

River Explorer

A Kid's Guide to Fun on the Upper Missouri River



Upper Missouri River Breaks National Monument

BLM

The Upper Missouri River Breaks National Monument Interpretive Center

Bureau of Land Management
Fort Benton, Montana



An upspoiled river is a very rare thing in this nation today.

--President Lyndon Johnson as he signed the Wild & Scenic Rivers Act, 1968.

Welcome to the Upper Missouri National Wild and Scenic River



Floating through the White Cliffs, Fort Benton Schools.

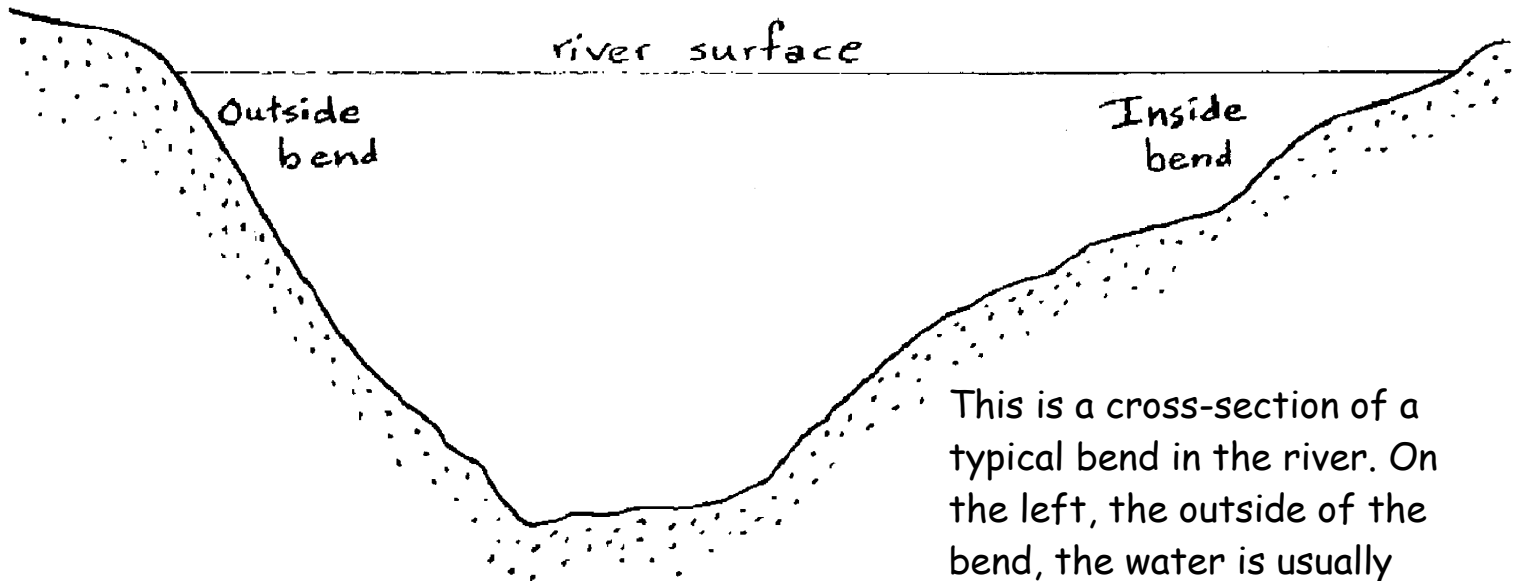
“In a country where nature has been so lavish and where we have been so spendthrift of indigenous beauty, to set aside a few rivers in their natural state should be considered an obligation.” – Senator Frank Church of Idaho, arguing for passage of the Wild & Scenic Rivers Act, 1968.

Did You Know?

- The National Wild & Scenic Rivers Act was passed by Congress and the legislation signed by President Lyndon Johnson in 1968.
- 149 miles of the Upper Missouri River through Montana are classified as Wild and Scenic and protected under the National Wild and Scenic Rivers Act.
- 200 free-flowing rivers are currently protected by the Act, which is 0.35% of all U.S. river miles (from *National Geographic Magazine*, Nov. 2011).

River Safety Tips

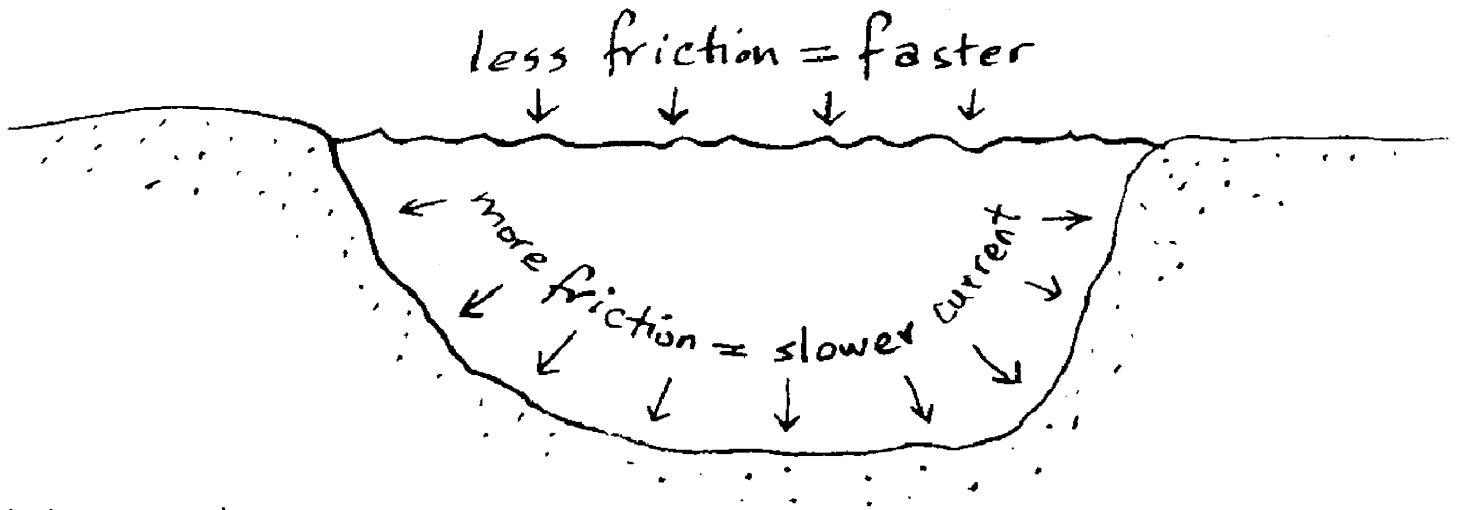
The following drawings will help you learn about river features. By learning these terms and features, you can learn to "read" the river. By reading the river, you will understand how water moves on any river. This knowledge will help keep you and your friends safe while boating.



This is a cross-section of a typical bend in the river. On the left, the outside of the bend, the water is usually deeper and the current moves faster. On the inside of the bend (on right) the river tends to be shallower and the current moves slower.

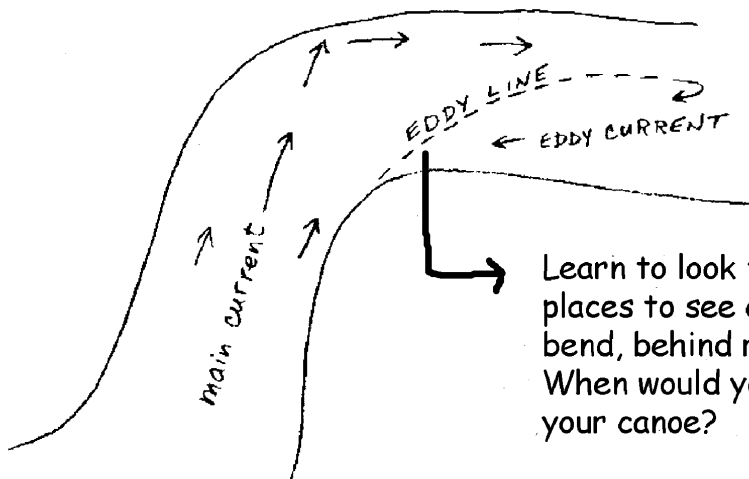
Page illustrations from River Safety: A Floater's Guide by Stan Bradshaw and courtesy of the author.

Where's the Rub?



Friction causes the current to move slower along the banks and the bottom. If you're looking for slower water, look to the river's edge. But don't forget that, on river bends, the outside of the turn will be faster than the inside.

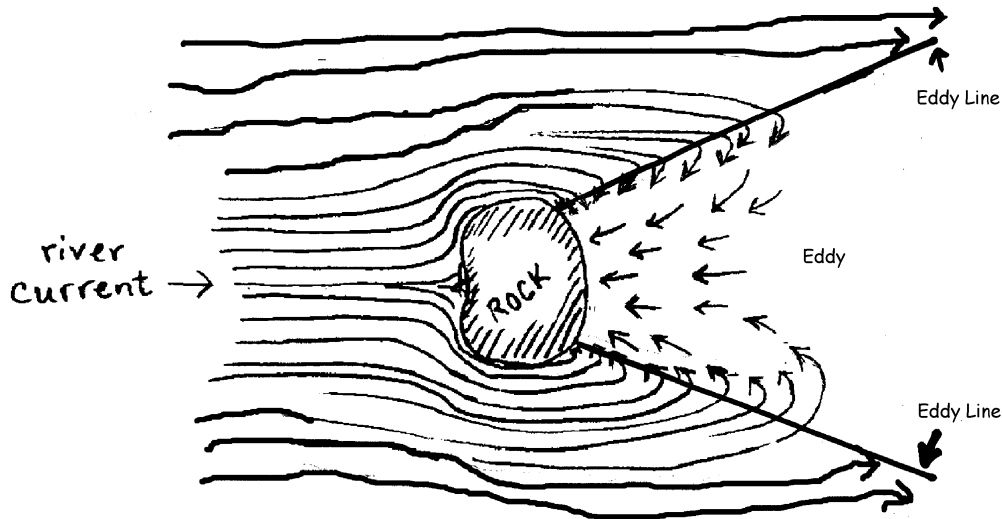
Around Each Bend



Below every inside bend on a river there will be an eddy.

Learn to look for these features in the river. Good places to see eddies and eddy lines are in each river bend, behind rocks, downstream ends of islands, etc. When would you want to use an eddy while you are in your canoe?

Eddy Who?



While it doesn't always seem like it, the water below the rock is actually flowing back upstream as it fills the vacuum created by the rock.

RIVER TERMS TO KNOW:

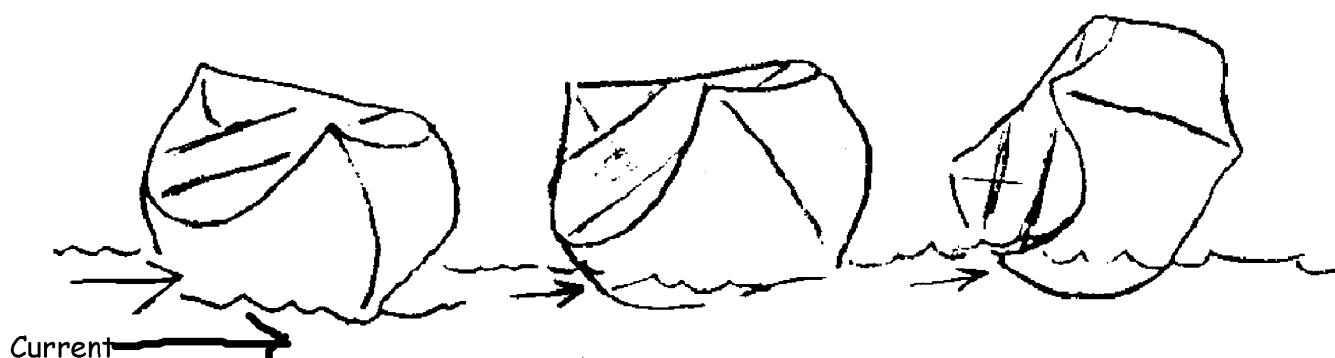
Eddy - where the river current flows upstream in the river. Eddies often form behind obstacles in the river, like a rock.

