

STREAM CARE



a guide for property owners in the clark fork watershed



STREAM CARE IN THE CLARK FORK

PROTECTING CLEAN WATER

2

STREAM HEALTH INDICATORS

4

HOMESITE PLANNING FOR HEALTHY STREAMS

6

STREAM-FRIENDLY LANDSCAPING

10

ONGOING CARE

14

**RESOURCES FOR STREAM CARE
& CONTACTS FOR PERMITS**

18

STREAM BASICS: DIAGRAM & GLOSSARY

20



WATERSHED

A LITTLE CARE GOES A LONG WAY

The Clark Fork Coalition works to protect and restore the river and its watershed. Please use us as a resource. Add your voice to the cause for a clean and healthy watershed by visiting:

www.clarkfork.org
140 S. 4th St. W.
Missoula, MT 59801
406 542 0539



BEFORE YOU START

A number of different local, state, and federal agencies regulate work in streams and wetlands. Before beginning any building, landscaping, stream enhancement, or bank stabilization project, be sure to check with these agencies for guidance. Permits may be required for work in stream channels, stream banks, floodplains and wetlands. The contacts listed in the back of this booklet are a good source of information.

see page 18 for contacts



PROTECTING

EVERYONE HAS A PART

The streams within the 22,000 square-mile Clark Fork River basin are a source of pride and pleasure for all of us. They provide the beautiful backdrop for where we live, work, and play, contributing to the quality of life we all enjoy. Even more importantly, our streams give us the water we drink, and are valued economic drivers that sustain our communities.

Whether we live next to the Clark Fork, the Blackfoot, the Bitterroot, the Flathead, or along one of their many feeder streams; whether we work in town or the surrounding rural landscape, many of our daily activities can affect water quality in the watershed.

This guide offers residents practical tips to make their home and property “stream-friendly.” Read on to learn how you can protect an irreplaceable part of our lives—clean water in the Clark Fork River basin.



photo - chase des

CLEAN WATER

THE PAY-OFF OF STREAM STEWARDSHIP

A stream running through your property is an invaluable amenity. Whether it flows year-round or seasonally, a stream provides drinking water, wildlife habitat, agricultural water supply, floodwater pathways, and countless recreation opportunities. Our streams are ribbons of life—sustaining people, plants and animals along their journey.

You can make the most of your location next to a waterway by helping to keep it clean and

healthy—and by helping your neighbors do the same. Even a little stream care can go a long way.

In this booklet, you will find out how you and your streamside neighbors can:

- ▶ **Boost the value of your property,**
- ▶ **Prevent erosion problems,**
- ▶ **Avoid flood losses,**
- ▶ **Preserve water quality, and**
- ▶ **Provide habitat for birds, fish, and wildlife.**

BELOW:

Homes, businesses and native vegetation mingle along the Clark Fork River in Missoula.





photo: rewild

STREAM HEALTH

HOW HEALTHY IS YOUR STREAM?

Stream care starts as simply as watching your stream for signs of distress and keeping tabs on its health. Is your stream clear and cold? Are native species thriving?

With some streams in our watershed, the signs of wear and tear are obvious: they're dammed, or channelized, or piped underground, or clogged with sediments and debris. But with other streams, the clues are harder to discern. The water may flow free and look clean, but it may not support much aquatic life if it's too warm or

contaminated with invisible pollutants, such as metals or pesticides.

You can play a key role in your stream's rejuvenation. Although the water's overall health may be tied to activities far beyond your property boundary, paying attention to the stream's natural tendencies and cooperating with your streamside neighbors can prevent and reduce harm.

How do you know when your stream care efforts are paying off? Check the table of stream health indicators to see how the stream on your land is faring.

RI-PAR-I-AN:

This is the green zone next to streams and rivers where plants depend on the presence of water and periodic flooding. Riparian areas are integral to the overall health of the entire watershed—they make up only 5% of Montana's landscape, yet they support 85% of our plant and animal species.

