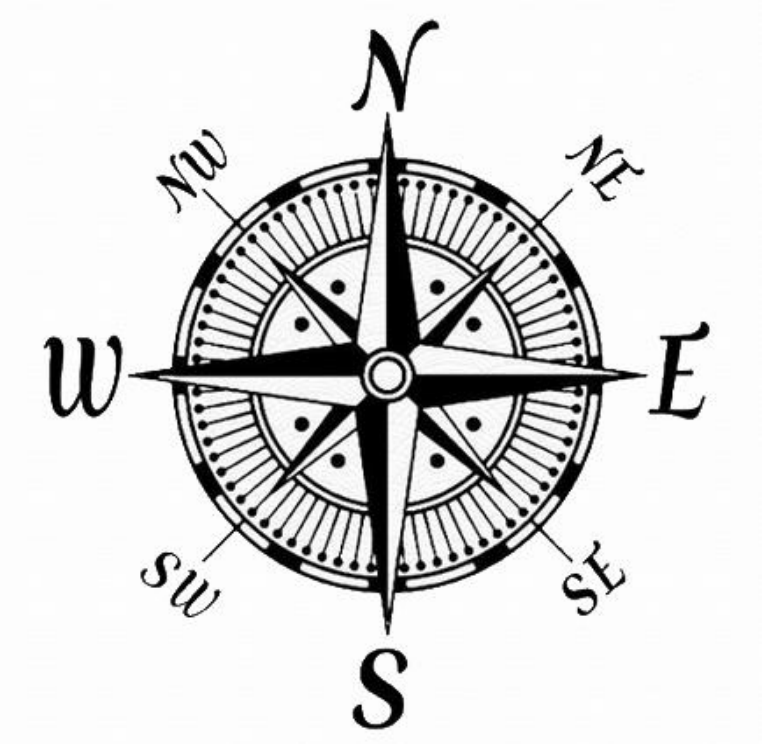
LLELA

Geocache Adventure



An Eagle Scout Project By

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2014 *(updated 2018)*

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INTRODUCTION

This is a geocaching course that goes through four of the trails in LLELA. Instead of typical geocache containers, you will find small tags with letters around different points of interest in the nature preserve.

Geocaching is a worldwide game based around using a GPS receiver, putting in coordinates, and then going to the marked location, which is usually a point of geographical, historical, or scenic interest. Upon arriving at the coordinates, the geocacher searches the area for a hidden object or container. The geocache could be small (the size of a pencil eraser) or large (the size of an ammo can) or anything in between.

In the case of our *LLELA Geocache Adventure*, you are searching for large square tags with letters on them. For most geocaches, you would record your name on a log sheet to prove you found it. You might also log your find on www.geocaching.com.

However, in this case you will find the cache-tag and then record the letter from that tag in its appropriate spot in the *Geocache Adventure Puzzle* on the last page. Once you find all the letters you can take the resulting phrase to the gatehouse to receive a patch. You will probably have to visit LLELA more than once to find all the letters.

If you would rather use a GPS that you are familiar with, you are most welcome to do so. If you have an iPhone, the free *spyglass* application is a great add-on. A PDF manual and links to at least a dozen short videos for using it can be found at

http://happymagenta.com/spyglass/manuals.ww.html

HOW TO USE LLELA'S GPSr (GPS RECEIVER)

1. **Hold down the "Light" button on the right to turn the unit on.**
2. **Press the left-side *Menu* button and use the little joystick button above the screen to select "*Where To*" and then press the joystick button to select**
3. **Use the joystick to move to "*Coordinates*" and then press it again to select.**
4. **Enter the *coordinates* of the place you are going, using the joystick and the on-screen number buttons (which you will have to select with the joystick.)**

   Click *done* and a line will appear, going from your current location straight to the tag position. Follow the line, but remember, you are not a bird and the trail won't always be going directly along the line that you see on the GPSr screen! The *walking distance* to the cache-tag from your current location will be much farther along the trail than the GPSr shows and may be anywhere from several hundred to several thousand feet. *Stay on the trail. It may twist and turn but will take you in the general direction you want to go. You will never have to go more than, at most, a few feet or so off-trail to find any of the hidden tags.*

   Although the trail itself does not show, dotted lines on the GPSr screen may show where others have gone before (sort of a ghost trail) and the up/down buttons on the left side will zoom the display in or out.

   Use common sense, and stay on the designated hiking trail as long as possible! You may have to walk for 15-45 minutes down the trail between locations. Once you get the coordinate area, look for the cache-tag. The GPS coordinates are generally on the trail but the cache-tag will be either close by (maybe on the back of a near-by tree or structure) or visible from the trail but on something farther away. Re-read the descriptive text – it will usually contain a subtle text or photo clue to the actual Geocache location. The cache-tag may be above head height or at knee or foot level, often (but not always) on a tree. If all else fails, there is also an encoded crypto-clue for each location (Page 5). Some are a challenge.

