

Mystery Geocaching – Navigation Primer



Upper Mississippi River National Wildlife and Fish Refuge

This tour will give you an introduction to the anatomy of a “Big” river as well as a quick look at some of the navigational tools and processes that are used to help maintain the navigation corridor for barge traffic.

These coordinates should get you within 40'-50' of the target site. At the sites, you should be able to find the answers to the questions. Your final set of coordinates will help you return to your starting point.

What are the rules for Mystery Geocaching on the Refuge?

Have fun trying to figure out the clues, but always be respectful of the wildlife and habitat.

Do not leave a cache, it is illegal.

What will you need?

You will need some type of watercraft to take this tour . . . boat, canoe, kayak, etc. A flat bottom boat is the preferred type of boat, but if you are careful, you should still be able to take this tour in a pontoon or v-hulled boat under ordinary water conditions.

A GPS unit. You may use your own and enter the coordinates found with each clue or you can check out a GPS unit from the Lansing Public Library. These units have the coordinates preset on the Waypoint menu page and were found utilizing the WGS84 Map Datum. They are identified as NAV1-NAV11. It is best to run these points in sequence. We are providing the locations in lat/long degrees and minutes. If you are using your own personal GPS unit, be sure to set your GPS unit to these standards.

The **Clues** on this sheet.

Pencil or pen to record your answers.

Optional – a digital camera. For fun, take pictures of yourself on the tour. Send us your photos with a brief description or caption and we will try to put you on our website. Send to: tim_loose@fws.gov

Starting Point - Big Slough Boat Landing located directly across the main channel from Lansing, IA.

The “**first rule**” you should always follow when navigating on the River is to wear a PFD, that stands for Personal Floatation Device. If you would accidentally fall out of your boat or worse yet get knocked unconscious and fall out of your boat, your PFD will help keep you afloat so that a passerby or rescuer can help find you and pull you to safety. Your PFD does you no good sitting on the bottom of your boat.

Here are your coordinates and clues!

NAV1 – N 43 22.237 W 91 12.613

Careful! Stay out of the way of boat traffic. As you look up and down the river, you should see two colors of bouys. What colors are they? _____ and _____. These bouys help to mark the navigation channel. Large boat operators know that as long as they stay between the colored bouys they should have at least 9 feet of water depth. Regardless of the size of your boat it's always a good idea to stay between the bouys when moving up and down the main channel. In a little bit you will learn about wing dams and how they can damage your boat and/or motor. The _____ bouys in the Mississippi River are found along the right edge of the main channel as you return to port or go upstream. The _____ bouys

are found along the right edge of the main channel as you go down stream or toward the Gulf of Mexico. Why do you think they are color coded like this? _____

NAV2 – N 43 22.327 W 91 12.798

There are **three** primary terms used to designate the location of water on a river. The primary body of water carrying the majority of the flow is referred to as the **main channel**. Smaller channels off of the main channel are often referred to as **sloughs**, secondary channels or running sloughs. Quite areas with limited flow are often referred to as **backwaters**. Backwaters might include emergent or submergent marshes, flooded lakes or open water with little flow. Many of the sloughs and backwater areas have colorful names. Some of these describe an event, while others might refer to a person, place or thing. You are entering the Natchway. Do you think this is a slough or a backwater? _____
It is always a good idea to move around fairly slowly when you leave the main channel. And keep an eye open for hidden stumps.

NAV3 - N 43 22.629 W 91 12.770

You should now be flanked by an extensive bed of emergent (meaning that the plants extend above the waterline) vegetation. You are still in the Natchway, so you should be able to detect a current. But the area on either side of the slough is considered **backwater**, with little or no current. The dominant plant in this bed is named after the shape of its leaves. What do you think the common name for this plant is? _____ This plant produces edible tubers that were used extensively by American Indians and early immigrants from Europe. The tubers taste similar to potatoes and chestnuts, and they can be prepared in the same fashions: roasting, frying, boiling, and so on. Despite the plants nickname of “duck potato”, they are rarely eaten by them. They are however important food for beavers, muskrats, ducks and migrating tundra swans!