Eddy Line - the area in the water where the water flowing downstream meets or mixes with the water flowing upstream in an eddy. Water in the eddy line is unsteady and often appears to be "boiling".



Tip the Wait Staff, Not Your Canoe!

In the classic “**upstream tip**”, the bottom of the canoe moves downstream faster than the rest of the boat. This can easily happen to your canoe when you are sideways to the river current. If this happens, try not to lean upstream - unless it's a hot day and everyone in your boat wants to go for a swim!



RIVER TERMS TO KNOW:

Upstream - where the water is coming from.

Downstream - where the water is going to.

River Left - while facing downstream, it will be on your left.

River Right - while facing downstream, it will be on your right.

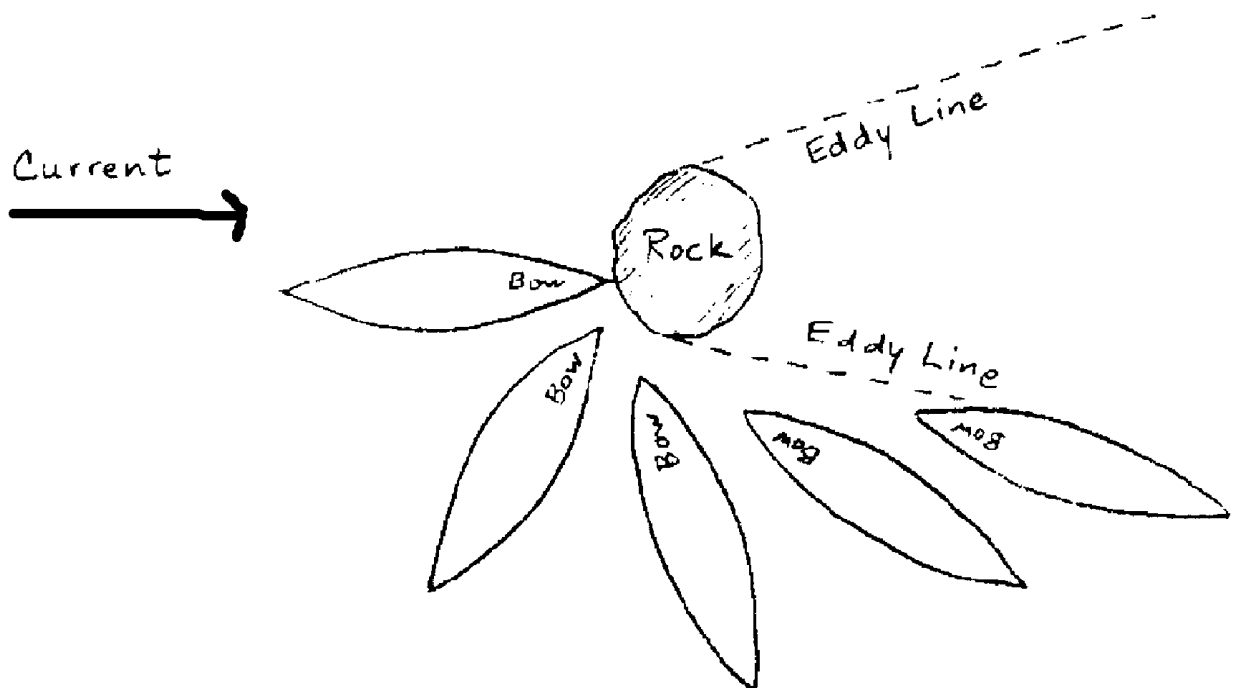
Safety Note: 100 Degree Rule

If the temperature of the river water and the temperature outdoors do not add up to 100 degrees or more there is a possibility for you to develop hypothermia - even if you become wet for just a brief moment. Example, 40 degree water on a 50 degree day can be risky. Remember, on windy days the temperature will be colder than what it seems to be.

Don't Rock the Boat!

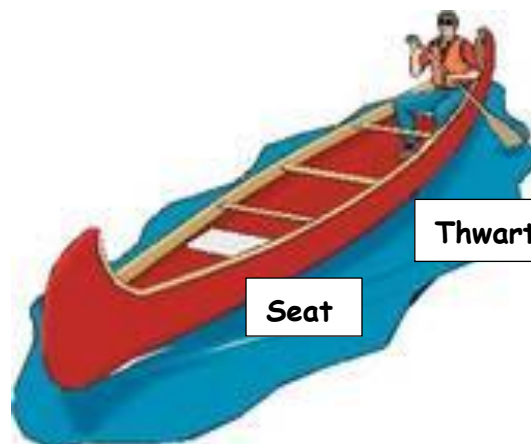
If you are in a canoe, try to avoid hitting rocks. As a last resort, try to bump it lightly head-on. That may at least allow you to pendulum (swing) off the rock.

As the boat starts to swing downstream, resist the temptation to lean upstream. That upstream lean will guarantee a swim. It's best for you and your canoe to avoid all the rocks you can.



Parts of a canoe:

Bow (front of canoe, where paddle power comes from)



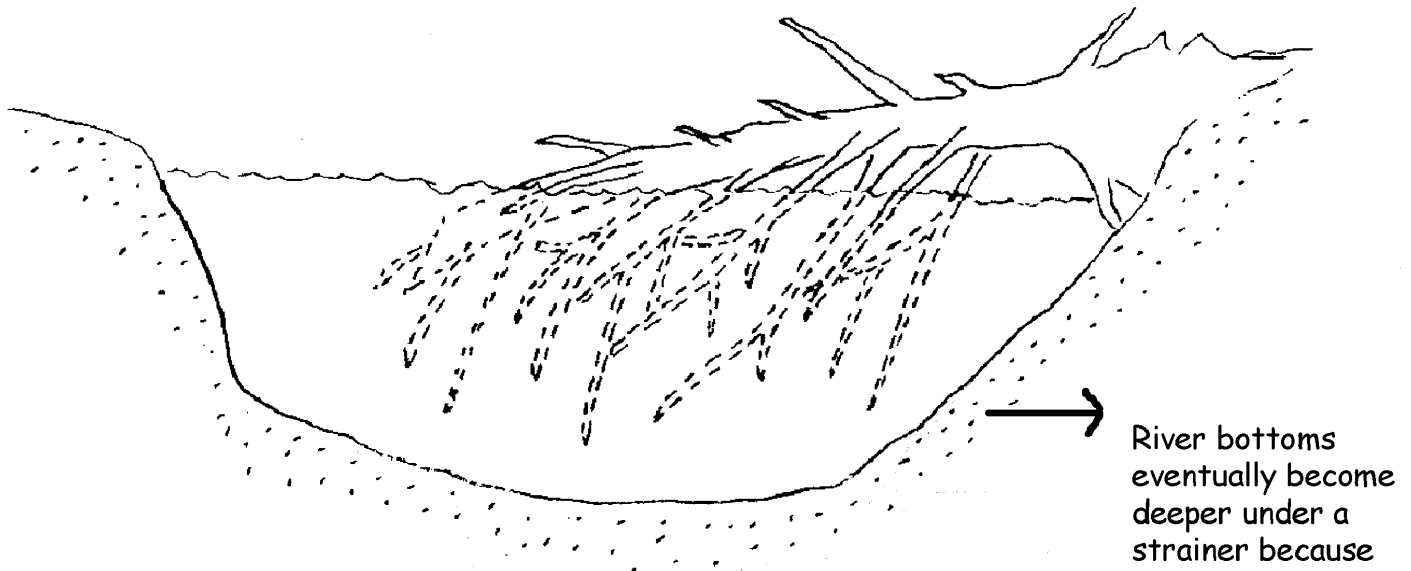
Seat

Thwart (cross bar)

Stern (back of canoe, where person steers from)

DANGER!

STRAINERS - STAY AWAY!

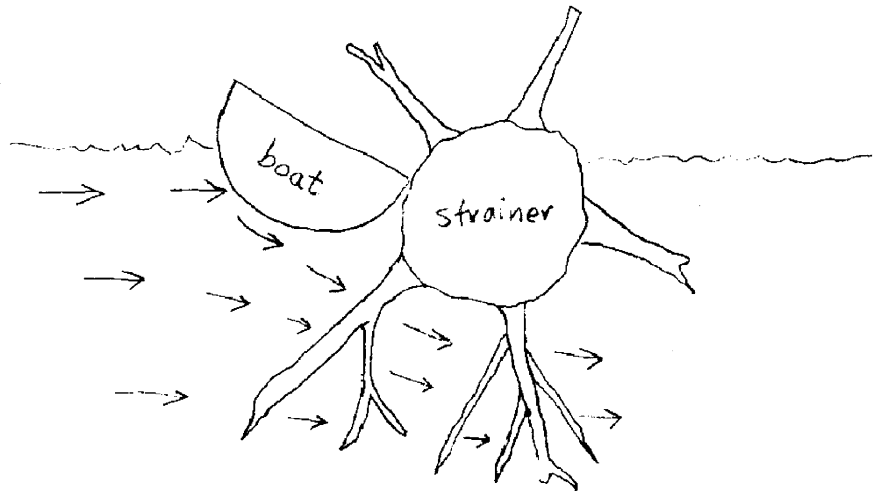


Fallen trees are the most common kind of strainer. You can see them on almost any stream or river. They are especially common in the spring, when high water cuts into river banks and drops trees into the river. Because they are so common, they might be the greatest danger to the recreational floater.

River bottoms eventually become deeper under a strainer because of the action of the water, which is DOWN and UNDER.

More Strainer Safety

Never approach a strainer while boating. If you accidentally find yourself upstream of a strainer and you can't get away, make sure you have that downstream lean.

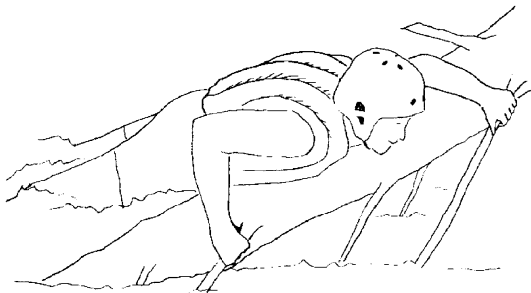


The river current pulls DOWN and UNDER a strainer with tremendous force, even on very small, shallow streams like the Teton.



If you're out of your boat and in the water and can't avoid a strainer, SWIM INTO IT. Don't start so soon that you wear out and lose your momentum before you get there. But, then again, don't wait too long or you may not build enough momentum.

When you arrive at the strainer, place your hands out in front of you and pull yourself up onto the strainer. Kick vigorously to help propel yourself up onto the strainer and to help keep your feet from getting pulled under.



When you get to the strainer, PULL YOURSELF UP AND KICK LIKE MAD! Don't stop kicking until your legs are mostly out of the water. Even a slight hesitation can stop your momentum and pull you back in. Do whatever it takes to stay on top of the tree, above water.

Outdoor Safety - Weather or Knot!

Here are some weather-related conditions to be aware of.

Hypothermia:

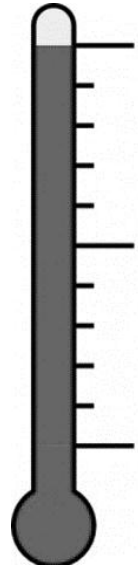
Hypothermia is a condition in which a person's body temperature drops too low.