5. **Once the cache-tag is found, record the letter on your copy of the puzzle sheet and put in the next set of coordinates.**

GPS COORDINATE DEFINITIONS

Depending on the GPSr device that you are using, the coordinates may be in one of several formats

Format	Notation System	Latitude	Longitude
1	Degree/Decimal-Minutes	N 33° 03.852	W 96° 58.666
2	Decimal-Degrees	33.0642˚	-96.9778˚
3	Degree-Minute-Seconds	33˚ 3’ 51.1”	-96˚ 58’ 40.0”

There are other formats but these are the three most common. Most geocachers, including LLELA GPSr devices, use Format #1 and this Geocache Guide provides Formats #1 and #2 for each location.

The first number measures the *Latitude* in degrees North or South (negative) from the equator. The second number measures the *longitude* in degrees East or West (negative) from the Prime Meridian (0˚0’0”) at the British Royal Observatory in Greenwich, England.

GSPr measurement change (using the LLELA GSPr)	Latitude distance	Longitude distance
0.001 minutes	6 feet	5 feet
1 minute	6070 feet	5110 feet
1 degree	69 miles	58 miles

As you walk, the Latitude and Longitude will only change in the decimal digits during an entire trail. In fact, at LLELA the least significant digit on the GPSr display is only about 5 feet or two adult steps.

A GEOCACHING RULE OF THUMB

C.I.T.O. = “Cache In, Trash Out.” Any trash that you find while geocaching, you should pick up and throw away or RECYCLE properly. This is Geocaching etiquette!

CRYPTO-CLUES

You should try to find each cache-tag on your own first, but if you just can't find it, use a crypto-clue. To decode a crypto-clue, just replace each letter with the third letter following. For letters near the end of the alphabet, start over again with A. For example A becomes (bc)D, L becomes (mn)O, Z becomes (ab)C, etc.[1]

Location #	FUBSWR-FOXH → CRYPTO-CLUE
1	ILLH LK QEB YXZH LC QEB JBPNRFQB QOBB
2	ILLH XII XOLRKA QEB CILLO PRMMLOQ MFIIXOP RKABO QEB YXZH LC QEB ELRPB
3	ILLH XII XOLRKA QEB FKPFAB LC QEB YFOA YIFKA
4	ILLH LK QEB YXZH LC X IXODB CLOHBA QOBB KBUQ QL QEB QOXFI
5	LK QEB YXZH LC X YFD QOBB KBUQ QL QEB QOXFI XKA ZILPB QL QEB PQBMP
6	ILLH FK QEB CLOH LC X IXODB QOBB LK QEB QOXFI
7	ILLH ILT KBXO QEB OLLQ LK QEB YXZH LC QEB CRKDRP ZLSBOBA QOBB
8	SFPFYIB COLJ QEB QOXFI LK X PQOXFDEQ MLPQ LXH QOBB XYLRQ 20 CBBQ XTXV
9	HKBB EFDE LK QEB YXZH LC QEB IXODBPQ LC QEB QTL ERDB YRO LXHP
10	TXFPQ EFDE LK X 6" AFXJBQBO QOBB TFQE TEFQB PMLQP
11	ZEBPQ EFDE LK QEB YXZH LC X ILKB QOBB FK X PJXII ZIBXOFKD
12	LK QEB QLM LC X YLXOATXIH PRMMLOQ KBXO X YBKZE XKA KXQROB NRLQB
13	RKABO QEB YOLTK JBQXI ZEBPQ XQ QEB YXZH LC QEB ZFZXAX MXSFIFLK

[1] Encryption Note: Although it can be done by hand, http://www.rot13.com/ with rot23 was used to encode the plain-text to the crypto-clue phrase. rot3 can be used to decode the crypto-clue back into plain-text.

COTTONWOOD TRAIL

Trailhead @ N 33° 03.951' W 96° 58.513'

1. N 33° 03.852' W 96° 58.666' (33.0642 -96.9778)

Sitting on the bench, note the Honey Mesquite tree above you at this location. While the mesquite is often regarded as a pest or weedy species, it did have an important role to play in human history. The tree's seed pods were a very important food for Native Americans in the desert Southwest. If you don't see any pods on the tree, search on the ground. The pods are rich in fiber, contain up to 39 percent protein, and taste sweet. They made up a very important food source for tribes such as the Comanche and Apache. Some Native Americans used the wood for bows, and settlers often used the wood for fence posts, tool handles, and furniture. The pods are also important food for deer, coyotes, rabbits, skunks, turkeys, quail, and other species of wildlife.

