test. Much of the well and spring water in the mountains tends to have a low pH, which can lead to corrosion in copper pipes joined with lead solder and in metal fixtures. This turn can cause lead and copper to be present in drinking water. Iron and manganese are present in many drilled wells in western North Carolina. While these are usually not considered a health hazard, they are

"nuisance" chemicals which can stain clothes and fixtures and may cause taste and odor problems.

If surface waters enter a well or spring, it can introduce microorganisms such as rotozoans, bacteria, and viruses into the water supply. These can cause illness - sometimes severe - and can be especially dangerous to very young or elderly individuals or to those with immune system disorders from illness or medical treatments such as chemotherapy.

Organic (man-made) chemicals can be present in wells and may be caused by gasoline from nearby leaking underground storage tanks, chemical spill, or herbicide and pesticide use. Testing for these chemicals is more costly and is not done routinely by local county health departments.

If there is a reason to suspect organic chemical contamination of a water supply, such as chemical odor, a sheen on water surfaces, nearby ground water contamination, or heavy herbicide/pesticide use nearby, environmental health specialists from the local county health department should be contacted for advice or assistance.

**Springs, dug wells, and bored wells** provide water from relatively shallow ground water sources and tend to be more susceptible to surface water contamination than drilled wells. If there is any question about the quality of water from these sources, the owner or potential buyer should have the water source evaluated by a professional. Sometimes the local county health department provides this service, or it can provide the names or qualified consultants who do. Surface water contamination may be indicated by changes in color, odor, or taste of the water, especially after heavy rainfall events. Positive coliform bacteria test results may also indicate surface water contamination.

**Dug and bored wells** typically penetrate unconsolidated materials such as soil, gravel and highly weathered rock. Deeper wells of this type (more than 20 feet deep), can provide safe drinking water supplies if properly constructed and protected, but shallow dug and bored wells, especially those near streams or in flood plains, should be avoided. Dug or bored wells should be tiled and should have concrete poured around the outside of the tiles to a depth of at least 20 feet. A concrete slab should be poured around the tile at the ground surface and surface water should be diverted away from the site. The well should be sealed to prevent insects, rodents, amphibians, etc. from entering.

**Springs** can also provide safe drinking water supplies, but they must be properly constructed and protected to prevent contamination. Springs used as drinking water sources typically consist of a collection system or "spring box" to collect the water, a reservoir for storage, and a piping system to transport water from the collection system to the reservoir and then to the home.

**The following items should be considered in determining if a spring is adequate and safe:**

- The better springs originate in bedrock (solid rock) as opposed to unconsolidated materials. Springs that originate in floodplains, low areas, and drainage ways or valleys are much harder to protect from contamination in those originating in higher, well-drained
- areas.
- All parts of the system should be sealed to prevent surface water from entering and to prevent insects, rodents, amphibians, crustaceans, or other critters from entering.
- The area upslope from the spring should be free from development or heavy agricultural usage. There should be no potential contamination sources sources within 100 feet upslope of the spring.
- Burrowing animals upslope from the spring can lead to contamination. The area within at least 100 feet of the spring should be inspected periodically for signs of burrowing.
- Some springs cease to flow, or the flow drops considerably during late summer or fall. Before investing too much in developing a spring, flow observations should be made during dry periods to determine if the spring continues to flow. If the spring flow fluctuates significantly in response to rainfall events or seasonally, there may not be enough water to supply the home during extremely dry periods. If the spring has been in use as a drinking water supply in the past, previous owners or neighbors may be able to provide information regarding the flow.
- Spring flows as low as one-half gallon per minute can provide adequate volume to serve a single residence. For low-volume springs, a larger reservoir is needed. The local health department or a professional consultant can provide information as to sizing the reservoir.

**Drilled wells** are the most common type of residential drinking water source for newer home. This type well is usually six inches in diameter, has a steel or Thermoplastic casing extending to bedrock, and is drilled into the bedrock in hopes of encountering a water-bearing fracture zone. Drilled wells tend to be less susceptible to contamination than springs, dug wells, or bored wells, but in some areas the inorganic chemicals can be a nuisance. In other areas, there may be difficulty in drilling a well and getting an adequate yield.