Symptoms include:

- Shivering
- Poor judgment
- Slurring and slowing of speech
- Shivering stops
- Unconsciousness

Treatment

1. Get the person out of water, wind and weather.
2. Remove wet clothing.
3. Insulate the person in something like a dry sleeping bag.
4. Add heat by body to body contact or use hot packs to help warm them.
5. If they are able to sit up and swallow, have them drink warm tea or soup.
6. After the person becomes more alert, have them eat high-energy foods.
7. If the person does not improve or gets worse, seek medical attention.



Heat Exhaustion:

Heat exhaustion is a heat-related illness where the body temperature is too high and the person is dehydrated. Dehydration occurs when you have not replaced the water and minerals your body needs after excessive perspiration.

Symptoms include:

- Mild confusion
- Dark-colored urine (which indicates dehydration)
- Dizziness
- Fainting
- Fatigue and headache
- Muscle cramps
- Nausea
- Pale skin and profuse sweating are key signs and symptoms

Treatment

1. Move person to cool, shady area and cool the body by fanning or ice packs.
2. Have person drink water with electrolytes.
3. Early recognition and treatment can prevent this from becoming heat stroke, which is a true medical emergency.

Heat stroke:

Heat stroke is a heat-related medical emergency where the body temperature is too high and the person stops sweating. It can be fatal if not properly and promptly treated.

Symptoms include:

- Difficulty breathing
- Elevated body temperature
- Strange behavior, hallucinations, severe confusion
- Seizure and/or coma
- The absence of sweating, with hot red or flushed dry skin are key signs and symptoms

Treatment

1. Cool the body to a normal temperature as soon as possible to prevent or reduce damage to the brain and vital organs.
2. Use cold water to cool the body.
3. Apply ice packs to the person's groin, neck, back and armpits to lower their body temperature.
4. Seek medical attention as soon as possible!

Rescue Whistle:

Take whistles on your trip for safety -- one whistle per person. That way anyone can signal for help. Three blasts long and repeated tells anyone nearby that you need emergency or rescue assistance.



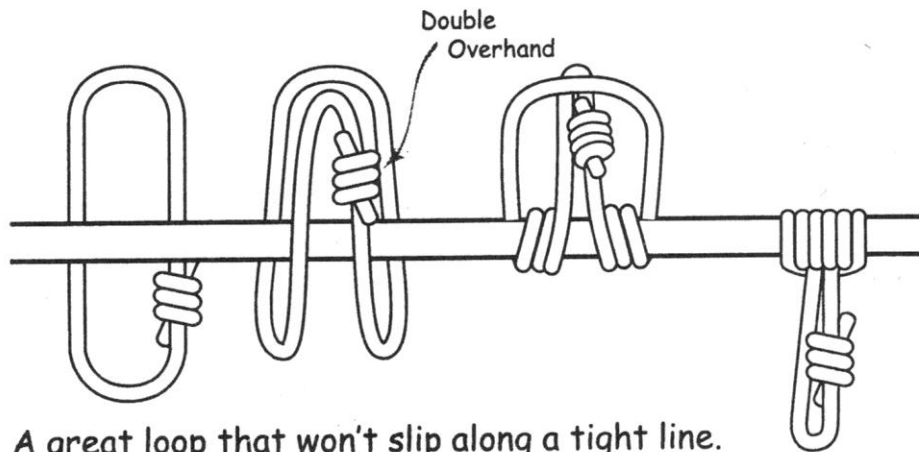
Knowing Knots:

If you can tie your own shoes, you can learn the correct way to tie a knot. Knowing knots can help you during your outdoor adventure, from securing tents to tying boats.

Follow these knot drawings to learn to knot correctly and securely. Remember, practice makes perfect.

Did you know that there are many knot pages online? In addition to the knots illustrated here, how many more knots can you learn to use?

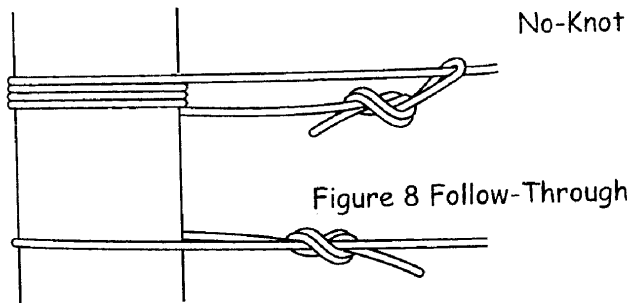
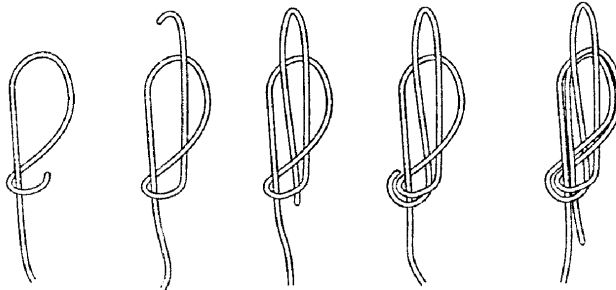
Prusik Loop



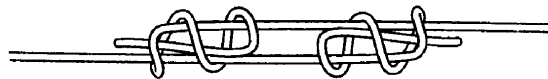
A great loop that won't slip along a tight line.

Figure 8 Follow-Through

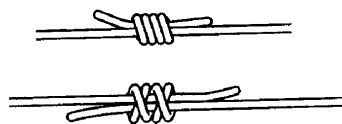
A good knot for setting up a Traditional Z-line.



Double Overhand

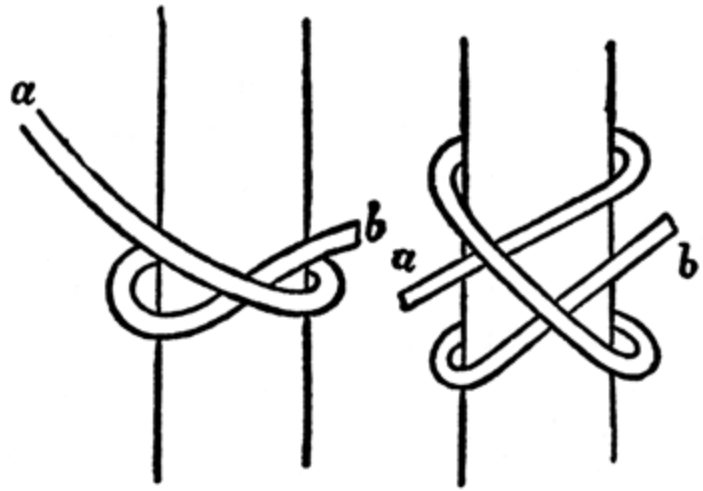


Use this knot to securely connect two lengths of rope together.





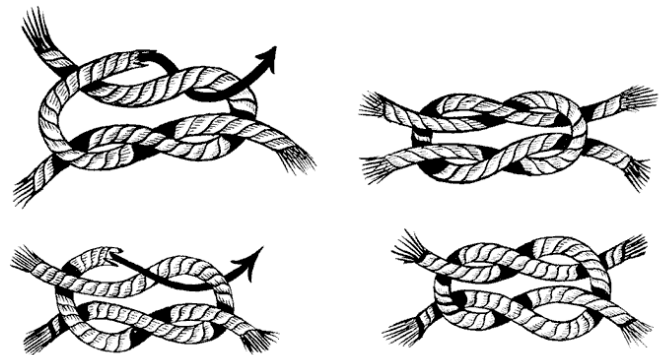
Half Hitch



Clove Hitch



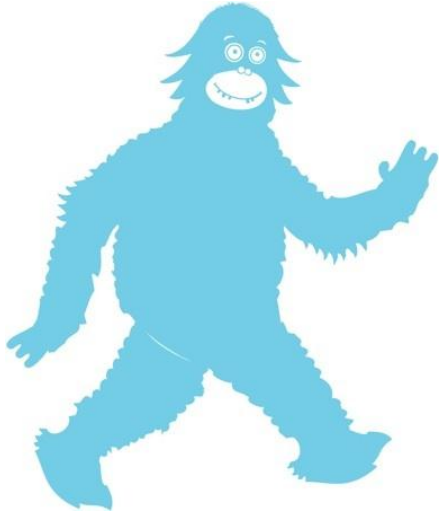
Granny Knot



Square Knot

***“Little drops of water, little grains of sand,
make the mighty ocean, and the pleasant land.
So the little minutes, humble though they be,
make the mighty ages of eternity.”***

– Julia Carney, *Little Things*



Can you “Leave No Trace”?

By using these principles you are Leaving No Trace where it matters most - the places you live, work and play.

Bigfoot's Been Doing it for Years!

- **Plan Ahead and Prepare**
 - Know which lands are public and which are private.
 - Prepare for extreme weather and for emergencies.
- **Travel and Camp on Durable Surfaces**
 - Avoid camping in the riparian and other fragile zones.
 - Travel on established trails.
- **Dispose of Waste Properly**
 - Use portable toilets.
 - Pack out trash and waste.
- **Leave What You Find**
 - Preserve the past - leave all cultural and historical artifacts in place.
 - Leave rocks, plants and other natural objects where you found them.
- **Minimize Campfire Impacts**
 - Use established fire rings. Keep fires small and put them out completely before leaving the area.
- **Respect Wildlife**
 - Observe wildlife from a distance, never feed wild animals, and leave young animals alone (their mother will eventually return).
 - Store food properly.
- **Be Considerate of Other Visitors**
 - Expect others, respect others.
 - Let nature's sounds prevail.

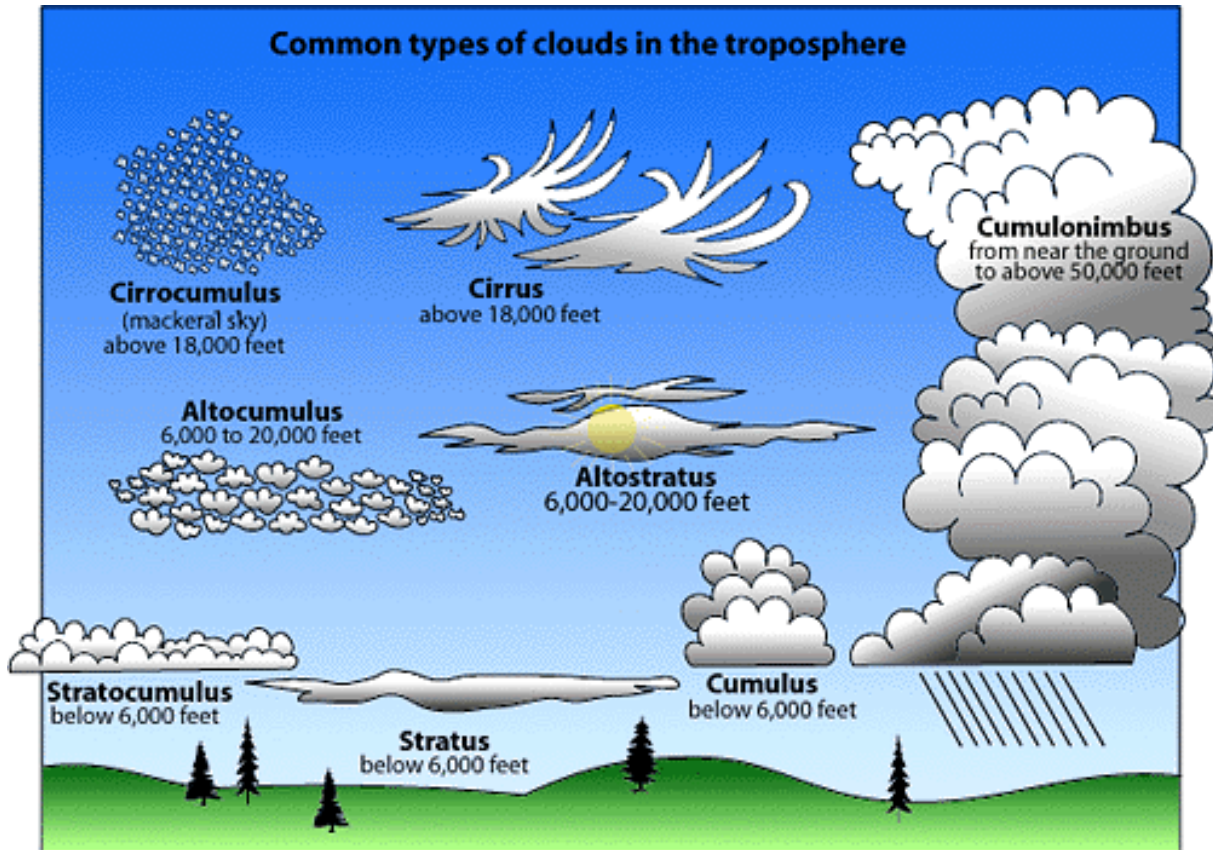
Learn more when you return home by visiting the Leave No Trace website at:

<http://www.lnt.org>

Have you ever seen Bigfoot? No? Because he Leaves No Trace!