INDICATORS

HEALTHY STREAM

UNHEALTHY STREAM

WATER QUALITY & FLOW

- ▶ Cool, clear water free of contaminants and excess algae
- ▶ Flow cycles that vary with seasons
- ▶ Poor water quality: excessive algae, suspended sediments, contamination from animal waste or sewage, presence of metals or other toxins
- ▶ High water temperature
- ▶ Reduced water flow

STREAMBED & BANKS

- ▶ Stable, vegetated banks
- ▶ Minimal erosion
- ▶ Presence of both slow pools and fast water running over shallow, rocky stretches
- ▶ Abundant rock and clean gravel
- ▶ Loss of natural stream channel, or a deeply incised streambed
- ▶ High proportion of crumbling, eroding banks lacking vegetation
- ▶ Stagnant water, absence of pools, riffles, or clean gravel
- ▶ Litter, trash, and other dumped debris

VEGETATION & WILDLIFE

- ▶ Abundance of native streamside vegetation
- ▶ Thriving fish, amphibian, and insect populations
- ▶ Cover for small mammals and wildlife
- ▶ Leaves, fallen logs, and other natural debris along the streambed and banks that support the aquatic food chain
- ▶ Lack of plant and animal diversity
- ▶ Barren streambanks
- ▶ Invading non-native plants choking out native species in the riparian corridor
- ▶ Diminished or non-existent fish, amphibian, and aquatic insect populations



HOMESITE PLANNING

BUILDINGS AND ROADS:

Streams have work to do. They must transport water and sediment, and to do so effectively they need room to roam. Here's how to protect your home from flooding:

- ▶ Place your home a safe distance from the stream's high water mark and make sure it's out of the floodplain. What is a safe distance? It depends on the size and nature of the waterway and the streambank—on smaller streams, 50 to 100 feet may be adequate. On larger rivers, you may need a buffer of several hundred feet.
- ▶ Check with your local planning office for floodplain information and maps before building.

- ▶ Build structures and roads on stable soils away from streams, and avoid steep slopes to prevent sediment from washing into the stream.
- ▶ Avoid paving surfaces unless absolutely necessary. Pavement prevents rainwater from soaking into the ground and instead adds to runoff, which can increase soil erosion and flooding. Consider permeable alternatives to pavement.
- ▶ Design bridges so they're long enough to cross over flood flows. This will protect the stream channel area, and ensure your bridge lasts longer.
- ▶ Maintain the floodplain in its natural state.

LEFT:

The Bitterroot River threatens homes in May 2008.

RIGHT:

A home built too close to eroding banks along the river.

FOR HEALTHY STREAMS

SOILS, SLOPE, AND RUNOFF:

Home-building can kick up a lot of dirt. And on a day-to-day basis, rain or snowmelt can wash loose topsoil into nearby streams, eroding your property and degrading water quality.

- ▶ Make sure the slope of your building site is not too steep—two to four feet horizontal to one foot vertical is a good rule of thumb.
- ▶ Build around native trees and shrubs as much as possible—particularly native riparian vegetation, which does the best job of stabilizing soils and streambanks.
- ▶ Slow and filter storm water and let it percolate back into the soil by using: straw bale or log barriers, rock ditches, retaining walls, or slope-stepping around your construction site.
- ▶ Install underground drainage to intercept seepage that could cause problems for building foundations.
- ▶ Stabilize eroding soils and unstable slopes by spreading wood chips, mill bark, or straw mulch on bare ground during actual construction, and later by planting native shrubs, grasses, ground cover, and trees.
- ▶ Convey runoff water to storm drains or a suitable watercourse to prevent it from washing away soils.



MAKING THE MOST OF YOUR PROPERTY AND YOUR STREAM

Perhaps you own a piece of land along a stream and are planning to build the home of your dreams. If that's the case, you have the chance to be "stream-smart" from the beginning. It all starts with a comprehensive plan—one that makes sure your homesite avoids flood-prone land, disrupts soil only minimally, controls water runoff, and protects riparian vegetation, wildlife corridors, and wetlands.