There are state regulations on well construction that require that wells be "grouted" (concrete poured around the casing) to prevent surface water or other contaminants from entering the well. Wells are also required to be tested as to the yield; a log is to be kept specifying the depth of the well, depth of casing, depth of yielding zones, and geologic conditions encountered. An ID plate is to be placed on the well indicating total depth, casing depth, the level water rises to, and the date the well is drilled. If this information is not readily available, the well drilling contractor may be able to help provide it.

State regulations governing on-site sewage (septic tank) systems and well construction standards contain separation distance requirements from several potential contamination sources, and, for most homes constructed since the mid-1980's, these requirements have been met. Buyers of older homes should check to see if separation distances are adequate to minimize the potential for contamination of the drinking water supply. For example, on-site sewage systems are required to be a minimum distance of 50 feet from wells in all cases, and in most cases are required to be 100 feet away. If springs, dug wells, or bored wells are downslope from an on-site sewage system, an owner or potential buyer should seek advice from Environmental Health Specialists or a qualified professional.

If a drinking water source is tested for contamination and a problem is indicated, the owner or potential buyer should get help in interpreting the results from the local county health department or a qualified professional. If a drinking water source tests positive for coliform bacteria, the source should be disinfected (usually using chlorine) and retested. It is important to wait until all traces of the disinfectant are gone before testing. If the water has tested positive, a series of tests should be run over a period of time to make sure the contamination does not recur over time.

**There are treatment systems** on the market that are geared toward residential use; however, homeowners should get professional advice before purchasing one of these units. Most small treatment systems are meant to take out a specific type of contaminant and, if improperly applied, may cause a worse problem.

Some buyers are served by water sources on an adjoining property. If this is the case, a potential buyer should understand the water rights provisions and make sure there are legal rights that guarantee continued use of the water source and provisions for maintenance or provisions to the source. If a home is to be served by a community as a public water system, the potential buyer should find out who is responsible for maintaining the system - a municipality, the developer, the homeowners, or a public utility. Information on public water systems can be obtained from the North Carolina Public Water Supply regional office in Asheville. The local county health department can provide the phone number and name of the PWS representative serving the county.

# Factor 4: Stormwater Management

Stormwater runoff is the rain or snow-melt that runs off streets, rooftops, parking lots, lawns and other land surfaces. As communities develop, more impervious surface are created and less rainfall can soak into the ground. This increases flooding and streambank erosion. For some communities, there is federal, state, and local law regulating the quantity, quality, and temperature of stormwater.

Regarding quality, stormwater picks up pollutants as it flows across land surfaces. Pollutants include:

- *Sediment from bare areas like construction sites.*
- *Pesticides and fertilizers from lawns, parks, and roadsides.*
- *Bacteria and disease causing organisms from pet waste and failing septic systems.*
- *Oil and grease from car leaks, gas stations and industrial areas.*
- *Salt used on roads and driveways, and*
- *Toxic chemicals from leaks, spills and auto wear and exhaust.*

Sometimes pollutants (e.g. used oil, paint thinners, etc.) are illegally dumped directly into storm drains and waterways.

Stormwater may eventually enter underground pipes called storm sewers. Unlike sanitary sewers, storm sewers do not lead to a treatment plant. So stormwater runoff directed to storm sewers usually receives no treatment before entering our streams, rivers and lakes. The result can be the contamination of our drinking water supplies, prohibitions on swimming, fishing or boating uses and loss of aquatic species like trout. In other words, dilution is NOT the solution to the pollution.