Try to Forecast the Weather

Why is it that on a cold day we can see our breath? The answer is that the air we breathe out contains moisture in the form of water vapor. When that warm, moist air meets the cold, dry air outside, a cloud forms.



Clouds are the sky's way of moving water from one place to another.

As you travel the river, notice the types of clouds throughout the day. Clouds often form where two weather fronts meet, like when a cold front meets a warm front. The kind of clouds that form can say a lot about what type of weather is coming! By learning to watch the clouds you can learn to predict the weather.

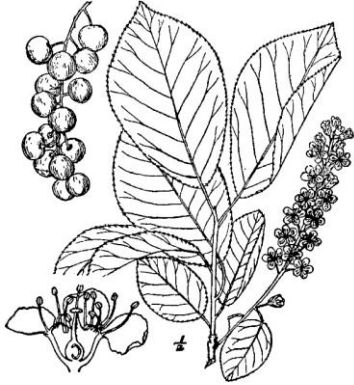
Here are some fun web sites to check out when you get home:

Web Weather for kids: <http://eo.ucar.edu/webweather/cloud3.html#Anchor-47857>

NASA's cloud web page: <http://spaceplace.nasa.gov/cloud-scramble/#>

"If there is magic on the planet, it is contained in Water."

- Loren Eiseley, *The Immense Journey*, 1957.



“The songs of the river ends not at her banks, but in the hearts of those who have loved her.” – Buffalo Joe

THIS LAND IS YOUR LAND!

The Upper Missouri River Breaks National Monument contains 375,000 acres. BLM manages many more acres in the “Breaks” region. This is public land, which means it belongs to you and every other American. The BLM, an agency of the U.S. federal government, takes care of this land for many purposes, including recreation and grazing. Scattered throughout the region are parcels of private land. Many of these lands began as homesteads.

Homesteaders arrived in the area during the late 1800s and early 1900s. Crops and cattle were their way of life. Prior to the homesteaders’ arrival, Native Americans, such as the Blackfeet, Sioux, Crow, Gros Ventre and Assiniboine lived and hunted buffalo here. Other tribes East and West of the Missouri River followed buffalo herds through the Breaks as well as other parts of Montana and beyond. Both homesteaders and Native Americans lived off the land, but in a very different way. These people made their living from the land by understanding the plants, animals, and weather in order to survive. Chokecherry, for example (shown in the drawing above), provided food for both Native Americans and settlers.

Even today, amenities in this region are scarce. People canoe and camp with no cell phone service, no video games, no electricity, and sometimes go for a day or more without seeing other people. In many ways, the Upper Missouri River Breaks remains very similar to the way homesteaders, Native Americans and the Lewis and Clark expedition encountered it. Can you survive like the Native Americans and early homesteaders did, without electricity or water from the tap?

CAN YOU LIVE OFF THE LAND?

Imagine you are a newly arriving homesteader. Look around you – try to identify as many plants and natural items that could be used to sustain yourself and your family through an entire year. What items might you use? Do you see rocks or large sticks? How would you carry and store water? What about clothing – where do things such as shirts, pants, coats and shoes come from (there is not a store nearby!)? How about food – what can you find to eat? In your booklet, make a list of items you would need to survive and how you would obtain those things. How much time do you think it would take to get the things you need to survive for a day, a month or a year? Remember, if you brought animals and livestock with you to your homestead you need to provide food, shelter and water for them too!

THE LAND TODAY

Remnants from Native Americans and our homesteading history remain in the Breaks today. Tipi rings and old log cabins can be seen in various places. The Upper Missouri River Breaks National Monument was designated in 2001, helping to protect the region’s cultural and natural historic values. This public land belongs to you. What does your journey through this area involve? Are you canoeing? Camping? Hiking or gathering cows with your neighbors? In your booklet, write down the activities you are enjoying as you journey down the river today. Make notes about the cultural and natural history you see around you in your journal pages.



Reminders of days gone by, including old homesteads like the Hagadone Homestead, above, can be found along the Upper Missouri National Wild and Scenic River. *BLM Photo*

DID YOU KNOW?

- Sixteen homesteads are located on BLM land in the Upper Missouri River Breaks National Monument including the Hagadone (pronounced Hag-a-Doan), Gus Nelson, Monroe, Murray, Ervin, and Gist properties. The Hagadone and Gus Nelson Homesteads are listed on the National Register of Historic Places.
- A homesteader had only to be the head of a household or at least 21 years of age to claim a 160-acre parcel of land, but they had to be a citizen before they could get the patent. Newly-arrived immigrants, farmers from the East without land of their own, single women, and former slaves were among the many who took the challenge of “proving up” a homestead.
- The homesteads in the Upper Missouri River Breaks were just some of about 151,600 homesteads in Montana, or 34 percent of Montana’s total area.

CAN YOU MAKE SETTLER SENSE (CENTS)?

To settle a homestead, pioneers needed supplies such as tools and food to get started. This activity will help you understand that even “free land” advertised by the government through its Homestead Act wasn’t entirely free!

Imagine you and your family decided to homestead in the Missouri River Breaks region in the 1870s. You need supplies to build your house, to construct a barn for your animals, to plant crops and enough food to eat for several months. Before heading out to the Breaks, you stop in the nearest town to load up with necessary supplies. You bring one change of clothing and some tools as well as a dozen chickens. You plan to buy a cow for milk, butter and cheese. You’ll need a team of horses for plowing and some fencing for the chickens. From the supply and price lists below, add up how much money you need to live on while you build your house, construct a barn for your animals and while you wait for your crops to grow. Will your house be a shack or a beautiful “prairie palace”?

Food and Supplies Needed:

- 6 lbs. of bacon _____
- 20 lbs. of beans _____
- 3 lbs. of butter _____
- 10 lbs. of coffee _____
- 50 lbs. of flour _____
- 5 gallons of molasses _____
- 10 lbs. salt _____
- 2 lbs. refined sugar _____
- 2 lbs. brown sugar _____
- 4 boxes matches _____
- 10 dozen nails _____
- 6 packs vegetable seeds _____
- 3 bushels wheat _____
- 3 bushels potatoes _____
- 3 chunks of soap _____
- 3 gallons lamp oil _____

Find the costs in the lists below

What else might you need that's not listed above? How much additional money will you need? What's necessary and what can you do without (at least for a while)? How does this list compare with what you need to survive today?

FOOD AND PROVISION COSTS IN 1870

- | | | |
|---------------------------------|------------------------------|---------------------------------|
| Bacon -- \$.10/pound | Apples -- \$.05/10 pounds | Beans -- \$.06/pound |
| Crackers -- \$.30/pound | Butter -- \$.10/pound. | Cheese -- \$.25/pound |
| Rice -- \$.05/pound | Coffee -- \$.50/pound | Salt -- \$.05/pound |
| Eggs -- \$.06/dozen | Sugar, brown -- \$.18/pound | Matches -- \$.05/box |
| Vegetable seeds -- \$.20/packet | Potatoes -- \$.25/bushel | Soap, large chunk -- \$.25/each |
| Lamp Oil -- \$.35/gallon | Nails -- \$.10/dozen | Oranges -- \$.50/dozen |
| Dried figs -- \$.20/pound | Dried apples -- \$.10/pound | Dried apricots -- \$.15/pound |
| Dried peaches -- \$.12/pound | Fresh peaches -- 3 for \$.10 | Fresh apples -- 2 for \$.05 |
| Sugar -- \$.10/pound | Flour -- \$.04/pound | Wheat -- \$1.02/bushel |
| Flour -- \$3/barrel | Corn -- \$.40/bushel | Molasses -- \$.15/gallon |
| Mess pork -- \$9.00/barrel | Mess beef -- \$8/barrel | Lard -- \$.06/pound |
| Butter -- \$.15/pound | Cheese -- \$.05/pound | Rice -- \$.05/pound |

MISCELLANEOUS...

- | | |
|------------------------------------|--|
| Cigars -- \$.05 to .10/each | Calico fabric -- \$.07/yard |
| Men's suspenders -- \$.25 | Nails -- \$.02/pound |
| Books -- hard cover average \$.50 | Pump organs -- \$99 to \$340 |
| German Student Lamp -- \$5 | New York Tribune Almanac -- \$.25 |
| Newspaper Subscription -- \$3/year | Webster's Unabridged Dictionary, 1,840 pages -- \$12 |

HORSES & GEAR...

Average work horse -- \$150
Wagon -- \$65
Saddle -- \$30
Harness -- \$40 to \$60

Good saddle horse -- \$200+
Buggy -- \$65 to \$85
Cowboy Saddle -- \$60

TELEGRAMS...

The Telegraph Act of 1860 established a limit of \$3 per every ten words, although in smaller towns such as where you will be purchasing your goods, the cost was significantly less. At this price how often will you communicate with family in other places far away? For what occasions - only births, marriage or deaths?

How often would you communicate if you had to pay this fee for every 10 words you **texted**? Estimate the number words you text in a day. Take that number and divide by 10 = _____. Multiply this number by \$3 = _____ dollars/per day!

Would you text as often if you had to pay this amount?

MONETARY WORDS...



bit -- 1/8 of a dollar (2 bits = \$.25)
eagle -- \$10 gold piece
double eagle -- \$20 gold piece (1849)
gold dollar -- first minted in 1850s
half dime -- 1800-1873
half dollar -- first minted in 1801
half eagle -- \$5 gold piece (1795)
nickel -- first minted in 1859
quarter -- first minted in 1804
quarter eagle -- \$2.50 gold piece (1796-1907)
silver dollar -- first minted 1798
slug -- \$50 dollar gold piece (1851)
V-spots -- \$5 bills

REWARDS OFFERED AT THE TIME...

\$300 -- For catching a stagecoach robber (offered by the state of California and Wells Fargo)
\$200 -- For catching someone who robbed the US mail (offered by the Federal government)
\$250 -- For catching a cattle rustler (offered by the Wyoming Stock Growers Association)

LAWMEN'S SALARIES...

1870 -- Abilene, Kansas, Tom Smith was initially paid \$150 per month, later raised to \$225.
1876 -- Wyatt Earp was paid \$250/month in Dodge City, Kansas (considered a very high amount)
1878 -- Dodge City, Kansas marshal \$100 per month, and Assistant marshal and policemen made \$75 per month

Salaries could be expected to vary by the size of the town, and the size of its problems.

HIDEAWAY COULEE AND THE WILD BUNCH

In a remote section of the Missouri River Breaks is reported to be a hideout of Kid Curry who ran with Butch Cassidy, the Sundance Kid and others of the Wild Bunch Gang. Kid Curry called this place "Hideaway Coulee". By all accounts, when sober, Curry was mild-mannered, likable, and loyal to both friends and his brothers. But Kid Curry (aka Harvey Logan) was also referred to as "the wildest of the Wild Bunch." Butch Cassidy, Kid Curry and others in the gang robbed a Great Northern train near Wagner, Mont., taking more than \$60,000 in cash. Did they evade capture by running to Hideaway Coulee after the robbery? No one knows for sure.