HOME SITE PLANNING



SEPTICS:

A faulty or poorly-placed septic system is a threat to your stream. Excess nutrients, such as nitrogen and phosphorus, can leach from overloaded or improperly installed septic drain fields and cause unwanted algae in your waterway. Too much algae can rob the water of life-sustaining oxygen. Algae also makes waters less appealing for recreational use.

- ▶ Apply for a permit from the Department of Environmental Quality—it's required by law.
- ▶ Consider replacing your old system with a modern, advanced treatment septic system.

LEFT:

Building too close to the water's edge threatens both homes and streams.

- ▶ Locate drain fields out of flood-prone areas.
- ▶ Avoid driving or parking over the septic system to prevent soil compaction.
- ▶ Install water-saving showers and toilets.
- ▶ Use only phosphate-free cleaners and detergents.
- ▶ Keep grease, plastics, solvents, and chemicals out of the system. They can destroy friendly bacteria and contaminate groundwater.
- ▶ Do not use garbage disposals. They burden the system with grease and solids.
- ▶ Monitor your septic tank annually and pump it out every three to five years.
- ▶ Avoid septic cleaning additives. They can allow partially broken-up sludge to leave the tank and clog drain lines.

FOR HEALTHY STREAMS

STABILIZING STREAMBANKS:

Some streambanks erode and shift quite a bit each year. Others only a little, or not at all. Though it's a natural stream process, too much sediment slumping into the stream means unpredictable flooding, the disappearance of good trout habitat, and potential property loss.

The best—and first—defense against crumbling banks is to maintain native riparian vegetation. Other low-tech, low-cost, stream-friendly options:

- ▶ Plant native shrubs, grasses, and sedges.
- ▶ Recontour streambanks (permit required) and revegetate with natives.
- ▶ Assess activities that could be harming your streambanks—e.g., livestock trampling—and redirect those activities out of the riparian zone.

RIGHT:

Rip-rap locks a streambank in place, threatening downstream neighbors and stream health.

- ▶ Recruit your upstream neighbors to practice “stream smart” techniques, too, to multiply the benefits of a natural flowing channel.
- ▶ Use “softer” flow diversion structures made of root wads or logs (permit required).
- ▶ If you have a serious erosion problem, consult a qualified professional listed in the back of this booklet about permit requirements.



THE UGLY TRUTH ABOUT RIP-RAP

A common response to erosion problems is to armor a streambank with large rock or concrete debris—known as rip-rap. **This is a mistake!** Locking the channel in place with rip-rap only transfers the erosive power of the river—and the problem—to your neighbors downstream.

STREAM FRIENDLY

PROTECTING RIPARIAN VALUES FOR PEOPLE, PROPERTY AND WILDLIFE

If you live along one of Montana's waterways, your property is likely already home to birds, shrubs, flowers, trees, waterfowl, and other creatures that rely on the land along a stream's edge. These riparian communities are part of a healthy, functioning waterway. Plus, they enhance the aesthetics of your site, increase the value of your property, and save you money on landscaping. Here are some tips on how to protect your investment and these vital streamside lands.

LEFT:

The Bitterroot River meanders through its riparian area.

RIGHT:

A streambank covered in non-native lawn crumbles into the river

RIPARIAN VEGETATION:

Riparian buffers are biological treasure troves. In fact, just about everything you like about these areas, with their songbirds, turtles, waterfowl, orchids, and lilies—depends on leaving them in their natural state.

- ▶ **Keep native riparian vegetation in place, particularly along the stream's edge and maintain overhanging streamside shrubs and grasses.**
- ▶ **Restore riparian areas that were previously cleared by planting natives.**
- ▶ **Control or eradicate invasive non-native species and weeds.**
- ▶ **Keep livestock off streambanks with fences.**
- ▶ **Avoid removing natural debris from riparian areas—the leaves from native trees and shrubs are the foundation of the food chain.**

LANDSCAPING

REDUCING EROSION:

When flowing water hits barren streambanks, you'll almost always see erosion. But too much sediment slumping into the stream means increased flooding, and the disappearance of pools and fish spawning habitat.