Temperance is of concern because trout and other mountain aquatic species rely upon cool mountain streams. Water from driveways, rooftops, and places like parking lots is much warmer and thus warms up the stream. The end result is the loss of those cold water species. Here are things you can do to help:

- *Retain or create a 50 foot buffer between the water and the impervious surface (driveway, parking, etc.)*
- *Keep your vehicle from leaking fluids.*
- *Wash your car on the lawn, not on the driveway.*
- *Stop soil erosion by seeding bare property.*
- *Never pour oil, pain thinners, or other pollutants into the storm drain, the waterway, or in your lawn. Take them to the recycling center.*
- *Minimize the use of fertilizers and pesticides on your lawn.*
- *Keep pet waste, grass clippings, and other debris out of the stream.*

These are also forms of pollution. Clean litter from the street or storm drain. Point your gutter drain into the grass and away from the stream. Design all new construction to prevent runoff and stormwater pollution. There are ways of making your driveway and other surfaces permeable so that the ground will absorb the stormwater.

# Factor 5: Site Access

A poorly designed or constructed road can be a major headache for a homeowner. It can limit access to your house, especially when the weather is snowy, icy, or wet, and can also cause severe erosion and stream sedimentation that can lower the value of your property and destroy the beauty of the land. Also, find out who is legally responsible for maintaining the road to the property or house: the state, the developer, or the property

owner. If the road to the property is private, make sure that you have legal access in and out to a state maintained road.

Accessibility to your home should be a major concern. Emergency vehicles such as fire and rescue will need turn-a-round space. This also applies to the large moving vehicles that will be loading and unloading. Place special attention to tree canopies as well as slopes and curves. To avoid these potential problems, plan ahead. Many communities do not have safeguards such as subdivision regulations so consider contacting your emergency services for consultation.

Road grades of 12 percent or less are desirable. A 12 percent road grade means the road rises or falls approximately 12 vertical feet in every 100 feet of length. Unpaved roads with grades in excess of 12 percent erode easily, and are difficult to maintain.

Road embankments should be stabilized and covered with healthy vegetation to help prevent erosion and localized land slides. You should visit the property when it is raining to evaluate how well surface water drains off the site. Water should be diverted away from the road and home site. Badly eroded roads, road embankments and ditches indicate an improper or non-existent drainage system for the property. They also lower the value of your property and destroy the beauty of the land.

# Factor 6: Flood Plains & Water Constraints

Annual precipitation in portions of western North Carolina is the highest in the eastern United States. The steep, mountain slopes permit rapid storm-water runoff. Considering these two facts, it is not surprising that floods are a frequent, natural occurrence in our region.

When people build houses and businesses on land that is periodically flooded, human suffering and economic loss inevitably result. These areas are called floodplains. The best farmland in western North Carolina is generally located in floodplains. The floods in eastern North Carolina that resulted from Hurricane Floyd contributed to the loss of human life, homes, and communities. Homes built in the mountains of North Carolina are not immune to similar circumstances. The mountains of North Carolina receive the highest amount of rainfall east of the Mississippi River.

Building a house on a floodplain not only endangers your life and property, but also removes another piece of land from agricultural production in a region where there is very little land remaining that is suitable for farming. Per the U.S. Census, over 72 percent of farms have been converted, between the years of 1949 and 1992, to other uses such as residential development.

Small creeks are as susceptible to flooding as large rivers. Before buying or building a house, check to see how close the site is to any creek or river. Ask residents of the area how high flood waters have risen on the property in the past. Communities that belong to the National Flood Insurance Program have maps that show the flood-prone areas within their community. These maps can be found in the county courthouse or city hall.

A large number of building sites have wetlands or streams on the property that need to be considered in any home construction. Any anticipated construction that would affect wetland area or stream (including but not limited to road crossing, stream enclosures, stream bank stabilization or stream maintenance) required approval from the United States Army Corps of Engineers prior to beginning any construction activity.

# Factor 7: Stewardship of the Land

The natural beauty of our mountains is in large part what attracts so many to the area. The Blue Ridge Mountains support a wide variety of plants and animals, many unique to the Southern Appalachians. By gaining an understanding of the complexities of your property's terrain and its natural resources, you can help promote the existing character of this area by preserving the natural character of your own home site. Prior to any land clearing activities, identify and protect features such as springs, streams, bogs, rock outcrops, as well as existing vegetation, such as large trees and rare wildflower areas. Work with your contractor to develop a site plan that enhances (rather than eliminates) these unique features.