2. N 33° 03.733' W 96° 58.733' (33.0622 -96.9789)

The log house you see was built of native Post Oak logs around 1869 by William Minor, who came to North Texas from Alabama in the mid 1850's. The house is a beautiful example of log house craftsmanship during the mid to late-1800's. Looking closely at the expertly cut half-dovetailed corners and the way the logs were prepared, one can't help but respect the skill involved in building a home with the simple tools available (examples are hanging on the back wall of the home). More information regarding the history of this structure is on a sign on the fence on the north side of the house. You can check LLELA.org for upcoming open house dates and times.

All around the back steps you can see ant-lion funnels and you can often see clusters of Daddy Longlegs hanging from the joists under the house. They are not spiders and are totally harmless even if a little creepy.

COTTONWOOD TRAIL (cont)

3. N 33° 03.639' W 96° 58.798' (33.0607 -96.9800)

This wildlife-watcher's blind overlooks Beaver Pond, formed as the result of holes left over from digging dirt to construct the Lewisville Dam. It gets its water from rain, runoff and overflow flooding of the Elm Fork River. It extends far to the right all the way to the Kayaking Trail put-in point. It is normally 6-8 feet deep, but during drought years dries up completely and can be walked across without getting your feet wet. Many different birds make their homes in the surrounding trees and shrubs including Redwing Blackbirds, Great Egrets and Great Blue Herons. Plant species also abound here including Buttonbush and Black Willow. To the far left (out of sight) is a beaver lodge and dam that the pond is named after.

CICADA TRAIL

Trailhead @ N 33° 03.924' W 96° 58.515'

4. N 33° 03.777' W 96° 58.526' (33.0691 -96.9755)

The Elm Fork of the Trinity River probably took its name from the Cedar Elm. Winged Elms, Cedar Elms, and American Elms can be found in our area, but Cedar Elms are the most common. Cedar Elms are medium-sized trees growing up to 60 feet tall. They thrive in a wide variety of soil types and habitats. Cedar Elms produce flat, winged seeds in the fall, an important food source for Wild Turkeys. This tree species is a great favorite of Yellow-bellied Sapsuckers, who spend the winter in North Texas. Sapsuckers make a series of small holes through which sap oozes and is licked up by the birds. The sweet sap attracts butterflies and other insects, and birds who like to eat them. Look for rows of horizontal holes pecked in the bark of many of our Cedar Elms.

CICADA TRAIL (cont)

5. N 33° 03.709’ W 96° 58.516’ (33.0618 -96.9753)

The large Eastern Cottonwood which fell across the trail in the spring of 2017 may seem ancient, but actually the Cottonwood is one of our fastest-growing trees. A Cottonwood can reach a height of 60 feet in only 15 years, and a Cottonwood is considered old at only 75 years. When the wind blows, the large waxy leaves rustle, sounding like water if you close your eyes. When the cottony seeds are ripe, they burst from green capsules and drift on the wind.

6. N 33° 03.671’ W 96° 58.475’ (33.0611 -96.9746)

The streambed below is what remains of the original Elm Fork channel before the Lewisville Dam was built. After emerging from Lewisville Dam, the Elm Fork now flows through a man-made channel for about a mile before re-entering its historic channel. There are river views on LLELA’s Redbud Trail and Bittern Marsh Trail. It can be difficult to see through the trees, but in some spots along the channel you can still see the natural terraces created through stream/floodplain interaction when the river flooded. This formed a riparian (riverside) habitat for Eastern Cottonwood, Buttonbush, and other water-loving species. With the river gone, the ecology and species composition of this area is slowly changing.

BLACKJACK TRAIL

Trailhead @ 33° 03.743' W 96° 59.368'

7. N 33° 03.670' W 96° 59.454' (33.0612 -96.9909)

What appears to be a rotting pile of sticks or an unattractive dead tree to many people is actually a vital part of the ecosystem. Standing dead trees (snags) provide hollows and holes for cavity-nesting birds and a rich supply of termites and other insects to eat. Brush piles can provide shelter for reptiles, amphibians, small mammals and insects. Within the rotting wood and leaf litter is an unseen world of microbes, worms, and other tiny creatures. They feed on the fallen organic debris, carrying out the natural decomposition and composting process. The result is rich humus whose nutrients are once again available to growing plants. Even large trees that die and fall soon become covered by fungus and decompose.