- ▶ **Keep an eye on lower parts of the streambank. A bank knit together with deep, dense roots and fallen logs is the best defense against undercutting and slumping banks.**
- ▶ **Replant barren banks or disturbed soils as quickly as possible.**
- ▶ **Choose a diversity of species for streambank planting and place your plants appropriately by wet and dry sites.**



WHY GREEN ISN'T SO "GREEN"

A blanket of green lawn may look friendly and inviting, but planting traditional suburban grass down to the stream's edge can create a domino effect of problems for your property and your backyard stream.

- ▶ **Non-native grasses have shallow roots and can't hold stream banks together as effectively as natives, leading to faster erosion and potential property loss in your yard.**
- ▶ **Lawn-care products typically used on non-native grasses can work their way into your stream, leading to nutrient or pesticide pollution that harms water quality.**
- ▶ **In arid western Montana, growing a lawn can take a lot of water during the short-but-hot summer months, leaving property owners with a big water bill and potentially leaving nearby streams thirstier.**
- ▶ **Replacing native vegetation, like willows and cottonwoods, with lawns means less shade for the stream, which leads to higher water temperature that is tough on fish and other aquatic life.**
- ▶ **Lawns are poor habitat for birds and wildlife, so converting native plants to traditional grass also means a loss of the treasured amenities of streamside living.**

STREAM FRIENDLY

YARD AND PASTURE MAINTENANCE:

Whatever you apply to your plants, crops, and soils can work its way into groundwater and seep into streams.

- ▶ Use compost and organic soil amendments.
- ▶ Choose “least-toxic option” pest management materials and approaches. These methods—which integrate biological, mechanical, physical, and chemical methods—are less toxic to aquatic life, humans, pets, wildlife, and beneficial insects.
- ▶ Avoid streamside applications of pesticides, herbicides, and chemical fertilizers and only spot-treat elsewhere.
- ▶ Consult your local weed board or extension office for help treating insect, disease, or weed infestations.
- ▶ Place pruning debris, leaves, and lawn clippings in your compost pile or dispose with a composting program to keep from drifting into streams or storm drains. These materials, even though they are organic, can smother aquatic habitat if dumped into streams, or clog storm drains, worsening flooding problems.



LANDSCAPING

COMMON NAME

LATIN NAME

GRASSES

Baltic rush	<i>Juncus balticus</i>
Basin wild rye	<i>Lemus cinereus</i>
Beaked sedge	<i>Carex utriculata</i>
Blue-joint reedgrass	<i>Calamagrostis canadensis</i>
Tufted hairgrass	<i>Deschampsia caespitosa</i>
Western wheatgrass	<i>Pascopyrum smithii</i>

GROUNDCOVER

Cow-parsnip	<i>Heracleum lanatum</i>
Field horsetail	<i>Equisetum arvense</i>
Smooth blue aster	<i>Aster laevis</i>
Virginia strawberry	<i>Fragaria virginiana</i>
Western yarrow (can get weedy)	<i>Achillea millefolium</i>
White sagebrush	<i>Artsemisia ludoviciana</i>

SHRUBS

Bebb willow	<i>Salix bebbiana</i>
Common chokecherry	<i>Prunus virginiana</i>
Currant	<i>Ribes species</i>
Douglas hawthorn	<i>Crataegus douglasii</i>
Mountain alder	<i>Alnus incana</i>
Red-osier dogwood	<i>Cornus stolonifera</i>
Sandbar willow	<i>Salix exigua</i>
Snowberry	<i>Symphoricarpos albus</i>
Serviceberry	<i>Amelanchier alnifolia</i>
Woods rose	<i>Rosa woodsii</i>

Find more on native landscaping at www.watersmartmt.com

NATIVE PLANTS

The native riparian vegetation growing within the Clark Fork River corridor is adapted to survive the flood conditions and temperature extremes unique to the area. Native plants protect against erosion, recover quickly when waters subside, provide food and shelter for pest-controlling songbirds and insects, and keep soil healthy.

Unlike their exotic counterparts, natives generally need less long-term maintenance to grow healthy and strong. Before planting natives, check with your local county extension service to be sure you're selecting plants appropriate for your specific property.