A well-landscaped home site will not only be attractive, but will also be protected from soil erosion and will prevent siltation of nearby streams. It is important to establish vegetation on barren land as soon as possible Deciduous trees will shade the house in the summer and let the sun in during the winter.

Trees and shrubs can also serve as windbreaks. The local Natural Resource Conservation Service office or North Carolina Cooperative Extension Service office can provide valuable technical assistance concerning plants, fertilizer, lime, mulches, and the best time and techniques for establishing vegetation on your property.

A large area of cut and fill will require extensive landscaping, some of which will take years to establish. Too often, too little thought is given to preserving the natural vegetation around the house site. Native trees and shrubs possess inherent qualities and adaptive traits that make them aesthetically pleasing, practical, and ecologically valuable.

Brochures listing western North Carolina native plants for landscaping and exotic pest plants are available on WNCT's Web page at www.wnct.org or by calling the U.S. Fish and Wildlife Service at 828-258-3939.

You can also help minimize the impact of loss of wildlife habitat by retaining and re-establishing beneficial native vegetation.

Encourage your landscaper to retain as much of your lot in its natural state as possible. Excessive clearing of underbrush eliminates essential wildlife habitat and threatens many rare wildflower species native to western North Carolina. Avoid the use of invasive exotic plants that may spread into adjacent woodlands and natural areas. Contact the local Cooperative Extension office for information and/or brochures on tree protection, landscaping for wildlife, and avoiding exotic pest plants.

**Wildlife**

Many types of wild animals are common in western North Carolina. Viewing wildlife in your own back yard can be an enjoyable and rewarding experience. Wild animals rarely present a danger to residents, but some animals can become a nuisance if homeowners do not take proper precautions.

Black bears are very common in western North Carolina and are sometimes seen in residential areas close to towns and cities. New homeowners should not be surprised to see an occasional bear in their yard. Bears are attracted to houses by the smell of food. They often venture into yards to raid garbage cans, tear down bird feeders, and eat dog food or cat food left outside. Recently used outdoor grills also attract bears, as do compost piles, and anything else that might smell like food. Bear problems around houses can usually be resolved by removing food sources. Homeowners may have to take down bird feeders, feed pets inside, and keep garbage in a safe place (such as a closed garage).

Bears may remain in the area if suitable habitat is nearby, but they should not pose a problem if food is not available around the house. Natural foods such as apple trees, blackberries, blueberries, and acorns can also attract bears to a yard at certain times of the year. A homeowner who encounters a bear in or near his yard should simply leave it alone. It will leave when the food source is gone. NEVER FEED BEARS! Bears that learn to associate food with humans sometimes lose their fear of people and become more dangerous.

Homeowners may encounter a number of wild animals. Deer can cause damage by browsing on ornamental plants and garden vegetables. Skunks, opossums, and groundhogs occasionally make their dens in crawl spaces under houses and trailers. Close off all openings and holes to keep them out. Coyotes, foxes, and bobcats are attracted to the edges of residential yards to hunt rabbits and mice and can become a danger to household pets. Gray squirrels, flying squirrels, and bats sometimes make their homes in attics or eaves and cause problems for homeowners. Homeowners living next to a creek may find beavers chewing on trees in the yard.

Bats are very beneficial animals because they eat flying insects. They are not dangerous as long as they are outside. Bats can be dangerous to people if they get into houses because of the diseases they may transmit through bites or feces. They are not generally

aggressive toward people, but they may bite if they are cornered or trapped. Homeowners can prevent bats and other animals from getting into their attics by making sure every opening is closed off with wire mesh, metal, or wood. Bats can squeeze through tiny cracks in between boards, so every little hole must be covered. If you move into a home that already has bats in the attic, close off every entrance hole except one. Wait until the bats leave at night and then close off the last hole.

There are simple solutions to most nuisance wildlife situations. New homeowners should be aware that they may have to adapt their lifestyle in order to live with wild animals that reside in nearby habitats.