Kid Curry was considered the "fastest gun in the West." The Sundance Kid, contrary to the way he was portrayed in movies, was not actually as mean of a gunman as Kid Curry was. Kid Curry was killed in Colorado in 1904, during a shootout with lawmen. In 1908, Cassidy and Sundance were allegedly killed in South America in a shootout with the Bolivian cavalry.



Sitting (l to r): Harry A. Longabaugh, alias the Sundance Kid; Ben Kilpatrick, alias the Tall Texan; Robert Leroy Parker, alias Butch Cassidy; **Standing** (l to r): Will Carver, alias News Carver; and Harvey Logan, alias Kid Curry. Fort Worth, Texas, 1900.

The Great Northern Train after it was robbed in 1901 by Butch Cassidy, Kid Curry, and others of the Wild Bunch. This postcard was printed soon after the robbery. The total loss was later discovered to be about \$60,000.



The Dynamited Express Car after the Curry "Hold Up" between Malta and Wagner, Mont. July 3, 1901. "Kid" Curry's gang got away with \$80,000.

How Big is Our River?

Understanding the volume of water flowing in a stream or river can help keep you safe as you journey on the water.

Stick Race

Measure and mark a 100-foot distance along a small side channel or stream that flows into the Missouri. If you can't find a 100-foot section, use 25 feet or 50 feet. Throw a stick (5 or 6 inches long) into the water above the upstream marker.

Record the number of seconds it takes to float

downstream between the markers. Record these measurements on your Stream Flow Activity Sheet.



To find the stream flow, first divide the 100-foot distance by the total seconds it took the stick to float between the stakes. Repeat this two more times, to get a total of three recorded times. To get the average time add all of these times together and divide by 3.

What's With the Width?

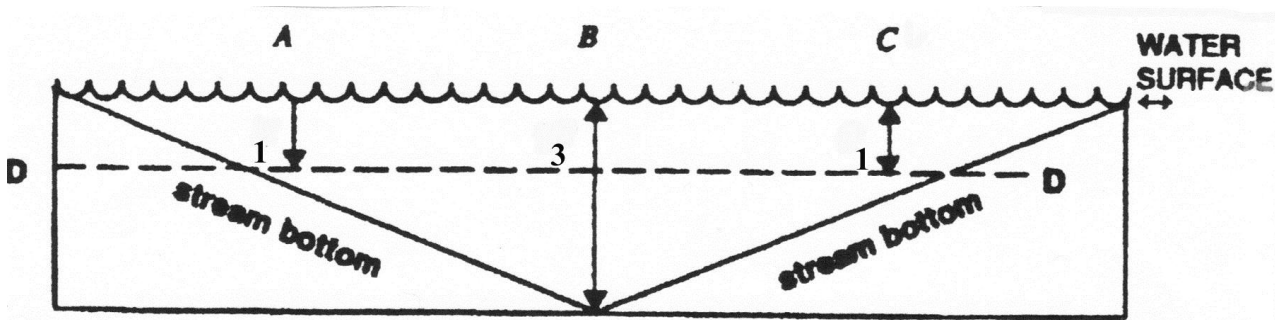
To find the average width of your section of the river, measure the width in at least three places within the 100-foot area. Divide the total by three to get the average width of the stream. Record these measurements on your Stream Flow Activity Sheet.

River Water Runs Deep!

Safety note: Do not measure moving water that goes above your knees. Moving water can be deceptively strong. Remember to wear your life vest (PFD) while taking measurements.

Find the average depth of a small stream or a side channel of the river. Measure the depth in three places across the river in a straight line. Divide the total by four to get the average depth of the river. Record these measurements on your Stream Flow Activity Sheet.

NOTE: The reason you take 3 depth measurements then divide by 4 is to take into account the shallow area of the river. It can be explained by the following drawing example of a river cross-section. If the depth in 3 places is A (1 foot), B (3 feet), C (1 foot) [total of 5], find an average by dividing by 3. Now look at the mean or average depth (D). Take a total of the depths and divide by 4, the correct average depth. This will account for all the water from bank to bank, even though you only took three measurements.



How Big is Our River? Stream Flow Activity Sheet

Stick Race:

First measurement

$$100 \text{ ft.} \div \frac{\text{_____}}{\text{(total seconds to float 100 feet)}} = \frac{\text{_____}}{\text{(number of feet stick floated each second)}} \text{ feet per second}$$

Second measurement

$$100 \text{ ft.} \div \text{_____} = \text{_____} \text{ feet per second}$$

Third measurement

$$100 \text{ ft.} \div \text{_____} = \text{_____} \text{ feet per second}$$

$$\text{Total } \frac{\text{_____}}{\text{(feet per second)}} \div 3 = \frac{\text{_____}}{\text{(feet per second average)}}$$

What's With the Width? (Average Width):

First measurement _____ feet

Second measurement _____ feet

Third measurement _____ feet

$$\text{Total } \text{_____} \text{ feet} \div 3 = \text{_____} \text{ feet (average width)}$$

River Water Runs Deep! (Average Depth):

First measurement _____ feet

Second measurement _____ feet

Third measurement _____ feet

$$\text{Total } \text{_____} \text{ feet} \div 4 = \text{_____} \text{ feet (average depth)}$$

Putting it All Together (Cubic Feet Per Second):

Find the cubic feet of water per second. Multiply the average width, average depth, and the number of feet the stick floated each second. Record this below.

$$\frac{\text{_____}}{\text{Average width}} \text{ ft} \times \frac{\text{_____}}{\text{Average depth}} \times \frac{\text{_____}}{\text{Number ft/second}} = \frac{\text{_____}}{\text{Cubic feet of water flow/sec}}$$

Putting It All Together (water usage):

NOTE: A cubic foot of water is the amount of water in a container 1 foot wide, 1 foot high and 1 foot long. It contains 7.48 gallons. In order to find out how many people could live from the water in this stream, complete the following calculations (don't forget to leave some water in the stream for the fish and animals!).

$$\frac{\text{_____}}{\text{Stream flow in cu. ft/sec}} \times 7.48 \text{ Gallons in 1 cu. ft. of water} = \frac{\text{_____}}{\text{Gallons of water per second}}$$

$$\frac{\text{_____}}{\text{Gallons of water/sec}} \times 60 \text{ Seconds in a minute} = \frac{\text{_____}}{\text{Gallons of water per minute}}$$

$$\frac{\text{_____}}{\text{Gallons of water/min}} \times 1440 \text{ # mins/day} = \frac{\text{_____}}{\text{Total gallons water/day}} \div \frac{200 \text{ Gals.}}{\text{Amt. of water 1 person uses in a day}} = \frac{\text{_____}}{\text{Total \# of people would use this much/day}}$$

Did You Know?

- Americans flush 6.8 billion gallons of water down their toilets every day.
- On average, a single American uses 80 to 100 gallons of water a day.
- Shower heads use 2 to 5 gallons of water a minute.
- A full bathtub contains about 36 gallons of water.
- Washing machines use 25 to 40 gallons of water per load, and dishwashers use 4 to 10 gallons per load (washing dishes by hand can use 20 gallons of water per load!)

Information Source: <http://ga.water.usgs.gov/edu/qa-home-percapita.html>

Water Conservation Tips:

- Turn off the faucet when brushing your teeth – you can save 25 gallons a month!
- Don't run the faucet to rinse when washing dishes by hand – instead, fill one sink with wash water and one with rinse water.
- Shorten your shower by a minute or two and you can save 150 gallons of water per month!
- Run your clothes washer and dishwasher only when full – you can save 1,000 gallons a month!
 - Water your lawn and garden in the mornings and evenings when the temperature is cooler and evaporation is less.
 - When cleaning out fish tanks, give the nutrient-rich water to your plants.
 - Collect water from your roof to use on your garden.
 - Saving water saves money – and helps the planet!



Information source: <http://www.wateruseitwisely.com/100-ways-to-serve/index.php>

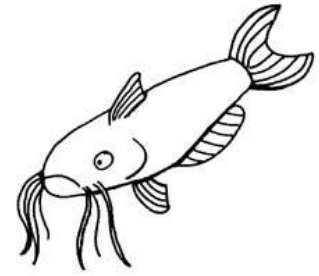
Did You Know?

- One cubic foot of water equals 7.48 gallons, which also equals 62.4 pounds of water.
- One cubic foot per second (CFS) equals 450 gallons of water per minute.
- One cubic foot per second would equal 646,320 gallons per day, which also equals 1.9 acre feet per day.
- One acre foot simply means one acre of land covered with one foot of water.

When the well's dry, we know the worth of water."
- Benjamin Franklin, (1706-1790), *Poor Richard's Almanac*

Word Search Puzzle

Flow on Mighty River!



See if you can find these words in the word search puzzle below. Words can appear forward, backward, up-and-down, and diagonally. Good luck!

Words:

canoe	chop	current	deer	duck	eagles	eddy
fire	fish	goose	hat	heron	map	moon
paddle	pelican	PFD	rain	river	scenic	stars
strainer	sunburn	tent	weather	white cliffs	wild	wind

H D V W H O M E T H M S N D V P G J K B P W V I L
O F Y Q C M C A N O E F M Q L O G H C P R E P J O
I C V J P O D R O J Q F A A O I H A T E T X P P Z
S B W V Y D A N H K G I L S P S W H V H E Z L Z G
O L Y E K C E B S O U L E H E E S I U S V F J A R
G T L V A S Q C G R L C A V L L R E L I R H Y F N
F W M Z M T H C U R R E N T I G T O R F E X E C N
H V R G T P H L H H P T Y N C A L M G T S E X A H
M I A W M I A E Z X Z I Q M A E O S M D S M P D P
Y X O S V Z E L R V H H I D N P T Z N U W V X I A
Z Z R F X D W L E P K W S H I J W T N H Q K E B K
F S S T P D U R D T Y O T O L G D B U Q E R J E B
Z I R O T I E T Y D D E A E A F U S P A E R L Q J
D F G G W N K E Y J A A R M P R I P L E Z P O W Q
P I Z N I R O N N P N P S X N B M M D F Q L X N H
K G M A Y R J T V C Y J H N Q P A M O X K T W Y M
W K R O Y U D J A K S O A V M N I A R H T L X U H
M T C I N E C S P H K Y K P K I F N C E B B L K T
S P E S C M P R Q V B J V V N T N P A X G Z K I J
L O O N I J S S C J D C X F D C K M Y W W D H F Q
P B S H X R C W X O W I N D J W X U H I W Y P J I
G Y X E C M E F J B G X K W L T D Y N X M Q X J F
J I S Q Z V R I U Q Y Z U V Z Q F U C Y O E Y G C
H U N B H I I M V J C G N M J Y M Z C C H X N L V
W D E A N V F N V L Z K N O I P P V E K H D R R B

“In rivers, the water that you touch is the last of what has passed and the first of that which comes...” – Leonardo da Vinci



Animal Olympics

Animals have certain characteristics that make them unique. By comparing ourselves to other species, we see how truly remarkable those species are. Even individuals within the same species have different physical abilities. For example, one frog may be able to jump higher than another one. One eagle may see further than another. These differences within a species are referred to as variation.