EVERYDAY TIPS FOR STREAM SIDE RESIDENTS

An important step on the path to being a stream-friendly property owner is learning what common practices and products are unsafe for water quality. Then it's just a matter of finding non-polluting alternatives. Soaps can harm water quality by adding too many nutrients, like phosphorus. Choosing laundry and dishwashing detergents that are "phosphate free" will keep your stream cleaner.

ONGOING CARE

CARS AND TRUCKS:

Even in low concentrations, automotive products—such as gasoline, motor oil, antifreeze, battery acid, or other automotive fluids—are extremely toxic to aquatic life.

- ▶ Even "biodegradable" soaps are toxic to fish and wildlife, so car cleaning is best done at commercial car washes.
- ▶ Put used motor oil and antifreeze in sturdy, sealed containers, caps taped down, and recycle through your local collection program or recycling depot. Never dump automotive fluids into a waterway or a storm drain that sends waste directly into the groundwater or stream.
- ▶ Use absorbent materials, such as cat litter, to clean driveway spills. Avoid spraying off spills on paved surfaces where wastewater could run into a storm drain or a stream. Depending on the substance spilled, dispose of absorbent materials in the garbage can or at a hazardous waste collection site.

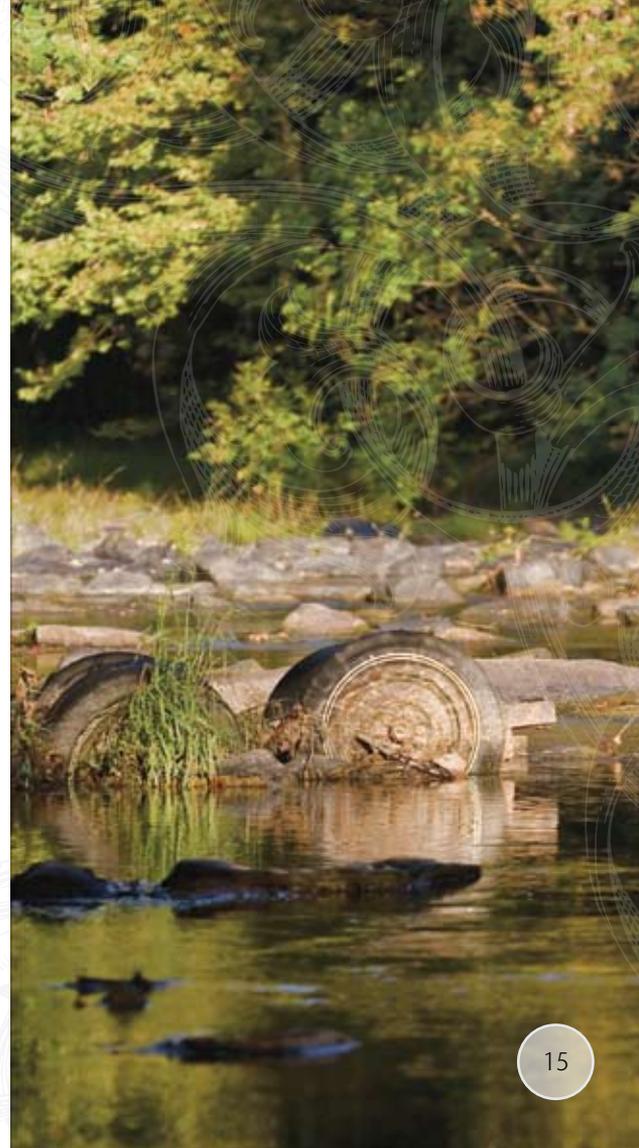


Volunteers pull waste from the Clark Fork River and its banks.

DUMPED DEBRIS:

Some people still view waterways as dumping grounds. Old tires, car parts, and plastic litter inevitably turn up after spring runoff. If left to sit in a stream, this garbage can threaten water quality and create hazards during high water.