# Factor 8: Solar Energy

The solar energy potential of a home site becomes increasingly important as energy costs continue to rise. Land on the south-facing slope of a mountain receives direct sunlight for many more hours each day then land on the north-facing slope. Houses on south-facing slopes are generally easier and less expensive to heat. They have the greatest potential for using solar energy for residential space and hot-water heating. Houses on east- and west-facing slopes have less potential, and those on north-facing slopes have minimal solar energy potential.

In addition, while trees and shrubbery can be beneficial for cooling in the hot summers, tall trees on the south-facing side of a home site can limit solar potential. The types of trees are important. Evergreens pose a year-round obstacle to solar gain. But deciduous trees are without leaves in the late fall and winter, which allows for 30 to 40 percent of sunlight to get through. This enables the use of some solar applications, for space heating in particular. However, the use of solar hot water and photovoltaic systems will still be limited.

For many sites, particularly on heavily wooded steep slopes, the only option is to clear trees for a wide radius. This may downgrade the beauty of your site and ruin one of the reasons you chose to live in the mountains. Be sure to have a thorough solar site evaluation before you buy, if you have solar in mind for your house. If your site is suitable for solar, North Carolina offers a 40 percent solar tax credit, up to $1,500 for residential solar energy systems. If your site is not suitable for solar, you may also wish to check out the wind potential. Ideally, for wind, your site must provide a 500 feet radius of unobstructed landscape for a windmill that is raised about 100 feet in the air. In the mountains, some building sites increase your home's potential for a wind energy system. In addition to this energy capability, the state of North Carolina provides a 10 percent wind energy tax credit.

# Factor 9: Mineral & Timber Rights

Under North Carolina law, ownership rights to the minerals on or under the ground can be severed from the surface rights to the land and transferred as separate estate. The owner of the mineral rights is legally entitled to use the surface of the property to reach and remove the minerals he or she owns. Therefore, before you buy property, check the deed closely to determine whether the mineral rights have been severed and belong to someone other then the owner of the surface rights to the property. The NC Division of Land Resources regulates all mining activities in North Carolina.

There are many issues pertaining to timber harvesting on your land. Should you make the decision to harvest timber on your property as a means of income for an extended period, it is suggested that you seek assistance in developing a forest management plan. The North Carolina Division of Forestry can assist you with developing you forest management plan. Specifically the Division of Forestry can assist you with tree growth rates, information on timber buyers and loggers, identifying road sites, and insect or disease plants.

A point to remember is that forestry practices are required to comply with such laws as the NC Sedimentation Pollution Control Act. If you timber your property with the sole intention of only harvesting trees, then you must comply with the Best Management Practices outlined in the sediment law. If you have any intention of developing an acre or more of your property following the clearing of timber, you are required to submit a plan to the NC Division of Land Resources. Therefore, it is suggested that you contact the NC Division of Forestry whenever you are clearing timber. They are an invaluable resource.

# Factor 10: Dark Skies

A well-placed home site should blend into the existing area. This is especially important with ridgetop home sites, which can either be unobtrusive or eyesores. Some counties have adopted a local ridgetop ordinance. Contact your county planning department to verify if your county has one. North Carolina's "Ridgetop Law" restricts development of buildings 40 feet or greater in height on identified, protected ridges.

Each county has maps identifying which ridgetops are protected. Counties that have their own ridgetop ordinance regulate, rather than prohibit, building on ridgetops. These structures must receive prior approval from city or county officials.

The beauty of the stars over our mountains is something we need to consider when introducing outdoor lighting into the environment. The spread of light pollution from our towns into the countryside is of growing concern not only astronomers but to all of us who inherit this precious view.

In the considerations for a mountain home you should check out the view of a prospective piece of property at night as well as daytime. If you have neighbors with security lights that glare into your home site, you may wish to consider if this will bother you. A friendly inquiry to the neighbors may reveal that they would be willing to shield them or may not. If they are not willing to do so, then you may be out of luck. Most counties and towns have no lighting ordinance. Also, if the light is above you on the hillside there may be little that can be done short of turning it off.