You will:

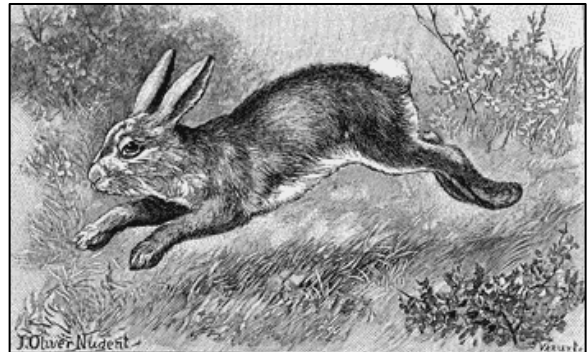
1. Compare and contrast differences between animals and yourself;
2. Define the concept of variation, a level of biological diversity;
3. Develop a classification system to group the animals (i.e. runners, swimmers, fliers, etc.).

You will need:

- Measuring tape
- Stop watch (or second hands on a watch)
- Blindfolds
- Animal Olympics Activity page

In a large open area, divide into groups of four (or as many groups as you have chaperones). Have an adult serve as leader at each station.

You will be competing in the Animal Olympics and will need one activity sheet for each participant in the group. You will also need to take measurements for each participant and each activity.



Following the Olympics, reassemble as a group and discuss various differences between humans and animals and among animals of the same species.

Pick two animals from the Activity Page and describe one likeness and one difference between the two animals. Similarities and differences should be based on food gathering, movement, birth of young, coloration and camouflage, or bright colors.

“If you talk to the animals, they will talk with you and you will know each other. If you do not talk to them, you will not know them and what you do not know, you will fear.

What one fears, one destroys.” – Chief Dan George, Actor and Member of Tsleil-Waututh Nation – British Columbia, Canada.



Animal Olympics Activity Page

Name: _____

Date: _____

1. A beaver can hold its breath for up to 15 minutes (900 seconds). I can hold my breath for _____ seconds.
2. A bald eagle may have a wingspan of 7 to 8 feet. I have a wingspan of _____ feet and _____ inches (how far can you stretch your arms?)
3. A mountain lion can jump 20 feet in one leap. I can jump _____ feet in one leap.
4. A sleeping heron can stand on one leg for more than an hour. Blindfolded, I can stand on one leg for _____ seconds or _____ minutes.
5. A snake can crawl along a branch without falling off. I can walk a straight line for _____ feet, without “falling off.”
6. A pronghorn antelope can run 70 miles per hour for a short distance (or about 6,160 feet in 60 seconds). I can run _____ feet and _____ inches in 60 seconds.
7. Frogs can leap 120 times consecutively without stopping. I can leap _____ times without stopping.
8. Owls have the ability to stare without blinking for hours. I can stare down my partner without blinking for _____ seconds.



Did You Know?

- Water covers nearly three-fourths of the earth’s surface.
- The 9 longest rivers in the U.S. are:
 - Missouri: 2,540 miles
 - Mississippi: 2,340 miles
 - Yukon: 1,980 miles
 - Rio Grande: 1,900 miles
 - St. Lawrence: 1,900 miles
 - Arkansas: 1,460 miles
 - Colorado: 1,450 miles
 - Atchafalaya: 1,420 miles
 - Ohio: 1,310 miles
- The Missouri-Mississippi river system (combination) is the third longest in the world.

Mad Libs – Our River Trip

With Mad Libs, you'll create a story about your river trip, but you don't know how the story goes until you come up with some great words! Let's begin with some words as described below, and then we'll see how the story comes together! When done, try to make your own Mad Lib story too!

Word List:

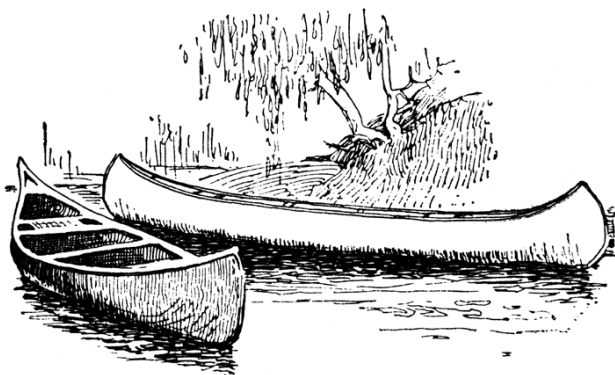
1. The name of your best friend _____
2. Your favorite color _____
3. An adjective _____
4. An animal _____
5. Another adjective _____
6. Your favorite food _____
7. A verb (past tense) _____
8. Another verb (past tense) _____
9. Your best friend's name again _____
10. How a horse moves (past tense) _____
11. Your favorite spring sport _____



Now, let's put the words together in a Mad-Lib story about a river adventure!

The Mad-Lib River Story

Yesterday _____₁_____ and I took a river trip. On our way to the _____₂_____ River, we saw a big _____₃_____ _____₄_____. We also saw a _____₅_____ bird eating _____₆_____. That bird _____₇_____ and _____₈_____. _____₉_____ and I decided it was time to head back home and so we _____₁₀_____ to our canoe. We'll wait until _____₁₁_____ season is over before we get in our canoe again.



“The air, the water and the ground are free gifts to man and no one has the power to portion them out in parcels. Man must drink and breathe and walk and therefore, each man has a right to his share of each.” – James Fennimore Cooper (1789 – 1851), *The Prairie*, 1827.

Nature Detective!



A variety of animals live in the Upper Missouri River Breaks area. From great blue heron to bighorn sheep, numerous and diverse animals inhabit this region. All animals need food, water, shelter and space to live.

Whether they live in some of the habitat zones or pass through the area on a migration route, the Upper Missouri River Breaks region provides food, water, and shelter for numerous animals. Even if you don't see the animals themselves, they often leave behind footprints (tracks) which you can discover. Whether in sand, dirt, or snow, you can become an investigator and learn more about the creatures using this area by identifying animal tracks!

- Discover and identify the various animals that reside (live in) or visit this region based upon the tracks they leave behind.
- Measure animal tracks and compare and contrast the species which created the tracks.
- Become a detective! Follow any animal tracks that you see for a short time. Then imagine a story about the animal tracks and write a short story based upon your discovery.

Who Made That Track?

Look for animal tracks along the river or in the dirt during a hike. Using the ruler in the back of the booklet, measure the length and width of the track. Draw what you see in your notebook, and using the booklet or an animal track book, identify the track(s) you have found. Write down your observations about the area – where was the track found? Were there other tracks around it? If so, can you identify those? How about feathers, scat (poop) or bones – do you see any of those lying around as well?

Keep a track log during your river trip – are certain tracks more abundant than others? What are they? Did you find any tracks from people? Did they go the same places as the animals?

There's a Story Out There!

After you have observed animal tracks for the first part of your trip, write a short story in your booklet about what you think the animals did. Go ahead and use your imagination!

For example, if you saw blue heron tracks and raccoon tracks near the river, you could write a story about a blue heron standing motionless in the river waiting to catch its meal. A secretive young raccoon happens upon the heron and decides he's going to let the heron fish for him. So the raccoon waits in the tall grass near the river and when he sees the heron prepare to spear a fish with its long, slender bill, the raccoon runs toward the heron, steals the fish and darts back into the grass. Let your imagination flow as you discover the story in the animal tracks you've found!

Writing on the River: Haiku Poetry



Haiku is an old, traditional form of Japanese poetry. Haiku (pronounced high-coo) poems consist of three lines. The first and last lines have five syllables and the middle line has seven syllables. The lines don't usually rhyme. Here's an example of a Haiku poem to show you the structure:

"I am first with five
Then seven in the middle --
Five again to end."

Create a haiku poem based upon your river trip experience. You will need something to write with and a notebook.

Based upon your experience travelling the river, listening to the sounds of nature and observing your surroundings, write a haiku poem in your notebook. After writing your poem, share your writings with your campmates. Help each other make the poems stronger by providing positive feedback and suggestions on how to improve each other's poems. Afterwards, take some time to incorporate some of those ideas and write another poem based on your classmates' suggestions. Share these new versions.

Below are some haikus for additional information and inspiration.

Haiku - River

River unchanging
Taking and giving as it goes
Water turns to sky
by Joseph Rohrbach, 2003

Dream River Haiku

running down rivers
life's endless dreams drifting by
free, but in limbo.
by Gloria Buono, 2006

<http://www.mindspring.com/~jarzap/poem0101.htm>
<http://www.authorsden.com/visit/viewPoetry.asp?id=161150>

Haiku of Owls...Hoo, Hoo!

The majestic owl
Soared in the sky oh so high!
A forgotten bird.

I just saw an owl.
I was very mystified.
It was my delight.

The owl flew early.
A rarity I am sure.
He was gliding high.

This owl makes me think.
I am honored to see him.
He looked mystical.

From WritersNetwork.com



Water Poetry Words – Missouri/Marias River Poetry

Write some observations, experiences and feelings about your day canoeing the river. Think of adjectives and verbs that describe your experience on the river. Write down your thoughts and create a poem about your experience on the river.

THE RIVER

In the space below, list 6 nouns that could be used for the river.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

From the list above, choose your favorite word (this will be the subject of your poem).

Now, choose any two adjectives you can think of to describe the river:

Next, choose three words which express the noun's action (past, present or future):

Choose four words which describe your feelings about the river:

Pick a word that is a synonym to the subject: _____

Here's an example of a cinquain poem: River by Miki
River
Clear, wonderful
Slapping, whirling, flowing
The river is cold
Water

Now, in your booklet, put the words you've chosen all together and create a cinquain poem, a 5-line poem featuring a noun, adjectives and verbs.

Drawing on Nature

Two important artists traveled this region: Karl Bodmer and Charlie Russell. Although they painted and sketched similar scenes (landscapes and Native Americans), their artistic style and their life background were very different. Bodmer was born in Zurich, Switzerland, in February 1809. While on a trip through Germany in 1832, he met Prince Maximilian of Wied, who was searching for a professional artist to accompany him on a trip to North America. Bodmer eagerly signed on, and the two traveled up the Missouri River, retracing the journey of Lewis and Clark. During this trip Bodmer recorded events occurring in the present states of Nebraska, South Dakota, North Dakota, Montana and Wyoming. Bodmer created many paintings of Indian subjects and river scenes. Bodmer is known for his careful observation and attention to detail. Unlike some other artists in the American West, he tried not to romanticize his subjects but show them as they really were. He returned to France, never to see America again, and died in 1893.



Nearly 45 years later, another important artist arrived on the Montana landscape: Charlie Russell. He left his home in St. Louis, Missouri, at the age of 16; he yearned to be a cowboy on the western frontier. Charlie was also interested in art, and while tending herds of cattle along the Judith River of central Montana, Charlie sketched the life and scenes of "cowboying." He was a cowboy and wrangler for 11 years, but finally left that job to pursue art as a full-time career. Russell admired Native Americans; he spent the summer of 1888 with the Blood tribe of Alberta, Canada. His art studio in Great Falls was next to the home Charlie shared with his wife and adopted son. He completed more than 4,000 works of art before his death in October 1926.

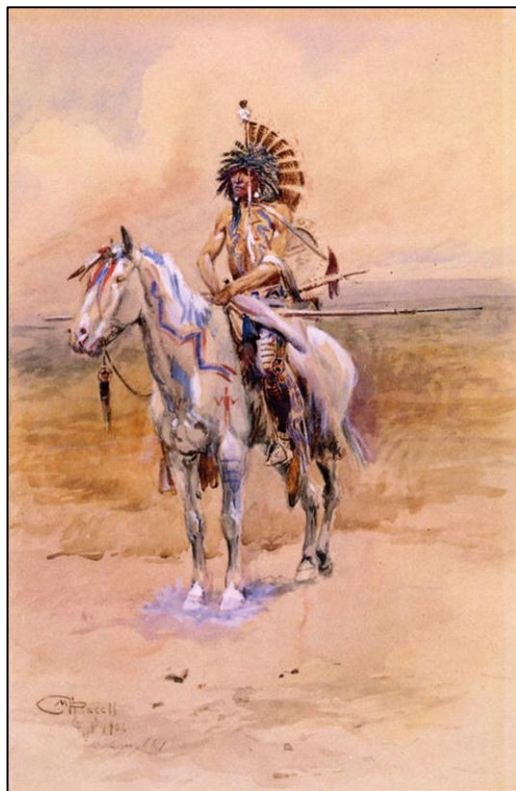


You can draw on nature too...