8. N 33° 03.624' W 96° 59.498' (33.0604 -96.9916)

Post Oaks (notice a couple of examples here) are the dominant tree species in the Cross Timbers. This vegetative region once stretched from southeastern Kansas to central Texas in a forest belt that varied from 5-10 miles in width in our area. It rose out of the adjoining prairies, appearing as an immense wall of trees as settlers traveled from east to west. Why was this area mostly forested, rather than grassy? The answer is below your feet, in the Woodbine Sandstone that produced sandy/loamy soils in this area, different from the clay soils in the prairies. These soils support an open forest which mixes with prairie grasses and wildflowers in little open glades. The Texas Cross Timbers has become highly fragmented as cities in North Texas have expanded, and we are working to preserve the remnants found at LLELA.

BITTERN MARSH TRAIL

Trailhead @ 33° 04.777' W 96° 57.782'

9. N 33° 03.925' W 96° 57.791' (33.0654 -96.9632)

The scientific name for the Bur Oak, *Quercus macrocarpa*, means "oak with big fruit." It's a good name, as this species produces nuts up to two inches long, with large, fringed caps. As you might imagine, such a large nut is a boon to wildlife. Wild turkeys, woodpeckers, deer, squirrels, raccoons, and many other creatures depend on these acorns, particularly in the winter when other foods become scarce. Among the largest trees in Texas, Bur Oaks can grow to great heights, up to 100 feet or more. In addition to being an important food source, a Bur Oak gives nesting cover and shelter to many species.

10. N 33° 03.869' W 96° 57.769' (33.0645 -96.9627)

Humans aren't the only travelers on LLELA's trails. The trails provide an easy path through the forest for other animals as well. Be sure to watch as you hike for tracks of deer, coyotes, raccoons, and wild turkeys (below, in that order), as well as other forest travelers, especially if the ground is damp or muddy from a recent rain. You may often see animal scat (poop) on the trail as well.

Deer Coyote Raccoon Turkey

There are lots of Bur Oaks around this part of the trail as well as a number of other species – some even with white spotted trunks!

BITTERN MARSH TRAIL (cont)

11. N 33° 03.720' W 96° 57.528' (33.0620 -96.9588)

The wetland area you see from here is Bittern Marsh, an extremely important wildlife hotspot at LLELA. Like all wetlands, it provides a variety of wildlife and human benefits, including prairie-like clearings which provide multiple ecological niches.

- **Flood Control—Water flowing into a wetland spreads out and slows down as it flows through wetland plants. Healthy wetlands decrease flood damage to surrounding areas.**
- **Silt Catching—When flood waters are slowed by wetlands, they drop sediments among the plant stems. This protects downstream water bodies from silting up.**
- **Erosion Control—The roots of wetland plants bind the soil, and the plant stems slow the water velocity, reducing its impact.**
- **Water Purification—Wetlands improve water quality by trapping sediments and retaining excess nutrients as well as toxic pollutants such as heavy metals.**
- **Nature's Nurseries—There is more life in one acre of healthy wetland than in an acre of almost any other kind of habitat. Wetlands are havens for wildlife, including about 35% of all plants and animals listed as threatened or endangered in the United States.**

12. N 33° 03.780' W 96° 57.915' (33.0630 -96.9652)

The areas of "orange goo" occasionally seen in the creeks in this winding section of the Bittern Marsh Trail are not pollution. Instead, they are colonies of naturally-occurring bacteria. Slimes, oil-like films, and rock coatings are often made by bacteria that are reacting to the presence of iron and manganese in the water. Along this portion of the trail you will also see large Black Walnut trees, Buttonbushes and a variety of other water loving plants. The boardwalk over the marsh has a number of benches near signs with nature-related philosophy.

While not part of the Geocache Adventure, be sure to take the two side trails to both boardwalks and Wildlife Viewing Blinds overlooking Bittern Marsh.

FINAL CACHE!

13. N 33° 03.939’ W 96° 58.491’ (33.0657 -96.9749)

The last stage is an actual Geocache – a large Ammo Can, filled with trade items and a log book! Remember to Take One Leave One and sign the log. (…Yes, it is possible to just go to the last stage without finding the 12 on the trails, but try to have fun with this!)

LLELA GEOCACHE ADVENTURE PUZZLE

Once all the letters at each location have been found and recorded, put them in this order.

Please do not write in the binder provided to you – use a separate piece of paper or your smartphone.

_ _ _ _ _ _ _ _ _ _ _ _

3 12 10 11 6 9 1 4 7 8 2 5

Once you have finished and discovered the phrase, go to the gatehouse and pick up your Geocaching fun patch! (Note that there are trade items and a logbook at Stage 13, but the patches are only given out at the gatehouse.)

****** Note that it often takes more than one visit to LLELA to hike all the trails and find all the letters, especially if you have young children in your group. If you hiked a trail and had fun learning new things, please FEEL FREE to ask for a patch even if you DID NOT complete all 12 geocache locations. The main goal is to have FUN!***