If you are fortunate enough to have a dark sky site you should plan to do your part to keep it that way for you are your neighbors. If you want outdoor lighting you should consider whether the security light from the utility company really is a good idea or not. In most mountain rural areas it is difficult for a vandal or thief to even figure out that your home is there, much less how to get to it. So, why put up a beacon to attract them in the first place? Recent federal research has shown no correlation between increased lighting and crime prevention. It is more perception than reality.

If you want some lighting it is best to put in your own fixtures, with switches so that they can be turned off. Lighting that is controlled by motions sensors that turn it on when it is needed are even better. The lights should be pointed down from the sky, toward the ground, and not point to your neighbors.

If you or your neighbors do have a standard "dusk-to-dawn" light, supplied by the utility company, it can be fitted with a shield to direct the light so that none goes above its horizon- a so-called "full cut-off" fix. There are aluminum "sky caps" that replace the plastic refractors and direct all the light you are paying for downward. They are manufactured by the Hubbell electric company and by GE Lighting Systems, and are attached by clips to the standard light fixture. The capped fixture actually puts more light on the ground at all distances from the pole than the uncapped lamp. If it looks dimmer directly, consider that this is good! When you see the bulb directly it causes your eye to shut down and you are left with reduced visual capability to see the lighted scene. Sadly, many people incorrectly associate such glare with good lighting - exactly the opposite of what it is.

For more background on the subject of good, sky-friendly lighting check out the website for the International Dark-Sky Association (www.darksky.org) or the North Carolina section of the IDA (www.ncdarksky.org). Finally, remember to go outside and enjoy what you have protected: the wonderful starry mountain skies.

# Factor 11: Streambank Stabilization

Private ownership of land could also include the banks of a river or stream. Removing the trees, shrubs, and other vegetation to plant exotic grasses or place rock (also known as rip-rap) along the bank degrades the stream. Removing vegetation eliminates the habitat for species that trout and other aquatic life use as food.

Trout require high levels of oxygen generated by cool water. Rocks lining a bank absorb the sun's heat and warm the water. Trees, shrubs and other native vegetation cool the water by shading it, thus helping to maintain trout populations.

Experience has demonstrated that straightening a stream increases the speed of the water flowing through it. Should you straighten your stream, clear the native vegetation, and line the banks with grass or rock, you will lessen, if not eliminate, the chances of wildlife visiting your home. Remember, birds and mammals require many of the things (insects, fish, vegetation, etc.) that are provided by a natural stream and streambank. You should also consult with the Army Corps of Engineers before manipulating a stream.

Federal law restricts development of any wetland, and a streambank could be considered a wetland.

Rivers and streams are not supposed to be muddy when it rains. The NC Sedimentation Pollution Control Act, a law enforced by the NC Division of Land Resources, maintains that when you develop your property, you must keep dirt out of rivers and streams.

**If you disturb more than one acre, you must submit a plan to the Division of Land Resources on how you will keep the dirt on your property and out of the streams. Check also to see if you have a local ordinance that may be more restrictive than the state law.**

**Sediment - Know the Law**

Dirt in streams clogs drinking water sources, fills used lakes for recreation and generating electricity, and kills aquatic life. Silt that erodes into streams smothers trout eggs thus killing future trout populations.

The North Carolina Sedimentation Pollution Control Act of 1973 states that if you, the landowner or person financially responsible, disturb one acre or more of land then you must, by law, submit a plan to the NC Division of Land Resources on how you will keep the dirt from your land from eroding into streams, roads, or on to another person's property. Call 828-251-6208 for more information.

# Conclusion

Purchasing a house or home site in the mountains is a complex decision involving financial, site, environmental, architectural, and personal considerations. A careful and thorough evaluation of the different considerations and limitations of your site will help to ensure your satisfaction with the home or lot you choose.

The decisions you make when building your home have direct impacts on the people and wildlife of your community. The choices you make can help benefit the health of our

people and environment. We hope this website has been helpful in understanding how we can be better stewards of our land.