- During your trip, find an animal to watch. Watch the animal as closely (and safely) as you can. Look at its color, form and body shape as if it were outlined against the sky.
- Close your eyes and try to reconstruct the animal in your mind. See its color, body shape, etc.

- Now, try to draw just the body of the animal. Draw the outline of the animal's body on your paper. Sometimes it helps to look at the animal - and not the paper - when you are drawing the animal's outline.
- Now that you've got the body outlined, that's the hardest part! Fill in some of the body parts, working to fill in more of the outlines and details.
- Next fill in some of the animal's surroundings - still closing your eyes to see the shapes clearly before you draw them on paper. You might outline a tree limb for a bird, or the horizon for an ant!
- Continue to fill in more details. Your drawing can remain a pencil sketch or you can color it in with pens, chalks or crayons.

Here are two paintings of Indians made by Charlie Russell and Karl Bodmer. Can you see how their styles are different? Which one do you like more? Why?



Mandan Warrior - Russell



Mandan Warrior - Bodmer

“The land is sacred. These words are at the core of our being. The land is our mother, the rivers our blood...” – Mary Brave Bird, Lakota.

River Trip Reflections

The Bureau of Land Management (BLM) manages over 375,000 acres within the Upper Missouri River Breaks region. This is public land, which means it belongs to you and every other American. Where else can a person hike, fish, hunt, camp or watch wildlife without a fee? Make sure you know where you are during your journey; you need permission from private land owners to access or cross their private land.



You and your family may wish to help out your public lands by volunteering for a National Public Lands Day event each year – usually held in September. National Public Lands Day (NPLD) is the nation's largest, single-day volunteer event for public lands in the United States.

What does your opportunity to float on this river through public land mean to you?

Date: _____ Weather: _____



Today I....

“The mark of a successful man is one that has spent an entire day on the bank of a river without feeling guilty about it.” – Chinese philosopher

Date: _____ **Weather:** _____



Today I....

“Sit by a river. Find peace and meaning in the rhythm of the lifeblood of the Earth.”
– Anonymous

Date: _____ Weather: _____



Today I....

“To have some parts flowing free again... with deer grazing on its banks... ducks and geese raising their young in the backwaters... eddies and twists and turns for canoeists...and fishing opportunities such as Lewis and Clark enjoyed...would be the finest possible tribute to the men of the Expedition, and a priceless gift for our children.” – Stephen Ambrose, *Undaunted Courage*

The Upper Missouri ROCKS!

with the

Upper Missouri River EarthCache Trail



Students on the Missouri River. Photo contributed by Renee McDonald

You can discover special EarthCache sites in the Upper Missouri River Breaks! However, before embarking on this adventure, you will need to prepare some things in advance.

What is an EarthCache Site?

EarthCaching is similar to geocaching. Both use Global Positioning Systems. While geocachers use their GPS units to find locations with actual hidden items — an EarthCache adventure is a treasure hunt where the participant finds a unique geologic feature in a particular place.

EarthCache sites do not use stored containers; their treasures are the lessons people learn about our planet when they visit the site.

Visiting an EarthCache site is a great way to learn more about our wonderful world. It can take you to many places that you would not normally visit, and teach you about why those places have special or unique geologic features.

EarthCache sites can also teach you and your family important skills such as navigation and map reading. What better way to learn than to have fun exploring this wonderful planet we call Earth!

What do I need to visit an EarthCache site?

To visit an EarthCache site you need a few things.

1. You need a Global Positional System Receiver (GPSr or GPS for short). This is a device that reads satellite signals and then, through the use of mathematics, can calculate your position on Earth as a latitude (how far north or south of the equator), longitude (how far east or west of Greenwich, UK) and altitude (how far above sea level).

GPS units come in many shapes and sizes. The most common used by geocachers is a small handheld unit that can be purchased from sports, camping, and some department stores. These can cost around \$95 for the basic model. The more you pay, the more features the GPS has. However, the most basic unit is suitable to get started.

You will need to read the instructions of your GPS unit carefully and learn how to input latitude and longitude numbers into the unit so you can find a location.

2. You will need a log-in name at geocaching.com where EarthCache sites are hosted. Click on LOG IN. Here you can create a new account. It is FREE and only takes a few minutes. You will need to think of a unique caching name and a password.
3. You need a sense of adventure and a way to get there. Most people visit EarthCache sites by driving close to the site then walking to find the location. The Upper Missouri River EarthCache sites are only accessible by river, although some can be reached by car near the boat launch. There are plenty of online mapping tools that can help you "see" where you need to go to discover the Upper Missouri EarthCache sites.

How do I find my Upper Missouri River EarthCache Sites?

Once you have your GPS unit and have practiced entering latitude and longitude coordinates, just go to the [EarthCache listings](#). Here all the EarthCache sites are listed in a table. You can sort these by country, state, name, etc. When you find one in the area you want to visit, click on its name and you will go to the page for that EarthCache site. You may have to log in to see the latitude and longitude details (use your log in name and password that you organized before).

4. Print that page. It will have all the important information that you can use to find the EarthCache site. Some EarthCache sites have additional 'clues' which you need to decrypt to read! You should read all the information on this page so you know exactly what you need to do to fully experience the EarthCache site.

Enter the latitude and longitude for the EarthCache site into your GPS. Then select or set your GPS to find (GOTO) that location. Your GPS will be able to tell you how far away and in what direction you have to travel to find the EarthCache site.

Plants and Animals Checklist

Use your field guides to help you learn about life in this area. Do you see or hear any of these animal or plants during your trip? Put a checkmark beside the ones you've encountered, and in this booklet write the date and place you encountered it. You can share your sightings with your campmates. If you can identify some of the animals by their tracks, that counts as a sighting too. And remember, always view wildlife from a safe distance.

BIRDS

- | | | | |
|---|---|---|---|
| <input type="checkbox"/> American Kestrel | <input type="checkbox"/> American White Pelican | <input type="checkbox"/> Bald Eagle | <input type="checkbox"/> Black-capped Chickadee |
| <input type="checkbox"/> Canada Goose | <input type="checkbox"/> Common Crow | <input type="checkbox"/> Common Flicker | <input type="checkbox"/> Golden Eagle |
| <input type="checkbox"/> Great Blue Heron | <input type="checkbox"/> Great Horned Owl | <input type="checkbox"/> Hairy Woodpecker | <input type="checkbox"/> House Wren |
| <input type="checkbox"/> Kingbird | <input type="checkbox"/> Kingfisher | <input type="checkbox"/> Magpie | <input type="checkbox"/> Mallard |
| <input type="checkbox"/> Merganser | <input type="checkbox"/> Mountain Bluebird | <input type="checkbox"/> Northern Harrier | <input type="checkbox"/> Osprey |
| <input type="checkbox"/> Pintail | <input type="checkbox"/> Red-tailed Hawk | <input type="checkbox"/> Yellow Warbler | |
| <input type="checkbox"/> Turkey Vulture | <input type="checkbox"/> Western Meadowlark | <input type="checkbox"/> Red-winged Blackbird | |

AMPHIBIANS AND REPTILES

- | | | | |
|--|--|--|---|
| <input type="checkbox"/> Chorus Frog | <input type="checkbox"/> Garter Snake | <input type="checkbox"/> Gopher (Bull) Snake | <input type="checkbox"/> Horned Lizard |
| <input type="checkbox"/> Northern Leopard Frog | <input type="checkbox"/> Painted Turtle | <input type="checkbox"/> Rattlesnake | <input type="checkbox"/> Woodhouse Toad |
| <input type="checkbox"/> Spiny Soft-shelled Turtle | <input type="checkbox"/> Plains Spadefoot Toad | | |

MAMMALS

- | | | | |
|---|---|---|-------------------------------------|
| <input type="checkbox"/> Black-tailed Prairie Dog | <input type="checkbox"/> Beaver | <input type="checkbox"/> Bighorn Sheep | <input type="checkbox"/> Chipmunk |
| <input type="checkbox"/> Cottontail Rabbit | <input type="checkbox"/> Coyote | <input type="checkbox"/> Elk | <input type="checkbox"/> Jackrabbit |
| <input type="checkbox"/> Mountain Lion | <input type="checkbox"/> Mule Deer | <input type="checkbox"/> Muskrat | <input type="checkbox"/> Pronghorn |
| <input type="checkbox"/> Raccoon | <input type="checkbox"/> Red Fox | <input type="checkbox"/> Whitetail Deer | |
| <input type="checkbox"/> Porcupine | <input type="checkbox"/> Richardson's Ground Squirrel | | |

GRASSES

- | | | | |
|---|--|--|---|
| <input type="checkbox"/> Blue Bunch Wheat Grass | <input type="checkbox"/> Blue Gramma | <input type="checkbox"/> Squirrel Tail | <input type="checkbox"/> Great Basin Wild Rye |
| <input type="checkbox"/> Green Needle Grass | <input type="checkbox"/> Indian Rice Grass | <input type="checkbox"/> Little Bluestem | <input type="checkbox"/> Cheat Grass (not native) |

SHRUBS

- | | | | |
|---|--|---|--|
| <input type="checkbox"/> Big Sagebrush | <input type="checkbox"/> Chokecherry | <input type="checkbox"/> Creeping Juniper | <input type="checkbox"/> Four-wing Saltbrush |
| <input type="checkbox"/> Fringed Sagewort | <input type="checkbox"/> Golden Current | <input type="checkbox"/> Greasewood | <input type="checkbox"/> Rubber Rabbitbrush |
| <input type="checkbox"/> Western Serviceberry | <input type="checkbox"/> Silver Buffaloberry | <input type="checkbox"/> Silver Sage | <input type="checkbox"/> Skunkbrush Sumac |
| <input type="checkbox"/> Western Snowberry | <input type="checkbox"/> Wild Rose | <input type="checkbox"/> Willow (various types) | |

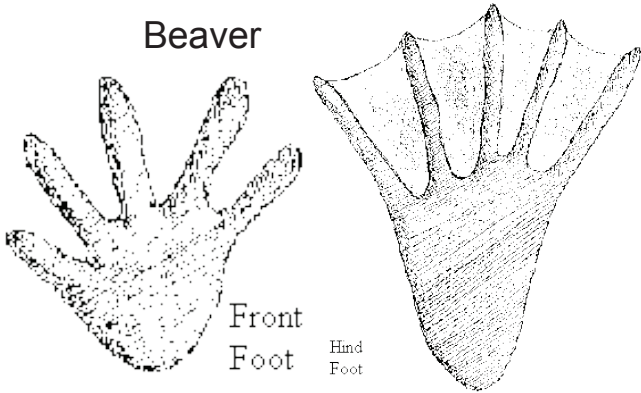
TREES

- | | | |
|---|--|---|
| <input type="checkbox"/> Douglas Fir | <input type="checkbox"/> Green Ash | <input type="checkbox"/> Plains Cottonwood |
| <input type="checkbox"/> Ponderosa Pine | <input type="checkbox"/> Quaking Aspen | <input type="checkbox"/> Rocky Mountain Juniper |

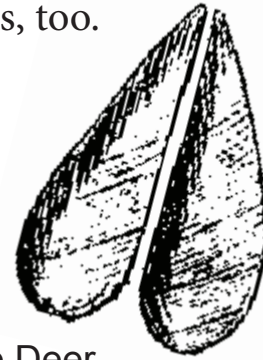
Wild Things!

Use the ruler to measure any tracks you find. Record the length of each track next to the ones illustrated below. If you find other tracks, draw them and record their lengths, too.