NAV4 – N 43 22.803 W 91 12.376

Careful! The area in front of you is known as a wing dam. The materials you see on the shoreline often extend underwater almost all the way out to the bouys. What material did they use to make this wing dam? _____. Boaters would be wise to watch for and stay away from the wing dams. They can cause a lot of damage to your boat! Wing dams are used to help steer the flow of the water into the main channel. The current in the main channel then helps keep sediment moving downstream. When current drops off especially along flat stretches of the river or around some bends, sand and other sediments can drop out of the water, building up on the bottom of the channel. Over time enough sediment may be deposited that the US Army Corps of Engineers has to bring equipment in to dredge the sediment out of the channel. Otherwise barges and other large craft might get stuck.

NAV5 – N 43 23.080 W 91 12.153

We often hear about the destructive force of rivers and streams especially when they are flooding. However, naturally flowing rivers also have a creative nature to them. This _____ in front of you is only a few years old. It is being formed as sediment material, primarily sand, is deposited here by the river.

If you have time, consider anchoring your boat and taking a walk to the shallow water behind this site. When I was here in July, I found three species of native mussels . . . hickory nuts, floaters, and a couple of fragile paper shells. These may seem like odd names for a mussel, but each describes some trait about the mussel. It is always a good idea to wear shoes and your PFD when wading in the river.

NAV6 – N 43 22.806 W 91 12.134

OK. So it's not entirely about navigation. In front of you is an island that is used frequently for _____. There is no entry fee to visit or use the Upper Mississippi River National Wildlife and Fish Refuge. Our funding is appropriated by Congress as part of the annual federal budget. Do you know who owns the Refuge? _____. Hopefully you got this one right! The same people who own and use the Refuge, also have a responsibility to help care for it, more about this later.

NAV7 – N 43 22.509 W 91 12.487

The area in front of you (to the west), is an emergency placement site. What material is being stored here?_____. In the event that the US Army Corps of Engineers (USACE) has to do some emergency dredging in this area to keep boats from grounding on the bottom, this is an area that has been set aside to store the material. The USACE uses both mechanical and hydraulic dredges. Mechanical dredges pick the material up using a bucket on a crane or track hoe and load it onto a barge. Once it is on the barge it has to be off loaded onto an island or the main shoreline somewhere. Hydraulic dredging is done using a large vacuum-like piece of equipment that sucks the material off the bottom and then pumps it to a nearby containment cell through a series of pipes. The USACE has started to remove some of the material from this emergency placement site, to make more room in the event of a need for emergency dredging. The sand was pumped over to the “beneficial use site” next to the Big Slough Boat Landing. Once it arrives there, the sand is free; but you have to move it yourself!

NAV8 – N 43 22.400 W 91 12.603

You should be standing in front of a sign. What is the main theme of the sign?_____ Please list one of the seven principles found on this sign. _____

NAV9 – N 43 22.221 W 91 12.870

The structure in front of you is a navigation aid. Barge traffic moving north or south knows that it needs to swing to this side of the channel to make the turn on this bend. These day markers often have solar panels that collect energy and power a light during the night time. They also usually have a black and white sign listing the river mile. What river mile are you at? _____ This means that you are this many miles north from the junction of the Ohio and Mississippi Rivers at Cairo, Illinois.

NAV10 – N 43 22.189 W 91 12.595

Right now you are sitting over the top of a rock closing structure. Closing structures are often put in place at the mouth of secondary channels or sloughs to slow down the amount of water that enters them. In a free flowing river the development of these channels or sloughs often resulted in a major shift of the main channel and was considered a natural process. Why do you think we have put this structure here?

Nav11 - N 43 22.010 W 91 12.526

We hope you enjoyed this tour and invite you to try another one on our website. If you follow this final set of coordinates you should find a log book. This log book has the answers to the questions from your Mystery Geocache. It also has space for you to share a little about your adventure with everyone. It would be fun to know what city you live in and some of the things you saw while you were out on your tour. If you have ideas or suggestions for other tours, be sure to tell us you ideas.