- ▶ **Remove dumped debris from the stream, and make sure any temporary storage areas are out of the floodplain.**
- ▶ **Compost your yard clippings and other organic debris. Do not deposit them along streambanks or within floodplains.**



ONGOING CARE

LIVESTOCK AND PETS:

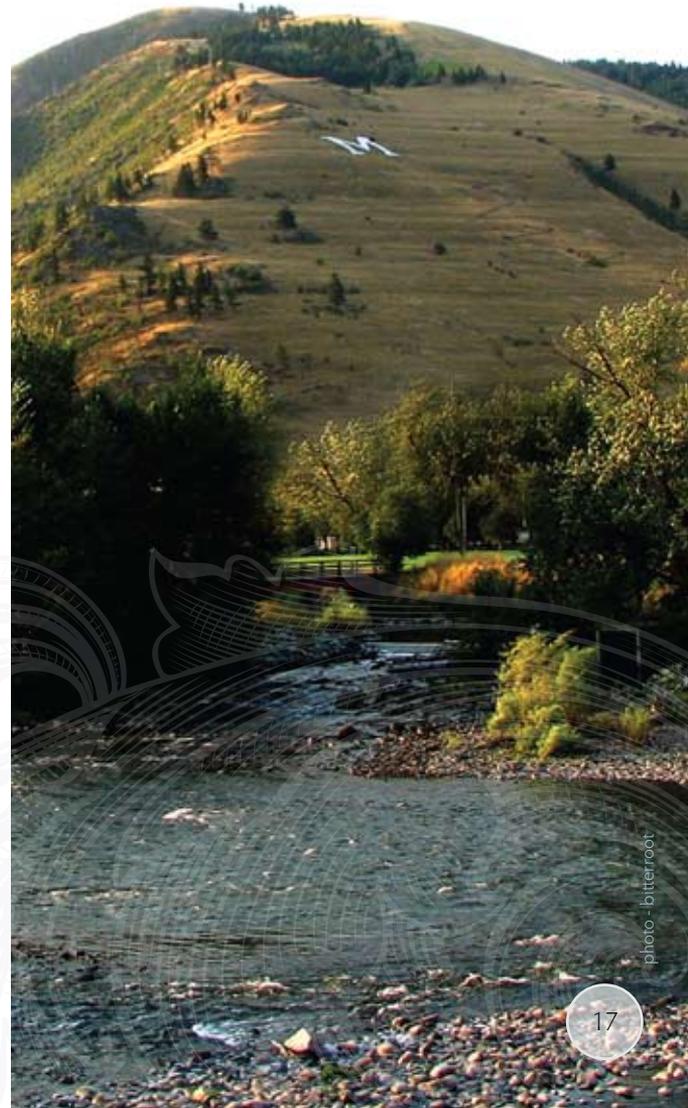
Animal waste adds excessive nutrients and bacterial pollution to water, which decreases water quality and can cause human health problems too.

- ▶ Keep livestock from trampling streambanks by creating wildlife-sensitive fencing and providing off-stream watering troughs.
- ▶ Keep manure piles well away from streams or watercourses – at least 100 feet.
- ▶ Manage manure by collecting and composting it. Check with your local extension service for advice on composting manure.
- ▶ For horses, consider creating a dry lot, or sacrifice area, so that the rest of your land can grow grass. This avoids over-grazing, soil compaction, and soil erosion during wet weather.
- ▶ Plant and maintain riparian vegetation between pastures and waterways to help filter and minimize nutrient-rich runoff and to discourage streambank trampling.



HOUSEHOLD CHEMICALS:

- ▶ Paints, thinners, and other solvents are dangerous to fish, wildlife, and people. Dispose of these products at your local hazardous waste facility.
- ▶ Use water-based latex paints whenever possible, which are less toxic than oil-based paints, turpentine, and thinners. Do not clean paint brushes in a gutter or near a storm drain or creek.
- ▶ Air-dry small amounts of leftover paints in cans and discard in the garbage.
- ▶ Many soaps and cleaners contain algae-producing phosphates. Check labels and use products with no phosphorus or less than 0.5%.
- ▶ Runoff from roof surfaces can compromise the health of a stream. Check to be sure your gutters, pipes, and drainage structures do not carry water directly to the stream.
- ▶ Carpet cleaning chemicals are detrimental to streams and should be avoided. If you use the services of a carpet cleaning company, make sure they do not dump wastewater into the stream or a nearby storm drain.
- ▶ Don't flush prescription medications down the drain or toilet. To dispose of unneeded drugs, put in a sturdy container, wrap tightly with tape, then place in a trash can where children and pets can't reach them.