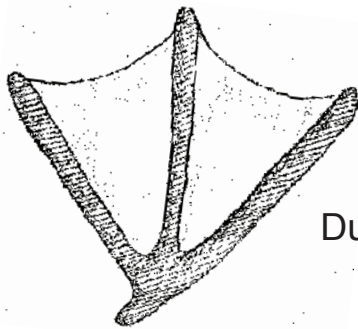
Beaver



Front Foot
Hind Foot

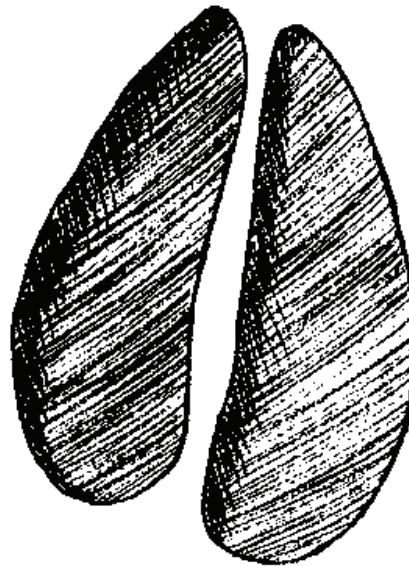
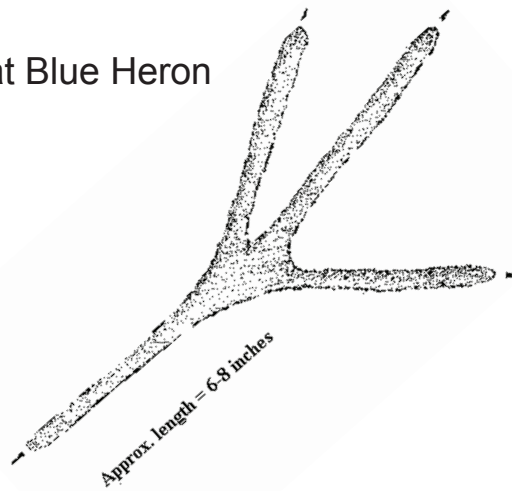


Mule Deer

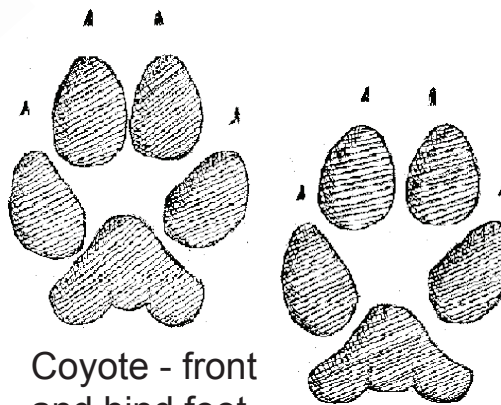


Duck

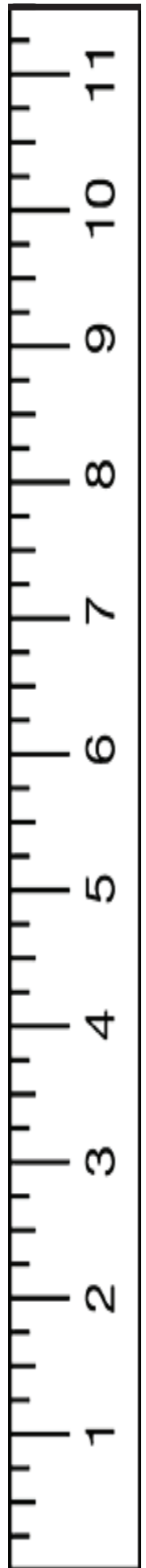
Great Blue Heron



Elk

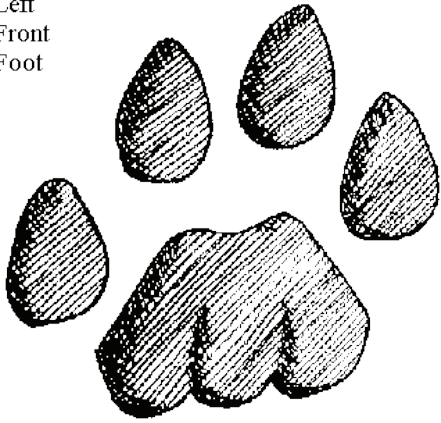


Coyote - front and hind foot



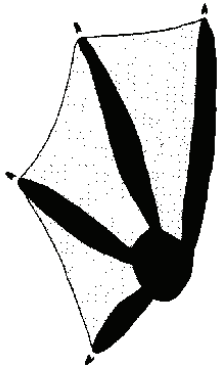
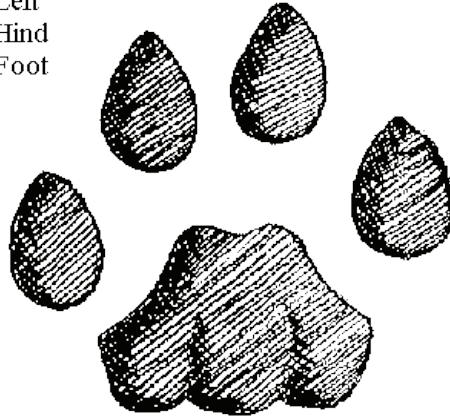
More wild things...

Left
Front
Foot



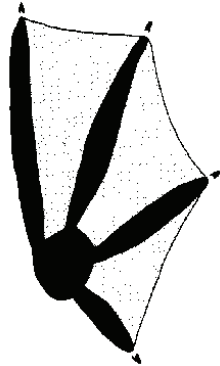
Cougar or Mountain Lion

Left
Hind
Foot

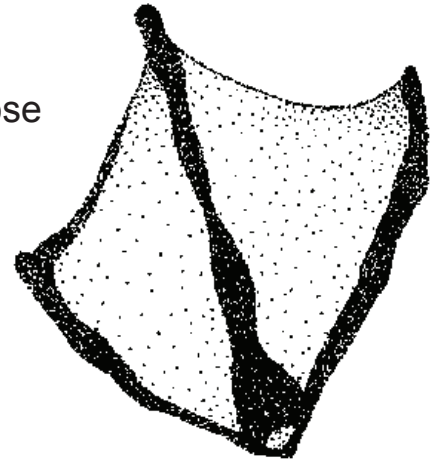


160 mm

Pelican



Goose



Raccoon



Front Foot



Hind Foot

WHAT'S COOKING?

Some of the best-tasting campground meals are also the most simple.

Campfire Pocket Stew is a favorite. It has the benefits of being quick to prepare, easy to serve and has minimal clean up. It also tastes wonderful, is healthy and affordable.



The pocket is especially helpful if your family has special diet requirements or preferences. Select from a variety of your favorite foods. Small or thinly-sliced potatoes, chicken tenders, fish, and thin chops also work well. The individual pockets can be assembled at home and transported in a cooler. At the campsite, they can be tossed onto campfire coals or cooked on a grill.

Below is a basic recipe for Pocket Stew that serves 4 people. Every pocket stew will be a little different depending on the ingredients you use – that is part of the fun of this meal.

Ingredients:

- 1 pound of lean ground beef formed into patties.
- 1 large portabella mushroom or 12-16 button mushrooms, sliced
- 1 small onion, sliced
- 1-2 carrots, sliced
- ¼ pound of green beans
- choice of seasonings
- 1-Tb. oil

Supplies:

- Heavy-duty aluminum foil.
- Tongs or heat-resistant gloves

Using the heavy-duty aluminum foil make a 12”x14” piece of foil for each pocket. Place the foil with the reflective side facing up and lightly oil the center. Place the meat in the center of the rectangle of foil. Add seasonings. Top with vegetables.

Bring the long side up over the food and fold them together. Repeat the fold. Make a double fold on each end of the pocket. Refrigerate until ready to pack the cooler.

At camp, place the pockets onto a bed of hot coals. Tongs or heat-resistant gloves are helpful. Cook for 10 minutes and flip over for 6-10 minutes more. Remove and allow them to cool for a couple of minutes. Open carefully; hot steam will escape.

Clean up is easy. Just fold up the foil and pack it out with the rest of your trash. Remember to Leave No Trace – even in the fire rings.

Many campers have wonderful memories of cooking and eating their own Pocket Stew. This recipe may give you your own great camping memories too!

Bureau of Land Management River Explorer



As a Bureau of Land Management River Explorer, I promise to:

- *Do all I can to help preserve and protect the natural and cultural resources of our public lands.
- *Be aware of how my actions can affect other living things and evidence of our past.
- *Keep learning about the importance of nature and our heritage.
- *Share what I have learned with others.

Date

Explorer Signature



BLM Staff Member

Water is the most critical resource issue of our lifetime and our children's lifetime. The health of our waters is the principle measure of how we live on the land. – Luna Leopold



River Explorer

Complete the following five questions and you will become a River Explorer! Submit your answers (with help from your parent or guardian) to [BLM MT Missouri Breaks Interpretive Center@blm.gov](mailto:BLM_MT_Missouri_Breaks_Interpretive_Center@blm.gov) and receive a signed River Explorer certificate.

Questions:

1. In what year was the National Wild & Scenic Rivers Act passed? _____
2. Which president signed the Act? _____
3. How many miles of the Upper Missouri River are part of the wild and scenic river system? _____
4. What North American prairie mammal can run 60 to 70 miles an hour for short distances? _____
5. What world-renowned artist traveled the Missouri River with Prince Maximillian during the 1830s? _____

Acknowledgements

The Bureau of Land Management, Upper Missouri River Breaks National Monument Interpretive Center, would like to acknowledge and thank the following organizations, agencies and individuals for their assistance with this project:

American Whitewater	Arthur's Clipart.com	Bear-tracker.com
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USDA Plant Database	U.S. Fish & Wildlife Service	Ruth Carlstrom
Renee McDonald	IStockPhoto.com	Laurie Baum
Dusty Kuehner	Gayle Irwin	Tim Burmeister
Florida's Educational Technology Clearinghouse (ClipArt Etc)		
Stan Bradshaw – <i>Floaters Guide</i>	U.S. Geological Survey	
Upper Missouri River Breaks National Monument Boaters' Guide		

Cinquain Poem example –

<http://courses.missouristate.edu/ShaeJohnson/CinquainPoetryInstrucandEx.htm>

Historical prices and information adapted from:

<http://www.drquinnmd.com/bank.html>, and from *The Writer's Guide to Everyday Life in the 1880's* by Marc McCutcheon

Project Wild Activity Guide, 1992– Drawing on Nature. Western Regional Environmental Education Council, Inc.

Recipe Source: letsgoexploring.com Garlic clip art source: <http://www.fundraw.com/clipart/>

Cover photo by Renee McDonald

[Largest Rivers in the United States](#): USGS Open-File Report 87-242

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Word Search Puzzle Solution

Flow On Mighty River!

HDVWHOMETHMSNDVPGJKBPWVIL
 OFYQCMCANOEFMOLQGHCPREPJO
 ICVJPODRQJQFAAOIHATEIXPPZ
 SBWVYDANKGILSPSNHVVHEZLZG
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 GTLVASQCGRLCAVLLRELIRHYFN
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 HUNBHIIMVJCGNMJYMZCCHXNLV
 WDEANVENVLZKNOIPPV EERH DRRB



The Upper Missouri National Wild and Scenic River

Below Iron City Islands, River Mile 95.3. *Photo courtesy of Rick and Suzie Graetz*

“For many of us, water simply flows from a faucet, and we think little about it beyond this point of contact. We have lost a sense of respect for the wild river, for the complex workings of a wetland, for the intricate web of life that water supports.”

– Sandra Postel, *Last Oasis: Facing Water Scarcity*, 2003.