# Subdivision Checklist

If buying a lot in a subdivision, there are several precautions you should take:

- **Check with the Soil and Water Conservation district office** to determine the soil types and their capabilities.
- **Check access into the development and the lot you intend to buy.** Who maintains the road? Is the drain adequate and are stream culverts or bridges large enough?
- **Check with the County Health Department** to determine sewage disposal treatments and underground water availability.
- **Check on zoning regulations for the subdivision or surrounding areas.** How will the land around the subdivision be used? Is there a local sedimentation control ordinance?
- **Check the water source.** If there is a community well, does your deed refer to your water rights? Have arrangements for maintenance and repair been drawn up?
- **Check to see if the lot is in a floodplain.** You may be required to purchase flood insurance if your property is in a flood hazard zone designated by the Federal Emergency Management Agency (FEMA). This information is normally available at the County Building Inspections Office.
- **Check access into the development and the lot you intend to buy.** Is there a road maintenance agreement? Ask one of the resident neighbors if the subdivision adheres to the agreement. Adequate road access and a maintenance agreement should be a condition of purchase. Do other property owners have access through the property you are considering? If so, how many properties use this access, where is this right-of-way and how might it affect your development plans?
- **Check to see if any 'private' access roads to your property (roads not maintained by the State of North Carolina) are in the floodplain.** In times of emergency, flooded roads may make it impossible for you to leave the subdivision. Damaged private roads and bridges can be very expensive to replace and may be your responsibility to repair. Also, be sure private bridges are constructed with steel beams. If you have questions or concerns, consider hiring a consulting engineer to inspect any bridge. Private roads may be eligible for dedication to the state for repair and maintenance if they were constructed to state standards and have a sufficient width of right-of-way. Contact the nearest North Carolina Division of Highways' regional office for more details. Confirmation that a road is eligible for dedication could be added as a condition of purchase.
- **Check to see if there is a Homeowners Association and if it is active.** Most homeowners' groups require the payment of annual dues. Be sure you understand the terms and conditions in the association agreement.
- **Check for development restrictions either in the form of restrictive covenants or in the form of municipal/county, state, or federal government regulations.**

Restrictive covenants should be available from your real estate agent or subdivision sales office. Enforcement of restrictive covenants are the responsibility of the property owner and/or the homeowners association. Ask one of the resident neighbors if there have been any problems enforcing these restrictions. Also, determine when the covenants expire and the process for their renewal. Restrictive covenants should be addressed in the purchase agreement. Government regulations will apply to the development of all property.

- **Check with the county health department to determine sewage disposal requirements and underground water availability.** Securing a permit for on-site sewage disposal should be part of the purchase contract for the property. Groundwater supply is generally available throughout the region, but there are sites where water is either difficult to find, and that require a deep well (potentially expensive) or that have poor water quality (often due to iron content).
- **Be sure to confirm your source of water supply before you begin construction of a home.** Ask one of the resident neighbors if there have been any problems with dry wells during drought conditions or with any other water quality issues.
- **If you plan to divide the property sometime in the future, be certain this is permissible under the terms of the restrictive covenant and/or under the terms of a County Subdivision Ordinance.** State and possibly local Sedimentation and Erosion Control Rules may require control measures prior to initiating any land disturbing activities. If your property has or is adjacent to any type of surface water such as a stream, river, lake, etc., additional restrictions may apply. Most of these restrictions are in the form of building setbacks from the water's edge.

The North Carolina Division of Water Quality has the most accurate information related to this situation. However, this information should also be available through the County Building Inspections Office.

If there are low areas in need of filling with soil or other materials, you should check with the U.S. Army Corps of Engineers to determine if the area is a wetland (even if it appears dry at the time you are inspecting the property). Local soil conditions may make development more difficult and costly. Check with the local Soil and water Conservation District office to determine the soil types and their limitations.

If you discover or suspect any unusual conditions on the property, consider hiring a local soil scientist for advice. Always engage the services of a reputable local attorney who is independent of the subdivision and its affiliates.

# Acknowledgements

**This website is provided as a public service of Goshen Timber Frames in Franklin, North Carolina.**

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