FOR HELP & INFORMATION

You can't put a dollar figure on the value of Montana's rivers, lakes, and streams. They're priceless. And for that reason, there are numerous resources and experts devoted to helping landowners protect healthy waterways and restore ailing ones. So right from the planning stages of your work, tap into this network of experts. Here are a few contacts to get you started:



HELP,

STREAM HEALTH

Montana Dept of Environmental Quality	444-6697
Montana Dept of Fish, Wildlife & Parks	444-2449

HOMESITE PLANNING

LOCAL PLANNING OFFICE/HEALTH DEPARTMENTS

Butte-Silverbow County	497-6250
Deer Lodge County	563-4060
Flathead County	758-5965
Granite County	859-3771
Lake County	883-7283
Lewis & Clark County	447-8342
Mineral County	822-3579
Missoula County	523-4657
Powell County	486-3680
Sanders County	827-4391

PERMITS & RESOURCES

PERMITTING

Montana Conservation Districts	829-3395
Bitterroot District	363-5010
Deer Lodge Valley District	846-1703
Eastern Sanders District	826-3701
Granite County District	859-3291
Green Mountain District	827-4833
Lewis & Clark County District	449-5278
Mile High District	287-3215
Mineral County District	822-3545
Missoula County District	829-3395
North Powell District	846-1703
Montana Dept of Environmental Quality	444-6697
Montana Dept of Natural Resources & Conservation	444-6610
Montana Extension Service (see Vegetation listings)	994-1752
Montana Floodplain Programs (see Planning listings)	444-6601
US Army Corps of Engineers, MT office	441-1375

VEGETATION

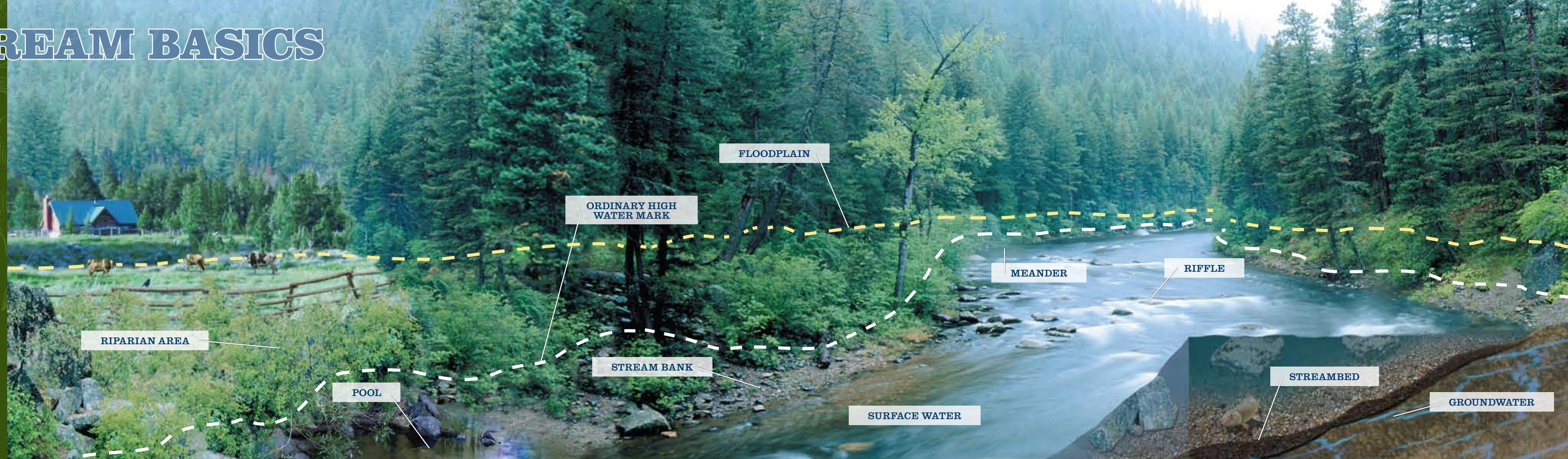
Montana Dept of Natural Resources & Conservation	444-6610
Montana Extension Service	994-1752
Butte-Silverbow County	497-6245
Deer Lodge County	563-4035
Flathead County	758-5553
Granite County	859-3304
Lake County	676-4271
Lewis & Clark County	447-8346
Mineral County	822-3545
Missoula County	829-4200
Powell County	846-3680
Sanders County	827-6934
Montana Weed Control Association	622-3421
USDA Natural Resources & Conservation Svc, MT office	587-6868

CONTACT

STREAM BASICS

THE GOAL: A CLEAN AND HEALTHY WATERSHED

Following the basic steps in this guide will lead to clear rewards for your stream and your property. Keeping visual tabs on your stream's health, strategically planning where you place your home, protecting riparian plants, and paying attention to how daily activities impact your stream will benefit the entire Clark Fork watershed.



HEALTHY RIPARIAN AREA

Maintaining a healthy riparian area is the key to a healthy stream system. It's also the best investment you can make in your property. That's because lush riparian and wetland vegetation along the water's edge performs all sorts of invaluable services. It slows flood flows, anchors streambanks, and reduces erosion and property loss. It filters out sediments, chemicals, and nutrients from runoff. It provides food and cover for fish, birds, and wildlife. Plus, it absorbs flows during high water, recharging groundwater and slowly releasing water all year as streamflow.

Illustration + design - josanna.yardley | my-design.net

GLOSSARY

AQUATIC INVERTEBRATES (macro-invertebrates) – insects found in the bed of streams and rivers. They are an important food for fish and birds. A diverse abundance of aquatic invertebrates in the stream bed is an indication of good water quality and a healthy stream.

EROSION – wearing away of soil or sediment by wind, water, or ice.

FLOODPLAIN – land that is covered by flood waters from any source. The 100-year floodplain is land that would be inundated by a “100-year flood,” which has a 1% probability of occurring in any given year. A FEMA-mapped 100-year floodplain includes the floodway (the area of flowing water) and the flood fringe (the area of standing water), but these maps are not highly accurate and FEMA maps usually only cover large rivers.

GROUNDWATER – underground water found in the spaces and cracks in soil and rocks. It is hydraulically connected to surface water, which means that in many areas, groundwater flows into streams,

ponds and lakes. In certain areas, or during certain seasons, surface water may replenish groundwater, instead of vice versa.

NUTRIENTS – nitrogen and phosphorus are nutrients required for aquatic plants like algae to grow. Nutrients come from the decomposition of organic debris. Our Montana trout streams thrive with very low levels of nutrients and algae. Too much nutrient-rich human and animal waste causes rampant algal growth, which chokes out other forms of aquatic life, like fish.

ORDINARY HIGH WATER MARK – this is the highest the water reaches up the stream bank on a typical year, usually during spring run-off. The mark can sometimes be identified by the lack of terrestrial vegetation beneath it.

PERENNIAL STREAM – a stream with a distinct channel that flows year-round (or at least 90% of the time). An intermittent stream typically flows part of the year, but may naturally go dry in some reaches during certain times of the

year. An ephemeral stream is an indistinct watercourse that flows only after extreme storms or in wet years.

RIPARIAN AREA – the green zone adjacent to streams, springs, rivers and wetlands, ponds and lakes where plant communities depend on the presence of water, either continually or during periodic floods. It's the transition zone between the water's edge and the dryer uplands.

SEDIMENT – minerals and organic particles (dirt, sand, gravel, decomposed vegetation). In streams, eroded sediment is suspended in water until it is deposited on the bed or banks.

SURFACE WATER – water that flows or collects in lakes and ponds above ground.

WATERSHED – the entire drainage area, from ridge-top to ridge-top, of a river or stream, including all its tributaries.



**YOUR VOICE
FOR THE
RIVER**

CLARK FORK



COALITION

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